Development of Demand Response Mechanism

Baseline Consumption Methodology – Phase 2 Results

Final Report

Australian Energy Market Operator
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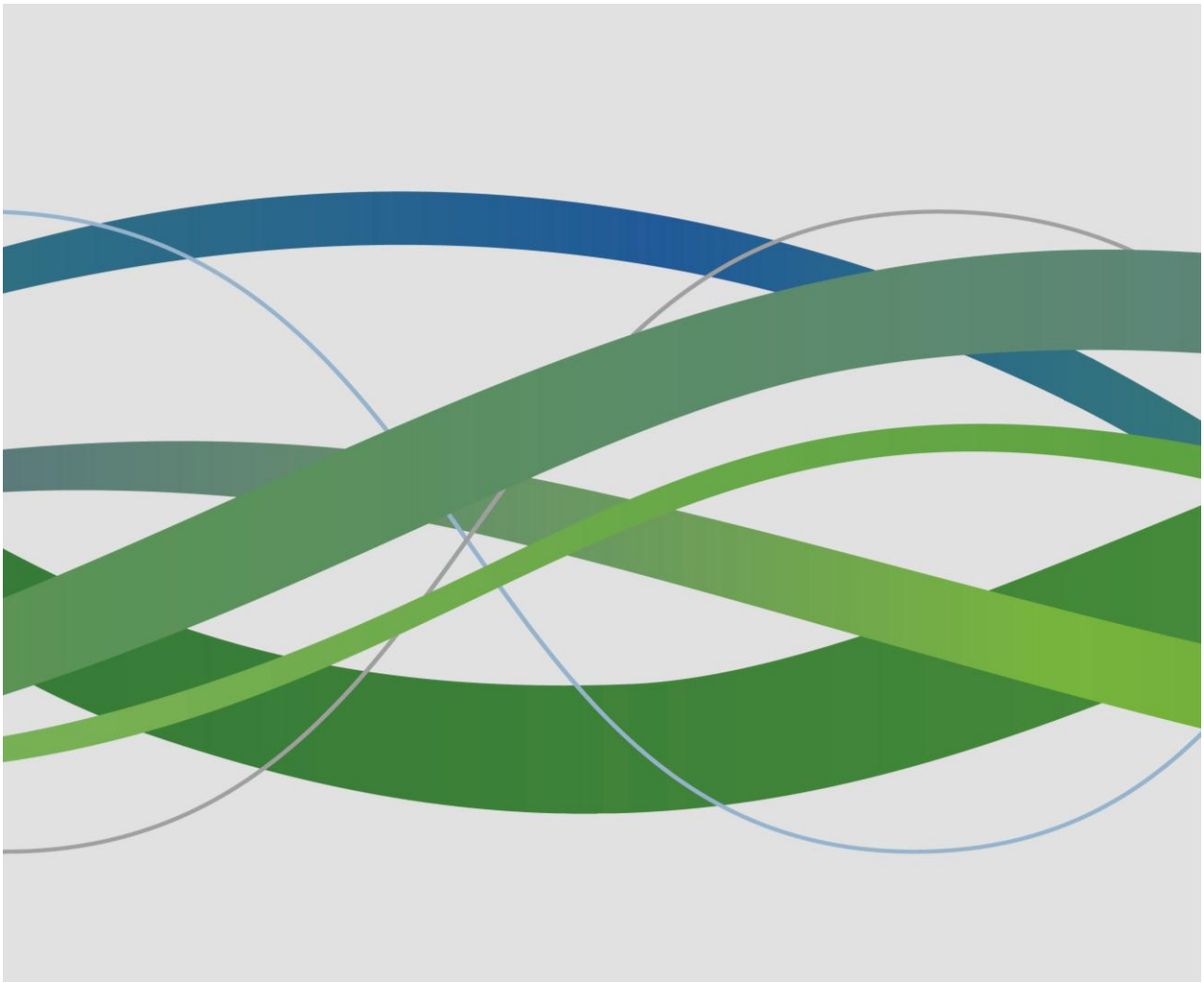

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E. Executive Summary

In November 2012 the Australian Energy Market Commission (AEMC) released its final report for the Power of Choice Review[1]. This report set out recommendations for market conditions that facilitate Demand Side participation. One of the recommendations was to have the Australian Energy Market Operator (AEMO) develop a rule change proposal establishing a new Demand Response Mechanism (DRM). This would allow consumers (or third parties acting on behalf of consumers) to directly participate in the wholesale market.

In January 2013 the Standing Council on Energy and Resources (SCER) requested the AEMO to lead the development of this DRM. To assist in this work the AEMO commissioned DNV KEMA to provide advice on the construct and concepts surrounding the development and implementation of a baseline consumption methodology for the implementation of the DRM in the National Electricity Market (NEM). The purpose of the study is to provide AEMO with technical advice regarding the following:

- How has DRM and baseline consumption methodology been *implemented* in other electricity markets;
- Identify components of DRM and baseline consumption methodology that *perform well* and those that *need improvement* in other electricity markets;
- What *lessons can be learnt* to advise AEMO on the development of the baseline consumption methodology for the DRM implementation in the NEM; and
- *Test the efficacy* of potential baseline consumption methodology options using customer data provided by NEM.

The study was conducted in two phases. Phase 1 included research into the baseline methodologies in use at the various United States (US) Independent System Operators (ISOs). A Phase 1 report was completed in July 2013 and entitled "Development of Demand Response Mechanism – Baseline Consumption Methodology Phase 1 Results".

This report presents the Phase 2 findings which involved the testing of the efficacy of potential baseline consumption methodologies and to consider how some of these baselines perform with data from

[11] AEMC 2012, Power of Choice Review – giving consumer options in the way they use electricity, Final Report, 30 November 2012, Sydney

Australian customers. The Phase 2 analysis was designed to examine the issues surrounding the development of accurate baselines. Specifically, the objectives of the project were to:

1. Determine the accuracy and bias of a variety of CBL methods;
2. Determine the feasibility of administering each CBL method for all market participants under consideration; and
3. Attempt to develop objective criteria to associate a customer load with a specific CBL method if this will result in significantly improved accuracy, less bias and less variability.

The remainder of this report focuses on the Phase 2 analyses.

E.1 Phase 2 Analyses

The Phase 2 analyses used a very large, robust sample of likely program participants, over a multiple year frame. The project team tested a broad range of representative baselines and commonly accepted adjustment approaches using multiple metrics to define the baselines' efficacy.

The analysis:

- Was based on data requested from across the NEM representing each State. In total, data for 10,000 likely participants were provided for analysis with a minimum consumption threshold set at 100 MWh per annum.
- Focused on a large random sample of approximately 2,500 customers[2] selected from the original data transfer.
- Included half hourly load data from July 1, 2011 through June 30, 2013.
- Featured a total of nine baselines, with up to four variants of each baseline for a total of 36 different CBL and adjustment methods analysed. The variants represent common adjustments to the baseline approaches.
- Examined the baselines performance on 83 candidate event days (62 weekdays and 21 weekend days) that were defined based on regional load characteristics, weather and pricing.
- Used three metrics to establish the baselines' statistical properties. These metrics measured each baseline's accuracy, variability and bias.

[2] The sample was selected to reduce the processing time for the computer simulations. Based on discussions with AEMO staff, the project team drew the sample for customers with a 2012 maximum demand greater than 175 kW. Following a preliminary review, the project team conducted additional analysis on the 2,469 customers excluded from the original sample draw to ensure the results were robust regardless of customer size.

- Resulted in calculating more than 120 million estimated baselines (customers * baselines * days).

E.1.1 Baseline Protocols and Adjustments

The analysis featured a total of nine baselines, with up to four variants of each baseline. The variants represent the unadjusted baseline and three common, same day, adjustments to the baseline including an additive adjustment, a multiplicative adjustment, and a multiplicative capped adjustment. Accordingly, there were 36 different baseline/variants combinations included in the analysis. The nine baselines included in the analysis are:

1. PJM Economic;
2. Middle 4 of 6 Preceding Like Days (Tested for PJM);
3. PJM Emergency Comparable Day, Non-weather Sensitive;
4. PJM Emergency Same Day;
5. PJM Emergency Comparable Day, Weather Sensitive;
6. ISO New England ("ISONE") Standard;
7. California ISO ("CAISO") Standard;
8. Weekend Middle 2 of 4; and
9. Weekend PJM Economic.

Please note, regression based baselines were excluded from the analysis due to the following factors:

- More difficult to implement and administer;
- More challenging to explain to participants;
- Have been found in other analyses to not outperform the more common baselines tested.

E.1.2 Performance Metrics

Three statistics were chosen to measure the three quantitative aspects of baseline performance:

1. Accuracy,
2. Bias, and
3. Variability.

Accuracy

The attribute given the most emphasis in the analysis was **accuracy**, or how closely a baseline method predicts customers' actual loads in the sample. The statistic chosen to measure accuracy was the baseline's relative root mean squared error (RRMSE). This statistic expresses the baseline's average half

hourly accuracy as a fraction of average hourly load. An RRMSE for an individual customer of 0.1, for example, means that the customer's estimated baseline is typically[3] within 10 percent of the actual load. For a given customer, some hours will have a higher difference and some smaller. For a group of customers, a median RRMSE of 0.1 means that for the typical customer the estimated baseline is typically within 10 percent of the average load. Since not all customers are typical, some will have a higher typical difference, and some smaller.[4]

The RRMSE is based on squared prediction errors. This technique in essence weights large errors much more heavily than small or midsized errors. In contrast, the errors are weighted evenly with a technique that measures errors based on the absolute values of the prediction errors. This means that the effect of large half hourly errors in the predicted load will result in a higher RRMSE as opposed to a mean absolute percentage error (MAPE).

Bias

The second baseline attribute analysed was **bias**, or the systematic tendency of a baseline method to over- or under-predict actual loads. Bias was measured using the baseline's average relative error (ARE). This statistic, for a given customer, is the average half hourly baseline less the average half hourly actual load, expressed as a fraction of actual half hourly load. A median ARE value of zero would indicate that the typical customer in our sample had no systematic tendency to over- or under-predict loads using that baseline, whereas a positive value would indicate a tendency to over predict and a negative value having the tendency to under predict loads. The closer ARE is to zero, the closer the baseline is to being unbiased.

Variability

The third baseline attribute analysed was **variability**, or how well the baseline does at predicting half hourly load under many different conditions and across many different customers. For example, two baselines may have the same RRMSE but one baseline may be able to better estimate half hourly load across a wider variety of situations such that the dispersion of errors is much closer to actual load than the other baseline. In other words, one baseline may estimate the load shapes more closely than the other baseline. The variability measurement chosen was the relative error ratio (RER), which is the standard deviation of the baseline's prediction errors expressed as a fraction of average load. The smaller the median RER, the less variable a baseline's error is for the typical customer and therefore the better the baseline performs across a wide variety of circumstances.

[3] In this context, typically means on the order of 2/3 of the time.

[4] The RRMSE combines the systematic errors measured by the ARE (bias) and the variability of errors captured by the RER (variability). For this reason, the overall accuracy measure was given primary emphasis in the study.

It should be noted that the accuracy, bias and variability were all calculated for the 10th percentile, median, mean and 90th percentile for each baseline method within each segment. This allows for a detailed analysis of the different baselines across a wide variety of circumstances to get a thorough understanding of how well each baseline estimates a customer actual half hourly load. The 10th percentile in effect illustrates an expected "top" case performance scenario while the 90th percentile illustrates a "bottom" case performance scenario so an analyst can understand the range of expected outcomes for the various metrics.

As an example, based on one of the top performing baselines in this analysis (CAISO 10 of 10 with an additive adjustment) we find:

- Accuracy represented by median RRMSE is 0.10
  - 10th percentile Accuracy is 0.05
  - 90th percentile is 0.22
- Variability represented by RER is 0.10
- Bias represented as ARE is 0

Simply put, one can expect the baseline to predict the typical customer's half hourly load within ±10% of their actual load most of the time, while accurately estimating the load shape over time with no tendency to over or underestimate. For 1 in 10 customers this estimate will be much better, typically within ±5% of actual half hourly load, while for 9 of 10 customers the prediction will typically be no worse than ±22% of the actual load.

E.2 Accuracy, Bias and Variability Results

The following sections present baseline performance results for the trimmed data set that excludes customers with a maximum demand below 175 kW and "highly variable" customers[5].

E.2.1 Accuracy

A comparison of the accuracy metric among the baselines tested is presented in Table 1. The results are sample medians of each metric, and are colour coded for ordering. Across all baselines and adjustments, the baseline with the smaller number or "greener" colour can be considered better than baselines with

[5] For this analysis, highly variable customers were defined as those customers with a variability index above the 85th percentile, (i.e., removing the top 15% highly variable customers). For determining highly variable load customers we first removed the variability due to weather and then calculated Theil's U-statistic which is the relative root mean squared error (RRMSE). A Thiel's U value greater than 0.40 was used as the cut point and was chosen to ensure the AEMO results were consistent with an earlier PJM examination. For PJM, this value represented the top 20 percent of highly variable customers.

higher numbers or "redder" colours. The values in the table are rounded, so the underlying data may produce slightly different shades for values that appear to be the same.

Table 1 Comparison of Accuracy of Baselines[6]

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.143	0.151	0.146	0.141	0.142	0.149	0.151		0.187	0.197
Additive Adjustment	0.107	0.108	0.127	0.142	0.123	0.101	0.103		0.136	0.141
Multiplicative Adjustment	0.109	0.110	0.132	0.142	0.127	0.102	0.103		0.137	0.139
Multiplicative Adjustment (Cap)	0.111	0.114	0.135	0.143	0.126	0.106	0.109		0.143	0.145

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

The comparison in the table highlights the superiority of baselines with same day, load-based adjustments. Across a range of different baselines, both the additive and multiplicative adjustments provide a significant improvement to the accuracy of the underlying baseline and therefore represent the best performance. The performance difference from the use of an additive adjustment when compared to a multiplicative adjustment is insignificant. The CAISO and ISONE baselines had slightly better, although relatively insignificant, empirical performance relative to the other X of Y type baselines (such as the PJM 4 of 5 or PJM 4 of 6). This is based purely on the empirical performance and does not consider the feasibility and administration involved or other factors that might go into the selection of a final baseline.

E.2.2 Bias

The baselines highlighted above also perform well with respect to bias as shown in Table 2.

Table 2 Comparison of Bias of Baselines[7]

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.003	0.030	0.013	0.055	0.004	0.039	0.034		0.027	0.025
Additive Adjustment	0.008	0.000	0.003	0.013	0.004	0.000	0.000		0.000	0.008
Multiplicative Adjustment	0.009	0.001	0.007	0.013	0.007	0.001	0.001		0.002	0.012
Multiplicative Adjustment (Cap)	0.005	0.007	0.003	0.036	0.001	0.006	0.007		0.011	0.014

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

[6] Note that each table presented uses a colour coding scale relative to the results contained within the weekday and weekend results of each table. The colour coding scale is not consistent among all tables in the report given that results are meant to be colour coded to show relative performance within each table's results.

[7] Note the bias statistics are presented in absolute terms for comparison purposes.

The level of bias was non-existent or extremely small, i.e., less than 1%, for all CBLs with the additive and multiplicative adjustments. Unadjusted baselines appeared to be more susceptible to bias, for example the PJM Same Day, which resulted in a 5.5% bias for the typical customer. A 1% positive bias indicates that the CBL will be estimated 1% too high for the typical customer during a likely summer event day. Examining the distribution of the statistic for the entire sample of customers provides an indication of the veracity of the estimate. Table 3 presents the distribution of bias for the CAISO additive adjustment. A full 80% of the customer data (10^{th} to 90^{th} percentile) ranged between an under estimation of 1.7% (-0.0170) to an over estimation of 1.7% (0.0172). Several baselines, including the CAISO 10 of 10 with the additive adjustment) were found to be unbiased for the typical customer as represented by a zero value in Table 2.

Table 3 Bias Distribution: CAISO with Additive Adjustment

Statistic	CAISO (10 of 10)
count	2117
10^{th} Percentile	-0.0170
Median	0.0000
Mean	-0.0004
90^{th} Percentile	0.0172

E.2.3 Variability

Table 4 presents the overall comparison of the variability metric among the baselines. Similar to the discussion represented above for accuracy, the use of a multiplicative or additive adjustment provide a significant reduction in the variability of the CBL performance which make it a better estimator. Again, the X of Y approaches are all comparable, with the CAISO and ISONE performing slightly better.

Table 4 Comparison of Variability of Baselines

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.142	0.146	0.144	0.102	0.141	0.140	0.144	Weekends	0.182	0.191
Additive Adjustment	0.106	0.107	0.126	0.120	0.122	0.101	0.103		0.133	0.139
Multiplicative Adjustment	0.108	0.109	0.131	0.120	0.127	0.100	0.102		0.136	0.137
Multiplicative Adjustment (Cap)	0.110	0.113	0.135	0.115	0.125	0.104	0.107		0.140	0.143

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

E.3 Segmentation

One of the goals of the evaluation was to determine whether or not customers should be segmented and then aligned to different CBLs in order to achieve more accurate results. Our criterion for choosing which segments to consider was that the segments should be sufficiently transparent that the market would readily understand which CBL goes with what type of customer.

The following customer segments were chosen to be evaluated as part of the analysis:

- Size of customer, based on demand[8];
- Customers with weather sensitive load versus customers with non-weather sensitive load;
- Customers with variable load versus customers with non-variable load; and
- Regional location, i.e., North versus South.

E.3.1 Segmentation by Customer Size

Table 5 presents a summary of the "Accuracy" statistic based on customer size as measured by the 2012 maximum demand of the customer. Examination of the table indicates that the same baseline strategies perform consistently across all size categories. The X of Y, ISONE, and CAISO baselines all perform similarly as long as an adjustment is allowed. On the weekends, the weekend 2 of 4 seems to perform best. Given these results, there is no apparent reason to segment by size.

[8] For this analysis, the customers excluded earlier based on magnitude of 2012 maximum demand were included as a separate size category.

Table 5 Accuracy of Baselines Segmented by Customer Size

Size Category	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Up to 175 kW (n=2,184)	Unadjusted Baseline	0.134	0.138	0.127	0.124	0.135	0.136	0.136	Weekends	0.162	0.162
	Additive Adjustment	0.110	0.109	0.130	0.147	0.129	0.103	0.105		0.128	0.132
	Multiplicative Adjustment	0.113	0.113	0.135	0.147	0.135	0.105	0.107		0.134	0.137
	Multiplicative Adjustment (Cap)	0.112	0.112	0.129	0.142	0.130	0.105	0.107		0.130	0.134
175 kW to 500 kW (n=1,355)	Unadjusted Baseline	0.145	0.151	0.146	0.137	0.137	0.149	0.150	Weekends	0.189	0.198
	Additive Adjustment	0.109	0.109	0.128	0.144	0.122	0.103	0.105		0.140	0.146
	Multiplicative Adjustment	0.111	0.112	0.134	0.144	0.127	0.103	0.105		0.141	0.144
	Multiplicative Adjustment (Cap)	0.112	0.114	0.135	0.147	0.124	0.106	0.109		0.145	0.149
500 to 2,000 kW (n=471)	Unadjusted Baseline	0.141	0.147	0.144	0.160	0.144	0.143	0.147	Weekends	0.184	0.199
	Additive Adjustment	0.103	0.104	0.122	0.135	0.123	0.098	0.099		0.132	0.140
	Multiplicative Adjustment	0.104	0.104	0.128	0.135	0.126	0.097	0.098		0.135	0.138
	Multiplicative Adjustment (Cap)	0.106	0.110	0.133	0.140	0.126	0.101	0.103		0.141	0.148
2,000 to 10,000 kW (n=141)	Unadjusted Baseline	0.138	0.147	0.144	0.126	0.170	0.148	0.152	Weekends	0.176	0.184
	Additive Adjustment	0.096	0.101	0.119	0.118	0.116	0.094	0.094		0.106	0.116
	Multiplicative Adjustment	0.099	0.098	0.128	0.118	0.125	0.093	0.093		0.112	0.118
	Multiplicative Adjustment (Cap)	0.109	0.115	0.131	0.123	0.144	0.100	0.108		0.133	0.134
Over 10,000 kW (n=50)	Unadjusted Baseline	0.192	0.197	0.196	0.105	0.251	0.198	0.200	Weekends	0.179	0.176
	Additive Adjustment	0.133	0.137	0.159	0.147	0.178	0.123	0.127		0.110	0.109
	Multiplicative Adjustment	0.134	0.140	0.165	0.147	0.195	0.124	0.130		0.111	0.108
	Multiplicative Adjustment (Cap)	0.146	0.148	0.161	0.140	0.222	0.141	0.142		0.137	0.117

Color coded, green = good, rank over rows within size category. Weekend baselines are color coded independently.

The size segmentation shows that baselines for smaller and very large accounts are slightly less accurate. This is likely due to the greater diversity of business types in the smaller account segments. Other than this observation, the segmentation by size provides little additional perspective on the choice of optimal baseline.

E.3.2 Segmentation by Weather Sensitivity

Table 6 presents the overall results after segmenting by weather sensitive load. Examining Table 6 indicates that the same four baselines, i.e., the two X of Y type baselines, ISONE and CAISO with same day load-based adjustments are equally effective across non-weather and weather sensitive segmentations. Our conclusion is that there is no need to segment based on weather sensitivity because the use of a same day adjustment improves both the non-weather sensitive and weather sensitive segments.

Table 6 Accuracy of Baselines Segmented by Weather Sensitivity

Weather Sensitive	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Not Weather Sensitive	Unadjusted Baseline	0.097	0.100	0.099	0.100	0.115	0.099	0.099	Weekends	0.116	0.114
	Additive Adjustment	0.086	0.085	0.102	0.108	0.105	0.081	0.082		0.100	0.104
	Multiplicative Adjustment	0.087	0.088	0.106	0.108	0.108	0.082	0.084		0.103	0.105
	Multiplicative Adjustment (Cap)	0.087	0.087	0.101	0.108	0.108	0.082	0.083		0.101	0.106
Weather Sensitive	Unadjusted Baseline	0.171	0.177	0.163	0.148	0.153	0.175	0.176	Weekends	0.213	0.209
	Additive Adjustment	0.136	0.137	0.159	0.189	0.151	0.127	0.130		0.160	0.163
	Multiplicative Adjustment	0.141	0.142	0.168	0.189	0.161	0.130	0.132		0.171	0.168
	Multiplicative Adjustment (Cap)	0.137	0.140	0.155	0.178	0.151	0.130	0.133		0.168	0.165

Color coded, green = good, rows are ranked within each category. Weekend baselines are color coded independently.

A common structure of DR programs stipulates an unadjusted baseline for all accounts with an option for a same-day, load-based adjustment for accounts that are weather sensitive. This assumes that the non-weather sensitive accounts do not materially improve with the same-day adjustment. Our analysis seems to indicate that there is sufficient improvement in accuracy to warrant a same day adjustment even for the non-weather sensitive accounts. While it is true that the same-day, load-based adjustment does not improve the accuracy for non-weather sensitive accounts to quite the same degree, there is still an improvement of 10 to 20 percent. A decision to forgo the load-based adjustment should be based on other considerations, such as administrative costs and/or non-typical event day behaviour (e.g.: pre-cooling).

E.3.3 Segmentation by Load Variability

Table 7 presents the accuracy of the baseline approaches based on a segmentation based on non-weather related load variability. Clearly these results indicate that the accuracy of the baseline erodes with increased load variability. The accuracy is exceptional for loads displaying low levels of variability. For the interquartile range of customers, i.e., variability category medium, the accuracy doubles but is still a very reasonable ±11 to ±12%. However, the "high" variable load category shows accuracy values that range above ±20%. It is important to note that these results are calculated after removing the most variable customers, i.e., the top 15% of the variable load customers. Whenever a customer's load is uncorrelated with any identifiable previous load pattern, no generalized baseline methodology can produce a consistent, effective baseline.

Table 7 Accuracy of Baselines based on "Variable Load" Segmentation

Variability Category	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Low (n=624)	Unadjusted Baseline	0.090	0.093	0.093	0.078	0.081	0.094	0.094	Weekends	0.119	0.113
	Additive Adjustment	0.068	0.069	0.082	0.088	0.074	0.064	0.066		0.081	0.083
	Multiplicative Adjustment	0.070	0.070	0.085	0.088	0.076	0.065	0.067		0.084	0.085
	Multiplicative Adjustment (Cap)	0.069	0.070	0.088	0.091	0.075	0.065	0.066		0.082	0.084
Med (n=1,250)	Unadjusted Baseline	0.162	0.170	0.163	0.159	0.165	0.167	0.169	Weekends	0.213	0.219
	Additive Adjustment	0.123	0.125	0.144	0.160	0.140	0.116	0.118		0.152	0.158
	Multiplicative Adjustment	0.125	0.127	0.148	0.160	0.147	0.116	0.118		0.154	0.158
	Multiplicative Adjustment (Cap)	0.127	0.131	0.150	0.157	0.147	0.120	0.124		0.160	0.164
High (n=243)	Unadjusted Baseline	0.289	0.304	0.292	0.241	0.421	0.305	0.311	Weekends	0.379	0.402
	Additive Adjustment	0.231	0.233	0.281	0.303	0.294	0.222	0.224		0.311	0.327
	Multiplicative Adjustment	0.232	0.240	0.301	0.303	0.321	0.219	0.226		0.317	0.324
	Multiplicative Adjustment (Cap)	0.249	0.267	0.281	0.258	0.360	0.244	0.263		0.333	0.343

Color coded, green = good, rank rows within category. Weekend baselines are color coded independently.

Other ISOs in the US are struggling with this same issue, i.e., baseline approaches considered in this analysis may not be applicable for customers with certain kinds of highly variable loads. The project team has had additional discussions with PJM regarding actions they are taking with regard to high variable load customers. PJM defines a high variable load customer as someone with an RRMSE greater than 20% during 60 simulated event periods[9]. PJM has used what they consider a rather simple, conservative load estimate by calculating the average minimum load during the event window for the five days prior to the actual event (Maximum Base Load approach). They also offer the use an approach called the "Same Day (3+2)" approach. This approach averages the three hours before the event starts (after skipping the first hour before the event) and the two hours after an event stops (after skipping the first hour after the event). An additional "Match Day (3 Day Average)" approach is available that look at matching non-event hours on event days with three "matched days" based on the lowest squared deviation of the non-event hours. The "Match Day" approach reaches back 45-60 days prior to the event. Clearly, what to do with high variable load customers continues to be a challenge.

E.3.4 Segmentation by Region

Table 8 presents the accuracy of the baseline approaches based on a segmentation based on geographic region. For this analysis, the Queensland area was defined as Region 1=North and all other areas were grouped together and defined as Region 2=South. While the accuracy is somewhat better, ±9% compared to ±11% for the North region, the "best" baselines are consistent between the two regions. There seems to be no discernible benefit for selecting different baselines for the different regions.

[9] *PJM Manual 11: Energy & Ancillary Services Market Operations*, Revision 62, August 30, 2013

Table 8 Accuracy of Baselines based on Regional Segmentation

Region	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
1=North	Unadjusted Baseline	0.122	0.128	0.127	0.138	0.120	0.128	0.130	Weekends	0.185	0.199
1=North	Additive Adjustment	0.091	0.091	0.111	0.119	0.107	0.085	0.087		0.133	0.139
1=North	Multiplicative Adjustment	0.092	0.093	0.115	0.119	0.111	0.086	0.088		0.137	0.137
1=North	Multiplicative Adjustment (Cap)	0.095	0.095	0.124	0.131	0.111	0.088	0.092		0.143	0.143
2=South	Unadjusted Baseline	0.158	0.164	0.154	0.143	0.154	0.161	0.163	Weekends	0.188	0.195
2=South	Additive Adjustment	0.118	0.118	0.139	0.154	0.133	0.111	0.113		0.138	0.143
2=South	Multiplicative Adjustment	0.119	0.120	0.144	0.154	0.136	0.110	0.112		0.138	0.140
2=South	Multiplicative Adjustment (Cap)	0.120	0.124	0.142	0.151	0.136	0.113	0.117		0.143	0.147

Color coded, green = good, rank over all rows within Region. Weekend baselines are color coded independently.

E.3.5 High Variable Load Customers

In the analyses the project team noted that high variable load customers did not perform particularly well. This result is consistent with work completed for PJM[10]. In PJM, high variable load customers are identified based on their relative root mean square error (RRMSE) during the targeted event period looking back 60 days[11]. If the customer has an RRMSE greater than 20% (i.e., 0.20) then the customers are labelled as "high variable load" customers and handled separately. We conducted a similar analysis on the full sample of customers using the CAISO, PJM Economic, and Middle 4 of 6 baseline methods (given these are top-performing baselines). All three baselines display similar characteristics and would identify (and exclude) approximately the top 25% as high variable load customers.

E.4 Administration

The ultimate results and conclusions are based on the baselines' empirical performance as well as the estimated cost, across all market participants, to administer the baselines. Market participants must be cognizant of the cost and complexity of administering one or more selected CBLs.

Administrative costs and the associated level of investment in activities such as data transfer, data quality review, analysis, training, and IT systems requirements need to be considered for a simple baseline, a baseline of medium complexity, and a complex baseline methodology. Results consistent with earlier work indicate that the annual total cost to administer a complex baseline methodology is more than three times as much as a simple baseline methodology[12]. For market participants the baseline operational feasibility is an important factor when determining the CBL to be utilized. As represented in the

[10] *PJM Empirical Analysis of Demand Response Baseline Methods*, KEMA April 20, 2011

[11] *PJM Manual 11: Energy & Ancillary Services Market Operations*, Revision 62, August 30, 2013

[12] *PJM Empirical Analysis of Demand Response Baseline Methods*, KEMA April 20, 2011

empirical analysis above, many of the CBLs with an additive or multiplicative adjustment have very similar results. In these instances, the administrative costs become a significant factor in determining which CBL to choose.

E.5 Recommendations

This selection summarizes the recommendations of the project team. Selection of an appropriate CBL must consider the results of the empirical analysis, the expected administrative costs, and any other known issues based on the previous practical experience of other ISOs.

- **Utilizing an additive adjustment is recommended.** The analysis clearly indicates that a same day additive or multiplicative adjustment has superior performance to an unadjusted CBL or a CBL using the PJM weather sensitive adjustment. The decision of whether to use a multiplicative or additive adjustment is fairly arbitrary because the impact on the performance metrics is not significant. However, due to a somewhat greater susceptibility of multiplicative adjustments to gross inaccuracies under certain demand conditions, we recommend that an additive adjustment be utilized.

- **Highly variable load customers should be segmented for purposes of applying a different CBL.** The ISONE and the X of Y CBLs (i.e., CAISO, PJM economic and mid 4 of 6) with a same day additive adjustment have similar results and performed well across all segments, time periods and weather conditions, except for predicting loads for highly variable load customers. It is therefore recommended that variable load customers be segmented for the purposes of applying a different CBL and/or market rule. Here again, some guidance can be gained from PJM and their "simplified" approach of using a "maximum base load" method, i.e., the average minimum load during the event window for the previous five weekdays.

- **Administrative and other factors are important considerations in the final determination of a CBL or CBLs.** Since the empirical results for non-variable load customers are similar, it is important to understand the administrative cost and other factors in the final decision. Table 9 presents a comparison of the four approaches.

- **The ISONE CBL, has slightly better empirical performance than the other methods, however, it entails significantly more administrative costs.** The higher administrative costs are driven from the requirement of contiguous load data (since each baseline is based on the prior day's baseline). This approach also requires additional administration to ensure transparency to all market participants, and requires significantly more administration for settlement adjustments that result in corrections in load data. Since the empirical performance of the ISONE baseline is only marginally better than that of the remaining two, it is not apparent that this additional administrative effort is warranted and therefore is not recommended.

Table 9 Summary of Results for Likely Event Weekdays, all Sizes of Customers, for All Weather Customers, with Non-Variable Load

Baseline	Accuracy	Bias	Variability	Administration	Strategic behaviour
ISONE w/additive adjustment	10%	0%	10%	Requires continuous meter data, difficult to make calculation transparent, admin for adjustments	Impact of pre-cooling[13]
CAISO w/additive adjustment	10%	0%	10%	Requires 10 non-event days	Impact of pre-cooling
PJM economic w/additive adjustment	11%	1%	11%	Requires limited load data based on specific reductions (5 non-event days, will use 4 if necessary) Currently implemented & minimum changes	Impact of pre-cooling Specific limit on how far to go back for CBL days (avoid issue with frequent settlements forcing outdate CBL days)
Middle 4 of 6 w/additive adjustment	11%	0%	11%	Requires 6 days (assumes same rules used for PJM economic CBL will be used)	Impact of pre-cooling Specific limit on how far to go back for CBL days (avoid issue with frequent settlements forcing outdated CBL days)

- **The remaining three CBLs, the PJM economic, the middle 4 of 6, and the CAISO are reasonably similar in terms of empirical performance and ease of administration.** We should note that the CAISO approach requires nearly twice the load data to provide similar results to the remaining two. Also, the true impact of customers that have frequent DR events has not been considered in this analysis. This issue may have a bigger impact on the CAISO baseline since it requires more days to be selected (as more event days occur, more days closer to the event are skipped which results in the use of days further from the event day). Therefore we would recommend consideration be given to one of the two remaining PJM identified approaches.

- **We recommend implementing DRM using two baseline methodologies to start.** Since AEMO is just launching their demand response market, the project team believes that it is appropriate to start simple and gain some practical experience before opening up the market to a wider array of baseline offerings. Therefore, we are recommending starting with a single weekday baseline and a single weekend baseline (both using the additive adjustment). There are three viable candidates for the weekday baseline, i.e., CAISO, PJM (M4of6) and PJM (H4of5). For the weekend, we recommend the M2of4.

- **If multiple baselines are used, then demand response aggregators (DRAs) should be allowed to select the baseline.** If AEMO wants to offer more than one baseline, then the experience in other regions that allows the DRA to choose seems to work well and it does not create undue or inappropriate results. It is worth noting that selecting a better performing baseline does not, in and of itself, suggest a gamed result. It may well be the case that the lower performing baseline is

[13] Customer would need to significantly increase load for 3 hours, 4 hour prior to event, only on event days, to have impact.

unduly depressing the value of the resource because of some inherent load character. Further, where gaming has occurred through the use of unique bidding strategies, for instance, other market monitoring oversight is able to address the issues. Thus, given the costs associated with creating infrastructure and capabilities that would be new to AEMO and otherwise unnecessary in order to assign baselines to specific loads on a case by case basis, allowing DRAs to select the baseline is a reasonable and cost effective approach when combined with overall market monitoring for inappropriate behaviour.

- **We support the use of unscheduled DRM in NEM.** As indicated in the previous table, pre-cooling, while justified operationally, can cause an artificially higher baseline than normal when an adjusted CBL scenario is employed. The use of unscheduled demand response in NEM will help mitigate this concern.

- **Scalability of systems and processes related to the administration of the CBLs should be considered.** Other ISOs have used simple approaches including spreadsheet based solutions for their pilots and/or early implementations. Key needs as volume grows are robust databases to capture bidding[14] and validation data and some automatic or semi-automatic system for processing the data through the baselines.

- **Strategic behaviour in the market to artificially inflate the CBL should not be permitted.** Any CBL can be manipulated to the market participant's economic advantage, and it is recommended that rules be established to identify and mitigate this behaviour. The opportunity to conduct this activity increases when the reduction event is announced well in advance of the start of the event; there is no ongoing oversight to identify and review activity; and the market participants can determine exactly when they need to respond.

[14] AEMO does not anticipate allowing bidding into the DRM initially.

Demand Response Mechanism
Baseline Consumption Methodology

Management Report on Phase 2 Results

1. Introduction

1.1 Purpose

The Australian Energy Market Operator (AEMO) hired DNV KEMA to provide advice on the construct and concepts surrounding the development and implementation of a baseline consumption methodology for the implementation of the Demand Response Mechanism (DRM) in the National Electricity Market (NEM). The purpose of this study is to provide AEMO with technical advice regarding the following:

- How has DRM and baseline consumption methodology been *implemented* in other electricity markets;
- Identify components of DRM and baseline consumption methodology that *perform well* and those that *need improvement* in other electricity markets;
- What *lessons can be learnt* to advise AEMO on the development of the baseline consumption methodology for the DRM implementation in the NEM; and
- *Test the efficacy* of potential baseline consumption methodology options using customer data provided by NEM.

The study was conducted in two phases. Phase 1 included research into the baseline methodologies in use at the various United States (US) Independent System Operators (ISOs). A Phase 1 report was completed in July 2013 and is entitled "Development of Demand Response Mechanism – Baseline Consumption Methodology Phase 1 Results". This report presents the Phase 2 findings which involved testing the efficacy of potential baseline consumption methodologies on a large sample of loads selected from across the NEM footprint.

1.2 NEM System

Figure 1 presents a map of the regional boundaries for the NEM along with the aggregate system load from July 1, 2011 through June 30, 2013. The territory spans the eastern part of the continent from Queensland in the North to Tasmania in the South. The system peak in this time period was in January 2013 at a maximum demand over 63,000 MW. There are six regions represented including:

- Australian Capital Territory,
- New South Wales,

- Queensland,
- South Australia,
- Victoria, and
- Tasmania

The system load is shown as a classic, two-dimensional graph with demand on the y-axis and ½ hour on the x-axis. In addition, we have presented an EnergyPrint™ that presents the time on the y-axis, the day of year on the x-axis and the magnitude of demand in a colour gradient with low levels of demand in the blue to black spectrum and high levels of load in the yellow-white spectrum.

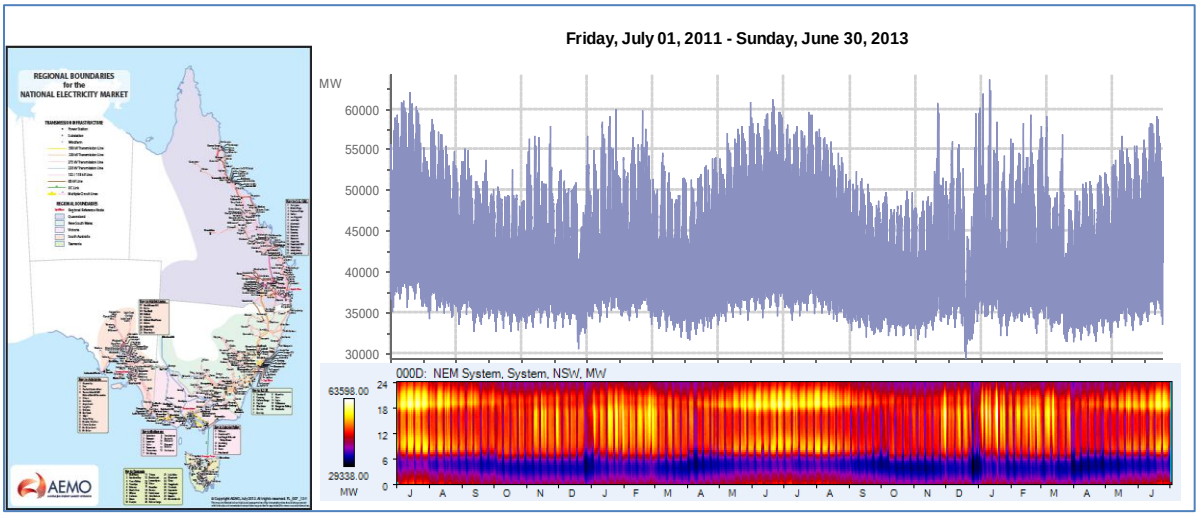

Figure 1 – AEMO Service Territory

Figure 2 presents the peak load profiles for July 2012 and January 2013. The July profile is bi-modal with a slightly higher evening peak and the January profile is uni-modal with a late afternoon peak.

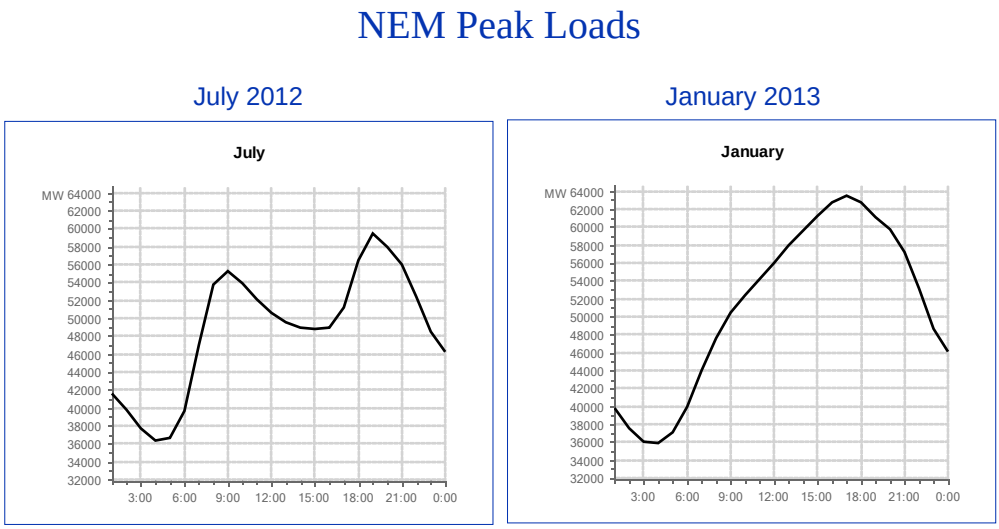

Figure 2 – Weekday Peak Load

1.3 Available Interval Load Data

For Phase 2, DNV KEMA was provided 30-minute interval load data for 10,000 potential demand response resources from across the NEM service territory. The data were provided for the period July 1, 2011 through June 30, 2013. Figure 3 presents' three sample profiles as EnergyPrints™ for the full two-year period. The 30-minute customer load data were found to be of extremely high quality.

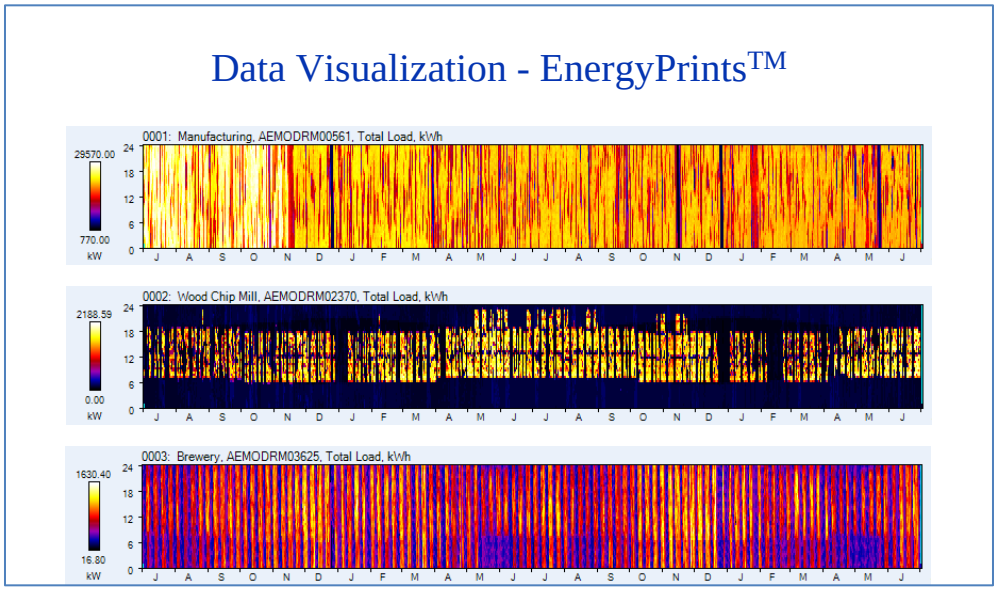

Figure 3 – Sample EnergyPrints™

The data provided spanned all regions and a breakdown of the interval load data by location is provided in Table 10. As evidenced by the table, the majority of resources were available in the New South Wales and Queensland area.

Table 10 Interval Load Data Available for Analysis

Location	Accounts	Total Annual Use (kWh)
Australian Capital Territory	340	779,438,868
New South Wales	3,543	16,727,180,576
Queensland	3,133	12,645,039,953
South Australia	535	1,763,980,930
Tasmania	342	5,499,771,112
Victoria	2,107	5,431,603,638
Totals	10,000	42,847,015,077

Discussions with AEMO indicated that customers that were less than 200 kW would have a difficult time justifying participation in the demand response market. Therefore, the project team applied a screen[15] requiring the customer to have a maximum demand of at least 175 kW during 2012. This screened reduced the full data set by an additional 2,469 customers. The 2,469 customers with a maximum demand less than 175 kW represented just 2.5% of the total energy associated with the original pool of 10,000 resources. Next, a large random sample of 2,500 was selected from the reduced population pool of 7,531 resources. The sample distribution by area is presented in Table 11.

Table 11 Samples Selected for Analysis

Area	Sample	Annual Use
ACT	97	234,283,141
NSW	861	6,199,863,701
QLD	833	3,684,922,461
SA	119	893,317,813
TAS	93	5,067,577,495
VIC	497	2,036,621,336
Totals	2,500	18,116,585,947

[15] Following preliminary review of the results with AEMO staff, a second analysis was conducted on the customers with a maximum demand of less than 175 kW to ensure the results observed for the selected sample were sufficiently robust to apply to these small customers.

1.4 Additional Data Resources

AEMO provided additional data resources including 30-minute regional system load data, 30-minute pricing data, hourly weather data, and information on holidays.

1.4.1 30-Minute Regional System Load Data

AEMO provided 30-minute regional system load data for use in the analysis. The regional load data was used to identify high load days by region for use in selecting candidate "event" days for the analysis. Figure 4 presents a sample of the 30-minute system load data provided by presenting the data for the New South Wales territory.

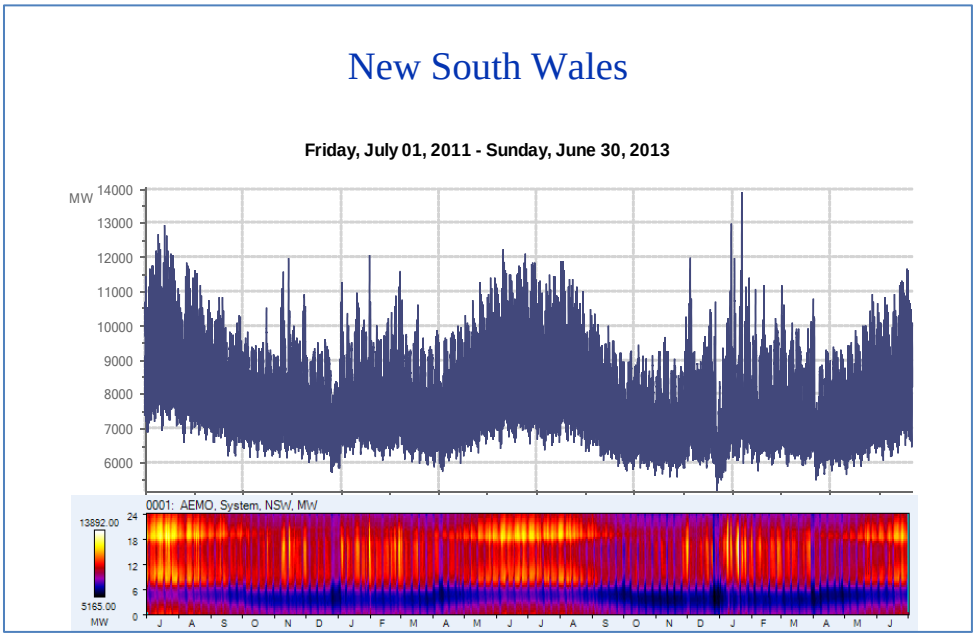

Figure 4 – Sample System Load Data

1.4.2 Weather Data

Regional hourly weather data was secured for the analysis. Table 12presents weather station representing each state/region/postal code. The individual customer load data were mapped to an appropriate weather station for use in the analysis. An array of weather variables were available with an emphasis placed on dry bulb temperature and relative humidity. The weather variables included:

- Dry bulb temperature,
- Relative humidity,
- Wind speed,
- Wind gusts,

- Cloud cover,
- Wind direction,
- Pressure, and
- Precipitation.

Table 12 Weather Station Mapping

Station_ID	Weather Station	Import_ID	State	Area	Post Code State	Post Code Local
Hobart Airport	Hobart Airport	94008	Tasmania	South East	7xxx	7170
Launceston	Launceston	91311	Tasmania	North East	7xxx	7250
Melbourne	Melbourne	86071	Victoria	South	3xxx	3000
Bendigo	Bendigo	81123	Victoria	North	3xxx	3550
Wagga Wagga	Wagga Wagga	72150	NSW	South West	2xxx	2650
Canberra Airport	Canberra Airport	70351	ACT	East	26xx	2609
Bankstown Airport	Bankstown Airport	66137	NSW	West Sydney	2xxx	2200
Coolangata	Coolangata	40717	Queensland	South East	4xxx	4225
Archerfield	Archerfield	40211	Queensland	South Brisbane	4xxx	4108
Rockhampton	Rockhampton	39083	Queensland	East	4xxx	4700
Townsville	Townsville	32040	Queensland	North East	4xxx	4810
Adelaide	Adelaide	23090	South Australia	South East	5xxx	5000
Sydney Airport	Sydney Airport	66037	NSW	South East Sydney	2xxx	2020
Melbourne Airport	Melbourne Airport	86282	Victoria	North West Melbourne	3xxx	3045
Adelaide Airport	Adelaide Airport	23034	South Australia	West Adelaide	5xxx	5950
Penrith	Penrith	67113	NSW	West Sydney	2xxx	2750
Mt Gambier	Mt Gambier, South Australia	94821	South Australia	South East	5xxx	5290
Armidale	Armidale	95773	NSW	North East	2xxx	2350
Cairns Airport	Cairns Airport	94287	Queensland	North	4xxx	4870
Orange	Orange	95726	NSW	East	2xxx	2800
Devonport	Devonport	95960	Tasmania	North	7xxx	7310
Wangaratta	Wangaratta	94889	Victoria	North	3xxx	3677

Figure 5 presents the dry bulb temperature data for Canberra Airport representing the Australian Capital Territory. The top part of the figure displays the conventional two-dimensional graph with dry bulb temperature on the y-axis and hour on the x-axis. The full two year period is presented.

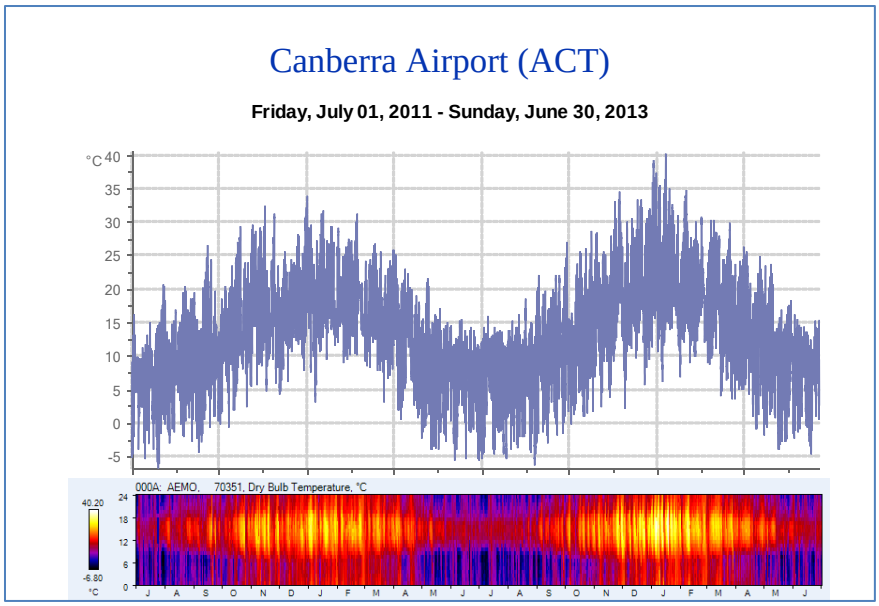

Figure 5 – Dry Bulb Temperature Data: Canberra Airport

1.4.3 Pricing Data

AEMO provided the project team with 30-minute pricing data by region. The pricing data was primarily used to identify high price periods for use in assigning candidate event days. Table 13 presents the top 20 half-hourly prices for each of the five regional areas. In the table we present the date, half-hour time and price. On selected half-hours the prices can range to nearly $10,000 per MWh.

Table 13 Top 20 Prices

New South Wales			Queensland			South Australia			Tasmania			Victoria		
Date	Half Hr	Price	Date	Half Hr	Price	Date	Half Hr	Price	Date	Half Hr	Price	Date	Half Hr	Price
9/11/2011	31	$6,498	29/01/2013	34	$6,299	4/1/2013	33	$4,203	18/04/2012	33	$4,928	29/11/2012	33	$9,974
29/11/2012	32	$ 318	17/06/2013	15	$4,335	2/7/2012	26	$4,140	21/01/2013	12	$2,544	29/11/2012	32	$8,956
29/11/2012	30	$ 304	12/1/2013	38	$3,625	21/10/2011	48	$3,956	5/1/2013	21	$2,189	29/11/2012	34	$8,219
23/07/2012	37	$ 292	9/11/2011	31	$3,608	2/7/2012	25	$3,938	2/7/2012	25	$2,188	2/7/2012	26	$4,364
31/07/2012	37	$ 291	12/1/2013	39	$3,183	12/9/2011	1	$3,801	22/01/2013	47	$2,186	4/1/2013	33	$4,282
29/11/2012	28	$ 279	29/01/2013	33	$3,167	29/11/2012	33	$2,479	27/01/2013	45	$2,184	2/7/2012	25	$3,798
16/10/2012	33	$ 278	29/01/2013	32	$3,100	7/1/2013	35	$2,357	27/01/2013	33	$2,184	29/11/2012	31	$2,321
23/07/2012	38	$ 275	13/01/2013	30	$2,918	4/1/2013	32	$2,284	1/1/2013	1	$2,184	4/1/2013	32	$2,319
16/10/2012	34	$ 273	10/1/2012	28	$2,893	31/05/2013	43	$2,218	5/1/2013	46	$2,183	11/9/2012	18	$2,221
29/11/2012	27	$ 265	13/01/2013	31	$2,613	21/06/2013	20	$2,217	6/1/2013	2	$2,181	11/9/2012	19	$2,212
30/11/2012	30	$ 264	14/01/2013	15	$2,499	24/05/2013	48	$2,217	25/07/2011	22	$2,084	4/1/2013	30	$2,200
16/10/2012	35	$ 260	13/01/2013	22	$2,487	5/10/2011	15	$2,211	24/01/2012	31	$1,527	13/12/2012	30	$2,185
30/11/2012	29	$ 258	11/1/2013	14	$2,350	4/1/2013	30	$2,202	13/01/2013	46	$1,280	12/3/2013	29	$2,139
30/11/2012	26	$ 254	13/01/2013	25	$2,290	29/04/2013	17	$2,200	4/1/2013	29	$1,234	21/06/2013	20	$2,026
16/10/2012	31	$ 254	29/01/2013	17	$2,278	3/6/2013	21	$2,195	4/1/2013	30	$1,060	21/06/2013	22	$1,937
23/07/2012	36	$ 248	30/01/2013	16	$2,240	25/04/2013	48	$2,195	6/5/2013	36	$ 776	18/02/2013	34	$1,937
2/7/2012	37	$ 243	20/12/2012	30	$2,234	30/11/2012	48	$2,177	6/5/2013	35	$ 600	28/05/2013	36	$1,426
29/11/2012	29	$ 240	16/03/2013	34	$2,230	21/10/2011	43	$2,171	12/11/2011	18	$ 500	4/1/2013	29	$1,409
2/7/2012	36	$ 239	10/1/2013	33	$2,228	5/6/2013	36	$2,164	12/11/2011	17	$ 500	29/11/2012	35	$ 962
9/7/2012	37	$ 238	17/06/2013	35	$2,222	2/6/2013	37	$2,156	30/10/2011	15	$ 499	18/02/2013	33	$ 958

1.4.4 Holidays

The project team used a provided website that identifies the regional holidays. The following website was used to develop a list of holidays for each region. Holidays do not play a significant role in the current analysis and are included simply for completeness.

http://www.fairwork.gov.au/leave/public-holidays/pages/listof2011publicholidays.aspx

A sample of the holiday list developed is provided in Table 14. The table is for Victoria.

Table 14 Holidays: Victoria

Area	Holiday	Date	Year
VIC	New Year's Day	Saturday 1 January and Monday 3 January *	2011
VIC	New Year's Day	Saturday 1 January and Monday 3 January *	2011
VIC	Australia Day	Wednesday 26 January	2011
VIC	Labour Day	Monday 14 March	2011
VIC	Good Friday	Friday 22 April	2011
VIC	Saturday after Good Friday	Saturday 23 April	2011
VIC	Easter Monday	Monday 25 April	2011
VIC	Anzac Day	Tuesday 26 April **	2011
VIC	Queen's Birthday	Monday 13 June	2011
VIC	Melbourne Cup	Tuesday 1 November ***	2011
VIC	Christmas Day	Tuesday 27 December ****	2011
VIC	Boxing Day	Monday 26 December	2011
VIC	New Year's Day	Sunday 1 January	2012
VIC	New Year's Day	Monday 2 January*	2012
VIC	Australia Day	Thursday 26 January	2012
VIC	Labour Day	Monday 12 March	2012
VIC	Good Friday	Friday 6 April	2012
VIC	Saturday after Good Friday	Saturday 7 April	2012
VIC	Easter Monday	Monday 9 April	2012
VIC	Anzac Day	Wednesday 25 April	2012
VIC	Queen's Birthday	Monday 11 June	2012
VIC	Melbourne Cup	Tuesday 6 November **	2012
VIC	Christmas Day	Tuesday 25 December	2012
VIC	Boxing Day	Wednesday 26 December	2012
VIC	New Year's Day	Tuesday 1 January	2013
VIC	Australia Day	Monday 28 January*	2013
VIC	Labour Day	Monday 11 March	2013
VIC	Good Friday	Friday 29 March	2013
VIC	Saturday after Good Friday	Saturday 30 March	2013
VIC	Easter Monday	Monday 1 April	2013
VIC	Anzac Day	Thursday 25 April	2013
VIC	Queen's Birthday	Monday 10 June	2013
VIC	Melbourne Cup	Tuesday 5 November**	2013
VIC	Christmas Day	Wednesday 25 December	2013
VIC	Boxing Day	Thursday 26 December	2013

1.5 Candidate Event Days

The project team examined the regional secondary data, i.e., system load, temperature, and pricing data, to construct an array of candidate event days for analysis and reporting. The analysis examined candidate days in October through March. The criterion used included:

1. High temperature days,
2. High system load days, and
3. High pricing days.

A total of 83 candidate event days (62 weekdays and 21 weekend days) were defined based on regional load characteristics, weather and pricing. This included several runs of multiple days, e.g., January 17, 2013 through January 21, 2013 and March 7, 2013 through March 9, 2013.

1.5.1 Candidate Event Half-Hours

AEMO selected the "candidate event" half-hours as afternoon hours ending 1pm through 5pm for the months of October through March. After conducting the analysis, the project team examined the timing of the highest demand periods. The analysis is presented in Figure 6. The figure presents a frequency distribution for the top 100 half-hour demands by region. All regions plus the aggregate system are represented. From this chart it seems prudent to extend the half-hour window to the period ending 7pm. All the analyses were rerun and are reported in the appendices.

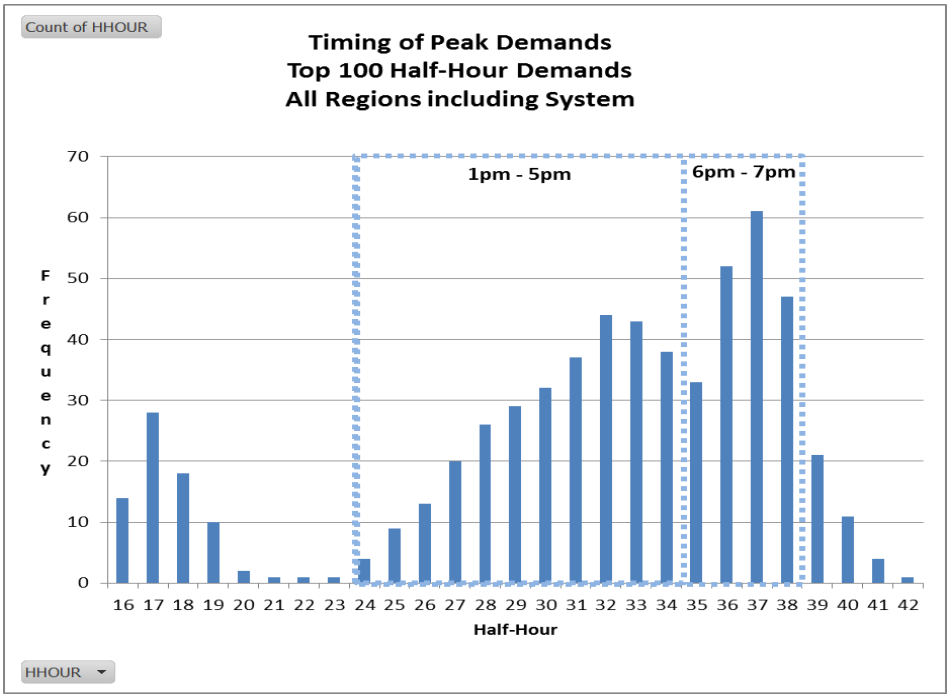

Figure 6 – Timing of Peak Demand

1.6 Baseline Methodologies

The analysis featured a total of nine baselines, with up to four variants of each baseline. The variants represent the unadjusted baseline and three common, same day, adjustments to the baseline including an additive adjustment, a multiplicative adjustment, and a multiplicative capped adjustment. Accordingly, there were 36 different baseline/variants combinations included in the analysis. The nine baselines included in the analysis are:

1. PJM Economic;
2. Middle 4 of 6 Preceding Like Days (PJM) [16];
3. PJM Emergency Comparable Day, Non-weather Sensitive;
4. PJM Emergency Same Day;
5. PJM Emergency Comparable Day, Weather Sensitive;
6. ISO New England ("ISONE") Standard;

[16] The Middle 4 of 6 baseline methodology was tested as part of the PJM baseline methodology study (*PJM Empirical Analysis of Demand Response Baseline Methods*, KEMA April 20, 2011). This methodology was proposed by PJM's Market Monitoring Unit for evaluation in that study. This report often refers to the Middle 4 of 6 as the 'PJM Middle 4 of 6' given it was included in that research.

7. California ISO ("CAISO") Standard;
8. Weekend Middle 2 of 4; and
9. Weekend PJM Economic.

Please note, regression based baselines were excluded from the analysis due to the following factors:

- More difficult to implement and administer;
- More challenging to explain to participants;
- Have been found in other analyses to not outperform the more common baselines tested.

Table 15 - Baseline Methodologies Evaluated

#	CBL Protocol	Final Selection	Estimation Method
1	PJM Economic	Weekday Events: High 4 of 5 most recent qualifying days.	Average
2	Middle 4 of 6 Preceding Like Days	Middle 4 of 6 most recent qualifying days.	Average
3	PJM Emergency Comparable Day, Non-weather Sensitive	1 Day, excluding weekend/holidays	Matching
4	PJM Emergency Same Day	Hours pre- and post-event	Average
5	PJM Emergency Comparable Day, Weather Sensitive	1 Day, excluding weekend/holidays	Matching
6	ISO-NE Standard	0.9*baseline + 0.1*meter	Average
7	CAISO Standard	Recent 10	Average
8	Weekend Middle 2 of 4	Weekend/holiday events: Middle of 2 of 3 most recent qualifying like days	Average
9	Weekend - PJM Economic	Weekend/holiday events: High of 2 of 3 most recent qualifying like days	Average

These baseline methodologies met the following criteria:

- Cover a range of estimation methods (averaging and matching);
- Cover a range of timeframes (from same/previous day to previous year);
- Cover a range of data selection rules (proximity to event, similarity of load, similarity of weather, highest or middle x of y);
- Can address weather-sensitive loads; and,
- Cover a range of complexities.

Each baseline is described in further detail below.

1.6.1 PJM Economic Baseline

The PJM Economic Baseline consists of half hourly loads averaged across the "highest *x* out of *y*" most recent days, where *x* and *y* are numbers that depend on day type:

- For *weekday* events, the baseline consists of the average half hourly loads of the 4 highest kWh days out of the 5 most recent weekdays preceding the event, excluding holidays, weekend days, and event days.

- For *weekend or holiday* events, the baseline consists of the average half hourly loads of the 2 highest kWh days out of the 3 most recent weekend or holiday days, excluding event days.

The loads in each event half hour are averaged over the selected comparison days to form the baseline. The protocol described in the PJM Operating Agreement limits the "look-back window" for calculating the baseline to 45 calendar days in most cases[17].

1.6.2 Middle 4 of 6

The Middle 4 of 6 baseline is an "x of y" baseline with the selection criterion for comparison days is to drop the highest and lowest kWh days out of the most recent six. The half hourly loads are then averaged over the remaining four days to form the baseline.

1.6.3 PJM Emergency GLD Comparable Day (non-weather sensitive) Baseline

This baseline only exists for weekdays. It consists of the half hourly loads from the non-holiday weekday in close proximity to the event day, either preceding or following it. In the event of a tie, the previous day is chosen.

1.6.4 PJM Emergency GLD Comparable Day (weather sensitive) Baseline

This baseline is also only defined for weekdays. The comparison day is chosen using a similarity measure based on the temperature-humidity index (THI)[18].

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[17] As stated, event days are typically excluded from the baseline calculation. If there are not enough non-event days in the 45 day look-back window, PJM then includes previous event days in the baseline calculation until the minimum number of CBL basis days is attained. In the case of the highest 4 of 5 baseline, PJM ranks the event days within the 45 day look-back window by usage and includes the highest usage event days until the number of CBL basis days is attained. The purpose of using event day loads instead of non-event day loads from the period prior to the look-back window is to include recent data in the baseline calculation which most represents the usage to the current period. The purpose of using the highest usage event days is to select event days where curtailment was likely less than lower usage event days, and thus more closely represents what usage would have been on a non-event day. Other ISOs have similar rules in their baseline calculations, e.g., CAISO and MISO.

[18] THI = temp – 0.55*(1 – humid)*(temp – 14.44), where temp is dry-bulb temperature in degrees Celsius, and humid is relative humidity expressed as a decimal fraction.

- The temperature-humidity index (THI) is calculated for each half-hour of the event period on the event day, and for the same hour on every other non-event, non-holiday weekday in the same season.
- The sum of squared differences between the half hourly THI values for the event period on the event day and the same half-hours on each comparison day is calculated.
- The comparable days are ranked by their sums of squared differences, and the minimum is chosen as the comparison day.

The baseline consists of the half hourly loads from the selected comparison day.

1.6.5 PJM Emergency GLD Same Day (Before/After Event) Baseline

This is a flat baseline consisting of the average of the half hourly loads in the two hours ending one hour prior to the event hour and the two hours beginning one hour after the end of the event hour.

1.6.6 CAISO Standard Baseline

The CAISO Standard Baseline is also of the "highest x out of y most recent days" type, except that there are no excluded days (that is, x = y):

- For weekday events, the baseline consists of the half hourly loads averaged over the 10 most recent days preceding the event, excluding holidays, weekend days, and event days.

- For weekend or holiday events, the baseline consists of the average half hourly loads of the 4 most recent weekend or holiday days, excluding event days.

The loads in each event half-hour are averaged over the selected comparison days to form the baseline.

1.6.7 ISONE Standard Baseline

This baseline differs from the preceding ones, in that it consists of a weighted average of the preceding day's baseline and the current day's actual metered load. The baseline is updated on every non-event weekday. It is not calculated on weekends or holidays. On (weekday) event days, the baseline is defined as the previous day's baseline.

For a new asset with no previously computed baseline, the baseline is the simple average half hourly load calculated for each half-hour of the day from the five most recent preceding business days with complete meter data. Since the asset isn't permitted to participate in a DR program during this initial 5-day window, event days are not excluded for these calculations. (For purposes of a performance analysis, all

of the accounts are "new" at the start of the file, or on the date they first enter the dataset, whichever comes later.)

For an existing asset (i.e., one with at least five days of usable load data), the current-day baseline is obtained as follows:

- If the current day is an event day, the asset's baseline for the day is equal to the baseline from the previous day.

- If the current day is not an event day, then the asset's baseline is updated according to the following algorithm:

  Current day baseline = 0.9*previous day baseline + 0.1*current day metered load

  for each half hour of the current day.

1.7 Adjustments

The two basic kinds of pre-event period adjustments are difference (additive) and ratio (multiplicative) adjustments. Traditionally, these approaches compare observed load and baseline load for some pre-event period. An adjustment that makes the pre-event period baseline load equal to the pre-event period observed load is applied to the baseline throughout the event period. The additive approach measures the magnitude of the pre-event period load difference (positive or negative), and adds that to the baseline throughout the event period. The ratio approach applies the ratio that makes the pre-event period baseline load equal to the pre-event period observed load to the baseline throughout the event period.

The basic additive and ratio adjustments utilized for the Phase 2 baseline performance testing are:

- The Symmetric Additive adjustment: This is the simple additive adjustment based on load differences in the first 3 of 4 previous hours. (Note: the asymmetric additive adjustments have been abandoned on the grounds that they can be too easily gamed).

- A Simple Ratio Adjustment based on the first 3 of 4 previous hours: The simple ratio adjustment we propose maintains consistency with the symmetric additive adjustment with regard to the hours used for the adjustment. This adjustment will allow an "apples to apples" comparison of additive and ratio adjustments.

1.8 Example Plots of Baselines

This section presents specific examples of the baselines included in this analysis. These examples are individual sites' actual, observed load compared to the predicted load using the various baseline

methodologies. These examples use the load data and the calculated baselines for Thursday, January 24, 2013, which is one of the days determined to be a likely event day.

Assuming that the event takes place from 1:00 PM to 5:00 PM, it is the accuracy with which a baseline can reproduce the actual load during this period that defines the success of the baseline. The four hours prior to the event, 9:00 AM to 1:00 PM, are the period during which baseline adjustments are calculated.

Though the plots in these examples include all weekday baselines considered in this analysis, the plots are only designed to illustrate baselines in general. These plots are not designed to necessarily distinguish certain baselines. They are examples of the kind of data that underlie the aggregate statistics that we use to distinguish baselines.

Figure 7 shows an example of a customer with a typical, bell-shaped load curve. This customer was defined as a low-variability load during the segmentation analysis meaning the load does not vary much for this site. The example shows that the set of unadjusted baselines provide a reasonably good estimate of the actual load.

Figure 7 - Example of Unadjusted Baselines

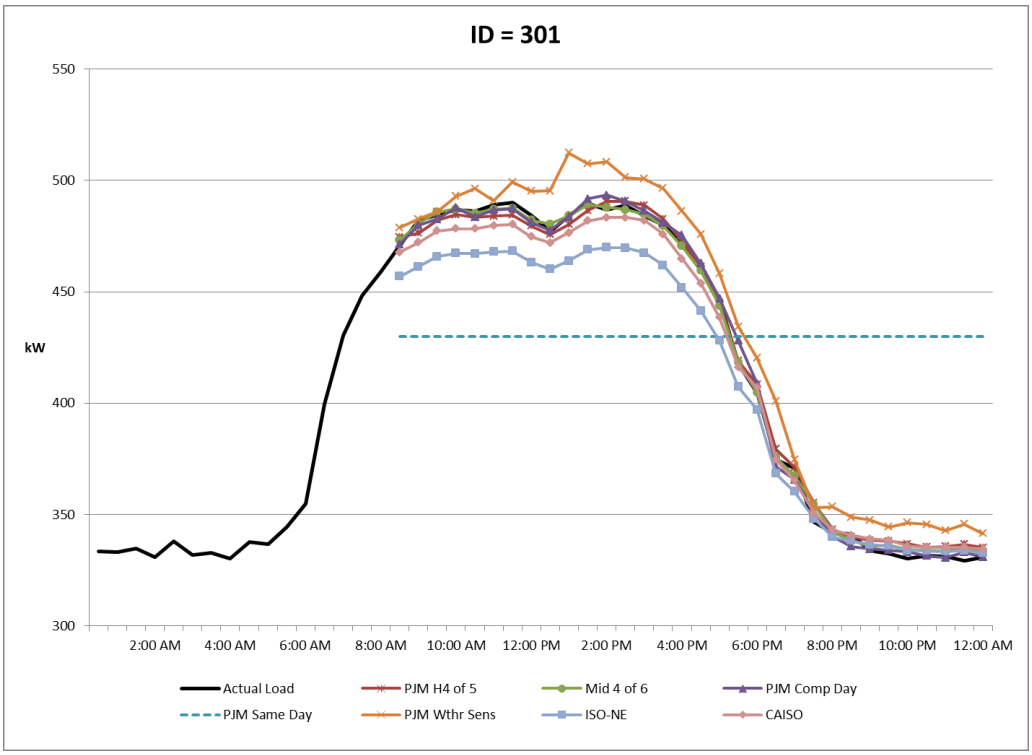
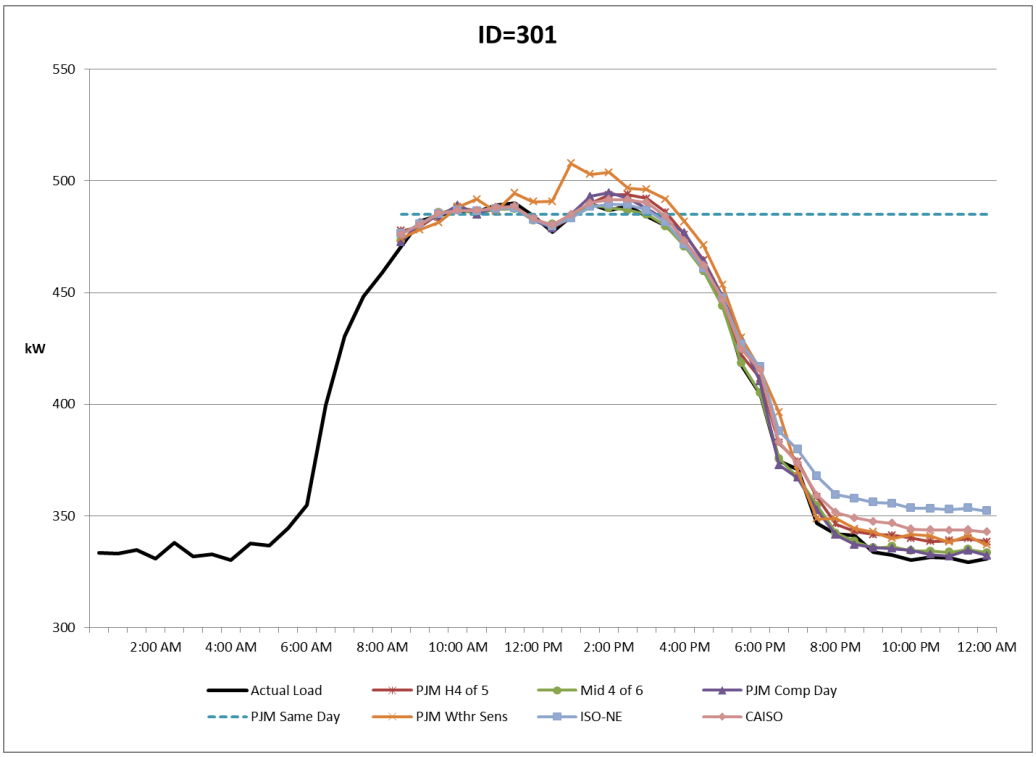


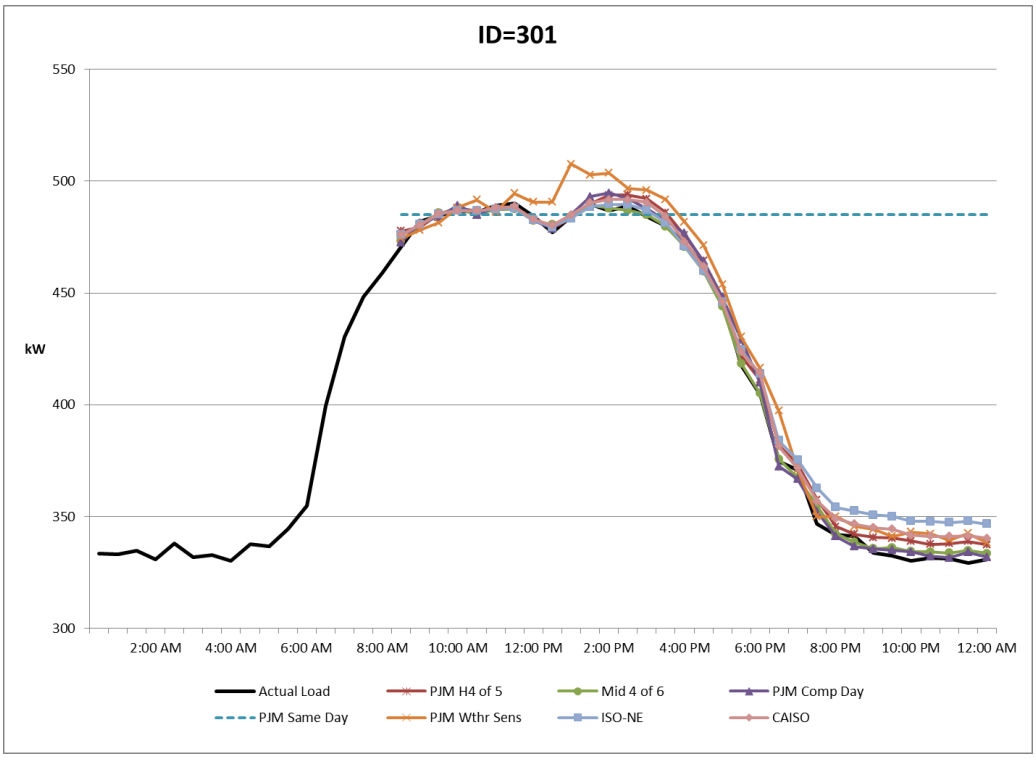
Figure 8 illustrates the same site in Figure 7, but now with an additive adjustment. With the additive adjustment, the baselines provide a better estimate of the actual load in general.

Figure 8 - Example of Baselines with Additive Adjustment



Using the same site and the same day as Figure 7 and Figure 8, Figure 9 illustrates the baselines using a multiplicative adjustment. This example shows that there is no discernible difference between the performances of the baselines for this site on this day using a multiplicative adjustment when compared to the additive adjustment.

Figure 9 - Example of Baselines with Multiplicative Adjustment



The next example in Figure 10 and Figure 11 is depicting a different site than the examples above and illustrates the potential differences between the multiplicative adjustment and the multiplicative adjustment that has been capped. Figure 10 shows the baselines with an 'uncapped' adjustment, and Figure 11 shows the baseline with a capped adjustment.

Figure 10 - Example of Baselines with Multiplicative Adjustment

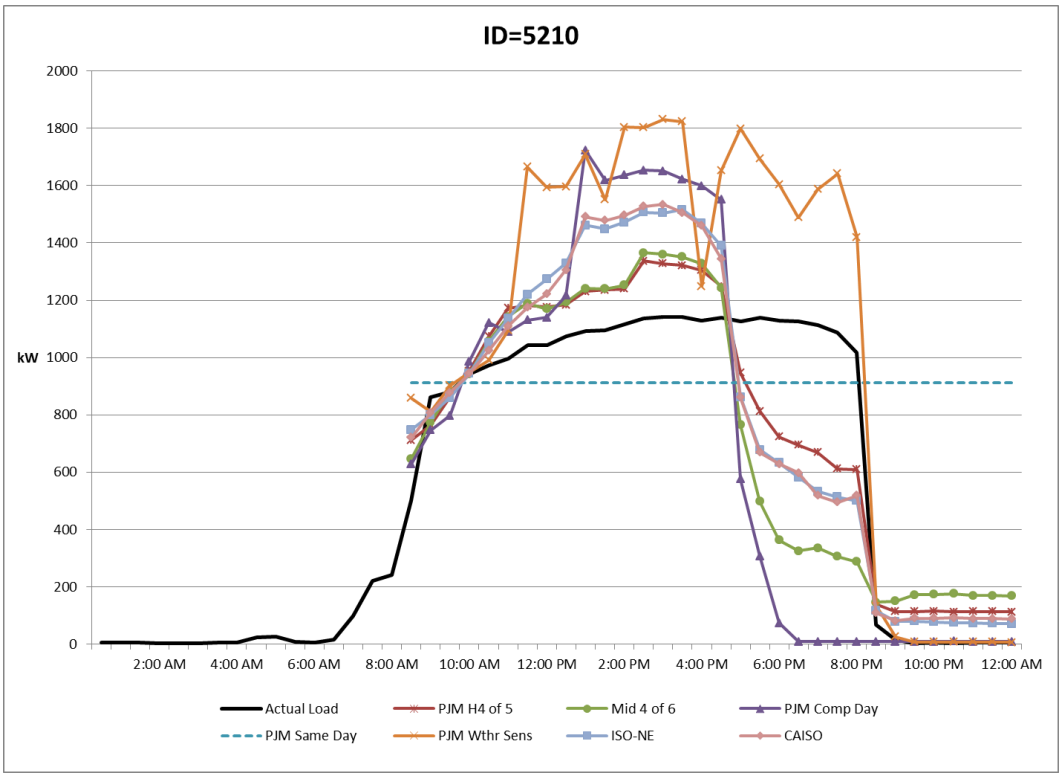
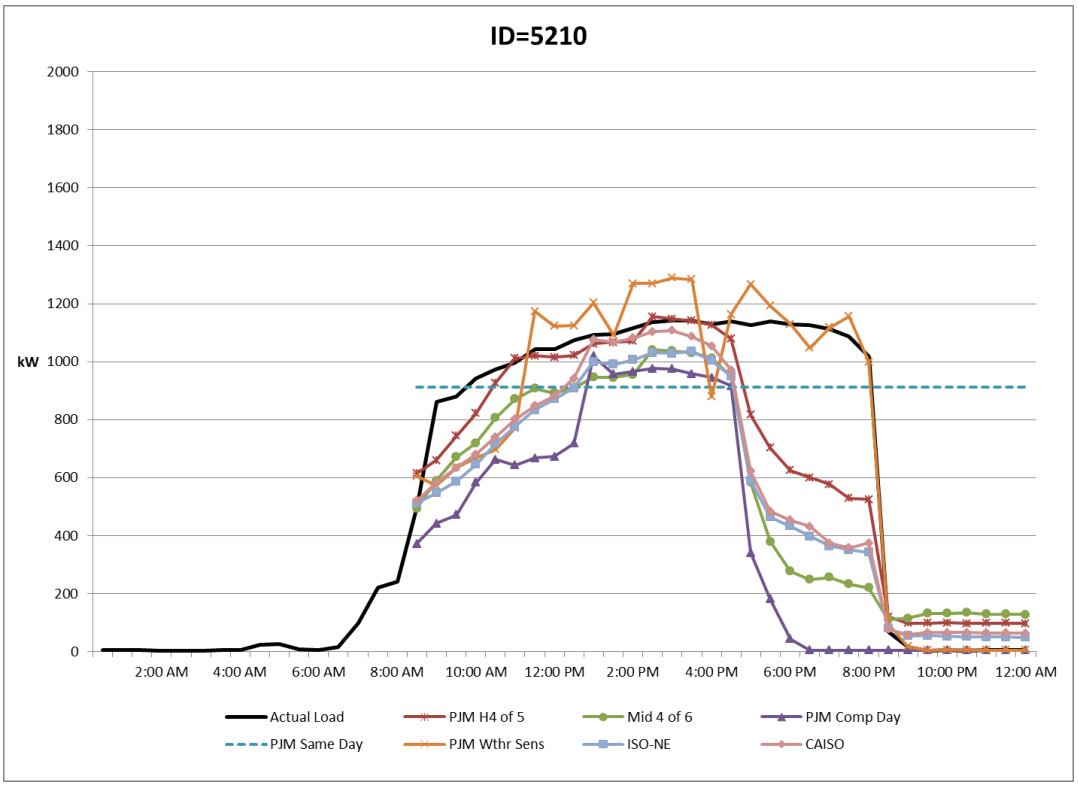


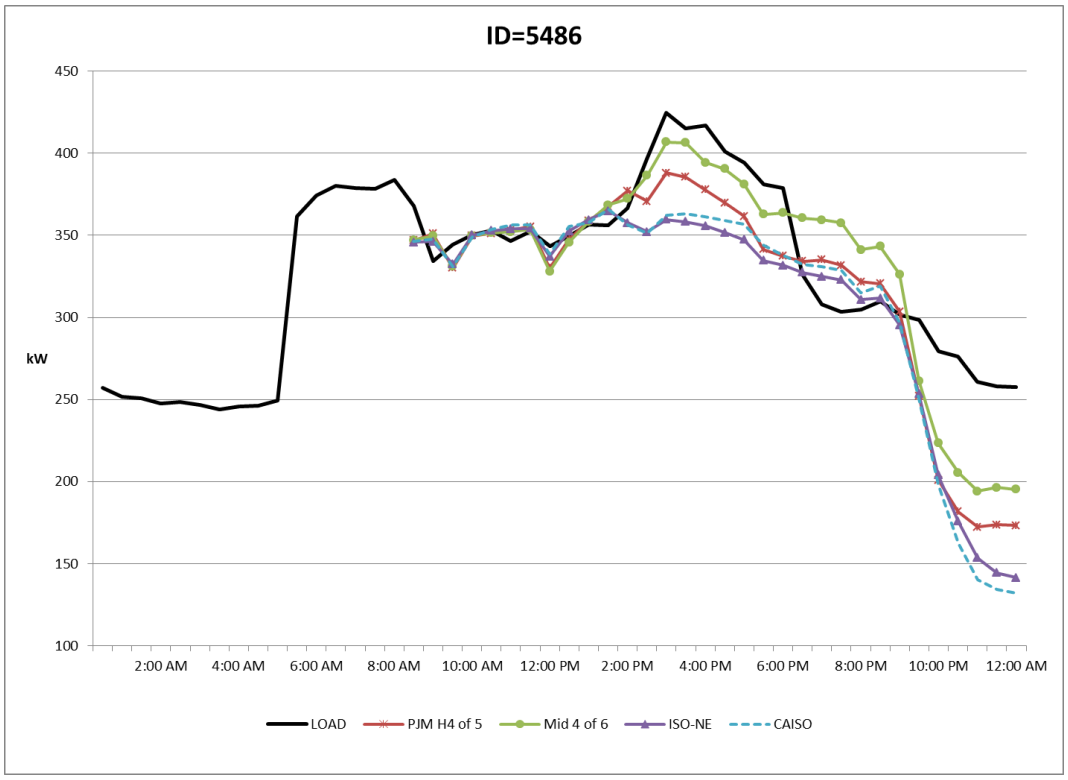
Figure 11 - Example of Baselines with Capped Multiplicative Adjustment



The final example in Figure 12 is depicting a different site than the examples above and illustrates the potential differences among the performance of certain baselines. The specific baselines are two baselines with a shorter (more recent) historical data requirement, the PJM High 4 of 5 and the Middle 4 of 6, compared to the CAISO and ISONE baselines which require longer period of data for their calculation. All of the baselines depicted are using an additive adjustment.

In this particular case, the site is a relatively higher variable load customer with load increasing in recent days. The baselines that are restricted to using the more recent days provide a better estimate of the actual load. The baselines relying on a longer historical period, CAISO and ISONE, underestimate the actual load given they smooth out the recent increase in load in the late afternoon.

Figure 12 - Comparison of Baselines with More vs. Less Days Included in Calculation



2. Results – Accuracy, Bias and Variability

In this section we review the results of the analysis based on the reduced dataset, i.e., after removing the high variable load customers[19]. Three statistics were chosen to measure the three quantitative aspects of baseline performance:

1. Accuracy – how closely a baseline method predicts customers' actual loads in the sample,
2. Bias – the systematic tendency of a baseline method to over- or under-predict actual loads, and
3. Variability – how well the baseline does at predicting half hourly load under many different conditions and across many different customers.

Following consultation with AEMO, the base analysis was conducted on the five hour period for hours ending 1pm through 5pm on candidate peak days. After further discussion, the project team conducted additional analyses on the seven hour period ending 7pm. Key tables for this additional analysis are included in an Appendix to this report.

In this section, results are presented for the overall group and then by the various segmentations including:

- Customer Size
  - Up to 175 kW,
  - 175 kW to 500 kW,
  - 500 kW to 2,000 kW,
  - 2,000 kW to 10,000 kW, and
  - Over 10,000 kW.
- Weather Sensitivity
  - Not Weather Sensitive, and
  - Weather Sensitive.
- Load Variability
  - Lower Quartile,
  - Inner Quartile Range, and
  - Upper Quartile.
- Geographic Region
  - North (Queensland), and
  - South (All Other Territories).

[19] Load variability was determined by examining the residuals after modelling the load for weather effects. Customers with a Thiel's U-statistic greater than 40% were excluded from the analysis. This is similar to the approach taken by the authors in the PJM analysis. Additional analysis was conducted on the 15% of variable load customers excluded from the base analysis and is included as an Appendix in this report.

2.1 Accuracy

The attribute given the most emphasis in the analysis was **accuracy**, or how closely a baseline method predicts customers' actual loads in the sample. The statistic chosen to measure accuracy was the baseline's relative root mean squared error (RRMSE). This statistic expresses the baseline's average half hourly accuracy as a fraction of average half hourly load. An RRMSE for an individual customer of 0.1, for example, means that the customer's estimated baseline is typically (on the order of 2/3 of the time) within 10 percent of the actual load. For a given customer, some half hours will have a higher difference and some smaller. For a group of customers, a median RRMSE of 0.1 means that for the typical customer the estimated baseline is typically within 10 percent of the average load. Since not all customers are typical, some will have a higher typical difference, and some smaller.[20]

The RRMSE is based on squared prediction errors. This technique in essence weights large errors much more heavily than small or midsized errors. In contrast, the errors are weighted evenly with a technique that measures errors based on the absolute values of the prediction errors. This means that the effect of large half hourly errors in the predicted load will result in a higher RRMSE as opposed to a mean absolute percentage error (MAPE).

2.1.1 Overall

A comparison of the accuracy metric among the baselines tested is presented in Table 16. The results are sample medians of each metric, and are colour coded for ordering. Across all baselines and adjustments, the baseline with the smaller number or "greener" colour can be considered better than baselines with higher numbers or "redder" colours. The values in the table are rounded, so the underlying data may produce slightly different shades for values that appear to be the same.

The comparison in the table highlights the superiority of baselines with same day, load-based adjustments. Across a range of different baselines, both the additive and multiplicative adjustments provide a significant improvement to the accuracy of the underlying baseline and therefore represent the best performance. The performance difference from the use of an additive adjustment when compared to a multiplicative adjustment is insignificant. The CAISO and ISONE baselines had slightly better, although relatively insignificant, empirical performance relative to the other X of Y type baselines (such as the PJM 4 of 5 or PJM 4 of 6). This is based purely on the empirical performance and does not consider the feasibility and administration involved or other factors that might go into the selection of a final baseline.

[20] The RRMSE combines the systematic errors measured by the ARE (bias) and the variability of errors captured by the RER (variability). For this reason, the overall accuracy measure was given primary emphasis in the study.

Table 16 Comparison of Accuracy of Baselines[21]

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.143	0.151	0.146	0.141	0.142	0.149	0.151	Weekends	0.187	0.197
Additive Adjustment	0.107	0.108	0.127	0.142	0.123	0.101	0.103		0.136	0.141
Multiplicative Adjustment	0.109	0.110	0.132	0.142	0.127	0.102	0.103		0.137	0.139
Multiplicative Adjustment (Cap)	0.111	0.114	0.135	0.143	0.126	0.106	0.109		0.143	0.145

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 17 presents a more complete array of statistics for each of the tested baselines including the adjustment mechanisms. The table presents the lower 10th percentile, median, mean, and upper 90th percentile statistics. For the CAISO baseline with the additive adjustment the accuracy statistic ranges from a low of 4.86% (10th percentile) to a high of 21.87% (90th percentile) with a median of 10.35%.

Table 17 Baseline Accuracy: Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
ACCURACY	Unadjusted	**10th Percentile**	0.0695	0.0723	0.0741	0.0603	0.0700	0.0738	0.0740	0.0820	0.0819
ACCURACY	Unadjusted	**Median**	0.1433	0.1511	0.1457	0.1405	0.1417	0.1485	0.1506	0.1872	0.1965
ACCURACY	Unadjusted	**Mean**	0.1633	0.1708	0.1678	0.1705	0.1810	0.1679	0.1699	0.2614	0.4195
ACCURACY	Unadjusted	**90th Percentile**	0.2857	0.2965	0.2892	0.3289	0.3676	0.2910	0.2959	0.4820	0.5589
ACCURACY	Additive Adj	**10th Percentile**	0.0511	0.0508	0.0615	0.0670	0.0590	0.0482	0.0486	0.0564	0.0584
ACCURACY	Additive Adj	**Median**	0.1072	0.1076	0.1270	0.1416	0.1228	0.1015	0.1035	0.1356	0.1412
ACCURACY	Additive Adj	**Mean**	0.1271	0.1278	0.1505	0.1684	0.1495	0.1207	0.1219	0.2294	0.2436
ACCURACY	Additive Adj	**90th Percentile**	0.2289	0.2316	0.2756	0.3068	0.2798	0.2187	0.2226	0.4102	0.4409
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0514	0.0514	0.0632	0.0670	0.0599	0.0482	0.0488	0.0573	0.0590
ACCURACY	Multiplicative Adj	**Median**	0.1091	0.1095	0.1322	0.1416	0.1274	0.1015	0.1030	0.1373	0.1391
ACCURACY	Multiplicative Adj	**Mean**	0.1320	0.1352	0.4935	0.1684	0.5227	0.1215	0.1234	0.2353	0.2524
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2376	0.2426	0.3193	0.3068	0.3242	0.2200	0.2252	0.4271	0.4390
ACCURACY	Capped Adjustment	**10th Percentile**	0.0524	0.0535	0.0689	0.0693	0.0617	0.0491	0.0507	0.0592	0.0602
ACCURACY	Capped Adjustment	**Median**	0.1108	0.1144	0.1351	0.1435	0.1263	0.1056	0.1087	0.1426	0.1451
ACCURACY	Capped Adjustment	**Mean**	0.1308	0.1357	0.1564	0.1623	0.1602	0.1255	0.1289	0.2152	0.3349
ACCURACY	Capped Adjustment	**90th Percentile**	0.2362	0.2510	0.2739	0.2842	0.3215	0.2301	0.2391	0.4168	0.4465

2.1.2 Customer Size

Table 18 presents a summary of the "Accuracy" statistic based on customer size as measured by the 2012 maximum demand of the customer. Examination of the table indicates that the same baseline strategies perform consistently across all size categories. The X of Y, ISONE, and CAISO baselines all perform similarly as long as an adjustment is allowed. On the weekends, the weekend 2 of 4 seems to perform best. Given these results, there is no apparent reason to segment by size.

[21] Note that each table presented uses a colour coding scale relative to the results contained within the weekday and weekend results of each table. The colour coding scale is not consistent among all tables in the report given that results are meant to be colour coded to show relative performance within each table's results.

Table 18 Accuracy of Baselines Segmented by Customer Size

Size Category	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Up to 175 kW (n=2,184)	Unadjusted Baseline	0.134	0.138	0.127	0.124	0.135	0.136	0.136	Weekends	0.162	0.162
	Additive Adjustment	0.110	0.109	0.130	0.147	0.129	0.103	0.105		0.128	0.132
	Multiplicative Adjustment	0.113	0.113	0.135	0.147	0.135	0.105	0.107		0.134	0.137
	Multiplicative Adjustment (Cap)	0.112	0.112	0.129	0.142	0.130	0.105	0.107		0.130	0.134
175 kW to 500 kW (n=1,355)	Unadjusted Baseline	0.145	0.151	0.146	0.137	0.137	0.149	0.150	Weekends	0.189	0.198
	Additive Adjustment	0.109	0.109	0.128	0.144	0.122	0.103	0.105		0.140	0.146
	Multiplicative Adjustment	0.111	0.112	0.134	0.144	0.127	0.103	0.105		0.141	0.144
	Multiplicative Adjustment (Cap)	0.112	0.114	0.135	0.147	0.124	0.106	0.109		0.145	0.149
500 to 2,000 kW (n=471)	Unadjusted Baseline	0.141	0.147	0.144	0.160	0.144	0.143	0.147	Weekends	0.184	0.199
	Additive Adjustment	0.103	0.104	0.122	0.135	0.123	0.098	0.099		0.132	0.140
	Multiplicative Adjustment	0.104	0.104	0.128	0.135	0.126	0.097	0.098		0.135	0.138
	Multiplicative Adjustment (Cap)	0.106	0.110	0.133	0.140	0.126	0.101	0.103		0.141	0.148
2,000 to 10,000 kW (n=141)	Unadjusted Baseline	0.138	0.147	0.144	0.126	0.170	0.148	0.152	Weekends	0.176	0.184
	Additive Adjustment	0.096	0.101	0.119	0.118	0.116	0.094	0.094		0.106	0.116
	Multiplicative Adjustment	0.099	0.098	0.128	0.118	0.125	0.093	0.093		0.112	0.118
	Multiplicative Adjustment (Cap)	0.109	0.115	0.131	0.123	0.144	0.100	0.108		0.133	0.134
Over 10,000 kW (n=50)	Unadjusted Baseline	0.192	0.197	0.196	0.105	0.251	0.198	0.200	Weekends	0.179	0.176
	Additive Adjustment	0.133	0.137	0.159	0.147	0.178	0.123	0.127		0.110	0.109
	Multiplicative Adjustment	0.134	0.140	0.165	0.147	0.195	0.124	0.130		0.111	0.108
	Multiplicative Adjustment (Cap)	0.146	0.148	0.161	0.140	0.222	0.141	0.142		0.137	0.117

Color coded, green = good, rank over rows within size category. Weekend baselines are color coded independently.

The size segmentation shows that baselines for smaller and very large accounts are slightly less accurate. This is likely due to the greater diversity of business types in the smaller account segments. Other than this observation, the segmentation by size provides little additional perspective on the choice of optimal baseline.

For reference, Table 19 lists the average annual kWh for each of the size categories.

Table 19 Average Annual kWh by Customer Size Segment

Size Segment	Average Annual kWh
<= 175 kW	472,998
175 – 500 kW	1,152,810
500 – 2,000 kW	3,273,390
2,000 – 10,000 kW	17,136,617
> 10,000 kW	103,863,642

2.1.3 Weather Sensitivity

Table 20 presents the overall results after segmenting by weather sensitive load. Examining Table 6 indicates that the same four baselines, i.e., the two X of Y type baselines, ISONE and CAISO with same day load-based adjustments are equally effective across non-weather and weather sensitive segmentations. Our conclusion is that there is no need to segment based on weather sensitivity because the use of a same day adjustment improves both the non-weather sensitive and weather sensitive segments.

Table 20 Accuracy of Baselines Segmented by Weather Sensitivity

Weather Sensitive	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Not Weather Sensitive	Unadjusted Baseline	0.097	0.100	0.099	0.100	0.115	0.099	0.099	Weekends	0.116	0.114
	Additive Adjustment	0.086	0.085	0.102	0.108	0.105	0.081	0.082		0.100	0.104
	Multiplicative Adjustment	0.087	0.088	0.106	0.108	0.108	0.082	0.084		0.103	0.105
	Multiplicative Adjustment (Cap)	0.087	0.087	0.101	0.108	0.108	0.082	0.083		0.101	0.106
Weather Sensitive	Unadjusted Baseline	0.171	0.177	0.163	0.148	0.153	0.175	0.176	Weekends	0.213	0.209
	Additive Adjustment	0.136	0.137	0.159	0.189	0.151	0.127	0.130		0.160	0.163
	Multiplicative Adjustment	0.141	0.142	0.168	0.189	0.161	0.130	0.132		0.171	0.168
	Multiplicative Adjustment (Cap)	0.137	0.140	0.155	0.178	0.151	0.130	0.133		0.168	0.165

Color coded, green = good, rows are ranked within each category. Weekend baselines are color coded independently.

A common structure of DR programs stipulates an unadjusted baseline for all accounts with an option for a same-day, load-based adjustment for accounts that are weather sensitive. This approach is not justified on the basis of the accuracy results reported in this study. While the same-day, load-based adjustment does not improve the accuracy for non-weather sensitive accounts to quite the same degree, there is still an improvement of 10 to 20 percent. A decision to forgo the load-based adjustment must be based on other considerations, such as administrative costs and/or non-typical event day behaviour (e.g.: pre-cooling).

2.1.4 Load Variability

Table 21 presents the accuracy of the baseline approaches based on a segmentation based on non-weather related load variability. Clearly these results indicate that the accuracy of the baseline erodes with increased load variability. The accuracy is exceptional for loads displaying low levels of variability. For the interquartile range of customers, i.e., variability category medium, the accuracy doubles but is still a very reasonable ±11 to ±12%. However, the "high" variable load category shows accuracy values that range above ±20%. It is important to note that these results are calculated after removing the most variable customers, i.e., the top 15% of the variable load customers. Whenever a customer's load is uncorrelated with any identifiable previous load pattern, no generalized baseline methodology can produce a consistent, effective baseline.

Table 21 Accuracy of Baselines based on "Variable Load" Segmentation

Variability Category	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Low (n=624)	Unadjusted Baseline	0.090	0.093	0.093	0.078	0.081	0.094	0.094	Weekends	0.119	0.113
	Additive Adjustment	0.068	0.069	0.082	0.088	0.074	0.064	0.066		0.081	0.083
	Multiplicative Adjustment	0.070	0.070	0.085	0.088	0.076	0.065	0.067		0.084	0.085
	Multiplicative Adjustment (Cap)	0.069	0.070	0.088	0.091	0.075	0.065	0.066		0.082	0.084
Med (n=1,250)	Unadjusted Baseline	0.162	0.170	0.163	0.159	0.165	0.167	0.169	Weekends	0.213	0.219
	Additive Adjustment	0.123	0.125	0.144	0.160	0.140	0.116	0.118		0.152	0.158
	Multiplicative Adjustment	0.125	0.127	0.148	0.160	0.147	0.116	0.118		0.154	0.158
	Multiplicative Adjustment (Cap)	0.127	0.131	0.150	0.157	0.147	0.120	0.124		0.160	0.164
High (n=243)	Unadjusted Baseline	0.289	0.304	0.292	0.241	0.421	0.305	0.311	Weekends	0.379	0.402
	Additive Adjustment	0.231	0.233	0.281	0.303	0.294	0.222	0.224		0.311	0.327
	Multiplicative Adjustment	0.232	0.240	0.301	0.303	0.321	0.219	0.226		0.317	0.324
	Multiplicative Adjustment (Cap)	0.249	0.267	0.281	0.258	0.360	0.244	0.263		0.333	0.343

Color coded, green = good, rank rows within category. Weekend baselines are color coded independently.

Other ISOs in the US are struggling with this same issue, i.e., baseline approaches considered in this analysis may not be applicable for customers with certain kinds of highly variable loads. The project team has had additional discussions with PJM regarding actions they are taking with regard to high variable load customers. PJM defines a high variable load customer as someone with an RRMSE greater than 20% during 60 simulated event periods[22]. PJM has used what they consider a rather simple, conservative load estimate by calculating the average minimum load during the event window for the five days prior to the actual event (Maximum Base Load approach). They also offer the use of an approach called the "Same Day (3+2)" approach. This approach averages the three hours before the event starts (after skipping the first hour before the event) and the two hours after an event stops (after skipping the first hour after the event). An additional "Match Day (3 Day Average)" approach is available that look at matching non-event hours on event days with three "matched days" based on the lowest squared deviation of the non-event hours. The "Match Day" approach reaches back 45-60 days prior to the event. Clearly, what to do with high variable load customers continues to be a challenge.

2.1.5 Geographic Region

Table 22 presents the accuracy of the baseline approaches for a segmentation based on geographic region. For this analysis, the Queensland area was defined as Region 1=North and all other areas were grouped together and defined as Region 2=South. While the accuracy is somewhat better, ±9% compared to ±11% for the North region, the "best" baselines are consistent between the two regions. There seems to be no discernible benefit for selecting different baselines for the different regions.

[22] *PJM Manual 11: Energy & Ancillary Services Market Operations*, Revision 60, August 20, 2013

Table 22 Accuracy of Baselines based on Regional Segmentation

Region	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
1=North	Unadjusted Baseline	0.122	0.128	0.127	0.138	0.120	0.128	0.130	Weekends	0.185	0.199
1=North	Additive Adjustment	0.091	0.091	0.111	0.119	0.107	0.085	0.087		0.133	0.139
1=North	Multiplicative Adjustment	0.092	0.093	0.115	0.119	0.111	0.086	0.088		0.137	0.137
1=North	Multiplicative Adjustment (Cap)	0.095	0.095	0.124	0.131	0.111	0.088	0.092		0.143	0.143
2=South	Unadjusted Baseline	0.158	0.164	0.154	0.143	0.154	0.161	0.163	Weekends	0.188	0.195
2=South	Additive Adjustment	0.118	0.118	0.139	0.154	0.133	0.111	0.113		0.138	0.143
2=South	Multiplicative Adjustment	0.119	0.120	0.144	0.154	0.136	0.110	0.112		0.138	0.140
2=South	Multiplicative Adjustment (Cap)	0.120	0.124	0.142	0.151	0.136	0.113	0.117		0.143	0.147

Color coded, green = good, rank over all rows within Region. Weekend baselines are color coded independently.

2.1.6 Observations

The following observations were made with respect to the Accuracy statistic:

- Across the board four of the seven weekday baselines testing outperformed the remaining three. The four high performers included:
  - PJM H4of5,
  - Middle 4of6,
  - ISONE, and
  - CAISO 10of10;
- In most instances, adjustment mechanisms improved the performance of the unadjusted baseline;
- The Weekend M2of4 consistently outperformed the Weekend H2of3;
- Segmentation had no discernible effect on the selection of high performing baselines.

2.2 Bias

The second baseline attribute analysed was **bias**, or the systematic tendency of a baseline method to over- or under-predict actual loads. Bias was measured using the baseline's average relative error (ARE). This statistic, for a given customer, is the average half hourly baseline less the average half hourly actual load, expressed as a fraction of actual half hourly load. A median ARE value of zero would indicate that the typical customer in our sample had no systematic tendency to over- or under-predict loads using that baseline, whereas a positive (negative) value would indicate a tendency to over- (under-) predict loads. The closer ARE is to zero, the closer the baseline is to being unbiased.

2.2.1 Overall

Table 37 presents the absolute value of the median bias estimates for each of the tested baselines and the associated adjustments. The level of bias was non-existent or extremely small, i.e., less than 1%, for all CBLs with the additive and multiplicative adjustments. Unadjusted baselines appeared to be more susceptible to bias, for example the PJM Same Day, which resulted in a 5.5% bias for the typical customer. A 1% positive bias indicates that the CBL will be estimated 1% too high for the typical customer during a likely summer event day. Several baselines, including the CAISO 10 of 10 with the additive adjustment) were found to be unbiased for the typical customer as represented by a zero value in Table 37.

Table 23 Comparison of Baseline Bias[23]

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.003	0.030	0.013	0.055	0.004	0.039	0.034	Weekends	0.027	0.025
Additive Adjustment	0.008	0.000	0.003	0.013	0.004	0.000	0.000		0.000	0.008
Multiplicative Adjustment	0.009	0.001	0.007	0.013	0.007	0.001	0.001		0.002	0.012
Multiplicative Adjustment (Cap)	0.005	0.007	0.003	0.036	0.001	0.006	0.007		0.011	0.014

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 24 presents the actual distribution statistics for the bias statistic. The table presents the 10th, 50th (median) and 90th percentiles along with the mean. For the PJM (m4of6) with additive adjustment, the 10th to 90th percentile range (i.e., 80% of all customers) fall between a -2.0% to a +1.8%. Distribution statistics tables are included in the Appendices.

[23] Note the bias statistics are presented in absolute terms for comparison purposes. Additional tables can be found in the Appendices that highlight the distribution statistics for the bias statistic.

Table 24 Baseline Bias: Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
BIAS	Unadjusted	**10th Percentile**	-0.0311	-0.0757	-0.0420	-0.2416	-0.0299	-0.0884	-0.0800	-0.0932	-0.0080
BIAS	Unadjusted	**Median**	-0.0028	-0.0305	-0.0126	-0.0553	-0.0038	-0.0395	-0.0339	-0.0271	0.0248
BIAS	Unadjusted	**Mean**	-0.0009	-0.0343	-0.0141	-0.0805	-0.0053	-0.0440	-0.0381	-0.0348	0.0934
BIAS	Unadjusted	**90th Percentile**	0.0292	-0.0005	0.0055	0.0222	0.0162	-0.0064	-0.0040	0.0149	0.1489
BIAS	Additive Adj	**10th Percentile**	-0.0053	-0.0202	-0.0139	-0.1140	-0.0136	-0.0192	-0.0170	-0.0387	-0.0287
BIAS	Additive Adj	**Median**	0.0080	-0.0004	0.0029	-0.0130	0.0038	0.0000	0.0000	-0.0003	0.0084
BIAS	Additive Adj	**Mean**	0.0110	-0.0009	0.0034	-0.0092	0.0040	-0.0014	-0.0004	0.0119	0.0274
BIAS	Additive Adj	**90th Percentile**	0.0321	0.0179	0.0217	0.0983	0.0215	0.0171	0.0172	0.0400	0.0622
BIAS	Multiplicative Adj	**10th Percentile**	-0.0042	-0.0172	-0.0083	-0.1140	-0.0088	-0.0177	-0.0166	-0.0325	-0.0185
BIAS	Multiplicative Adj	**Median**	0.0092	0.0009	0.0070	-0.0130	0.0070	0.0008	0.0006	0.0024	0.0118
BIAS	Multiplicative Adj	**Mean**	0.0141	0.0030	0.0519	-0.0092	0.0628	0.0003	0.0010	0.0164	0.0355
BIAS	Multiplicative Adj	**90th Percentile**	0.0379	0.0238	0.0424	0.0983	0.0360	0.0197	0.0193	0.0565	0.0792
BIAS	Capped Adjustment	**10th Percentile**	-0.0143	-0.0447	-0.0246	-0.1556	-0.0287	-0.0448	-0.0465	-0.0817	-0.0134
BIAS	Capped Adjustment	**Median**	0.0053	-0.0074	-0.0028	-0.0358	0.0012	-0.0063	-0.0065	-0.0106	0.0138
BIAS	Capped Adjustment	**Mean**	0.0070	-0.0124	-0.0038	-0.0418	-0.0024	-0.0124	-0.0127	-0.0240	0.0631
BIAS	Capped Adjustment	**90th Percentile**	0.0291	0.0102	0.0135	0.0539	0.0180	0.0106	0.0093	0.0197	0.0918

2.2.2 Customer Size

Table 25 presents the absolute value of the baseline bias statistics ranked by size category. Once again, green indicates "good". For the bias statistic most (104 out of 140) of the weekday baselines have a median bias under 1%. For the weekend, the middle 2 of 4 (M2of4) outperforms the high 2 of 3 (H2of3).

Table 25 Baseline Bias: Segmented by Customer Size

Size Category	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM Weathsens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Up to 175 kW (n=2,184)	Unadjusted Baseline	0.004	0.019	0.006	0.025	0.003	0.026	0.020	Weekends	0.021	0.019
	Additive Adjustment	0.009	0.001	0.001	0.026	0.004	0.001	0.000		0.000	0.012
	Multiplicative Adjustment	0.010	0.001	0.005	0.026	0.007	0.001	0.001		0.004	0.015
	Multiplicative Adjustment (Cap)	0.008	0.004	0.001	0.040	0.002	0.004	0.003		0.005	0.014
175 kW to 500 kW (n=1,355)	Unadjusted Baseline	0.003	0.031	0.013	0.053	0.004	0.040	0.033	Weekend	0.029	0.024
	Additive Adjustment	0.008	0.001	0.002	0.017	0.004	0.001	0.000		0.001	0.010
	Multiplicative Adjustment	0.010	0.000	0.007	0.017	0.008	0.000	0.000		0.002	0.014
	Multiplicative Adjustment (Cap)	0.006	0.008	0.003	0.041	0.002	0.008	0.007		0.012	0.015
500 to 2,000 kW (n=471)	Unadjusted Baseline	0.004	0.031	0.012	0.075	0.003	0.041	0.036	Weekend	0.025	0.028
	Additive Adjustment	0.008	0.000	0.004	0.004	0.003	0.001	0.001		0.001	0.008
	Multiplicative Adjustment	0.009	0.001	0.008	0.004	0.006	0.002	0.001		0.004	0.009
	Multiplicative Adjustment (Cap)	0.005	0.007	0.003	0.032	0.000	0.006	0.006		0.011	0.012
2,000 to 10,000 kW (n=141)	Unadjusted Baseline	0.000	0.019	0.008	0.024	0.003	0.028	0.030	Weekend	0.017	0.031
	Additive Adjustment	0.006	0.001	0.004	0.009	0.004	0.003	0.001		0.001	0.001
	Multiplicative Adjustment	0.008	0.003	0.008	0.009	0.006	0.003	0.002		0.003	0.003
	Multiplicative Adjustment (Cap)	0.006	0.003	0.003	0.018	0.001	0.000	0.005		0.005	0.008
Over 10,000 kW (n=50)	Unadjusted Baseline	0.017	0.000	0.013	0.012	0.013	0.017	0.013	Weekend	0.021	0.018
	Additive Adjustment	0.008	0.001	0.000	0.011	0.003	0.001	0.000		0.000	0.002
	Multiplicative Adjustment	0.009	0.003	0.007	0.011	0.002	0.002	0.003		0.001	0.005
	Multiplicative Adjustment (Cap)	0.008	0.002	0.004	0.010	0.015	0.000	0.001		0.003	0.005

Color coded, green = good, ranked within size category. Weekend baselines are color coded independently.

2.2.3 Weather Sensitivity

Table 26 presents the absolute values of the median bias estimates segmented by weather sensitivity. Many of the baselines perform very well with a median bias of less than 1%.

Table 26 Baseline Bias: Weather Sensitivity

Weath Sens?	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
No (n=992)	Unadjusted Baseline	0.002	0.019	0.009	0.033	0.003	0.025	0.022	Weekend	0.018	0.026
	Additive Adjustment	0.007	0.000	0.003	0.000	0.002	0.001	0.001		0.000	0.005
	Multiplicative Adjustment	0.008	0.001	0.006	0.000	0.005	0.001	0.001		0.001	0.008
	Multiplicative Adjustment (Cap)	0.005	0.003	0.002	0.010	0.000	0.001	0.003		0.006	0.011
Yes (n=1,125)	Unadjusted Baseline	0.008	0.042	0.017	0.083	0.005	0.053	0.044	Weekend	0.037	0.024
	Additive Adjustment	0.009	0.001	0.003	0.029	0.005	0.001	0.000		0.000	0.011
	Multiplicative Adjustment	0.011	0.001	0.008	0.029	0.009	0.001	0.000		0.005	0.016
	Multiplicative Adjustment (Cap)	0.005	0.013	0.004	0.063	0.002	0.012	0.011		0.015	0.016

Color coded, green = good, ranked within weather sensitivity category. Weekend baselines are color coded independently.

2.2.4 Load Variability

Table 27 presents the absolute value of the median bias based on load variability. The low variability category is the lower quartile (i.e., 25% of least variable customers), the medium category represents the inner quartile range (i.e., from 25% to 75%) and the high category represents the top 25% most variable customers. Even for the most variable load customers, a number of the baseline performed quite well, i.e., less than 1% bias. The ISONE, CAISO, and Middle 4of6 with an additive or multiplicative adjustment were all less than the 1% threshold.

Table 27 Baseline Bias: Load Variability

Var	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Low (n=624)	Unadjusted Baseline	0.002	0.020	0.010	0.043	0.002	0.028	0.021	Weekend	0.021	0.012
	Additive Adjustment	0.006	0.000	0.002	0.025	0.003	0.000	0.000		0.000	0.004
	Multiplicative Adjustment	0.007	0.001	0.003	0.025	0.005	0.001	0.001		0.001	0.006
	Multiplicative Adjustment (Cap)	0.006	0.001	0.000	0.034	0.004	0.001	0.000		0.003	0.006
Med (n=1,250)	Unadjusted Baseline	0.005	0.037	0.015	0.070	0.006	0.048	0.042	Weekend	0.031	0.031
	Additive Adjustment	0.008	0.001	0.003	0.008	0.004	0.000	0.000		0.000	0.011
	Multiplicative Adjustment	0.010	0.001	0.008	0.008	0.008	0.000	0.000		0.003	0.016
	Multiplicative Adjustment (Cap)	0.004	0.012	0.005	0.041	0.000	0.010	0.011		0.015	0.019
High (n=243)	Unadjusted Baseline	0.004	0.045	0.011	0.050	0.001	0.056	0.058	Weekend	0.042	0.070
	Additive Adjustment	0.020	0.004	0.013	0.031	0.008	0.004	0.005		0.002	0.022
	Multiplicative Adjustment	0.025	0.006	0.033	0.031	0.024	0.003	0.003		0.009	0.031
	Multiplicative Adjustment (Cap)	0.010	0.028	0.008	0.009	0.011	0.024	0.032		0.036	0.028

Color coded, green = good, rank rows within category. Weekend baselines are color coded independently.

2.2.5 Geographic Region

Table 28 presents the absolute value of the median bias statistic by geographic region. The north is represented by Queensland with all other regions aggregated together to represent the South. Most of the weekday baselines are under the 1% threshold. Once again, the weekend M2of4 outperformed the weekend H2of3.

Table 28 Baseline Bias: Geographic Region

Region	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
1=North	Unadjusted Baseline	0.003	0.026	0.005	0.053	0.002	0.036	0.029		0.019	0.028
1=North	Additive Adjustment	0.009	0.001	0.004	0.014	0.004	0.002	0.001		0.003	0.009
1=North	Multiplicative Adjustment	0.010	0.002	0.007	0.014	0.007	0.003	0.001		0.006	0.011
1=North	Multiplicative Adjustment (Cap)	0.008	0.003	0.001	0.037	0.002	0.001	0.003		0.007	0.013
2=South	Unadjusted Baseline	0.003	0.034	0.019	0.056	0.005	0.042	0.037		0.034	0.023
2=South	Additive Adjustment	0.008	0.001	0.002	0.013	0.004	0.001	0.000		0.002	0.008
2=South	Multiplicative Adjustment	0.009	0.000	0.007	0.013	0.007	0.001	0.000		0.001	0.012
2=South	Multiplicative Adjustment (Cap)	0.003	0.010	0.004	0.036	0.001	0.010	0.009		0.012	0.014

Color coded, green = good, rank over all rows within Region. Weekend baselines are color coded independently.

2.2.6 Observations

The following observations were made with respect to the Bias statistic:

- While most of the baselines performed adequately with regard to bias, the same four baselines that showed superior performance with regard to accuracy also performed well with regard to bias. The four high performers included:
  - PJM H4of5,
  - Middle 4of6,
  - ISONE, and
  - CAISO 10of10;
- Adjustment mechanisms improved the performance of the unadjusted baseline with regard to bias;
- The Weekend M2of4 consistently outperformed the Weekend H2of3; and
- Segmentation had no discernible effect on the selection of high performing baselines.

2.3 Variability

The third baseline attribute analysed was **variability**, or how well the baseline does at predicting half hourly load under many different conditions and across many different customers. For example, two baselines may have the same RRMSE, but one baseline may be able to better estimate half hourly load across a wider variety of situations such that the dispersion of errors is much closer to actual load than the other baseline. In other words, one baseline may estimate the load shapes more closely than the other baseline. The variability measurement chosen was the relative error ratio (RER), which is the standard deviation of the baseline's prediction errors expressed as a fraction of average load. The smaller the median RER, the less variable a baseline's error is for the typical customer and therefore the better the baseline performs across a wide variety of circumstances.

It should be noted that the accuracy, bias and variability were all calculated for the 10th percentile, median, mean and 90th percentile for each baseline method within each segment. This allows for a detailed analysis of the different baselines across a wide variety of circumstances to get a thorough understanding of how well each baseline estimates a customer actual half hourly load. The 10th percentile in effect illustrates an expected "top" case performance scenario while the 90th percentile illustrates a "bottom" case performance scenario so an analyst can understand the range of expected outcomes for the various metrics.

2.3.1 Overall

Table 37 presents the overall comparison of the variability metric among the baselines. Similar to the discussion represented above for accuracy and bias, the use of an adjustment mechanism provides a significant reduction in the variability of the CBL performance making it a better estimator. Again, the X of Y approaches are all comparable, with the CAISO and ISONE performing slightly better.

Table 29 Variability of Baselines: Overall

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.142	0.146	0.144	0.102	0.141	0.140	0.144	Weekends	0.182	0.191
Additive Adjustment	0.106	0.107	0.126	0.120	0.122	0.101	0.103		0.133	0.139
Multiplicative Adjustment	0.108	0.109	0.131	0.120	0.127	0.100	0.102		0.136	0.137
Multiplicative Adjustment (Cap)	0.110	0.113	0.135	0.115	0.125	0.104	0.107		0.140	0.143

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 30 presents distribution statistics for the variability statistic. The distribution statistics include the 10th, 50th (Median), and 90th percentiles along with the mean. For the ISONE baseline with additive adjustment, the median variability statistic was 10.1% with a 10th percentile of 4.8% and a 90th percentile of 21.8%.

Table 30 Variability: Overall Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
VARIABILITY	Unadjusted	**10th Percentile**	0.0690	0.0704	0.0734	0.0496	0.0698	0.0689	0.0715	0.0795	0.0794
VARIABILITY	Unadjusted	**Median**	0.1424	0.1457	0.1443	0.1024	0.1411	0.1396	0.1444	0.1824	0.1914
VARIABILITY	Unadjusted	**Mean**	0.1616	0.1652	0.1653	0.1262	0.1801	0.1594	0.1635	0.2555	0.4074
VARIABILITY	Unadjusted	**90th Percentile**	0.2812	0.2899	0.2875	0.2414	0.3628	0.2794	0.2865	0.4708	0.5350
VARIABILITY	Additive Adj	**10th Percentile**	0.0504	0.0508	0.0613	0.0595	0.0586	0.0478	0.0484	0.0554	0.0578
VARIABILITY	Additive Adj	**Median**	0.1061	0.1065	0.1263	0.1200	0.1222	0.1010	0.1029	0.1328	0.1391
VARIABILITY	Additive Adj	**Mean**	0.1260	0.1269	0.1499	0.1446	0.1489	0.1198	0.1212	0.2249	0.2379
VARIABILITY	Additive Adj	**90th Percentile**	0.2279	0.2294	0.2752	0.2668	0.2794	0.2176	0.2210	0.4049	0.4345
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0507	0.0509	0.0629	0.0595	0.0594	0.0479	0.0486	0.0564	0.0581
VARIABILITY	Multiplicative Adj	**Median**	0.1081	0.1086	0.1309	0.1200	0.1272	0.1004	0.1025	0.1355	0.1371
VARIABILITY	Multiplicative Adj	**Mean**	0.1305	0.1341	0.4901	0.1446	0.5180	0.1206	0.1226	0.2316	0.2471
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2343	0.2397	0.3162	0.2668	0.3204	0.2190	0.2247	0.4191	0.4333
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0521	0.0528	0.0687	0.0598	0.0611	0.0485	0.0502	0.0584	0.0596
VARIABILITY	Capped Adjustment	**Median**	0.1098	0.1129	0.1346	0.1153	0.1255	0.1041	0.1073	0.1399	0.1432
VARIABILITY	Capped Adjustment	**Mean**	0.1296	0.1338	0.1551	0.1356	0.1594	0.1233	0.1270	0.2111	0.3272
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2357	0.2461	0.2728	0.2440	0.3209	0.2252	0.2355	0.4067	0.4371

2.3.2 Customer Size

Table 31 presents a summary of the variability statistic segmented by customer size. The tables are conditionally formatted within size category to highlight the baseline that performs the best for each size classification. The same four baselines identified earlier, namely ISONE, CAISO, H4of5, and M4of6, continue to perform well. Interestingly, the PJM Same Day unadjusted baseline performed the best for the largest customers.

Table 31 Variability: Segmented by Customer Size

Size Category	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Up to 175 kW (n=2,184)	Unadjusted Baseline	0.133	0.134	0.127	0.100	0.134	0.130	0.132	Weekends	0.157	0.159
	Additive Adjustment	0.109	0.108	0.129	0.119	0.128	0.102	0.104		0.127	0.130
	Multiplicative Adjustment	0.112	0.112	0.135	0.119	0.135	0.105	0.107		0.132	0.133
	Multiplicative Adjustment (Cap)	0.110	0.111	0.128	0.111	0.129	0.104	0.106		0.129	0.131
175 kW to 500 kW (n=1,355)	Unadjusted Baseline	0.144	0.146	0.144	0.102	0.136	0.140	0.145	Weekend	0.185	0.193
	Additive Adjustment	0.108	0.108	0.128	0.122	0.121	0.102	0.104		0.137	0.143
	Multiplicative Adjustment	0.110	0.111	0.133	0.122	0.127	0.102	0.104		0.139	0.141
	Multiplicative Adjustment (Cap)	0.110	0.113	0.135	0.117	0.124	0.104	0.108		0.142	0.145
500 to 2,000 kW (n=471)	Unadjusted Baseline	0.139	0.142	0.143	0.104	0.144	0.132	0.138	Weekend	0.180	0.195
	Additive Adjustment	0.103	0.104	0.122	0.119	0.123	0.097	0.099		0.130	0.139
	Multiplicative Adjustment	0.102	0.104	0.128	0.119	0.125	0.097	0.097		0.133	0.136
	Multiplicative Adjustment (Cap)	0.105	0.109	0.133	0.112	0.126	0.100	0.102		0.138	0.146
2,000 to 10,000 kW (n=141)	Unadjusted Baseline	0.136	0.143	0.143	0.102	0.169	0.143	0.148	Weekend	0.170	0.181
	Additive Adjustment	0.094	0.100	0.119	0.111	0.116	0.093	0.092		0.106	0.113
	Multiplicative Adjustment	0.098	0.098	0.128	0.111	0.124	0.093	0.093		0.110	0.114
	Multiplicative Adjustment (Cap)	0.107	0.114	0.131	0.108	0.144	0.100	0.107		0.131	0.132
Over 10,000 kW (n=50)	Unadjusted Baseline	0.183	0.192	0.194	0.100	0.247	0.196	0.192	Weekend	0.172	0.174
	Additive Adjustment	0.131	0.135	0.158	0.127	0.178	0.122	0.126		0.109	0.106
	Multiplicative Adjustment	0.132	0.137	0.164	0.127	0.194	0.124	0.128		0.108	0.102
	Multiplicative Adjustment (Cap)	0.141	0.144	0.159	0.121	0.216	0.139	0.141		0.135	0.116

Color coded, green = good, rank over rows within size category. Weekend baselines are color coded independently.

2.3.3 Weather Sensitivity

Table 32 presents a summary of the median variability statistics based on weather sensitivity. As expected the non-weather sensitive loads are less variable than the weather sensitive loads. But the adjustment mechanisms do a good job of helping to reduce the variability. The same four weekday baselines continue to perform well. And, the Weekend M2of4 outperforms the alternative.

Table 32 Variability: Weather Sensitivity

Weath Sens?	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
No (n=992)	Unadjusted Baseline	0.121	0.124	0.127	0.092	0.140	0.117	0.120	Weekend	0.151	0.155
	Additive Adjustment	0.098	0.099	0.116	0.110	0.121	0.093	0.094		0.118	0.120
	Multiplicative Adjustment	0.099	0.099	0.121	0.110	0.126	0.093	0.095		0.120	0.120
	Multiplicative Adjustment (Cap)	0.100	0.103	0.123	0.104	0.127	0.094	0.097		0.124	0.127
Yes (n=1,125)	Unadjusted Baseline	0.159	0.161	0.152	0.110	0.142	0.155	0.159	Weekend	0.206	0.213
	Additive Adjustment	0.112	0.113	0.134	0.131	0.123	0.106	0.108		0.145	0.152
	Multiplicative Adjustment	0.114	0.115	0.139	0.131	0.127	0.106	0.108		0.146	0.149
	Multiplicative Adjustment (Cap)	0.117	0.120	0.140	0.126	0.125	0.108	0.113		0.150	0.157

Color coded, green = good, ranked within weather sensitivity category. Weekend baselines are color coded independently.

2.3.4 Load Variability

Table 33 presents the median variability statistic for the three customer classifications based on whether or not the customer had variable load. As expected, the variability statistics increases as we go from low variable load (6-10% range) customers to high variable load customers (20-40% range).

Table 33 Variability: Load Variability

Var	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Low (n=624)	Unadjusted Baseline	0.090	0.090	0.092	0.061	0.081	0.087	0.089	Weekend	0.114	0.112
	Additive Adjustment	0.068	0.068	0.082	0.073	0.074	0.064	0.065		0.080	0.083
	Multiplicative Adjustment	0.069	0.070	0.084	0.073	0.076	0.064	0.066		0.083	0.084
	Multiplicative Adjustment (Cap)	0.068	0.069	0.088	0.073	0.074	0.064	0.065		0.080	0.082
Med (n=1,250)	Unadjusted Baseline	0.160	0.164	0.161	0.118	0.164	0.157	0.161	Weekend	0.208	0.215
	Additive Adjustment	0.122	0.124	0.144	0.141	0.140	0.116	0.118		0.150	0.156
	Multiplicative Adjustment	0.124	0.126	0.147	0.141	0.146	0.115	0.118		0.152	0.155
	Multiplicative Adjustment (Cap)	0.126	0.130	0.149	0.132	0.146	0.118	0.123		0.157	0.162
High (n=243)	Unadjusted Baseline	0.287	0.297	0.288	0.227	0.419	0.296	0.301	Weekend	0.365	0.388
	Additive Adjustment	0.229	0.230	0.278	0.271	0.294	0.221	0.223		0.307	0.320
	Multiplicative Adjustment	0.232	0.239	0.300	0.271	0.319	0.219	0.225		0.315	0.319
	Multiplicative Adjustment (Cap)	0.248	0.261	0.278	0.242	0.358	0.240	0.255		0.325	0.330

Color coded, green = good, rank rows within category. Weekend baselines are color coded independently.

2.3.5 Geographic Region

Table 34 presents a summary of the median of the variability statistic by geographic region. The load in the north seems slightly less variable than the load in the south. Once again, the same four candidate weekday baselines performed very well with the weekend M2of4 outperforming the alternative weekend.

Table 34 Variability: Segmented by Region

Region	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
1=North	Unadjusted Baseline	0.121	0.124	0.127	0.092	0.120	0.121	0.125	Weekend	0.183	0.192
1=North	Additive Adjustment	0.090	0.091	0.111	0.100	0.107	0.084	0.087		0.132	0.138
1=North	Multiplicative Adjustment	0.091	0.092	0.114	0.100	0.111	0.085	0.087		0.135	0.136
1=North	Multiplicative Adjustment (Cap)	0.095	0.095	0.124	0.097	0.110	0.088	0.091		0.141	0.142
2=South	Unadjusted Baseline	0.156	0.157	0.153	0.109	0.153	0.151	0.156	Weekend	0.182	0.191
2=South	Additive Adjustment	0.117	0.117	0.138	0.133	0.133	0.110	0.112		0.134	0.141
2=South	Multiplicative Adjustment	0.116	0.118	0.142	0.133	0.135	0.109	0.111		0.136	0.138
2=South	Multiplicative Adjustment (Cap)	0.119	0.122	0.141	0.127	0.136	0.111	0.116		0.139	0.144

Color coded, green = good, rank over all rows within Region. Weekend baselines are color coded independently.

2.3.6 Observations

The following observations were made with respect to the variability statistic:

- The same four baselines that showed superior performance with regard to accuracy and bias also performed well with regard to variability. The four high performers included:
  - PJM H4of5,
  - Middle 4of6,
  - ISONE, and
  - CAISO 10of10;
- Adjustment mechanisms improved the performance of the unadjusted baseline with regard to variability;
- The Weekend M2of4 consistently outperformed the Weekend H2of3; and
- Segmentation had no discernible effect on the selection of high performing baselines.

2.4 Additional Analyses

During the course of the project, AEMO and DNV KEMA staff met regularly to review the preliminary results. As a result of these meetings additional analyses were conducted to examine the veracity of the estimates. Some of the additional analyses (e.g., selected results for customers with a maximum demand less than 175 kW) were included in the main body of this report while others are included in separate appendices. The additional analyses included:

- Analysed customers that had a 2012 peak demand less than the threshold peak of 175 kW;
- Analysed customers that were excluded due to highly variable load, i.e., the top 15% of variable load customers;
- Expanded the base analyses to include the additional half-hours ending at 7pm.

2.5 High Variable Load Customers

In the analyses the project team noted that high variable load customers did not perform particularly well. This result is consistent with work completed for PJM. In PJM, high variable load customers are identified based on their relative root mean square error (RRMSE) during the targeted event period looking back 60 days[24]. If the customer has an RRMSE greater than 20% (i.e., 0.20) then the customers

[24] *PJM Manual 11: Energy & Ancillary Services Market Operations*, Revision 62, August 30, 2013

are labelled as “high variable load” customers and handled separately. We conducted a similar analysis on the full sample of customers. For this analysis we selected January 1, 2013 through March 31, 2013 as the test period and examined the RRMSE during the 1pm to 5pm event period for each of the three candidate baselines, i.e., CAISO, PJM (M4of6), and PJM (H4of5). Table 35 presents the distribution statistics for the RRMSE across the full sample. All three baselines display similar characteristics and would identify (and exclude) approximately the top 25% of as high variable load customers.

Table 35 Distribution Statistics for Selecting Variable Load Customers

Quantile	CALISO	PJM M40f6	PJM H4of5
99%	1.205	1.227	1.206
95%	0.585	0.597	0.585
90%	0.361	0.371	0.372
75% Q3	0.195	0.202	0.201
50% Median	0.119	0.124	0.123
25% Q1	0.075	0.080	0.079
10%	0.051	0.054	0.053
5%	0.039	0.041	0.041
1%	0.021	0.021	0.021

3. Recommendations

This selection summarizes the recommendations of the project team. Selection of an appropriate CBL must consider the results of the empirical analysis, the expected administrative costs, and any other known issues based on the previous practical experience of other ISOs.

- **Utilizing an additive adjustment is recommended.** The analysis clearly indicates that a same day additive or multiplicative adjustment has superior performance to an unadjusted CBL or a CBL using the PJM weather sensitive adjustment. The decision of whether to use a multiplicative or additive adjustment is fairly arbitrary because the impact on the performance metrics is not significant. However, due to a somewhat greater susceptibility of multiplicative adjustments to gross inaccuracies under certain demand conditions, we recommend that an additive adjustment be utilized.

- **Highly variable load customers should be segmented for purposes of applying a different CBL.** The ISONE and the X of Y CBLs (i.e., CAISO, PJM economic and mid 4 of 6) with a same day additive adjustment have similar results and performed well across all segments, time periods and weather conditions, except for predicting loads for highly variable load customers. It is therefore recommended that variable load customers be segmented for the purposes of applying a different CBL and/or market rule. Here again, some guidance can be gained from PJM and their "simplified" approach of using a "maximum base load" method, i.e., the average minimum load during the event window for the previous five weekdays.

- **Administrative and other factors are important considerations in the final determination of a CBL or CBLs.** Since the empirical results for non-variable load customers are similar, it is important to understand the administrative cost and other factors in the final decision. Table 36 presents a comparison of the four approaches.

Table 36 Summary of Results for Likely Event Weekdays, all Sizes of Customers, for All Weather Customers, with Non-Variable Load

Baseline	Accuracy	Bias	Variability	Administration	Strategic behaviour
ISONE w/additive adjustment	10%	0%	10%	Requires continuous meter data, difficult to make calculation transparent, admin for adjustments	Impact of pre-cooling[25]
CAISO w/additive adjustment	10%	0%	10%	Requires 10 non-event days	Impact of pre-cooling
PJM economic w/additive adjustment	11%	1%	11%	Requires limited load data based on specific reductions (5 non-event days, will use 4 if necessary) Currently implemented & minimum changes	Impact of pre-cooling Specific limit on how far to go back for CBL days (avoid issue with frequent settlements forcing outdated CBL days)
Middle 4 of 6 w/additive adjustment	11%	0%	11%	Requires 6 days (assumes same rules used for PJM economic CBL will be used)	Impact of pre-cooling Specific limit on how far to go back for CBL days (avoid issue with frequent settlements forcing outdated CBL days)

- **The ISONE CBL, has slightly better empirical performance than the other methods, however, it entails significantly more administrative costs.** The higher administrative costs are driven from the requirement of contiguous load data (since each baseline is based on the prior day's baseline). This approach also requires additional administration to ensure transparency to all market participants, and requires significantly more administration for settlement adjustments that result in corrections in load data. Since the empirical performance of the ISONE baseline is only marginally better than that of the remaining two, it is not apparent that this additional administrative effort is warranted and therefore is not recommended.

- **The remaining three CBLs, the PJM economic, the middle 4 of 6, and the CAISO are reasonably similar in terms of empirical performance and ease of administration.** We should note that the CAISO approach requires nearly twice the load data to provide similar results to the remaining two. Also, the true impact of customers that have frequent DR events has not been considered in this analysis. This issue may have a bigger impact on the CAISO baseline since it requires more days to be selected (as more event days occur, more days closer to the event are skipped which results in the use of days further from the event day). Therefore we would recommend consideration be given to one of the two remaining PJM identified approaches.

- **We recommend implementing DRM using two baseline methodologies to start.** Since AEMO is just launching their demand response market, the project team believes that it is appropriate to start simple and gain some practical experience before opening up the market to a wider array of baseline offerings. Therefore, we are recommending starting with a single

[25] Customer would need to significantly increase load for 3 hours, 4 hour prior to event, only on event days, to have impact.

weekday baseline and a single weekend baseline (both using the additive adjustment). There are three viable candidates for the weekday baseline, i.e., CAISO, PJM (M4of6) and PJM (H4of5). For the weekend, we recommend the M2of4.

- **If multiple baselines are used, then demand response aggregators (DRAs) should be allowed to select the baseline.** If AEMO wants to offer more than one baseline, then the experience in other regions that allows the DRA to choose seems to work well and it does not create undue or inappropriate results. It is worth noting that selecting a better performing baseline does not, in and of itself, suggest a gamed result. It may well be the case that the lower performing baseline is unduly depressing the value of the resource because of some inherent load character. Further, where gaming has occurred through the use of unique bidding strategies, for instance, other market monitoring oversight is able to address the issues. Thus, given the costs associated with creating infrastructure and capabilities that would be new to AEMO and otherwise unnecessary in order to assign baselines to specific loads on a case by case basis, allowing DRAs to select the baseline is a reasonable and cost effective approach when combined with overall market monitoring for inappropriate behaviour.

- **We support the use of unscheduled DRM in NEM.** As indicated in the previous table, pre-cooling, while justified operationally, can cause an artificially higher baseline than normal when an adjusted CBL scenario is employed. The use of unscheduled demand response in NEM will help mitigate this concern.

- **Scalability of systems and processes related to the administration of the CBLs should be considered.** Other ISOs have used simple approaches including spreadsheet based solutions for their pilots and/or early implementations. Key needs as volume grows are robust databases to capture bidding[26] and validation data and some automatic or semi-automatic system for processing the data through the baselines.

- **Strategic behaviour in the market to artificially inflate the CBL should not be permitted.** Any CBL can be manipulated to the market participant's economic advantage, and it is recommended that rules be established to identify and mitigate this behaviour. The opportunity to conduct this activity increases when the reduction event is announced well in advance of the start of the event; there is no ongoing oversight to identify and review activity; and the market participants can determine exactly when they need to respond.

[26] AEMO does not anticipate allowing bidding into the DRM initially.

A. Appendix – Distribution Statistics (Hours 1-5pm)

The following tables present the distribution characteristics for each statistic for each baseline and baseline variant.

Table 37 Bias (Overall): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
BIAS	Unadjusted	**10th Percentile**	-0.0311	-0.0757	-0.0420	-0.2416	-0.0299	-0.0884	-0.0800	-0.0932	-0.0080
BIAS	Unadjusted	**Median**	-0.0028	-0.0305	-0.0126	-0.0553	-0.0038	-0.0395	-0.0339	-0.0271	0.0248
BIAS	Unadjusted	**Mean**	-0.0009	-0.0343	-0.0141	-0.0805	-0.0053	-0.0440	-0.0381	-0.0348	0.0934
BIAS	Unadjusted	**90th Percentile**	0.0292	-0.0005	0.0055	0.0222	0.0162	-0.0064	-0.0040	0.0149	0.1489
BIAS	Additive Adj	**10th Percentile**	-0.0053	-0.0202	-0.0139	-0.1140	-0.0136	-0.0192	-0.0170	-0.0387	-0.0287
BIAS	Additive Adj	**Median**	0.0080	-0.0004	0.0029	-0.0130	0.0038	0.0000	0.0000	-0.0003	0.0084
BIAS	Additive Adj	**Mean**	0.0110	-0.0009	0.0034	-0.0092	0.0040	-0.0014	-0.0004	0.0119	0.0274
BIAS	Additive Adj	**90th Percentile**	0.0321	0.0179	0.0217	0.0983	0.0215	0.0171	0.0172	0.0400	0.0622
BIAS	Multiplicative Adj	**10th Percentile**	-0.0042	-0.0172	-0.0083	-0.1140	-0.0088	-0.0177	-0.0166	-0.0325	-0.0185
BIAS	Multiplicative Adj	**Median**	0.0092	0.0009	0.0070	-0.0130	0.0070	0.0008	0.0006	0.0024	0.0118
BIAS	Multiplicative Adj	**Mean**	0.0141	0.0030	0.0519	-0.0092	0.0628	0.0003	0.0010	0.0164	0.0355
BIAS	Multiplicative Adj	**90th Percentile**	0.0379	0.0238	0.0424	0.0983	0.0360	0.0197	0.0193	0.0565	0.0792
BIAS	Capped Adjustment	**10th Percentile**	-0.0143	-0.0447	-0.0246	-0.1556	-0.0287	-0.0448	-0.0465	-0.0817	-0.0134
BIAS	Capped Adjustment	**Median**	0.0053	-0.0074	-0.0028	-0.0358	0.0012	-0.0063	-0.0065	-0.0106	0.0138
BIAS	Capped Adjustment	**Mean**	0.0070	-0.0124	-0.0038	-0.0418	-0.0024	-0.0124	-0.0127	-0.0240	0.0631
BIAS	Capped Adjustment	**90th Percentile**	0.0291	0.0102	0.0135	0.0539	0.0180	0.0106	0.0093	0.0197	0.0918

Table 38 Accuracy (Overall): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
ACCURACY	Unadjusted	**10th Percentile**	0.0695	0.0723	0.0741	0.0603	0.0700	0.0738	0.0740	0.0820	0.0819
ACCURACY	Unadjusted	**Median**	0.1433	0.1511	0.1457	0.1405	0.1417	0.1485	0.1506	0.1872	0.1965
ACCURACY	Unadjusted	**Mean**	0.1633	0.1708	0.1678	0.1705	0.1810	0.1679	0.1699	0.2614	0.4195
ACCURACY	Unadjusted	**90th Percentile**	0.2857	0.2965	0.2892	0.3289	0.3676	0.2910	0.2959	0.4820	0.5589
ACCURACY	Additive Adj	**10th Percentile**	0.0511	0.0508	0.0615	0.0670	0.0590	0.0482	0.0486	0.0564	0.0584
ACCURACY	Additive Adj	**Median**	0.1072	0.1076	0.1270	0.1416	0.1228	0.1015	0.1035	0.1356	0.1412
ACCURACY	Additive Adj	**Mean**	0.1271	0.1278	0.1505	0.1684	0.1495	0.1207	0.1219	0.2294	0.2436
ACCURACY	Additive Adj	**90th Percentile**	0.2289	0.2316	0.2756	0.3068	0.2798	0.2187	0.2226	0.4102	0.4409
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0514	0.0514	0.0632	0.0670	0.0599	0.0482	0.0488	0.0573	0.0590
ACCURACY	Multiplicative Adj	**Median**	0.1091	0.1095	0.1322	0.1416	0.1274	0.1015	0.1030	0.1373	0.1391
ACCURACY	Multiplicative Adj	**Mean**	0.1320	0.1352	0.4935	0.1684	0.5227	0.1215	0.1234	0.2353	0.2524
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2376	0.2426	0.3193	0.3068	0.3242	0.2200	0.2252	0.4271	0.4390
ACCURACY	Capped Adjustment	**10th Percentile**	0.0524	0.0535	0.0689	0.0693	0.0617	0.0491	0.0507	0.0592	0.0602
ACCURACY	Capped Adjustment	**Median**	0.1108	0.1144	0.1351	0.1435	0.1263	0.1056	0.1087	0.1426	0.1451
ACCURACY	Capped Adjustment	**Mean**	0.1308	0.1357	0.1564	0.1623	0.1602	0.1255	0.1289	0.2152	0.3349
ACCURACY	Capped Adjustment	**90th Percentile**	0.2362	0.2510	0.2739	0.2842	0.3215	0.2301	0.2391	0.4168	0.4465

Table 39 Variability (Overall): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
VARIABILITY	Unadjusted	**10th Percentile**	0.0690	0.0704	0.0734	0.0496	0.0698	0.0689	0.0715	0.0795	0.0794
VARIABILITY	Unadjusted	**Median**	0.1424	0.1457	0.1443	0.1024	0.1411	0.1396	0.1444	0.1824	0.1914
VARIABILITY	Unadjusted	**Mean**	0.1616	0.1652	0.1653	0.1262	0.1801	0.1594	0.1635	0.2555	0.4074
VARIABILITY	Unadjusted	**90th Percentile**	0.2812	0.2899	0.2875	0.2414	0.3628	0.2794	0.2865	0.4708	0.5350
VARIABILITY	Additive Adj	**10th Percentile**	0.0504	0.0508	0.0613	0.0595	0.0586	0.0478	0.0484	0.0554	0.0578
VARIABILITY	Additive Adj	**Median**	0.1061	0.1065	0.1263	0.1200	0.1222	0.1010	0.1029	0.1328	0.1391
VARIABILITY	Additive Adj	**Mean**	0.1260	0.1269	0.1499	0.1446	0.1489	0.1198	0.1212	0.2249	0.2379
VARIABILITY	Additive Adj	**90th Percentile**	0.2279	0.2294	0.2752	0.2668	0.2794	0.2176	0.2210	0.4049	0.4345
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0507	0.0509	0.0629	0.0595	0.0594	0.0479	0.0486	0.0564	0.0581
VARIABILITY	Multiplicative Adj	**Median**	0.1081	0.1086	0.1309	0.1200	0.1272	0.1004	0.1025	0.1355	0.1371
VARIABILITY	Multiplicative Adj	**Mean**	0.1305	0.1341	0.4901	0.1446	0.5180	0.1206	0.1226	0.2316	0.2471
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2343	0.2397	0.3162	0.2668	0.3204	0.2190	0.2247	0.4191	0.4333
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0521	0.0528	0.0687	0.0598	0.0611	0.0485	0.0502	0.0584	0.0596
VARIABILITY	Capped Adjustment	**Median**	0.1098	0.1129	0.1346	0.1153	0.1255	0.1041	0.1073	0.1399	0.1432
VARIABILITY	Capped Adjustment	**Mean**	0.1296	0.1338	0.1551	0.1356	0.1594	0.1233	0.1270	0.2111	0.3272
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2357	0.2461	0.2728	0.2440	0.3209	0.2252	0.2355	0.4067	0.4371

Table 40 Bias (175 kW to 500 kW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	175 kW to 500 kW	**count**	1355	1355	1355	1355	1355	1355	1355	1355	1355
BIAS	Unadjusted	**10th Percentile**	-0.0317	-0.0779	-0.0418	-0.2419	-0.0280	-0.0900	-0.0796	-0.0949	-0.0074
BIAS	Unadjusted	**Median**	-0.0034	-0.0313	-0.0133	-0.0529	-0.0038	-0.0402	-0.0332	-0.0293	0.0237
BIAS	Unadjusted	**Mean**	-0.0023	-0.0361	-0.0142	-0.0766	-0.0051	-0.0453	-0.0384	-0.0361	0.0565
BIAS	Unadjusted	**90th Percentile**	0.0256	-0.0030	0.0050	0.0375	0.0150	-0.0090	-0.0045	0.0140	0.1552
BIAS	Additive Adj	**10th Percentile**	-0.0053	-0.0203	-0.0140	-0.1260	-0.0117	-0.0201	-0.0179	-0.0401	-0.0260
BIAS	Additive Adj	**Median**	0.0082	-0.0009	0.0025	-0.0175	0.0042	-0.0006	-0.0005	-0.0008	0.0101
BIAS	Additive Adj	**Mean**	0.0111	-0.0017	0.0029	-0.0132	0.0047	-0.0027	-0.0012	0.0127	0.0291
BIAS	Additive Adj	**90th Percentile**	0.0321	0.0177	0.0215	0.0996	0.0212	0.0163	0.0166	0.0400	0.0627
BIAS	Multiplicative Adj	**10th Percentile**	-0.0042	-0.0178	-0.0093	-0.1260	-0.0074	-0.0185	-0.0167	-0.0341	-0.0155
BIAS	Multiplicative Adj	**Median**	0.0095	0.0004	0.0067	-0.0175	0.0076	0.0002	0.0000	0.0020	0.0135
BIAS	Multiplicative Adj	**Mean**	0.0138	0.0014	0.0344	-0.0132	0.0337	-0.0010	0.0001	0.0149	0.0363
BIAS	Multiplicative Adj	**90th Percentile**	0.0369	0.0235	0.0381	0.0996	0.0324	0.0193	0.0187	0.0565	0.0807
BIAS	Capped Adjustment	**10th Percentile**	-0.0142	-0.0467	-0.0239	-0.1659	-0.0218	-0.0449	-0.0454	-0.0815	-0.0116
BIAS	Capped Adjustment	**Median**	0.0055	-0.0081	-0.0026	-0.0406	0.0018	-0.0075	-0.0071	-0.0115	0.0150
BIAS	Capped Adjustment	**Mean**	0.0063	-0.0133	-0.0029	-0.0459	-0.0005	-0.0142	-0.0134	-0.0246	0.0347
BIAS	Capped Adjustment	**90th Percentile**	0.0275	0.0101	0.0141	0.0543	0.0184	0.0092	0.0087	0.0186	0.0935

Table 41 Accuracy (175 kW to 500 kW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	175 kW to 500 kW	**count**	1355	1355	1355	1355	1355	1355	1355	1355	1355
ACCURACY	Unadjusted	**10th Percentile**	0.0744	0.0772	0.0775	0.0621	0.0723	0.0777	0.0784	0.0870	0.0842
ACCURACY	Unadjusted	**Median**	0.1448	0.1512	0.1456	0.1366	0.1366	0.1487	0.1495	0.1890	0.1981
ACCURACY	Unadjusted	**Mean**	0.1606	0.1677	0.1643	0.1712	0.1698	0.1654	0.1667	0.2638	0.2932
ACCURACY	Unadjusted	**90th Percentile**	0.2657	0.2786	0.2743	0.3331	0.3254	0.2794	0.2827	0.4891	0.5906
ACCURACY	Additive Adj	**10th Percentile**	0.0552	0.0556	0.0662	0.0712	0.0624	0.0529	0.0537	0.0612	0.0634
ACCURACY	Additive Adj	**Median**	0.1091	0.1089	0.1281	0.1444	0.1216	0.1031	0.1048	0.1397	0.1456
ACCURACY	Additive Adj	**Mean**	0.1264	0.1270	0.1488	0.1710	0.1466	0.1203	0.1214	0.2369	0.2463
ACCURACY	Additive Adj	**90th Percentile**	0.2197	0.2201	0.2577	0.2995	0.2690	0.2094	0.2111	0.4224	0.4527
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0558	0.0560	0.0682	0.0712	0.0637	0.0525	0.0539	0.0626	0.0636
ACCURACY	Multiplicative Adj	**Median**	0.1114	0.1115	0.1339	0.1444	0.1270	0.1027	0.1047	0.1409	0.1442
ACCURACY	Multiplicative Adj	**Mean**	0.1294	0.1301	0.3390	0.1710	0.2870	0.1208	0.1223	0.2372	0.2543
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2245	0.2237	0.2854	0.2995	0.2931	0.2060	0.2070	0.4296	0.4474
ACCURACY	Capped Adjustment	**10th Percentile**	0.0585	0.0593	0.0731	0.0729	0.0662	0.0534	0.0546	0.0625	0.0637
ACCURACY	Capped Adjustment	**Median**	0.1118	0.1142	0.1349	0.1468	0.1239	0.1063	0.1087	0.1448	0.1486
ACCURACY	Capped Adjustment	**Mean**	0.1286	0.1329	0.1539	0.1658	0.1526	0.1238	0.1262	0.2174	0.2349
ACCURACY	Capped Adjustment	**90th Percentile**	0.2272	0.2352	0.2591	0.2848	0.2876	0.2180	0.2252	0.4207	0.4625

Table 42 Variability (175 kW to 500 kW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	175 kW to 500 kW	**count**	1355	1355	1355	1355	1355	1355	1355	1355	1355
VARIABILITY	Unadjusted	**10th Percentile**	0.0733	0.0755	0.0769	0.0516	0.0720	0.0730	0.0763	0.0827	0.0816
VARIABILITY	Unadjusted	**Median**	0.1436	0.1463	0.1437	0.1023	0.1359	0.1400	0.1449	0.1851	0.1927
VARIABILITY	Unadjusted	**Mean**	0.1590	0.1621	0.1614	0.1273	0.1689	0.1566	0.1603	0.2580	0.2840
VARIABILITY	Unadjusted	**90th Percentile**	0.2631	0.2706	0.2716	0.2415	0.3225	0.2636	0.2701	0.4840	0.5545
VARIABILITY	Additive Adj	**10th Percentile**	0.0551	0.0554	0.0654	0.0643	0.0622	0.0525	0.0537	0.0606	0.0628
VARIABILITY	Additive Adj	**Median**	0.1077	0.1081	0.1277	0.1223	0.1210	0.1023	0.1044	0.1367	0.1431
VARIABILITY	Additive Adj	**Mean**	0.1252	0.1261	0.1481	0.1452	0.1459	0.1193	0.1207	0.2317	0.2405
VARIABILITY	Additive Adj	**90th Percentile**	0.2178	0.2190	0.2570	0.2603	0.2688	0.2076	0.2105	0.4175	0.4514
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0556	0.0559	0.0676	0.0643	0.0636	0.0521	0.0539	0.0619	0.0629
VARIABILITY	Multiplicative Adj	**Median**	0.1101	0.1107	0.1327	0.1223	0.1266	0.1020	0.1040	0.1385	0.1410
VARIABILITY	Multiplicative Adj	**Mean**	0.1279	0.1291	0.3364	0.1452	0.2841	0.1197	0.1215	0.2335	0.2490
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2219	0.2226	0.2842	0.2603	0.2914	0.2041	0.2062	0.4236	0.4425
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0583	0.0589	0.0728	0.0652	0.0660	0.0528	0.0543	0.0620	0.0633
VARIABILITY	Capped Adjustment	**Median**	0.1104	0.1128	0.1346	0.1169	0.1236	0.1043	0.1076	0.1418	0.1452
VARIABILITY	Capped Adjustment	**Mean**	0.1274	0.1309	0.1522	0.1377	0.1519	0.1215	0.1242	0.2135	0.2294
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2250	0.2303	0.2587	0.2433	0.2872	0.2124	0.2217	0.4112	0.4536

Table 43 Bias (500 kW to 2,000 kW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	500 kW to 2000 kW	**count**	571	571	571	571	571	571	571	571	571
BIAS	Unadjusted	**10th Percentile**	-0.0321	-0.0727	-0.0429	-0.2512	-0.0303	-0.0894	-0.0843	-0.0958	-0.0106
BIAS	Unadjusted	**Median**	-0.0035	-0.0313	-0.0124	-0.0750	-0.0035	-0.0409	-0.0360	-0.0252	0.0281
BIAS	Unadjusted	**Mean**	-0.0026	-0.0358	-0.0150	-0.0995	-0.0054	-0.0457	-0.0410	-0.0374	0.1974
BIAS	Unadjusted	**90th Percentile**	0.0265	-0.0052	0.0041	0.0073	0.0154	-0.0091	-0.0079	0.0118	0.1416
BIAS	Additive Adj	**10th Percentile**	-0.0042	-0.0168	-0.0112	-0.0943	-0.0136	-0.0162	-0.0137	-0.0372	-0.0326
BIAS	Additive Adj	**Median**	0.0081	0.0002	0.0036	-0.0037	0.0033	0.0009	0.0008	0.0009	0.0075
BIAS	Additive Adj	**Mean**	0.0115	0.0008	0.0047	0.0015	0.0039	0.0013	0.0015	0.0137	0.0318
BIAS	Additive Adj	**90th Percentile**	0.0322	0.0178	0.0223	0.1115	0.0218	0.0193	0.0174	0.0471	0.0690
BIAS	Multiplicative Adj	**10th Percentile**	-0.0029	-0.0151	-0.0062	-0.0943	-0.0088	-0.0148	-0.0137	-0.0316	-0.0238
BIAS	Multiplicative Adj	**Median**	0.0094	0.0013	0.0079	-0.0037	0.0060	0.0016	0.0012	0.0041	0.0095
BIAS	Multiplicative Adj	**Mean**	0.0157	0.0067	0.1012	0.0015	0.1421	0.0031	0.0032	0.0224	0.0420
BIAS	Multiplicative Adj	**90th Percentile**	0.0401	0.0231	0.0514	0.1115	0.0409	0.0209	0.0196	0.0606	0.0871
BIAS	Capped Adjustment	**10th Percentile**	-0.0159	-0.0440	-0.0240	-0.1489	-0.0335	-0.0459	-0.0495	-0.0867	-0.0155
BIAS	Capped Adjustment	**Median**	0.0046	-0.0068	-0.0032	-0.0323	0.0004	-0.0057	-0.0062	-0.0111	0.0125
BIAS	Capped Adjustment	**Mean**	0.0063	-0.0134	-0.0052	-0.0390	-0.0042	-0.0121	-0.0137	-0.0271	0.1444
BIAS	Capped Adjustment	**90th Percentile**	0.0280	0.0076	0.0116	0.0592	0.0159	0.0116	0.0084	0.0181	0.0943

Table 44 Accuracy (500 kW to 2,000 kW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	500 kW to 2000 kW	**count**	571	571	571	571	571	571	571	571	571
ACCURACY	Unadjusted	**10th Percentile**	0.0648	0.0684	0.0682	0.0570	0.0651	0.0679	0.0692	0.0760	0.0816
ACCURACY	Unadjusted	**Median**	0.1407	0.1472	0.1443	0.1598	0.1440	0.1433	0.1467	0.1842	0.1989
ACCURACY	Unadjusted	**Mean**	0.1649	0.1733	0.1695	0.1803	0.1900	0.1694	0.1730	0.2748	0.7873
ACCURACY	Unadjusted	**90th Percentile**	0.3143	0.3217	0.3143	0.3370	0.4003	0.3127	0.3239	0.5465	0.5764
ACCURACY	Additive Adj	**10th Percentile**	0.0481	0.0485	0.0587	0.0645	0.0549	0.0454	0.0455	0.0524	0.0537
ACCURACY	Additive Adj	**Median**	0.1035	0.1045	0.1221	0.1347	0.1228	0.0978	0.0994	0.1318	0.1399
ACCURACY	Additive Adj	**Mean**	0.1273	0.1278	0.1510	0.1683	0.1515	0.1205	0.1218	0.2368	0.2650
ACCURACY	Additive Adj	**90th Percentile**	0.2441	0.2489	0.2971	0.3194	0.3018	0.2316	0.2347	0.4102	0.4535
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0482	0.0483	0.0606	0.0645	0.0562	0.0458	0.0455	0.0527	0.0546
ACCURACY	Multiplicative Adj	**Median**	0.1036	0.1044	0.1281	0.1347	0.1263	0.0968	0.0975	0.1346	0.1376
ACCURACY	Multiplicative Adj	**Mean**	0.1364	0.1454	0.9433	0.1683	1.1610	0.1216	0.1241	0.2567	0.2785
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2686	0.2602	0.3821	0.3194	0.3414	0.2419	0.2407	0.4805	0.4700
ACCURACY	Capped Adjustment	**10th Percentile**	0.0484	0.0497	0.0653	0.0670	0.0572	0.0454	0.0474	0.0543	0.0573
ACCURACY	Capped Adjustment	**Median**	0.1060	0.1101	0.1335	0.1395	0.1258	0.1009	0.1030	0.1407	0.1480
ACCURACY	Capped Adjustment	**Mean**	0.1321	0.1377	0.1579	0.1617	0.1653	0.1258	0.1310	0.2276	0.6292
ACCURACY	Capped Adjustment	**90th Percentile**	0.2656	0.2705	0.3017	0.2894	0.3421	0.2475	0.2614	0.4536	0.4778

Table 45 Variability (500 kW to 2,000 kW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	500 kW to 2000 kW	**count**	571	571	571	571	571	571	571	571	571
VARIABILITY	Unadjusted	**10th Percentile**	0.0637	0.0653	0.0681	0.0460	0.0651	0.0637	0.0656	0.0746	0.0773
VARIABILITY	Unadjusted	**Median**	0.1393	0.1424	0.1434	0.1039	0.1440	0.1324	0.1384	0.1803	0.1948
VARIABILITY	Unadjusted	**Mean**	0.1633	0.1677	0.1679	0.1286	0.1890	0.1606	0.1661	0.2680	0.7670
VARIABILITY	Unadjusted	**90th Percentile**	0.3116	0.3149	0.3103	0.2507	0.3983	0.3031	0.3162	0.5151	0.5600
VARIABILITY	Additive Adj	**10th Percentile**	0.0477	0.0484	0.0586	0.0559	0.0544	0.0453	0.0454	0.0525	0.0535
VARIABILITY	Additive Adj	**Median**	0.1028	0.1039	0.1220	0.1191	0.1228	0.0973	0.0993	0.1297	0.1385
VARIABILITY	Additive Adj	**Mean**	0.1262	0.1271	0.1504	0.1463	0.1509	0.1198	0.1212	0.2330	0.2587
VARIABILITY	Additive Adj	**90th Percentile**	0.2430	0.2488	0.2958	0.2939	0.3010	0.2316	0.2324	0.4063	0.4437
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0479	0.0480	0.0606	0.0559	0.0546	0.0458	0.0454	0.0522	0.0547
VARIABILITY	Multiplicative Adj	**Median**	0.1024	0.1043	0.1276	0.1191	0.1248	0.0967	0.0973	0.1326	0.1363
VARIABILITY	Multiplicative Adj	**Mean**	0.1349	0.1442	0.9378	0.1463	1.1519	0.1208	0.1233	0.2526	0.2723
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2657	0.2593	0.3808	0.2939	0.3388	0.2413	0.2406	0.4688	0.4449
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0482	0.0492	0.0650	0.0568	0.0568	0.0454	0.0472	0.0532	0.0557
VARIABILITY	Capped Adjustment	**Median**	0.1052	0.1089	0.1332	0.1115	0.1258	0.1005	0.1024	0.1378	0.1458
VARIABILITY	Capped Adjustment	**Mean**	0.1310	0.1359	0.1572	0.1351	0.1643	0.1238	0.1291	0.2226	0.6152
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2650	0.2679	0.3004	0.2594	0.3390	0.2441	0.2557	0.4390	0.4673

Table 46 Bias (2 MW to 10 MW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	2 MW to 10 MW	**count**	141	141	141	141	141	141	141	140	140
BIAS	Unadjusted	**10th Percentile**	-0.0224	-0.0619	-0.0363	-0.1848	-0.0340	-0.0717	-0.0676	-0.0622	-0.0052
BIAS	Unadjusted	**Median**	0.0005	-0.0191	-0.0082	-0.0244	-0.0031	-0.0284	-0.0296	-0.0172	0.0313
BIAS	Unadjusted	**Mean**	0.0106	-0.0189	-0.0103	-0.0580	-0.0033	-0.0294	-0.0300	-0.0178	0.0478
BIAS	Unadjusted	**90th Percentile**	0.0561	0.0194	0.0085	0.0035	0.0242	0.0118	0.0101	0.0242	0.1118
BIAS	Additive Adj	**10th Percentile**	-0.0078	-0.0192	-0.0154	-0.0713	-0.0274	-0.0193	-0.0204	-0.0322	-0.0445
BIAS	Additive Adj	**Median**	0.0063	0.0008	0.0038	-0.0087	0.0040	0.0028	0.0014	0.0007	0.0014
BIAS	Additive Adj	**Mean**	0.0084	0.0005	0.0051	-0.0106	0.0011	0.0008	0.0005	0.0020	-0.0018
BIAS	Additive Adj	**90th Percentile**	0.0293	0.0218	0.0290	0.0553	0.0250	0.0195	0.0185	0.0281	0.0415
BIAS	Multiplicative Adj	**10th Percentile**	-0.0054	-0.0141	-0.0043	-0.0713	-0.0163	-0.0163	-0.0175	-0.0222	-0.0251
BIAS	Multiplicative Adj	**Median**	0.0077	0.0030	0.0081	-0.0087	0.0061	0.0030	0.0020	0.0032	0.0035
BIAS	Multiplicative Adj	**Mean**	0.0109	0.0040	0.0309	-0.0106	0.0303	0.0017	0.0019	0.0092	0.0088
BIAS	Multiplicative Adj	**90th Percentile**	0.0376	0.0310	0.0632	0.0553	0.0693	0.0204	0.0232	0.0397	0.0517
BIAS	Capped Adjustment	**10th Percentile**	-0.0126	-0.0312	-0.0293	-0.1122	-0.0406	-0.0246	-0.0375	-0.0577	-0.0162
BIAS	Capped Adjustment	**Median**	0.0055	-0.0033	-0.0026	-0.0183	-0.0010	0.0001	-0.0051	-0.0055	0.0075
BIAS	Capped Adjustment	**Mean**	0.0125	-0.0037	-0.0054	-0.0212	-0.0071	0.0001	-0.0056	-0.0110	0.0223
BIAS	Capped Adjustment	**90th Percentile**	0.0408	0.0234	0.0121	0.0473	0.0191	0.0181	0.0153	0.0238	0.0664

Table 47 Accuracy (2 MW to 10 MW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	2 MW to 10 MW	**count**	141	141	141	141	141	141	141	140	140
ACCURACY	Unadjusted	**10th Percentile**	0.0558	0.0573	0.0679	0.0415	0.0558	0.0609	0.0605	0.0765	0.0765
ACCURACY	Unadjusted	**Median**	0.1384	0.1470	0.1445	0.1264	0.1701	0.1477	0.1519	0.1757	0.1839
ACCURACY	Unadjusted	**Mean**	0.1664	0.1744	0.1769	0.1398	0.2199	0.1714	0.1751	0.2061	0.2219
ACCURACY	Unadjusted	**90th Percentile**	0.3003	0.3128	0.3568	0.2468	0.4804	0.3223	0.3206	0.3808	0.4105
ACCURACY	Additive Adj	**10th Percentile**	0.0406	0.0403	0.0499	0.0558	0.0462	0.0381	0.0395	0.0428	0.0457
ACCURACY	Additive Adj	**Median**	0.0964	0.1014	0.1193	0.1181	0.1160	0.0941	0.0936	0.1064	0.1163
ACCURACY	Additive Adj	**Mean**	0.1249	0.1261	0.1534	0.1480	0.1567	0.1176	0.1194	0.1618	0.1709
ACCURACY	Additive Adj	**90th Percentile**	0.2575	0.2604	0.3327	0.3019	0.3385	0.2447	0.2437	0.3331	0.3625
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0415	0.0413	0.0523	0.0558	0.0470	0.0386	0.0401	0.0443	0.0459
ACCURACY	Multiplicative Adj	**Median**	0.0990	0.0984	0.1281	0.1181	0.1255	0.0926	0.0932	0.1119	0.1181
ACCURACY	Multiplicative Adj	**Mean**	0.1300	0.1328	0.2359	0.1480	0.2533	0.1205	0.1236	0.1642	0.1697
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2748	0.2816	0.4357	0.3019	0.4978	0.2570	0.2647	0.3426	0.3597
ACCURACY	Capped Adjustment	**10th Percentile**	0.0430	0.0432	0.0562	0.0567	0.0485	0.0384	0.0433	0.0475	0.0464
ACCURACY	Capped Adjustment	**Median**	0.1090	0.1151	0.1311	0.1233	0.1441	0.1004	0.1078	0.1328	0.1335
ACCURACY	Capped Adjustment	**Mean**	0.1355	0.1422	0.1627	0.1395	0.1879	0.1279	0.1355	0.1633	0.1670
ACCURACY	Capped Adjustment	**90th Percentile**	0.2701	0.2736	0.3356	0.2485	0.4082	0.2527	0.2669	0.3206	0.3135

Table 48 Variability (2 MW to 10 MW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	2 MW to 10 MW	**count**	141	141	141	141	141	141	141	140	140
VARIABILITY	Unadjusted	**10th Percentile**	0.0554	0.0569	0.0664	0.0394	0.0555	0.0579	0.0581	0.0740	0.0752
VARIABILITY	Unadjusted	**Median**	0.1362	0.1426	0.1434	0.1022	0.1694	0.1435	0.1484	0.1698	0.1805
VARIABILITY	Unadjusted	**Mean**	0.1638	0.1702	0.1760	0.1105	0.2187	0.1651	0.1696	0.2024	0.2140
VARIABILITY	Unadjusted	**90th Percentile**	0.2999	0.3080	0.3560	0.2031	0.4791	0.3206	0.3170	0.3740	0.3997
VARIABILITY	Additive Adj	**10th Percentile**	0.0400	0.0403	0.0499	0.0443	0.0459	0.0378	0.0394	0.0426	0.0455
VARIABILITY	Additive Adj	**Median**	0.0945	0.1003	0.1186	0.1109	0.1160	0.0926	0.0924	0.1059	0.1131
VARIABILITY	Additive Adj	**Mean**	0.1239	0.1252	0.1527	0.1314	0.1557	0.1168	0.1186	0.1603	0.1681
VARIABILITY	Additive Adj	**90th Percentile**	0.2571	0.2605	0.3309	0.2533	0.3345	0.2430	0.2413	0.3338	0.3542
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0409	0.0410	0.0523	0.0443	0.0466	0.0384	0.0400	0.0440	0.0459
VARIABILITY	Multiplicative Adj	**Median**	0.0984	0.0978	0.1281	0.1109	0.1245	0.0925	0.0926	0.1098	0.1138
VARIABILITY	Multiplicative Adj	**Mean**	0.1287	0.1318	0.2328	0.1314	0.2495	0.1197	0.1229	0.1622	0.1672
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2739	0.2803	0.4300	0.2533	0.4921	0.2562	0.2639	0.3421	0.3514
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0429	0.0432	0.0563	0.0451	0.0477	0.0375	0.0418	0.0471	0.0460
VARIABILITY	Capped Adjustment	**Median**	0.1074	0.1145	0.1306	0.1076	0.1436	0.0996	0.1066	0.1307	0.1317
VARIABILITY	Capped Adjustment	**Mean**	0.1335	0.1401	0.1621	0.1204	0.1866	0.1259	0.1334	0.1605	0.1630
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2653	0.2710	0.3345	0.2244	0.4063	0.2487	0.2639	0.3108	0.2945

Table 49 Bias (Over 10 MW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Over 10 MW	**count**	50	50	50	50	50	50	50	50	50
BIAS	Unadjusted	**10th Percentile**	-0.0303	-0.0685	-0.0518	-0.1021	-0.0487	-0.0814	-0.0677	-0.0770	-0.0146
BIAS	Unadjusted	**Median**	0.0166	0.0001	-0.0131	-0.0115	-0.0132	-0.0174	-0.0131	-0.0211	0.0181
BIAS	Unadjusted	**Mean**	0.0233	-0.0106	-0.0086	-0.0318	-0.0122	-0.0282	-0.0195	-0.0166	0.0348
BIAS	Unadjusted	**90th Percentile**	0.0872	0.0470	0.0328	0.0143	0.0246	0.0212	0.0208	0.0511	0.1112
BIAS	Additive Adj	**10th Percentile**	-0.0141	-0.0390	-0.0264	-0.0886	-0.0342	-0.0335	-0.0309	-0.0334	-0.0144
BIAS	Additive Adj	**Median**	0.0080	0.0008	0.0001	-0.0105	-0.0028	0.0006	0.0001	0.0002	0.0023
BIAS	Additive Adj	**Mean**	0.0070	-0.0027	-0.0027	-0.0199	-0.0070	-0.0037	-0.0029	0.0005	0.0116
BIAS	Additive Adj	**90th Percentile**	0.0320	0.0224	0.0201	0.0262	0.0204	0.0178	0.0155	0.0244	0.0472
BIAS	Multiplicative Adj	**10th Percentile**	-0.0130	-0.0350	-0.0133	-0.0886	-0.0197	-0.0314	-0.0281	-0.0317	-0.0111
BIAS	Multiplicative Adj	**Median**	0.0089	0.0031	0.0069	-0.0105	0.0023	0.0015	0.0026	0.0007	0.0053
BIAS	Multiplicative Adj	**Mean**	0.0122	0.0041	0.0217	-0.0199	0.0356	-0.0017	-0.0004	0.0067	0.0172
BIAS	Multiplicative Adj	**90th Percentile**	0.0406	0.0306	0.0936	0.0262	0.0908	0.0196	0.0193	0.0302	0.0536
BIAS	Capped Adjustment	**10th Percentile**	-0.0171	-0.0388	-0.0443	-0.0840	-0.0521	-0.0445	-0.0378	-0.0595	-0.0185
BIAS	Capped Adjustment	**Median**	0.0083	0.0025	-0.0037	-0.0097	-0.0155	0.0000	-0.0007	-0.0028	0.0054
BIAS	Capped Adjustment	**Mean**	0.0181	-0.0005	-0.0078	-0.0216	-0.0191	-0.0025	-0.0023	-0.0090	0.0179
BIAS	Capped Adjustment	**90th Percentile**	0.0671	0.0409	0.0197	0.0243	0.0063	0.0358	0.0292	0.0383	0.0554

Table 50 Accuracy (Over 10 MW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Over 10 MW	**count**	50	50	50	50	50	50	50	50	50
ACCURACY	Unadjusted	**10th Percentile**	0.0807	0.0893	0.0917	0.0496	0.1194	0.0930	0.0901	0.0668	0.0583
ACCURACY	Unadjusted	**Median**	0.1916	0.1966	0.1959	0.1051	0.2513	0.1981	0.1997	0.1786	0.1756
ACCURACY	Unadjusted	**Mean**	0.2096	0.2133	0.2155	0.1251	0.2731	0.2105	0.2082	0.1995	0.1949
ACCURACY	Unadjusted	**90th Percentile**	0.3733	0.3618	0.4000	0.2287	0.4810	0.3423	0.3520	0.3447	0.3494
ACCURACY	Additive Adj	**10th Percentile**	0.0444	0.0434	0.0579	0.0519	0.0518	0.0436	0.0446	0.0374	0.0369
ACCURACY	Additive Adj	**Median**	0.1327	0.1372	0.1588	0.1472	0.1784	0.1228	0.1267	0.1105	0.1091
ACCURACY	Additive Adj	**Mean**	0.1504	0.1525	0.1860	0.1547	0.1877	0.1420	0.1424	0.1311	0.1302
ACCURACY	Additive Adj	**90th Percentile**	0.2782	0.2737	0.3494	0.2585	0.3405	0.2531	0.2551	0.3042	0.2923
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0439	0.0430	0.0643	0.0519	0.0581	0.0433	0.0441	0.0375	0.0364
ACCURACY	Multiplicative Adj	**Median**	0.1340	0.1401	0.1646	0.1472	0.1950	0.1244	0.1298	0.1106	0.1077
ACCURACY	Multiplicative Adj	**Mean**	0.1586	0.1624	0.2674	0.1547	0.3685	0.1440	0.1448	0.1374	0.1329
ACCURACY	Multiplicative Adj	**90th Percentile**	0.3166	0.3338	0.7583	0.2585	0.7019	0.2508	0.2539	0.3144	0.3005
ACCURACY	Capped Adjustment	**10th Percentile**	0.0451	0.0452	0.0741	0.0519	0.0689	0.0605	0.0545	0.0471	0.0425
ACCURACY	Capped Adjustment	**Median**	0.1461	0.1482	0.1610	0.1403	0.2224	0.1413	0.1424	0.1373	0.1173
ACCURACY	Capped Adjustment	**Mean**	0.1650	0.1710	0.1884	0.1364	0.2307	0.1602	0.1606	0.1603	0.1516
ACCURACY	Capped Adjustment	**90th Percentile**	0.3044	0.3071	0.3703	0.2039	0.4294	0.2786	0.2878	0.3172	0.3023

Table 51 Variability (Over 10 MW): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Over 10 MW	**count**	50	50	50	50	50	50	50	50	50
VARIABILITY	Unadjusted	**10th Percentile**	0.0757	0.0764	0.0907	0.0466	0.1193	0.0778	0.0775	0.0650	0.0559
VARIABILITY	Unadjusted	**Median**	0.1832	0.1920	0.1935	0.0997	0.2467	0.1956	0.1917	0.1725	0.1737
VARIABILITY	Unadjusted	**Mean**	0.2048	0.2082	0.2134	0.1102	0.2714	0.2036	0.2032	0.1929	0.1877
VARIABILITY	Unadjusted	**90th Percentile**	0.3631	0.3582	0.3963	0.2001	0.4770	0.3408	0.3504	0.3329	0.3371
VARIABILITY	Additive Adj	**10th Percentile**	0.0438	0.0431	0.0579	0.0501	0.0517	0.0436	0.0446	0.0372	0.0369
VARIABILITY	Additive Adj	**Median**	0.1311	0.1353	0.1584	0.1265	0.1784	0.1220	0.1263	0.1085	0.1060
VARIABILITY	Additive Adj	**Mean**	0.1493	0.1511	0.1853	0.1453	0.1866	0.1408	0.1415	0.1291	0.1276
VARIABILITY	Additive Adj	**90th Percentile**	0.2776	0.2738	0.3490	0.2546	0.3389	0.2531	0.2551	0.3048	0.2928
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0433	0.0426	0.0643	0.0501	0.0575	0.0432	0.0440	0.0373	0.0362
VARIABILITY	Multiplicative Adj	**Median**	0.1323	0.1374	0.1643	0.1265	0.1935	0.1237	0.1277	0.1084	0.1017
VARIABILITY	Multiplicative Adj	**Mean**	0.1570	0.1606	0.2651	0.1453	0.3647	0.1429	0.1439	0.1347	0.1298
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.3129	0.3298	0.7530	0.2546	0.6994	0.2507	0.2536	0.3137	0.3003
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0444	0.0449	0.0739	0.0501	0.0689	0.0578	0.0540	0.0472	0.0418
VARIABILITY	Capped Adjustment	**Median**	0.1412	0.1437	0.1593	0.1210	0.2162	0.1386	0.1405	0.1350	0.1163
VARIABILITY	Capped Adjustment	**Mean**	0.1620	0.1683	0.1873	0.1281	0.2288	0.1571	0.1583	0.1561	0.1476
VARIABILITY	Capped Adjustment	**90th Percentile**	0.3010	0.3046	0.3663	0.2017	0.4281	0.2740	0.2861	0.3010	0.2984

Table 52 Bias (Not Weather Sensitive): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Not Weather Sensitive	**count**	992	992	992	992	992	992	992	991	991
BIAS	Unadjusted	**10th Percentile**	-0.0224	-0.0533	-0.0305	-0.1674	-0.0285	-0.0635	-0.0671	-0.0758	-0.0058
BIAS	Unadjusted	**Median**	0.0019	-0.0193	-0.0092	-0.0334	-0.0029	-0.0252	-0.0223	-0.0175	0.0255
BIAS	Unadjusted	**Mean**	0.0063	-0.0208	-0.0074	-0.0497	-0.0033	-0.0290	-0.0276	-0.0245	0.1410
BIAS	Unadjusted	**90th Percentile**	0.0379	0.0064	0.0095	0.0255	0.0204	0.0030	0.0025	0.0219	0.1478
BIAS	Additive Adj	**10th Percentile**	-0.0041	-0.0150	-0.0129	-0.0746	-0.0164	-0.0159	-0.0145	-0.0349	-0.0314
BIAS	Additive Adj	**Median**	0.0074	0.0004	0.0029	-0.0002	0.0024	0.0009	0.0008	-0.0002	0.0055
BIAS	Additive Adj	**Mean**	0.0106	0.0010	0.0040	0.0114	0.0026	-0.0001	0.0010	0.0211	0.0341
BIAS	Additive Adj	**90th Percentile**	0.0311	0.0179	0.0220	0.1099	0.0210	0.0177	0.0173	0.0392	0.0566
BIAS	Multiplicative Adj	**10th Percentile**	-0.0028	-0.0132	-0.0073	-0.0746	-0.0103	-0.0155	-0.0146	-0.0315	-0.0198
BIAS	Multiplicative Adj	**Median**	0.0080	0.0010	0.0062	-0.0002	0.0047	0.0006	0.0009	0.0010	0.0083
BIAS	Multiplicative Adj	**Mean**	0.0129	0.0032	0.0889	0.0114	0.0856	0.0003	0.0012	0.0197	0.0351
BIAS	Multiplicative Adj	**90th Percentile**	0.0360	0.0216	0.0415	0.1099	0.0370	0.0182	0.0184	0.0542	0.0727
BIAS	Capped Adjustment	**10th Percentile**	-0.0095	-0.0333	-0.0214	-0.1053	-0.0342	-0.0278	-0.0354	-0.0747	-0.0112
BIAS	Capped Adjustment	**Median**	0.0055	-0.0030	-0.0020	-0.0101	-0.0002	-0.0014	-0.0030	-0.0058	0.0107
BIAS	Capped Adjustment	**Mean**	0.0098	-0.0060	-0.0015	-0.0116	-0.0044	-0.0045	-0.0071	-0.0206	0.0986
BIAS	Capped Adjustment	**90th Percentile**	0.0320	0.0133	0.0142	0.0749	0.0167	0.0140	0.0123	0.0214	0.0885

Table 53 Accuracy (Not Weather Sensitive): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Not Weather Sensitive	**count**	992	992	992	992	992	992	992	991	991
ACCURACY	Unadjusted	**10th Percentile**	0.0524	0.0556	0.0600	0.0500	0.0650	0.0573	0.0576	0.0604	0.0606
ACCURACY	Unadjusted	**Median**	0.1224	0.1275	0.1282	0.1181	0.1408	0.1227	0.1259	0.1549	0.1621
ACCURACY	Unadjusted	**Mean**	0.1465	0.1525	0.1598	0.1465	0.1916	0.1496	0.1526	0.2497	0.5582
ACCURACY	Unadjusted	**90th Percentile**	0.2809	0.2934	0.2997	0.2742	0.4170	0.2875	0.2954	0.5279	0.5764
ACCURACY	Additive Adj	**10th Percentile**	0.0394	0.0391	0.0466	0.0561	0.0476	0.0372	0.0374	0.0425	0.0445
ACCURACY	Additive Adj	**Median**	0.0992	0.0994	0.1163	0.1223	0.1220	0.0938	0.0948	0.1199	0.1220
ACCURACY	Additive Adj	**Mean**	0.1212	0.1217	0.1443	0.1548	0.1521	0.1160	0.1163	0.2477	0.2638
ACCURACY	Additive Adj	**90th Percentile**	0.2327	0.2353	0.2833	0.3014	0.3057	0.2242	0.2265	0.4491	0.4907
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0388	0.0391	0.0481	0.0561	0.0484	0.0364	0.0370	0.0420	0.0444
ACCURACY	Multiplicative Adj	**Median**	0.0997	0.0999	0.1218	0.1223	0.1267	0.0931	0.0951	0.1227	0.1219
ACCURACY	Multiplicative Adj	**Mean**	0.1247	0.1262	0.8126	0.1548	0.7361	0.1163	0.1173	0.2487	0.2586
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2426	0.2456	0.3426	0.3014	0.3502	0.2228	0.2290	0.4498	0.4666
ACCURACY	Capped Adjustment	**10th Percentile**	0.0406	0.0413	0.0564	0.0571	0.0539	0.0370	0.0393	0.0444	0.0458
ACCURACY	Capped Adjustment	**Median**	0.1012	0.1030	0.1232	0.1194	0.1272	0.0941	0.0976	0.1261	0.1289
ACCURACY	Capped Adjustment	**Mean**	0.1252	0.1292	0.1520	0.1445	0.1686	0.1189	0.1229	0.2136	0.4522
ACCURACY	Capped Adjustment	**90th Percentile**	0.2482	0.2602	0.2910	0.2622	0.3574	0.2338	0.2518	0.4371	0.4778

Table 54 Variability (Not Weather Sensitive): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Not Weather Sensitive	**count**	992	992	992	992	992	992	992	991	991
VARIABILITY	Unadjusted	**10th Percentile**	0.0510	0.0534	0.0599	0.0418	0.0648	0.0532	0.0551	0.0594	0.0596
VARIABILITY	Unadjusted	**Median**	0.1212	0.1241	0.1268	0.0918	0.1399	0.1175	0.1201	0.1507	0.1554
VARIABILITY	Unadjusted	**Mean**	0.1448	0.1492	0.1568	0.1160	0.1906	0.1442	0.1480	0.2448	0.5420
VARIABILITY	Unadjusted	**90th Percentile**	0.2776	0.2882	0.2970	0.2240	0.4129	0.2849	0.2912	0.5103	0.5543
VARIABILITY	Additive Adj	**10th Percentile**	0.0390	0.0389	0.0464	0.0502	0.0470	0.0369	0.0373	0.0421	0.0441
VARIABILITY	Additive Adj	**Median**	0.0983	0.0991	0.1160	0.1096	0.1214	0.0930	0.0938	0.1183	0.1204
VARIABILITY	Additive Adj	**Mean**	0.1201	0.1211	0.1437	0.1345	0.1515	0.1151	0.1157	0.2420	0.2565
VARIABILITY	Additive Adj	**90th Percentile**	0.2300	0.2334	0.2827	0.2560	0.3048	0.2223	0.2258	0.4414	0.4877
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0386	0.0390	0.0480	0.0502	0.0478	0.0363	0.0370	0.0416	0.0440
VARIABILITY	Multiplicative Adj	**Median**	0.0986	0.0993	0.1211	0.1096	0.1260	0.0929	0.0949	0.1204	0.1203
VARIABILITY	Multiplicative Adj	**Mean**	0.1235	0.1254	0.8073	0.1345	0.7303	0.1154	0.1167	0.2448	0.2535
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2389	0.2430	0.3410	0.2560	0.3482	0.2212	0.2273	0.4416	0.4573
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0402	0.0408	0.0562	0.0504	0.0536	0.0367	0.0393	0.0445	0.0453
VARIABILITY	Capped Adjustment	**Median**	0.1002	0.1025	0.1228	0.1035	0.1266	0.0938	0.0969	0.1241	0.1271
VARIABILITY	Capped Adjustment	**Mean**	0.1238	0.1279	0.1500	0.1256	0.1676	0.1175	0.1216	0.2096	0.4417
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2452	0.2564	0.2903	0.2310	0.3553	0.2277	0.2468	0.4267	0.4579

Table 55 Bias (Weather Sensitive): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Weather Sensitive	**count**	1125	1125	1125	1125	1125	1125	1125	1125	1125
BIAS	Unadjusted	**10th Percentile**	-0.0381	-0.0893	-0.0485	-0.2724	-0.0308	-0.0997	-0.0892	-0.0995	-0.0122
BIAS	Unadjusted	**Median**	-0.0080	-0.0419	-0.0167	-0.0834	-0.0048	-0.0533	-0.0438	-0.0367	0.0243
BIAS	Unadjusted	**Mean**	-0.0074	-0.0461	-0.0199	-0.1075	-0.0070	-0.0572	-0.0474	-0.0438	0.0515
BIAS	Unadjusted	**90th Percentile**	0.0227	-0.0113	0.0034	0.0167	0.0127	-0.0214	-0.0139	0.0117	0.1489
BIAS	Additive Adj	**10th Percentile**	-0.0065	-0.0221	-0.0150	-0.1415	-0.0112	-0.0215	-0.0190	-0.0407	-0.0272
BIAS	Additive Adj	**Median**	0.0085	-0.0014	0.0030	-0.0294	0.0050	-0.0007	-0.0005	-0.0003	0.0109
BIAS	Additive Adj	**Mean**	0.0112	-0.0025	0.0029	-0.0274	0.0052	-0.0026	-0.0016	0.0039	0.0215
BIAS	Additive Adj	**90th Percentile**	0.0322	0.0180	0.0215	0.0897	0.0222	0.0160	0.0171	0.0409	0.0660
BIAS	Multiplicative Adj	**10th Percentile**	-0.0050	-0.0200	-0.0093	-0.1415	-0.0073	-0.0200	-0.0184	-0.0353	-0.0163
BIAS	Multiplicative Adj	**Median**	0.0106	0.0008	0.0079	-0.0294	0.0088	0.0009	0.0002	0.0049	0.0155
BIAS	Multiplicative Adj	**Mean**	0.0151	0.0029	0.0193	-0.0274	0.0428	0.0002	0.0009	0.0135	0.0359
BIAS	Multiplicative Adj	**90th Percentile**	0.0385	0.0259	0.0425	0.0897	0.0350	0.0206	0.0205	0.0587	0.0856
BIAS	Capped Adjustment	**10th Percentile**	-0.0184	-0.0554	-0.0274	-0.1790	-0.0230	-0.0594	-0.0526	-0.0839	-0.0147
BIAS	Capped Adjustment	**Median**	0.0051	-0.0126	-0.0036	-0.0633	0.0023	-0.0120	-0.0114	-0.0153	0.0160
BIAS	Capped Adjustment	**Mean**	0.0045	-0.0181	-0.0059	-0.0685	-0.0006	-0.0193	-0.0177	-0.0271	0.0318
BIAS	Capped Adjustment	**90th Percentile**	0.0266	0.0081	0.0129	0.0344	0.0183	0.0071	0.0065	0.0182	0.0935

Table 56 Accuracy (Weather Sensitive): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Weather Sensitive	**count**	1125	1125	1125	1125	1125	1125	1125	1125	1125
ACCURACY	Unadjusted	**10th Percentile**	0.0916	0.0960	0.0919	0.0703	0.0743	0.0986	0.0968	0.1165	0.1105
ACCURACY	Unadjusted	**Median**	0.1605	0.1692	0.1541	0.1623	0.1423	0.1670	0.1679	0.2103	0.2153
ACCURACY	Unadjusted	**Mean**	0.1781	0.1868	0.1748	0.1917	0.1718	0.1840	0.1852	0.2717	0.2973
ACCURACY	Unadjusted	**90th Percentile**	0.2870	0.2997	0.2846	0.3603	0.3175	0.2918	0.2963	0.4648	0.5429
ACCURACY	Additive Adj	**10th Percentile**	0.0646	0.0647	0.0745	0.0825	0.0669	0.0603	0.0615	0.0759	0.0762
ACCURACY	Additive Adj	**Median**	0.1147	0.1138	0.1344	0.1548	0.1239	0.1065	0.1087	0.1463	0.1532
ACCURACY	Additive Adj	**Mean**	0.1323	0.1331	0.1560	0.1803	0.1473	0.1248	0.1267	0.2132	0.2258
ACCURACY	Additive Adj	**90th Percentile**	0.2226	0.2264	0.2636	0.3115	0.2639	0.2113	0.2158	0.3891	0.4172
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0652	0.0652	0.0776	0.0825	0.0678	0.0604	0.0616	0.0769	0.0770
ACCURACY	Multiplicative Adj	**Median**	0.1155	0.1158	0.1395	0.1548	0.1279	0.1068	0.1090	0.1486	0.1518
ACCURACY	Multiplicative Adj	**Mean**	0.1384	0.1431	0.2125	0.1803	0.3348	0.1262	0.1287	0.2235	0.2468
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2324	0.2380	0.3121	0.3115	0.2927	0.2129	0.2227	0.3967	0.4117
ACCURACY	Capped Adjustment	**10th Percentile**	0.0657	0.0669	0.0839	0.0895	0.0683	0.0611	0.0636	0.0775	0.0766
ACCURACY	Capped Adjustment	**Median**	0.1178	0.1212	0.1403	0.1596	0.1255	0.1106	0.1147	0.1534	0.1593
ACCURACY	Capped Adjustment	**Mean**	0.1358	0.1415	0.1602	0.1779	0.1529	0.1313	0.1342	0.2167	0.2315
ACCURACY	Capped Adjustment	**90th Percentile**	0.2332	0.2460	0.2626	0.2979	0.2828	0.2291	0.2357	0.3958	0.4414

Table 57 Variability (Weather Sensitive): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Weather Sensitive	**count**	1125	1125	1125	1125	1125	1125	1125	1125	1125
VARIABILITY	Unadjusted	**10th Percentile**	0.0905	0.0923	0.0912	0.0579	0.0736	0.0898	0.0925	0.1116	0.1092
VARIABILITY	Unadjusted	**Median**	0.1593	0.1610	0.1523	0.1103	0.1416	0.1548	0.1595	0.2063	0.2126
VARIABILITY	Unadjusted	**Mean**	0.1764	0.1793	0.1728	0.1351	0.1708	0.1727	0.1772	0.2649	0.2888
VARIABILITY	Unadjusted	**90th Percentile**	0.2840	0.2902	0.2800	0.2530	0.3171	0.2763	0.2849	0.4490	0.5166
VARIABILITY	Additive Adj	**10th Percentile**	0.0638	0.0645	0.0741	0.0704	0.0662	0.0600	0.0612	0.0746	0.0753
VARIABILITY	Additive Adj	**Median**	0.1123	0.1133	0.1339	0.1314	0.1229	0.1060	0.1081	0.1448	0.1518
VARIABILITY	Additive Adj	**Mean**	0.1311	0.1320	0.1554	0.1535	0.1466	0.1239	0.1260	0.2099	0.2216
VARIABILITY	Additive Adj	**90th Percentile**	0.2220	0.2247	0.2635	0.2787	0.2638	0.2108	0.2159	0.3866	0.4082
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0645	0.0650	0.0775	0.0704	0.0674	0.0599	0.0614	0.0763	0.0762
VARIABILITY	Multiplicative Adj	**Median**	0.1140	0.1149	0.1387	0.1314	0.1273	0.1061	0.1084	0.1455	0.1492
VARIABILITY	Multiplicative Adj	**Mean**	0.1368	0.1418	0.2107	0.1535	0.3312	0.1251	0.1278	0.2200	0.2414
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2314	0.2348	0.3078	0.2787	0.2909	0.2121	0.2214	0.3960	0.4055
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0650	0.0669	0.0835	0.0705	0.0682	0.0604	0.0633	0.0751	0.0762
VARIABILITY	Capped Adjustment	**Median**	0.1166	0.1200	0.1399	0.1261	0.1250	0.1085	0.1130	0.1500	0.1566
VARIABILITY	Capped Adjustment	**Mean**	0.1347	0.1389	0.1595	0.1444	0.1521	0.1283	0.1317	0.2124	0.2263
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2322	0.2422	0.2616	0.2563	0.2828	0.2234	0.2293	0.3903	0.4280

Table 58 Bias (Low Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Low Variability	**count**	624	624	624	624	624	624	624	623	623
BIAS	Unadjusted	**10th Percentile**	-0.0173	-0.0430	-0.0248	-0.2026	-0.0131	-0.0521	-0.0438	-0.0501	-0.0064
BIAS	Unadjusted	**Median**	-0.0017	-0.0201	-0.0098	-0.0428	-0.0018	-0.0279	-0.0212	-0.0210	0.0120
BIAS	Unadjusted	**Mean**	-0.0016	-0.0218	-0.0111	-0.0674	-0.0022	-0.0291	-0.0230	-0.0226	0.0266
BIAS	Unadjusted	**90th Percentile**	0.0138	-0.0029	0.0010	0.0030	0.0084	-0.0082	-0.0044	0.0039	0.0632
BIAS	Additive Adj	**10th Percentile**	-0.0028	-0.0116	-0.0080	-0.1000	-0.0056	-0.0119	-0.0110	-0.0188	-0.0137
BIAS	Additive Adj	**Median**	0.0058	-0.0001	0.0016	-0.0246	0.0033	-0.0001	0.0000	-0.0005	0.0043
BIAS	Additive Adj	**Mean**	0.0072	-0.0002	0.0018	-0.0307	0.0036	-0.0009	-0.0003	-0.0001	0.0062
BIAS	Additive Adj	**90th Percentile**	0.0189	0.0101	0.0121	0.0331	0.0132	0.0081	0.0077	0.0184	0.0272
BIAS	Multiplicative Adj	**10th Percentile**	-0.0024	-0.0102	-0.0058	-0.1000	-0.0047	-0.0111	-0.0097	-0.0168	-0.0108
BIAS	Multiplicative Adj	**Median**	0.0066	0.0007	0.0034	-0.0246	0.0046	0.0008	0.0006	0.0010	0.0057
BIAS	Multiplicative Adj	**Mean**	0.0083	0.0015	0.0491	-0.0307	0.1352	0.0006	0.0009	0.0027	0.0105
BIAS	Multiplicative Adj	**90th Percentile**	0.0208	0.0132	0.0172	0.0331	0.0163	0.0107	0.0106	0.0263	0.0303
BIAS	Capped Adjustment	**10th Percentile**	-0.0033	-0.0135	-0.0116	-0.1364	-0.0061	-0.0147	-0.0122	-0.0275	-0.0078
BIAS	Capped Adjustment	**Median**	0.0061	-0.0006	-0.0003	-0.0342	0.0038	-0.0008	-0.0004	-0.0028	0.0061
BIAS	Capped Adjustment	**Mean**	0.0071	-0.0014	-0.0002	-0.0445	0.0038	-0.0021	-0.0014	-0.0065	0.0145
BIAS	Capped Adjustment	**90th Percentile**	0.0185	0.0093	0.0109	0.0273	0.0141	0.0087	0.0084	0.0141	0.0367

Table 59 Accuracy (Low Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Low Variability	**count**	624	624	624	624	624	624	624	623	623
ACCURACY	Unadjusted	**10th Percentile**	0.0485	0.0505	0.0520	0.0461	0.0519	0.0507	0.0518	0.0528	0.0552
ACCURACY	Unadjusted	**Median**	0.0899	0.0935	0.0933	0.0777	0.0812	0.0939	0.0940	0.1192	0.1130
ACCURACY	Unadjusted	**Mean**	0.0931	0.0969	0.0956	0.1055	0.0833	0.0968	0.0967	0.1392	0.1482
ACCURACY	Unadjusted	**90th Percentile**	0.1403	0.1461	0.1425	0.2343	0.1166	0.1418	0.1425	0.2180	0.2468
ACCURACY	Additive Adj	**10th Percentile**	0.0369	0.0360	0.0443	0.0509	0.0431	0.0344	0.0348	0.0408	0.0423
ACCURACY	Additive Adj	**Median**	0.0684	0.0688	0.0817	0.0876	0.0741	0.0645	0.0659	0.0806	0.0835
ACCURACY	Additive Adj	**Mean**	0.0696	0.0698	0.0833	0.0939	0.0764	0.0653	0.0664	0.1067	0.1130
ACCURACY	Additive Adj	**90th Percentile**	0.1024	0.1042	0.1221	0.1428	0.1138	0.0958	0.0970	0.1763	0.1875
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0372	0.0368	0.0450	0.0509	0.0432	0.0343	0.0348	0.0406	0.0417
ACCURACY	Multiplicative Adj	**Median**	0.0699	0.0704	0.0847	0.0876	0.0760	0.0652	0.0665	0.0844	0.0853
ACCURACY	Multiplicative Adj	**Mean**	0.0712	0.0715	0.4374	0.0939	1.0361	0.0663	0.0674	0.1087	0.1217
ACCURACY	Multiplicative Adj	**90th Percentile**	0.1068	0.1082	0.1307	0.1428	0.1207	0.0977	0.0992	0.1839	0.1986
ACCURACY	Capped Adjustment	**10th Percentile**	0.0379	0.0375	0.0481	0.0520	0.0449	0.0350	0.0353	0.0406	0.0420
ACCURACY	Capped Adjustment	**Median**	0.0690	0.0696	0.0882	0.0909	0.0746	0.0646	0.0660	0.0815	0.0842
ACCURACY	Capped Adjustment	**Mean**	0.0698	0.0704	0.0888	0.1008	0.0772	0.0661	0.0666	0.1042	0.1119
ACCURACY	Capped Adjustment	**90th Percentile**	0.1023	0.1037	0.1304	0.1690	0.1131	0.0973	0.0969	0.1763	0.1939

Table 60 Variability (Low Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Low Variability	**count**	624	624	624	624	624	624	624	623	623
VARIABILITY	Unadjusted	**10th Percentile**	0.0482	0.0492	0.0519	0.0377	0.0518	0.0469	0.0497	0.0521	0.0531
VARIABILITY	Unadjusted	**Median**	0.0895	0.0902	0.0920	0.0612	0.0809	0.0872	0.0893	0.1143	0.1122
VARIABILITY	Unadjusted	**Mean**	0.0924	0.0936	0.0946	0.0664	0.0829	0.0913	0.0932	0.1358	0.1440
VARIABILITY	Unadjusted	**90th Percentile**	0.1397	0.1422	0.1412	0.0995	0.1162	0.1357	0.1382	0.2151	0.2367
VARIABILITY	Additive Adj	**10th Percentile**	0.0368	0.0358	0.0442	0.0446	0.0430	0.0340	0.0346	0.0400	0.0414
VARIABILITY	Additive Adj	**Median**	0.0681	0.0684	0.0817	0.0734	0.0741	0.0640	0.0652	0.0795	0.0827
VARIABILITY	Additive Adj	**Mean**	0.0688	0.0693	0.0830	0.0739	0.0760	0.0649	0.0660	0.1054	0.1113
VARIABILITY	Additive Adj	**90th Percentile**	0.1012	0.1029	0.1221	0.1030	0.1127	0.0944	0.0965	0.1746	0.1841
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0366	0.0365	0.0449	0.0446	0.0432	0.0339	0.0346	0.0399	0.0414
VARIABILITY	Multiplicative Adj	**Median**	0.0688	0.0704	0.0840	0.0734	0.0758	0.0642	0.0659	0.0827	0.0837
VARIABILITY	Multiplicative Adj	**Mean**	0.0703	0.0709	0.4344	0.0739	1.0273	0.0658	0.0670	0.1075	0.1200
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.1043	0.1073	0.1302	0.1030	0.1195	0.0974	0.0993	0.1805	0.1943
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0378	0.0375	0.0480	0.0449	0.0446	0.0348	0.0353	0.0399	0.0416
VARIABILITY	Capped Adjustment	**Median**	0.0682	0.0693	0.0879	0.0733	0.0743	0.0642	0.0653	0.0802	0.0824
VARIABILITY	Capped Adjustment	**Mean**	0.0690	0.0698	0.0885	0.0738	0.0768	0.0655	0.0661	0.1029	0.1096
VARIABILITY	Capped Adjustment	**90th Percentile**	0.1008	0.1027	0.1300	0.1013	0.1125	0.0966	0.0964	0.1718	0.1836

Table 61 Bias (Medium Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Medium Variability	**count**	1250	1250	1250	1250	1250	1250	1250	1250	1250
BIAS	Unadjusted	**10th Percentile**	-0.0356	-0.0794	-0.0453	-0.2498	-0.0331	-0.0924	-0.0836	-0.0969	-0.0075
BIAS	Unadjusted	**Median**	-0.0049	-0.0373	-0.0148	-0.0697	-0.0063	-0.0485	-0.0418	-0.0307	0.0314
BIAS	Unadjusted	**Mean**	-0.0034	-0.0388	-0.0156	-0.0899	-0.0075	-0.0495	-0.0426	-0.0370	0.0602
BIAS	Unadjusted	**90th Percentile**	0.0292	-0.0023	0.0065	0.0299	0.0150	-0.0071	-0.0043	0.0192	0.1582
BIAS	Additive Adj	**10th Percentile**	-0.0068	-0.0216	-0.0166	-0.1243	-0.0167	-0.0215	-0.0200	-0.0431	-0.0313
BIAS	Additive Adj	**Median**	0.0083	-0.0012	0.0032	-0.0080	0.0038	-0.0004	-0.0004	-0.0003	0.0108
BIAS	Additive Adj	**Mean**	0.0106	-0.0017	0.0025	-0.0101	0.0035	-0.0025	-0.0013	0.0068	0.0225
BIAS	Additive Adj	**90th Percentile**	0.0309	0.0187	0.0213	0.0974	0.0215	0.0172	0.0169	0.0437	0.0628
BIAS	Multiplicative Adj	**10th Percentile**	-0.0055	-0.0198	-0.0103	-0.1243	-0.0110	-0.0197	-0.0192	-0.0353	-0.0205
BIAS	Multiplicative Adj	**Median**	0.0098	0.0007	0.0079	-0.0080	0.0080	0.0002	0.0001	0.0030	0.0161
BIAS	Multiplicative Adj	**Mean**	0.0136	0.0019	0.0446	-0.0101	0.0177	-0.0006	0.0003	0.0137	0.0338
BIAS	Multiplicative Adj	**90th Percentile**	0.0363	0.0253	0.0382	0.0974	0.0343	0.0206	0.0198	0.0594	0.0798
BIAS	Capped Adjustment	**10th Percentile**	-0.0174	-0.0489	-0.0266	-0.1651	-0.0280	-0.0465	-0.0477	-0.0838	-0.0139
BIAS	Capped Adjustment	**Median**	0.0042	-0.0116	-0.0045	-0.0411	-0.0004	-0.0100	-0.0108	-0.0152	0.0194
BIAS	Capped Adjustment	**Mean**	0.0053	-0.0150	-0.0046	-0.0462	-0.0028	-0.0152	-0.0149	-0.0261	0.0360
BIAS	Capped Adjustment	**90th Percentile**	0.0283	0.0105	0.0136	0.0590	0.0185	0.0113	0.0100	0.0212	0.0941

Table 62 Accuracy (Medium Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Medium Variability	**count**	1250	1250	1250	1250	1250	1250	1250	1250	1250
ACCURACY	Unadjusted	**10th Percentile**	0.0963	0.1021	0.0994	0.0770	0.0995	0.0985	0.1019	0.1082	0.1081
ACCURACY	Unadjusted	**Median**	0.1617	0.1697	0.1628	0.1592	0.1655	0.1671	0.1690	0.2133	0.2189
ACCURACY	Unadjusted	**Mean**	0.1716	0.1800	0.1763	0.1843	0.1841	0.1757	0.1780	0.2720	0.3028
ACCURACY	Unadjusted	**90th Percentile**	0.2619	0.2721	0.2716	0.3333	0.3047	0.2645	0.2688	0.4602	0.5550
ACCURACY	Additive Adj	**10th Percentile**	0.0667	0.0672	0.0770	0.0890	0.0767	0.0628	0.0638	0.0746	0.0768
ACCURACY	Additive Adj	**Median**	0.1235	0.1247	0.1444	0.1601	0.1403	0.1161	0.1177	0.1516	0.1585
ACCURACY	Additive Adj	**Mean**	0.1323	0.1333	0.1560	0.1769	0.1557	0.1261	0.1270	0.2310	0.2424
ACCURACY	Additive Adj	**90th Percentile**	0.2118	0.2137	0.2476	0.2872	0.2568	0.1986	0.2024	0.4003	0.4314
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0665	0.0669	0.0793	0.0890	0.0772	0.0621	0.0631	0.0751	0.0760
ACCURACY	Multiplicative Adj	**Median**	0.1253	0.1265	0.1479	0.1601	0.1470	0.1163	0.1185	0.1543	0.1581
ACCURACY	Multiplicative Adj	**Mean**	0.1362	0.1380	0.4725	0.1769	0.2120	0.1272	0.1284	0.2365	0.2506
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2225	0.2218	0.2897	0.2872	0.2891	0.2006	0.2054	0.4236	0.4309
ACCURACY	Capped Adjustment	**10th Percentile**	0.0699	0.0731	0.0895	0.0911	0.0822	0.0650	0.0679	0.0789	0.0800
ACCURACY	Capped Adjustment	**Median**	0.1268	0.1311	0.1505	0.1572	0.1469	0.1199	0.1238	0.1602	0.1641
ACCURACY	Capped Adjustment	**Mean**	0.1365	0.1422	0.1633	0.1718	0.1625	0.1306	0.1339	0.2227	0.2392
ACCURACY	Capped Adjustment	**90th Percentile**	0.2186	0.2289	0.2512	0.2748	0.2708	0.2080	0.2146	0.4044	0.4413

Table 63 Variability (Medium Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Medium Variability	**count**	1250	1250	1250	1250	1250	1250	1250	1250	1250
VARIABILITY	Unadjusted	**10th Percentile**	0.0953	0.0982	0.0982	0.0660	0.0990	0.0902	0.0965	0.1021	0.1055
VARIABILITY	Unadjusted	**Median**	0.1601	0.1635	0.1608	0.1184	0.1643	0.1566	0.1610	0.2079	0.2146
VARIABILITY	Unadjusted	**Mean**	0.1697	0.1736	0.1730	0.1344	0.1831	0.1656	0.1705	0.2660	0.2929
VARIABILITY	Unadjusted	**90th Percentile**	0.2581	0.2620	0.2689	0.2343	0.3035	0.2517	0.2609	0.4502	0.5278
VARIABILITY	Additive Adj	**10th Percentile**	0.0659	0.0670	0.0769	0.0802	0.0761	0.0625	0.0635	0.0737	0.0750
VARIABILITY	Additive Adj	**Median**	0.1222	0.1241	0.1437	0.1408	0.1395	0.1156	0.1177	0.1497	0.1560
VARIABILITY	Additive Adj	**Mean**	0.1311	0.1324	0.1553	0.1534	0.1550	0.1250	0.1262	0.2272	0.2377
VARIABILITY	Additive Adj	**90th Percentile**	0.2107	0.2126	0.2469	0.2459	0.2547	0.1977	0.2015	0.3997	0.4231
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0663	0.0666	0.0792	0.0802	0.0768	0.0616	0.0628	0.0741	0.0749
VARIABILITY	Multiplicative Adj	**Median**	0.1236	0.1257	0.1473	0.1408	0.1459	0.1154	0.1176	0.1520	0.1551
VARIABILITY	Multiplicative Adj	**Mean**	0.1347	0.1369	0.4697	0.1534	0.2104	0.1260	0.1276	0.2330	0.2454
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2173	0.2196	0.2872	0.2459	0.2862	0.1996	0.2036	0.4146	0.4246
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0697	0.0723	0.0888	0.0781	0.0819	0.0648	0.0672	0.0778	0.0785
VARIABILITY	Capped Adjustment	**Median**	0.1256	0.1302	0.1492	0.1319	0.1464	0.1185	0.1226	0.1567	0.1619
VARIABILITY	Capped Adjustment	**Mean**	0.1353	0.1400	0.1615	0.1442	0.1616	0.1279	0.1316	0.2184	0.2334
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2173	0.2237	0.2505	0.2305	0.2694	0.2025	0.2131	0.3959	0.4325

Table 64 Bias (High Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	High Variability	**count**	243	243	243	243	243	243	243	243	243
BIAS	Unadjusted	**10th Percentile**	-0.0407	-0.0980	-0.0551	-0.2390	-0.0597	-0.1101	-0.1102	-0.1915	-0.0289
BIAS	Unadjusted	**Median**	0.0038	-0.0447	-0.0115	-0.0499	0.0007	-0.0559	-0.0581	-0.0417	0.0695
BIAS	Unadjusted	**Mean**	0.0134	-0.0430	-0.0134	-0.0653	-0.0018	-0.0536	-0.0541	-0.0543	0.4355
BIAS	Unadjusted	**90th Percentile**	0.0814	0.0187	0.0265	0.0377	0.0558	0.0062	0.0031	0.0528	0.2856
BIAS	Additive Adj	**10th Percentile**	-0.0081	-0.0310	-0.0210	-0.1108	-0.0348	-0.0290	-0.0292	-0.0721	-0.0487
BIAS	Additive Adj	**Median**	0.0204	0.0036	0.0131	0.0308	0.0078	0.0045	0.0050	0.0019	0.0221
BIAS	Additive Adj	**Mean**	0.0223	0.0014	0.0118	0.0504	0.0077	0.0029	0.0039	0.0692	0.1065
BIAS	Additive Adj	**90th Percentile**	0.0554	0.0335	0.0444	0.2382	0.0502	0.0355	0.0339	0.1491	0.2031
BIAS	Multiplicative Adj	**10th Percentile**	-0.0008	-0.0232	-0.0039	-0.1108	-0.0146	-0.0263	-0.0257	-0.0564	-0.0311
BIAS	Multiplicative Adj	**Median**	0.0247	0.0055	0.0331	0.0308	0.0240	0.0033	0.0032	0.0089	0.0312
BIAS	Multiplicative Adj	**Mean**	0.0314	0.0131	0.0970	0.0504	0.1092	0.0037	0.0047	0.0654	0.1087
BIAS	Multiplicative Adj	**90th Percentile**	0.0701	0.0486	0.1320	0.2382	0.1214	0.0361	0.0381	0.1654	0.2339
BIAS	Capped Adjustment	**10th Percentile**	-0.0245	-0.0778	-0.0443	-0.1513	-0.0611	-0.0705	-0.0780	-0.1877	-0.0418
BIAS	Capped Adjustment	**Median**	0.0100	-0.0279	-0.0079	-0.0092	-0.0113	-0.0235	-0.0324	-0.0363	0.0276
BIAS	Capped Adjustment	**Mean**	0.0151	-0.0275	-0.0089	-0.0125	-0.0159	-0.0245	-0.0306	-0.0583	0.3268
BIAS	Capped Adjustment	**90th Percentile**	0.0673	0.0166	0.0259	0.1092	0.0280	0.0210	0.0141	0.0381	0.1855

Table 65 Accuracy (High Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	High Variability	**count**	243	243	243	243	243	243	243	243	243
ACCURACY	Unadjusted	**10th Percentile**	0.1900	0.2078	0.1791	0.1279	0.2803	0.2180	0.2188	0.1835	0.2166
ACCURACY	Unadjusted	**Median**	0.2889	0.3039	0.2918	0.2414	0.4213	0.3050	0.3110	0.3793	0.4018
ACCURACY	Unadjusted	**Mean**	0.3009	0.3125	0.3091	0.2661	0.4157	0.3101	0.3161	0.5201	1.7153
ACCURACY	Unadjusted	**90th Percentile**	0.4263	0.4298	0.4627	0.4272	0.5565	0.4082	0.4237	1.0616	1.1916
ACCURACY	Additive Adj	**10th Percentile**	0.1293	0.1308	0.1515	0.1746	0.1670	0.1266	0.1308	0.1324	0.1430
ACCURACY	Additive Adj	**Median**	0.2309	0.2329	0.2809	0.3034	0.2940	0.2225	0.2238	0.3114	0.3275
ACCURACY	Additive Adj	**Mean**	0.2479	0.2480	0.2951	0.3158	0.3056	0.2350	0.2378	0.5358	0.5846
ACCURACY	Additive Adj	**90th Percentile**	0.3893	0.3880	0.4697	0.4622	0.4688	0.3641	0.3725	0.9928	1.0769
ACCURACY	Multiplicative Adj	**10th Percentile**	0.1267	0.1279	0.1495	0.1746	0.1638	0.1175	0.1186	0.1313	0.1334
ACCURACY	Multiplicative Adj	**Median**	0.2324	0.2402	0.3013	0.3034	0.3206	0.2190	0.2258	0.3175	0.3243
ACCURACY	Multiplicative Adj	**Mean**	0.2666	0.2842	0.7457	0.3158	0.8033	0.2341	0.2408	0.5532	0.5963
ACCURACY	Multiplicative Adj	**90th Percentile**	0.4317	0.4198	0.8341	0.4622	0.7276	0.3673	0.3764	1.0458	1.0773
ACCURACY	Capped Adjustment	**10th Percentile**	0.1419	0.1512	0.1569	0.1560	0.2303	0.1548	0.1581	0.1478	0.1678
ACCURACY	Capped Adjustment	**Median**	0.2492	0.2675	0.2809	0.2578	0.3601	0.2445	0.2633	0.3327	0.3428
ACCURACY	Capped Adjustment	**Mean**	0.2584	0.2699	0.2940	0.2706	0.3616	0.2517	0.2632	0.4618	1.3989
ACCURACY	Capped Adjustment	**90th Percentile**	0.3745	0.3836	0.4372	0.3860	0.4927	0.3536	0.3658	0.9590	1.0309

Table 66 Variability (High Load Variable Customers): Distribution Statistics

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	High Variability	**count**	243	243	243	243	243	243	243	243	243
VARIABILITY	Unadjusted	**10th Percentile**	0.1889	0.1993	0.1787	0.1253	0.2798	0.2113	0.2095	0.1806	0.2084
VARIABILITY	Unadjusted	**Median**	0.2871	0.2966	0.2877	0.2272	0.4191	0.2955	0.3010	0.3653	0.3881
VARIABILITY	Unadjusted	**Mean**	0.2976	0.3058	0.3070	0.2369	0.4134	0.3017	0.3081	0.5087	1.6721
VARIABILITY	Unadjusted	**90th Percentile**	0.4213	0.4223	0.4628	0.3495	0.5521	0.4032	0.4201	1.0301	1.1822
VARIABILITY	Additive Adj	**10th Percentile**	0.1270	0.1301	0.1508	0.1529	0.1659	0.1262	0.1293	0.1308	0.1433
VARIABILITY	Additive Adj	**Median**	0.2293	0.2304	0.2779	0.2715	0.2936	0.2215	0.2232	0.3074	0.3202
VARIABILITY	Additive Adj	**Mean**	0.2459	0.2466	0.2938	0.2808	0.3042	0.2335	0.2366	0.5196	0.5638
VARIABILITY	Additive Adj	**90th Percentile**	0.3871	0.3870	0.4671	0.4037	0.4659	0.3627	0.3716	0.9843	1.0778
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.1263	0.1280	0.1492	0.1529	0.1626	0.1164	0.1182	0.1280	0.1330
VARIABILITY	Multiplicative Adj	**Median**	0.2322	0.2391	0.3001	0.2715	0.3190	0.2189	0.2251	0.3150	0.3193
VARIABILITY	Multiplicative Adj	**Mean**	0.2637	0.2821	0.7381	0.2808	0.7936	0.2328	0.2396	0.5424	0.5812
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.4213	0.4166	0.8207	0.4037	0.7200	0.3641	0.3740	1.0447	1.0651
VARIABILITY	Capped Adjustment	**10th Percentile**	0.1414	0.1504	0.1569	0.1476	0.2305	0.1519	0.1526	0.1454	0.1659
VARIABILITY	Capped Adjustment	**Median**	0.2482	0.2615	0.2783	0.2416	0.3583	0.2396	0.2548	0.3255	0.3295
VARIABILITY	Capped Adjustment	**Mean**	0.2559	0.2658	0.2927	0.2496	0.3594	0.2477	0.2589	0.4514	1.3672
VARIABILITY	Capped Adjustment	**90th Percentile**	0.3732	0.3808	0.4374	0.3523	0.4844	0.3473	0.3589	0.9599	1.0082

B. Appendix – Distribution Statistics (1PM – 7 PM)

The following tables present the distribution characteristics for each statistic for each baseline and baseline variant for the analysis conducted for potential event hours 1PM to 7PM.

Table 67 Bias (Overall): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
BIAS	Unadjusted	**10th Percentile**	-0.0305	-0.0758	-0.0427	-0.1161	-0.0292	-0.0852	-0.0785	-0.0895	-0.0089
BIAS	Unadjusted	**Median**	-0.0030	-0.0308	-0.0124	-0.0212	-0.0036	-0.0382	-0.0328	-0.0262	0.0232
BIAS	Unadjusted	**Mean**	-0.0009	-0.0339	-0.0152	-0.0319	-0.0042	-0.0419	-0.0369	-0.0336	0.0733
BIAS	Unadjusted	**90th Percentile**	0.0296	-0.0015	0.0063	0.0269	0.0186	-0.0047	-0.0031	0.0155	0.1299
BIAS	Additive Adj	**10th Percentile**	-0.0057	-0.0187	-0.0158	-0.0994	-0.0139	-0.0161	-0.0149	-0.0374	-0.0394
BIAS	Additive Adj	**Median**	0.0094	0.0018	0.0045	0.0292	0.0056	0.0037	0.0033	0.0010	0.0057
BIAS	Additive Adj	**Mean**	0.0129	0.0028	0.0054	0.0541	0.0063	0.0047	0.0044	0.0194	0.0255
BIAS	Additive Adj	**90th Percentile**	0.0370	0.0264	0.0274	0.2388	0.0260	0.0283	0.0268	0.0494	0.0634
BIAS	Multiplicative Adj	**10th Percentile**	-0.0041	-0.0175	-0.0092	-0.0994	-0.0092	-0.0162	-0.0158	-0.0300	-0.0238
BIAS	Multiplicative Adj	**Median**	0.0094	0.0014	0.0083	0.0292	0.0082	0.0020	0.0018	0.0035	0.0098
BIAS	Multiplicative Adj	**Mean**	0.0144	0.0038	0.0584	0.0541	0.0659	0.0149	0.0023	0.0228	0.0332
BIAS	Multiplicative Adj	**90th Percentile**	0.0398	0.0261	0.0463	0.2388	0.0401	0.0231	0.0219	0.0581	0.0773
BIAS	Capped Adjustment	**10th Percentile**	-0.0140	-0.0441	-0.0262	-0.0972	-0.0268	-0.0418	-0.0434	-0.0761	-0.0165
BIAS	Capped Adjustment	**Median**	0.0051	-0.0074	-0.0022	0.0094	0.0017	-0.0052	-0.0063	-0.0102	0.0111
BIAS	Capped Adjustment	**Mean**	0.0071	-0.0120	-0.0044	0.0143	-0.0011	-0.0103	-0.0115	-0.0224	0.0470
BIAS	Capped Adjustment	**90th Percentile**	0.0300	0.0109	0.0145	0.1253	0.0200	0.0123	0.0107	0.0205	0.0801

Table 68 Accuracy (Overall): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
ACCURACY	Unadjusted	**10th Percentile**	0.0737	0.0783	0.0784	0.0603	0.0764	0.0785	0.0793	0.0848	0.0836
ACCURACY	Unadjusted	**Median**	0.1523	0.1612	0.1548	0.1515	0.1571	0.1575	0.1595	0.1909	0.1993
ACCURACY	Unadjusted	**Mean**	0.1745	0.1825	0.1808	0.1900	0.1987	0.1787	0.1807	0.2648	0.3944
ACCURACY	Unadjusted	**90th Percentile**	0.3081	0.3189	0.3163	0.3793	0.3952	0.3135	0.3142	0.4848	0.5503
ACCURACY	Additive Adj	**10th Percentile**	0.0597	0.0607	0.0718	0.0857	0.0681	0.0574	0.0584	0.0620	0.0648
ACCURACY	Additive Adj	**Median**	0.1250	0.1259	0.1475	0.2084	0.1428	0.1181	0.1196	0.1501	0.1597
ACCURACY	Additive Adj	**Mean**	0.1478	0.1499	0.1752	0.2487	0.1766	0.1422	0.1433	0.2573	0.2701
ACCURACY	Additive Adj	**90th Percentile**	0.2698	0.2755	0.3180	0.4750	0.3382	0.2595	0.2657	0.4669	0.5025
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0586	0.0591	0.0722	0.0857	0.0678	0.0557	0.0564	0.0621	0.0646
ACCURACY	Multiplicative Adj	**Median**	0.1222	0.1229	0.1509	0.2084	0.1453	0.1149	0.1163	0.1487	0.1531
ACCURACY	Multiplicative Adj	**Mean**	0.1491	0.1540	0.5456	0.2487	0.5537	0.4754	0.1401	0.2757	0.2723
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2744	0.2807	0.3650	0.4750	0.3849	0.2571	0.2606	0.4743	0.4746
ACCURACY	Capped Adjustment	**10th Percentile**	0.0593	0.0602	0.0748	0.0842	0.0687	0.0560	0.0569	0.0626	0.0653
ACCURACY	Capped Adjustment	**Median**	0.1234	0.1266	0.1473	0.1932	0.1429	0.1171	0.1198	0.1503	0.1546
ACCURACY	Capped Adjustment	**Mean**	0.1456	0.1510	0.1729	0.2178	0.1808	0.1403	0.1435	0.2237	0.3218
ACCURACY	Capped Adjustment	**90th Percentile**	0.2710	0.2832	0.3096	0.3938	0.3605	0.2613	0.2689	0.4292	0.4566

Table 69 Variability (Overall): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Overall	**count**	2117	2117	2117	2117	2117	2117	2117	2116	2116
VARIABILITY	Unadjusted	**10th Percentile**	0.0732	0.0756	0.0774	0.0580	0.0758	0.0747	0.0764	0.0818	0.0819
VARIABILITY	Unadjusted	**Median**	0.1505	0.1550	0.1529	0.1470	0.1564	0.1483	0.1528	0.1862	0.1951
VARIABILITY	Unadjusted	**Mean**	0.1730	0.1774	0.1791	0.1819	0.1977	0.1712	0.1749	0.2592	0.3853
VARIABILITY	Unadjusted	**90th Percentile**	0.3045	0.3098	0.3156	0.3642	0.3933	0.3018	0.3091	0.4709	0.5318
VARIABILITY	Additive Adj	**10th Percentile**	0.0595	0.0603	0.0716	0.0756	0.0679	0.0569	0.0576	0.0611	0.0646
VARIABILITY	Additive Adj	**Median**	0.1237	0.1252	0.1470	0.1768	0.1423	0.1171	0.1189	0.1479	0.1565
VARIABILITY	Additive Adj	**Mean**	0.1465	0.1488	0.1743	0.2121	0.1758	0.1410	0.1424	0.2518	0.2637
VARIABILITY	Additive Adj	**90th Percentile**	0.2683	0.2737	0.3171	0.4074	0.3368	0.2584	0.2628	0.4593	0.4880
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0585	0.0588	0.0716	0.0756	0.0675	0.0553	0.0563	0.0612	0.0637
VARIABILITY	Multiplicative Adj	**Median**	0.1211	0.1220	0.1493	0.1768	0.1445	0.1142	0.1159	0.1462	0.1513
VARIABILITY	Multiplicative Adj	**Mean**	0.1477	0.1529	0.5415	0.2121	0.5488	0.4745	0.1394	0.2714	0.2670
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2719	0.2781	0.3633	0.4074	0.3814	0.2550	0.2598	0.4649	0.4684
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0591	0.0596	0.0747	0.0750	0.0684	0.0554	0.0565	0.0619	0.0647
VARIABILITY	Capped Adjustment	**Median**	0.1223	0.1256	0.1467	0.1671	0.1419	0.1158	0.1183	0.1483	0.1530
VARIABILITY	Capped Adjustment	**Mean**	0.1445	0.1492	0.1721	0.1978	0.1799	0.1384	0.1418	0.2199	0.3162
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2695	0.2783	0.3091	0.3698	0.3592	0.2573	0.2647	0.4198	0.4446

Table 70 Bias (175 kW to 500 kW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	175 kW to 500 kW	**count**	1355	1355	1355	1355	1355	1355	1355	1355	1355
BIAS	Unadjusted	**10th Percentile**	-0.0314	-0.0774	-0.0424	-0.1145	-0.0277	-0.0873	-0.0784	-0.0896	-0.0085
BIAS	Unadjusted	**Median**	-0.0039	-0.0318	-0.0132	-0.0210	-0.0037	-0.0389	-0.0325	-0.0282	0.0219
BIAS	Unadjusted	**Mean**	-0.0023	-0.0357	-0.0157	-0.0298	-0.0043	-0.0431	-0.0373	-0.0342	0.0503
BIAS	Unadjusted	**90th Percentile**	0.0259	-0.0033	0.0055	0.0306	0.0163	-0.0072	-0.0039	0.0167	0.1346
BIAS	Additive Adj	**10th Percentile**	-0.0054	-0.0192	-0.0154	-0.1181	-0.0124	-0.0174	-0.0156	-0.0386	-0.0387
BIAS	Additive Adj	**Median**	0.0094	0.0013	0.0043	0.0231	0.0060	0.0028	0.0025	0.0007	0.0074
BIAS	Additive Adj	**Mean**	0.0130	0.0020	0.0050	0.0490	0.0069	0.0034	0.0035	0.0197	0.0272
BIAS	Additive Adj	**90th Percentile**	0.0372	0.0257	0.0267	0.2386	0.0258	0.0275	0.0264	0.0494	0.0645
BIAS	Multiplicative Adj	**10th Percentile**	-0.0040	-0.0185	-0.0098	-0.1181	-0.0083	-0.0176	-0.0162	-0.0320	-0.0215
BIAS	Multiplicative Adj	**Median**	0.0094	0.0009	0.0078	0.0231	0.0087	0.0013	0.0010	0.0031	0.0114
BIAS	Multiplicative Adj	**Mean**	0.0140	0.0020	0.0360	0.0490	0.0354	0.0208	0.0013	0.0225	0.0339
BIAS	Multiplicative Adj	**90th Percentile**	0.0396	0.0252	0.0408	0.2386	0.0359	0.0216	0.0209	0.0572	0.0808
BIAS	Capped Adjustment	**10th Percentile**	-0.0138	-0.0447	-0.0249	-0.1123	-0.0212	-0.0421	-0.0433	-0.0746	-0.0158
BIAS	Capped Adjustment	**Median**	0.0049	-0.0083	-0.0019	0.0051	0.0025	-0.0063	-0.0070	-0.0105	0.0125
BIAS	Capped Adjustment	**Mean**	0.0064	-0.0129	-0.0038	0.0085	0.0006	-0.0119	-0.0123	-0.0224	0.0298
BIAS	Capped Adjustment	**90th Percentile**	0.0285	0.0107	0.0150	0.1231	0.0201	0.0111	0.0099	0.0205	0.0801

Table 71 Accuracy (175 kW to 500 kW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	175 kW to 500 kW	**count**	1355	1355	1355	1355	1355	1355	1355	1355	1355
ACCURACY	Unadjusted	**10th Percentile**	0.0783	0.0806	0.0812	0.0625	0.0776	0.0798	0.0813	0.0898	0.0861
ACCURACY	Unadjusted	**Median**	0.1520	0.1603	0.1530	0.1486	0.1504	0.1571	0.1579	0.1952	0.2014
ACCURACY	Unadjusted	**Mean**	0.1718	0.1795	0.1769	0.1909	0.1869	0.1758	0.1774	0.2669	0.2935
ACCURACY	Unadjusted	**90th Percentile**	0.2915	0.3022	0.3048	0.3909	0.3644	0.2986	0.3039	0.4850	0.5736
ACCURACY	Additive Adj	**10th Percentile**	0.0626	0.0634	0.0742	0.0869	0.0705	0.0599	0.0608	0.0672	0.0686
ACCURACY	Additive Adj	**Median**	0.1257	0.1261	0.1475	0.2065	0.1406	0.1183	0.1201	0.1530	0.1611
ACCURACY	Additive Adj	**Mean**	0.1461	0.1482	0.1723	0.2513	0.1722	0.1405	0.1418	0.2634	0.2733
ACCURACY	Additive Adj	**90th Percentile**	0.2621	0.2641	0.3078	0.4844	0.3229	0.2512	0.2536	0.4844	0.5146
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0615	0.0619	0.0736	0.0869	0.0705	0.0581	0.0594	0.0677	0.0682
ACCURACY	Multiplicative Adj	**Median**	0.1240	0.1255	0.1510	0.2065	0.1436	0.1161	0.1175	0.1515	0.1588
ACCURACY	Multiplicative Adj	**Mean**	0.1454	0.1472	0.3629	0.2513	0.3104	0.6630	0.1383	0.2856	0.2740
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2594	0.2650	0.3346	0.4844	0.3487	0.2469	0.2484	0.4843	0.4915
ACCURACY	Capped Adjustment	**10th Percentile**	0.0630	0.0635	0.0769	0.0861	0.0710	0.0589	0.0600	0.0664	0.0677
ACCURACY	Capped Adjustment	**Median**	0.1236	0.1259	0.1463	0.1936	0.1400	0.1171	0.1194	0.1524	0.1568
ACCURACY	Capped Adjustment	**Mean**	0.1430	0.1479	0.1699	0.2203	0.1726	0.1380	0.1405	0.2257	0.2421
ACCURACY	Capped Adjustment	**90th Percentile**	0.2573	0.2667	0.2951	0.4002	0.3327	0.2490	0.2570	0.4319	0.4735

Table 72 Variability (175 kW to 500 kW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	175 kW to 500 kW	**count**	1355	1355	1355	1355	1355	1355	1355	1355	1355
VARIABILITY	Unadjusted	**10th Percentile**	0.0770	0.0784	0.0805	0.0595	0.0771	0.0758	0.0785	0.0859	0.0857
VARIABILITY	Unadjusted	**Median**	0.1504	0.1549	0.1516	0.1446	0.1494	0.1483	0.1529	0.1897	0.1990
VARIABILITY	Unadjusted	**Mean**	0.1704	0.1742	0.1753	0.1830	0.1860	0.1681	0.1716	0.2615	0.2858
VARIABILITY	Unadjusted	**90th Percentile**	0.2896	0.2958	0.3018	0.3715	0.3627	0.2866	0.2918	0.4743	0.5503
VARIABILITY	Additive Adj	**10th Percentile**	0.0622	0.0629	0.0737	0.0781	0.0699	0.0593	0.0605	0.0662	0.0677
VARIABILITY	Additive Adj	**Median**	0.1241	0.1254	0.1471	0.1724	0.1398	0.1176	0.1196	0.1512	0.1597
VARIABILITY	Additive Adj	**Mean**	0.1449	0.1471	0.1715	0.2123	0.1714	0.1393	0.1409	0.2575	0.2670
VARIABILITY	Additive Adj	**90th Percentile**	0.2587	0.2629	0.3059	0.4153	0.3215	0.2500	0.2525	0.4827	0.5120
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0614	0.0615	0.0730	0.0781	0.0700	0.0581	0.0594	0.0669	0.0673
VARIABILITY	Multiplicative Adj	**Median**	0.1221	0.1233	0.1503	0.1724	0.1427	0.1150	0.1168	0.1496	0.1551
VARIABILITY	Multiplicative Adj	**Mean**	0.1441	0.1463	0.3601	0.2123	0.3074	0.6622	0.1375	0.2815	0.2688
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2578	0.2638	0.3313	0.4153	0.3488	0.2457	0.2473	0.4671	0.4873
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0623	0.0634	0.0769	0.0770	0.0709	0.0583	0.0597	0.0657	0.0667
VARIABILITY	Capped Adjustment	**Median**	0.1225	0.1250	0.1459	0.1643	0.1387	0.1155	0.1178	0.1500	0.1553
VARIABILITY	Capped Adjustment	**Mean**	0.1420	0.1461	0.1691	0.1991	0.1719	0.1362	0.1388	0.2222	0.2376
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2550	0.2638	0.2941	0.3756	0.3327	0.2462	0.2550	0.4218	0.4639

Table 73 Bias (500 kW to 2,000 kW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	500 kW to 2000 kW	**count**	571	571	571	571	571	571	571	571	571
BIAS	Unadjusted	**10th Percentile**	-0.0315	-0.0734	-0.0476	-0.1212	-0.0292	-0.0846	-0.0819	-0.0947	-0.0099
BIAS	Unadjusted	**Median**	-0.0036	-0.0310	-0.0122	-0.0264	-0.0030	-0.0397	-0.0350	-0.0247	0.0254
BIAS	Unadjusted	**Mean**	-0.0021	-0.0355	-0.0160	-0.0392	-0.0042	-0.0437	-0.0396	-0.0376	0.1388
BIAS	Unadjusted	**90th Percentile**	0.0293	-0.0045	0.0058	0.0191	0.0190	-0.0075	-0.0062	0.0108	0.1259
BIAS	Additive Adj	**10th Percentile**	-0.0043	-0.0159	-0.0142	-0.0592	-0.0154	-0.0136	-0.0114	-0.0368	-0.0473
BIAS	Additive Adj	**Median**	0.0103	0.0026	0.0051	0.0556	0.0054	0.0057	0.0047	0.0030	0.0046
BIAS	Additive Adj	**Mean**	0.0144	0.0053	0.0065	0.0781	0.0068	0.0083	0.0075	0.0239	0.0305
BIAS	Additive Adj	**90th Percentile**	0.0396	0.0284	0.0282	0.2624	0.0278	0.0337	0.0309	0.0552	0.0693
BIAS	Multiplicative Adj	**10th Percentile**	-0.0022	-0.0155	-0.0088	-0.0592	-0.0079	-0.0134	-0.0132	-0.0291	-0.0278
BIAS	Multiplicative Adj	**Median**	0.0099	0.0018	0.0094	0.0556	0.0078	0.0032	0.0031	0.0062	0.0085
BIAS	Multiplicative Adj	**Mean**	0.0167	0.0077	0.1192	0.0781	0.1475	0.0052	0.0048	0.0278	0.0394
BIAS	Multiplicative Adj	**90th Percentile**	0.0431	0.0276	0.0550	0.2624	0.0442	0.0245	0.0247	0.0670	0.0793
BIAS	Capped Adjustment	**10th Percentile**	-0.0144	-0.0458	-0.0297	-0.0699	-0.0320	-0.0442	-0.0482	-0.0892	-0.0188
BIAS	Capped Adjustment	**Median**	0.0053	-0.0066	-0.0031	0.0209	0.0011	-0.0043	-0.0060	-0.0114	0.0099
BIAS	Capped Adjustment	**Mean**	0.0069	-0.0130	-0.0058	0.0299	-0.0028	-0.0101	-0.0121	-0.0270	0.0974
BIAS	Capped Adjustment	**90th Percentile**	0.0302	0.0081	0.0129	0.1333	0.0196	0.0134	0.0104	0.0166	0.0813

Table 74 Accuracy (500 kW to 2,000 kW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	500 kW to 2000 kW	**count**	571	571	571	571	571	571	571	571	571
ACCURACY	Unadjusted	**10th Percentile**	0.0680	0.0722	0.0720	0.0564	0.0748	0.0718	0.0715	0.0786	0.0812
ACCURACY	Unadjusted	**Median**	0.1501	0.1602	0.1550	0.1783	0.1631	0.1533	0.1598	0.1875	0.1998
ACCURACY	Unadjusted	**Mean**	0.1784	0.1874	0.1856	0.2039	0.2118	0.1829	0.1861	0.2796	0.6939
ACCURACY	Unadjusted	**90th Percentile**	0.3477	0.3590	0.3528	0.3918	0.4227	0.3324	0.3451	0.5390	0.5646
ACCURACY	Additive Adj	**10th Percentile**	0.0567	0.0578	0.0689	0.0849	0.0637	0.0542	0.0544	0.0567	0.0651
ACCURACY	Additive Adj	**Median**	0.1189	0.1202	0.1453	0.2321	0.1459	0.1152	0.1166	0.1525	0.1665
ACCURACY	Additive Adj	**Mean**	0.1519	0.1540	0.1794	0.2614	0.1835	0.1468	0.1475	0.2724	0.2935
ACCURACY	Additive Adj	**90th Percentile**	0.2988	0.3038	0.3461	0.4964	0.3568	0.2862	0.2891	0.4728	0.5040
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0557	0.0555	0.0694	0.0849	0.0629	0.0517	0.0518	0.0562	0.0650
ACCURACY	Multiplicative Adj	**Median**	0.1149	0.1195	0.1447	0.2321	0.1444	0.1105	0.1129	0.1498	0.1550
ACCURACY	Multiplicative Adj	**Mean**	0.1572	0.1694	1.0686	0.2614	1.2090	0.1412	0.1434	0.2869	0.3014
ACCURACY	Multiplicative Adj	**90th Percentile**	0.3101	0.3084	0.4265	0.4964	0.4072	0.2772	0.2775	0.5082	0.4803
ACCURACY	Capped Adjustment	**10th Percentile**	0.0559	0.0556	0.0704	0.0831	0.0633	0.0517	0.0526	0.0570	0.0650
ACCURACY	Capped Adjustment	**Median**	0.1184	0.1239	0.1467	0.2094	0.1439	0.1149	0.1168	0.1504	0.1542
ACCURACY	Capped Adjustment	**Mean**	0.1493	0.1556	0.1772	0.2272	0.1897	0.1436	0.1481	0.2374	0.5617
ACCURACY	Capped Adjustment	**90th Percentile**	0.2900	0.3087	0.3278	0.4135	0.3872	0.2849	0.2960	0.4573	0.4807

Table 75 Variability (500 kW to 2,000 kW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	500 kW to 2000 kW	**count**	571	571	571	571	571	571	571	571	571
VARIABILITY	Unadjusted	**10th Percentile**	0.0675	0.0681	0.0709	0.0542	0.0745	0.0677	0.0691	0.0777	0.0787
VARIABILITY	Unadjusted	**Median**	0.1486	0.1530	0.1530	0.1695	0.1625	0.1441	0.1509	0.1843	0.1944
VARIABILITY	Unadjusted	**Mean**	0.1770	0.1823	0.1838	0.1945	0.2107	0.1752	0.1799	0.2730	0.6809
VARIABILITY	Unadjusted	**90th Percentile**	0.3440	0.3533	0.3475	0.3815	0.4196	0.3275	0.3394	0.5320	0.5601
VARIABILITY	Additive Adj	**10th Percentile**	0.0562	0.0576	0.0686	0.0737	0.0633	0.0540	0.0542	0.0568	0.0643
VARIABILITY	Additive Adj	**Median**	0.1184	0.1201	0.1453	0.1945	0.1439	0.1146	0.1160	0.1504	0.1655
VARIABILITY	Additive Adj	**Mean**	0.1506	0.1530	0.1785	0.2249	0.1827	0.1456	0.1465	0.2668	0.2860
VARIABILITY	Additive Adj	**90th Percentile**	0.2965	0.3023	0.3462	0.4256	0.3558	0.2842	0.2853	0.4618	0.4907
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0552	0.0554	0.0691	0.0737	0.0626	0.0514	0.0518	0.0557	0.0647
VARIABILITY	Multiplicative Adj	**Median**	0.1143	0.1194	0.1439	0.1945	0.1434	0.1101	0.1126	0.1471	0.1533
VARIABILITY	Multiplicative Adj	**Mean**	0.1557	0.1682	1.0612	0.2249	1.1994	0.1404	0.1427	0.2817	0.2950
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.3053	0.3055	0.4252	0.4256	0.4018	0.2774	0.2770	0.5007	0.4764
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0558	0.0555	0.0699	0.0718	0.0629	0.0514	0.0526	0.0568	0.0643
VARIABILITY	Capped Adjustment	**Median**	0.1178	0.1221	0.1464	0.1846	0.1431	0.1132	0.1165	0.1473	0.1539
VARIABILITY	Capped Adjustment	**Mean**	0.1484	0.1539	0.1764	0.2085	0.1887	0.1419	0.1464	0.2326	0.5530
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2884	0.3025	0.3268	0.3905	0.3821	0.2810	0.2949	0.4538	0.4774

Table 76 Bias (2 MW to 10 MW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	2 MW to 10 MW	**count**	141	141	141	141	141	141	141	140	140
BIAS	Unadjusted	**10th Percentile**	-0.0215	-0.0551	-0.0345	-0.0945	-0.0327	-0.0652	-0.0692	-0.0586	-0.0057
BIAS	Unadjusted	**Median**	0.0012	-0.0210	-0.0084	-0.0138	-0.0020	-0.0277	-0.0291	-0.0161	0.0281
BIAS	Unadjusted	**Mean**	0.0096	-0.0189	-0.0091	-0.0259	-0.0014	-0.0279	-0.0290	-0.0174	0.0438
BIAS	Unadjusted	**90th Percentile**	0.0486	0.0175	0.0121	0.0152	0.0271	0.0108	0.0070	0.0253	0.1100
BIAS	Additive Adj	**10th Percentile**	-0.0121	-0.0210	-0.0164	-0.0731	-0.0233	-0.0181	-0.0178	-0.0262	-0.0557
BIAS	Additive Adj	**Median**	0.0068	0.0018	0.0046	0.0149	0.0039	0.0051	0.0034	0.0006	0.0001
BIAS	Additive Adj	**Mean**	0.0080	0.0019	0.0072	0.0278	0.0033	0.0042	0.0032	0.0036	-0.0059
BIAS	Additive Adj	**90th Percentile**	0.0322	0.0259	0.0337	0.1449	0.0272	0.0243	0.0254	0.0330	0.0359
BIAS	Multiplicative Adj	**10th Percentile**	-0.0099	-0.0161	-0.0035	-0.0731	-0.0125	-0.0153	-0.0154	-0.0159	-0.0304
BIAS	Multiplicative Adj	**Median**	0.0083	0.0030	0.0086	0.0149	0.0080	0.0025	0.0020	0.0018	0.0030
BIAS	Multiplicative Adj	**Mean**	0.0102	0.0043	0.0376	0.0278	0.0366	0.0034	0.0031	0.0107	0.0065
BIAS	Multiplicative Adj	**90th Percentile**	0.0357	0.0305	0.0786	0.1449	0.0966	0.0222	0.0237	0.0471	0.0462
BIAS	Capped Adjustment	**10th Percentile**	-0.0110	-0.0310	-0.0204	-0.0660	-0.0417	-0.0194	-0.0361	-0.0625	-0.0158
BIAS	Capped Adjustment	**Median**	0.0049	-0.0038	-0.0019	0.0076	-0.0003	0.0007	-0.0025	-0.0048	0.0057
BIAS	Capped Adjustment	**Mean**	0.0116	-0.0035	-0.0035	0.0152	-0.0048	0.0017	-0.0045	-0.0103	0.0190
BIAS	Capped Adjustment	**90th Percentile**	0.0345	0.0220	0.0140	0.1026	0.0263	0.0175	0.0145	0.0234	0.0603

Table 77 Accuracy (2 MW to 10 MW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	2 MW to 10 MW	**count**	141	141	141	141	141	141	141	140	140
ACCURACY	Unadjusted	**10th Percentile**	0.0675	0.0706	0.0717	0.0417	0.0706	0.0713	0.0704	0.0753	0.0759
ACCURACY	Unadjusted	**Median**	0.1502	0.1564	0.1659	0.1291	0.1916	0.1544	0.1572	0.1719	0.1836
ACCURACY	Unadjusted	**Mean**	0.1741	0.1827	0.1875	0.1483	0.2335	0.1794	0.1829	0.2076	0.2211
ACCURACY	Unadjusted	**90th Percentile**	0.3096	0.3208	0.3565	0.2631	0.4708	0.3220	0.3189	0.3776	0.3998
ACCURACY	Additive Adj	**10th Percentile**	0.0521	0.0538	0.0661	0.0697	0.0631	0.0519	0.0543	0.0498	0.0493
ACCURACY	Additive Adj	**Median**	0.1205	0.1223	0.1449	0.1701	0.1494	0.1191	0.1175	0.1236	0.1335
ACCURACY	Additive Adj	**Mean**	0.1427	0.1452	0.1779	0.1988	0.1815	0.1365	0.1379	0.1782	0.1896
ACCURACY	Additive Adj	**90th Percentile**	0.2886	0.2893	0.3674	0.3455	0.3665	0.2687	0.2689	0.3779	0.4015
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0521	0.0530	0.0670	0.0697	0.0625	0.0495	0.0505	0.0501	0.0487
ACCURACY	Multiplicative Adj	**Median**	0.1213	0.1201	0.1484	0.1701	0.1534	0.1148	0.1166	0.1218	0.1247
ACCURACY	Multiplicative Adj	**Mean**	0.1456	0.1499	0.2717	0.1988	0.2921	0.1370	0.1399	0.1797	0.1846
ACCURACY	Multiplicative Adj	**90th Percentile**	0.3026	0.3100	0.5059	0.3455	0.5592	0.2762	0.2763	0.3701	0.3814
ACCURACY	Capped Adjustment	**10th Percentile**	0.0545	0.0558	0.0677	0.0674	0.0618	0.0487	0.0511	0.0535	0.0495
ACCURACY	Capped Adjustment	**Median**	0.1253	0.1339	0.1540	0.1647	0.1721	0.1186	0.1266	0.1389	0.1342
ACCURACY	Capped Adjustment	**Mean**	0.1477	0.1550	0.1782	0.1788	0.2047	0.1410	0.1482	0.1699	0.1735
ACCURACY	Capped Adjustment	**90th Percentile**	0.2874	0.2960	0.3412	0.2949	0.4161	0.2788	0.2861	0.3476	0.3475

Table 78 Variability (2 MW to 10 MW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	2 MW to 10 MW	**count**	141	141	141	141	141	141	141	140	140
VARIABILITY	Unadjusted	**10th Percentile**	0.0669	0.0692	0.0715	0.0416	0.0707	0.0671	0.0697	0.0717	0.0758
VARIABILITY	Unadjusted	**Median**	0.1492	0.1520	0.1655	0.1249	0.1917	0.1498	0.1517	0.1669	0.1772
VARIABILITY	Unadjusted	**Mean**	0.1718	0.1789	0.1866	0.1421	0.2323	0.1738	0.1780	0.2041	0.2143
VARIABILITY	Unadjusted	**90th Percentile**	0.3083	0.3173	0.3558	0.2507	0.4667	0.3215	0.3141	0.3757	0.3903
VARIABILITY	Additive Adj	**10th Percentile**	0.0520	0.0535	0.0661	0.0603	0.0628	0.0514	0.0536	0.0485	0.0492
VARIABILITY	Additive Adj	**Median**	0.1202	0.1223	0.1432	0.1550	0.1492	0.1187	0.1175	0.1226	0.1309
VARIABILITY	Additive Adj	**Mean**	0.1417	0.1443	0.1772	0.1761	0.1805	0.1356	0.1371	0.1768	0.1869
VARIABILITY	Additive Adj	**90th Percentile**	0.2874	0.2865	0.3654	0.2940	0.3600	0.2686	0.2683	0.3770	0.3937
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0510	0.0522	0.0669	0.0603	0.0622	0.0495	0.0504	0.0487	0.0487
VARIABILITY	Multiplicative Adj	**Median**	0.1209	0.1197	0.1473	0.1550	0.1534	0.1147	0.1165	0.1217	0.1228
VARIABILITY	Multiplicative Adj	**Mean**	0.1444	0.1489	0.2677	0.1761	0.2878	0.1363	0.1392	0.1777	0.1823
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.3003	0.3098	0.5007	0.2940	0.5577	0.2754	0.2761	0.3687	0.3769
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0542	0.0551	0.0676	0.0602	0.0617	0.0480	0.0508	0.0532	0.0489
VARIABILITY	Capped Adjustment	**Median**	0.1245	0.1333	0.1537	0.1463	0.1706	0.1181	0.1242	0.1358	0.1324
VARIABILITY	Capped Adjustment	**Mean**	0.1459	0.1531	0.1777	0.1617	0.2034	0.1393	0.1463	0.1672	0.1702
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2826	0.2922	0.3395	0.2608	0.4159	0.2723	0.2757	0.3351	0.3415

Table 79 Bias (Over 10 MW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Over 10 MW	**count**	50	50	50	50	50	50	50	50	50
BIAS	Unadjusted	**10th Percentile**	-0.0294	-0.0670	-0.0518	-0.0464	-0.0496	-0.0803	-0.0655	-0.0755	-0.0175
BIAS	Unadjusted	**Median**	0.0145	-0.0001	-0.0098	-0.0132	-0.0137	-0.0159	-0.0122	-0.0184	0.0186
BIAS	Unadjusted	**Mean**	0.0211	-0.0104	-0.0085	-0.0205	-0.0120	-0.0268	-0.0189	-0.0141	0.0336
BIAS	Unadjusted	**90th Percentile**	0.0816	0.0445	0.0302	0.0116	0.0278	0.0209	0.0194	0.0567	0.1166
BIAS	Additive Adj	**10th Percentile**	-0.0121	-0.0334	-0.0245	-0.0719	-0.0316	-0.0330	-0.0292	-0.0246	-0.0201
BIAS	Additive Adj	**Median**	0.0044	0.0020	-0.0001	-0.0091	-0.0027	0.0009	0.0015	0.0000	0.0019
BIAS	Additive Adj	**Mean**	0.0054	-0.0016	-0.0021	-0.0067	-0.0065	-0.0013	-0.0014	0.0033	0.0102
BIAS	Additive Adj	**90th Percentile**	0.0293	0.0251	0.0202	0.0629	0.0203	0.0201	0.0195	0.0258	0.0462
BIAS	Multiplicative Adj	**10th Percentile**	-0.0116	-0.0314	-0.0146	-0.0719	-0.0184	-0.0309	-0.0273	-0.0206	-0.0136
BIAS	Multiplicative Adj	**Median**	0.0072	0.0046	0.0106	-0.0091	0.0051	0.0020	0.0013	0.0010	0.0044
BIAS	Multiplicative Adj	**Mean**	0.0105	0.0048	0.0264	-0.0067	0.0411	0.0000	0.0005	0.0096	0.0167
BIAS	Multiplicative Adj	**90th Percentile**	0.0366	0.0273	0.1071	0.0629	0.1208	0.0205	0.0203	0.0328	0.0506
BIAS	Capped Adjustment	**10th Percentile**	-0.0188	-0.0405	-0.0381	-0.0733	-0.0482	-0.0434	-0.0364	-0.0497	-0.0196
BIAS	Capped Adjustment	**Median**	0.0083	0.0005	-0.0037	-0.0111	-0.0142	0.0015	-0.0001	-0.0063	0.0020
BIAS	Capped Adjustment	**Mean**	0.0161	-0.0001	-0.0068	-0.0086	-0.0180	-0.0010	-0.0016	-0.0063	0.0170
BIAS	Capped Adjustment	**90th Percentile**	0.0643	0.0406	0.0167	0.0624	0.0078	0.0341	0.0274	0.0375	0.0642

Table 80 Accuracy (Over 10 MW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Over 10 MW	**count**	50	50	50	50	50	50	50	50	50
ACCURACY	Unadjusted	**10th Percentile**	0.0776	0.0857	0.0951	0.0510	0.1200	0.0933	0.0872	0.0765	0.0660
ACCURACY	Unadjusted	**Median**	0.1927	0.1936	0.1893	0.1061	0.2395	0.1909	0.1939	0.1755	0.1736
ACCURACY	Unadjusted	**Mean**	0.2053	0.2092	0.2099	0.1237	0.2704	0.2065	0.2044	0.1993	0.1935
ACCURACY	Unadjusted	**90th Percentile**	0.3614	0.3497	0.3943	0.2234	0.4721	0.3331	0.3468	0.3631	0.3547
ACCURACY	Additive Adj	**10th Percentile**	0.0533	0.0535	0.0744	0.0829	0.0644	0.0496	0.0508	0.0349	0.0353
ACCURACY	Additive Adj	**Median**	0.1438	0.1449	0.1704	0.1546	0.1942	0.1353	0.1388	0.1221	0.1185
ACCURACY	Additive Adj	**Mean**	0.1586	0.1610	0.1978	0.1724	0.2022	0.1503	0.1505	0.1404	0.1391
ACCURACY	Additive Adj	**90th Percentile**	0.2802	0.2758	0.3627	0.2856	0.3583	0.2566	0.2584	0.3150	0.2976
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0512	0.0514	0.0752	0.0829	0.0658	0.0490	0.0500	0.0345	0.0348
ACCURACY	Multiplicative Adj	**Median**	0.1456	0.1488	0.1826	0.1546	0.2046	0.1354	0.1387	0.1201	0.1166
ACCURACY	Multiplicative Adj	**Mean**	0.1667	0.1710	0.2888	0.1724	0.3969	0.1526	0.1529	0.1465	0.1405
ACCURACY	Multiplicative Adj	**90th Percentile**	0.3198	0.3370	0.7752	0.2856	0.8198	0.2567	0.2594	0.3125	0.3009
ACCURACY	Capped Adjustment	**10th Percentile**	0.0479	0.0484	0.0758	0.0633	0.0731	0.0601	0.0551	0.0483	0.0466
ACCURACY	Capped Adjustment	**Median**	0.1488	0.1517	0.1661	0.1470	0.2186	0.1438	0.1453	0.1426	0.1226
ACCURACY	Capped Adjustment	**Mean**	0.1661	0.1720	0.1895	0.1517	0.2330	0.1612	0.1618	0.1649	0.1553
ACCURACY	Capped Adjustment	**90th Percentile**	0.3045	0.3055	0.3648	0.2371	0.4293	0.2791	0.2889	0.3214	0.3079

Table 81 Variability (Over 10 MW): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Over 10 MW	**count**	50	50	50	50	50	50	50	50	50
VARIABILITY	Unadjusted	**10th Percentile**	0.0735	0.0744	0.0929	0.0503	0.1199	0.0798	0.0770	0.0689	0.0658
VARIABILITY	Unadjusted	**Median**	0.1878	0.1913	0.1854	0.1032	0.2383	0.1871	0.1925	0.1633	0.1703
VARIABILITY	Unadjusted	**Mean**	0.2010	0.2045	0.2080	0.1180	0.2688	0.2002	0.1999	0.1928	0.1864
VARIABILITY	Unadjusted	**90th Percentile**	0.3521	0.3470	0.3901	0.2118	0.4696	0.3284	0.3454	0.3378	0.3445
VARIABILITY	Additive Adj	**10th Percentile**	0.0530	0.0533	0.0742	0.0813	0.0643	0.0496	0.0507	0.0349	0.0353
VARIABILITY	Additive Adj	**Median**	0.1416	0.1439	0.1702	0.1431	0.1931	0.1343	0.1376	0.1189	0.1168
VARIABILITY	Additive Adj	**Mean**	0.1576	0.1598	0.1970	0.1618	0.2012	0.1493	0.1497	0.1387	0.1364
VARIABILITY	Additive Adj	**90th Percentile**	0.2797	0.2758	0.3627	0.2618	0.3548	0.2565	0.2584	0.3149	0.2980
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0510	0.0514	0.0752	0.0813	0.0648	0.0489	0.0499	0.0346	0.0349
VARIABILITY	Multiplicative Adj	**Median**	0.1427	0.1476	0.1821	0.1431	0.2043	0.1345	0.1382	0.1176	0.1158
VARIABILITY	Multiplicative Adj	**Mean**	0.1652	0.1694	0.2861	0.1618	0.3927	0.1517	0.1521	0.1439	0.1373
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.3169	0.3337	0.7678	0.2618	0.8112	0.2556	0.2579	0.3087	0.3007
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0477	0.0484	0.0757	0.0621	0.0730	0.0592	0.0547	0.0484	0.0457
VARIABILITY	Capped Adjustment	**Median**	0.1448	0.1471	0.1641	0.1278	0.2165	0.1416	0.1431	0.1354	0.1207
VARIABILITY	Capped Adjustment	**Mean**	0.1634	0.1695	0.1885	0.1427	0.2313	0.1584	0.1597	0.1609	0.1513
VARIABILITY	Capped Adjustment	**90th Percentile**	0.3005	0.3021	0.3647	0.2281	0.4294	0.2728	0.2858	0.3101	0.2941

Table 82 Bias (Not Weather Sensitive): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Not Weather Sensitive	**count**	992	992	992	992	992	992	992	991	991
BIAS	Unadjusted	**10th Percentile**	-0.0212	-0.0523	-0.0305	-0.0770	-0.0278	-0.0621	-0.0663	-0.0713	-0.0058
BIAS	Unadjusted	**Median**	0.0020	-0.0195	-0.0090	-0.0124	-0.0022	-0.0246	-0.0219	-0.0176	0.0247
BIAS	Unadjusted	**Mean**	0.0063	-0.0205	-0.0094	-0.0169	-0.0025	-0.0269	-0.0267	-0.0236	0.1059
BIAS	Unadjusted	**90th Percentile**	0.0389	0.0050	0.0114	0.0343	0.0224	0.0050	0.0033	0.0213	0.1362
BIAS	Additive Adj	**10th Percentile**	-0.0057	-0.0157	-0.0143	-0.0670	-0.0160	-0.0144	-0.0137	-0.0350	-0.0394
BIAS	Additive Adj	**Median**	0.0080	0.0017	0.0037	0.0219	0.0032	0.0031	0.0029	0.0002	0.0031
BIAS	Additive Adj	**Mean**	0.0114	0.0027	0.0052	0.0542	0.0041	0.0038	0.0037	0.0286	0.0336
BIAS	Additive Adj	**90th Percentile**	0.0359	0.0233	0.0263	0.2234	0.0246	0.0255	0.0247	0.0469	0.0585
BIAS	Multiplicative Adj	**10th Percentile**	-0.0037	-0.0141	-0.0080	-0.0670	-0.0112	-0.0143	-0.0147	-0.0288	-0.0237
BIAS	Multiplicative Adj	**Median**	0.0082	0.0017	0.0073	0.0219	0.0058	0.0019	0.0017	0.0013	0.0066
BIAS	Multiplicative Adj	**Mean**	0.0130	0.0037	0.1012	0.0542	0.0899	0.0033	0.0021	0.0293	0.0335
BIAS	Multiplicative Adj	**90th Percentile**	0.0380	0.0241	0.0493	0.2234	0.0424	0.0209	0.0202	0.0570	0.0744
BIAS	Capped Adjustment	**10th Percentile**	-0.0098	-0.0316	-0.0228	-0.0679	-0.0323	-0.0264	-0.0354	-0.0688	-0.0152
BIAS	Capped Adjustment	**Median**	0.0056	-0.0030	-0.0015	0.0128	0.0005	-0.0005	-0.0023	-0.0059	0.0092
BIAS	Capped Adjustment	**Mean**	0.0099	-0.0056	-0.0027	0.0266	-0.0033	-0.0024	-0.0061	-0.0193	0.0705
BIAS	Capped Adjustment	**90th Percentile**	0.0330	0.0143	0.0160	0.1407	0.0188	0.0168	0.0135	0.0218	0.0815

Table 83 Accuracy (Not Weather Sensitive): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Not Weather Sensitive	**count**	992	992	992	992	992	992	992	991	991
ACCURACY	Unadjusted	**10th Percentile**	0.0566	0.0604	0.0613	0.0509	0.0680	0.0611	0.0617	0.0613	0.0638
ACCURACY	Unadjusted	**Median**	0.1283	0.1334	0.1370	0.1220	0.1552	0.1294	0.1318	0.1584	0.1688
ACCURACY	Unadjusted	**Mean**	0.1560	0.1625	0.1678	0.1566	0.2058	0.1585	0.1618	0.2550	0.5060
ACCURACY	Unadjusted	**90th Percentile**	0.2967	0.3101	0.3139	0.2957	0.4284	0.3091	0.3141	0.5356	0.5826
ACCURACY	Additive Adj	**10th Percentile**	0.0456	0.0458	0.0563	0.0696	0.0585	0.0442	0.0448	0.0460	0.0484
ACCURACY	Additive Adj	**Median**	0.1119	0.1144	0.1338	0.1659	0.1410	0.1066	0.1077	0.1308	0.1365
ACCURACY	Additive Adj	**Mean**	0.1376	0.1392	0.1632	0.2130	0.1749	0.1322	0.1332	0.2777	0.2892
ACCURACY	Additive Adj	**90th Percentile**	0.2671	0.2679	0.3122	0.4126	0.3470	0.2565	0.2590	0.4900	0.5267
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0443	0.0450	0.0570	0.0696	0.0583	0.0423	0.0435	0.0458	0.0472
ACCURACY	Multiplicative Adj	**Median**	0.1105	0.1121	0.1372	0.1659	0.1425	0.1056	0.1062	0.1322	0.1334
ACCURACY	Multiplicative Adj	**Mean**	0.1401	0.1431	0.8898	0.2130	0.7709	0.1391	0.1324	0.3121	0.2788
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2721	0.2810	0.3722	0.4126	0.4090	0.2550	0.2588	0.5018	0.5056
ACCURACY	Capped Adjustment	**10th Percentile**	0.0452	0.0455	0.0603	0.0685	0.0597	0.0424	0.0438	0.0475	0.0487
ACCURACY	Capped Adjustment	**Median**	0.1107	0.1143	0.1342	0.1563	0.1425	0.1055	0.1076	0.1336	0.1352
ACCURACY	Capped Adjustment	**Mean**	0.1378	0.1425	0.1635	0.1857	0.1858	0.1314	0.1357	0.2237	0.4172
ACCURACY	Capped Adjustment	**90th Percentile**	0.2733	0.2868	0.3110	0.3332	0.3917	0.2613	0.2795	0.4520	0.4920

Table 84 Variability (Not Weather Sensitive): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Not Weather Sensitive	**count**	992	992	992	992	992	992	992	991	991
VARIABILITY	Unadjusted	**10th Percentile**	0.0562	0.0582	0.0605	0.0489	0.0679	0.0566	0.0585	0.0590	0.0627
VARIABILITY	Unadjusted	**Median**	0.1270	0.1306	0.1362	0.1177	0.1544	0.1242	0.1278	0.1550	0.1608
VARIABILITY	Unadjusted	**Mean**	0.1545	0.1595	0.1666	0.1499	0.2049	0.1538	0.1576	0.2503	0.4945
VARIABILITY	Unadjusted	**90th Percentile**	0.2962	0.3074	0.3126	0.2813	0.4277	0.3045	0.3101	0.5217	0.5574
VARIABILITY	Additive Adj	**10th Percentile**	0.0455	0.0454	0.0560	0.0651	0.0581	0.0436	0.0444	0.0453	0.0476
VARIABILITY	Additive Adj	**Median**	0.1106	0.1133	0.1330	0.1471	0.1402	0.1062	0.1076	0.1298	0.1335
VARIABILITY	Additive Adj	**Mean**	0.1365	0.1384	0.1623	0.1808	0.1742	0.1313	0.1325	0.2704	0.2808
VARIABILITY	Additive Adj	**90th Percentile**	0.2639	0.2653	0.3113	0.3422	0.3454	0.2551	0.2577	0.4857	0.5270
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0440	0.0449	0.0565	0.0651	0.0583	0.0422	0.0433	0.0453	0.0469
VARIABILITY	Multiplicative Adj	**Median**	0.1101	0.1117	0.1364	0.1471	0.1421	0.1045	0.1056	0.1297	0.1300
VARIABILITY	Multiplicative Adj	**Mean**	0.1390	0.1423	0.8832	0.1808	0.7647	0.1384	0.1317	0.3071	0.2734
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2715	0.2807	0.3712	0.3422	0.4087	0.2517	0.2567	0.4994	0.5061
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0449	0.0454	0.0599	0.0633	0.0595	0.0422	0.0435	0.0468	0.0485
VARIABILITY	Capped Adjustment	**Median**	0.1102	0.1138	0.1339	0.1396	0.1415	0.1042	0.1067	0.1319	0.1320
VARIABILITY	Capped Adjustment	**Mean**	0.1366	0.1412	0.1627	0.1663	0.1849	0.1303	0.1344	0.2198	0.4100
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2735	0.2846	0.3101	0.2986	0.3882	0.2596	0.2731	0.4443	0.4774

Table 85 Bias (Weather Sensitive): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Weather Sensitive	**count**	1125	1125	1125	1125	1125	1125	1125	1125	1125
BIAS	Unadjusted	**10th Percentile**	-0.0368	-0.0871	-0.0503	-0.1334	-0.0296	-0.0951	-0.0850	-0.0960	-0.0128
BIAS	Unadjusted	**Median**	-0.0092	-0.0416	-0.0168	-0.0324	-0.0046	-0.0516	-0.0428	-0.0359	0.0224
BIAS	Unadjusted	**Mean**	-0.0073	-0.0458	-0.0202	-0.0451	-0.0058	-0.0551	-0.0460	-0.0424	0.0446
BIAS	Unadjusted	**90th Percentile**	0.0228	-0.0125	0.0046	0.0203	0.0152	-0.0199	-0.0129	0.0099	0.1264
BIAS	Additive Adj	**10th Percentile**	-0.0057	-0.0211	-0.0161	-0.1307	-0.0112	-0.0180	-0.0158	-0.0389	-0.0390
BIAS	Additive Adj	**Median**	0.0107	0.0021	0.0049	0.0386	0.0076	0.0042	0.0039	0.0025	0.0081
BIAS	Additive Adj	**Mean**	0.0141	0.0029	0.0055	0.0541	0.0082	0.0054	0.0051	0.0112	0.0184
BIAS	Additive Adj	**90th Percentile**	0.0384	0.0299	0.0275	0.2566	0.0277	0.0327	0.0294	0.0501	0.0660
BIAS	Multiplicative Adj	**10th Percentile**	-0.0044	-0.0199	-0.0103	-0.1307	-0.0074	-0.0182	-0.0164	-0.0315	-0.0240
BIAS	Multiplicative Adj	**Median**	0.0105	0.0012	0.0089	0.0386	0.0103	0.0021	0.0020	0.0063	0.0126
BIAS	Multiplicative Adj	**Mean**	0.0156	0.0038	0.0206	0.0541	0.0447	0.0251	0.0025	0.0171	0.0329
BIAS	Multiplicative Adj	**90th Percentile**	0.0409	0.0281	0.0437	0.2566	0.0390	0.0244	0.0234	0.0591	0.0812
BIAS	Capped Adjustment	**10th Percentile**	-0.0172	-0.0534	-0.0278	-0.1235	-0.0207	-0.0530	-0.0490	-0.0794	-0.0173
BIAS	Capped Adjustment	**Median**	0.0048	-0.0127	-0.0034	0.0064	0.0030	-0.0110	-0.0110	-0.0145	0.0128
BIAS	Capped Adjustment	**Mean**	0.0047	-0.0176	-0.0058	0.0035	0.0009	-0.0172	-0.0162	-0.0252	0.0263
BIAS	Capped Adjustment	**90th Percentile**	0.0269	0.0080	0.0141	0.1137	0.0204	0.0085	0.0079	0.0174	0.0792

Table 86 Accuracy (Weather Sensitive): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Weather Sensitive	**count**	1125	1125	1125	1125	1125	1125	1125	1125	1125
ACCURACY	Unadjusted	**10th Percentile**	0.1006	0.1054	0.0974	0.0707	0.0839	0.1058	0.1042	0.1165	0.1109
ACCURACY	Unadjusted	**Median**	0.1700	0.1793	0.1663	0.1788	0.1584	0.1766	0.1782	0.2126	0.2198
ACCURACY	Unadjusted	**Mean**	0.1909	0.2001	0.1922	0.2194	0.1923	0.1965	0.1973	0.2734	0.2960
ACCURACY	Unadjusted	**90th Percentile**	0.3108	0.3228	0.3184	0.4346	0.3618	0.3158	0.3150	0.4643	0.5341
ACCURACY	Additive Adj	**10th Percentile**	0.0756	0.0762	0.0899	0.1065	0.0794	0.0719	0.0728	0.0815	0.0816
ACCURACY	Additive Adj	**Median**	0.1337	0.1352	0.1559	0.2372	0.1459	0.1281	0.1299	0.1618	0.1727
ACCURACY	Additive Adj	**Mean**	0.1567	0.1592	0.1858	0.2801	0.1780	0.1509	0.1522	0.2393	0.2532
ACCURACY	Additive Adj	**90th Percentile**	0.2728	0.2823	0.3241	0.5136	0.3294	0.2694	0.2716	0.4477	0.4679
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0741	0.0747	0.0905	0.1065	0.0796	0.0694	0.0709	0.0819	0.0824
ACCURACY	Multiplicative Adj	**Median**	0.1300	0.1317	0.1564	0.2372	0.1465	0.1219	0.1238	0.1623	0.1654
ACCURACY	Multiplicative Adj	**Mean**	0.1570	0.1635	0.2423	0.2801	0.3624	0.7716	0.1470	0.2435	0.2666
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2747	0.2801	0.3614	0.5136	0.3499	0.2575	0.2624	0.4529	0.4484
ACCURACY	Capped Adjustment	**10th Percentile**	0.0738	0.0752	0.0919	0.1054	0.0791	0.0703	0.0715	0.0804	0.0813
ACCURACY	Capped Adjustment	**Median**	0.1302	0.1337	0.1537	0.2155	0.1433	0.1244	0.1270	0.1623	0.1663
ACCURACY	Capped Adjustment	**Mean**	0.1524	0.1585	0.1811	0.2460	0.1763	0.1481	0.1504	0.2238	0.2377
ACCURACY	Capped Adjustment	**90th Percentile**	0.2669	0.2800	0.3077	0.4311	0.3313	0.2612	0.2649	0.4069	0.4430

Table 87 Variability (Weather Sensitive): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Weather Sensitive	**count**	1125	1125	1125	1125	1125	1125	1125	1125	1125
VARIABILITY	Unadjusted	**10th Percentile**	0.0999	0.1003	0.0969	0.0668	0.0834	0.0972	0.1001	0.1120	0.1103
VARIABILITY	Unadjusted	**Median**	0.1684	0.1716	0.1652	0.1717	0.1571	0.1666	0.1712	0.2067	0.2157
VARIABILITY	Unadjusted	**Mean**	0.1893	0.1932	0.1902	0.2101	0.1914	0.1864	0.1901	0.2670	0.2892
VARIABILITY	Unadjusted	**90th Percentile**	0.3093	0.3127	0.3163	0.4149	0.3612	0.3005	0.3074	0.4575	0.5156
VARIABILITY	Additive Adj	**10th Percentile**	0.0751	0.0758	0.0892	0.0921	0.0789	0.0711	0.0723	0.0803	0.0807
VARIABILITY	Additive Adj	**Median**	0.1323	0.1343	0.1555	0.2034	0.1444	0.1273	0.1290	0.1589	0.1707
VARIABILITY	Additive Adj	**Mean**	0.1553	0.1580	0.1849	0.2397	0.1771	0.1495	0.1511	0.2355	0.2487
VARIABILITY	Additive Adj	**90th Percentile**	0.2714	0.2808	0.3210	0.4450	0.3290	0.2631	0.2656	0.4400	0.4647
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0735	0.0740	0.0899	0.0921	0.0795	0.0692	0.0706	0.0804	0.0817
VARIABILITY	Multiplicative Adj	**Median**	0.1288	0.1316	0.1554	0.2034	0.1452	0.1218	0.1228	0.1591	0.1630
VARIABILITY	Multiplicative Adj	**Mean**	0.1554	0.1622	0.2404	0.2397	0.3587	0.7706	0.1461	0.2400	0.2614
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2724	0.2766	0.3587	0.4450	0.3500	0.2572	0.2619	0.4396	0.4397
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0733	0.0746	0.0916	0.0887	0.0788	0.0698	0.0711	0.0791	0.0806
VARIABILITY	Capped Adjustment	**Median**	0.1297	0.1326	0.1530	0.1921	0.1425	0.1233	0.1255	0.1595	0.1631
VARIABILITY	Capped Adjustment	**Mean**	0.1514	0.1563	0.1804	0.2256	0.1755	0.1456	0.1483	0.2200	0.2336
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2668	0.2761	0.3067	0.4179	0.3312	0.2561	0.2623	0.4040	0.4287

Table 88 Bias (Low Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Low Variability	**count**	624	624	624	624	624	624	624	623	623
BIAS	Unadjusted	**10th Percentile**	-0.0181	-0.0432	-0.0254	-0.1042	-0.0129	-0.0512	-0.0424	-0.0490	-0.0078
BIAS	Unadjusted	**Median**	-0.0024	-0.0201	-0.0104	-0.0181	-0.0015	-0.0273	-0.0206	-0.0211	0.0100
BIAS	Unadjusted	**Mean**	-0.0020	-0.0220	-0.0115	-0.0307	-0.0012	-0.0285	-0.0226	-0.0222	0.0240
BIAS	Unadjusted	**90th Percentile**	0.0131	-0.0036	0.0004	0.0096	0.0118	-0.0077	-0.0045	0.0037	0.0635
BIAS	Additive Adj	**10th Percentile**	-0.0032	-0.0111	-0.0089	-0.0775	-0.0060	-0.0102	-0.0091	-0.0183	-0.0215
BIAS	Additive Adj	**Median**	0.0059	0.0007	0.0017	0.0035	0.0043	0.0016	0.0013	0.0003	0.0028
BIAS	Additive Adj	**Mean**	0.0074	0.0008	0.0021	0.0124	0.0048	0.0013	0.0013	0.0022	0.0037
BIAS	Additive Adj	**90th Percentile**	0.0194	0.0120	0.0138	0.1195	0.0156	0.0123	0.0107	0.0239	0.0270
BIAS	Multiplicative Adj	**10th Percentile**	-0.0029	-0.0105	-0.0070	-0.0775	-0.0047	-0.0099	-0.0091	-0.0152	-0.0150
BIAS	Multiplicative Adj	**Median**	0.0062	0.0007	0.0033	0.0035	0.0056	0.0011	0.0012	0.0011	0.0047
BIAS	Multiplicative Adj	**Mean**	0.0079	0.0014	0.0494	0.0124	0.1377	0.0013	0.0013	0.0034	0.0089
BIAS	Multiplicative Adj	**90th Percentile**	0.0202	0.0131	0.0180	0.1195	0.0188	0.0129	0.0115	0.0285	0.0323
BIAS	Capped Adjustment	**10th Percentile**	-0.0033	-0.0136	-0.0116	-0.0807	-0.0062	-0.0140	-0.0120	-0.0265	-0.0105
BIAS	Capped Adjustment	**Median**	0.0054	-0.0005	-0.0003	-0.0020	0.0044	-0.0001	-0.0004	-0.0031	0.0053
BIAS	Capped Adjustment	**Mean**	0.0068	-0.0015	-0.0005	-0.0040	0.0048	-0.0014	-0.0010	-0.0059	0.0125
BIAS	Capped Adjustment	**90th Percentile**	0.0178	0.0093	0.0106	0.0724	0.0169	0.0100	0.0092	0.0142	0.0363

Table 89 Accuracy (Low Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Low Variability	**count**	624	624	624	624	624	624	624	623	623
ACCURACY	Unadjusted	**10th Percentile**	0.0511	0.0535	0.0551	0.0466	0.0569	0.0546	0.0555	0.0561	0.0567
ACCURACY	Unadjusted	**Median**	0.0961	0.1010	0.1001	0.0784	0.0891	0.1009	0.1013	0.1215	0.1150
ACCURACY	Unadjusted	**Mean**	0.1015	0.1058	0.1081	0.1161	0.0976	0.1050	0.1047	0.1431	0.1516
ACCURACY	Unadjusted	**90th Percentile**	0.1559	0.1611	0.1663	0.2694	0.1481	0.1586	0.1581	0.2415	0.2580
ACCURACY	Additive Adj	**10th Percentile**	0.0436	0.0432	0.0520	0.0637	0.0503	0.0413	0.0413	0.0438	0.0472
ACCURACY	Additive Adj	**Median**	0.0780	0.0788	0.0948	0.1153	0.0846	0.0732	0.0745	0.0880	0.0923
ACCURACY	Additive Adj	**Mean**	0.0828	0.0838	0.1022	0.1452	0.0942	0.0793	0.0800	0.1221	0.1300
ACCURACY	Additive Adj	**90th Percentile**	0.1277	0.1284	0.1569	0.2749	0.1438	0.1212	0.1232	0.2215	0.2481
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0433	0.0425	0.0522	0.0637	0.0507	0.0397	0.0407	0.0441	0.0462
ACCURACY	Multiplicative Adj	**Median**	0.0780	0.0792	0.0966	0.1153	0.0857	0.0730	0.0745	0.0888	0.0913
ACCURACY	Multiplicative Adj	**Mean**	0.0828	0.0839	0.4579	0.1452	1.0629	0.0786	0.0794	0.1192	0.1326
ACCURACY	Multiplicative Adj	**90th Percentile**	0.1280	0.1296	0.1644	0.2749	0.1540	0.1231	0.1222	0.2089	0.2297
ACCURACY	Capped Adjustment	**10th Percentile**	0.0431	0.0426	0.0528	0.0631	0.0524	0.0401	0.0409	0.0441	0.0462
ACCURACY	Capped Adjustment	**Median**	0.0769	0.0776	0.0957	0.1141	0.0845	0.0725	0.0737	0.0861	0.0893
ACCURACY	Capped Adjustment	**Mean**	0.0813	0.0826	0.1042	0.1373	0.0936	0.0782	0.0783	0.1118	0.1198
ACCURACY	Capped Adjustment	**90th Percentile**	0.1251	0.1274	0.1603	0.2553	0.1424	0.1217	0.1200	0.2020	0.2296

Table 90 Variability (Low Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Low Variability	**count**	624	624	624	624	624	624	624	623	623
VARIABILITY	Unadjusted	**10th Percentile**	0.0511	0.0523	0.0545	0.0446	0.0568	0.0522	0.0538	0.0542	0.0559
VARIABILITY	Unadjusted	**Median**	0.0957	0.0967	0.0987	0.0757	0.0886	0.0953	0.0960	0.1168	0.1141
VARIABILITY	Unadjusted	**Mean**	0.1008	0.1027	0.1072	0.1089	0.0972	0.1000	0.1014	0.1397	0.1479
VARIABILITY	Unadjusted	**90th Percentile**	0.1544	0.1553	0.1651	0.2461	0.1476	0.1540	0.1547	0.2373	0.2546
VARIABILITY	Additive Adj	**10th Percentile**	0.0433	0.0430	0.0516	0.0596	0.0503	0.0407	0.0410	0.0438	0.0470
VARIABILITY	Additive Adj	**Median**	0.0777	0.0780	0.0945	0.0981	0.0843	0.0726	0.0740	0.0871	0.0902
VARIABILITY	Additive Adj	**Mean**	0.0821	0.0833	0.1019	0.1242	0.0938	0.0788	0.0796	0.1207	0.1282
VARIABILITY	Additive Adj	**90th Percentile**	0.1264	0.1276	0.1569	0.2502	0.1428	0.1205	0.1218	0.2188	0.2459
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0425	0.0425	0.0517	0.0596	0.0507	0.0397	0.0405	0.0437	0.0460
VARIABILITY	Multiplicative Adj	**Median**	0.0773	0.0784	0.0958	0.0981	0.0854	0.0726	0.0743	0.0879	0.0903
VARIABILITY	Multiplicative Adj	**Mean**	0.0820	0.0834	0.4548	0.1242	1.0537	0.0781	0.0789	0.1179	0.1308
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.1266	0.1291	0.1643	0.2502	0.1534	0.1227	0.1218	0.2049	0.2282
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0427	0.0425	0.0525	0.0589	0.0524	0.0399	0.0408	0.0437	0.0460
VARIABILITY	Capped Adjustment	**Median**	0.0765	0.0774	0.0952	0.0947	0.0839	0.0719	0.0732	0.0856	0.0879
VARIABILITY	Capped Adjustment	**Mean**	0.0806	0.0821	0.1038	0.1211	0.0931	0.0776	0.0779	0.1106	0.1179
VARIABILITY	Capped Adjustment	**90th Percentile**	0.1239	0.1259	0.1603	0.2429	0.1414	0.1212	0.1191	0.2014	0.2189

Table 91 Bias (Medium Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Medium Variability	**count**	1250	1250	1250	1250	1250	1250	1250	1250	1250
BIAS	Unadjusted	**10th Percentile**	-0.0342	-0.0782	-0.0487	-0.1226	-0.0310	-0.0898	-0.0810	-0.0942	-0.0078
BIAS	Unadjusted	**Median**	-0.0056	-0.0367	-0.0150	-0.0266	-0.0056	-0.0463	-0.0414	-0.0290	0.0292
BIAS	Unadjusted	**Mean**	-0.0032	-0.0383	-0.0177	-0.0366	-0.0065	-0.0468	-0.0411	-0.0355	0.0528
BIAS	Unadjusted	**90th Percentile**	0.0309	-0.0015	0.0076	0.0295	0.0163	-0.0042	-0.0025	0.0205	0.1381
BIAS	Additive Adj	**10th Percentile**	-0.0072	-0.0212	-0.0196	-0.1123	-0.0168	-0.0184	-0.0173	-0.0402	-0.0435
BIAS	Additive Adj	**Median**	0.0106	0.0023	0.0053	0.0487	0.0060	0.0051	0.0044	0.0013	0.0072
BIAS	Additive Adj	**Mean**	0.0130	0.0026	0.0045	0.0596	0.0058	0.0048	0.0043	0.0130	0.0189
BIAS	Additive Adj	**90th Percentile**	0.0361	0.0269	0.0268	0.2393	0.0260	0.0289	0.0276	0.0525	0.0644
BIAS	Multiplicative Adj	**10th Percentile**	-0.0056	-0.0209	-0.0119	-0.1123	-0.0112	-0.0184	-0.0179	-0.0324	-0.0262
BIAS	Multiplicative Adj	**Median**	0.0102	0.0015	0.0097	0.0487	0.0093	0.0023	0.0019	0.0046	0.0128
BIAS	Multiplicative Adj	**Mean**	0.0141	0.0027	0.0495	0.0596	0.0200	0.0029	0.0019	0.0206	0.0305
BIAS	Multiplicative Adj	**90th Percentile**	0.0396	0.0261	0.0420	0.2393	0.0365	0.0243	0.0219	0.0607	0.0754
BIAS	Capped Adjustment	**10th Percentile**	-0.0172	-0.0453	-0.0285	-0.1094	-0.0260	-0.0453	-0.0452	-0.0811	-0.0167
BIAS	Capped Adjustment	**Median**	0.0043	-0.0120	-0.0039	0.0163	0.0002	-0.0085	-0.0099	-0.0154	0.0159
BIAS	Capped Adjustment	**Mean**	0.0056	-0.0144	-0.0060	0.0158	-0.0015	-0.0124	-0.0134	-0.0242	0.0300
BIAS	Capped Adjustment	**90th Percentile**	0.0298	0.0116	0.0144	0.1270	0.0203	0.0136	0.0112	0.0218	0.0805

Table 92 Accuracy (Medium Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Medium Variability	**count**	1250	1250	1250	1250	1250	1250	1250	1250	1250
ACCURACY	Unadjusted	**10th Percentile**	0.1006	0.1059	0.1014	0.0762	0.1078	0.1029	0.1054	0.1099	0.1073
ACCURACY	Unadjusted	**Median**	0.1715	0.1793	0.1719	0.1714	0.1759	0.1760	0.1786	0.2147	0.2226
ACCURACY	Unadjusted	**Mean**	0.1829	0.1918	0.1877	0.2064	0.2017	0.1863	0.1889	0.2742	0.3013
ACCURACY	Unadjusted	**90th Percentile**	0.2878	0.2991	0.3039	0.3965	0.3377	0.2855	0.2894	0.4667	0.5345
ACCURACY	Additive Adj	**10th Percentile**	0.0768	0.0779	0.0908	0.1150	0.0912	0.0737	0.0750	0.0803	0.0829
ACCURACY	Additive Adj	**Median**	0.1388	0.1409	0.1606	0.2326	0.1619	0.1328	0.1350	0.1675	0.1792
ACCURACY	Additive Adj	**Mean**	0.1536	0.1561	0.1800	0.2658	0.1830	0.1478	0.1490	0.2556	0.2682
ACCURACY	Additive Adj	**90th Percentile**	0.2525	0.2575	0.2972	0.4727	0.3127	0.2443	0.2473	0.4587	0.5019
ACCURACY	Multiplicative Adj	**10th Percentile**	0.0733	0.0736	0.0886	0.1150	0.0890	0.0692	0.0707	0.0804	0.0815
ACCURACY	Multiplicative Adj	**Median**	0.1364	0.1382	0.1648	0.2326	0.1639	0.1272	0.1292	0.1663	0.1725
ACCURACY	Multiplicative Adj	**Mean**	0.1529	0.1558	0.5140	0.2658	0.2384	0.1501	0.1450	0.2841	0.2701
ACCURACY	Multiplicative Adj	**90th Percentile**	0.2584	0.2600	0.3330	0.4727	0.3483	0.2455	0.2464	0.4710	0.4704
ACCURACY	Capped Adjustment	**10th Percentile**	0.0759	0.0793	0.0946	0.1118	0.0908	0.0724	0.0740	0.0831	0.0837
ACCURACY	Capped Adjustment	**Median**	0.1372	0.1418	0.1616	0.2120	0.1605	0.1291	0.1334	0.1686	0.1720
ACCURACY	Capped Adjustment	**Mean**	0.1514	0.1575	0.1784	0.2344	0.1832	0.1451	0.1486	0.2305	0.2453
ACCURACY	Capped Adjustment	**90th Percentile**	0.2471	0.2575	0.2909	0.3964	0.3127	0.2415	0.2459	0.4135	0.4448

Table 93 Variability (Medium Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	Medium Variability	**count**	1250	1250	1250	1250	1250	1250	1250	1250	1250
VARIABILITY	Unadjusted	**10th Percentile**	0.0996	0.1036	0.1000	0.0737	0.1075	0.0970	0.1002	0.1057	0.1064
VARIABILITY	Unadjusted	**Median**	0.1693	0.1733	0.1704	0.1670	0.1750	0.1661	0.1714	0.2089	0.2183
VARIABILITY	Unadjusted	**Mean**	0.1812	0.1858	0.1858	0.1975	0.2008	0.1774	0.1821	0.2686	0.2933
VARIABILITY	Unadjusted	**90th Percentile**	0.2855	0.2923	0.3003	0.3793	0.3357	0.2757	0.2817	0.4589	0.5216
VARIABILITY	Additive Adj	**10th Percentile**	0.0767	0.0770	0.0904	0.1047	0.0907	0.0728	0.0743	0.0783	0.0820
VARIABILITY	Additive Adj	**Median**	0.1376	0.1400	0.1601	0.1981	0.1611	0.1316	0.1338	0.1661	0.1769
VARIABILITY	Additive Adj	**Mean**	0.1524	0.1550	0.1791	0.2271	0.1822	0.1465	0.1480	0.2514	0.2631
VARIABILITY	Additive Adj	**90th Percentile**	0.2506	0.2539	0.2947	0.4039	0.3109	0.2412	0.2445	0.4556	0.4879
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.0725	0.0735	0.0879	0.1047	0.0878	0.0689	0.0704	0.0792	0.0806
VARIABILITY	Multiplicative Adj	**Median**	0.1354	0.1375	0.1635	0.1981	0.1625	0.1266	0.1287	0.1650	0.1686
VARIABILITY	Multiplicative Adj	**Mean**	0.1516	0.1547	0.5106	0.2271	0.2367	0.1492	0.1442	0.2802	0.2652
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.2568	0.2599	0.3313	0.4039	0.3476	0.2433	0.2453	0.4626	0.4664
VARIABILITY	Capped Adjustment	**10th Percentile**	0.0757	0.0785	0.0944	0.0989	0.0906	0.0714	0.0734	0.0821	0.0827
VARIABILITY	Capped Adjustment	**Median**	0.1362	0.1406	0.1612	0.1861	0.1601	0.1274	0.1319	0.1665	0.1689
VARIABILITY	Capped Adjustment	**Mean**	0.1503	0.1555	0.1775	0.2136	0.1824	0.1430	0.1466	0.2266	0.2407
VARIABILITY	Capped Adjustment	**90th Percentile**	0.2464	0.2522	0.2887	0.3813	0.3121	0.2383	0.2391	0.4083	0.4414

Table 94 Bias (High Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	High Variability	**count**	243	243	243	243	243	243	243	243	243
BIAS	Unadjusted	**10th Percentile**	-0.0390	-0.0961	-0.0587	-0.0990	-0.0571	-0.1091	-0.1038	-0.1897	-0.0325
BIAS	Unadjusted	**Median**	0.0060	-0.0458	-0.0099	-0.0056	0.0006	-0.0550	-0.0562	-0.0356	0.0624
BIAS	Unadjusted	**Mean**	0.0135	-0.0422	-0.0113	-0.0104	-0.0006	-0.0507	-0.0521	-0.0525	0.3054
BIAS	Unadjusted	**90th Percentile**	0.0795	0.0190	0.0298	0.0635	0.0574	0.0059	0.0026	0.0602	0.2537
BIAS	Additive Adj	**10th Percentile**	-0.0117	-0.0322	-0.0197	-0.1065	-0.0344	-0.0258	-0.0246	-0.0690	-0.0635
BIAS	Additive Adj	**Median**	0.0256	0.0087	0.0198	0.0920	0.0154	0.0133	0.0123	0.0090	0.0173
BIAS	Additive Adj	**Mean**	0.0263	0.0086	0.0181	0.1329	0.0128	0.0129	0.0131	0.0961	0.1157
BIAS	Additive Adj	**90th Percentile**	0.0649	0.0487	0.0546	0.4258	0.0568	0.0518	0.0498	0.1635	0.1852
BIAS	Multiplicative Adj	**10th Percentile**	-0.0010	-0.0273	-0.0053	-0.1065	-0.0194	-0.0254	-0.0279	-0.0583	-0.0372
BIAS	Multiplicative Adj	**Median**	0.0255	0.0082	0.0358	0.0920	0.0299	0.0054	0.0070	0.0157	0.0256
BIAS	Multiplicative Adj	**Mean**	0.0324	0.0156	0.1266	0.1329	0.1178	0.1118	0.0070	0.0839	0.1092
BIAS	Multiplicative Adj	**90th Percentile**	0.0721	0.0531	0.1638	0.4258	0.1274	0.0399	0.0426	0.2030	0.2043
BIAS	Capped Adjustment	**10th Percentile**	-0.0246	-0.0758	-0.0454	-0.0865	-0.0644	-0.0689	-0.0747	-0.1774	-0.0462
BIAS	Capped Adjustment	**Median**	0.0107	-0.0234	-0.0046	0.0349	-0.0109	-0.0204	-0.0306	-0.0379	0.0213
BIAS	Capped Adjustment	**Mean**	0.0154	-0.0265	-0.0060	0.0535	-0.0140	-0.0217	-0.0285	-0.0558	0.2231
BIAS	Capped Adjustment	**90th Percentile**	0.0669	0.0214	0.0302	0.2231	0.0349	0.0219	0.0133	0.0398	0.1828

Table 95 Accuracy (High Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	High Variability	**count**	243	243	243	243	243	243	243	243	243
ACCURACY	Unadjusted	**10th Percentile**	0.1963	0.2120	0.1820	0.1303	0.2906	0.2284	0.2231	0.1797	0.2159
ACCURACY	Unadjusted	**Median**	0.3101	0.3218	0.3057	0.2570	0.4414	0.3204	0.3252	0.3792	0.3884
ACCURACY	Unadjusted	**Mean**	0.3188	0.3317	0.3314	0.2948	0.4418	0.3288	0.3336	0.5283	1.4958
ACCURACY	Unadjusted	**90th Percentile**	0.4439	0.4464	0.5051	0.5092	0.5766	0.4267	0.4322	1.0166	1.2505
ACCURACY	Additive Adj	**10th Percentile**	0.1473	0.1488	0.1752	0.2004	0.1987	0.1452	0.1449	0.1434	0.1591
ACCURACY	Additive Adj	**Median**	0.2664	0.2698	0.3101	0.3999	0.3363	0.2567	0.2654	0.3428	0.3497
ACCURACY	Additive Adj	**Mean**	0.2842	0.2872	0.3376	0.4261	0.3547	0.2741	0.2762	0.6124	0.6390
ACCURACY	Additive Adj	**90th Percentile**	0.4416	0.4415	0.5256	0.6903	0.5310	0.4253	0.4236	1.1068	1.1271
ACCURACY	Multiplicative Adj	**10th Percentile**	0.1412	0.1427	0.1660	0.2004	0.1900	0.1318	0.1324	0.1396	0.1580
ACCURACY	Multiplicative Adj	**Median**	0.2627	0.2692	0.3401	0.3999	0.3559	0.2443	0.2484	0.3456	0.3543
ACCURACY	Multiplicative Adj	**Mean**	0.2993	0.3242	0.9324	0.4261	0.8706	3.1656	0.2709	0.6337	0.6418
ACCURACY	Multiplicative Adj	**90th Percentile**	0.4925	0.4766	1.0442	0.6903	0.9427	0.4143	0.4165	1.1772	1.1588
ACCURACY	Capped Adjustment	**10th Percentile**	0.1518	0.1594	0.1682	0.1678	0.2451	0.1660	0.1597	0.1546	0.1681
ACCURACY	Capped Adjustment	**Median**	0.2701	0.2874	0.3057	0.3081	0.3884	0.2613	0.2803	0.3429	0.3417
ACCURACY	Capped Adjustment	**Mean**	0.2806	0.2930	0.3208	0.3387	0.3917	0.2745	0.2849	0.4761	1.2328
ACCURACY	Capped Adjustment	**90th Percentile**	0.4027	0.4175	0.4944	0.5231	0.5316	0.3862	0.3988	1.0046	1.0620

Table 96 Variability (High Load Variable Customers): Distribution Statistics 1PM-7PM

Metric	Baseline	Statistic	PJM Economic	PJM (m4of6)	PJM NWS (CompDay)	PJM (SameDay)	PJM WS (CompDay)	ISONE	CAISO (10 of 10)	WkEnd (M2 of 4)	WkEnd (H2 of 3)
Sample	High Variability	**count**	243	243	243	243	243	243	243	243	243
VARIABILITY	Unadjusted	**10th Percentile**	0.1946	0.2014	0.1810	0.1290	0.2898	0.2211	0.2160	0.1745	0.2131
VARIABILITY	Unadjusted	**Median**	0.3073	0.3174	0.3044	0.2496	0.4405	0.3145	0.3184	0.3715	0.3836
VARIABILITY	Unadjusted	**Mean**	0.3158	0.3257	0.3292	0.2885	0.4395	0.3214	0.3265	0.5172	1.4677
VARIABILITY	Unadjusted	**90th Percentile**	0.4374	0.4417	0.5004	0.5014	0.5770	0.4240	0.4303	1.0181	1.2063
VARIABILITY	Additive Adj	**10th Percentile**	0.1457	0.1484	0.1739	0.1714	0.1968	0.1427	0.1441	0.1399	0.1571
VARIABILITY	Additive Adj	**Median**	0.2623	0.2674	0.3076	0.3288	0.3343	0.2551	0.2614	0.3421	0.3480
VARIABILITY	Additive Adj	**Mean**	0.2817	0.2853	0.3358	0.3601	0.3530	0.2718	0.2742	0.5905	0.6139
VARIABILITY	Additive Adj	**90th Percentile**	0.4364	0.4404	0.5254	0.5835	0.5301	0.4238	0.4237	1.1029	1.1257
VARIABILITY	Multiplicative Adj	**10th Percentile**	0.1400	0.1422	0.1644	0.1714	0.1859	0.1298	0.1309	0.1358	0.1555
VARIABILITY	Multiplicative Adj	**Median**	0.2578	0.2680	0.3359	0.3288	0.3554	0.2426	0.2473	0.3449	0.3453
VARIABILITY	Multiplicative Adj	**Mean**	0.2964	0.3220	0.9222	0.3601	0.8600	3.1643	0.2695	0.6196	0.6255
VARIABILITY	Multiplicative Adj	**90th Percentile**	0.4899	0.4749	1.0184	0.5835	0.9333	0.4107	0.4149	1.1664	1.1457
VARIABILITY	Capped Adjustment	**10th Percentile**	0.1484	0.1584	0.1677	0.1604	0.2436	0.1631	0.1585	0.1545	0.1664
VARIABILITY	Capped Adjustment	**Median**	0.2673	0.2851	0.3012	0.2813	0.3840	0.2559	0.2774	0.3328	0.3360
VARIABILITY	Capped Adjustment	**Mean**	0.2783	0.2894	0.3194	0.3133	0.3895	0.2712	0.2811	0.4660	1.2128
VARIABILITY	Capped Adjustment	**90th Percentile**	0.3983	0.4035	0.4896	0.5081	0.5306	0.3798	0.3957	0.9685	1.0630

C. Appendix – Results for Highly Variable Load Customers

In this section we highlight the results for customers with highly variable load. Highly variable load resources are defined as those customers with a Theil's U statistic greater than 0.4 (i.e., top 15% of resources in sample). These customers are excluded from the results reported in the body of the report.

Table 97 Accuracy: Highly Variable Customers Overall

Baseline Type	PJM HA of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.483	0.491	0.496	0.420	0.677	0.492	0.481	Weekend	0.567	0.603
Additive Adjustment	0.420	0.423	0.474	0.568	0.501	0.402	0.406		0.459	0.490
Multiplicative Adjustment	0.434	0.432	0.601	0.568	0.624	0.391	0.398		0.499	0.523
Multiplicative Adjustment (Cap)	0.436	0.453	0.477	0.449	0.618	0.436	0.444		0.518	0.539

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 98 Bias: Highly Variable Customers Overall

Baseline Type	PJM HA of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.026	0.044	0.004	0.026	0.004	0.045	0.056	Weekend	0.054	0.078
Additive Adjustment	0.038	0.015	0.030	0.091	0.031	0.011	0.013		0.012	0.041
Multiplicative Adjustment	0.042	0.014	0.069	0.091	0.059	0.008	0.008		0.031	0.059
Multiplicative Adjustment (Cap)	0.023	0.035	0.003	0.013	0.021	0.026	0.037		0.051	0.046

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 99 Variability: Highly Variable Customers Overall

Baseline Type	PJM HA of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.478	0.483	0.494	0.408	0.672	0.486	0.478	Weekend	0.539	0.576
Additive Adjustment	0.419	0.417	0.472	0.492	0.497	0.400	0.405		0.453	0.473
Multiplicative Adjustment	0.428	0.432	0.596	0.492	0.618	0.387	0.396		0.495	0.505
Multiplicative Adjustment (Cap)	0.431	0.448	0.466	0.419	0.617	0.430	0.437		0.510	0.525

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 100 Accuracy: Highly Variable Customers by Customer Size

Size	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Up to 500 kW (n=233)	Unadjusted Baseline	0.421	0.433	0.444	0.449	0.648	0.447	0.440	Weekend	0.512	0.571
	Additive Adjustment	0.383	0.388	0.425	0.576	0.474	0.373	0.376		0.467	0.490
	Multiplicative Adjustment	0.363	0.369	0.468	0.576	0.522	0.343	0.349		0.490	0.497
	Multiplicative Adjustment (Cap)	0.389	0.405	0.412	0.462	0.581	0.388	0.407		0.465	0.500
500 to 2,000 kW (n=101)	Unadjusted Baseline	0.544	0.546	0.587	0.444	0.766	0.558	0.556	Weekend	0.672	0.755
	Additive Adjustment	0.485	0.492	0.571	0.616	0.609	0.480	0.475		0.484	0.629
	Multiplicative Adjustment	0.635	0.525	0.998	0.616	0.961	0.502	0.514		0.564	0.621
	Multiplicative Adjustment (Cap)	0.509	0.510	0.561	0.477	0.707	0.510	0.493		0.612	0.616
2,000 to 10,000 kW (n=41)	Unadjusted Baseline	0.542	0.533	0.584	0.313	0.681	0.517	0.507	Weekend	0.522	0.512
	Additive Adjustment	0.423	0.433	0.508	0.420	0.493	0.419	0.407		0.411	0.404
	Multiplicative Adjustment	0.434	0.465	0.730	0.420	0.770	0.403	0.404		0.488	0.490
	Multiplicative Adjustment (Cap)	0.465	0.481	0.527	0.370	0.589	0.457	0.465		0.495	0.458
Over 10,000 kW (n=8)	Unadjusted Baseline	0.555	0.523	0.528	0.222	0.692	0.666	0.476	Weekend	0.609	0.596
	Additive Adjustment	0.365	0.354	0.500	0.319	0.437	0.335	0.340		0.457	0.460
	Multiplicative Adjustment	0.440	0.373	0.558	0.319	0.494	0.400	0.355		0.492	0.508
	Multiplicative Adjustment (Cap)	0.457	0.484	0.487	0.262	0.559	0.590	0.392		0.539	0.514

Color coded, green = good, rank within each category. Weekend baselines are color coded independently.

Table 101 Bias: Highly Variable Customers by Customer Size

Size	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Up to 500 kW (n=233)	Unadjusted Baseline	0.021	0.046	0.004	0.039	0.002	0.049	0.061	Weekend	0.055	0.069
	Additive Adjustment	0.038	0.015	0.031	0.140	0.033	0.012	0.014		0.008	0.031
	Multiplicative Adjustment	0.037	0.009	0.058	0.140	0.052	0.002	0.005		0.026	0.048
	Multiplicative Adjustment (Cap)	0.020	0.035	0.001	0.029	0.023	0.027	0.040		0.050	0.043
500 to 2,000 kW (n=101)	Unadjusted Baseline	0.043	0.044	0.002	0.021	0.020	0.040	0.063	Weekend	0.054	0.106
	Additive Adjustment	0.041	0.015	0.024	0.052	0.036	0.016	0.014		0.024	0.068
	Multiplicative Adjustment	0.060	0.019	0.111	0.052	0.084	0.011	0.015		0.051	0.078
	Multiplicative Adjustment (Cap)	0.033	0.037	0.003	0.006	0.020	0.017	0.043		0.051	0.077
2,000 to 10,000 kW (n=41)	Unadjusted Baseline	0.060	0.014	0.010	0.003	0.005	0.025	0.017	Weekend	0.042	0.063
	Additive Adjustment	0.009	0.005	0.023	0.011	0.021	0.006	0.011		0.016	0.028
	Multiplicative Adjustment	0.043	0.029	0.098	0.011	0.094	0.012	0.016		0.027	0.047
	Multiplicative Adjustment (Cap)	0.036	0.018	0.018	0.016	0.011	0.014	0.007		0.051	0.041
Over 10,000 kW (n=8)	Unadjusted Baseline	0.045	0.040	0.010	0.050	0.119	0.171	0.036	Weekend	0.082	0.062
	Additive Adjustment	0.035	0.008	0.004	0.015	0.013	0.017	0.006		0.002	0.085
	Multiplicative Adjustment	0.053	0.005	0.037	0.015	0.022	0.041	0.008		0.044	0.096
	Multiplicative Adjustment (Cap)	0.015	0.034	0.007	0.040	0.069	0.174	0.032		0.058	0.082

Color coded, green = good, rank within each category. Weekend baselines are color coded independently.

Table 102 Variability: Highly Variable Customers by Customer Size

Size	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
Up to 500 kW (n=233)	Unadjusted Baseline	0.418	0.430	0.443	0.426	0.642	0.441	0.434	Weekend	0.512	0.537
	Additive Adjustment	0.378	0.388	0.420	0.494	0.473	0.366	0.375		0.457	0.473
	Multiplicative Adjustment	0.358	0.368	0.463	0.494	0.516	0.342	0.349		0.485	0.492
	Multiplicative Adjustment (Cap)	0.385	0.403	0.410	0.438	0.579	0.388	0.408		0.458	0.483
500 to 2,000 kW (n=101)	Unadjusted Baseline	0.535	0.541	0.585	0.435	0.761	0.558	0.545	Weekend	0.644	0.731
	Additive Adjustment	0.486	0.483	0.569	0.563	0.606	0.480	0.475		0.467	0.614
	Multiplicative Adjustment	0.629	0.520	0.987	0.563	0.962	0.501	0.513		0.563	0.589
	Multiplicative Adjustment (Cap)	0.507	0.507	0.561	0.450	0.708	0.494	0.493		0.601	0.607
2,000 to 10,000 kW (n=41)	Unadjusted Baseline	0.519	0.528	0.566	0.311	0.677	0.517	0.501	Weekend	0.513	0.488
	Additive Adjustment	0.416	0.429	0.502	0.418	0.492	0.419	0.407		0.402	0.399
	Multiplicative Adjustment	0.428	0.459	0.707	0.418	0.710	0.402	0.398		0.488	0.478
	Multiplicative Adjustment (Cap)	0.462	0.456	0.506	0.326	0.586	0.449	0.456		0.490	0.451
Over 10,000 kW (n=8)	Unadjusted Baseline	0.538	0.522	0.525	0.221	0.686	0.519	0.429	Weekend	0.599	0.582
	Additive Adjustment	0.362	0.354	0.498	0.318	0.432	0.333	0.339		0.443	0.439
	Multiplicative Adjustment	0.434	0.372	0.557	0.318	0.494	0.398	0.354		0.476	0.485
	Multiplicative Adjustment (Cap)	0.448	0.454	0.485	0.261	0.542	0.479	0.386		0.529	0.496

Color coded, green = good, rank within each category. Weekend baselines are color coded independently.

Table 103 Accuracy: Highly Variable Customers by Weather Sensitivity

Weath Sens?	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
No (n=155)	Unadjusted Baseline	0.470	0.479	0.480	0.415	0.676	0.469	0.478	Weekend	0.558	0.582
	Additive Adjustment	0.413	0.419	0.474	0.580	0.516	0.399	0.403		0.499	0.547
	Multiplicative Adjustment	0.422	0.421	0.597	0.580	0.600	0.374	0.389		0.588	0.589
	Multiplicative Adjustment (Cap)	0.408	0.438	0.453	0.443	0.617	0.419	0.442		0.516	0.532
Yes (n=228)	Unadjusted Baseline	0.490	0.504	0.507	0.433	0.678	0.508	0.497	Weekend	0.568	0.637
	Additive Adjustment	0.429	0.437	0.474	0.557	0.479	0.419	0.410		0.413	0.460
	Multiplicative Adjustment	0.443	0.449	0.603	0.557	0.643	0.401	0.401		0.484	0.474
	Multiplicative Adjustment (Cap)	0.449	0.465	0.479	0.450	0.618	0.456	0.452		0.519	0.542

Color coded, green = good, rank within each category. Weekend baselines are color coded independently.

Table 104 Bias: Highly Variable Customers by Weather Sensitivity

Weath Sens?	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
No (n=155)	Unadjusted Baseline	0.033	0.035	0.001	0.007	0.013	0.036	0.049	Weekend	0.052	0.102
	Additive Adjustment	0.039	0.013	0.032	0.093	0.021	0.012	0.014		0.020	0.049
	Multiplicative Adjustment	0.043	0.014	0.076	0.093	0.055	0.008	0.008		0.042	0.075
	Multiplicative Adjustment (Cap)	0.028	0.029	0.001	0.025	0.006	0.015	0.029		0.054	0.061
Yes (n=228)	Unadjusted Baseline	0.017	0.053	0.007	0.040	0.005	0.067	0.064	Weekend	0.057	0.064
	Additive Adjustment	0.037	0.015	0.027	0.088	0.035	0.010	0.013		0.008	0.035
	Multiplicative Adjustment	0.042	0.014	0.064	0.088	0.063	0.006	0.010		0.025	0.048
	Multiplicative Adjustment (Cap)	0.018	0.040	0.003	0.004	0.025	0.037	0.044		0.050	0.040

Color coded, green = good, rank within each category. Weekend baselines are color coded independently.

Table 105 Variability: Highly Variable Customers by Weather Sensitivity

Weath Sens?	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekend	Weekend M2 of 4	Weekend H2 of 3
No (n=155)	Unadjusted Baseline	0.466	0.469	0.473	0.400	0.666	0.467	0.474	Weekend	0.536	0.560
	Additive Adjustment	0.410	0.415	0.472	0.477	0.511	0.399	0.403		0.497	0.547
	Multiplicative Adjustment	0.421	0.420	0.596	0.477	0.600	0.371	0.388		0.566	0.576
	Multiplicative Adjustment (Cap)	0.408	0.438	0.454	0.415	0.615	0.416	0.436		0.509	0.503
Yes (n=228)	Unadjusted Baseline	0.481	0.501	0.508	0.413	0.675	0.498	0.495	Weekend	0.557	0.608
	Additive Adjustment	0.424	0.432	0.472	0.509	0.479	0.417	0.411		0.410	0.456
	Multiplicative Adjustment	0.435	0.447	0.595	0.509	0.639	0.401	0.399		0.480	0.458
	Multiplicative Adjustment (Cap)	0.446	0.455	0.479	0.420	0.618	0.449	0.447		0.516	0.531

Color coded, green = good, rank within each category. Weekend baselines are color coded independently.

D. Appendix – Results for Customers up to 175 kW

In this section we highlight the results for customers with a 2012 maximum demand of up to 175 kW. These customers were originally excluded from the analysis following discussions with AEMO regarding the size a customer that would need to be to make it economically feasible to participate in the DRM.

Table 106 Accuracy: Customers up to 175 kW

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.134	0.138	0.127	0.124	0.135	0.136	0.136	Weekends	0.162	0.162
Additive Adjustment	0.110	0.109	0.130	0.147	0.129	0.103	0.105		0.128	0.132
Multiplicative Adjustment	0.113	0.113	0.135	0.147	0.135	0.105	0.107		0.134	0.137
Multiplicative Adjustment (Cap)	0.112	0.112	0.129	0.142	0.130	0.105	0.107		0.130	0.134

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 107 Bias: Customers up to 175 kW

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.004	0.019	0.006	0.025	0.003	0.026	0.020	Weekends	0.021	0.019
Additive Adjustment	0.009	0.001	0.001	0.026	0.004	0.001	0.000		0.000	0.012
Multiplicative Adjustment	0.010	0.001	0.005	0.026	0.007	0.001	0.001		0.004	0.015
Multiplicative Adjustment (Cap)	0.008	0.004	0.001	0.040	0.002	0.004	0.003		0.005	0.014

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 108 Variability: Customers up to 175 kW

Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Unadjusted Baseline	0.133	0.134	0.127	0.100	0.134	0.130	0.132	Weekends	0.157	0.159
Additive Adjustment	0.109	0.108	0.129	0.119	0.128	0.102	0.104		0.127	0.130
Multiplicative Adjustment	0.112	0.112	0.135	0.119	0.135	0.105	0.107		0.132	0.133
Multiplicative Adjustment (Cap)	0.110	0.111	0.128	0.111	0.129	0.104	0.106		0.129	0.131

Color coded, green = good, rank over all rows combined. Weekend baselines are color coded independently.

Table 109 Accuracy: Customers up to 175 kW by Weather Sensitivity

Weather Sensitive	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Not Weather Sensitive	Unadjusted Baseline	0.097	0.100	0.099	0.100	0.115	0.099	0.099	Weekends	0.116	0.114
	Additive Adjustment	0.086	0.085	0.102	0.108	0.105	0.081	0.082		0.100	0.104
	Multiplicative Adjustment	0.087	0.088	0.106	0.108	0.108	0.082	0.084		0.103	0.105
	Multiplicative Adjustment (Cap)	0.087	0.087	0.101	0.108	0.108	0.082	0.083		0.101	0.106
Weather Sensitive	Unadjusted Baseline	0.171	0.177	0.163	0.148	0.153	0.175	0.176	Weekends	0.213	0.209
	Additive Adjustment	0.136	0.137	0.159	0.189	0.151	0.127	0.130		0.160	0.163
	Multiplicative Adjustment	0.141	0.142	0.168	0.189	0.161	0.130	0.132		0.171	0.168
	Multiplicative Adjustment (Cap)	0.137	0.140	0.155	0.178	0.151	0.130	0.133		0.168	0.165

Color coded, green = good, rows are ranked within each category. Weekend baselines are color coded independently.

Table 110 Bias: Customers up to 175 kW by Weather Sensitivity

Weather Sensitive	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Not Weather Sensitive	Unadjusted Baseline	0.005	0.011	0.005	0.013	0.002	0.015	0.011	Weekends	0.012	0.017
	Additive Adjustment	0.007	0.000	0.001	0.014	0.002	0.000	0.000		0.001	0.009
	Multiplicative Adjustment	0.007	0.001	0.003	0.014	0.004	0.001	0.001		0.003	0.011
	Multiplicative Adjustment (Cap)	0.006	0.001	0.001	0.019	0.001	0.001	0.001		0.001	0.011
Weather Sensitive	Unadjusted Baseline	0.002	0.034	0.010	0.049	0.005	0.044	0.034	Weekends	0.037	0.022
	Additive Adjustment	0.013	0.001	0.002	0.050	0.006	0.003	0.001		0.002	0.015
	Multiplicative Adjustment	0.015	0.003	0.009	0.050	0.011	0.000	0.001		0.006	0.021
	Multiplicative Adjustment (Cap)	0.009	0.010	0.001	0.066	0.003	0.013	0.010		0.014	0.018

Color coded, green = good, rows are ranked by category. Weekend baselines are color coded independently.

Table 111 Variability: Customers up to 175 kW by Weather Sensitivity

Weather Sensitive	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Not Weather Sensitive	Unadjusted Baseline	0.096	0.098	0.098	0.080	0.115	0.096	0.097	Weekends	0.113	0.111
	Additive Adjustment	0.085	0.085	0.102	0.091	0.105	0.080	0.081		0.099	0.101
	Multiplicative Adjustment	0.087	0.087	0.105	0.091	0.108	0.082	0.083		0.103	0.103
	Multiplicative Adjustment (Cap)	0.086	0.086	0.101	0.089	0.107	0.081	0.082		0.100	0.103
Weather Sensitive	Unadjusted Baseline	0.170	0.173	0.162	0.116	0.152	0.167	0.170	Weekends	0.207	0.207
	Additive Adjustment	0.134	0.135	0.159	0.146	0.150	0.126	0.129		0.159	0.160
	Multiplicative Adjustment	0.139	0.140	0.166	0.146	0.159	0.130	0.132		0.166	0.165
	Multiplicative Adjustment (Cap)	0.136	0.138	0.154	0.135	0.150	0.129	0.131		0.164	0.162

Color coded, green = good, rows are ranked by category. Weekend baselines are color coded independently.

Table 112 Accuracy: Customers up to 175 kW by Load Variability

Variablity	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Low	Unadjusted Baseline	0.079	0.080	0.078	0.073	0.081	0.080	0.080		0.090	0.087
	Additive Adjustment	0.068	0.068	0.080	0.083	0.080	0.064	0.066	Weekends	0.076	0.077
	Multiplicative Adjustment	0.070	0.069	0.082	0.083	0.083	0.065	0.066		0.078	0.078
	Multiplicative Adjustment (Cap)	0.069	0.068	0.081	0.083	0.080	0.064	0.065		0.078	0.077
Medium	Unadjusted Baseline	0.147	0.152	0.143	0.137	0.149	0.147	0.148		0.180	0.178
	Additive Adjustment	0.123	0.123	0.146	0.161	0.143	0.116	0.119	Weekends	0.144	0.148
	Multiplicative Adjustment	0.126	0.127	0.152	0.161	0.150	0.118	0.120		0.150	0.152
	Multiplicative Adjustment (Cap)	0.123	0.125	0.142	0.153	0.144	0.116	0.118		0.145	0.147
High	Unadjusted Baseline	0.266	0.272	0.255	0.276	0.330	0.266	0.275		0.324	0.343
	Additive Adjustment	0.231	0.230	0.264	0.325	0.281	0.221	0.223	Weekends	0.293	0.311
	Multiplicative Adjustment	0.230	0.236	0.279	0.325	0.300	0.216	0.219		0.304	0.309
	Multiplicative Adjustment (Cap)	0.232	0.240	0.249	0.285	0.294	0.222	0.233		0.286	0.300

Table 113 Bias: Customers up to 175 kW by Load Variability

Variablity	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Low	Unadjusted Baseline	0.002	0.011	0.004	0.013	0.001	0.016	0.011		0.013	0.010
	Additive Adjustment	0.005	0.000	0.001	0.027	0.003	0.000	0.000	Weekends	0.001	0.007
	Multiplicative Adjustment	0.006	0.001	0.002	0.027	0.004	0.001	0.001		0.003	0.008
	Multiplicative Adjustment (Cap)	0.006	0.000	0.002	0.030	0.003	0.000	0.000		0.000	0.009
Medium	Unadjusted Baseline	0.004	0.022	0.007	0.033	0.004	0.033	0.024		0.026	0.023
	Additive Adjustment	0.010	0.001	0.001	0.035	0.003	0.002	0.001	Weekends	0.000	0.013
	Multiplicative Adjustment	0.012	0.002	0.006	0.035	0.008	0.000	0.000		0.005	0.017
	Multiplicative Adjustment (Cap)	0.008	0.005	0.001	0.048	0.002	0.006	0.005		0.008	0.016
High	Unadjusted Baseline	0.014	0.034	0.009	0.058	0.007	0.037	0.031		0.038	0.048
	Additive Adjustment	0.019	0.002	0.006	0.017	0.010	0.000	0.001	Weekends	0.004	0.022
	Multiplicative Adjustment	0.023	0.001	0.020	0.017	0.024	0.000	0.001		0.008	0.033
	Multiplicative Adjustment (Cap)	0.013	0.020	0.001	0.029	0.004	0.018	0.019		0.029	0.032

Color coded, green = good, rows ranked by category. Weekend baselines are color coded independently.

Table 114 Variability: Customers up to 175 kW by Load Variability

Variablity	Baseline Type	PJM H4 of 5	Middle 4 of 6	PJM Comp Day	PJM Same Day	PJM WeathSens	ISONE	CAISO 10 of 10	Weekends	Weekend M2 of 4	Weekend H2 of 3
Low	Unadjusted Baseline	0.078	0.079	0.077	0.062	0.081	0.076	0.078		0.087	0.086
	Additive Adjustment	0.068	0.068	0.080	0.071	0.079	0.064	0.065		0.076	0.075
	Multiplicative Adjustment	0.069	0.069	0.082	0.071	0.082	0.065	0.066		0.078	0.077
	Multiplicative Adjustment (Cap)	0.068	0.068	0.081	0.070	0.080	0.063	0.065	Weekends	0.077	0.076
Medium	Unadjusted Baseline	0.146	0.148	0.142	0.111	0.148	0.142	0.145		0.174	0.176
	Additive Adjustment	0.121	0.122	0.146	0.134	0.142	0.115	0.117		0.142	0.145
	Multiplicative Adjustment	0.125	0.126	0.151	0.134	0.149	0.117	0.119		0.147	0.149
	Multiplicative Adjustment (Cap)	0.122	0.124	0.141	0.124	0.143	0.114	0.117	Weekends	0.143	0.144
High	Unadjusted Baseline	0.265	0.269	0.252	0.247	0.328	0.261	0.269		0.319	0.331
	Additive Adjustment	0.227	0.230	0.263	0.292	0.280	0.219	0.220		0.290	0.299
	Multiplicative Adjustment	0.229	0.233	0.276	0.292	0.297	0.214	0.218		0.301	0.301
	Multiplicative Adjustment (Cap)	0.229	0.239	0.249	0.261	0.294	0.217	0.229	Weekends	0.276	0.289

Color coded, green = good, rows ranked by category. Weekend baselines are color coded independently.

E. Holidays

In this appendix we document the dates used as holidays by region.

Table 115 Holidays: Australian Capital Territory

Area	Holiday	Date1	Year	Date	Full_Date
ACT	New Year's Day	Monday 3 January *	2011	01/03/11	Monday, January 03, 2011
ACT	Australia Day	Wednesday 26 January	2011	01/26/11	Wednesday, January 26, 2011
ACT	Canberra Day	Monday 14 March	2011	03/14/11	Monday, March 14, 2011
ACT	Good Friday	Friday 22 April	2011	04/22/11	Friday, April 22, 2011
ACT	Saturday after Good Friday	Saturday 23 April	2011	04/23/11	Saturday, April 23, 2011
ACT	Easter Monday	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
ACT	Anzac Day	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
ACT	Additional public holiday	Tuesday 26 April**	2011	04/26/11	Tuesday, April 26, 2011
ACT	Queen's Birthday	Monday 13 June	2011	06/13/11	Monday, June 13, 2011
ACT	Labour Day	Monday 3 October	2011	10/03/11	Monday, October 03, 2011
ACT	Family and Community Day	Monday 10 October	2011	10/10/11	Monday, October 10, 2011
ACT	Christmas Day	Sunday 25 December***	2011	12/25/11	Sunday, December 25, 2011
ACT	Christmas Day	Monday 26 December*	2011	12/26/11	Monday, December 26, 2011
ACT	Boxing Day	Tuesday 27 December *	2011	12/27/11	Tuesday, December 27, 2011
ACT	New Year's Day	Sunday 1 January*	2012	01/01/12	Sunday, January 01, 2012
ACT	New Year's Day	Monday 2 January**	2012	01/02/12	Monday, January 02, 2012
ACT	Australia Day	Thursday 26 January	2012	01/26/12	Thursday, January 26, 2012
ACT	Canberra Day	Monday 12 March	2012	03/12/12	Monday, March 12, 2012
ACT	Good Friday	Friday 6 April	2012	04/06/12	Friday, April 06, 2012
ACT	Saturday after Good Friday	Saturday 7 April	2012	04/07/12	Saturday, April 07, 2012
ACT	Easter Monday	Monday 9 April	2012	04/09/12	Monday, April 09, 2012
ACT	Anzac Day	Wednesday 25 April	2012	04/25/12	Wednesday, April 25, 2012
ACT	Queen's Birthday	Monday 11 June	2012	06/11/12	Monday, June 11, 2012
ACT	Labour Day	Monday 1 October	2012	10/01/12	Monday, October 01, 2012
ACT	Family and Community Day	Monday 8 October	2012	10/08/12	Monday, October 08, 2012
ACT	Christmas Day	Tuesday 25 December	2012	12/25/12	Tuesday, December 25, 2012
ACT	Boxing Day	Wednesday 26 December	2012	12/26/12	Wednesday, December 26, 2012
ACT	New Year's Day	Tuesday 1 January	2013	01/01/13	Tuesday, January 01, 2013
ACT	Australia Day	Monday 28 January*	2013	01/28/13	Monday, January 28, 2013
ACT	Canberra Day	Monday 11 March	2013	03/11/13	Monday, March 11, 2013
ACT	Good Friday	Friday 29 March	2013	03/29/13	Friday, March 29, 2013
ACT	Easter Saturday	Saturday 30 March	2013	03/30/13	Saturday, March 30, 2013
ACT	Easter Monday	Monday 1 April	2013	04/01/13	Monday, April 01, 2013
ACT	Anzac Day	Thursday 25 April	2013	04/25/13	Thursday, April 25, 2013
ACT	Queen's Birthday	Monday 10 June	2013	06/10/13	Monday, June 10, 2013
ACT	Family and Community Day	Monday 30 September	2013	09/30/13	Monday, September 30, 2013
ACT	Labour Day	Monday 7 October	2013	10/07/13	Monday, October 07, 2013
ACT	Christmas Day	Wednesday 25 December	2013	12/25/13	Wednesday, December 25, 2013
ACT	Boxing Day	Thursday 26 December	2013	12/26/13	Thursday, December 26, 2013

Table 116 Holidays: New South Wales

Area	Holiday	Date1	Year	Date	Full_Date
NSW	New Year's Day	Saturday 1 January and Monday 3 January *	2011	01/01/11	Saturday, January 01, 2011
NSW	New Year's Day	Saturday 1 January and Monday 3 January *	2011	01/03/11	Monday, January 03, 2011
NSW	Australia Day	Wednesday 26 January	2011	01/26/11	Wednesday, January 26, 2011
NSW	Good Friday	Friday 22 April	2011	04/22/11	Friday, April 22, 2011
NSW	Saturday after Good Friday	Saturday 23 April	2011	04/23/11	Saturday, April 23, 2011
NSW	Easter Sunday	Sunday 24 April	2011	04/24/11	Sunday, April 24, 2011
NSW	Anzac Day	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
NSW	Easter Monday	Tuesday 26 April **	2011	04/26/11	Tuesday, April 26, 2011
NSW	Queen's Birthday	Monday 13 June	2011	06/13/11	Monday, June 13, 2011
NSW	Labour Day	Monday 3 October	2011	10/03/11	Monday, October 03, 2011
NSW	Christmas Day	Sunday 25 December ***	2011	12/25/11	Sunday, December 25, 2011
NSW	Christmas Day	Monday 26 December ****	2011	12/26/11	Monday, December 26, 2011
NSW	Boxing Day	Tuesday 27 December	2011	12/27/11	Tuesday, December 27, 2011
NSW	New Year's Day	Sunday 1 January	2012	01/01/12	Sunday, January 01, 2012
NSW	New Year's Day	Monday 2 January*	2012	01/02/12	Monday, January 02, 2012
NSW	Australia Day	Thursday 26 January	2012	01/26/12	Thursday, January 26, 2012
NSW	Good Friday	Friday 6 April	2012	04/06/12	Friday, April 06, 2012
NSW	Saturday after Good Friday	Saturday 7 April	2012	04/07/12	Saturday, April 07, 2012
NSW	Easter Sunday	Sunday 8 April	2012	04/08/12	Sunday, April 08, 2012
NSW	Easter Monday	Monday 9 April	2012	04/09/12	Monday, April 09, 2012
NSW	Anzac Day	Wednesday 25 April	2012	04/25/12	Wednesday, April 25, 2012
NSW	Queen's Birthday	Monday 11 June	2012	06/11/12	Monday, June 11, 2012
NSW	Bank Holiday**	Monday 6 August	2012	08/06/12	Monday, August 06, 2012
NSW	Labour Day	Monday 1 October	2012	10/01/12	Monday, October 01, 2012
NSW	Christmas Day	Tuesday 25 December	2012	12/25/12	Tuesday, December 25, 2012
NSW	Boxing Day	Wednesday 26 December	2012	12/26/12	Wednesday, December 26, 2012
NSW	New Year's Day	Tuesday 1 January	2013	01/01/13	Tuesday, January 01, 2013
NSW	Australia Day	Monday 28 January*	2013	01/28/13	Monday, January 28, 2013
NSW	Good Friday	Friday 29 March	2013	03/29/13	Friday, March 29, 2013
NSW	Easter Saturday	Saturday 30 March	2013	03/30/13	Saturday, March 30, 2013
NSW	Easter Sunday	Sunday 31 March	2013	03/31/13	Sunday, March 31, 2013
NSW	Easter Monday	Monday 1 April	2013	04/01/13	Monday, April 01, 2013
NSW	Anzac Day	Thursday 25 April	2013	04/25/13	Thursday, April 25, 2013
NSW	Queen's Birthday	Monday 10 June	2013	06/10/13	Monday, June 10, 2013
NSW	Bank Holiday	Monday 5 August**	2013	08/05/13	Monday, August 05, 2013
NSW	Labour Day	Monday 7 October	2013	10/07/13	Monday, October 07, 2013
NSW	Christmas Day	Wednesday 25 December	2013	12/25/13	Wednesday, December 25, 2013
NSW	Boxing Day	Thursday 26 December	2013	12/26/13	Thursday, December 26, 2013

Table 117 Holidays: Queensland

Area	Holiday	Date1	Year	Date	Full_Date
QLD	New Year's Day	Saturday 1 January and Monday 3 January *	2011	01/01/11	Saturday, January 01, 2011
QLD	New Year's Day	Saturday 1 January and Monday 3 January *	2011	01/03/11	Monday, January 03, 2011
QLD	Australia Day	Wednesday 26 January	2011	01/26/11	Wednesday, January 26, 2011
QLD	Good Friday	Friday 22 April	2011	04/22/11	Friday, April 22, 2011
QLD	Saturday after Good Friday	Saturday 23 April	2011	04/23/11	Saturday, April 23, 2011
QLD	Anzac Day	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
QLD	Easter Monday	Tuesday 26 April **	2011	04/26/11	Tuesday, April 26, 2011
QLD	Labour Day	Monday 2 May	2011	05/02/11	Monday, May 02, 2011
QLD	Queen's Birthday	Monday 13 June	2011	06/13/11	Monday, June 13, 2011
QLD	Royal Queensland Show - Brisbane Area Only	Wednesday 17 August ***	2011	08/17/11	Wednesday, August 17, 2011
QLD	Christmas Day	Sunday 25 December****	2011	12/25/11	Sunday, December 25, 2011
QLD	Boxing Day	Monday 26 December	2011	12/26/11	Monday, December 26, 2011
QLD	Christmas Day	Tuesday 27 December****	2011	12/27/11	Tuesday, December 27, 2011
QLD	New Year's Day	Sunday 1 January	2012	01/01/12	Sunday, January 01, 2012
QLD	New Year's Day	Monday 2 January*	2012	01/02/12	Monday, January 02, 2012
QLD	Australia Day	Thursday 26 January	2012	01/26/12	Thursday, January 26, 2012
QLD	Good Friday	Friday 6 April	2012	04/06/12	Friday, April 06, 2012
QLD	Saturday after Good Friday	Saturday 7 April	2012	04/07/12	Saturday, April 07, 2012
QLD	Easter Monday	Monday 9 April	2012	04/09/12	Monday, April 09, 2012
QLD	Anzac Day	Wednesday 25 April	2012	04/25/12	Wednesday, April 25, 2012
QLD	Labour Day	Monday 7 May	2012	05/07/12	Monday, May 07, 2012
QLD	Queen's Diamond Jubilee	Monday 11 June**	2012	06/11/12	Monday, June 11, 2012
QLD	Royal Queensland Show - Brisbane Area Only	Wednesday 15 August***	2012	08/15/12	Wednesday, August 15, 2012
QLD	Queen's Birthday	Monday 1 October	2012	10/01/12	Monday, October 01, 2012
QLD	Christmas Day	Tuesday 25 December	2012	12/25/12	Tuesday, December 25, 2012
QLD	Boxing Day	Wednesday 26 December	2012	12/26/12	Wednesday, December 26, 2012
QLD	New Year's Day	Tuesday 1 January	2013	01/01/13	Tuesday, January 01, 2013
QLD	Australia Day	Monday 28 January*	2013	01/28/13	Monday, January 28, 2013
QLD	Good Friday	Friday 29 March	2013	03/29/13	Friday, March 29, 2013
QLD	Easter Saturday	Saturday 30 March	2013	03/30/13	Saturday, March 30, 2013
QLD	Easter Monday	Monday 1 April	2013	04/01/13	Monday, April 01, 2013
QLD	Anzac Day	Thursday 25 April	2013	04/25/13	Thursday, April 25, 2013
QLD	Queen's Birthday	Monday 10 June	2013	06/10/13	Monday, June 10, 2013
QLD	Royal Queensland Show	Wednesday 14 August	2013	08/14/13	Wednesday, August 14, 2013
QLD	Labour Day	Monday 7 October	2013	10/07/13	Monday, October 07, 2013
QLD	Christmas Day	Wednesday 25 December	2013	12/25/13	Wednesday, December 25, 2013
QLD	Boxing Day	Thursday 26 December	2013	12/26/13	Thursday, December 26, 2013

Table 118 Holidays: South Australia

Area	Holiday	Date1	Year	Date	Full_Date
SA	New Year's Day	Monday 3 January *	2011	01/03/11	Monday, January 03, 2011
SA	Australia Day	Wednesday 26 January	2011	01/26/11	Wednesday, January 26, 2011
SA	Adelaide Cup	Monday 14 March	2011	03/14/11	Monday, March 14, 2011
SA	Good Friday	Friday 22 April	2011	04/22/11	Friday, April 22, 2011
SA	Saturday after Good Friday	Saturday 23 April	2011	04/23/11	Saturday, April 23, 2011
SA	Easter Monday	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
SA	Anzac Day	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
SA	Easter Tuesday	Tuesday 26 April **	2011	04/26/11	Tuesday, April 26, 2011
SA	Queen's Birthday/ Volunteers Day	Monday 13 June	2011	06/13/11	Monday, June 13, 2011
SA	Labour Day	Monday 3 October	2011	10/03/11	Monday, October 03, 2011
SA	Christmas Day	Sunday 25 December and Monday 26 December***	2011	12/25/11	Sunday, December 25, 2011
SA	Christmas Day	Sunday 25 December and Monday 26 December***	2011	12/26/11	Monday, December 26, 2011
SA	Proclamation Day	Monday 26 December and	2011	12/26/11	Monday, December 26, 2011
SA	Proclamation Day	Tuesday 27 December****	2011	12/27/11	Tuesday, December 27, 2011
SA	New Year's Day	Sunday 1 January	2012	01/01/12	Sunday, January 01, 2012
SA	New Year's Day	Monday 2 January*	2012	01/02/12	Monday, January 02, 2012
SA	Australia Day	Thursday 26 January	2012	01/26/12	Thursday, January 26, 2012
SA	Adelaide Cup	Monday 12 March**	2012	03/12/12	Monday, March 12, 2012
SA	Good Friday	Friday 6 April	2012	04/06/12	Friday, April 06, 2012
SA	Saturday after Good Friday	Saturday 7 April	2012	04/07/12	Saturday, April 07, 2012
SA	Easter Monday	Monday 9 April	2012	04/09/12	Monday, April 09, 2012
SA	Anzac Day	Wednesday 25 April	2012	04/25/12	Wednesday, April 25, 2012
SA	Queen's Birthday / Volunteers Day	Monday 11 June	2012	06/11/12	Monday, June 11, 2012
SA	Labour Day	Monday 1 October	2012	10/01/12	Monday, October 01, 2012
SA	Christmas Eve	Monday, 24 December**	2012	12/24/12	Monday, December 24, 2012
SA	Christmas Day	Tuesday 25 December	2012	12/25/12	Tuesday, December 25, 2012
SA	Boxing Day / Proclamation Day	Wednesday 26 December	2012	12/26/12	Wednesday, December 26, 2012
SA	New Year's Eve	Monday, 31 December**	2012	12/31/12	Monday, December 31, 2012
SA	New Year's Day	Tuesday 1 January	2013	01/01/13	Tuesday, January 01, 2013
SA	Australia Day	Monday 28 January*	2013	01/28/13	Monday, January 28, 2013
SA	Adelaide Cup	Monday 11 March	2013	03/11/13	Monday, March 11, 2013
SA	Good Friday	Friday 29 March	2013	03/29/13	Friday, March 29, 2013
SA	Saturday after Good Friday	Saturday 30 March	2013	03/30/13	Saturday, March 30, 2013
SA	Easter Monday	Monday 1 April	2013	04/01/13	Monday, April 01, 2013
SA	Anzac Day	Thursday 25 April	2013	04/25/13	Thursday, April 25, 2013
SA	Queen's Birthday / Volunteers Day	Monday 10 June	2013	06/10/13	Monday, June 10, 2013
SA	Labour Day	Monday 7 October	2013	10/07/13	Monday, October 07, 2013
SA	Christmas Eve **	Tuesday 24 December	2013	12/24/13	Tuesday, December 24, 2013
SA	Christmas Day	Wednesday 25 December	2013	12/25/13	Wednesday, December 25, 2013
SA	Boxing Day / Proclamation Day	Thursday 26 December	2013	12/26/13	Thursday, December 26, 2013
SA	New Years Eve**	Tuesday 31 December	2013	12/31/13	Tuesday, December 31, 2013

Table 119 Holidays: Tasmania

Area	Holiday	Date1	Year	Date	Full_Date
TAS	New Year's Day	Monday 3 January *	2011	01/03/11	Monday, January 03, 2011
TAS	Australia Day	Wednesday 26 January	2011	01/26/11	Wednesday, January 26, 2011
TAS	Eight Hours Day / Labour Day	Monday 14 March	2011	03/14/11	Monday, March 14, 2011
TAS	Good Friday	Friday 22 April	2011	04/22/11	Friday, April 22, 2011
TAS	Easter Monday	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
TAS	Anzac Day	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
TAS	Queen's Birthday	Monday 13 June	2011	06/13/11	Monday, June 13, 2011
TAS	Christmas Day	Sunday 25 December and Tuesday 27 December **	2011	12/25/11	Sunday, December 25, 2011
TAS	Christmas Day	Sunday 25 December and Tuesday 27 December **	2011	12/27/11	Tuesday, December 27, 2011
TAS	Boxing Day	Monday 26 December	2011	12/26/11	Monday, December 26, 2011
TAS	New Year's Day	Monday 2 January *	2012	01/02/12	Monday, January 02, 2012
TAS	Australia Day	Thursday 26 January	2012	01/26/12	Thursday, January 26, 2012
TAS	Eight Hours Day	Monday 12 March	2012	03/12/12	Monday, March 12, 2012
TAS	Good Friday	Friday 6 April	2012	04/06/12	Friday, April 06, 2012
TAS	Easter Monday	Monday 9 April	2012	04/09/12	Monday, April 09, 2012
TAS	Anzac Day	Wednesday 25 April	2012	04/25/12	Wednesday, April 25, 2012
TAS	Queen's Birthday	Monday 11 June	2012	06/11/12	Monday, June 11, 2012
TAS	Christmas Day	Tuesday 25 December	2012	12/25/12	Tuesday, December 25, 2012
TAS	Boxing Day	Wednesday 26 December	2012	12/26/12	Wednesday, December 26, 2012
TAS	New Year's Day	Tuesday 1 January	2013	01/01/13	Tuesday, January 01, 2013
TAS	Australia Day	Monday 28 January*	2013	01/28/13	Monday, January 28, 2013
TAS	Royal Hobart Regatta	Monday 11 February**	2013	02/11/13	Monday, February 11, 2013
TAS	Eight Hours Day	Monday 11 March	2013	03/11/13	Monday, March 11, 2013
TAS	Good Friday	Friday 29 March	2013	03/29/13	Friday, March 29, 2013
TAS	Easter Monday	Monday 1 April	2013	04/01/13	Monday, April 01, 2013
TAS	Easter Tuesday	Tuesday 2 April***	2013	04/02/13	Tuesday, April 02, 2013
TAS	Anzac Day	Thursday 25 April	2013	04/25/13	Thursday, April 25, 2013
TAS	Queen's Birthday	Monday 10 June	2013	06/10/13	Monday, June 10, 2013
TAS	Recreation Day	Monday 4 November**	2013	11/04/13	Monday, November 04, 2013
TAS	Christmas Day	Wednesday 25 December	2013	12/25/13	Wednesday, December 25, 2013
TAS	Boxing Day	Thursday 26 December	2013	12/26/13	Thursday, December 26, 2013

Table 120 Holidays: Victoria

Area	Holiday	Date1	Year	Date	Full_Date
VIC	New Year's Day	Saturday 1 January and Monday 3 January *	2011	01/01/11	Saturday, January 01, 2011
VIC	New Year's Day	Saturday 1 January and Monday 3 January *	2011	01/03/11	Monday, January 03, 2011
VIC	Australia Day	Wednesday 26 January	2011	01/26/11	Wednesday, January 26, 2011
VIC	Labour Day	Monday 14 March	2011	03/14/11	Monday, March 14, 2011
VIC	Good Friday	Friday 22 April	2011	04/22/11	Friday, April 22, 2011
VIC	Saturday after Good Friday	Saturday 23 April	2011	04/23/11	Saturday, April 23, 2011
VIC	Easter Monday	Monday 25 April	2011	04/25/11	Monday, April 25, 2011
VIC	Anzac Day	Tuesday 26 April **	2011	04/26/11	Tuesday, April 26, 2011
VIC	Queen's Birthday	Monday 13 June	2011	06/13/11	Monday, June 13, 2011
VIC	Melbourne Cup	Tuesday 1 November ***	2011	11/01/11	Tuesday, November 01, 2011
VIC	Christmas Day	Tuesday 27 December ****	2011	12/27/11	Tuesday, December 27, 2011
VIC	Boxing Day	Monday 26 December	2011	12/26/11	Monday, December 26, 2011
VIC	New Year's Day	Sunday 1 January	2012	01/01/12	Sunday, January 01, 2012
VIC	New Year's Day	Monday 2 January*	2012	01/02/12	Monday, January 02, 2012
VIC	Australia Day	Thursday 26 January	2012	01/26/12	Thursday, January 26, 2012
VIC	Labour Day	Monday 12 March	2012	03/12/12	Monday, March 12, 2012
VIC	Good Friday	Friday 6 April	2012	04/06/12	Friday, April 06, 2012
VIC	Saturday after Good Friday	Saturday 7 April	2012	04/07/12	Saturday, April 07, 2012
VIC	Easter Monday	Monday 9 April	2012	04/09/12	Monday, April 09, 2012
VIC	Anzac Day	Wednesday 25 April	2012	04/25/12	Wednesday, April 25, 2012
VIC	Queen's Birthday	Monday 11 June	2012	06/11/12	Monday, June 11, 2012
VIC	Melbourne Cup	Tuesday 6 November **	2012	11/06/12	Tuesday, November 06, 2012
VIC	Christmas Day	Tuesday 25 December	2012	12/25/12	Tuesday, December 25, 2012
VIC	Boxing Day	Wednesday 26 December	2012	12/26/12	Wednesday, December 26, 2012
VIC	New Year's Day	Tuesday 1 January	2013	01/01/13	Tuesday, January 01, 2013
VIC	Australia Day	Monday 28 January*	2013	01/28/13	Monday, January 28, 2013
VIC	Labour Day	Monday 11 March	2013	03/11/13	Monday, March 11, 2013
VIC	Good Friday	Friday 29 March	2013	03/29/13	Friday, March 29, 2013
VIC	Saturday after Good Friday	Saturday 30 March	2013	03/30/13	Saturday, March 30, 2013
VIC	Easter Monday	Monday 1 April	2013	04/01/13	Monday, April 01, 2013
VIC	Anzac Day	Thursday 25 April	2013	03/25/13	Monday, March 25, 2013
VIC	Queen's Birthday	Monday 10 June	2013	06/10/13	Monday, June 10, 2013
VIC	Melbourne Cup	Tuesday 5 November**	2013	11/05/13	Tuesday, November 05, 2013
VIC	Christmas Day	Wednesday 25 December	2013	12/25/13	Wednesday, December 25, 2013
VIC	Boxing Day	Thursday 26 December	2013	12/26/13	Thursday, December 26, 2013

F. Appendix – Candidate Event Days

The candidate event days used in the analysis include those in Table 121.

Table 121 Candidate Event Days

Candidate Event Days	
Tuesday, October 04, 2011	Wednesday, January 02, 2013
Wednesday, October 05, 2011	Thursday, January 03, 2013
Friday, October 21, 2011	Friday, January 04, 2013
Sunday, October 30, 2011	Saturday, January 05, 2013
Wednesday, November 09, 2011	Sunday, January 06, 2013
Friday, November 11, 2011	Monday, January 07, 2013
Saturday, November 12, 2011	Tuesday, January 08, 2013
Monday, November 14, 2011	Thursday, January 10, 2013
Saturday, November 19, 2011	Friday, January 11, 2013
Monday, November 28, 2011	Saturday, January 12, 2013
Tuesday, November 29, 2011	Sunday, January 13, 2013
Tuesday, January 03, 2012	Monday, January 14, 2013
Monday, January 09, 2012	Thursday, January 17, 2013
Tuesday, January 10, 2012	Friday, January 18, 2013
Wednesday, January 11, 2012	Saturday, January 19, 2013
Thursday, January 12, 2012	Sunday, January 20, 2013
Tuesday, January 17, 2012	Monday, January 21, 2013
Monday, January 23, 2012	Tuesday, January 22, 2013
Tuesday, January 24, 2012	Thursday, January 24, 2013
Sunday, January 29, 2012	Sunday, January 27, 2013
Monday, January 30, 2012	Tuesday, January 29, 2013
Monday, February 06, 2012	Wednesday, January 30, 2013
Tuesday, February 07, 2012	Thursday, January 31, 2013
Monday, February 13, 2012	Thursday, February 07, 2013
Monday, February 20, 2012	Sunday, February 17, 2013
Friday, February 24, 2012	Monday, February 18, 2013
Saturday, February 25, 2012	Sunday, February 24, 2013
Sunday, February 26, 2012	Monday, February 25, 2013
Tuesday, February 28, 2012	Thursday, February 28, 2013
Tuesday, October 16, 2012	Wednesday, March 06, 2013
Sunday, November 04, 2012	Thursday, March 07, 2013
Friday, November 23, 2012	Friday, March 08, 2013
Thursday, November 29, 2012	Saturday, March 09, 2013
Friday, November 30, 2012	Tuesday, March 12, 2013
Saturday, December 01, 2012	Friday, March 15, 2013
Tuesday, December 04, 2012	Saturday, March 16, 2013
Wednesday, December 05, 2012	Thursday, March 21, 2013
Wednesday, December 12, 2012	Friday, March 22, 2013
Thursday, December 13, 2012	
Sunday, December 16, 2012	
Monday, December 17, 2012	
Tuesday, December 18, 2012	
Wednesday, December 19, 2012	
Thursday, December 20, 2012	
Sunday, December 23, 2012	