PJM Empirical Analysis of Demand Response Baseline Methods Results

Presented to:
MIC May 10, 2011

Presented by:
Pete Langbein, PJM
Tim Hennessy, KEMA

- Primary Project Objectives:
  - Determine the accuracy and bias of a variety of CBL methods;
  - Determine the feasibility of administering each CBL method for all market participants under consideration; and
  - 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.

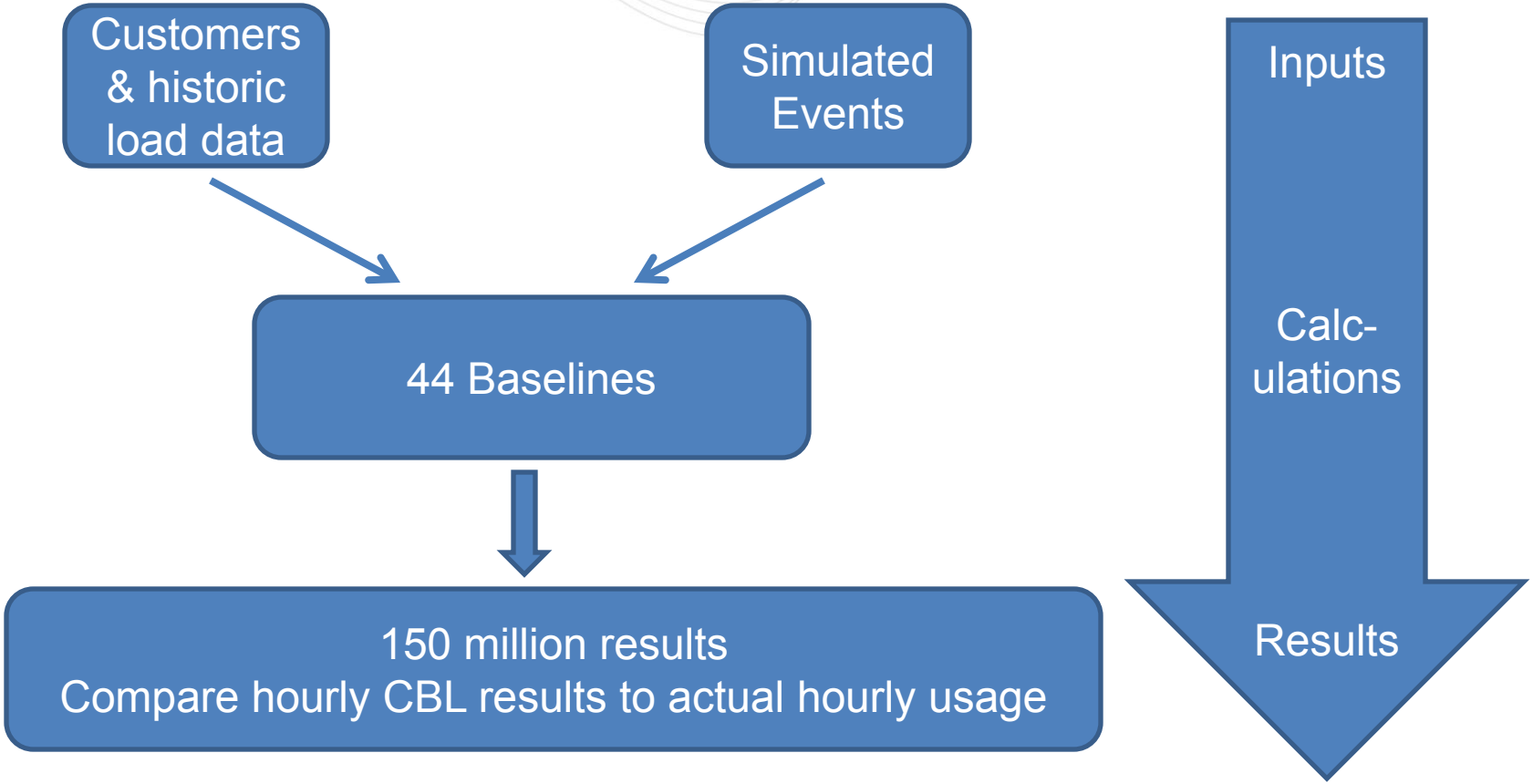
Analytical design: Analysis Basis

- 4,565 of 11,730 participants (40 percent) across 14 of 17 zones, were included in analysis.
- Represented over 9,000 MW of the total 16,000 MW (54 percent) of program's Peak Load Contribution (PLC).
- Two EDCs also provided 16,000 nonparticipating customers for a control pool.
- Hourly load data from June 1, 2008 through September 30, 2010.

Analytical design: General Approach

- Analyzed 11 baselines, with up to four variants of each baseline for a total of 44 different CBLs and adjustment methods analyzed.
- Compared the seasonal efficacy of the baseline performance during the summer afternoon and winter morning event periods.
- Used three metrics to establish the baselines' statistical properties.

Analytical design: General Approach



Analytical design: CBLs Considered

- PJM Economic
- PJM Emergency Comparable Day Non-weather Sensitive
- PJM Emergency Comparable Day Weather Sensitive
- PJM Emergency Same Day
- PJM Emergency Energy Settlement
- California ISO (“CAISO”) Standard
- New York ISO (“NYISO”) Standard
- ISO New England (“ISONE”) Standard
- Electric Reliability Council of Texas (“ERCOT”) Regression
- KEMA Regression
- Middle 4 of 6

Analytical design: CBL Adjustments Considered

- Same Day Adjustments
  - Additive Adjustment
    - Add/Subtract kw from CBL based on difference in CBL and event day load prior to event
  - Multiplicative Adjustment
    - Ratio CBL up or down based on difference in CBL and event day load prior to event
  - Weather Sensitivity Adjustment
    - Add/Subtract kw from CBL based on difference in weather on CBL and event days and load's sensitivity to weather.

Analytical design: Metrics

- Accuracy: Measured by the relative root mean squared error.
  - Expresses the baseline's average hourly accuracy as a fraction of average hourly load for the typical customer.
  - Reflects both Bias and Variability
- Bias: Measured by the average error.
  - Defines the systematic tendency of a baseline method to over- or under-predict actual loads.
- Variability: Measured by the error ratio, or the average standard deviation of the errors divided by the average load during the period.
  - Determines the baseline's ability to predict hourly load under many different conditions and across many different customers.

Results: Accuracy

Baseline Type	1-PJM Eco	2-CAISO	4-Mid4of6	5-NYISO	6-ISONE	7-PJM NWS	8-PJM WS	10-PJM Same	11-PJM Settle	12-ERCOT Reg	13-KEMA Reg
Unadjusted Baseline	0.11	0.11	0.11	0.13	0.11	0.10	0.11	0.11	0.09	0.13	0.09
Additive Adjustment	0.08	0.07	0.08	0.08	0.07	0.09	0.10	0.11	0.09	0.08	0.08
Multiplicative Adjustment	0.08	0.07	0.08	0.08	0.07	0.10	0.10	0.11	0.09	0.08	0.08
PJM WS Adjustment	0.09	0.09	0.09	0.10	0.09	0.10	0.12	0.11	0.09	0.13	0.09

Color coded, green = good, ranked over all rows combined

- The CAISO and ISONE baselines had slightly better, performance relative to the other X of Y type baselines and both regression approaches.
- The baselines with same day, load-based adjustments out performed other adjustment approaches.
- The performance difference from the use of an additive adjustment when compared to a multiplicative adjustment is insignificant.

Results: Bias

Baseline Type	1-PJM Eco	2-CAISO	4-Mid4of6	5-NYISO	6-ISONE	7-PJM NWS	8-PJM WS	10-PJM Same	11-PJM Settle	12-ERCOT Reg	13-KEMA Reg
Unadjusted Baseline	0.02	0.00	0.00	0.06	0.01	0.00	0.00	0.04	0.01	0.01	0.00
Additive Adjustment	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.01	0.00	0.00
Multiplicative Adjustment	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.01	0.00	0.00
PJM WS Adjustment	0.02	0.00	0.00	0.04	0.00	0.00	0.00	0.04	0.01	0.01	0.00

Color coded, green = good, ranked over all rows combined

- Several baselines were found to be unbiased for the typical customer as represented by a zero value in the table above
- The level of bias was inconsequential for CBLs with the additive and multiplicative adjustments except for the PJM Same Day CBL
- Unadjusted baselines were more susceptible to bias.

Results: Variability

Baseline Type	1-PJM Eco	2-CAISO	4-Mid4of6	5-NYISO	6-ISONE	7-PJM NWS	8-PJM WS	10-PJM Same	11-PJM Settle	12-ERCOT Reg	13-KEMA Reg
Unadjusted Baseline	0.11	0.11	0.11	0.12	0.11	0.10	0.11	0.08	0.08	0.10	0.09
Additive Adjustment	0.08	0.07	0.08	0.08	0.07	0.09	0.10	0.08	0.08	0.08	0.08
Multiplicative Adjustment	0.08	0.07	0.08	0.08	0.07	0.10	0.10	0.08	0.08	0.08	0.08
PJM WS Adjustment	0.09	0.09	0.09	0.10	0.09	0.10	0.12	0.08	0.08	0.10	0.09

Color coded, green = good, rank over all rows combined

- The use of a multiplicative or additive adjustment provide a significant reduction in the variability
- The regression and X of Y approaches are all comparable, with the CAISO and ISONE performing slightly better.

Results: Segmentation

Baseline Type	1-PJM Eco	2-CAISO	4-Mid4of6	5-NYISO	6-ISONE	7-PJM NWS	8-PJM WS	10-PJM Same	11-PJM Settle	12-ERCOT Reg	13-KEMA Reg
Unadjusted Baseline	0.44	0.44	0.44	0.52	0.45	0.45	0.66	0.52	0.68	0.62	0.48
Additive Adjustment	0.40	0.39	0.40	0.41	0.40	0.47	0.55	0.52	0.68	0.49	0.41
Multiplicative Adjustment	0.37	0.35	0.38	0.38	0.34	0.49	0.60	0.52	0.68	0.45	0.36
PJM WS Adjustment	0.49	0.48	0.49	0.58	0.48	0.48	0.67	0.52	0.68	0.61	0.48

Color coded, green = good, ranked over all rows combined

- **Segmentation by Variability**
  - Baseline approaches considered may not be applicable for customers with certain kinds of variable loads. When a customer's load is uncorrelated with any identifiable previous load pattern, no generalized baseline methodology can produce an effective baseline.
    - Variable participants represent ~11% of the population of participants
    - Hourly CBL results for typical variable participant were at least 4 times less accurate than for typical non-variable participant.
  - The analysis results indicate that an upper limit on variability should be considered and that customers that fall above it should be measured using a different CBL than other customers.

- **Segmentation by Weather Sensitivity**
  - Baselines with same day load-based adjustments are equally effective across all account segmentations; There is no need to segment based on weather sensitivity.
  - The use of a same day adjustment improves both the non-weather sensitive and weather sensitive segments.

- **Segmentation by Customer Size**
  - The structural aspect of baseline performance does not change as a result of account load level.
  - Accordingly, there is no reason to segment by size based on the results of this study unless the administrative costs associated with variable load accounts are sufficiently large that it is only feasible to include medium and large accounts.

- Administration should consider impact to all market participants
  - Customer, LSE, EDC, CSP and PJM
- The annual cost to administer a complex baseline methodology (i.e.: Regression) is estimated to be more than three times as much as a simple baseline methodology.
- The empirical analysis shows that 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.

- 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.
- Due to a somewhat greater susceptibility of multiplicative adjustments to gross inaccuracies under certain demand conditions, we therefore recommend that an additive adjustment be utilized.
- It is recommended that variable load customers be segmented for purposes of applying a different CBL and/or market rule.

Recommendations

Baseline	Accuracy	Bias	Variability	Administration	Strategic behavior
ISONE w/additive adjustment	7%	0%	7%	Requires continuous meter data, difficult to make calculation transparent, admin for adjustments	Impact of pre-cooling[1]
CAISO w/additive adjustment	7%	0%	7%	Requires 10 non event days	Impact of pre-cooling
PJM economic w/additive adjustment	8%	1%	8%	Requires limited load data based on specific reductions (5 non event days, will use 4 if necessary)	Impact of pre-cooling
				Currently implemented & minimum changes	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	8%	0%	8%	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)
Kema	9%	0%	9%	Significantly more effort, data and system requirements.	Not exposed to pre-cooling issue but may be exposed to other

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

- The CAISO and ISONE methods are not recommended, due to data and administrative considerations relative to very small gain in accuracy or bias.
- The PJM economic and the mid 4 of 6 are similar in performance and ease of administration.

The PJM economic CBL with the additive adjustment is recommended as it has already been implemented and is currently operational in the PJM market.

Recommendations

- The measurement of reductions in the energy market should be done on a consistent basis.
  - Utilized PJM economic with additive adjustment as default CBL for both emergency and economic energy settlements
  - Continue to allow alternative CBLs if results are significantly more accurate, less bias and less variable.
- Strategic behavior in the market to artificially inflate the CBL should not be permitted.
- The measurement of load reductions in the energy market are different than measurement of capacity compliance in the Capacity market and therefore each requires a different measurement method.
  - Capacity compliance should be measured based on firm service level approach.

- Determine stakeholder process for recommendations?
  - Demand Response Subcommittee or MIC
- Develop details on how to segment variable participants.
  - Continue to explore appropriate CBLs for this segment

- Example of detailed CBL report Appendix tables
  - Non-variable loads, extreme summer
  - Variable loads, extreme summer

Results for Extreme Summer Weekdays, All Sizes of Customers, For All Weather Customers, **with Non-Variable Load** sorted by Accuracy Median and Variability Median

Baseline	Adjustment	Accuracy 10th Pct	Accuracy Median	Accuracy Mean	Accuracy 90th Pct	Bias 10th Pct	Bias Median	Bias Mean	Bias 90th Pct	Variability 10th Pct	Variability Median	Variability Mean	Variability 90th Pct
06 - ISONE Standard	CBL Add Adj	0.03	0.06	0.11	0.21	(0.03)	(0.00)	0.01	0.04	0.03	0.06	0.10	0.20
06 - ISONE Standard	CBL Mul Adj	0.03	0.07	0.10	0.20	(0.03)	(0.00)	0.01	0.03	0.03	0.06	0.10	0.20
02 - CAISO Standard	CBL Add Adj	0.03	0.07	0.11	0.21	(0.03)	(0.00)	0.01	0.04	0.03	0.06	0.10	0.21
02 - CAISO Standard	CBL Mul Adj	0.03	0.07	0.11	0.21	(0.03)	(0.00)	0.01	0.03	0.03	0.06	0.10	0.20
05 - NYISO Standard	CBL Add Adj	0.03	0.07	0.12	0.23	(0.01)	0.01	0.03	0.06	0.03	0.06	0.10	0.22
13 - KEMA Regression	CBL Mul Adj	0.03	0.07	0.11	0.21	(0.03)	(0.00)	0.01	0.03	0.03	0.06	0.10	0.21
13 - KEMA Regression	CBL Add Adj	0.03	0.07	0.11	0.22	(0.03)	(0.00)	0.01	0.03	0.03	0.06	0.10	0.22
01 - PJM Economic	CBL Add Adj	0.03	0.07	0.11	0.22	(0.02)	0.00	0.02	0.05	0.03	0.07	0.10	0.21
05 - NYISO Standard	CBL Mul Adj	0.03	0.07	0.11	0.22	(0.01)	0.01	0.03	0.07	0.03	0.07	0.10	0.21
01 - PJM Economic	CBL Mul Adj	0.03	0.07	0.11	0.21	(0.01)	0.01	0.02	0.05	0.03	0.07	0.10	0.21
04 - Middle 4 of 6	CBL Add Adj	0.03	0.07	0.11	0.22	(0.03)	(0.00)	0.01	0.04	0.03	0.07	0.10	0.21
04 - Middle 4 of 6	CBL Mul Adj	0.03	0.07	0.11	0.22	(0.03)	0.00	0.01	0.04	0.03	0.07	0.10	0.21
07 - PJM Emergency Non-Weather	CBL Add Adj	0.03	0.07	0.12	0.26	(0.02)	0.00	0.01	0.03	0.03	0.07	0.12	0.26
07 - PJM Emergency Non-Weather	CBL WSA Adj	0.03	0.07	0.12	0.25	(0.02)	(0.00)	0.00	0.03	0.03	0.07	0.12	0.25
07 - PJM Emergency Non-Weather	CBL Mul Adj	0.03	0.08	0.13	0.27	(0.01)	0.01	0.01	0.04	0.03	0.07	0.13	0.27
07 - PJM Emergency Non-Weather	None	0.04	0.08	0.12	0.25	(0.03)	(0.01)	0.00	0.02	0.03	0.07	0.12	0.25
12 - ERCOT Regression	CBL Mul Adj	0.03	0.08	0.12	0.25	(0.05)	0.01	0.02	0.08	0.03	0.07	0.11	0.23
12 - ERCOT Regression	CBL Add Adj	0.03	0.08	0.15	0.26	(0.05)	0.01	0.04	0.08	0.03	0.07	0.12	0.24
01 - PJM Economic	CBL WSA Adj	0.04	0.08	0.13	0.26	(0.05)	(0.00)	0.01	0.06	0.03	0.07	0.12	0.24
02 - CAISO Standard	CBL WSA Adj	0.04	0.08	0.13	0.28	(0.08)	(0.02)	(0.01)	0.04	0.03	0.07	0.12	0.25
08 - PJM Emergency Weather	CBL Add Adj	0.04	0.08	0.13	0.28	(0.03)	(0.00)	0.00	0.02	0.04	0.08	0.13	0.28
05 - NYISO Standard	CBL WSA Adj	0.04	0.08	0.14	0.29	(0.03)	0.01	0.04	0.11	0.03	0.07	0.12	0.26
11 - PJM Emergency Settlement	None	0.03	0.08	0.15	0.32	(0.04)	0.02	0.06	0.17	0.03	0.07	0.12	0.26
11 - PJM Emergency Settlement	CBL Add Adj	0.03	0.08	0.15	0.32	(0.04)	0.02	0.06	0.17	0.03	0.07	0.12	0.26
11 - PJM Emergency Settlement	CBL Mul Adj	0.03	0.08	0.15	0.32	(0.04)	0.02	0.06	0.17	0.03	0.07	0.12	0.26
11 - PJM Emergency Settlement	CBL WSA Adj	0.03	0.08	0.15	0.32	(0.04)	0.02	0.06	0.17	0.03	0.07	0.12	0.26
04 - Middle 4 of 6	CBL WSA Adj	0.04	0.08	0.13	0.28	(0.08)	(0.01)	(0.01)	0.05	0.03	0.07	0.12	0.25
06 - ISONE Standard	CBL WSA Adj	0.04	0.08	0.13	0.27	(0.08)	(0.01)	(0.01)	0.04	0.03	0.07	0.12	0.24
08 - PJM Emergency Weather	CBL Mul Adj	0.04	0.08	0.14	0.29	(0.02)	(0.00)	0.01	0.03	0.04	0.08	0.14	0.29
05 - NYISO Standard	None	0.04	0.08	0.14	0.28	(0.05)	(0.01)	0.02	0.11	0.03	0.08	0.12	0.25
13 - KEMA Regression	None	0.04	0.09	0.14	0.27	(0.07)	(0.03)	(0.01)	0.03	0.03	0.08	0.12	0.26
13 - KEMA Regression	CBL WSA Adj	0.04	0.09	0.14	0.27	(0.07)	(0.03)	(0.01)	0.03	0.03	0.08	0.12	0.26
08 - PJM Emergency Weather	None	0.04	0.09	0.15	0.33	(0.03)	(0.00)	0.00	0.03	0.04	0.09	0.15	0.32
08 - PJM Emergency Weather	CBL WSA Adj	0.04	0.10	0.15	0.33	(0.03)	0.00	0.00	0.03	0.04	0.09	0.15	0.33
01 - PJM Economic	None	0.05	0.10	0.14	0.25	(0.08)	(0.04)	(0.01)	0.05	0.04	0.08	0.12	0.24
10 - PJM Emergency Same Day	None	0.04	0.11	0.15	0.29	(0.16)	(0.04)	(0.04)	0.04	0.03	0.07	0.11	0.23
10 - PJM Emergency Same Day	CBL Add Adj	0.04	0.11	0.15	0.29	(0.16)	(0.04)	(0.04)	0.04	0.03	0.07	0.11	0.23
10 - PJM Emergency Same Day	CBL Mul Adj	0.04	0.11	0.15	0.29	(0.16)	(0.04)	(0.04)	0.04	0.03	0.07	0.11	0.23
10 - PJM Emergency Same Day	CBL WSA Adj	0.04	0.11	0.15	0.29	(0.16)	(0.04)	(0.04)	0.04	0.03	0.07	0.11	0.23
02 - CAISO Standard	None	0.05	0.11	0.14	0.26	(0.11)	(0.05)	(0.04)	0.02	0.03	0.07	0.11	0.24
06 - ISONE Standard	None	0.06	0.11	0.14	0.25	(0.11)	(0.06)	(0.04)	0.02	0.03	0.07	0.11	0.24
04 - Middle 4 of 6	None	0.06	0.11	0.15	0.26	(0.11)	(0.05)	(0.04)	0.03	0.04	0.08	0.12	0.24
12 - ERCOT Regression	None	0.05	0.14	0.22	0.40	(0.15)	0.02	0.02	0.19	0.04	0.10	0.17	0.31
12 - ERCOT Regression	CBL WSA Adj	0.05	0.14	0.21	0.40	(0.15)	0.02	0.03	0.19	0.04	0.10	0.16	0.31

Results for Extreme Summer Weekdays, All Sizes of Customers, For All Weather Customers, with Variable Load sorted by Accuracy Median and Variability Median

Baseline	Adjustment	Accuracy 10th Pct	Accuracy Median	Accuracy Mean	Accuracy 90th Pct	Bias 10th Pct	Bias Median	Bias Mean	Bias 90th Pct	Variability 10th Pct	Variability Median	Variability Mean	Variability 90th Pct
06 - ISONE Standard	CBL Mul Adj	0.13	0.35	0.64	1.07	(0.09)	0.01	0.10	0.20	0.13	0.34	0.61	0.99
02 - CAISO Standard	CBL Mul Adj	0.13	0.36	0.69	1.08	(0.09)	0.01	0.12	0.22	0.13	0.35	0.65	1.03
13 - KEMA Regression	CBL Mul Adj	0.13	0.36	0.69	1.06	(0.08)	0.01	0.11	0.25	0.13	0.35	0.66	1.04
04 - Middle 4 of 6	CBL Mul Adj	0.13	0.38	0.82	1.16	(0.11)	0.01	0.14	0.25	0.13	0.37	0.78	1.06
05 - NYISO Standard	CBL Mul Adj	0.14	0.38	0.89	1.40	(0.03)	0.07	0.27	0.51	0.14	0.37	0.82	1.26
01 - PJM Economic	CBL Mul Adj	0.14	0.39	0.82	1.23	(0.05)	0.04	0.18	0.30	0.13	0.37	0.78	1.16
06 - ISONE Standard	CBL Add Adj	0.15	0.41	0.73	1.18	(0.08)	0.03	0.16	0.36	0.14	0.40	0.68	1.07
01 - PJM Economic	CBL Add Adj	0.15	0.42	0.75	1.22	(0.06)	0.05	0.19	0.37	0.14	0.39	0.71	1.11
05 - NYISO Standard	CBL Add Adj	0.16	0.42	0.81	1.31	(0.04)	0.08	0.25	0.53	0.15	0.41	0.74	1.19
02 - CAISO Standard	CBL Add Adj	0.15	0.43	0.72	1.21	(0.08)	0.04	0.16	0.36	0.15	0.41	0.68	1.08
13 - KEMA Regression	CBL Add Adj	0.16	0.43	0.77	1.20	(0.08)	0.03	0.17	0.33	0.15	0.42	0.73	1.11
07 - PJM Emergency Non-Weather	None	0.13	0.43	0.68	1.33	(0.07)	0.02	0.05	0.17	0.13	0.42	0.67	1.32
04 - Middle 4 of 6	CBL Add Adj	0.15	0.43	0.72	1.18	(0.09)	0.03	0.14	0.33	0.14	0.41	0.68	1.10
07 - PJM Emergency Non-Weather	CBL WSA Adj	0.17	0.44	0.75	1.36	(0.09)	0.01	0.07	0.15	0.17	0.44	0.73	1.35
07 - PJM Emergency Non-Weather	CBL Add Adj	0.15	0.45	0.74	1.36	(0.06)	0.03	0.11	0.28	0.14	0.45	0.73	1.33
12 - ERCOT Regression	CBL Mul Adj	0.18	0.45	3.82	1.44	(0.24)	0.02	1.67	0.53	0.16	0.41	3.34	1.27
01 - PJM Economic	None	0.17	0.45	0.87	1.31	(0.12)	0.04	0.27	0.39	0.16	0.44	0.77	1.22
02 - CAISO Standard	None	0.19	0.46	0.76	1.20	(0.19)	(0.03)	0.13	0.25	0.18	0.44	0.67	1.13
04 - Middle 4 of 6	None	0.18	0.47	0.79	1.28	(0.21)	(0.02)	0.11	0.23	0.16	0.45	0.72	1.18
06 - ISONE Standard	None	0.20	0.47	0.74	1.19	(0.18)	(0.03)	0.14	0.32	0.18	0.45	0.66	1.10
07 - PJM Emergency Non-Weather	CBL Mul Adj	0.13	0.48	2.59	2.23	(0.04)	0.04	0.59	0.51	0.13	0.47	2.52	2.20
13 - KEMA Regression	None	0.20	0.49	0.81	1.26	(0.17)	(0.01)	0.16	0.32	0.20	0.47	0.75	1.18
13 - KEMA Regression	CBL WSA Adj	0.20	0.49	0.81	1.26	(0.17)	(0.01)	0.16	0.32	0.20	0.47	0.75	1.18
01 - PJM Economic	CBL WSA Adj	0.25	0.50	0.90	1.30	(0.31)	(0.04)	0.12	0.30	0.21	0.45	0.79	1.24
08 - PJM Emergency Weather	CBL Add Adj	0.18	0.52	0.89	1.47	(0.07)	0.03	0.15	0.35	0.18	0.51	0.86	1.43
05 - NYISO Standard	None	0.20	0.52	1.02	1.59	(0.05)	0.16	0.49	0.79	0.19	0.47	0.82	1.35
02 - CAISO Standard	CBL WSA Adj	0.27	0.52	0.79	1.23	(0.40)	(0.12)	(0.02)	0.19	0.21	0.45	0.69	1.15
12 - ERCOT Regression	CBL Add Adj	0.21	0.53	1.45	1.50	(0.24)	0.06	0.56	0.63	0.19	0.48	1.17	1.30
08 - PJM Emergency Weather	CBL Mul Adj	0.17	0.53	3.22	2.41	(0.08)	0.03	0.76	0.49	0.17	0.52	3.12	2.37
06 - ISONE Standard	CBL WSA Adj	0.28	0.53	0.78	1.19	(0.41)	(0.13)	(0.04)	0.20	0.21	0.46	0.67	1.12
04 - Middle 4 of 6	CBL WSA Adj	0.27	0.54	0.84	1.27	(0.42)	(0.12)	(0.02)	0.17	0.21	0.47	0.75	1.21
05 - NYISO Standard	CBL WSA Adj	0.26	0.54	0.99	1.48	(0.25)	0.07	0.31	0.63	0.23	0.49	0.82	1.36
10 - PJM Emergency Same Day	None	0.16	0.55	0.82	1.39	(0.15)	0.04	0.22	0.64	0.14	0.50	0.72	1.23
10 - PJM Emergency Same Day	CBL Add Adj	0.16	0.55	0.82	1.39	(0.15)	0.04	0.22	0.64	0.14	0.50	0.72	1.23
10 - PJM Emergency Same Day	CBL Mul Adj	0.16	0.55	0.82	1.39	(0.15)	0.04	0.22	0.64	0.14	0.50	0.72	1.23
10 - PJM Emergency Same Day	CBL WSA Adj	0.16	0.55	0.82	1.39	(0.15)	0.04	0.22	0.64	0.14	0.50	0.72	1.23
08 - PJM Emergency Weather	None	0.24	0.57	0.82	1.52	(0.14)	0.00	0.03	0.19	0.24	0.56	0.81	1.51
08 - PJM Emergency Weather	CBL WSA Adj	0.26	0.58	0.85	1.54	(0.15)	(0.00)	0.03	0.19	0.26	0.57	0.84	1.55
11 - PJM Emergency Settlement	None	0.17	0.69	0.95	1.81	(0.06)	0.29	0.47	1.18	0.16	0.55	0.74	1.35
11 - PJM Emergency Settlement	CBL Add Adj	0.17	0.69	0.95	1.81	(0.06)	0.29	0.47	1.18	0.16	0.55	0.74	1.35
11 - PJM Emergency Settlement	CBL Mul Adj	0.17	0.69	0.95	1.81	(0.06)	0.29	0.47	1.18	0.16	0.55	0.74	1.35
11 - PJM Emergency Settlement	CBL WSA Adj	0.17	0.69	0.95	1.81	(0.06)	0.29	0.47	1.18	0.16	0.55	0.74	1.35
12 - ERCOT Regression	CBL WSA Adj	0.33	0.70	3.85	2.14	(0.48)	(0.00)	2.86	1.17	0.27	0.58	1.61	1.52
12 - ERCOT Regression	None	0.33	0.70	4.03	2.19	(0.52)	(0.02)	2.67	1.15	0.27	0.58	1.78	1.56