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# Removing Barriers to Residential DR Participation in the IESO DR Auction

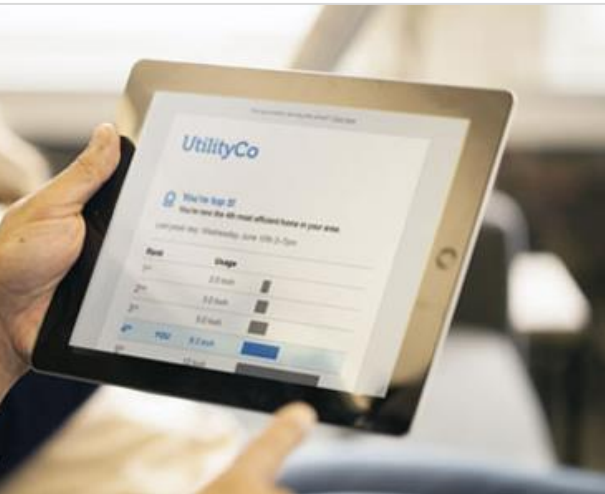
IESO DR Working Group  
May 30, 2016

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OP@WER

# Opower partnered with Hydro Ottawa and the MOE to deploy BDR to 50,908 Households

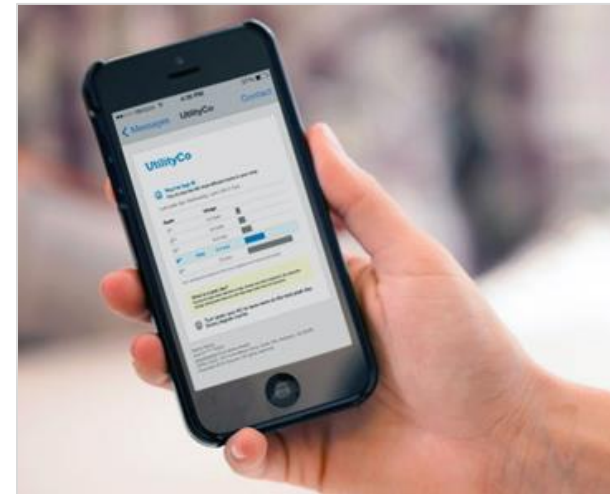
## Peak day notification



## Personalized adjustments



## Post-event feedback



- » Targeted communication
- » Channel of choice
- » Opt-out program design

- » Large-scale engagement
- » Access to more load
- » Highly accurate EM&V

- » Immediate feedback
- » Highly personalized results
- » Ongoing encouragement

**2.93% average hourly savings (0.063 kW / HH)**  
**3.18 MW of total load reduction**



# Removing Barriers to Residential DR

## First Tier Solutions

- Measure Residential DR Appropriately
- Plan for Existing Metering Characteristics

## Additional Hurdles

- Allow Bulk Uploads to the Contributor Management System
- Increase the Procurement Target
- Automate the Dispatch Signal
- Include Activation Hours in Standby Notifications



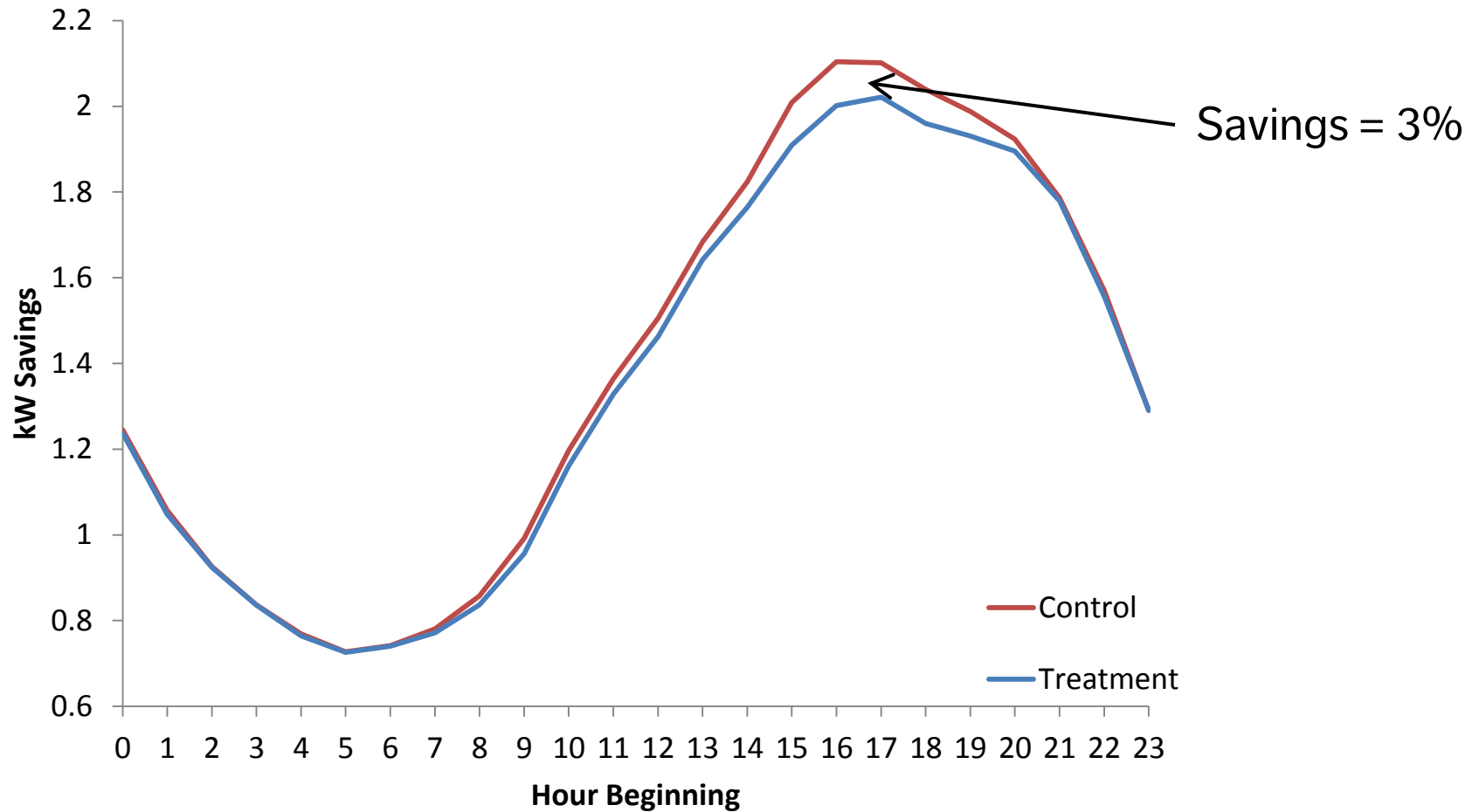
# 1. Measure Residential DR Appropriately

- IESO baseline methodology may not be appropriate for all resources
  - High 15 of 20 baseline with in-day adjustment
  - Developed with C&I customers in mind
- Residential customers behave differently than C&I
  - Weather-sensitive, use more energy on peak days
  - High X of Y methodology may lead to negatively biased baselines
- Residential response different than C&I
  - Pre-cooling
  - Pre-curtailment
  - In-day adjustment could erroneously capture these pre-event behaviors



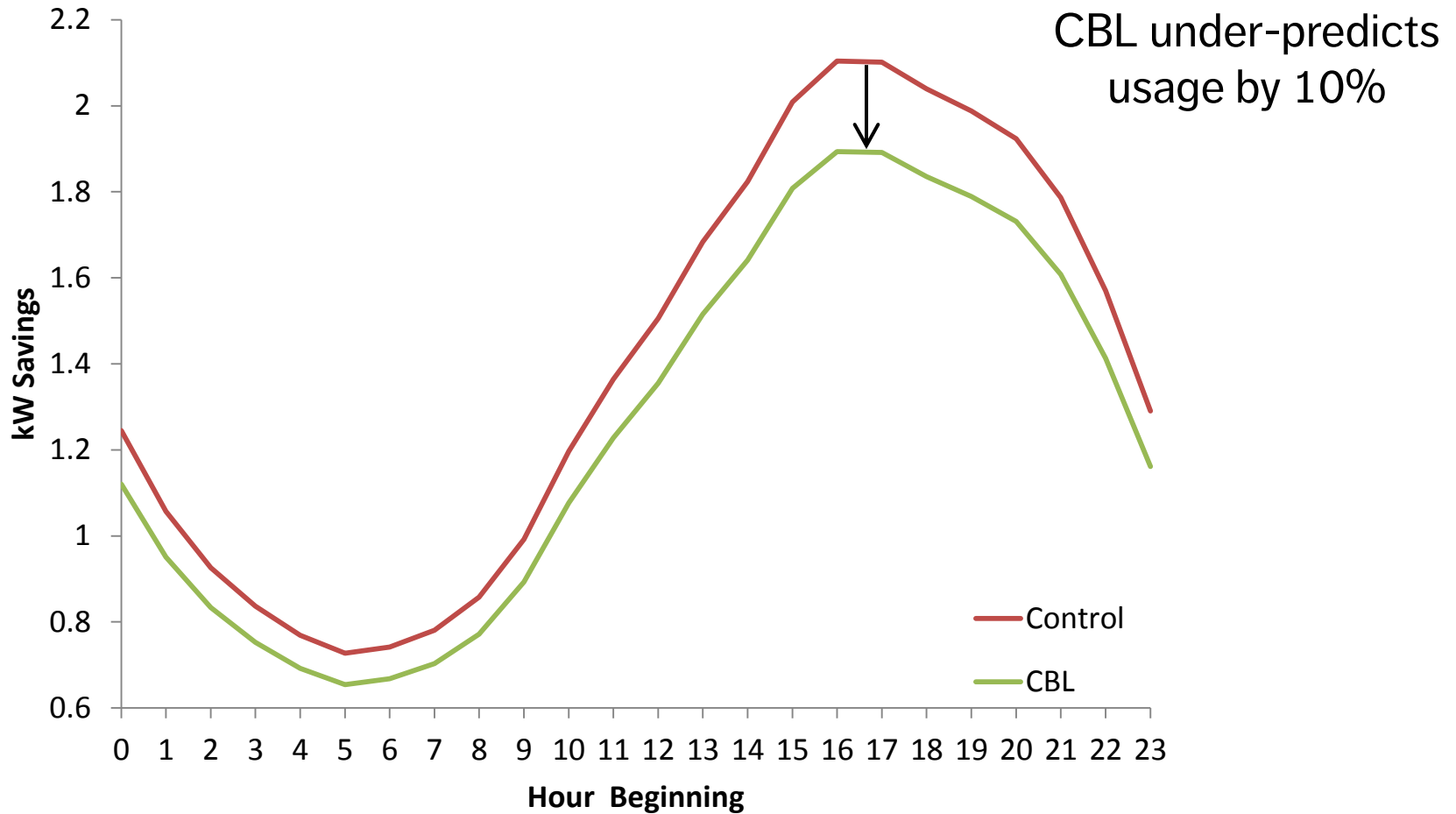
# Customer Baseline Bias in Residential DR

Treatment customers achieved 3% savings rate



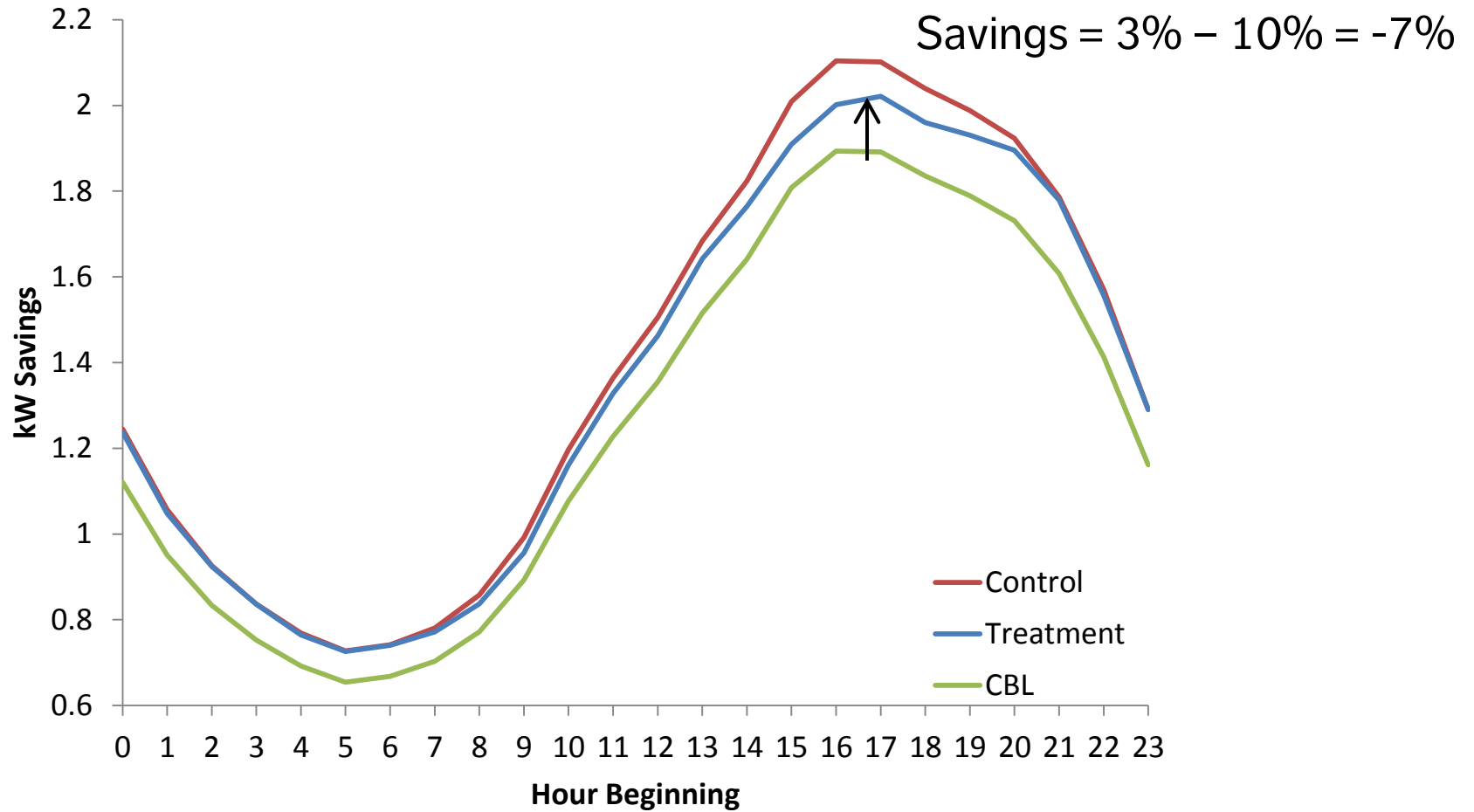
# Customer Baseline Bias in Residential DR

Customer baseline has a negative 10% bias



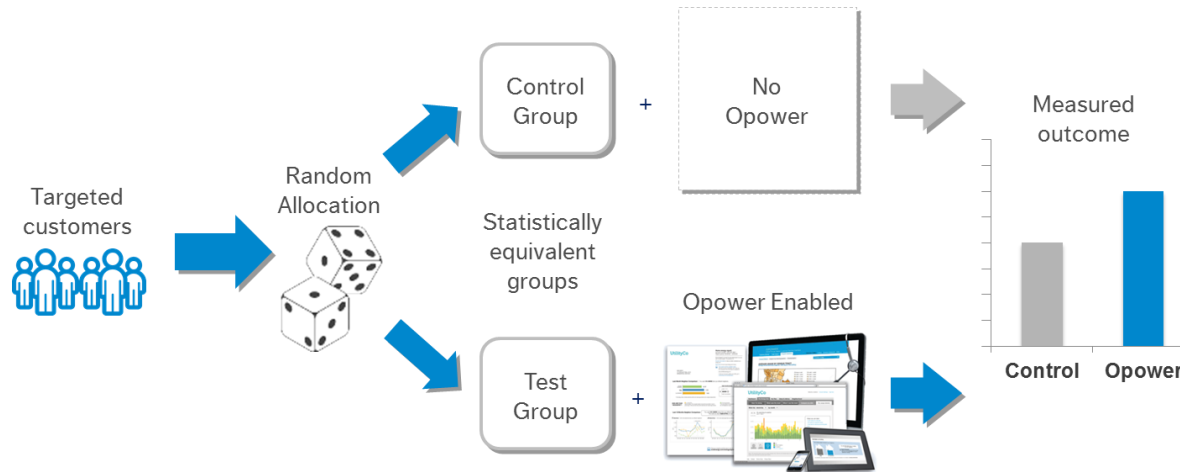
# Customer Baseline Bias in Residential DR

3% savings are nullified by negative 10% bias from customer baseline



# Examples of Alternative Baselines

- Randomized Controlled Trial (RCT)



- U.S. DOE best practice protocol for behavior-based DR
  - Used to measure Opower behavioral DR pilot at Hydro Ottawa
  - Used to measure residential DLC programs at PG&E, SCE
- Other Residential-Appropriate Baselines
    - E.g., weather-sensitive baselines
  - Statistical Sampling





# Accommodating Alternative Baselines

- DR market participants can work with IESO staff to define an alternative baseline methodology that is likely to produce more accurate estimates of load reduction
- Processes to introduce alternative baselines are in place at PJM, ISO-NE, and MISO



## 2. Plan for Existing Metering Characteristics

- Current rules require 5-minute meter read frequency
- Residential AMI record usage on 60-minute or 15-minute granularity, depending on system
- **Proposed solution:** Allow residential DR to submit usage data at native read frequency (60-minute or 15-minute) as the average usage for that period
- PJM and MISO both allow capacity and energy market participation using 60-minute interval data



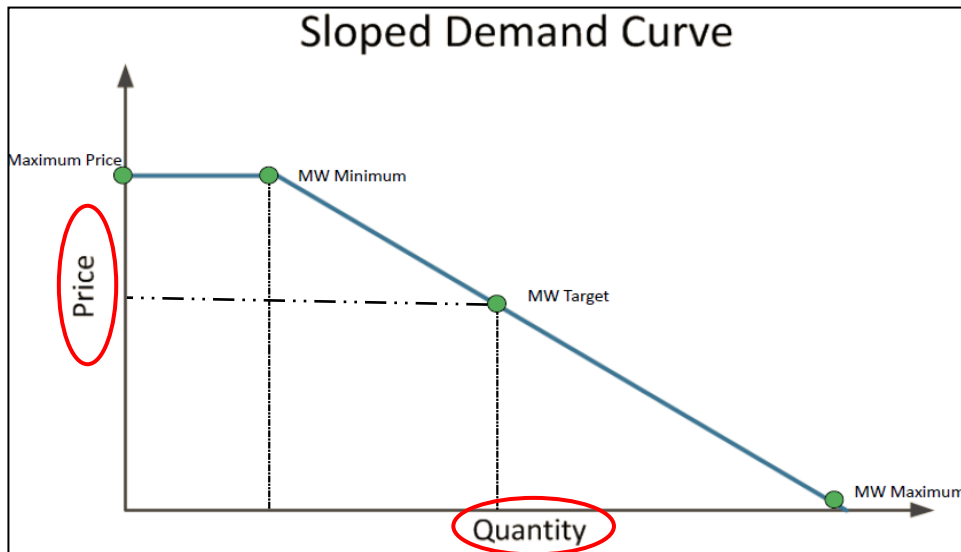
### 3. Allow Bulk Uploads to the Contributor Management System

- Contributor management system should allow for the bulk upload of DR contributors
- Residential programs typically consist of much larger aggregations of individual contributors
  - Ex: Behavioral DR program at Hydro Ottawa had ~50,000 participant households



## 4. Increase the Procurement Target to Reflect Residential Capabilities

- Demand curve designed to maintain 367 MW of DR from expiring DR3 contracts from C&I sector
- Target quantity and price parameters should be adjusted to reflect residential DR potential
  - Example: ~113 MW of existing *peaksaverPLUS*®



## 5. Automate the Dispatch Signals

- Deliver standby notifications and activation notifications via automated dispatch signal
  - **Reduce administrative burden** for market participants
  - **Maximize the response time** for market participants



## 6. Include Activation Hours in Standby Notifications

- DR market participants would benefit if activation hours and energy (MW) commitments were included in the standby notification
- Certainty about activation hours would facilitate scheduling and benefit DR participants from all sectors

# Removing Barriers to Residential DR

## First Tier Solutions

- Measure Residential DR Appropriately
- Plan for Existing Metering Characteristics

## Additional Hurdles

- Fix the Contributor Management System
- Increase the Procurement Target
- Automate the Dispatch Signal
- Include Activation Hours in Standby Notifications



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# Thank you!

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# Appendix

# Allowances for Alternative Baselines in Other ISOs/RTOs

ISO/RTO	Allowance for Alternative Baselines
PJM	<p><b>Manual 11: 10.2.5 CBL Certification Process</b></p> <p>An alternative [Customer Base Line] may be requested if the alternative CBL is more accurate than the standard CBL and has [a relative root mean square error] less than or equal to 20%.</p>
ISO-NE	<p><b>5.3 Alternative Measurement and Verification Methodologies</b></p> <p>The Project Sponsors may propose alternative methodologies not listed in Section 5.2. Project Sponsors proposing alternative methodologies shall demonstrate that the alternative methodologies will be equivalent to one of the accepted methodologies described in Section 5.2 above, conform to Market Rule 1, and demonstrate justifiable need for deviation from the acceptable methodologies described in Section 5.2 based on unique Project requirements. Alternative measurement and verification methodologies are subject to approval by the ISO</p>
MISO	<p><b>4.8.1.3.4 Custom Baseline</b></p> <p>The [Market Participant] sponsoring a [Demand Response Resource] may develop a custom Consumption Baseline if none of the three standard baselines described above would produce reasonable estimates of the resource's demand reductions. MISO must approve of the specific methodology to be employed before the [Market Participant] can utilize such a baseline. For custom Consumption Baselines, the input provided becomes the Consumption Baseline that will be subtracted from metered amounts to determine performance (demand reduction).</p>

