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Proposed Measurement and Verification Plan

For

Demand Reduction Value from Various Retail Customer Site Locations

Aggregation of Special Case Resources

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Measurement and Verification Plan

Introduction

Constellation NewEnergy (the "Enrolling Participant") proposes to aggregate by zone and enroll several capacity resources from various retail store companies located throughout New York into the Special Case Resource (SCR) Program. The capacity resources of each of the Enrolling Participant's retail store customers will be enrolled individually as aggregated assets consisting of multiple site locations within a NYISO zone that will meet or exceed the minimum asset size criteria of 100kW.

The new resources proposed through this Measurement and Verification (M&V) plan will be registered by the Enrolling Participant under the Special Case Resource (SCR) guidelines for Small Customer Aggregations.

Load Curtailment Measures

The load curtailment strategy will primarily consist of direct load control of the heating, ventilating and air conditioning (HVAC) and lighting loads at each site location during demand response events to achieve the enrolled load reduction.

Each site location has an existing on-site building automation system (BAS) that is connected to a remote national operations center (NOC). Upon receipt of an activation notice of a NYISO demand response event, the NOC will dispatch a command to the on-site BAS at each enrolled site to initiate the pre-programmed load curtailment strategy. The on-site BAS will then initiate its program sequence to directly control the connected HVAC and lighting loads for load reduction below normal operating levels.

- **Type, quantity, and location of end-use devices that will be controlled:**

  The HVAC end-use devices at the retail site locations include multiple (typical quantities: 4 to 15) rooftop units (RTU) and exhaust fans. Lighting systems typically consist of exterior (parking lot and signage) and interior (sales floor, display, and enclosed areas) lighting fixtures.

- **Manner in which end-use devices will be controlled:**

  Load reduction of end-use devices will be controlled by the on-site BAS, generally as:

  1. The load of HVAC systems will be reduced from normal operational levels by RTU temperature set point adjustment, air conditioning stage lockout, and/or fan shutdown.
  2. Lighting load reduction will be controlled by the BAS to shut off or dim lighting systems below normal levels.

- **General characteristics of the end-use devices, with respect to factors such as load variability, time- or weather-dependence, and interactive effects on other end-use equipment:**

Typical retail store operational schedules are standard on a weekly basis - with consistent hours of operation Monday through Friday, and slight differences in schedules on Saturday, Sunday, and holidays. The electrical loads at a retail site location track the hours of operation closely – increasing to full load one to two hours before store opening, and decreasing to reduced load one to hours after closing.

Lighting systems and equipment loads a constant load and are schedule-dependent.

The load of HVAC systems are a staged load and are also schedule-dependent. Normally, the HVAC systems have a constant base component of fan horsepower. The variable portion of the staged load of HVAC from air conditioning compressors is dependent on ambient weather conditions.

Interactive effects of the respective end-use devices are minimal.

- **Detailed specifications, to the extent possible, for each end-use device to be controlled, including nameplate capacity, operating schedule, and customer controls:**

Within a retail company portfolio of site locations, there is usually a prototypical site design that is comparatively consistent in approximate building size and its associated equipment, lighting, and HVAC systems. However, nameplate capacity of individual components is widely varied. Individual RTU capacities will vary from 2 to 20 tons based on the number of RTUs installed at a given site.

Operating schedules vary by the retail company and its business model. A typical example of store hours for many retail chains are Monday through Friday, 8:00am to 9:00pm, Saturday, 9:00am to 9:00pm, and Sunday, 9:00am to 6:00pm. The associated operating schedules will add one to two hours before store opening, and after store closing.

Typically, the HVAC and lighting loads are scheduled and controlled through the BAS. The customer may have some on-site override control of these systems for special situations.

Measurement and Monitoring Strategy

For its Measurement and Verification (M&V) Plan, the Enrolling Participant proposes to interface with the existing BAS through its NOC to gather, record, and store the measurement data required to calculate the baseline and load reductions for each hour and NYISO zone.

The BAS NOC monitors, records and stores measured data from the on-site BAS at each site location. The Enrolling Participant will connect to the BAS NOC directly to receive the required measurement data.

- **Parameters that will be measured:**

The parameters that will be measured include facility-wide interval demand (kW) data for each site location within the aggregated asset.

- **Duration over which monitoring will be conducted**

The on-site BAS monitors the facility-wide interval demand (kW) data continuously. The Enrolling Participant will connect to the BAS NOC at least once per day to collect the measured data from each of the aggregated site locations. The data received will be cataloged and stored by the Enrolling Participant and reported to NYISO as required for performance measurement.

For any missing interval data for a given day and site location(s), the BAS NOC would re-poll those stores having missing data the following day so that any missing interval data from the previous day would be filled.

- **The interval over which monitoring data will be averaged and recorded**

The data is measured continuously and averaged over a 15 minute interval.

- **Type and accuracy of monitoring and data logging equipment to be used:**

The interval demand data is monitored by a dedicated facility wide metering instruments. The manufacturer and model numbers of existing on-site measurement equipment for metering the interval demand (kW) vary somewhat across the portfolio of site locations. However, the precision of the metering equipment in all cases will exceed the accuracy requirements of ±2% as per Section 5, “Metering, Verification, Billing and Settlement”, of the NYISO EDRP manual.

The predominant metering device installed across a majority of the site locations is a Veris Model H8463VBSN1, a revenue grade meter with accuracy of ±1% that meets ANSI C12.16.

Sampling is not applicable. This M&V plan is based on actual measured data for all locations.

Load Reduction Calculation Methodology

Interval billing meter data for the new Special Case Resource(s) (SCR) covered under this M&V Plan is generally not available for the Prior Equivalent Capability Period. Therefore, its Installed Capacity value shall be provisionally based on peak monthly metered demands in accordance with the guidelines of Section 4.12 "Special Case Resources", of the NYISO ICAP Manual.

The calculation of the Average Peak Monthly Demand (APMD) for performance evaluation and future enrollments of the SCR will use the actual in-period measured interval demand data (kW) for the aggregated asset.

The projected load reduction at each site during an event is estimated to be 10-30% of the actual normal load, but will be calculated specifically for each site location using actual measured parameters. Therefore, the Contracted Minimum Demand (CMD) will be calculated on a site by site basis and aggregated to determine the overall aggregated asset CMD.

Performance calculations of load reduction for each Special Case Resource will use actual in-period hourly interval meter data for the applicable Capability Period.

It is understood that each SCR covered under this M&V Plan is subject to actual in-period verification using actual hourly interval meter data for the applicable Capability Period and subject to the same deficiency payments and forward de-ratings as apply to all other Special Case Resources.

- **Calculation of Customer Baseline (CBL) and actual load reduction**

  The actual load for each hour and zone will be calculated as the aggregation of the actual measured load at each site location from the actual facility-wide interval meter data.

  The baseline load will be calculated as the aggregation of the actual measured load at each site location over the baseline period in accordance with the methodology described in Section 5.2, "Calculation of Customer Baseline (CBL)" in the NYISO EDRP manual. The option for the weather-adjusted CBL methodology will be determined by the weather sensitivity of the aggregated asset.

  The actual load reduction for each hour and zone will be calculated as the difference between the aggregated CBL and the aggregation of the actual measured load from the facility-wide interval meter data at each site location during an event or audit.

- **Load reductions in sub-sets of NYISO pricing zones**

  The aggregated sites will be enrolled by NYISO zone, which will allow for load reductions and associated calculations within sub-sets of pricing zones using the methodologies described herein.