RG&E Demand Response Programs

Calculating Customer Baseline Load (CBL)

1. Introduction

This document is an excerpt from the NYISO (New York Independent System Operator) Emergency Demand Response Program Manual (January 2022, Version 7.5, Section 5.2). It is intended for use by Customers/Aggregators enrolled in RG&E Demand Response Programs as it provides guidance for calculating the Customer Baseline Load (CBL).

2. Definitions

2.1. **Curtailment Service Providers (CSP):** NYISO-approved Curtailment Customer Aggregators (Aggregators) of retail end users capable of load reduction. Aggregators may claim load reductions from Demand Side Resources with which they have a contractual arrangements

2.2. **Customer Base Load (CBL):** Average hourly energy consumption as calculated in Section 5, used to determine the level of load curtailment provided.

3. Select a CBL method

3.1. The participant selects the CBL formula when it enrolls, or is enrolled by its CSP, with RG&E for Demand Response program participation. The choice of CBL becomes effective when RG&E accepts the enrollment.

3.2. At the initial enrollment in the Programs, participants may elect either the Average Day CBL or the Weather Adjusted CBL formula.

3.3. A change in the CBL formula can be made when resources reenroll in the Programs during the next Capability Period.

4. Baseline Calculation for All Accounts

4.1. It is the responsibility of RG&E to provide the CBL calculation to the CSP.

5. The Average Day CBL

The Average Day CBL for Weekdays

Establish the CBL Window. Establish a set of days that will serve as representative of participant's typical usage.

 5.1.1.1.   Determine the participant's peak load hour within, but not to exceed, the last 30 days that corresponds to the hours that cover the event for which the CBL is being developed. Multiply the peak load hour value by 25% to calculate the initial seed value. (Figure 1)

 5.1.1.2.   Beginning with the day prior to the event for which the CBL is being calculated, exclude the following:

  5.1.1.2.1.   Any holidays within the last 30 days, as specified by RG&E.

  5.1.1.2.2.   Any days within the last 30 days, when RG&E declared a CSRP or DLRP event for which the resource was eligible for payment for a curtailment.

  5.1.1.2.3.   Any days within the last 30 days, when the NYISO declared a EDRP or SCR event.

  5.1.1.2.4.   Eliminate the day prior to any day when RG&E declared a CSRP or DLRP event for which the participant was eligible for payment for a curtailment.

 5.1.1.3.   For each remaining weekday within the last 30 days, create the Average Daily Event Period Usage for that day, defined as the simple average of the resource's actual usage over the hours that define the event for which the CBL is being developed. Eliminate low usage days. For each day that has not been excluded within the last 30 days, compare the resulting Average Daily Event Period Usage to the initial seed value. If the Average Daily Event Period Usage is less than the initial seed value, exclude that day. If, after all exclusions, fewer than 10 days, but no less than 5 days, remain within the 30 day period, continue the calculation of the CBL using the number of days remaining.

 5.1.1.4.   Move back one day to step 5.1.1.2.1. and repeat for all remaining weekdays within the 30 days prior to the event for which the CBL is being calculated.

 5.1.1.5.   Continue with section 5.1.2. the calculation of CBL Basis for Weekdays.

Figure 1 shows the determination and calculation of the initial seed value.

SUN	MON	TUE	WED	THU	FRI	S AT
JUN 8	JUN 9 Day 30 Maximum Load Value during Event Hours: 9	JUN 10 Day 29 Maximum Load Value during Event Hours: 9	JUN 11 Day 28 Maximum Load Value during Event Hours: 8	JUN 12 Day 27 Maximum Load Value during Event Hours: 8	JUN 13 Day 26 Maximum Load Value during Event Hours: 10	JUN 14 Day 25 Maximum Load Value during Event Hours: 7
JUN 15 Day 24 Maximum Load Value during Event Hours: 5	JUN 16 Day 23 Maximum Load Value during Event Hours: 8	JUN 17 Day 22 Maximum Load Value during Event Hours: 9	JUN 18 Day 21 Maximum Load Value during Event Hours: 10	JUN 19 Day 20 Maximum Load Value during Event Hours: 13	JUN 20 Day 19 Maximum Load Value during Event Hours: 11	JUN 21 Day 18 Maximum Load Value during Event Hours: 6
JUN 22 Day 17 Maximum Load Value during Event Hours: 5	JUN 23 Day 16 Maximum Load Value during Event Hours: 10	JUN 24 Day 15 Maximum Load Value during Event Hours: 7	JUN 25 Day 14 Maximum Load Value during Event Hours: 8	JUN 26 Day 13 Maximum Load Value during Event Hours: 8	JUN 27 Day 12 Maximum Load Value during Event Hours: 12	JUN 28 Day 11 Maximum Load Value during Event Hours: 7
JUN 29 Day 10 Maximum Load Value during Event Hours: 5	JUN 30 Day 9 Maximum Load Value during Event Hours: 11	JUL 1 Day 8 Maximum Load Value during Event Hours: 8	JUL 2 Day 7 Maximum Load Value during Event Hours: 12	JUL 3 Day 6 Maximum Load Value during Event Hours: 9	JUL 4 HOLIDAY Day 5 Maximum Load Value during Event Hours: 5	JUL 5 Day 4 Maximum Load Value during Event Hours: 6
JUL 6 Day 3 Maximum Load Value during Event Hours: 5	JUL 7 Day 2 Maximum Load Value during Event Hours: 11	JUL 8 INELIGIBLE DAY (DAY BEFORE) Day 1 Maximum Load Value during Event Hours: 11	JUL 9 SCR/EDRP EVENT	JUL 10	JUL 11	JUL 12
KEY:	NON-EVENT D AY	SCR/EDRP EVENT	DADRP SCHEDULE	INELIGIBLE DAY (DAY BEFORE)	HOLIDAY	Maximum Load Value During Event Hours - over past 30 days

Maximum Load Value During Event Hours - over past 30 days	Exclude the CBL Day if Average Event Period Usage is lower than the Initial Seed Value (Maximum Load * 0.25):
13	3.25

Figure 1   Example of Determining a Resource's Peak Load Hour that Occurred During Event Hours Over the Past 30 Days and the Calculation of the Initial Seed Value

5.1.2. **Establish the CBL Basis for Weekdays.**

    5.1.2.1.   Identify the five days from the CBL Window (up to 10 days) to be used to develop CBL values for each hour of the event. (Figure 2)

    5.1.2.2.   Rank the days from the CBL Window according to their Average Daily Event Period Usage level, and eliminate the days with the lowest Average Daily Event Period Usage, so that a maximum of five weekdays remain.

5.1.3. **Calculate hourly Average Day CBL values for the event.**

    5.1.3.1.   For each hour of the event, compute the CBL as the simple average of the corresponding hourly Loads from the CBS Basis of Weekdays.

Figure 2 below shows CBL Window selection for a single weekday event. The calendar view illustrates the reverse order selection of the 10 days of the CBL Window. The calendar view shows the dates of the CBL Window for the event.

SUN	MON	TUE	WED	THU	FRI	SAT
JUN 15	JUN 16	JUN 17	JUN 18	JUN 19	JUN 20	JUN 21
JUN 22	JUN 23 *CBL DAY 10 FOR 7/9*	JUN 24 *CBL DAY 9 FOR 7/9*	JUN 25 *CBL DAY 8 FOR 7/9*	JUN 26 *CBL DAY 7 FOR 7/9*	JUN 27 *CBL DAY 6 FOR 7/9*	JUN 28
JUN 29	JUN 30 *CBL DAY 5 FOR 7/9*	JUL 1 *CBL DAY 4 FOR 7/9*	JUL 2 *CBL DAY 3 FOR 7/9*	JUL 3 *CBL DAY 2 FOR 7/9*	JUL 4 HOLIDAY	JUL 5
JUL 6	JUL 7 *CBL DAY 1 FOR 7/9*	JUL 8 INELIGIBLE DAY (DAY BEFORE)	JUL 9 SCR/EDRP EVENT	JUL 10	JUL 11	JUL 12

KEY:	NON-EVENT DAY	SCR/EDRP EVENT	DADRP SCHEDULE	INELIGIBLE DAY (DAY BEFORE)	HOLIDAY

CBL WINDOW FOR SINGLE WEEKDAY EVENT EXAMPLE												
EVENT DATE	PROGRAM	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10
9-Jul	SCR/EDRP	7-Jul	3-Jul	2-Jul	1-Jul	30-Jun	27-Jun	26-Jun	25-Jun	24-Jun	23-Jun

Figure 2 Example of CBL Window Selection - Single Weekday Event

Figure 3 below shows the CBL Windows when multiple weekday events occur. The calendar view illustrates the reverse order selection of the 10 days of the CBL Window for each event. For example, June 27 will be used as

        Day 1 for the June 30th event

        Day 2 for the July 3rd event, and

Day 4 for both the July 10th and July 11th events.

The table view shows the dates of the CBL Window for each event.

SUN	MON	TUE	WED	THU	FRI	SAT
JUN 15	JUN 16 CBL DAY 10 FOR 6/30	JUN 17 CBL DAY 9 FOR 6/30 CBL DAY 10 FOR 7/3	JUN 18 CBL DAY 8 FOR 6/30 CBL DAY 9 FOR 7/3	JUN 19 CBL DAY 7 FOR 6/30 CBL DAY 8 FOR 7/3 CBL DAY 10 FOR 7/10 CBL DAY 10 FOR 7/11	JUN 20 CBL DAY 6 FOR 6/30 CBL DAY 7 FOR 7/3 CBL DAY 9 FOR 7/10 CBL DAY 9 FOR 7/11	JUN 21
JUN 22	JUN 23 CBL DAY 5 FOR 6/30 CBL DAY 6 FOR 7/3 CBL DAY 8 FOR 7/10 CBL DAY 8 FOR 7/11	JUN 24 CBL DAY 4 FOR 6/30 CBL DAY 5 FOR 7/3 CBL DAY 7 FOR 7/10 CBL DAY 7 FOR 7/11	JUN 25 CBL DAY 3 FOR 6/30 CBL DAY 4 FOR 7/3 CBL DAY 6 FOR 7/10 CBL DAY 6 FOR 7/11	JUN 26 CBL DAY 2 FOR 6/30 CBL DAY 3 FOR 7/3 CBL DAY 5 FOR 7/10 CBL DAY 5 FOR 7/11	JUN 27 CBL DAY 1 FOR 6/30 CBL DAY 2 FOR 7/3 CBL DAY 4 FOR 7/10 CBL DAY 4 FOR 7/11	JUN 28
JUN 29	JUN 30 DADRP SCHEDULE	JUL 1 CBL DAY 1 FOR 7/3 CBL DAY 3 FOR 7/10 CBL DAY 3 FOR 7/11	JUL 2 INELIGIBLE DAY (DAY BEFORE)	JUL 3 DADRP SCHEDULE	JUL 4 HOLIDAY	JUL 5
JUL 6	JUL 7 CBL DAY 2 FOR 7/10 CBL DAY 2 FOR 7/11	JUL 8 CBL DAY 1 FOR 7/10 CBL DAY 1 FOR 7/11	JUL 9 INELIGIBLE DAY (DAY BEFORE)	JUL 10 SCR/EDRP EVENT	JUL 11 DADRP SCHEDULE	JUL 12

KEY:				
NON-EVENT	SCR/EDRP EVENT	DADRP SCHEDULE	INELIGIBLE DAY (DAY	HOLIDAY

CBL WINDOW FOR MULTIPLE WEEKDAY EVENT EXAMPLE											
EVENT DATE	PROGRAM	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10
30-Jun	DADRP	27-Jun	26-Jun	25-Jun	24-Jun	23-Jun	20-Jun	19-Jun	18-Jun	17-Jun	16-Jun
3-Jul	DADRP	1-Jul	27-Jun	26-Jun	25-Jun	24-Jun	23-Jun	20-Jun	19-Jun	18-Jun	17-Jun
10-Jul	SCR/EDRP	8-Jul	7-Jul	1-Jul	27-Jun	26-Jun	25-Jun	24-Jun	23-Jun	20-Jun	19-Jun
11-Jul	DADRP	8-Jul	7-Jul	1-Jul	27-Jun	26-Jun	25-Jun	24-Jun	23-Jun	20-Jun	19-Jun

Figure 3 Example of CBL Window Selection - Multiple Weekday Events

5.2. **The Average Day CBL for Weekends**

5.2.1. **Establish the CBL Window for Weekend**

5.2.1.1.　The CBL Window is comprised of the most recent three like (Saturday or Sunday) weekend days. There are no exclusions for Holidays or event days.

5.2.2. Establish the CBL Basis

5.2.2.1.　Calculate the Average Daily Event Period Usage value for each of the three days in the CBL Window. (Figure 4).

5.2.2.2. Order the three days according to their Average Daily Event Period Usage level.

5.2.2.3.　Eliminate the day with the lowest average value.

5.2.2.4.　The Weekend CBL Basis contains 2 days.

5.2.3. Calculate Weekend Average Day CBL values for the event.

5.2.3.1.　For each hour of the event, the CBL value is average of Load in that hour in the two days that comprise the CBL basis.

Figure 4 below shows the CBL Window when a weekend event occurs. The calendar view illustrates the reverse order selection of the 3 days of the CBL Window for the weekend event. The table view shows the dates of the CBL Window for the weekend event.

Figure 4 Example of CBL Window Selection - Weekend Event

6. Elective Weather-Sensitive CBL Formulation

6.1. Calculate the Average Day CBL values for each hour of the event period described in (5) above.

6.2. Calculate the Event Final Adjustment Factor. This factor is applied to each of the individual hourly values of the Average Day CBL.

    6.2.1. Calculate the Adjustment Basis Average CBL

        6.2.1.1. Establish the adjustment period, the two-hour period beginning with the start of the hour that is four hours prior to the commencement of the event through the end of the hour three hours prior to the event.

        6.2.1.2. Calculate the Adjustment Basis Average CBL.

        6.2.1.3. Apply the Average Day CBL formula as described in Weekdays to the adjustment period hours as though it were an event period two hours in duration, but using the five days selected for use in the Average CBL Basis (i.e., average the Loads of all ten hours).

        6.2.1.4. Calculate the average of the two load values derived in 6.2.1.3. which is the Adjustment Basis Average CBL.

    6.2.2. Calculate the Adjustment Basis Average Load

6.2.2.1.   The Adjustment Basis Average Load is the simple average the resource's Load over the two-hour adjustment period on the event day.

6.2.3. Calculate the Gross Adjustment Factor

6.2.3.1. The Gross Adjustment Factor is equal to the Adjustment Basis Average Load divided by the Adjustment Basis Average CBL

6.2.4. Determine the Final Adjustment Factor. The Final Adjustment Factor is as follows:

6.2.4.1. If the Gross Adjustment Factor is greater than 1.00, then the Final Adjustment Factor is the lesser of the Gross Adjustment Factor or 1.20

6.2.4.2.   If the Gross Adjustment Factor is less than 1.00, the Final Adjustment Factors is the greater of the Gross Adjustment Factor or .80.

6.2.4.3.   If the Gross Adjustment Factor is equal to 1.00, the Final adjustment Factor is equal to the Gross Adjustment Factor.

6.3. **Calculate the Adjusted CBL values.**

6.3.1. The Event Adjusted CBL value for each hour of an event is the product of the Final Adjustment Factor and the Average CBL value for that hour.

7. Example CBL Calculation

As an example, assume a 4-hour event was called from 12 noon to 4 pm; notice was sent out at 10 a.m. The past 10 days MWh consumption for similar hours, along with the four hours prior to event initiation, was:

Time	HB 8	HB 9	HB 10	HB 11	HB 12	HB 13	HB 14	HB 15	Avg Event Period Usage	Total Event Period Usage	Rank
CBL DAY 1	5	5	7	8	10	11	7	5	8.33	33	4
CBL DAY 2	4	3	5	6	8	6	9	6	7.25	29	7
CBL DAY 3	4	5	6	8	9	12	9	7	9.30	37	1
CBL DAY 4	4	4	5	6	7	8	6	6	6.75	27	8
CBL DAY 5	3	4	5	7	10	11	9	7	9.25	37	2
CBL DAY 6	6	2	5	8	12	8	9	7	9.00	36	3
CBL DAY 7	2	3	4	5	5	8	8	6	6.75	27	8
CBL DAY 8	3	3	4	6	7	8	8	7	7.50	30	6
CBL DAY 9	3	2	4	6	7	6	6	5	6.00	24	10
CBL DAY 10	4	4	5	7	8	10	9	6	8.25	33	5

HB: Hour Beginning

Steps 1 and 2: sum the MWh for the hours 12-4 each day and select the 5 highest total average event period usage days.

Time	HB 8	HB 9	HB 10	HB 11	HB 12	HB 13	HB 14	HB 15	Avg Event Period Usage	Total Event Period Usage	Rank
CBL DAY 1	5	5	7	8	10	11	7	5	8.33	33	4
CBL DAY 3	4	5	6	8	9	12	9	7	9.30	37	1
CBL DAY 5	3	4	5	7	10	11	9	7	9.25	37	2
CBL DAY 6	6	2	5	8	12	8	9	7	9.00	36	3
CBL DAY 10	4	4	5	7	8	10	9	6	8.25	33	5

Step 3: Calculate the CBL for each hour using the five highest days selected:

Time	HB 12	HB 13	HB 14	HB 15
Avg Day CBL	9.8	10.4	8.6	6.5

To calculate the hourly Load Reduction, for each hour, subtract the actual Load from the CBL.

Time	HB 12	HB 13	HB 14	HB 15
Avg Day CBL	9.8	10.4	8.6	6.5
EVENT DAY - Actual Load	2	3	3	4
Load Reduction using Average Day CBL	7.8	7.4	5.6	2.5

The CBL shown in Step 3 above is the non-weather-adjusted value. If this customer signed up with the weather-sensitive calculation option, the CBL would be adjusted upward or downward based on the actual usage in the two hours prior to event notification. In this example, the Adjustment Basis Average CBL will be the average of the MWh for hours beginning 8 and 9 over the five days chosen for the CBL:

Time	HB 8	HB 9	Adjustment Basis Average CBL
Avg Day CBL - Adjustment Hours	4.4	4.0	4.2

On the day of the event (day N), assume the actual metered Load Reduction is as shown in the following table:

Time	HB 8	HB 9	HB 10	HB 11	HB 12	HB 13	HB 14	HB 15	Adjustment Basis Average Usage
EVENT DAY - Actual Load	4	5	4	3	2	3	3	4	4.50

In this case, the Adjustment Basis Average Usage is the average of the MWh in hours 8 and 9, or 4.5 MWh.

The Gross Adjustment Factor is the ratio of the Adjustment Basis Average Usage to the Adjustment Basis Average CBL, 4.5/4.2 or 1.07.

Adjustment Basis Average Usage	Adjustment Basis Average CBL	Gross Adjustment Factor
4.50	4.2	1.07

The CBL will therefore be adjusted upward by seven percent. The following table shows the resulting weather-adjusted CBL and the computed Load Reduction for the four-hour event period.

Time	HB 12	HB 13	HB 14	HB 15
Weather-Adjusted CBL	10.5	11.1	9.2	7.0
EVENT DAY - Actual Load	2	3	3	4
Load Reduction using Weather-Adjusted CBL	8.5	8.1	6.2	3.0

It is important to note that if the actual usage in the two hours prior to notification was *lower* than the Adjustment Basis Average CBL, the CBL curve would have been shifted *downward* and would result in Load Reduction performance that was lower than would have been determined using the Average Day CBL (without weather adjustment).