

## Normalized EUE Calculation Methods

### Background

A request was brought up at the February 2, 2023 NYSRC RCMS meeting, during the 2022 Long Term Resource Adequacy Assessment (LTRAA) presentation that we (for both the IRM and the LTRAA) also provide, **for information**, a normalized Expected Unserved Energy (EUE), additional to the already-provided EUE in MWh.

Al Adamson suggested the “Simple Method” below to present a normalized EUE value. Ben O’Rourke of NYISO Resource Planning indicated that since NYISO models 7x8760h MW load levels (bins), it may involve additional considerations. Below are the two methods that were developed to date following that discussion.

### Simple Method

Normalized EUE (ppm) = (EUE/GB forecast)\*1,000,000

ppm = parts per million; GB = NYISO’s Gold Book

### Bin Method

At the February 2 RCMC meeting, Ben O’Rourke suggested that—since NYISO uses different load levels (bins), each weighted differently, in MARS 7—the Normalized EUE should be calculated for each Bin, and then weighted by the bin probabilities:

Normalized EUE (ppm) = 1,000,000 \*  $\sum_1^n (EUE_n / LFU\_Adj\_Energy_n) * Weight_n$

*n = load level (bin number)*

*LFU\_Adj\_Energy = Modeled load after LFU multiplication*

*Weight = Load Level (bin) probability*

The “Bin Method” calculation requires a more intensive effort to calculate based on the margin files and case parameters.

### Summary

As an example, we used both calculation methodologies on the **2022 RNA Base Case for study year 2032** model, and below are the results.

Simple Method: 0.071 ppm

Bin Method: 0.062 ppm

**Figure 1: 2022 RNA Base Case for Study Year 2032 Results**

2022 RNA Base Case Study Year		LOLE	LOLH	LOEE (EUE)	Normalized LOEE (EUE)	Normalized LOEE (EUE)
		event-days/year	event-hours/year	MWh/year	"Simple Method" ppm	"Bin Method" ppm
y10	2032	0.022	0.045	11.382	0.071	0.062

Additionally, the normalized EUE for the 2023-2024 IRM, with applying both calculation methodologies are as follows:

**Figure 2: 2023-2024 IRM Results**

Cases	IRM	J_LCR (Preliminary)	K_LCR (Preliminary)	LOLE	LOLH	Normalized EUE Simple method	Normalized EUE Bin method
2023-2024 IRM FBC Base Case Technical Results	19.9%	78.2%	107.4%	0.100	0.35842	1.264	1.103
Adjusted 2023-2024 IRM FBC with EC approved IRM	20.0%	78.2%	107.4%	0.098	0.35334	1.236	1.078