

Review of 2023 Regional Load Growth Factors

Max Schuler

Demand Forecasting & Analysis

Load Forecasting Task Force

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Agenda

- **Regional Load Growth Factor (RLGF) Evaluation Criteria**
- **2022 Economic Data**
- **Evaluation of 2023 RLGFs**

RLGF Evaluation Criteria

Evaluation of RLGFs – Criteria 1, 2, and 3

- **Regional Load Growth Factors are submitted to the NYISO by the Transmission Owners, and reflect expected growth in summer peak load. The 1+RLGF is expressed as the ratio of the forecast year peak load to the current year weather normalized peak.**

- **The Load Forecasting Manual specifies that the NYISO will evaluate Regional Load Growth Factors (RLGFs) in the current year for each Transmission District based upon three criteria:**
 - **Criterion 1 – Index of Recent Historical Peak Load Growth**
Bandwidth based only on the recent growth of weather-adjusted peaks
 - **Criterion 2 – Projection of Peak Load Growth in Relation to Economic Growth**
Projection of peak load growth based on a regression of historical summer daily peaks, historical economic data and other variables, and projected economic growth
 - **Criterion 3 – Projections Performed by the ISO**
An independent projection of load growth currently based upon a regression of historical summer energy, historical economic data and other variables, and projected economic growth

- **If at least two of the three criteria are satisfied, then the load growth factor for the Transmission District is accepted.**

Criterion 1 – Index of Recent Historical Peak Load Growth

- Calculate annual growth in weather normalized peaks over the past five years, using Transmission Owner's weather normalized peaks
- Select the 2nd highest annual growth rate of weather-normalized peaks as the upper bound on growth and the 2nd lowest annual growth rate of weather normalized peaks as the lower bound on growth, with a minimum of a 1% difference between the two

Criterion 2 – Projection of Peak Load Growth in Relation to Economic Growth

- Uses daily weather, peak and economic data from the most recent five to 15 summers
- Regression model based on top ten Transmission District peak load days from each summer
- Regress daily peak MW against daily weather, annual macroeconomic variable(s), energy efficiency and BTM solar growth variable if significant, and other variables as appropriate to determine next year's predicted peak load using the projected economic growth
- Calculate a 25th to 75th percentile confidence interval for the predicted peak load based on the standard error of the regression to obtain the upper and lower bounds for the RLGf, with a minimum of a 1% difference between the two. The NYISO may take into account additional factors when establishing the range for Criterion 2.

Criterion 3 – Projections Performed by the ISO: Summer Energy Growth

- Regress historical summer energy against summer CTHI (Cumulative Temperature & Humidity Index), macroeconomic variable(s) if significant, energy efficiency and BTM solar growth variable, and other variables as appropriate to determine the predicted summer energy for the following year
- Calculate a 25th to 75th percentile confidence interval for the predicted summer energy based on the standard error of the regression to obtain the upper and lower bounds for the RLGf, with a minimum of a 1% difference between the two. The NYISO may take into account additional factors when establishing the range for Criterion 3
- Criterion 3 is an independent projection performed by the ISO, and is an independent measure separate from Criteria 1 and 2. The NYISO may change the Criterion 3 methodology as necessary

Combined Criterion (Criteria 1 and 2)

- In the event that the ranges for Criterion 1 and Criterion 2 are mutually exclusive, the NYISO will construct an alternate Criterion by combining the ranges of Criterion 1 and Criterion 2
- The upper and lower bounds of the combined Criterion shall typically be calculated by averaging the upper bounds of Criterion 1 and Criterion 2, and averaging the lower bounds of Criterion 1 and Criterion 2, with a minimum 1% difference between the upper and lower bounds
- In the event that Criterion 1 and Criterion 2 are combined, then it is sufficient for the RLGf to satisfy either the Combined Criterion or Criterion 3

2022 Economic Data

Summary of Economic Data (1 of 2)

Variable & TD	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Con-Ed_Employment	4,452	4,598	4,734	4,823	4,918	4,997	5,186	4,461	4,675	4,917	5,017	5,077
Con-Ed_GDP	758,714	778,822	786,858	811,725	822,064	850,346	889,341	826,615	883,226	905,534	928,235	950,311
Con-Ed_Households	3,583	3,611	3,636	3,656	3,649	3,644	3,636	3,610	3,628	3,636	3,643	3,645
Con-Ed_Income-Real	557,756	578,484	603,517	622,925	668,014	672,588	682,237	710,555	721,681	695,538	723,945	741,801
Con-Ed_Population	9,364	9,403	9,434	9,443	9,407	9,357	9,300	9,270	9,266	9,283	9,299	9,305
Cen-Hud_Employment	191	191	193	195	196	198	200	176	184	189	191	194
Cen-Hud_GDP	23,008	22,924	23,127	23,333	23,381	24,208	24,588	22,238	23,967	24,263	24,907	25,621
Cen-Hud_Households	201	202	202	203	205	206	207	205	205	205	206	205
Cen-Hud_Income-Real	22,880	23,203	24,194	24,512	25,353	25,471	26,193	27,716	28,029	26,356	27,304	28,011
Cen-Hud_Population	525	523	521	519	520	520	519	516	515	515	515	514
LIPA_Employment	1,285	1,297	1,313	1,333	1,347	1,349	1,367	1,190	1,281	1,320	1,347	1,361
LIPA_GDP	172,034	174,759	178,221	179,639	180,604	182,252	183,892	170,252	185,783	188,741	193,131	197,672
LIPA_Households	966	970	973	976	978	982	983	976	981	981	982	982
LIPA_Income-Real	179,713	184,753	192,853	196,815	203,498	206,717	210,585	218,689	224,806	213,979	221,779	226,309
LIPA_Population	2,850	2,851	2,847	2,842	2,841	2,838	2,834	2,823	2,820	2,817	2,817	2,813
N-Grid_Employment	1,817	1,821	1,830	1,849	1,858	1,866	1,883	1,675	1,742	1,799	1,825	1,844
N-Grid_GDP	224,545	230,011	233,510	237,437	238,450	243,093	249,087	232,387	248,926	250,389	255,311	261,773
N-Grid_Households	1,648	1,655	1,659	1,665	1,671	1,679	1,680	1,665	1,671	1,672	1,673	1,672
N-Grid_Income-Real	164,625	166,255	173,352	172,982	180,456	179,811	183,906	198,120	200,779	187,667	192,541	196,231
N-Grid_Population	4,007	4,001	3,987	3,970	3,966	3,959	3,947	3,923	3,917	3,915	3,914	3,908

Variable	Unit
Employment	1,000
GDP	\$ Millions
Households	1,000
Income-Real	\$ Millions
Population	1,000

Data is from Moody's Analytics, August 2022.

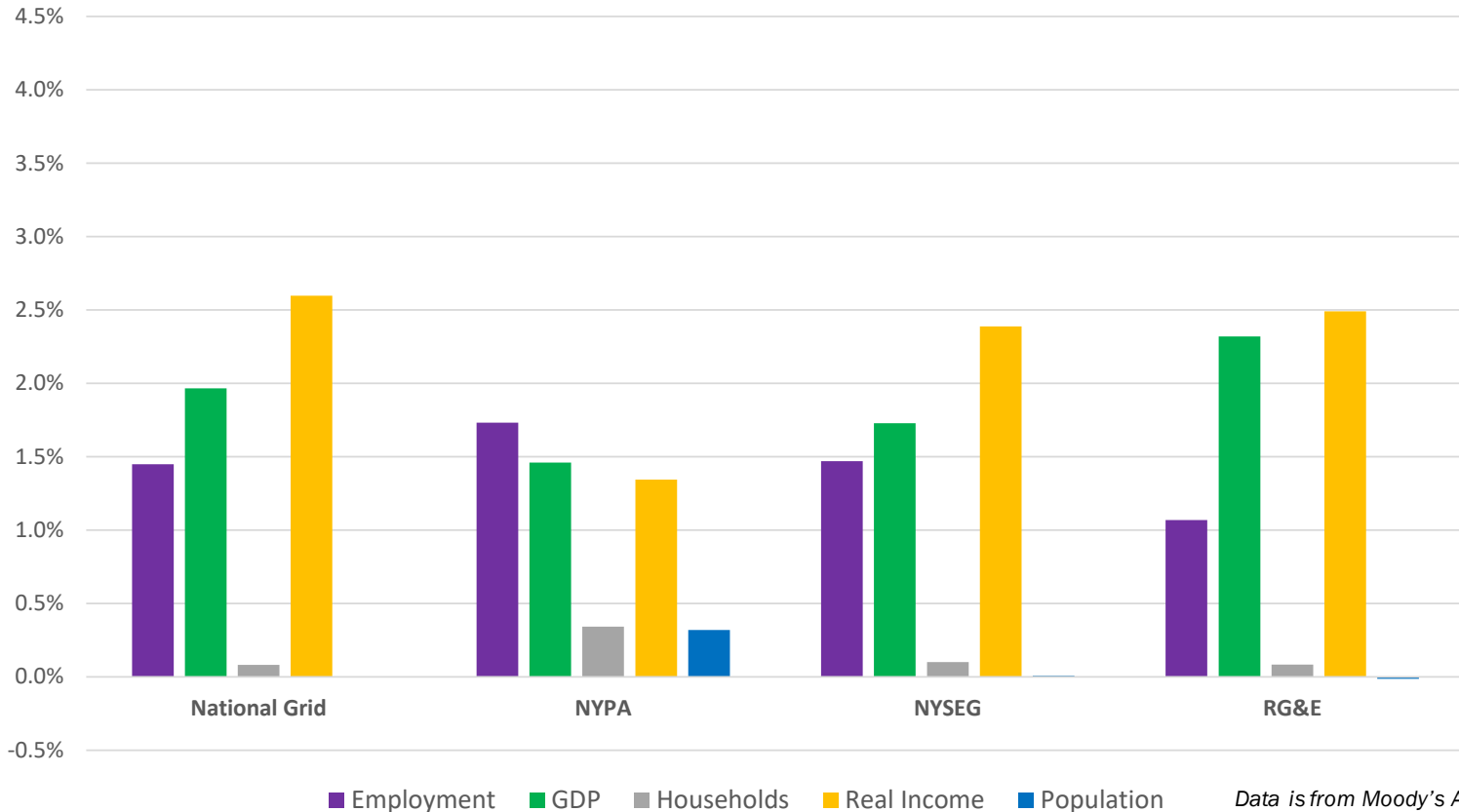
Summary of Economic Data (2 of 2)

Variable & TD	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
NYPA_Employment	34	34	33	34	35	35	35	31	32	34	34	35
NYPA_GDP	3,729	3,711	3,764	3,859	3,987	4,125	4,168	3,604	3,950	3,974	4,032	4,124
NYPA_Households	32	32	32	33	33	33	33	33	33	33	33	33
NYPA_Income-Real	3,042	3,039	3,211	3,163	3,287	3,209	3,253	3,488	3,446	3,301	3,346	3,413
NYPA_Population	81	82	81	80	81	81	81	80	80	80	81	80
NYSEG_Employment	420	418	416	418	420	424	426	376	391	403	409	413
NYSEG_GDP	48,928	48,933	49,140	49,470	49,511	51,093	52,170	47,228	50,876	51,028	51,910	53,229
NYSEG_Households	421	421	421	422	421	423	422	418	420	420	420	420
NYSEG_Income-Real	40,252	40,765	41,981	41,582	43,221	43,250	44,100	47,254	47,701	44,724	45,792	46,693
NYSEG_Population	1,052	1,046	1,039	1,033	1,027	1,024	1,019	1,011	1,009	1,009	1,009	1,007
OR_Employment	261	267	272	276	282	286	298	264	277	293	300	306
OR_GDP	32,416	32,990	33,904	34,585	34,947	35,972	37,720	35,069	37,573	38,241	39,062	40,317
OR_Households	229	231	232	233	235	236	238	237	240	242	244	245
OR_Income-Real	32,733	33,188	34,741	34,747	35,873	36,156	37,024	39,641	40,075	39,299	40,595	41,754
OR_Population	694	696	699	701	705	708	711	711	714	720	725	730
RGE_Employment	501	504	507	512	513	517	522	464	484	499	504	510
RGE_GDP	62,436	63,502	64,512	66,174	65,157	66,836	68,250	62,736	67,228	68,112	69,692	71,683
RGE_Households	427	429	431	432	433	436	437	433	435	435	436	435
RGE_Income-Real	44,122	44,307	46,649	46,288	48,221	48,021	48,889	52,370	52,557	48,838	50,055	50,897
RGE_Population	1,055	1,053	1,049	1,046	1,043	1,043	1,041	1,035	1,033	1,032	1,032	1,031
Employment_NYCA	8,961	9,130	9,299	9,439	9,568	9,672	9,916	8,637	9,066	9,453	9,629	9,739
GDP_NYCA	1,325,809	1,355,653	1,373,035	1,406,222	1,418,101	1,457,926	1,509,216	1,400,130	1,501,529	1,530,281	1,566,281	1,604,730
Households_NYCA	7,508	7,552	7,586	7,620	7,625	7,640	7,636	7,578	7,614	7,625	7,637	7,638
Income_NYCA	1,045,125	1,073,995	1,120,497	1,143,012	1,207,924	1,215,224	1,236,186	1,297,832	1,319,075	1,259,703	1,305,357	1,335,110
Population_NYCA	19,628	19,653	19,656	19,634	19,589	19,529	19,451	19,369	19,355	19,371	19,392	19,388

Data is from Moody's Analytics, August 2022.

Transmission District Economic Indicators (1 of 2)

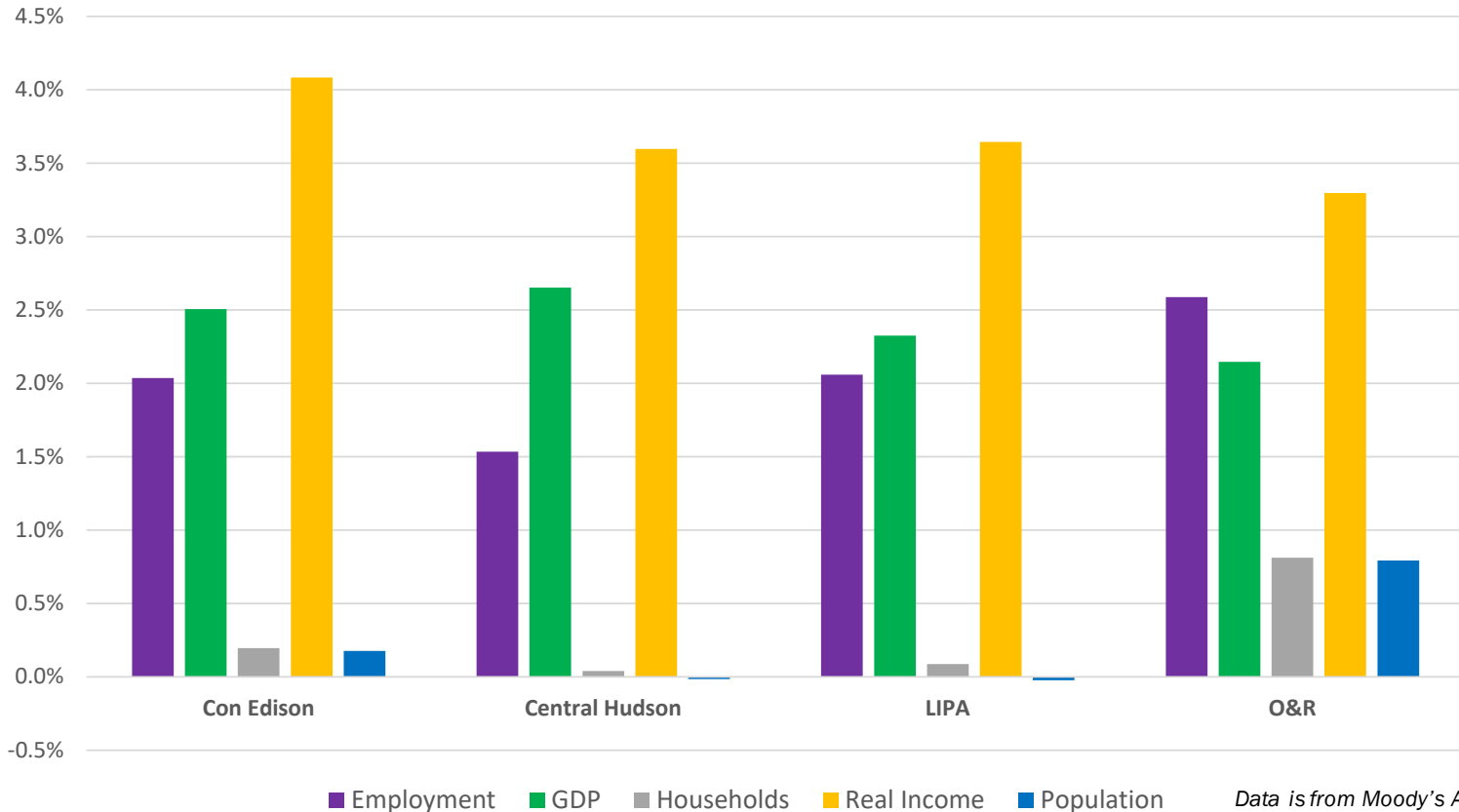
Forecasted percent growth – July 2022 to July 2023



Data is from Moody's Analytics, August 2022.

Transmission District Economic Indicators (2 of 2)

Forecasted percent growth – July 2022 to July 2023



Data is from Moody's Analytics, August 2022.

Evaluation of 2023 RLGFs

2023 Criteria 1, 2 & 3 RLGf Evaluation Summary

T.O.	Criterion	Lower Bound	2023 1+RLGf	Upper Bound	Test	2022 1+RLGf
Con Edison	Criterion 1 - Historical Peaks	0.9950	1.0203	1.0050	0	1.0190
Con Edison	Criterion 2 - Economic Projection	0.9987	1.0203	1.0217	1	1.0190
Con Edison	Criterion 3 - Summer Energy	0.9918	1.0203	1.0206	1	1.0190
Central Hudson	Criterion 1 - Historical Peaks	0.9697	0.9928	1.0085	1	1.0050
Central Hudson	Criterion 2 - Economic Projection	0.9749	0.9928	1.0243	1	1.0050
Central Hudson	Criterion 3 - Summer Energy	0.9816	0.9928	1.0174	1	1.0050
LIPA	Criterion 1 - Historical Peaks	0.9814	0.9874	0.9915	1	0.9781
LIPA	Criterion 2 - Economic Projection	0.9858	0.9874	1.0157	1	0.9781
LIPA	Criterion 3 - Summer Energy	0.9877	0.9874	0.9998	0	0.9781
National Grid	Criterion 1 - Historical Peaks	0.9911	1.0039	1.0073	1	1.0000
National Grid	Criterion 2 - Economic Projection	0.9783	1.0039	1.0044	1	1.0000
National Grid	Criterion 3 - Summer Energy	0.9857	1.0039	1.0001	0	1.0000
NYSEG	Criterion 1 - Historical Peaks	0.9724	0.9944	1.0150	1	1.0081
NYSEG	Criterion 2 - Economic Projection	0.9887	0.9944	1.0130	1	1.0081
NYSEG	Criterion 3 - Summer Energy	0.9921	0.9944	1.0069	1	1.0081
O&R	Criterion 1 - Historical Peaks	0.9774	1.0036	1.0308	1	0.9900
O&R	Criterion 2 - Economic Projection	0.9969	1.0036	1.0389	1	0.9900
O&R	Criterion 3 - Summer Energy	1.0016	1.0036	1.0186	1	0.9900
RG&E	Criterion 1 - Historical Peaks	0.9652	1.0145	1.0180	1	0.9974
RG&E	Criterion 2 - Economic Projection	0.9929	1.0145	1.0255	1	0.9974
RG&E	Criterion 3 - Summer Energy	1.0029	1.0145	1.0154	1	0.9974

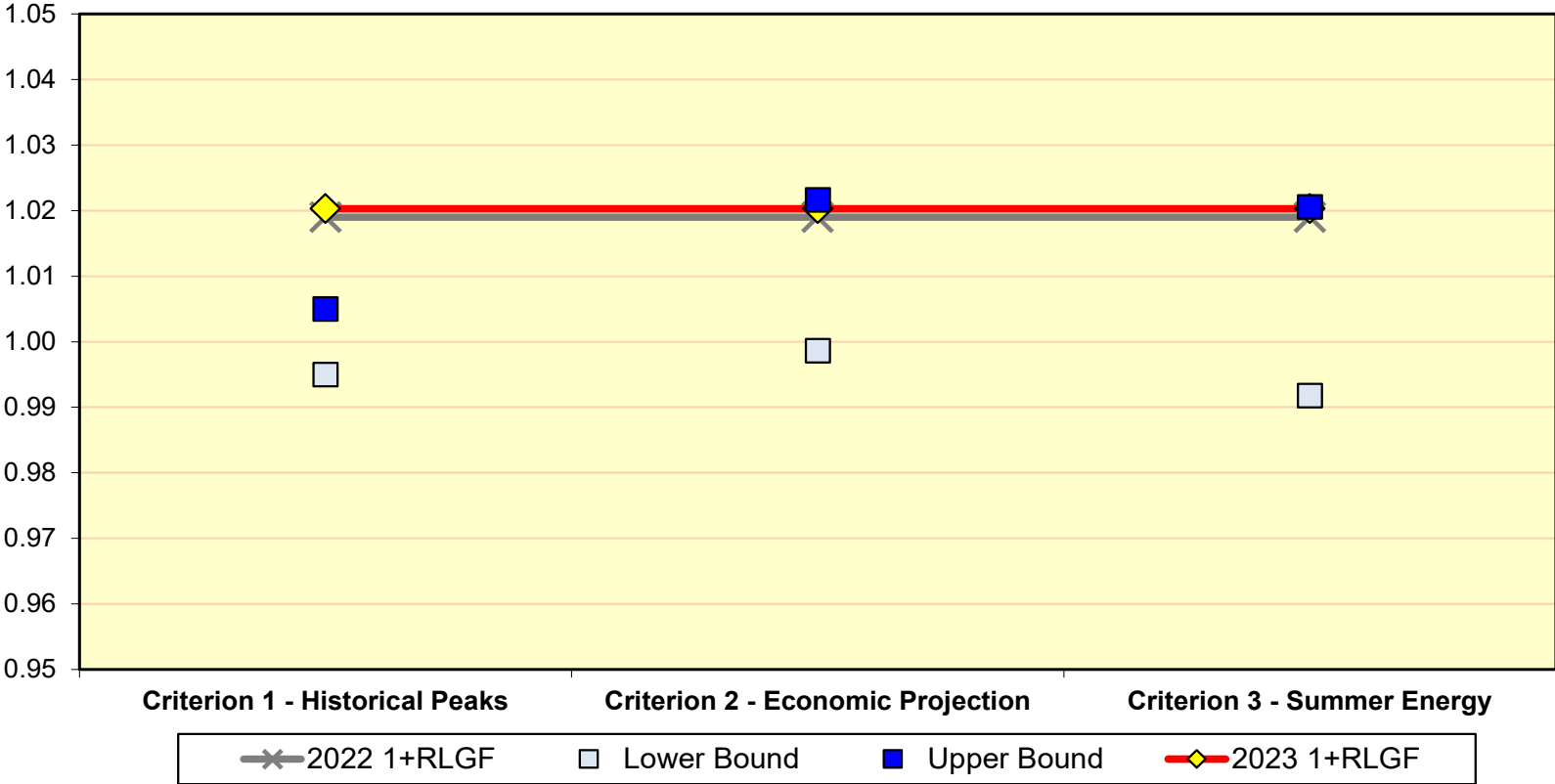
Load Growth Criteria

A '1' in the column labeled 'Test' indicates that the RLGf is between the upper and lower bandwidths.

A '0' in the column labeled 'Test' indicates that the RLGf is not between the upper and lower bandwidths.

Each RLGf must fall within 2 of the 3 criteria. In the event that Criteria 1 and 2 are mutually exclusive and a Combined Criterion is required, it is sufficient for the RLGf to fall within either the Combined Criterion or Criterion 3.

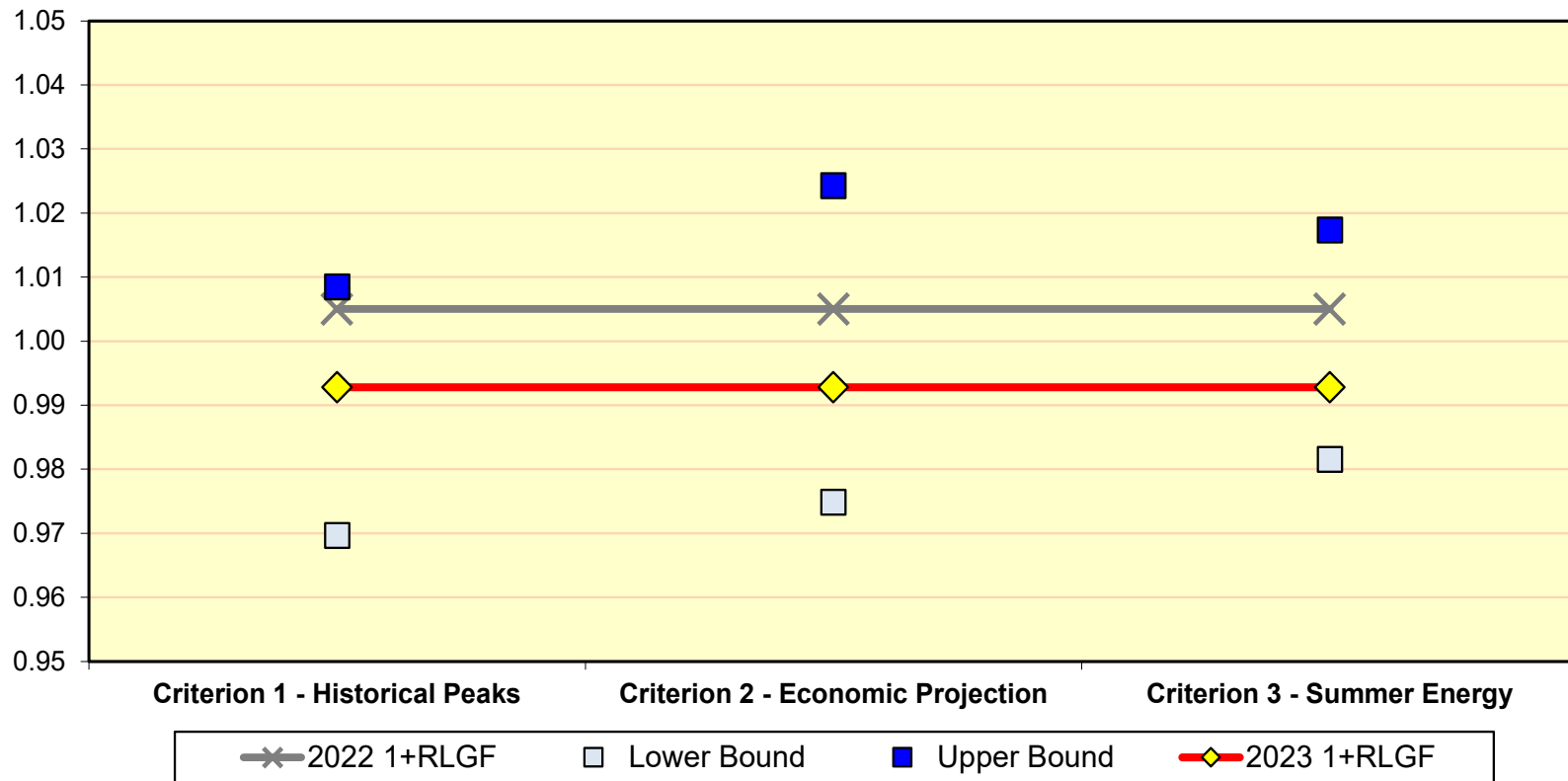
Con Edison 1+RLGF Criteria



The Con Edison 1+RLGF of 1.0203 passes Criteria 2 and 3, and is accepted.

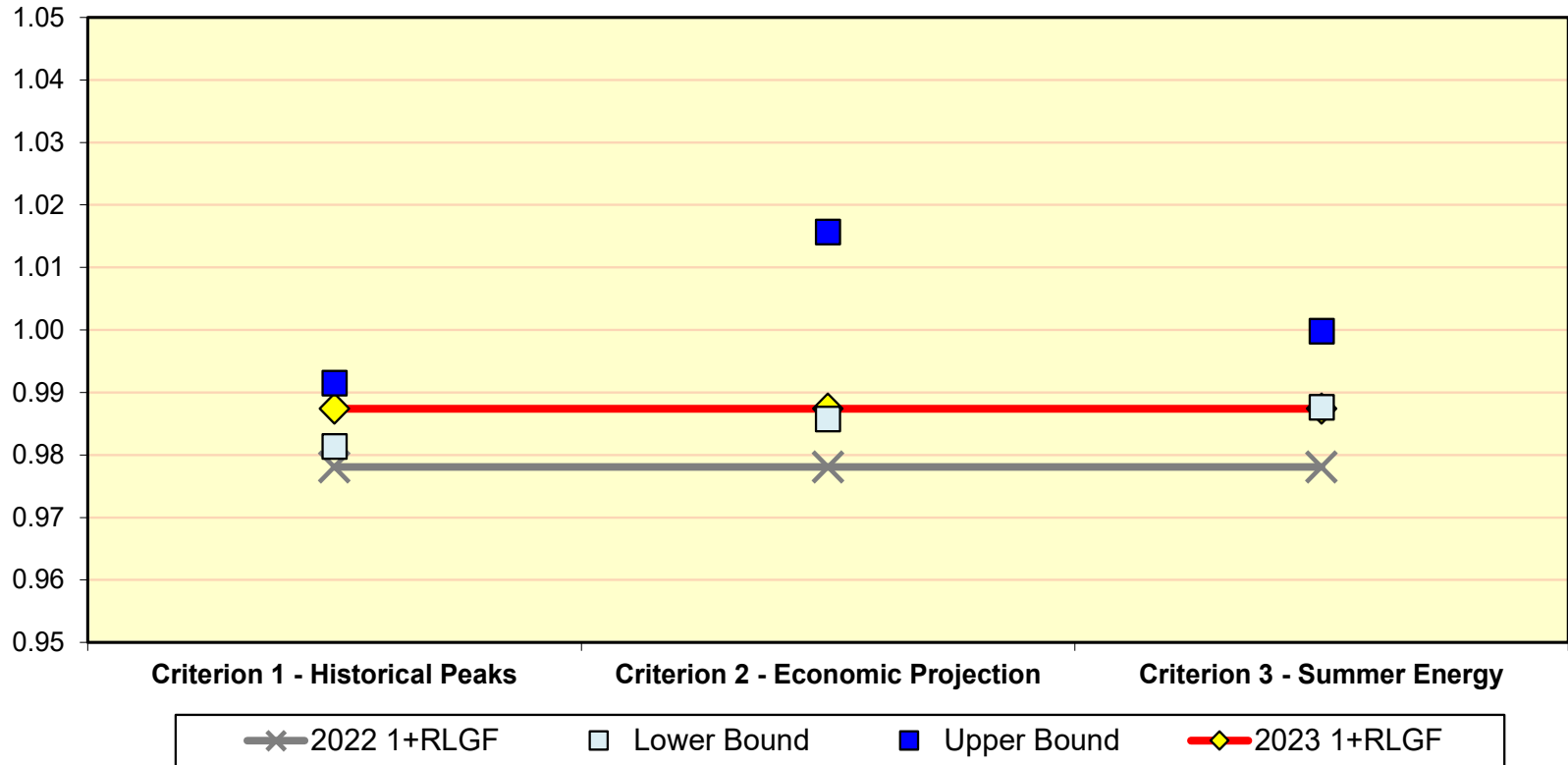


Central Hudson 1+RLGF Criteria



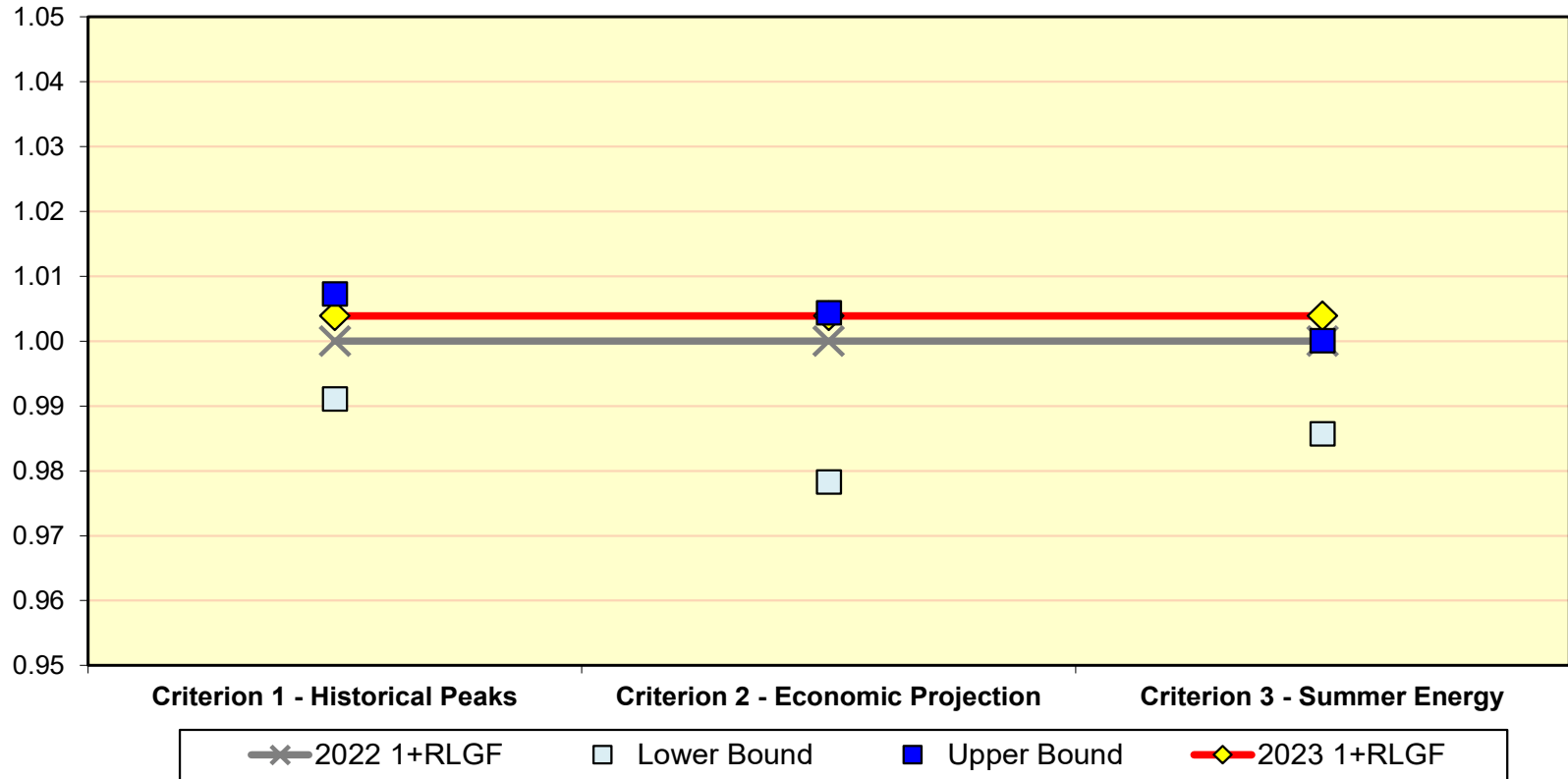
The Central Hudson 1+RLGF of 0.9928 passes all three Criteria and is accepted.

LIPA 1+RLGF Criteria



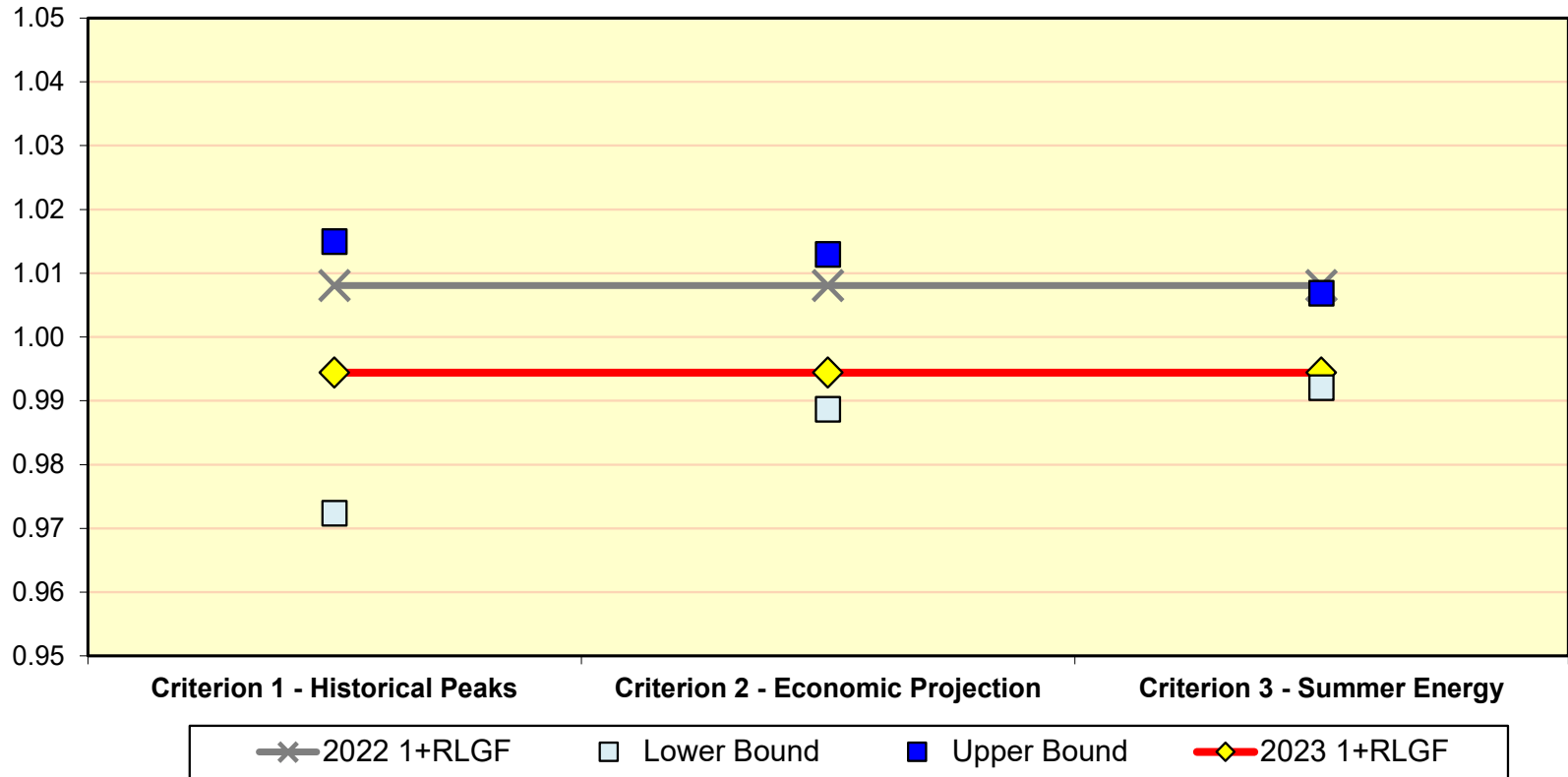
The LIPA 1+RLGF of 0.9874 passes Criteria 1 and 2, and is accepted.

National Grid 1+RLGF Criteria



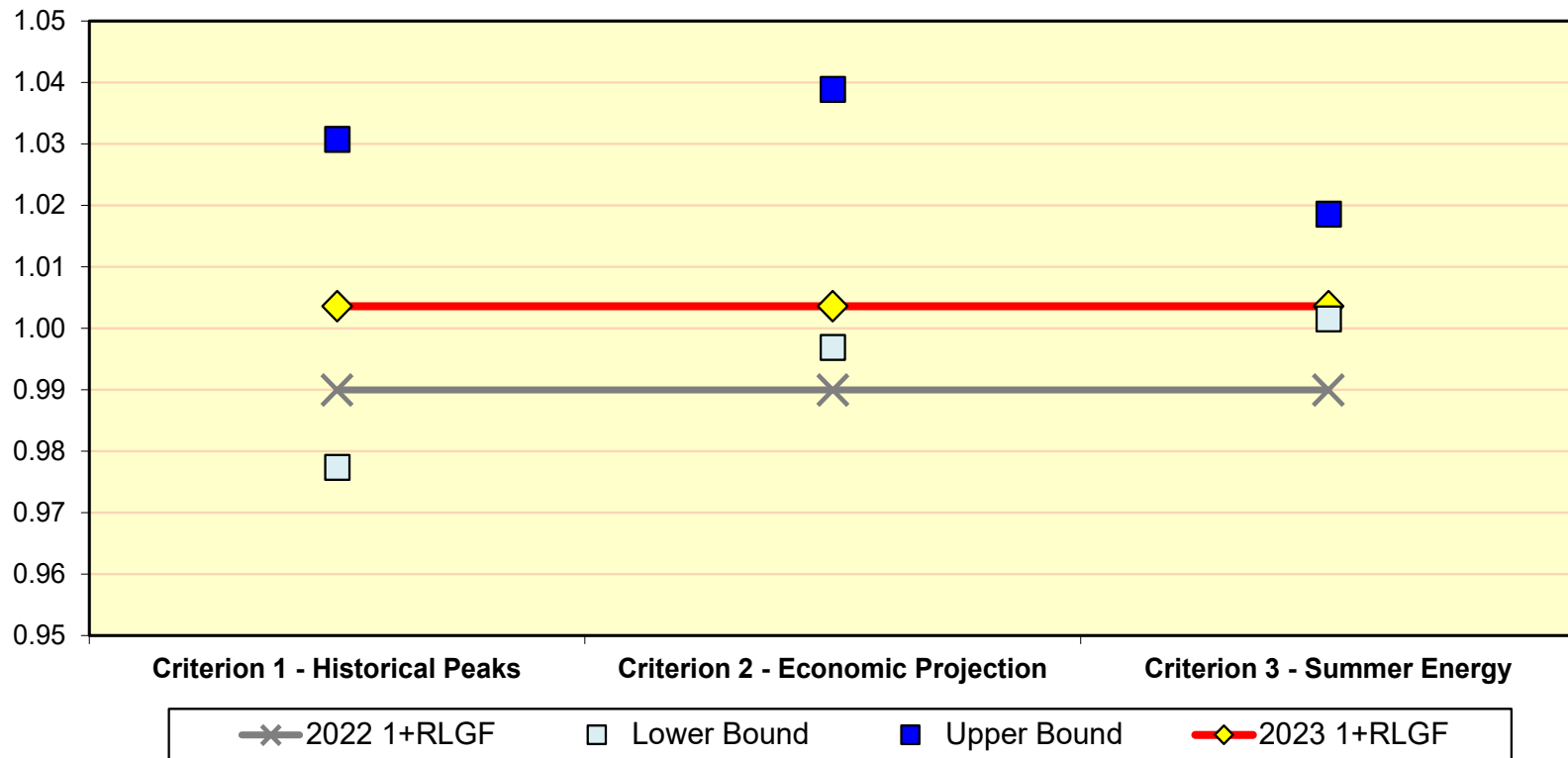
The National Grid 1+RLGF of 1.0039 passes Criteria 1 and 2, and is accepted.

NYSEG 1+RLGF Criteria



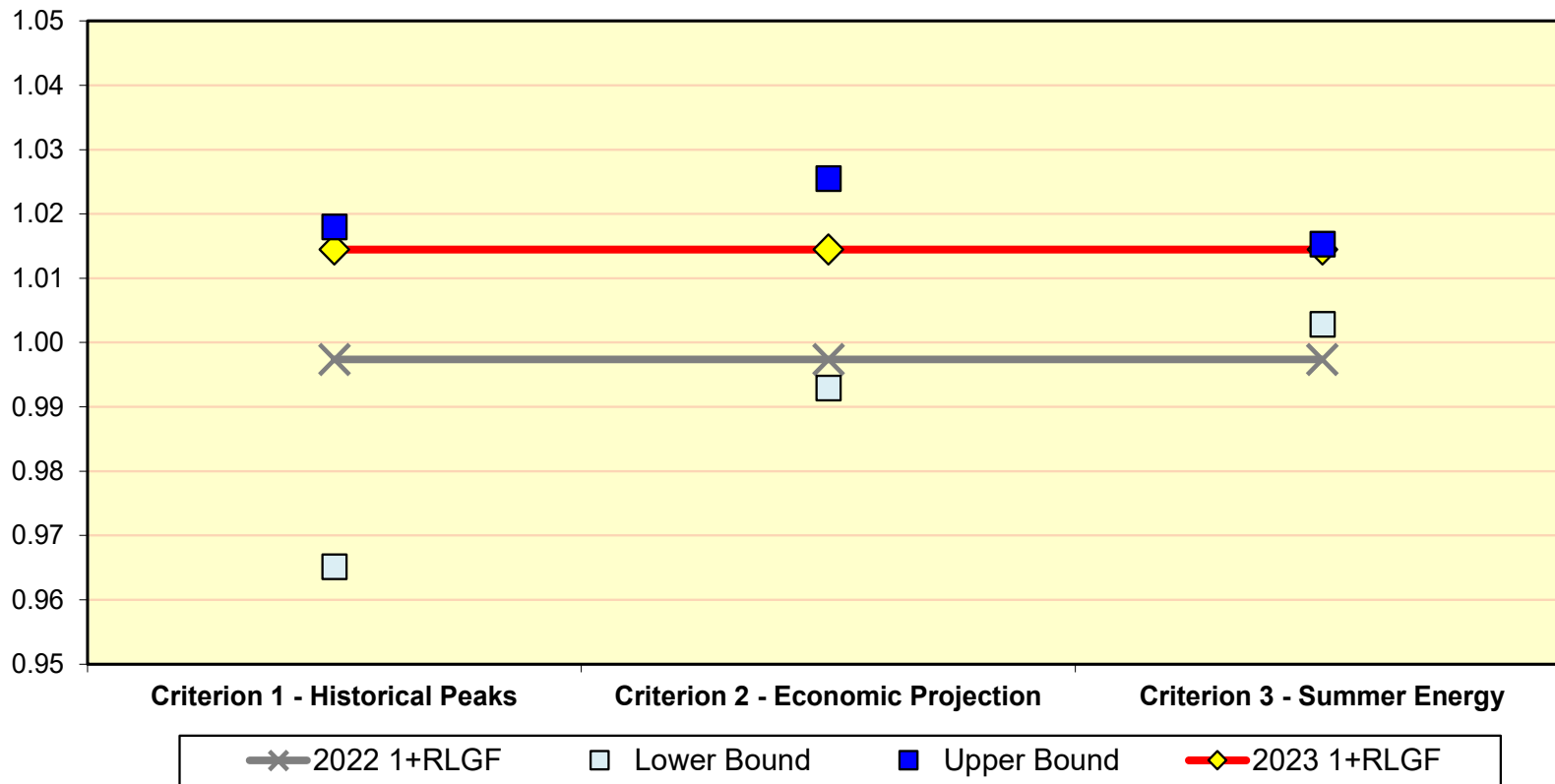
The NYSEG 1+RLGF of 0.9944 passes all three Criteria and is accepted.

Orange & Rockland 1+RLGF Criteria



The Orange & Rockland 1+RLGF of 1.0036 passes all three Criteria and is accepted.

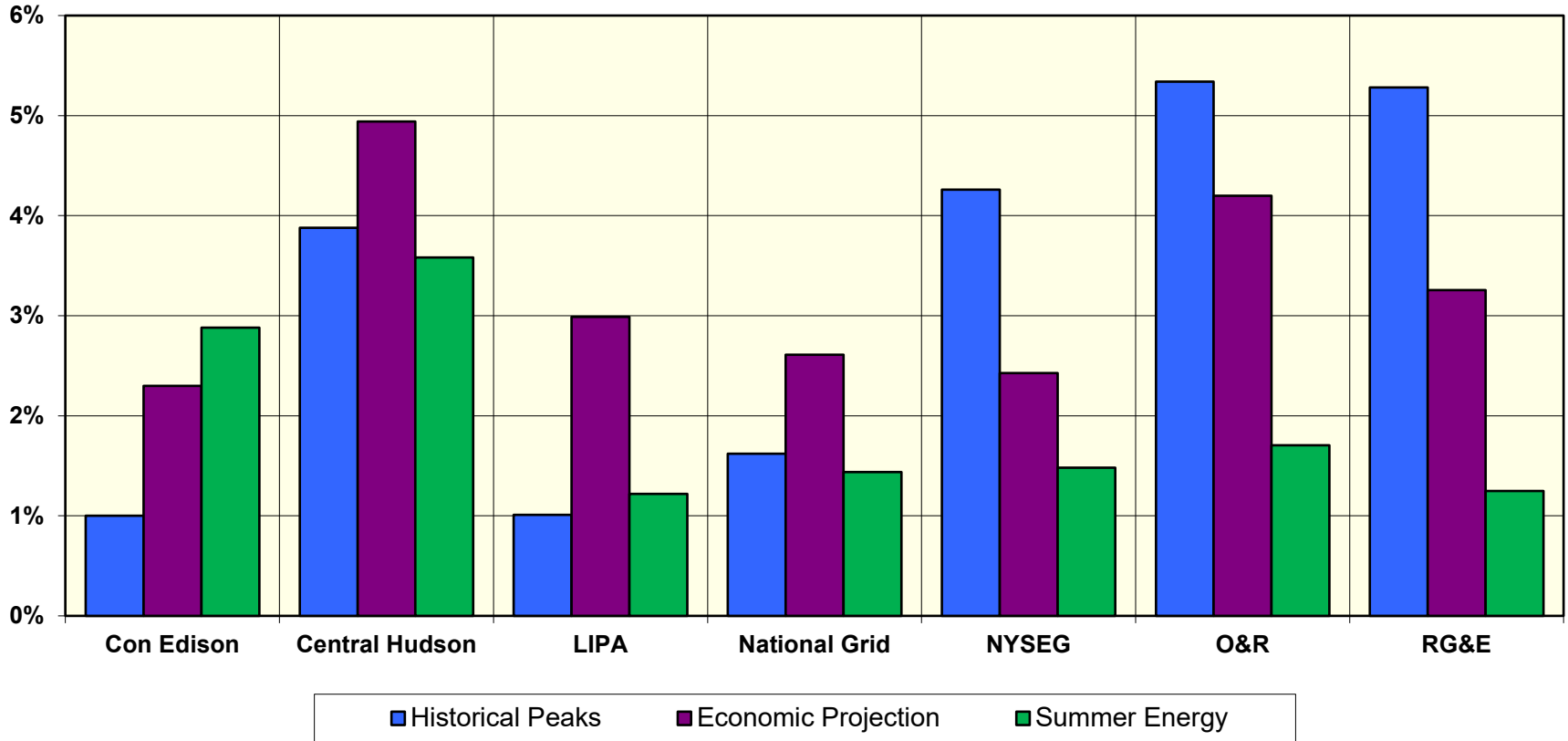
RG&E 1+RLGF Criteria



The RG&E 1+RLGF of 1.0145 passes all three Criteria and is accepted.

Summary of Criteria Bandwidths (Low to High)

Shows the Range of Variation for the Three Criteria



Questions?

Our Mission & Vision



Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation