

NYSRC Fall Forecast Update –

Preliminary 2020 Weather Normalization and 2021 IRM Forecast

Max Schuler

Demand Forecasting & Analysis

Load Forecasting Task Force

September 25, 2020

Agenda

Summary of 2020 Preliminary Weather Normalized Peaks

Weather Normalization Models

Update of Ratios of Non-Coincident Peaks to Coincident Peaks

Preliminary 2021 IRM Forecast



Preliminary IRM Forecast Updates

- Transmission Owner 2020 peak weather adjustment estimates were compared with NYISO estimates. Weather normalized peak values were adjusted where appropriate. Transmission Districts with updated 2020 coincident peak weather normalized values include Con Ed, Central Hudson, LIPA, National Grid, and O&R.
- The RG&E coincident peak weather normalized load was adjusted upwards to account for the load-reducing impacts of a cool front with showers passing through the Rochester area during the hour of the NYCA peak.
- Transmission Owner 2021 Regional Load Growth Factor estimates were compared with NYISO estimates. 1+RLGF values where adjusted where appropriate. Transmission Districts with updated 2021 1+RLGF projections include Con Ed, Central Hudson, LIPA, National Grid, NYPA, and O&R.
- Resulting changes were made to the Locality weather normalized peaks and forecast values.
- The Zone K Locality NCP to CP ratio was modified to use a 15-year history and the removal of an outlier to better represent the typical diversity in the Zone K peak.



Summary of 2020 Preliminary Weather Normalized Peaks



Actual and 20-Year Normal Peak-Producing CTHI Statistics – 2001-2020

NYCA Coincident Peak-Producing CTHI

Statistic	CE	СН	LI	N Grid	NYPA	NYSEG	OR	RGE	NYCA
Max	90.73	89.63	89.71	86.42	87.72	87.44	89.60	87.75	88.06
20 Yr Avg	85.71	85.65	85.03	82.57	82.30	82.78	84.85	83.21	84.02
Min	82.80	81.18	80.18	77.35	77.13	78.22	81.59	77.80	80.38
StDev	2.33	2.33	2.61	2.24	3.14	2.29	2.41	2.37	2.26
50th	85.71	85.65	85.03	82.57	82.30	82.78	84.85	83.21	84.02
57th	86.12	86.06	85.49	82.96	82.85	83.18	85.27	83.63	84.42
67th	86.72	86.66	86.16	83.54	83.66	83.77	85.89	84.23	85.00
90th	88.70	88.64	88.38	85.44	86.33	85.72	87.94	86.25	86.92
2020	84.59	85.21	85.02	82.11	84.19	83.02	83.96	81.35	83.56
Percentile	32%	43%	50%	42%	73%	54%	36%	22%	42%
z (2020)	-0.48	-0.19	0.00	-0.21	0.60	0.10	-0.37	-0.78	-0.20
CTHI Delta	-1.12	-0.44	-0.01	-0.46	1.89	0.24	-0.89	-1.86	-0.46

Notes: Cumulative Temperature & Humidity Index (CTHI) is a three-day weighted average of maximum temperature and humidity The NYCA design condition of the 57th percentile is based upon a load-weighted average of the TD design conditions. The 2020 NYCA peak occurred on July 27, Hour Beginning 17.

Summary of 2020 Preliminary Weather Normalization

Weather Normalized Coincident Peak

			Weather	2020 WN CP
TD	Actual CP MW	Delta CTHI	Adjustment	MW
טו	Actual CF IVIVV	Denta CITI	Aujustinent	
Con Ed	11,273	2.13	605	11,878
Cen Hud	1,093	0.44	15	1,108
LIPA	5,344	0.01	-181	5,163
Nat Grid	6,702	0.46	36	6,738
ΝΥΡΑ	405	-1.89	-1	404
NYSEG	3,178	-0.24	-17	3,161
O&R	1,038	1.93	36	1,074
RG&E	1,417	1.86	137	1,554
NYCA	30,450	0.86	631	31,081

Notes: Con-Edison & O&R are at 67th percentile design conditions. Excludes DR impacts and municipal generation.



Summary of 2020 Preliminary Transmission District Weather Normalization NYCA Coincident Peak

(1)	(2)	(3a)	(3b)	(4)	(5)	(6) = (3b)+(4)+(5)	(7)	(8) = (7)-(6)	(9) = (8)/(7)
Transmission District	2020 Actual MW, 7/27/2020 HB 17	Demand Response Estimate MW	2020 Actual MW, with DR Estimate	Estimated Muni Self-Gen	Weather Adjustment MW	2020 Weather Normalized MW	2020 ICAP Forecast, Without Loss Adjustment	TO Forecast, Over /Under MW	TO Forecast Delta, Percent Over /Under
Con Edison	11,273	177	11,450	0	605	12,055	13,034	979	7.5%
Cen Hudson	1,093	0	1,093	0	15	1,108	1,087	-21	-1.9%
LIPA	5,344	20	5,364	7	-181	5,190	5,115	-75	-1.5%
Nat. Grid	6,702	186	6,888	48	36	6,972	6,921	-51	-0.7%
NYPA	405	0	405	0	-1	404	387	-17	-4.4%
NYSEG	3,178	54	3,232	0	-17	3,215	3,173	-42	-1.3%
O&R	1,038	11	1,049	0	36	1,085	1,059	-26	-2.5%
RG&E	1,417	8	1,425	0	137	1,562	1,520	-42	-2.8%
NYCA Total	30,450	456	30,906	55	631	31,592	32,296	704	2.2%

Notes: Peak load hours are defined by PI. Actual load data is from DSS. The Demand Response impacts are estimates.



Summary of 2020 Preliminary Transmission District Weather Normalization Locality Peaks

	2020 Locality Peak Information				2020 Locality Weather Normalization Calculation							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	$(9) = (7)^*(8)$	(10) = (9)-(6)	(11)	(12)	(13)
Locality	Date and Time (Hr Beginning)	2020 Actual MW	Demand Response Estimate MW	Estimated Muni Self-Gen	2020 Actual Load including DR and Muni Self-Gen	2020 Weather Normalized Coincident Peak Demand	NCP to CP Ratio	2020 Locality Weather Normalized MW	Locality Weather Adjustment MW	2020 ICAP Market Forecast MW	Forecast Over/Under MW	Forecast Percent Over/Under
Zone J - NYC	7/28/2020 HB 15	10,061	0	0	10,061	10,372	1.0183	10,562	501	11,477	915	8.7%
Zone K - LI	7/28/2020 HB 15	5,428	20	7	5,455	5,190	1.0152	5,268	-187	5,228	-40	-0.8%
Zones G-to-J	7/28/2020 HB 14	14,057	0	0	14,057	14,635	1.0106	14,791	734	15,695	904	6.1%

Notes: Peak load hours are defined by PI. Actual load data is from DSS.

The Demand Response impacts are estimates.

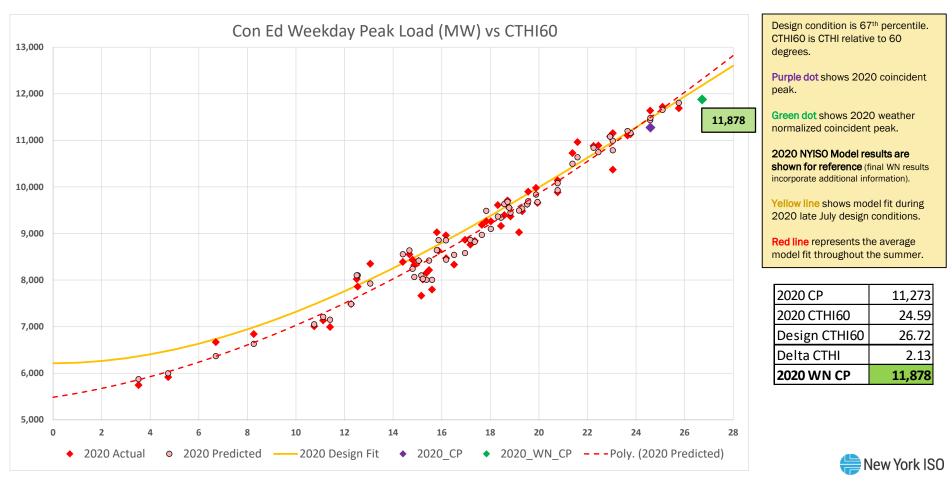
Demand Response calls on July 28th in the Zone J and Zones G-to-J Localities occurred after the hours of the Locality peaks.



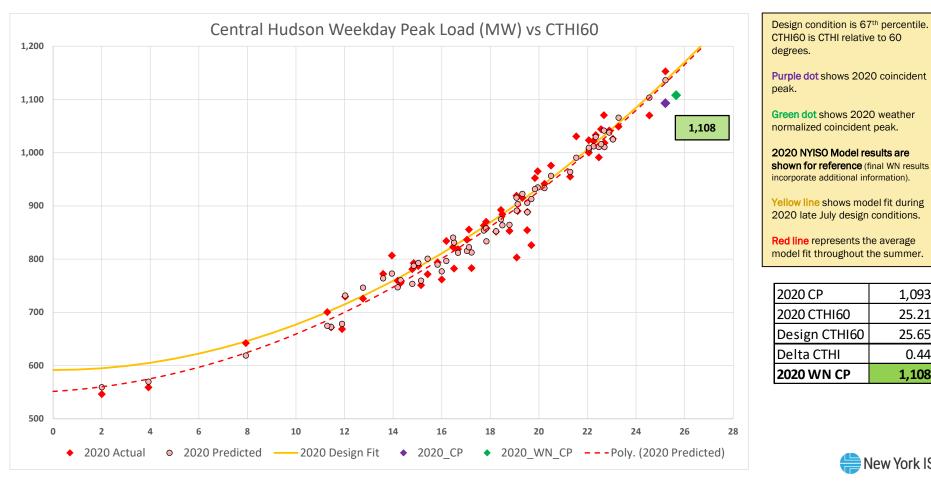
Weather Normalization Models



Con Ed 2020 Weather Adjusted Coincident Peak



Central Hudson 2020 Weather Adjusted Coincident Peak



1,093

25.21

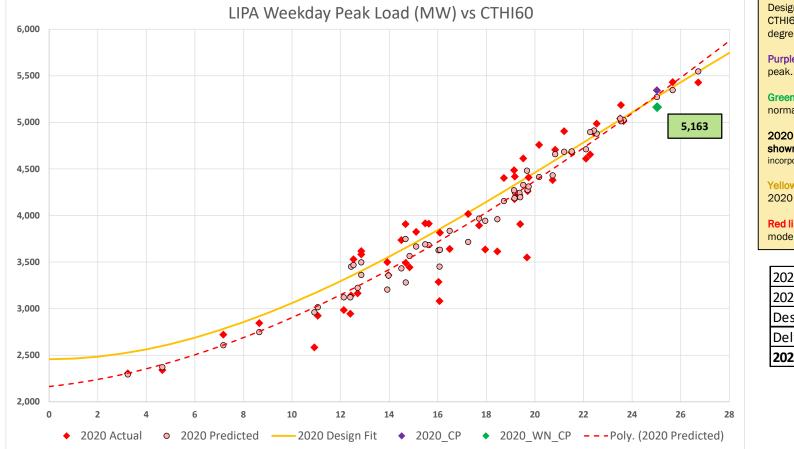
25.65

0.44

1.108

New York ISO

LIPA 2020 Weather Adjusted Coincident Peak



Design condition is 67th percentile. CTHI60 is CTHI relative to 60 degrees.

Purple dot shows 2020 coincident peak.

Green dot shows 2020 weather normalized coincident peak.

2020 NYISO Model results are shown for reference (final WN results incorporate additional information).

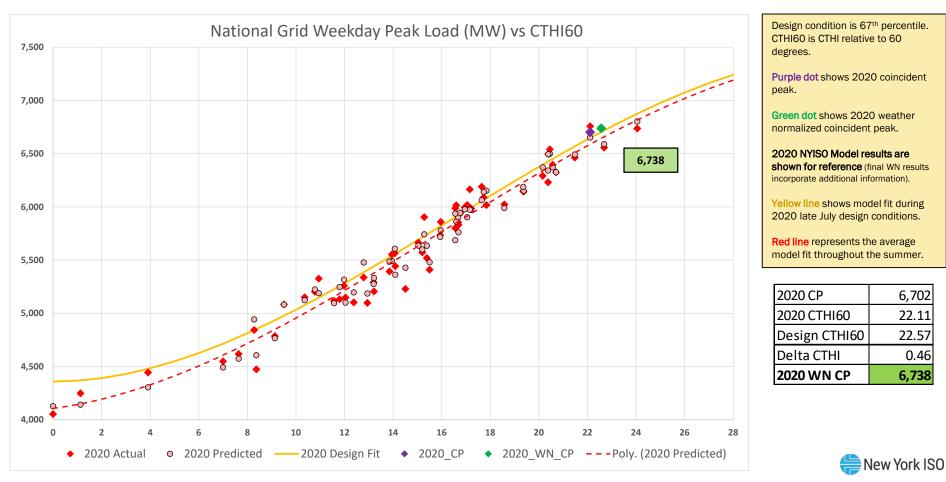
Yellow line shows model fit during 2020 late July design conditions.

Red line represents the average model fit throughout the summer.

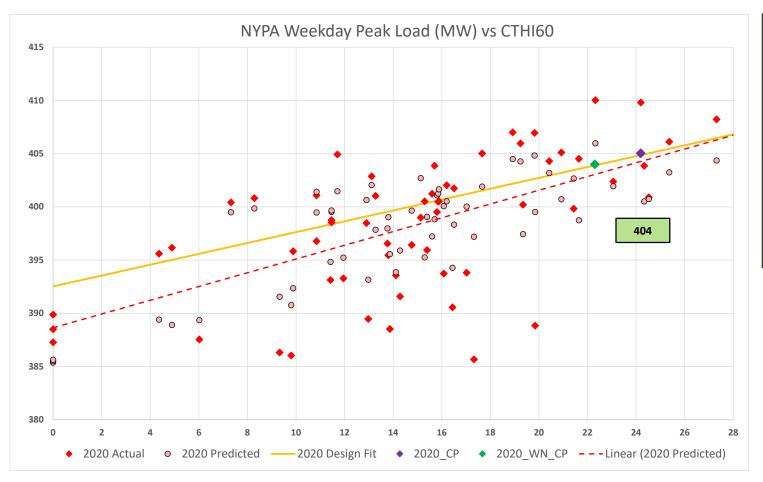
2020 WN CP	5,163
Delta CTHI	0.01
Design CTHI60	25.03
2020 CTHI60	25.02
2020 CP	5,344

🛑 New York ISO

National Grid 2020 Weather Adjusted Coincident Peak



NYPA 2020 Weather Adjusted Coincident Peak



Design condition is 67th percentile. CTHI60 is CTHI relative to 60 degrees.

Purple dot shows 2020 coincident peak.

Green dot shows 2020 weather normalized coincident peak.

2020 NYISO Model results are shown for reference (final WN results incorporate additional information).

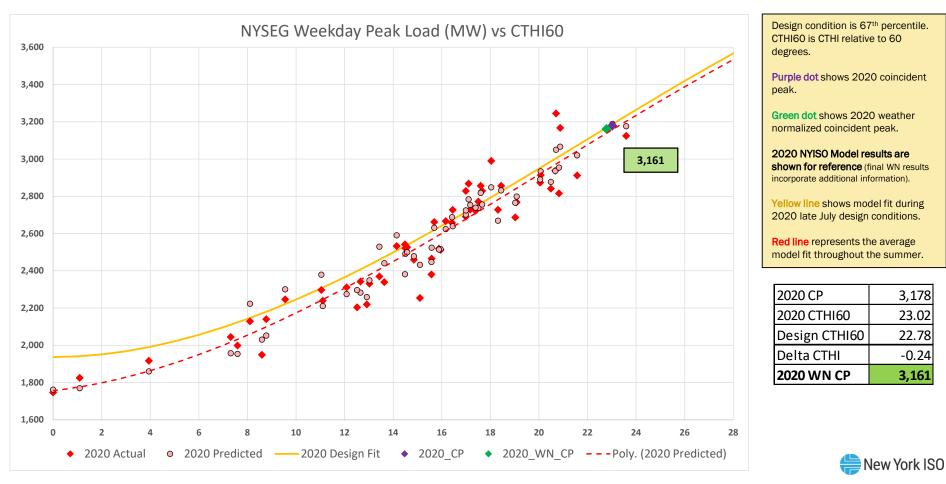
Yellow line shows model fit during 2020 late July design conditions.

Red line represents the average model fit throughout the summer.

2020 WN CP	404
Delta CTHI	-1.89
Design CTHI60	22.30
2020 CTHI60	24.19
2020 CP	405



NYSEG 2020 Weather Adjusted Coincident Peak



3,178

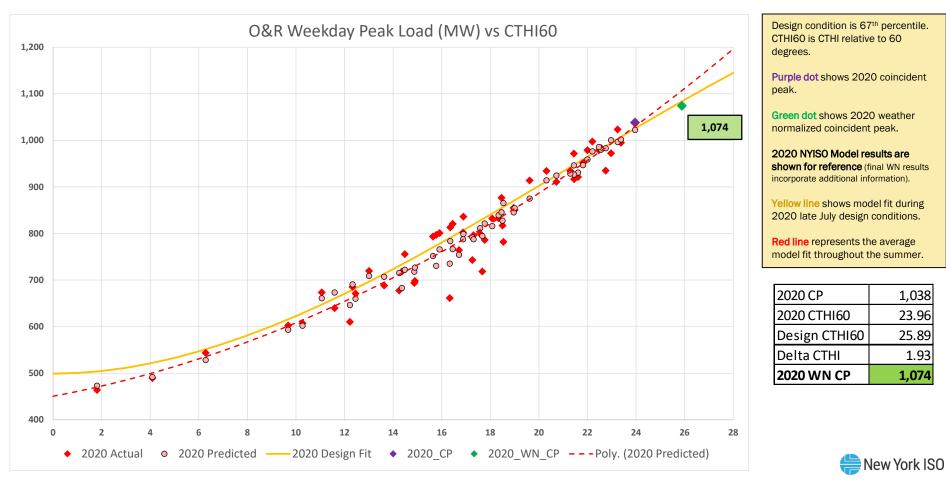
23.02

22.78

-0.24

3.161

O&R 2020 Weather Adjusted Coincident Peak



1,038

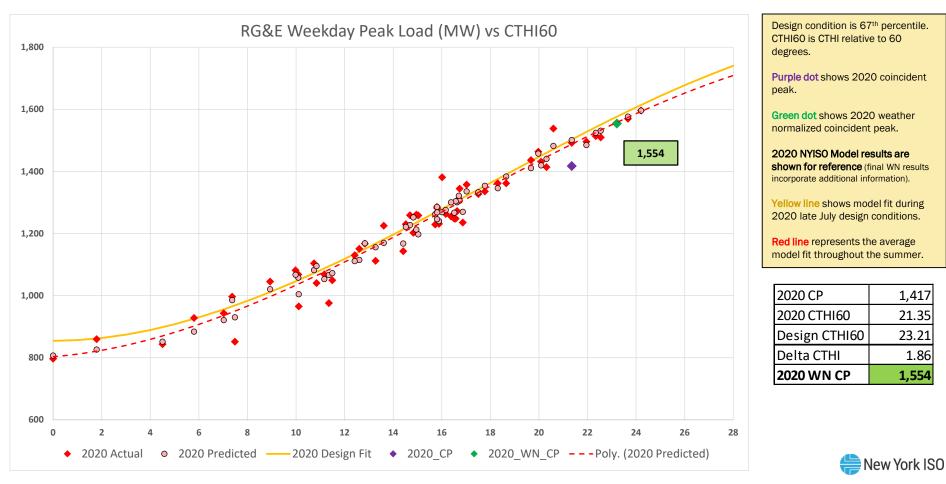
23.96

25.89

1.93

1.074

RG&E 2020 Weather Adjusted Coincident Peak



1,417

21.35

23.21

1.554

1.86

Ratios of Non-Coincident to Coincident Peaks



Update of Ten-Year Rolling Average of Coincident and Locality Peaks To Obtain NCP/CP Ratios for 2021

The conclusion for barry to this to bound if the								
Year	NYCA Date	Hr Beg	Zone G	Zones H+I	Zone J	NYCA CP		
2011	7/22/2011	16	2,482	2,239	11,826	16,546		
2012	7/17/2012	14	2,282	2,082	11,405	15,769		
2013	7/19/2013	17	2,384	2,253	11,736	16,373		
2014	9/2/2014	16	2,036	1,917	10,567	14,520		
2015	7/29/2015	16	2,070	1,930	10,455	14,455		
2016	8/11/2016	16	2,069	1,993	11,006	15,068		
2017	7/19/2017	17	2,011	1,898	10,249	14,158		
2018	8/29/2018	16	2,189	1,966	11,037	15,192		
2019	7/20/2019	16	2,199	1,935	9,999	14,133		
2020	7/27/2020	17	2,177	1,947	9,661	13,785		
Average			2,190	2,016	10,794	15,000		

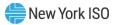
NYCA Coincident Peak Dates & Times & Zonal MW

	G-to-J Locality reak Dates & Times & Zonal Wiw									
Year	G-to-J Date	Hr Beg	Zone G	Zones H+I	Zone J	G-J NCP				
2011	7/22/2011	16	2,482	2,239	11,826	16,546				
2012	7/18/2012	13	2,288	2,071	11,424	15,783				
2013	7/19/2013	17	2,384	2,253	11,736	16,373				
2014	9/2/2014	17	2,046	1,933	10,572	14,551				
2015	7/20/2015	16	2,059	1,996	10,675	14,730				
2016	8/11/2016	16	2,069	1,993	11,006	15,068				
2017	7/20/2017	16	2,046	1,936	10,722	14,704				
2018	8/29/2018	16	2,189	1,966	11,037	15,192				
2019	7/17/2019	17	1,942	1,874	10,769	14,585				
2020	7/28/2020	14	2,024	1,947	10,086	14,057				
Average			2,153	2,021	10,985	15,159				

G-to-I Locality Peak Dates & Times & Zonal MW

Note: DSS loads peaked during these hours. PI loads may have peaked on different hours.

The NCP to CP ratios are calculated using DSS Data.



Update of Ten-Year Rolling Average of Coincident and Locality Peaks To Obtain NCP/CP Ratios for 2021

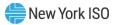
Zone J Locality Peak Dates & Times & Zonal MW								
Year	Zone J Date	Hr Beg	Zone G	Zones H+I	Zone J	G-J NCP		
2011	7/22/2011	12	2,375	2,107	11,876	16,358		
2012	7/18/2012	15	2,115	2,002	11,438	15,554		
2013	7/19/2013	17	2,384	2,253	11,736	16,373		
2014	9/2/2014	17	2,046	1,933	10,572	14,551		
2015	7/20/2015	16	2,059	1,996	10,675	14,730		
2016	8/11/2016	16	2,069	1,993	11,006	15,068		
2017	7/20/2017	17	2,046	1,936	10,722	14,704		
2018	8/29/2018	16	2,189	1,966	11,037	15,192		
2019	7/17/2019	17	1,942	1,874	10,769	14,585		
2020	7/28/2020	14	2,024	1,947	10,086	14,057		
Average			2,125	2,001	10,992	15,117		

Zone K Locanty Feak Dates & Times & Zonai M W									
Year	Zone K Date	Hr Beg	СР	NCP	NCP/CP Ratio	Difference			
2011	7/22/2011	15	5,896	5,914	1.0030	18			
2012	6/21/2012	16	5,079	5,510	1.0848	431			
2013	7/18/2013	16	5,589	5,764	1.0314	175			
2014	9/2/2014	16	5,054	5,054	1.0000	-			
2015	7/20/2015	16	5,136	5,247	1.0216	111			
2016	8/12/2016	16	5,190	5,411	1.0426	221			
2017	7/20/2017	16	4,989	5,137	1.0297	148			
2018	8/29/2018	16	5,412	5,412	1.0000	-			
2019	7/21/2019	17	5,323	5,452	1.0242	129			
2020	7/20/2020	17	5,344	5,433	1.0167	89			
Average			5,301	5,433	1.0249	132			

Zone K Locality Peak Dates & Times & Zonal MW

Note: DSS loads peaked during these hours. PI loads may have peaked on different hours.

The NCP to CP ratios are calculated using DSS Data.



Calculation of G-to-J Locality NCP/CP Ratio

Coincident Peaks									
Period Zone G Zone H+I Zone J G-to-J CP									
3 Yr Avg	2,188	1,949	10,232	14,370					
5 Yr Avg	2,129	1,948	10,390	14,467					
10 Yr Avg	2,190	2,016	10,794	15,000					

G-to-J Locality Peak Statistics - 2011 to 2020

Period	Zone G	Zone H+I	Zone J	G-to-J NCP
3 Yr Avg	2,052	1,929	10,631	14,611
5 Yr Avg	2,054	1,943	10,724	14,721
10 Yr Avg	2,153	2,021	10,985	15,159

Period	Zone G	Zone H+I	Zone J	G-to-J NCP
3 Yr Avg	(137)	(20)	398	241
5 Yr Avg	(75)	(5)	334	254
10 Yr Avg	(37)	5	191	159

Period	Zone G	Zone H+I	Zone J	G-to-J NCP
3 Yr Avg	0.9375	0.9896	1.0389	1.0168
5 Yr Avg	0.9648	0.9976	1.0321	1.0176
10 Yr Avg	0.9831	1.0024	1.0177	1.0106

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15,159/15,000 = 1.0106

Calculation of Zone J NCP/CP Ratio

Period 3 Yr Avg 5 Yr Avg 10 Yr Avg

Coincident Peaks										
Period	Zone G	Zone H+I	Zone J	G-to-J CP						
3 Yr Avg	2,188	1,949	10,232	14,370						
5 Yr Avg	2,129	1,948	10,390	14,467						
10 Yr Avg	2,190	2,016	10,794	15,000						

Zone J Locality Peak Statistics - 2011 to 2020

Period	Zone G	Zone H+I	Zone J	G-to-J NCP
3 Yr Avg	2,052	1,929	10,631	14,611
5 Yr Avg	2,054	1,943	10,724	14,721
10 Yr Avg	2,125	2,001	10,992	15,117

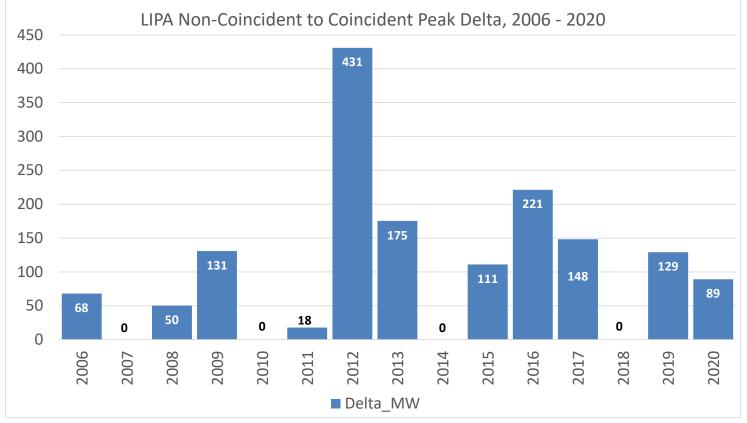
Period	Zone G	Zone H+I	Zone J	G-to-J NCP
3 Yr Avg	(137)	(20)	398	241
5 Yr Avg	(75)	(5)	334	254
10 Yr Avg	(65)	(15)	198	117

10,992/10,794 = 1.0183

Zone J							
1.0389							
1.0321							
1.0183							



LIPA 15 -Year History of Non-Coincident to Coincident Peak Loads



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Calculation of Zone K NCP/CP Ratio

Zone K Peak Statistics - 2006 to 2020

Period	К СР	K NCP	Ratio
3 Yr Avg	5,360	5,432	1.0136
5 Yr Avg	5,252	5,369	1.0224
10 Yr Avg	5,301	5,433	1.0249
15 Yr Avg*	5,367	5,448	1.0152

Period		Diff.
3 Yr Avg		73
5 Yr Avg		117
10 Yr Avg		132
15 Yr Avg*		81

5,448/5,367 = 1.0152

*Note: The 15-year average Zone K NCP to CP ratio was used in the Zone K Locality calculation to better reflect typical load diversity on LI. 2012, with an NCP to CP delta of 431 MW, was excluded from the 15-year ratio calculation as an outlier.



Preliminary 2021 IRM Forecast



2021 IRM Coincident Peak Forecast by Transmission District

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	2021 IRM Coincident Peak Forecast by Transmission District for NYSRC												
(1)	(2)	(3)	(4)	(5)	(6a)	(6b)	(6c)	(7)	(8)=(6a)*(7)	(9)	(10)=(8)+(9)		
Transmission District	2020 Actual MW	Demand Response Estimate MW	2020 Estimated Muni Self-Gen	Total Weather Adjustment MW	2020 Weather Normalized MW	Loss Reallocation MW	2020 WN MW, Adj for Losses	Regional Load Growth Factors	2021 Forecast, Before Adjustments	BTM:NG and Other Adjustments to Load	2021 IRM Final Forecast		
Con Edison	11,273	177	0	605	12,055	0	12,055	1.0492	12,649	21.3	12,670.3		
Cen Hudson	1,093	0	0	15	1,108	0	1,108	0.9910	1,098		1,098.0		
LIPA	5,344	20	7	-181	5,190	0	5,190	0.9948	5,162	42.0	5,204.0		
NGrid	6,702	186	48	36	6,972	0	6,972	1.0026	6,991	2.7	6,993.7		
NYPA	405	0	0	-1	404	0	404	1.0262	415		415.0		
NYSEG	3,178	54	0	-17	3,215	0	3,215	1.0031	3,225	32.0	3,257.0		
O&R	1,038	11	0	36	1,085	0	1,085	0.9914	1,076		1,076.0		
RG&E	1,417	8	0	137	1,562	0	1,562	0.9785	1,529		1,529.0		
Total	30,450	456	55	631	31,592	0	31,592	1.0175	32,145	98.0	32,243.0		
	· ·	-		2021 Forecast	t from 2020 G	old Book	· · · · · · · · · · · · · · · · · · ·	·	32,129				
	Change from 2020 Gold Book												



2021 IRM Locality Peak Forecasts

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)=(8)+(11)
Locality	2020 Actual MW	Demand Response Estimate MW	2020 Estimated Muni Self- Gen	Locality Weather Adjustment MW	2020 Weather Normalized MW	Regional Load Growth Factors	2021 Forecast, Before Adjustments	2021 Forecast from 2020 Gold Book	Change from Gold Book Forecast	BTM:NG and Other Adjustments to Load	2021 IRM Final Forecast
Zone J - NYC	10,061	0	0	501	10,562	1.0492	11,082	11,460	-378	21.3	11,103.3
Zone K - LI	5,428	20	7	-187	5,268	0.9948	5,240	5,139	101	42.0	5,282.0
Zone GHIJ	14,057	0	0	734	14,791	1.0393	15,372	15,660	-288	21.3	15,393.3



2021 IRM Coincident Peak Forecast by Transmission District and Zone

2021 IRM Coincident Peak Forecast by Transmission District and Zone, With BTM:NG Adjustments

	А	В	С	D	E	F	G	Н	I	J	K	NYCA
Con Edison								294.5	1,471.7	10,904.1		12,670.3
Cen Hudson					4.0		1,094.0					1,098.0
LIPA											5,204.0	5,204.0
Nat. Grid	1,831.1	425.4	1,365.2	95.3	982.8	2,293.9						6,993.7
NYPA				415.0								415.0
NYSEG	686.4		1,464.5	117.1	431.0	166.1	21.2	370.7				3,257.0
O&R							1,076.0					1,076.0
RG&E		1,529.0										1,529.0
Total	2,517.5	1,954.4	2,829.7	627.4	1,417.8	2,460.0	2,191.2	665.2	1,471.7	10,904.1	5,204.0	32,243.0

Note: Includes BTM:NG Adjustments.



2021 IRM Non-Coincident Peak Forecast by Transmission District and Zone

2021 IRM Non-Coincident Peak Forecast by Transmission District and Zone, With BTM:NG Adjustments

	А	В	С	D	Е	F	G	Н	I	J	K
Con Edison								299.9	1,498.6	11,103.3	
Cen Hudson					4.2		1,113.1				
LIPA											5,282.0
Nat. Grid	1,956.2	442.5	1,424.4	100.8	1,029.9	2,368.4					
NYPA				439.1							
NYSEG	733.3		1,526.6	123.9	451.7	171.5	21.6	377.5			
O&R							1,094.8				
RG&E		1,590.5									
Total	2,689.5	2,033.0	2,951.0	663.8	1,485.8	2,539.9	2,229.5	677.4	1,498.6	11,103.3	5,282.0

Note: Includes BTM:NG Adjustments.



2021 IRM G-to-J Locality Forecast by Transmission District and Zone

2021 Peak Forecast for G-to-J Locality									
Transmission	G	н	1	J	G-to-J	RLGF			
District					Total				
Con Edison		298.0	1,487.3	11,018.7	12,804.0	1.0492			
Cen Hudson	1,105.6				1,105.6	0.9910			
LIPA									
Nat. Grid									
NYPA									
NYSEG	21.4	374.7			396.1	1.0031			
O&R	1,087.6				1,087.6	0.9914			
RG&E									
Grand Total	2,214.6	672.7	1,487.3	11,018.7	15,393.3	1.0393			

Note: Includes BTM:NG Adjustments.



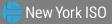
2021 IRM Forecast BTM:NG Adjustments

2021 IRM BTM:NG Adjustments to Load

	А	В	С	D	E	F	G	Н	l.	J	K	NYCA
Con Edison										21.3		21.3
Cen Hudson												
LIPA							_				42.0	42.0
Nat. Grid					2.7							2.7
NYPA		_							_			
NYSEG			32.0									32.0
O&R		_							-			
RG&E												
Total			32.0		2.7					21.3	42.0	98.0



Questions?



Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system



