

2019 CARIS Draft Report

Jason Frasier

Manager, Economic Planning

Electric System Planning Working Group

May 22, 2020

Draft Report Overview

- **Draft Report:**
 - Executive Summary
 - Base Case and 70x30 Scenario
 - Key Findings
 - Appendix A Glossary
- **Draft Appendix – B through M**
- **Feedback due by May 27 to LBullock@nyiso.com**

Sections of the Draft Report

EXECUTIVE SUMMARY

1. INTRODUCTION
2. BACKGROUND
3. CARIS METHODOLOGY AND METRICS
4. BASE CASE SYSTEM ASSUMPTIONS
5. “70X30 SCENARIO” MODEL ASSUMPTIONS
6. 2019 CARIS PHASE 1 BASE CASE RESULTS
7. SCENARIO ANALYSIS
8. NEXT STEPS

Appendices

APPENDIX A – GLOSSARY

APPENDIX B - CONGESTION ASSESSMENT AND RESOURCE INTEGRATION STUDY PROCESS

APPENDIX C - BASE CASE SYSTEM ASSUMPTIONS AND METHODOLOGY

APPENDIX D - OVERVIEW OF CARIS MODEL

APPENDIX E - DETAILED RESULTS OF 2019 CARIS PHASE 1

APPENDIX F - ECONOMIC PLANNING PROCESS MANUAL - CONGESTION ASSESSMENT AND RESOURCE INTEGRATION STUDY (LINK)

APPENDIX G - 2018 RNA AND 2019-2028 CRP REPORTS (LINK)

APPENDIX H - GENERIC SOLUTION RESULTS - ADDITIONAL DETAILS

APPENDIX I - SCENARIO CASE RESULTS

APPENDIX J – TIE-LINE IMPORT & EXPORT

APPENDIX K – ANNUALIZED GROWTH RATES FOR THE BASE, LOW AND HIGH LOADS

APPENDIX L - 70X30 SCENARIO CASES

APPENDIX M – CARIS PUBLIC DATA FILE DIRECTORY

Next Steps

- Review additional stakeholder feedback from today's meeting
- Complete review of CARIS Draft Report at June 4 ESPWG/TPAS
- Seek approval at June 24 BIC and July 1 MC
- Seek approval from Board of Directors in July

Scenario Background and Dataset Overview

Benjamin Cohen

Sr. Planning Environmental Engineer

70x30 Scenario Presentation and Data Catalog

Previously presented at ESPWG

September 11, 2019

[CARIS Preliminary 70 x 30 Scenario Development](#)

October 4, 2019

[CARIS Scenario Load Forecast Development](#)

[CARIS 1 70x30 Scenario ESR Modeling](#)

October 23, 2019

[CARIS 70x30 Scenario Assumptions and Calculation](#)

November 18, 2019

[Preliminary Scenario Results \(High/Low Gas Prices and Loads\)](#)

February 27, 2020

[Review of Assumptions and Resource Mix](#)

March 16, 2020

[Preliminary Scenario Load Constraint Modeling, Nuclear Sensitivity and Additional Results](#)

April 6, 2020

[Preliminary Base Load Constraint Modeling, Nuclear Sensitivity and Additional Results](#)

April 23, 2020

[Constraint Modeling, Energy Storage Sensitivity and Additional Case Results](#)

May 4, 2020

[2019 CARIS Draft Report - 70x30 Section](#)

Posted to ESPWG Meeting Materials

March 16, 2020

[Monthly Case Energy Output MWh – Updated
70x30 Build Out Scenario Load](#)

April 6, 2020

[Case Output By Type and By Zone](#)

[Monthly Case Type Energy MWh](#)

[70x30 RE Buildout Base Load](#)

[Preliminary 70x30 Scenario Pocket Map](#)

April 23, 2020

[Case Output By Type and By Zone](#)

[Case Output By Type and By Pocket](#)

[Monthly Case Type Energy MWh](#)

[Monthly Average Zonal LBMP](#)

[Hourly Information By Pocket](#)

May 22, 2020

[Hourly Wind Solar Curtailments By Pocket](#)

[Hourly Zonal Net Load](#)

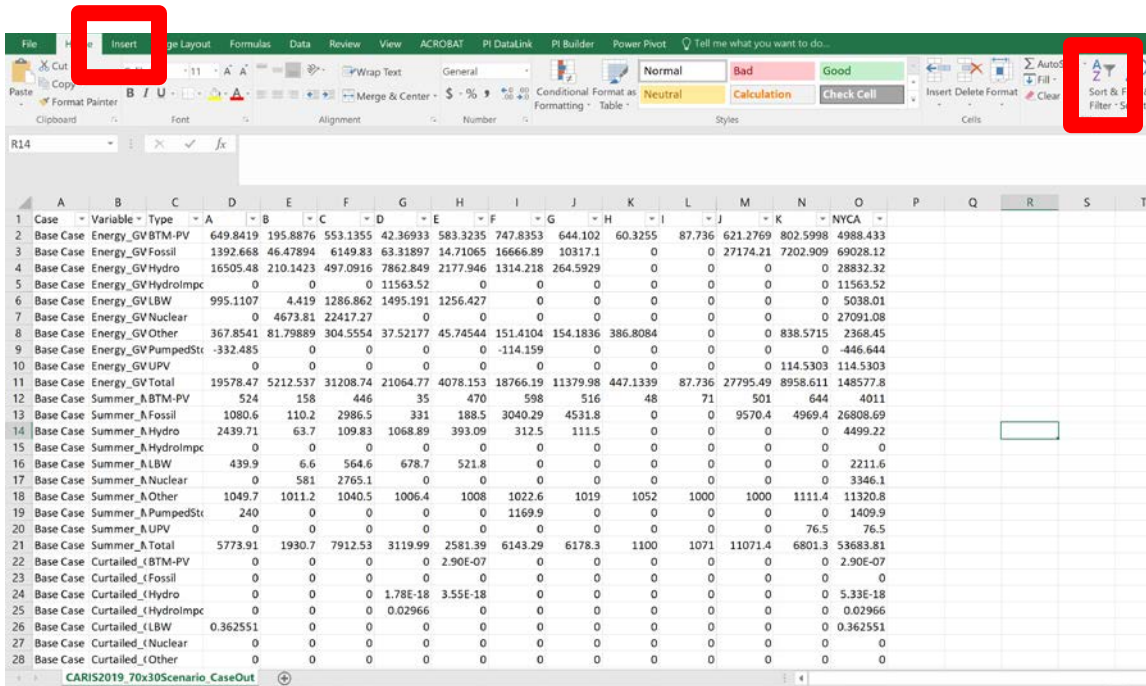
[Fuel Forecast](#)

70x30 Scenario Case List

Case	Load	Relaxed/ Constrained	Nuclear Sensitivity	ESR Sensitivity
Base Case	Base Case	Constrained		
BaseLoad Relaxed	Base Load	Relaxed		
BaseLoad Constrained	Base Load	Constrained		
BaseLoad Constrained NuclearRetired	Base Load	Constrained	Nuclear Retired	
BaseLoad Constrained ESR	Base Load	Constrained		MAPS ESR
BaseLoad Constrained HRM	Base Load	Constrained		External HRM
ScenarioLoad Relaxed	Scenario Load	Relaxed		
ScenarioLoad Constrained	Scenario Load	Constrained		
ScenarioLoad Constrained NuclearRetired	Scenario Load	Constrained	Nuclear Retired	
ScenarioLoad Constrained ESR	Scenario Load	Constrained		MAPS ESR
ScenarioLoad Constrained HRM	Scenario Load	Constrained		External HRM

Detailed File Description and Examples

Excel Data Tools Introduction and Annual Zonal Results



Case	Variable	Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	NYCA
1	Base Case	Energy_GVBTM-PV	649.8419	195.8876	553.1355	42.36933	583.3235	747.8353	644.102	60.3255	87.736	621.2769	802.5998	4988.433				
2	Base Case	Energy_GVFossil	1392.668	46.47894	6149.83	63.31897	14.71065	16666.89	10317.1	0	0	27174.21	7202.909	69028.12				
3	Base Case	Energy_GVHydro	16505.48	210.1423	497.0916	7862.849	2177.946	1314.218	264.5929	0	0	0	0	28832.32				
4	Base Case	Energy_GVHydroImpc	0	0	0	11563.52	0	0	0	0	0	0	0	11563.52				
5	Base Case	Energy_GVLBW	995.1107	4.419	1286.862	1495.191	1256.427	0	0	0	0	0	0	5038.01				
6	Base Case	Energy_GVNuclear	0	4673.81	22417.27	0	0	0	0	0	0	0	0	27091.08				
7	Base Case	Energy_GVOther	367.8541	81.79889	304.5554	37.52177	45.74544	151.4104	154.1836	386.8084	0	0	838.5715	2368.45				
8	Base Case	Energy_GVPumpedSt	-332.485	0	0	0	0	-114.159	0	0	0	0	0	-446.644				
9	Base Case	Energy_GVUPV	0	0	0	0	0	0	0	0	0	0	114.5303	114.5303				
10	Base Case	Energy_GVTotal	19578.47	5212.537	31208.74	21064.77	4078.153	18766.19	11379.98	447.1339	87.736	27795.49	8958.611	148577.8				
11	Base Case	Summer_ABTM-PV	524	158	446	35	470	598	516	48	71	501	644	4011				
12	Base Case	Summer_AFossil	1080.6	110.2	2986.5	331	188.5	3040.29	4531.8	0	0	9570.4	4969.4	26808.69				
13	Base Case	Summer_AHydro	2439.71	63.7	109.83	1068.89	393.09	312.5	111.5	0	0	0	0	4499.22				
14	Base Case	Summer_AHydroImpc	0	0	0	0	0	0	0	0	0	0	0	0				
15	Base Case	Summer_ALBW	439.9	6.6	564.6	678.7	521.8	0	0	0	0	0	0	2211.6				
16	Base Case	Summer_ANuclear	0	581	2765.1	0	0	0	0	0	0	0	0	3346.1				
17	Base Case	Summer_AOther	1049.7	1011.2	1040.5	1006.4	1008	1022.6	1019	1052	1000	1000	1111.4	11320.8				
18	Base Case	Summer_APumpedSt	240	0	0	0	0	1169.9	0	0	0	0	0	1409.9				
19	Base Case	Summer_AUPV	0	0	0	0	0	0	0	0	0	0	76.5	76.5				
20	Base Case	Summer_ATotal	5773.91	1930.7	7912.53	3119.99	2581.39	6143.29	6178.3	1100	1071	11071.4	6801.3	53683.81				
21	Base Case	Curtailed_(BTM-PV)	0	0	0	0	2.90E-07	0	0	0	0	0	0	2.90E-07				
22	Base Case	Curtailed_(Fossil)	0	0	0	0	0	0	0	0	0	0	0	0				
23	Base Case	Curtailed_(Hydro)	0	0	0	1.78E-18	3.55E-18	0	0	0	0	0	0	5.33E-18				
24	Base Case	Curtailed_(HydroImpc)	0	0	0	0.02966	0	0	0	0	0	0	0	0.02966				
25	Base Case	Curtailed_(LBW)	0.362551	0	0	0	0	0	0	0	0	0	0	0.362551				
26	Base Case	Curtailed_(Nuclear)	0	0	0	0	0	0	0	0	0	0	0	0				
27	Base Case	Curtailed_(Other)	0	0	0	0	0	0	0	0	0	0	0	0				
28	Base Case	Curtailed_(Other)	0	0	0	0	0	0	0	0	0	0	0	0				

Excel data tools helpful in navigating the posted datasets

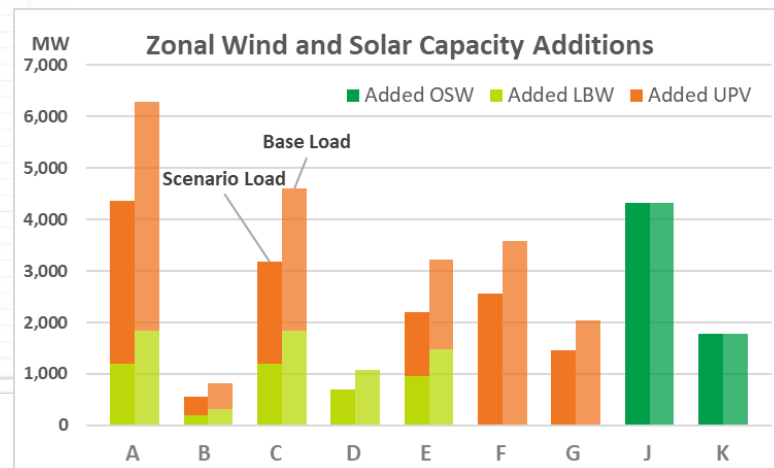
- **Filter**
 - Allows the dataset to be reduced to contain only values of interest
- **Pivot Tables**
 - In the Insert Menu
 - Allows the dataset to be recast based on the values and variables of interest

Renewable Energy Build Out Details

Area	Sub-type	PSSE Bus	PSSE Bus name	Voltage Level(KV)	Scenario Load Summer Cap.	Base Load Summer Cap.
1	NYCITY	Added OSW	126287 GOWANUS	345	816	816
2	LONG ISLAND	Added OSW	129421 HOLBROOK	138	880	880
3	LONG ISLAND	Added OSW	129868 EHAMP	69	130	130
4	NYCITY	Added OSW	126645 FARRAGUT	345	544	544
5	LONG ISLAND	Added OSW	129415 BRKHVEN3	138	384	384
6	NYCITY	Added OSW	126287 GOWANUS	345	640	640
7	NYCITY	Added OSW	126645 FARRAGUT	345	368	368
8	NYCITY	Added OSW	126645 FARRAGUT	345	528	528
9	NYCITY	Added OSW	126282 FRESH KI	345	320	320
10	NYCITY	Added OSW	126282 FRESH KI	345	448	448
11	NYCITY	Added OSW	126282 FRESH KI	345	384	384
12	NYCITY	Added OSW	126282 FRESH KI	345	272	272
13	LONG ISLAND	Added OSW	129361 RULND RD	138	384	384
14	WEST	Added LBW	146245 PPC_DUMMY	115	81	124
15	WEST	Added LBW	146286 ARKWR_11	115	50	77
16	WEST	Added LBW	130754 SOMERSET	345	129	198
17	WEST	Added LBW	135277 FALCONER	115	84	130
18	WEST	Added LBW	135250 DUNKIRK	230	64	98
19	WEST	Added LBW	147804 FREEDOM	115	64	98
20	WEST	Added LBW	135398 SMILE345	345	217	334
21	WEST	Added LBW	135300 BETH-149	115	128	197
22	WEST	Added LBW	135301 BETH-150	115	192	295
23	WEST	Added LBW	135250 DUNKIRK	230	192	295
24	GENESEE	Added LBW	135867 OAKFLDTP	115	50	77
25	GENESEE	Added LBW	135874 SWDN-113	115	125	192
26	GENESEE	Added LBW	135853 BATAVIA1	115	13	19
27	GENESEE	Added LBW	135864 NAKR-107	115	13	19

70x30 RE Buildout Base Load

Load Level	Variable	Type	Zone
Base Load	Zone	UPV	A
Scenario Load	Type	LBW	B
	PSSE Bus	OSW	C
	PSSE Bus Name		D
	Voltage Level		E
	Capacity		F
			G
			J
			K

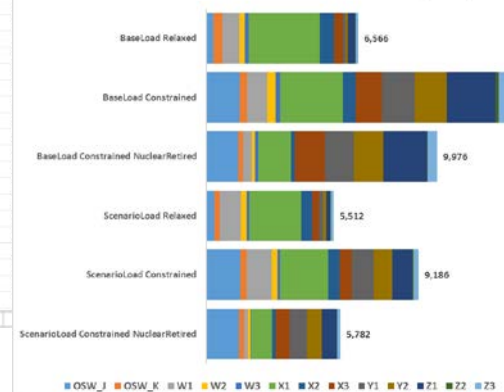


Generation Pocket Annual Aggregate Results

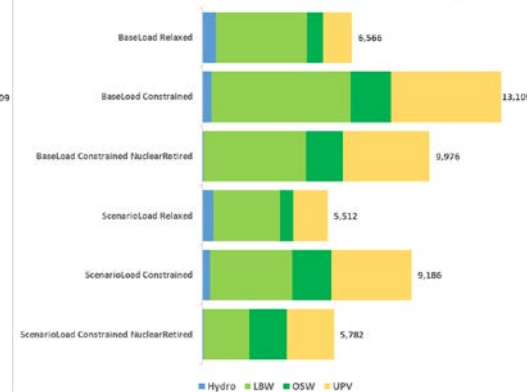
Case	Variable	Type	OSW_J	OSW_K	W1	W2	W3	X1	X2	X3	Y1	Y2	Z1	Z2	Z3	PocketTotal
Base Case	Energy_GWh	BTM-PV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	Fossil	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	Hydro	0	0	0	0	0	7631.29	969.998	0	0	0	0	0	0	8601.286176
Base Case	Energy_GWh	HydroImports	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	LBW	0	0	4.419	1100.32	704.258	1495.19	782.172	189.262	173.849	0	436.307	0	152.233	5038.010135
Base Case	Energy_GWh	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	PumpedStorage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	UPV	0	114.53	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Energy_GWh	Total	0	114.53	4.419	1100.32	704.258	9126.48	1752.17	189.262	173.849	0	0	0	0	0
Base Case	Summer_MW	BTM-PV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	Fossil	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	Hydro	0	0	0	0	0	1008.17	162.8	0	0	0	0	0	0	0
Base Case	Summer_MW	HydroImports	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	LBW	0	0	6.6	473.5	304.4	678.7	321.8	79.9	74	0	0	0	0	0
Base Case	Summer_MW	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	PumpedStorage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	UPV	0	76.5	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Summer_MW	Total	0	76.5	6.6	473.5	304.4	1686.87	484.6	79.9	74	0	0	0	0	0
Base Case	Curtailed_GWh	BTM-PV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Curtailed_GWh	Fossil	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Curtailed_GWh	Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Curtailed_GWh	HydroImports	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Curtailed_GWh	LBW	0	0	0	0	0	0.36255	0	0	0	0	0	0	0	0
Base Case	Curtailed_GWh	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Case	Curtailed_GWh	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Cases	Variable	Type	Areas
Base Case	Energy_GWh	BTM-PV	OSW_J
BaseLoad Relaxed	Summer_MW	UPV	OSW_K
BaseLoad Constrained	Curtailed_GWh	LBW	W1
BaseLoad Constrained NuclearRetired	MaximumCurtailmnt_MW	OSW	W2
BaseLoad Constrained ESR	CurtailedHours	Hydro	W3
BaseLoad Constrained HRM	MaximumGeneration_MW	HydroImports	X1
ScenarioLoad Relaxed	GeneratingHours	Nuclear	X2
ScenarioLoad Constrained		Fossil	X3
ScenarioLoad Constrained NuclearRetired		Other	Y1
ScenarioLoad Constrained ESR		PumpedStorage	Y2
ScenarioLoad Constrained HRM			Z1
ScenarioLoad Constrained 100xHurdleRate			Z2
			Z3
			PocketTotal

Annual Generation Pocket Curtailments (GWh)



Annual Generation Pocket Curtailments (GWh)

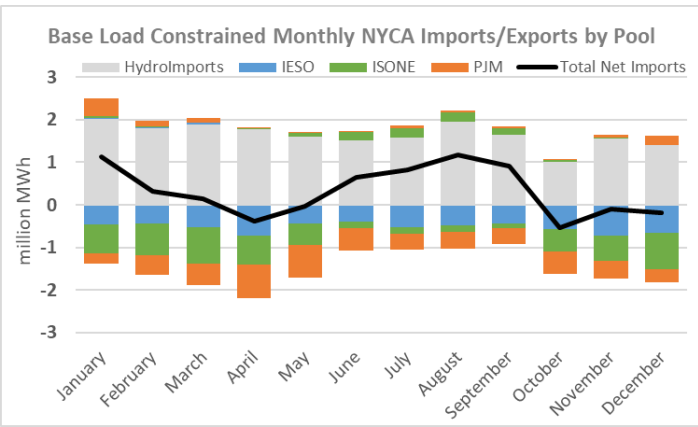


Case Output By Type and By Pocket

NYCA Monthly Aggregate Generation and Energy Results

Case	Month	Nuclear	Other	Fossil	Hydro	Pumps	Storage	Curtailed	GrossLoad	IESO_imp	IESO_exp	ISONE_lim	ISONE_e_PJM_imp	PJM_imp	PJM_exp					
1	Base Case January	2502965	175836.3	3805942	1204462	2339648	497507.8	0	4590.05	267995	-24708.9	0	0.00029	12924627	201893.4	-51614.9	55891.53	-410006	2353979	0
2	Base Case February	2341483	195641.3	4063671	1110000	2206771	565194.9	0	8555.96	336072	-23136.8	0	0.1308079	11886810	148107	-59534.8	4054.172	-707030	1700144	-3163.9
3	Base Case March	1451801	222708.1	5018776	1104218	2562619	554006.2	0	10358	451292	-32850	0	0.1394551	12562788	152063.3	-56680.3	11980.69	-631330	1744308	-0.0006
4	Base Case April	1762387	183359.8	4672085	1061956	2451896	417126.8	0	10938.4	495274	-36444.6	0	0	11772923	3727.804	-250617	96832.58	-153539	1008662	-4767.4
5	Base Case May	2489498	1957268.8	4294979	923725	2558305	407760	0	11501.8	527497	-31666	0	0.3085561	11966105	121116	-31885.7	216577.3	-39738	335896.5	-13392
6	Base Case June	2409192	210101	6101124	844151	2489926	384954	0	13039.2	534010	-36678.4	0	0.13449604	49382.33	0	-266157	536451.9	-4799.4	241957.7	-57323
7	Base Case July	2489498	213463.7	7887345	934438	2585999	220106.4	0	12798.7	564589	-61027.6	0	0.5059568	15566590	251.5825	-506004	524870.9	-23098	752821.1	-29034
8	Base Case August	2489498	206969.1	8703474	1129145	2359204	252537.4	0	12806	519616	-53468.3	0	0.16064531	982.8757	0	-456267	505599.1	-20865	504829.8	-89671
9	Base Case September	2368613	216358.3	6634802	952363	2110964	166935.5	0	10790.3	450359	-49023.2	0	0.13234252	2003789	0	-528213	370152.3	-11270	560924.2	-19536
10	Base Case October	1860953	168518.4	6758495	996093	2159148	510105.7	0	6588.79	346416	-43922.5	0	0.1470497	12498438	4013.103	-566981	248030.3	-35012	499299.7	-12709
11	Base Case November	2422224	160178	5402498	887162	2515778	536157.5	0	7565.09	227552	-36865.5	0	0.12145558	18489.78	0	-555007	71050.12	-360518	805667.5	-1437.8
12	Base Case December	2502965	219588.9	5684929	815811	2492064	471018.2	0	4998.06	222761	-17032.4	0	0.8962151	13345810	24907.05	-258347	5592.408	-785335	1961828	0
13	Base Load F January	2502565	175825.7	1728502	2030411	2223735	2030900	2146783	1168513	500849	-74097.9	0	0.7346039	13213220	42942.66	-366892	16915.39	-777742	264353.2	-400458
14	Base Load F February	2259902	110401.4	1407380	1814799	2078481	1755838	2225690	1359626	619576	-64002.5	0	0.1193141	11812310	31126.68	-371594	3735.616	-884044	83253.4	-618098
15	Base Load F March	1878774	194144.9	1936951	1902085	2471679	1552008	2036911	2107961	858400	-90547.5	0	0.9849338	12870619	37691.78	-508605	101.983	-982807	69914.81	-594050
16	Base Load F April	1765720	160948.3	1356236	1717131	2418001	1903223	2403203	2151256	919199	-47193.1	0	0.1594146	12363886	0	-719359	4946.084	-881897	91964.02	-815504
17	Base Load F May	2488456	164564.5	1504441	1609499	2486352	1549131	1595272	2203724	1003662	-39180.6	0	0.1106104	12590813	3155.005	-431381	16638.52	-735083	392.239	-829052
18	Base Load F June	2409061	207330.3	3034551	1507283	2423349	985463.2	1121200	2439895	1000044	-85476.9	0	0.1116141	13948514	6100.726	-372014	155135.6	-297738	1707.167	-588205
19	Base Load F July	2489424	210553.7	4219962	1580797	2510952	1363536	1275770	2811728	1054927	-92913.1	0	0.1568549	16411970	0	-516595	184938.3	-226637	21156.68	-486317
20	Base Load F August	2489497	189222.9	4754912	1953940	2258877	1123037	1021911	2429198	963518	-74552.8	0	0.1306482	16181249	156.1257	-471050	187253.7	-165759	10948.52	-490724
21	Base Load F September	2368585	183731.9	3278077	1645661	2030705	1246833	1333291	1782675	838095	-95060.5	0	0.1172328	13641756	51.78487	-446002	99918.49	-193040	3907.903	-436227
22	Base Load F October	1860346	185381.5	3122627	1001013	2148389	1791930	2393707	1519896	640600	-85343.8	0	0.1847726	12896095	84.20943	-574503	29723.53	-608455	21898.78	-551142
23	Base Load F November	2420617	171011.1	2485080	1561449	2469288	1668643	2129855	922654	491508	-92286.5	0	0.3124417	12361289	10.00136	-723242	5389.315	-719472	35956.24	-465162
24	Base Load F December	2502594	200116.1	2439138	1401327	2435816	2272331	2972837	915057	410845	-89607.8	0	0.497283	13642786	2149.436	-652109	1706.459	-943557	195215.7	-439248
25	Base Load J January	2502459	170054	1886430	2018760	2258534	1777714	2013044	1036337	501914	-69666.9	0	0.1229492	1303987	25284.45	-468706	48242.43	-666877	405157.9	-234570
26	Base Load J February	2259760	107781	1591291	1802589	2116987	1525004	2131593	1207500	619479	-62559.4	0	0.1639297	11810641	22501.31	-426969	9606.853	-763332	129992.1	-460736

Cases	Months	Generation and Energy Information	
Base Case	January	BTM_PV	PumpedStorage
BaseLoad Relaxed	February	UPV	Storage
BaseLoad Constrained	March	LBW	Curtailement
BaseLoad Constrained NuclearRetired	April	OSW	GrossLoad
BaseLoad Constrained ESR	May	Hydro	IESO_import
BaseLoad Constrained HRM	June	HydroImports	IESO_export
ScenarioLoad Relaxed	July	Nuclear	ISONE_import
ScenarioLoad Constrained	August	Fossil	ISONE_export
ScenarioLoad Constrained NuclearRetired	September	Other	PJM_import
ScenarioLoad Constrained ESR	October		PJM_export
ScenarioLoad Constrained HRM	November		
ScenarioLoad Constrained 100xHurdleRate	December		

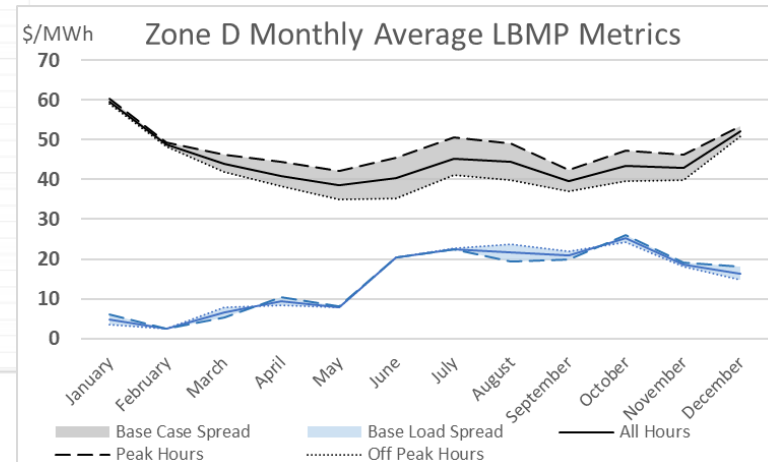


Monthly Case Type Energy MWh

Zonal Monthly Aggregate LBMP Metrics

Case	Hours	Month	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Base Case All	January	55.49	58.45	65.39	59.48	67.41	81.75	79.89	80.69	80.52	81.28	85.24				
Base Case All	February	47.81	49.8	54.03	48.8	55.38	63.92	63.41	63.73	63.54	63.82	67.53				
Base Case All	March	44.33	45.99	47.44	44.04	47.62	48.92	48.86	49.08	48.93	49	49.7				
Base Case All	April	42.53	43.2	43.26	40.96	42.93	43.38	43.58	43.66	43.62	43.7	44				
Base Case All	May	39.44	39.73	40.48	38.5	40.43	40.74	41.45	41.56	41.59	41.96	43.98				
Base Case All	June	42.27	42.37	43.05	40.24	42.74	42.13	43.54	43.79	43.81	44.59	45.34				
Base Case All	July	47.41	47.53	48.71	45.31	48.35	47.01	49.48	49.38	49.39	50.79	52.41				
Base Case All	August	47.03	47.11	48.76	44.38	48.15	46.7	48.2	48.35	48.41	49.11	51.65				
Base Case All	September	41.33	41.09	41.91	39.57	41.6	40.79	41.32	41.39	41.46	42.09	43.78				
Base Case All	October	44.14	44.29	44.67	43.29	44.82	44.28	44.39	44.43	44.42	44.55	45.7				
Base Case All	November	43.45	43.89	44.43	42.96	44.81	45.24	45.64	45.77	45.74	45.85	47.28				
Base Case All	December	49.36	51.52	55.3	52.05	56.72	58.68	58.82	59.17	59.02	59.16	63.93				
Base Case On-Peak	January	55.79	59.43	68.54	60.17	70.25	90.41	88.21	89.32	89.16	90.66	96.97				
Base Case On-Peak	February	48.03	50.53	55.97	49.41	57.08	68.52	68.38	68.73	68.56	69.14	74.28				
Base Case On-Peak	March	46.17	48.32	50.39	46.24	50.47	51.79	52.44	52.8	52.71	53	53.9				
Base Case On-Peak	April	46.27	47.04	47.15	44.34	46.68	46.87	47.74	47.91	47.93	48.23	48.96				
Base Case On-Peak	May	43.31	43.81	44.72	42.21	44.53	44.66	46.02	46.19	46.28	47.08	49.72				
Base Case On-Peak	June	47.77	48.05	49.2	45.51	48.58	47.4	49.66	50.02	50.07	51.48	51.92				
Base Case On-Peak	July	52.25	52.9	55.21	50.48	54.55	52.3	56.89	56.44	56.46	59.15	60.56				
Base Case On-Peak	August	51.46	51.98	54.75	48.99	53.7	51.68	54.05	54.21	54.3	55.31	57.83				
Base Case On-Peak	September	43.6	43.62	45.71	42.46	45.03	43.98	45.04	45.15	45.28	46.53	49.1				
Base Case On-Peak	October	48.14	48.6	49.27	47.29	49.23	48.76	49.33	49.44	49.48	49.8	51.68				
Base Case On-Peak	November	46.72	47.46	48.28	46.34	48.46	49.08	50.05	50.24	50.26	50.54	52.81				
Base Case On-Peak	December	50.65	53.6	58.82	53.41	60	62.86	63.57	64.08	63.98	64.36	71.43				
Base Case Off-Peak	January	55.24	57.64	62.79	58.91	65.07	74.62	73.03	73.59	73.41	73.56	75.57				
Base Case Off-Peak	February	47.61	49.12	52.22	48.23	53.78	59.62	58.76	59.07	58.85	58.86	61.23				
Base Case Off-Peak	March	42.52	43.7	44.56	41.88	44.84	46.11	45.35	45.45	45.23	45.09	45.59				

Cases	Hours	Months	Areas
Base Case	All	January	A
BaseLoad Relaxed	On-Peak	February	B
BaseLoad Constrained	Off-Peak	March	C
BaseLoad Constrained NuclearRetired		April	D
ScenarioLoad Relaxed		May	E
ScenarioLoad Constrained		June	F
ScenarioLoad Constrained NuclearRetired		July	G
		August	H
		September	I
		October	J
		November	K
		December	NYCA



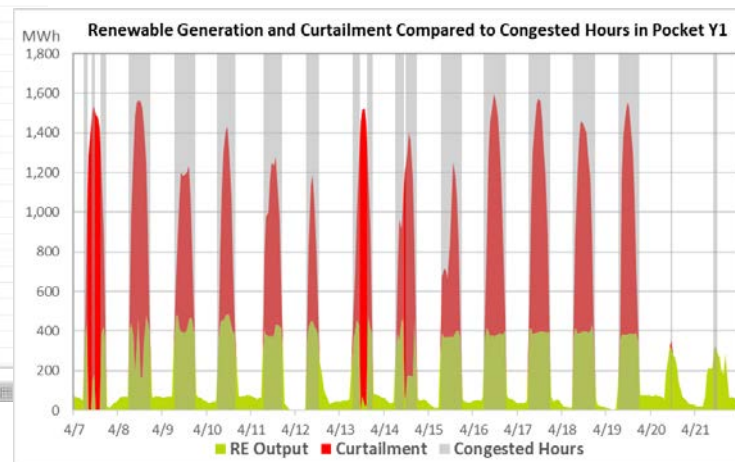
Monthly Average Zonal LBMP

Hourly Pocket Information

Case	Timestamps	OSW_J	OSW_K	W1	W2	W3	X1	X2	X3	Y1	Y2	Z1	Z2	Z3
1 BaseLoad Constrained	1/1/2030 0:00	0	0	0	0	0	1	0	0	0	0	1	1	0
2 BaseLoad Constrained	1/1/2030 1:00	0	0	0	0	0	1	0	0	0	0	1	1	0
3 BaseLoad Constrained	1/1/2030 2:00	0	0	0	0	0	1	0	0	0	0	1	1	0
4 BaseLoad Constrained	1/1/2030 3:00	0	0	0	0	0	1	0	0	0	0	1	1	0
5 BaseLoad Constrained	1/1/2030 4:00	0	0	0	0	1	0	0	0	0	0	1	0	0
6 BaseLoad Constrained	1/1/2030 5:00	0	0	0	0	0	1	0	0	0	0	1	0	0
7 BaseLoad Constrained	1/1/2030 6:00	0	0	0	0	0	1	0	0	0	0	1	0	0
8 BaseLoad Constrained	1/1/2030 7:00	0	0	0	0	0	1	0	0	0	0	1	0	0
9 BaseLoad Constrained	1/1/2030 8:00	0	0	1	0	0	1	0	0	0	0	1	0	0
10 BaseLoad Constrained	1/1/2030 9:00	0	1	1	0	0	1	0	0	1	0	0	0	1
11 BaseLoad Constrained	1/1/2030 10:00	0	0	1	0	0	1	0	0	0	0	1	0	0
12 BaseLoad Constrained	1/1/2030 11:00	0	0	1	1	0	1	0	0	0	0	1	0	0
13 BaseLoad Constrained	1/1/2030 12:00	0	0	1	0	0	1	0	0	1	0	0	1	0
14 BaseLoad Constrained	1/1/2030 13:00	0	0	0	1	0	1	0	0	1	0	0	0	0
15 BaseLoad Constrained	1/1/2030 14:00	0	0	1	0	0	1	0	0	0	0	0	0	0
16 BaseLoad Constrained	1/1/2030 15:00	0	0	1	0	0	1	0	0	0	0	0	0	0
17 BaseLoad Constrained	1/1/2030 16:00	0	0	1	0	0	1	0	0	1	0	0	0	0
18 BaseLoad Constrained	1/1/2030 17:00	0	0	1	0	0	1	1	0	1	0	0	1	0
19 BaseLoad Constrained	1/1/2030 18:00	1	0	0	0	1	1	1	1	0	0	1	0	0
20 BaseLoad Constrained	1/1/2030 19:00	1	0	1	0	0	1	1	1	1	0	0	1	0
21 BaseLoad Constrained	1/1/2030 20:00	0	0	1	0	0	1	0	1	0	0	1	0	1
22 BaseLoad Constrained	1/1/2030 21:00	1	0	1	0	0	1	0	1	0	0	0	0	1
23 BaseLoad Constrained	1/1/2030 22:00	1	0	1	0	0	1	0	1	0	0	0	0	1
24 BaseLoad Constrained	1/1/2030 23:00	1	0	0	1	0	1	0	1	0	0	0	0	1
25 BaseLoad Constrained	1/1/2030 0:00	1	0	0	0	0	1	0	1	0	0	1	0	1
26 BaseLoad Constrained	1/2/2030 0:00	1	0	0	0	0	1	0	1	0	0	1	0	1
27 BaseLoad Constrained	1/2/2030 1:00	1	0	0	0	0	1	0	1	0	0	1	0	1
28 BaseLoad Constrained	1/2/2030 2:00	1	0	0	0	0	1	0	1	0	0	1	1	1

Cases	Areas
Input RE Tab	
BaseLoad	OSW_J
ScenarioLoad	OSW_K
	W1
	W2
	W3
Congestion and Curtailment Tabs	
	X1
BaseLoad Constrained	X2
BaseLoad Constrained NuclearRetired	X3
ScenarioLoad Constrained	Y1
ScenarioLoad Constrained NuclearRetired	Y2
	Z1
	Z2
	Z3
	PocketTotal

Hourly Information By Pocket

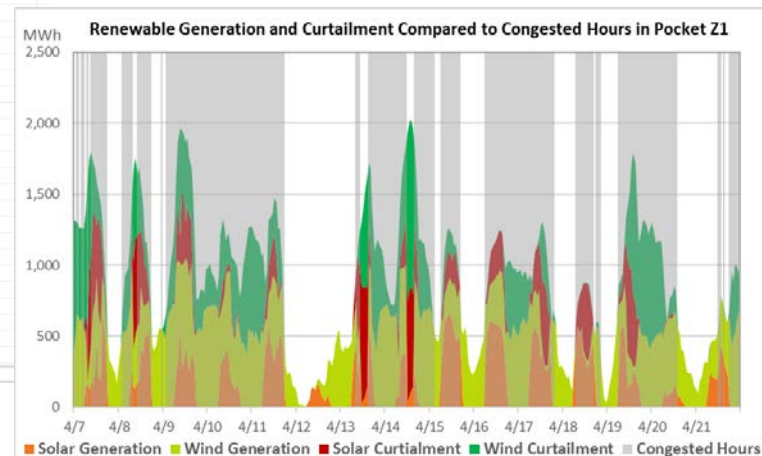


Wind and Solar Hourly Pocket Information

Case	Pocket	Timestamps	Solar Generation (MWh)	Solar Curtailment (MWh)	Wind Generation (MWh)	Wind Curtailment (MWh)
BaseLoadConstrained	OSW_J	1/1/2030 0:00	0	0	1557	0
BaseLoadConstrained	OSW_J	1/1/2030 1:00	0	0	1730	0
BaseLoadConstrained	OSW_J	1/1/2030 2:00	0	0	1424	0
BaseLoadConstrained	OSW_J	1/1/2030 3:00	0	0	1156	0
BaseLoadConstrained	OSW_J	1/1/2030 4:00	0	0	781	0
BaseLoadConstrained	OSW_J	1/1/2030 5:00	0	0	674	0
BaseLoadConstrained	OSW_J	1/1/2030 6:00	0	0	613	0
BaseLoadConstrained	OSW_J	1/1/2030 7:00	0	0	442	0
BaseLoadConstrained	OSW_J	1/1/2030 8:00	0	0	436	0
BaseLoadConstrained	OSW_J	1/1/2030 9:00	0	0	532	0
BaseLoadConstrained	OSW_J	1/1/2030 10:00	0	0	491	0
BaseLoadConstrained	OSW_J	1/1/2030 11:00	0	0	421	0
BaseLoadConstrained	OSW_J	1/1/2030 12:00	0	0	432	0
BaseLoadConstrained	OSW_J	1/1/2030 13:00	0	0	496	0
BaseLoadConstrained	OSW_J	1/1/2030 14:00	0	0	675	0
BaseLoadConstrained	OSW_J	1/1/2030 15:00	0	0	888	0
BaseLoadConstrained	OSW_J	1/1/2030 16:00	0	0	1159	0
BaseLoadConstrained	OSW_J	1/1/2030 17:00	0	0	1403	0
BaseLoadConstrained	OSW_J	1/1/2030 18:00	0	0	1622	0
BaseLoadConstrained	OSW_J	1/1/2030 19:00	0	0	1655	0
BaseLoadConstrained	OSW_J	1/1/2030 20:00	0	0	1945	0
BaseLoadConstrained	OSW_J	1/1/2030 21:00	0	0	2368	0
BaseLoadConstrained	OSW_J	1/1/2030 22:00	0	0	2882.332611	271.6673889
BaseLoadConstrained	OSW_J	1/1/2030 23:00	0	0	3223.913666	490.0863342
BaseLoadConstrained	OSW_J	1/2/2030 0:00	0	0	3275.485443	556.5145569

Hourly Wind Solar Curtailments By Pocket

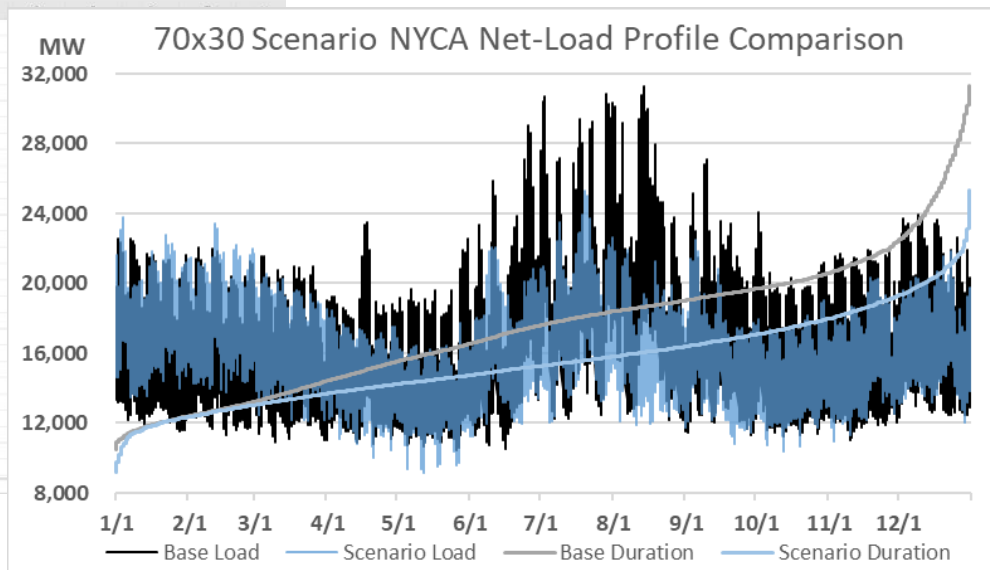
Cases	Type - Metric	Areas
BaseLoad Constrained	Solar Generation	OSW_J
BaseLoad Constrained NuclearRetired	Solar Curtialment	OSW_K
ScenarioLoad Constrained	Wind Generation	W1
ScenarioLoad Constrained NuclearRetired	Wind Curtialment	W2
		W3
		X1
		X2
		X3
		Y1
		Y2
		Z1
		Z2
		Z3



Zonal Net Load Profiles

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	Date/Hour	A	B	C	D	E	F	G	H	I	J	K				
3	1/1/2030 0:00	1577	914	1501	654	799	1188	1058	355	654	5020	2286				
4	1/1/2030 1:00	1519	873	1454	655	786	1131	1009	331	624	4779	2131				
5	1/1/2030 2:00	1468	852	1427	651	772	1108	979	321	600	4624	2035				
6	1/1/2030 3:00	1442	841	1417	651	769	1097	966	312	592	4539	1985				
7	1/1/2030 4:00	1437	857	1434	652	788	1120	970	318	594	4529	2011				
8	1/1/2030 5:00	1445	912	1506	661	842	1182	1005	340	613	4711	2113				
9	1/1/2030 6:00	1456	980	1606	673	892	1270	1042	365	657	4996	2260				
10	1/1/2030 7:00	1448	1029	1664	676	929	1317	1072	383	687	5174	2401				
11	1/1/2030 8:00	1378	1054	1599	669	840	1179	1032	395	711	5433	2461				
12	1/1/2030 9:00	1416	1098	1524	668	769	1386	848	406	726	5597	2507				
13	1/1/2030 10:00	1375	1094	1501	652	670	1375	762	409	733	5726	2552				
14	1/1/2030 11:00	1336	1089	1468	626	599	1368	945	393	726	5717	2383				
15	1/1/2030 12:00	1289	1075	1633	617	627	1313	1007	389	752	5734	2425				
16	1/1/2030 13:00	1342	1068	1371	623	630	1319	1029	402	760	5761	2449				
17	1/1/2030 14:00	1442	1056	1528	636	659	1328	1070	403	760	5818	2459				
18	1/1/2030 15:00	1545	1059	1653	660	759	1362	1095	430	775	5946	2682				
19	1/1/2030 16:00	1656	1127	1804	701	978	1507	1254	486	853	6239	3009				
20	1/1/2030 17:00	1822	1233	1967	718	1065	1672	1410	570	1007	6537	3615				
21	1/1/2030 18:00	1826	1234	1952	713	1061	1663	1409	588	996	6405	3734				
22	1/1/2030 19:00	1828	1198	1907	669	1041	1628	1375	578	965	6291	3667				
23	1/1/2030 20:00	1811	1169	1850	699	1021	1586	1348	524	860	5988	3272				
24	1/1/2030 21:00	1754	1118	1778	694	986	1520	1298	483	833	5790	3057				
25	1/1/2030 22:00	1681	1070	1715	688	956	1470	1256	455	803	5653	2876				
26	1/1/2030 23:00	1610	1014	1669	688	930	1421	1220	432	785	5565	2739				
27	1/2/2030 0:00	1595	880	1568	631	792	1233	1120	313	773	5352	2515				
28	1/2/2030 1:00	1590	842	1528	626	777	1190	1061	283	728	5196	2316				

Hourly Zonal Net Load



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

