New York Battery and Energy Storage Technology Consortium, Inc.

VIA ELECTRONIC FILING

July 26, 2019

Hon. Kathleen H. Burgess
Secretary to the Commission
New York State Public Service Commission
Empire State Plaza, Agency Building 3
Albany, New York 12223-1350

Re: CASE 18-E-0130 – In the Matter of the Energy Storage Deployment Program

Dear Secretary Burgess:

The New York Battery and Energy Storage Technology Consortium ("NY-BEST") submits these comments for consideration in the above referenced case in relation to the Department of Public Service (DPS) Staff report entitled, "The Potential for Energy Storage to Repower or Replace Peaking Units in New York State**,"** and also referred to as the "Unit by Unit Peaker Study**"**[1] (hereinafter referred to as the "Peaker Study" or "Study"). Although Staff have not issued a public notice soliciting comments on the Peaker Study, NY-BEST has identified several concerns with the Study's methodology and findings, and as a result, we are concerned that the Study may be misinterpreted and misused in the context of this proceeding as well as in other related matters. As detailed below, NY-BEST urges DPS Staff to clarify the study findings and we recommend that DPS perform additional analysis and a more comprehensive forward-looking study to further demonstrate the role for energy storage and other clean energy resources in replacing 'traditional' peaking units.

INTRODUCTION

The New York Battery and Energy Storage Technology Consortium ("NY-BEST") is a not-for-profit industry trade association with a mission to catalyze and grow the energy storage industry and establish New York State as a global leader in energy storage. Our 175 member organizations include: technology developers ranging in size from global energy storage companies to small start-ups, manufacturers, project developers, project integrators, engineering firms, law firms, leading

[1] NYS PSC Case 18-E-0301, Report dated July 1, 2019 and amended July 2, 2019
http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4B623B91-CAF8-448C-BE98-6104F2861F98}

research institutions and universities, national labs and numerous companies involved in the electricity and transportation sectors.

NY-BEST commends DPS staff and New York State Energy Research and Development Authority (NYSERDA) staff for their significant efforts in developing the Peaker Study under a tight timeframe and we appreciate the opportunity to provide additional information and feedback on the Study findings.

NY-BEST concerns with Unit by Unit Peaker Study

The Public Service Commission's Energy Storage Deployment Order called for DPS Staff to consult with the New York Independent System Operator (NYISO), NYSERDA, the Department of Environmental Conservation (DEC), the Long Island Power Authority (LIPA), and Consolidated Edison Company of New York, Inc. (Con Edison) to develop a methodology to analyze peaker operational and emission profiles on a unit-by-unit basis to determine which units are potential candidates for hybridization[2] or replacement. The goal of the Peaker Study was to complete an initial analysis of how many MW of peaking units could be replaced or hybridized with energy storage and clean resources, particularly with regard to those units impacted by the DEC's proposed NOx rule. To that point, the overall findings suggest that there is an opportunity to replace or hybridize a substantial portion of the peaking units subject to DEC's proposed NOx rule. As we discuss in more detail below, we believe the Study greatly underestimates the amount of peaking generation that could be replaced with storage and/or hybrid solutions.

Importantly, the Peaker Study is not a study of the capacity value of energy storage as some stakeholders have already asserted in other venues and proceedings.[3] NY-BEST has significant concerns about misinterpretation and misuse of the Study and recommends that DPS Staff issue comments clarifying that this is not a capacity value study, so that this is clear in future deliberations and PSC proceedings, as well as in other regulatory venues and dockets.

It is also important to note that the Peaker Study utilized an extreme case analysis, focusing on operational data from 2013 – the all-time peak NYISO year. The Study is fundamentally flawed because the underlying assumption that to evaluate the ability to replace 'traditional' peakers with storage we must exactly replicate individual plants' operations during 2013 does not accurately reflect the ability of energy storage to replace peaker plants either today or going forward into the future.

[2] Per the Peaker Study, p. 3 "For this analysis, the term "hybridization" refers to the installation of energy storage at an existing conventional unit's site where it is assumed to charge from the grid and discharge to displace the generation of those conventional units"

[3] See comments filed in FERC Docket ER19-2276 on NYSISO 205 tariff filing in relation to DER; Eastern Generation, LLC and Helix Ravenswood, LLC (collectively, "New York Suppliers")

NY-BEST has identified three major concerns with the Peaker Study methodology which are discussed in more detail below:

1. **Peaker plant operations can be affected by properties of the peaker plants and may not reflect actual reliability needs. The study ignores the temporal characteristics of traditional peakers that are more restrictive and less flexible than Energy Storage Resources (ESRs), and assumes that peaker operation is solely determined by system reliability needs**

The Peaker Study takes historical operation of peakers as the 'gold standard' of how to meet short-term peak reliability needs and ignores that operational characteristics of traditional peakers sometimes leads them to run longer or generate more energy than a perfectly flexible capacity resource would. Some reasons that a peaker may differ from a perfectly flexible capacity resource include:

- **Block loading of peakers –** The NYISO dispatches peaker plants in a method known as "block loading" where the peakers are dispatched at full power. Contrary to the implication of the nickname "peaker" that these units might follow and clip peaks, for example running at quarter power, then half power, then full power, then back down to half, quarter and off, they are almost always either fully on or fully off. This means that they generally produce more energy than is needed to clip the peak, and cause other, more efficient generators to back down when the peakers are dispatched. An energy storage system, without the temporal and block-loading operational limitations of a peaker plant, would not need to inject as much energy to provide an equivalent reliability value in clipping the same peak.

- **Startup costs and maintenance costs –** Traditional peakers have startup costs that are not included in incremental energy offers. Furthermore, each startup of a traditional peaker contributes to periodic maintenance requirements and costs. Both of these are economic reasons to extend the run time for a peaker once started, to minimize multiple unit starts.

- **Startup time and reliability –** Part of the energy output from a peaker plant is associated with the startup time of the plant. This is energy that would not need to be produced by an energy storage system which can respond virtually instantaneously to meet the same reliability need. Failures of traditional peakers to start are common, especially for the many 30+ year old units in New York. The combination of startup time and concerns about startup reliability can lead to a conservatism and extended run-times for traditional peakers that would not be needed with energy storage.

- **NOx "Bubble" rules –** NOx rules that were in place at the time of the 2013 peak conditions created a complex set of interactions between the operation of certain downstate peakers and steam units. These complex relationships might lead to certain gas turbines running more than was strictly necessary to meet the peak reliability need, based on inter-related emissions limitations

There are a number of other potential reasons for peakers to deviate from the operations that would be expected from a perfectly flexible capacity resource such as minimum run times, gas procurement, and the New York City minimum oil burn program. It is important to recognize that any effect of these operating characteristics on peaker plant dispatch in the 2013 period is a source of error in the analysis.

2. Examining snapshots of individual units in isolation without a system model, or taking into account other operational factors at a given time, can create misleading results.

Consider the following simplified example. Two peaker plants, one named Generally Short and the other named Usually Long, participate in the energy market. Generally Short has a slightly higher marginal cost to operate than Usually Long. Throughout the summer on typical high demand days, Usually Long operates for 8 hours and Generally Short operates for 4 hours. On one day during the summer Generally Short bids lower than Usually Long and operates for 8 hours causing Usually Long to only operate for 4 hours. The analysis method employed in the study would say that we require 8-hour duration to replace Generally Short, whereas in reality four hours would be sufficient and Usually Long would have simply done what it usually did.

A similar effect can occur if there is unused capacity. If we add a third plant to the example above that has a slightly higher marginal cost than Generally Short and increase load, we can have a situation where Generally Short's duration increases but the third plant still is not producing power. In this case a four-hour ESS would be able to replace Generally Short even though the study would indicate that it could not.

It is important to understand how traditional peaker plants collectively were dispatched, whether they are effectively switching places or if there is further unused capacity, and how more flexible energy storage resources would be dispatched if they were available instead of the traditional, temporally-limited peakers. An evaluation of peak days that considers the operation of storage resources in response to economic and reliability dispatch would be a more effective method of evaluating the potential for peaker replacement.

It is illustrative to look at the all-time NYISO peak day which occurred on July 19th 2013. Table 1 shows the energy generated by each of the peaker units on that day, the unit's summer capacity, the unit's max output and MWh injected that day and a calculated effective duration.[4] The effective duration is the duration of an energy storage system with the same max summer capacity that would have been necessary to produce the same energy output produced by that unit on that day.

[4] Table 1 was generated using information available through US EPA's CEMS data, queried here: https://ampd.epa.gov/ampd/

Table 1. All-time peak NYISO day peaker unit operation

Summary	Sized to Summer Max Capacity	Sized to Nameplate
< 4 hour Effective Duration	858 MW	1,105 MW
< 6 hour Effective Duration	1,395 MW	1,683 MW

July 19, 2013 All-time NYISO peak day

Unit	Summer MW	MW injected max	Assumed MW (max of MW injected, summer MW)	MWh injected	Effective duration	
74th StreetCT0001	10.2		10.2	-	-	
74th StreetCT0002	18.4		18.4	-	-	
Astoria Gas Turbine PowerCT0005	16.3		16.3	-	-	
Astoria Gas Turbine PowerCT0007	16.3		16.3	-	-	
Astoria Gas Turbine PowerCT0008	16.3		16.3	-	-	
Astoria Gas Turbine PowerCT0010	23.8		23.8	-	-	
Astoria Gas Turbine PowerCT0011	31.8		31.8	-	-	
Astoria Gas Turbine PowerCT0012	23.8		23.8	-	-	
Astoria Gas Turbine PowerCT0013	23.8		23.8	-	-	
E F BarrettU00010	18		18	-	-	
E F BarrettU00012	23		23	-	-	
E F BarrettU00013	23		23	-	-	
E F BarrettU00014	22		22	-	-	
E F BarrettU00015	22		22	-	-	
GlenwoodU00020	49.6		49.6	-	-	
GlenwoodU00021	55.1		55.1	-	-	
Gowanus Generating StationCT01-5	16		16	-	-	
Gowanus Generating StationCT04-6	17.9		17.9	-	-	
Hillburn1	33.1	0	33.1	-	-	
Hudson AvenueCT0003	14.3		14.3	-	-	
Hudson AvenueCT0004	14.6		14.6	-	-	
Hudson AvenueCT0005	15.7		15.7	-	-	
Narrows Generating StationCT02-4	18.3		18.3	-	-	
NorthportUGT001	12.4		12.4	-	-	
Port Jefferson Energy CenterUGT001	12.4		12.4	-	-	
Port Jefferson Energy CenterUGT003	39.7		39.7	-	-	
Ravenswood Generating StationCT0005	17.5		17.5	-	-	
Ravenswood Generating StationCT0007	22		22	-	-	
Ravenswood Generating StationCT0008	25		25	-	-	
Ravenswood Generating StationCT0010	25		25	-	-	
West Babylon FacilityUGT001	49.9		49.9	-	-	
Ravenswood Generating StationCT03-2	0	26	26	51	2.0	
59th StreetCT0001	15.4	14	15.4	44	2.9	
Narrows Generating StationCT02-8	17.4	17	17.4	68	3.9	
Holtsville FacilityU00004	50.5	18	50.5	200	4.0	
Ravenswood Generating StationCT0006	22	8	22	88	4.0	**858 MW total <=4 hrs**
Holtsville FacilityU00008	54.3	20	54.3	223	4.1	
Holtsville FacilityU00003	47.3	18	47.3	200	4.2	
Holtsville FacilityU00007	51.1	20	51.1	223	4.4	
Holtsville FacilityU00009	54.3	22	54.3	243	4.5	
Holtsville FacilityU00001	51.9	21	51.9	236	4.5	
Holtsville FacilityU00005	51.5	21	51.5	235	4.6	
Holtsville FacilityU00006	51.5	21	51.5	235	4.6	
Wading River FacilityUGT014	15.4	12	15.4	73	4.7	
E F BarrettU00007	18	10	18	86	4.8	
Holtsville FacilityU00002	48.4	21	48.4	236	4.9	
E F BarrettU00004	18	10	18	89	4.9	
Wading River FacilityUGT013	47.7	36	47.7	240	5.0	
Arthur KillCT0001	12	15	15	86	5.8	
Glenwood Landing Energy CenterUGT011	11.8	12	12	70	5.8	**1,395 MW total <=6 hrs**
E F BarrettU00009	18	10	18	110	6.1	
Gowanus Generating StationCT04-7	16.6	15	16.6	105	6.3	
E F BarrettU00008	18	11	18	116	6.4	
E F BarrettU00005	16	10	16	105	6.6	
E F BarrettU00011	19	10	19	125	6.6	
E F BarrettU00006	18	11	18	120	6.7	
Astoria Gas Turbine PowerCT4-3A	16.5	20	20	135	6.8	
Astoria Gas Turbine PowerCT4-3B	16.5	20	20	135	6.8	
Gowanus Generating StationCT04-3	17.5	15	17.5	120	6.9	
Gowanus Generating StationCT04-8	17.5	15	17.5	120	6.9	
Astoria Gas Turbine PowerCT3-4A	17.3	20	20	145	7.3	
Astoria Gas Turbine PowerCT3-4B	17.3	20	20	145	7.3	
Gowanus Generating StationCT04-5	16.1	15	16.1	120	7.5	
Ravenswood Generating StationCT0004	17.8	13	17.8	133	7.5	
Astoria Gas Turbine PowerCT2-4A	17.4	20	20	150	7.5	
Astoria Gas Turbine PowerCT2-4B	17.4	20	20	150	7.5	
Gowanus Generating StationCT04-4	15.9	15	15.9	120	7.5	
Shoreham EnergyCT02	42.5	40	42.5	329	7.7	
Gowanus Generating StationCT04-2	17.4	15	17.4	135	7.8	
Ravenswood Generating StationCT0009	25	17	25	200	8.0	
Ravenswood Generating StationCT0011	25	18	25	205	8.2	
Shoreham EnergyCT01	42.5	40	42.5	353	8.3	
Gowanus Generating StationCT04-1	14.6	15	15	135	9.0	
Astoria Gas Turbine PowerCT4-4A	17	20	20	185	9.3	
Astoria Gas Turbine PowerCT4-4B	17	20	20	185	9.3	
East Hampton FacilityUGT001	18.9	16	18.9	176	9.3	
Shoemaker1	33	32	33	311	9.4	
Astoria Generating StationCT0001	15.1	20	20	189	9.5	
E F BarrettU00016	23	16	23	224	9.7	
E F BarrettU00017	23	16	23	224	9.7	
Astoria Gas Turbine PowerCT3-2A	17.35	20	20	195	9.8	
Astoria Gas Turbine PowerCT3-2B	17.35	20	20	195	9.8	
Astoria Gas Turbine PowerCT4-1A	16.45	20	20	195	9.8	
Astoria Gas Turbine PowerCT4-1B	16.45	20	20	195	9.8	
Astoria Gas Turbine PowerCT4-2A	16.05	20	20	195	9.8	
Astoria Gas Turbine PowerCT4-2B	16.05	20	20	195	9.8	
Ravenswood Generating StationCT03-1	0	27	27	265	9.8	
Astoria Gas Turbine PowerCT2-3A	17.95	20	20	200	10.0	

Astoria Gas Turbine PowerCT2-3B	17.95	20	20	200	10.0	
Ravenswood Generating StationCT03-3	0	31	31	310	10.0	
E F BarrettU00018	22	16	22	227	10.3	
E F BarrettU00019	22	16	22	227	10.3	
Astoria Gas Turbine PowerCT2-1A	18.65	20	20	210	10.5	
Astoria Gas Turbine PowerCT2-1B	18.65	20	20	210	10.5	
Astoria Gas Turbine PowerCT2-2A	17.55	20	20	210	10.5	
Astoria Gas Turbine PowerCT2-2B	17.55	20	20	210	10.5	
Astoria Gas Turbine PowerCT3-1A	16.85	20	20	210	10.5	
Astoria Gas Turbine PowerCT3-1B	16.85	20	20	210	10.5	
Astoria Gas Turbine PowerCT3-3A	16.1	20	20	210	10.5	
Astoria Gas Turbine PowerCT3-3B	16.1	20	20	210	10.5	
Ravenswood Generating StationCT02-4	0	25	25	264	10.6	
Ravenswood Generating StationCT0001	7.9	7	7.9	84	10.6	
Holtsville FacilityU00010	0	22	22	243	11.0	
Gowanus Generating StationCT01-6	16.9	16	16.9	192	11.4	
Holtsville FacilityU00017	0	24	24	273	11.4	
Holtsville FacilityU00018	0	24	24	273	11.4	
Ravenswood Generating StationCT02-1	0	30	30	353	11.8	
Holtsville FacilityU00015	0	22	22	266	12.1	
Holtsville FacilityU00016	0	22	22	266	12.1	
Wading River FacilityUGT007	78.5	72	78.5	956	12.2	
Wading River FacilityUGT008	77.5	71	77.5	956	12.3	
Gowanus Generating StationCT01-7	16.8	16	16.8	208	12.4	
Wading River FacilityUGT009	75.9	70	75.9	941	12.4	
Bayswater Peaking Facility2	0	53	53	663	12.5	
Holtsville FacilityU00013	0	24	24	303	12.6	
Holtsville FacilityU00014	0	24	24	303	12.6	
Narrows Generating StationCT01-4	18.8	17	18.8	238	12.7	
Gowanus Generating StationCT01-1	18.9	16	18.9	240	12.7	
Holtsville FacilityU00019	0	23	23	295	12.8	
Holtsville FacilityU00020	0	23	23	295	12.8	
Gowanus Generating StationCT01-2	18.5	16	18.5	240	13.0	
Gowanus Generating StationCT01-3	15.2	16	16	208	13.0	
Holtsville FacilityU00011	0	22	22	288	13.1	
Holtsville FacilityU00012	0	22	22	288	13.1	
Freeport Power Plant No. 25	0	41	41	556	13.6	
Edgewood EnergyCT02	42.5	41	42.5	579	13.6	
Gowanus Generating StationCT01-4	16	16	16	224	14.0	
Gowanus Generating StationCT01-8	15.5	16	16	224	14.0	
Gowanus Generating StationCT03-7	16.9	15	16.9	240	14.2	
Port Jefferson Energy CenterUGT002	43.3	41	43.3	619	14.3	
Gowanus Generating StationCT02-6	18.9	16	18.9	272	14.4	
Edgewood EnergyCT01	42.5	41	42.5	612	14.4	
Hawkeye Energy Greenport, LLCU-01	52.5	51	52.5	780	14.9	
BrentwoodBW01	47	45	47	703	15.0	
Gowanus Generating StationCT02-3	19.2	16	19.2	288	15.0	
Gowanus Generating StationCT02-7	18.7	16	18.7	288	15.4	
Gowanus Generating StationCT02-5	17.4	16	17.4	272	15.6	
Narrows Generating StationCT02-5	18.2	17	18.2	289	15.9	
Gowanus Generating StationCT02-8	17	16	17	272	16.0	
Narrows Generating StationCT01-5	18.7	17	18.7	306	16.4	
Gowanus Generating StationCT02-2	18.1	16	18.1	304	16.8	
Bethpage Energy CenterGT3	0	44	44	740	16.8	
Gowanus Generating StationCT02-4	17.1	16	17.1	288	16.8	
Harlem River YardHR02	40	42	42	710	16.9	
Hell GateHG02	40	43	43	728	16.9	
Hell GateHG01	39.9	43	43	728	16.9	
Glenwood Landing Energy CenterUGT012	40.6	41	41	696	17.0	
Glenwood Landing Energy CenterUGT013	38.6	41	41	696	17.0	
Narrows Generating StationCT01-2	16.9	17	17	289	17.0	
Equus Power I1	47.9	49	49	838	17.1	
Narrows Generating StationCT01-8	17.3	17	17.3	306	17.7	
Gowanus Generating StationCT02-1	17	16	17	304	17.9	
Vernon BoulevardVB01	39.9	42	42	754	18.0	
Vernon BoulevardVB02	40	42	42	755	18.0	
Harlem River YardHR01	39.9	42	42	755	18.0	
Narrows Generating StationCT01-1	18.7	17	18.7	340	18.2	
Narrows Generating StationCT01-3	18.4	17	18.4	340	18.5	
Gowanus Generating StationCT03-5	18.5	15	18.5	345	18.6	
Narrows Generating StationCT02-7	19	17	19	357	18.8	
Narrows Generating StationCT02-6	16.5	17	17	323	19.0	
Narrows Generating StationCT02-1	18.5	17	18.5	357	19.3	
Gowanus Generating StationCT03-3	18.2	15	18.2	360	19.8	
Gowanus Generating StationCT03-8	17.4	15	17.4	345	19.8	
Gowanus Generating StationCT03-2	16.6	15	16.6	330	19.9	
Narrows Generating StationCT01-6	17.1	17	17.1	340	19.9	
Narrows Generating StationCT01-7	17.4	17	17.4	357	20.5	
Gowanus Generating StationCT03-1	16.6	15	16.6	345	20.8	
Narrows Generating StationCT02-2	17.8	17	17.8	374	21.0	
Gowanus Generating StationCT03-6	16.2	15	16.2	345	21.3	
23rd and 3rd2302	0	40	40	868	21.7	
Gowanus Generating StationCT03-4	16.3	15	16.3	360	22.1	
23rd and 3rd2301	0	43	43	987	23.0	
Bayswater Peaking Facility1	55	53	55	1,270	23.1	
Nissequogue Energy Center1	0	42	42	976	23.2	
Pouch TerminalPT01	47	47	47	1,100	23.4	
North 1stNO1	47	47	47	1,120	23.8	
Narrows Generating StationCT02-3	17	17	17	408	24.0	**4,674 MW total all durations**

The table is sorted by effective durations with units with effective durations of less than four hours are highlighted in dark green and units with effective durations of less than six hours highlighted in light green. Overall there were 858MW of peaking units that had an effective duration of less than four hours and 1,395MW of peaking units with effective duration of less than six hours. If the effective capacity is based on nameplate (i.e. sizing battery capacity to peaker unit nameplate rather than summer max output) then the amount of units with an effective duration rises to 1,105 MW of less than four hour effective duration and 1,683MW of less than six hour effective duration.

Table 1 potentially underestimates the potential for energy storage to have replaced the plants on this day because it does not include sufficient information to determine if the effective duration of the peaker dispatch was over contiguous hours or made up of two or more separate runs during the day. In the event of multiple, shorter duration runs during the day, correspondingly shorter duration storage units may be capable of providing the same energy contribution by charging in the intervening hours.

3. Load shapes and peaking needs will change dramatically as renewable energy increases, making the Study's use of 2013 data inappropriate to analyze future New York peaking needs

The Peaker Study acknowledges that "While this study examined historical energy data from 2013 to determine how storage resources could have participated, historical data may not be an accurate predictor of future use. The system changes between 2013 and 2023/2025 are likely to impact how traditional peaking units and storage resources operate in the future."

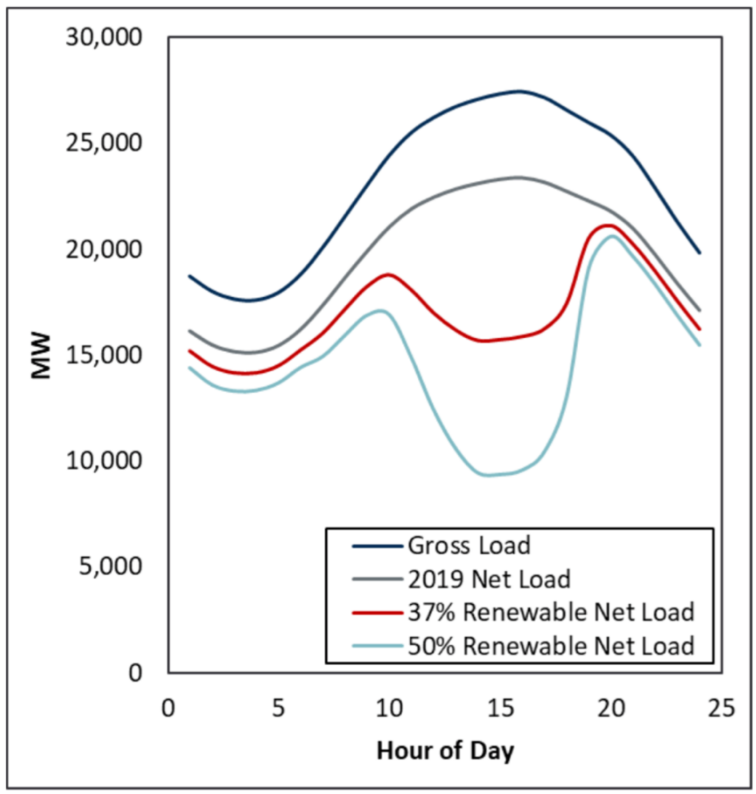

Figure 2. Net load shape for New York Control Area as a function of renewable energy generation (Source: Astrapé Report[5])

The Astrapé Consulting report[5] shows that peak needs change and durations shorten as we move to a system with high renewables. A 70 percent renewable grid in 2030, as mandated by the 2019 Climate Leadership and Community Protection Act, will be very different from the 2013 grid. Even the electric grid in 2025 will be quite different. By only looking at the historic 2013 period rather than taking a forward-looking approach incorporating higher penetrations of renewable resources, the Study results are effective only to indicate a *bare minimum* level of opportunity for storage to replace traditional peakers. An

[5] Astrape Consulting. Load Shape Development and Energy Limited Resource Capacity Valuation. Final Report. March 18, 2019, Prepared for New York Battery and Energy Storage Technology Consortium ("NY-BEST") by Kevin Carden, Nick Wintermantel, Alex Krasny, Astrapé Consulting

analysis using more realistic projections of future load shapes would show greater levels of potential.

Figure 2 shows the net load for the New York Control Area as renewables increase, where the 37% Renewable case corresponds to the State's target for 2025 and the 50% Renewable case corresponds to a point in time between 2025 and 2030. It is evident that the historical load shape, exhibiting a single daily peak, will not be at all reflective of the load shape going forward in New York State.

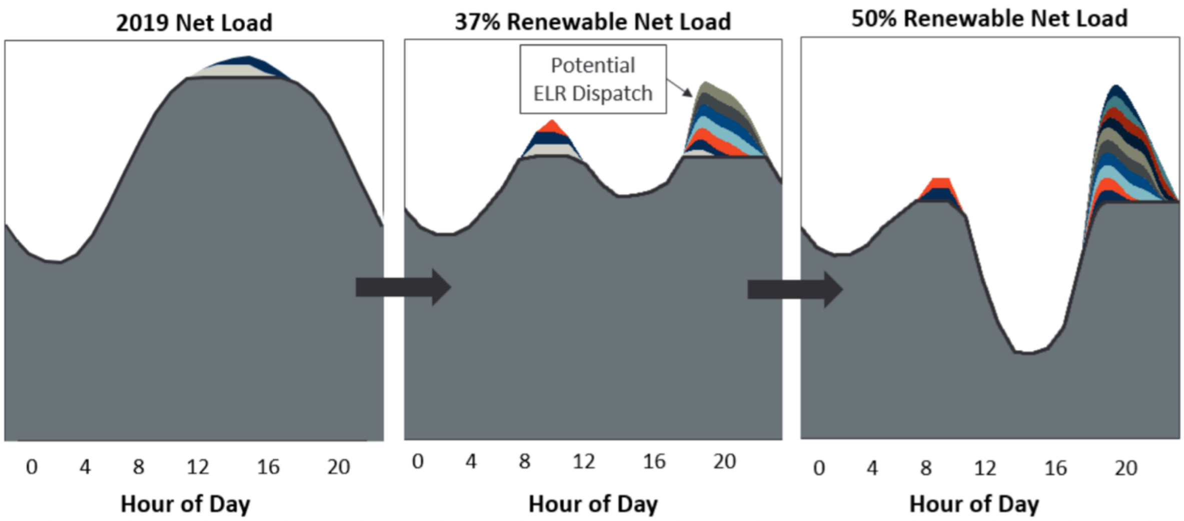

Figure 3. Illustration of how peak shaving will change as renewables increase (Source: Astrapé Report[6])

Figure 3 illustrates how peak shaving will change as renewables increase. The creation of sharper peaks means that the duration of peaker operation (whether traditional or ESR) needed to meet the peak demand will be reduced.

This trend has also been observed in NREL's recent study[7] of the ability of four-hour duration resources to provide capacity value. Figure 4 shows the amount of four-hour resources that NREL determined can provide full capacity value

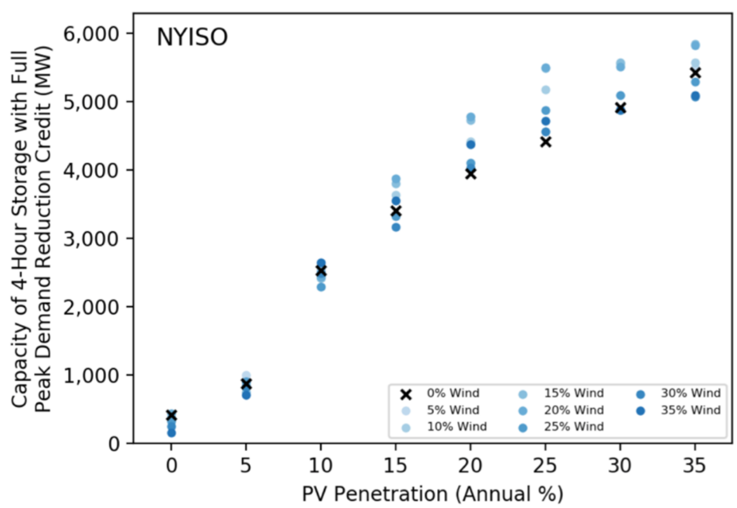

Figure 4. Capacity value of four-hour energy storage as a function of PV penetration (source NREL Study[7])

[6] Ibid, p.7

[7] Denholm, Paul, Jacob Nunemaker, Pieter Gagnon, and Wesley Cole. 2019. The Potential for Battery Energy Storage to Provide Peaking Capacity in the United States. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-74184. https://www.nrel.gov/docs/fy19osti/74184.pdf.

in the New York Control Area as a function of PV penetration. While 'capacity value' is not synonymous with the ability of ESR to replace or hybridize traditional peakers, NREL's results are consistent with Astrapé's and indicate that ESR has a higher reliability value as the penetration of renewables increases.

It is clear from the Astrape and NREL studies of New York that any analysis based only on 2013 load data and not taking into account the readily predictable changes in load shape that will result from the State's aggressive re-making of the generation fleet is of very little value in establishing the value and potential for energy storage to provide reliability services going forward.

Future load curves for systems with high levels of renewables will vary greatly from today's with steeper peaks driving requirements for faster ramping and the ability to meet dynamic voltage and frequency conditions. These changing conditions will need to be accounted for in future analyses.

Conclusion

Based on the concerns we have identified above regarding the limitations of the Peaker Study, many of which are acknowledged within the Study itself, NY-BEST agrees with DPS Staff that additional analysis in needed to more accurately establish the potential for energy storage to replace traditional peaking units in the State. Specifically, we urge DPS staff and NYSERDA to take near term action on the following**:**

1. As DPS Staff state in the Peaker Study, "A study that considers the reliability contribution of storage and other resources over time is recommended. An example of how this type of analysis and study could be performed is provided in Appendix D."[8] NY-BEST notes the we believe Staff intended to reference "Appendix C" and we urge that such a study be completed promptly.

2. In the Energy Storage Deployment Order, the Commission indicated the need for a Peaking Unit Contingency Plan to consider and report on portfolios of alternatives that could be deployed in the event that the peaking units are no longer available. NY-BEST urges the Commission to institute a proceeding in the near future to examine the potential for the proposed DEC regulations to lead to retirements and reliability impacts, and to identify potential portfolios of resources, including ESRs, that could meet the requisite reliability planning requirements.

   We further recommend that the additional analyses referenced above should be forward-looking, take a holistic comprehensive system planning approach and incorporate the State's new aggressive renewable energy goals of 70 percent renewable energy by 2030 and 100 percent carbon free emissions by 2040.

[8] p. 10 of the Peaker Study

We appreciate your consideration of these comments and stand ready to answer any questions or provide assistance to the Department going forward.

Respectfully Submitted,

Dr. William Acker
Excutive Director