Comments on the Draft Scope for Lincoln Park Grid Support Center
DRAFT ENVIRONEMENTAL IMPACT STATEMENT (DEIS)
(PART 617.8 STATE ENVIRONMENTAL QUALITY REVIEW (SEQR))
TOWN OF ULSTER
ULSTER COUNTY, NEW YORK

Citizens for Local Power (CLP) appreciates this opportunity to provide comments on the Draft Scope for preparation of the draft Environmental Impact Statement (EIS) for the proposed Lincoln Park energy project. CLP's comments focus on the energy system aspects of the project, specifically: The project description, need, and benefits; assessment of alternatives; and greenhouse gas (GHG) emissions. A comprehensive, accurate, and thorough review of these areas is essential to evaluating the impacts of, and justification for, the proposed project. CLP also supports the broader comments submitted by Town of Ulster Citizens.

1. Project description

The projection description in the Draft Scope states:

"The project will provide short-term peaking power generation, assist in the management of short-term frequency and voltage fluctuations, assist in the integration of variable renewable generation from wind and solar projects, and provide critical grid resiliency services such as micro-grid and grid-restart." (Section I.A.2.a)

Some of these terms refer to well-defined standard grid services. *Short-term peaking power generation* and *management of short-term frequency and voltage fluctuations* refer to participation in the NYISO capacity and ancillary services markets, respectively. The other purported services are more vague and require further technical documentation and/or supporting technical studies to support their inclusion in the project description.

a. Renewables integration

The draft project description states that the project will "assist in the integration of variable renewable generation from wind and solar projects". This sounds like a wonderful project benefit, but it does not refer to a specific current NYISO service. In order to include this phrase in the project description – and in the project's benefits – the applicant needs to further define specifically how the project will assist in integrating renewable generation and to quantify both the need for this assistance and the amount of such assistance the project will typically be able to provide.

In a white paper posted on the project website,[1] the applicant states:

"The Lincoln Park project provides support services without competing against renewables to sell power. Large coal or gas plants cannot provide support services unless they are also generating power that competes with wind and solar. For example, large baseload plants can't shut down on windy nights, and smaller gas plants

[1] https://www.dropbox.com/s/oy850kth8y6wxsj/GridSupportandNYCleanEnergy.02.13.pdf?dl=0

can't throttle down during the sunniest part of the day if they need to be quickly restarted when the sun goes down at night. The result is excess energy generation that can crowd out renewables and force wind and solar plants to curtail their output."

For the purposes of these comments, we will assume that this paragraph describes what the applicant means by "assist in integration of variable renewable generation" in the Draft Scope. The "support services" referred to in the white paper are the capacity and ancillary services that are well-defined in the project description. In the white paper, the applicant correctly notes that large coal and gas plants, as well as peaker plants based on turbine rather than engine technologies, are less flexible than the proposed project. When these other plant types provide peaking and ancillary services that are needed on a short-term (minutes or hours) basis, they may be unable to ramp back down quickly when variable renewable generation becomes available.

Systems with very large quantities of wind and solar generation may find that they need to "curtail" – that is, refuse the generation that could be provided by – wind and solar facilities at times when the more inflexible generation on the system cannot ramp down quickly enough to absorb them. For example, in California – which now has nearly 20 percent of its total annual electricity generation from wind and large-scale solar, and at times more than 50 percent of total instantaneous production from these resources – curtailments of up to 3 percent of total possible wind and solar generation occurred in the spring of 2017, when hydroelectric supplies were also overabundant due to an unusually large snowpack.[2]

The California grid operator (CAISO) is actively seeking to develop further flexibility on the California grid in order to continue to accommodate more renewable generation. There are many ways to increase the flexibility of a power grid, including battery storage, rate designs that encourage customers to move loads to times of day when they can be better accommodated, demand response programs that compensate customers for cutting load at peak times, better coordination with power markets in neighboring states, integration of additional flexible load such as electric vehicles, and construction of new flexible power plants. Of these options, most are less costly than constructing a new power plant. In this context, it is worth noting that the California Public Utility Commission recently issued a ruling requiring that any load-serving entity proposing a new natural gas-fired plant "make a showing as to why another lower-emitting or preferably zero-emitting resource could not reasonably meet the need identified."[3] In other words, even in a context where renewable curtailment issues are pressing, regulators are finding that a natural gas peaker plant is not the preferred approach to increasing system flexibility.

In contrast with the California situation, the downstate portion of the New York state energy grid received less than two percent of its generation from wind and solar in 2017.[4] **In CLP's evaluation, it is unlikely to face issues with curtailment in the near future. The NYISO reports that in recent years, monthly wind curtailments in New York state ranged from 0.1 to 3.8 percent. Of these, none occurred in the Hudson Valley (NYISO load Zone G) or the downstate regions that the proposed project will serve.** All of them occurred in NYISO Zones A-E, the areas with the greatest wind resources. The primary cause of these curtailments, particularly the larger ones, was transmission outages, not grid inflexibility.

[2] https://www.caiso.com/Documents/CurtailmentFastFacts.pdf
[3] http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M209/K771/209771632.PDF, page 70.
[4] NYISO *Power Trends 2017*, available at: http://www.nyiso.com/public/webdocs/media_room/publications_presentations/Power_Trends/Power_Trends/2017_Power_Trends.pdf.

Finally, it should be noted that in the Lincoln Park white paper the applicant incorrectly characterizes combined cycle natural gas plants as baseload plants which "need to generate power as much as possible to be financially viable." In most parts of the country, combined cycle plants are used as load-following plants, ramping up and down throughout every day to serve changing load. In contrast to baseload coal and nuclear units, which are much more inflexible and tend to be run at a nearly constant level day and night for many days at a time, combined cycle plants tend to be run at capacity factors of 50 percent or less, as a result of this load-following dispatch. While combined cycle units do require extended start up/shut down times as the white paper states, they are designed to ramp up and down over a wide range of load factors over the course of a day. They thus occupy an intermediate level of flexibility between baseload units and highly flexible units such as the proposed project.

Although New York's power grid is expected to incorporate increasing levels of renewable generation in the coming years, at the same time its non-renewable fleet will be shifting away from the most inflexible nuclear and coal units toward more flexible gas combined cycle. Over this time, we can also expect that increases in flexible load from electric vehicles, improvements in utility rate design, and increasing use of battery storage will be providing greater flexibility. All of these changes will lead the system to be more flexible, not less, so it will have a greater inherent ability to absorb variable renewable generation without the need for new gas-fired facilities such as the proposed project.

The highest priority in New York state for integrating variable renewable generation and avoiding curtailment is construction of additional transmission capability to move wind power from upstate to downstate areas. **The proposed Lincoln Park project does not, in CLP's evaluation, serve real variable renewable integration needs in its proposed location.**

To demonstrate any renewable integration project benefits, the applicant must provide one or more of the following:

a. Examples of recent renewable curtailment events in Zone G, detailing the system configuration at the time of the event and identifying the inflexible generators that would have remained undispatched had the proposed project been in place, enabling the curtailment to be avoided. The description of the system configuration should be sufficiently detailed to identify the cause of the dispatch of the inflexible generator (capacity, energy, and/or ancillary service needs) and verify that the proposed project's resources would have been sufficient to avoid this dispatch, or

b. If the claim is that the proposed project will provide these integration benefits in a future New York grid with higher penetrations of variable renewables, the applicant should provide power system modeling results in a unit commitment power flow modeling system such as GE-MAPS, PROMOD, or similar tool, demonstrating the ability of the proposed project to reduce curtailment under a future system simulation. The future scenario should be situated no more than halfway through the proposed project's technical lifetime, in order to ensure that it is relevant to the project's operations. New York state renewable energy goals should be used as the basis for the total levels of renewable capacity projections at that time, unless the applicant can provide reasonable support for an alternative projection.

The future scenario should contain projections of future loads based upon NYISO forecasts and renewable capacity installations based upon NYSERDA modeling of renewable resources, including the most likely locations for wind and solar capacity to be constructed. These locations must be identified with enough geographical specificity to support model inputs. Model runs with and without the proposed project should be

compared to specify the level and fraction of annual renewable curtailment that the proposed project can avert.

If the applicant is unable or unwilling to provide this support, claims that the project will assist in the integration of renewable generation should be removed from the project description and all descriptions of project benefits and needs served.

b. Resiliency

The terms *resiliency* and *micro-grid* are currently very popular buzzwords in the power sector. Resiliency does not refer to any single technology or activity, but a set of activities that together enhance the power system's ability to rebound from storms, terrorist attacks, and other hazardous events. A recent report from the Electric Power Research Institute[5] suggests that resiliency planning should include three components: protecting the system from damage, facilitating and speeding recovery from outages, and supporting customers and communities while service is being restored. Recommended measures include protecting infrastructure from hazards, relocating distribution wires underground, enhancing utility cybersecurity, developing enhanced damage prediction and assessment capabilities, improving utilities' ability to track restoration services and communicate with customers during outages, and providing backup generation for critical facilities and community centers.

If the applicant is suggesting that the proposed project will offer one or more of these or other resiliency benefits, technical details describing the proposed benefits and how the project will achieve them should be provided. The project description in the Draft Scope mentions two specific resiliency services: micro-grid and grid-restart.

A micro-grid, as the name suggests, is a small, localized set of electricity sources and loads that can be disconnected from the main power grid and run independently when the main grid is unavailable. While a battery and small generator system might be part of a micro-grid design, and a micro-grid supporting critical community facilities such as emergency services, hospitals, schools, or senior housing might indeed be an important resiliency measure, we have not seen any technical plans for a micro-grid around the proposed project and are not aware of any critical facilities that are co-located with the project which it could support in a micro-grid. **If there are specific plans to develop a micro-grid around this project, their technical details should be included in the project design and the environmental review process. If there are no such plans, the word *micro-grid* does not accurately describe the project and should be removed from the project description.**

Grid-restart, or black start, capabilities are one of the standard NYISO ancillary services for which qualified facilities are compensated. When a major disruption has brought down an entire power grid area, it needs to be brought up in stages in order to allow large spinning generators to reconnect to the grid. Typically, this is done by co-locating diesel generators at selected larger power plants. These diesel generators are used to bring their co-located units back on line. Dedicated transmission lines to other plants can then be used to re-energize the rest of the system. As a diesel-capable generator, the proposed project may indeed qualify for NYISO black start payments, if it is appropriately connected to larger facilities. **However, NYISO has stated that the New York State grid currently has sufficient black start capability from existing hydro resources, and it is**

[5] https://www.epri.com/#/pages/sa/grid_resiliency

not presently looking for additional black start capability.[6] In addition, given the small project size relative to this standard NYISO market, we do not believe that participation in this market, even if it were to occur, would be itself justify use of the term *critical grid resiliency services* in the project description.

In summary, the applicant should clearly define and provide technical documentation to support any resiliency services the project is intended to provide, beyond its participation in the capacity and ancillary services markets. If appropriate documentation is not provided, terms such as resiliency and micro-grid should be removed from the project description.

2. Purpose/Need/Public Benefit

Section VI.E of the Draft Scope calls for a description of the need and benefits of the project, "including a more resilient energy supply" (Section VI.E.3). As detailed in the previous section, any claims that the project will increase system resiliency or assist in renewables integration must be backed up by detailed technical studies that demonstrate the need for these services, specify how the proposed project will meet the need, and quantify the significance of the project relative to the need. For example, to support a claim that the project will assist in renewable integration, the applicant should demonstrate the level of renewables curtailment that the proposed project could avert with appropriate historical evidence or power system modeling of future system scenarios. Without such supporting documentation, description of the needs to be served by the project should be limited to its participation in NYISO energy, capacity, and ancillary services markets.

Section VI.E.1 requests "information addressing service area". CLP wishes to emphasize the importance of this requirement. In order to properly balance the benefits and risks of the proposed project, it is essential to specify *where* system benefits will be experienced. It is well understood that the environmental risks and harms of the project will be strongly concentrated locally to the project. However, CLP's understanding, based upon repeated filings by Central Hudson to the Public Service Commission, is that the immediate local area does not currently need, and is not projected to need, the backup capacity services that form the primary revenue stream for the proposed project. **Peak load on the Lincoln Park circuit has been declining steadily and stands below half of total rated capacity. Peak loads are declining or stagnant on most circuits in the Central Hudson service territory**, according to figures published by Central Hudson in their Distribution System Implementation Plan (see Figure 1).[7] The proposed project is economically feasible because of the New Capacity Zone created by the Federal Energy Regulatory Commission in 2014, which lumps our region – NYISO Zone G – with Zones H, I, and J further downstate, providing higher capacity payments for facilities located anywhere in these four zones. This New Capacity Zone concentrates environmental impacts in the mid-Hudson Valley to serve peak capacity needs in higher load and load-growth areas downstate.

[6] NYISO, *The State of Storage: Energy Storage Resources in New York's Wholesale Electricity Markets*, Dec. 2017, available at https://home.nyiso.com/wp-content/uploads/2017/12/State_of_Storage_Report_Final_1Dec2017.pdf.
[7] Central Hudson, *Initial Distributed System Implementation Plan*. June 30, 2016. Available at http://nyssmartgrid.com/wp-content/uploads/Central-Hudson-DSIP-Report.pdf.

Table VI-5: Substation and Planning Load Area Historical Peaks, Design Ratings, and Growth Trends

Load Area	Substation	Design rating	Historical Annual Peak (MW)						Annual growth trend (%)*
			2010	2011	2012	2013	2014	2015	
1 Northwest	Hunter	19.5	11.5	13.3	14.4	13.5	14.0	-	3.3%
	Lawrenceville	19.3	-	-	-	16.4	17.0	-	6.8%
	New Baltimore	25.8	11.0	10.1	9.2	10.0	9.2	9.2	-1.0%
	North Catskill	35.1	27.4	26.8	24.8	26.5	23.4	22.8	-0.5%
	Vinegar Hill	18.8	9.0	9.3	9.1	9.0	9.0	9.8	0.7%
	Westerlo	27.0	8.9	8.0	7.7	8.2	8.6	8.1	0.1%
	Total	**N/A**	**75.0**	**81.2**	**65.9**	**79.5**	**80.4**	**66.2**	**2.7%**
2 Kingston - Saugerties	Boulevard	30.6	23.6	24.3	22.4	26.6	20.5	20.6	-1.1%
	East Kingston	48.0	13.8	13.6	12.8	13.1	11.9	12.0	-1.0%
	Hurley Ave	23.1	19.9	20.5	18.7	20.2	17.6	17.0	-0.8%
	Lincoln Park	84.0	46.2	47.2	44.5	44.0	42.1	41.0	-1.7%
	Saugerties	50.0	-	-	-	24.2	21.0	20.6	-0.6%
	Woodstock	20.9	20.5	19.7	18.1	19.3	20.9	20.2	1.2%
	Total	**N/A**	**120.3**	**124.2**	**114.4**	**118.8**	**107.7**	**105.0**	**-0.9%**
3 Ellenville	Clinton Ave	7.7	1.2	1.3	1.2	1.4	1.6	1.4	1.2%
	Dashville	2.0	1.2	1.1	1.3	1.6	1.4	1.1	0.8%
	Grimley	7.2	-	-	1.1	5.0	4.1	4.4	3.6%
	High Falls	34.5	18.7	18.9	17.7	19.2	17.1	17.0	0.5%
	Honk Falls	18.2	6.1	6.1	6.3	6.1	5.9	5.8	0.8%
	Total	**N/A**	**26.8**	**26.6**	**26.1**	**26.4**	**24.7**	**24.5**	**1.0%**
4 Modena	Galeville	28.7	7.1	9.5	9.6	9.3	9.0	10.9	4.4%
	Highland	32.9	18.7	18.9	17.7	19.2	17.1	17.0	1.2%
	Modena	21.1	13.3	14.8	13.5	14.1	12.0	12.4	1.4%
	Ohioville	29.7	30.0	25.4	25.2	25.3	24.2	22.7	-2.9%
	Total	**N/A**	**61.5**	**65.8**	**63.9**	**65.7**	**60.7**	**61.4**	**1.4%**
5 Newburgh	Bethlehem	47.8	46.2	37.5	36.3	41.9	34.1	35.2	-0.6%
	Coldenham	47.8	31.9	35.3	33.0	39.0	33.5	30.7	1.5%
	East Walden	26.2	15.8	14.0	15.1	15.5	14.1	14.6	0.7%
	Marlboro	30.9	20.1	19.9	19.7	20.3	18.2	19.6	0.4%
	Maybrook	30.0	18.3	16.8	16.5	15.2	14.3	17.7	-0.1%
	Union Ave	94.5	-	61.9	59.9	56.7	53.1	55.6	-0.2%
	West Balmville	47.8	42.5	43.1	40.9	39.1	32.9	34.9	-2.4%
	Total	**N/A**	**211.5**	**206.9**	**215.8**	**224.0**	**194.1**	**203.9**	**0.9%**

Figure 1 - Peak loads on Central Hudson substations

If the applicant disputes this characterization – that the proposed project will serve needs elsewhere while concentrating impacts locally – the applicant should provide a projection of future peak load growth on the local distribution circuit and/or in Central Hudson service territory, supported by detailed and reasonable projections of local population and economic growth and end use or other changes in electricity demand that show that additional peak capacity will be needed here during the proposed project's technical lifetime. The applicant should specify how and why their projection differs from the characterization of system capability that has been provided by Central Hudson in its distribution system planning filings, such that this capacity is needed locally.[8]

3. Air and greenhouse gas emissions

Section VII.N of the Draft Scope describes requirements for assessing air emissions impacts. CLP supports comments made by Town of Ulster Citizens to improve the requirements for assessment of impacts on air quality, including all relevant emissions. In this section of the current comments, CLP describes the recommended procedure and documentation for quantifying direct and indirect greenhouse gas (GHG)

[8] See *Central Hudson Initial Distributed System Implementation Plan*, June 30, 2016: http://nyssmartgrid.com/wp-content/uploads/Central-Hudson-DSIP-Report.pdf; and Appendices to that Plan: http://nyssmartgrid.com/wp-content/uploads/Central-Hudson-DSIP-Appendices.pdf. All utility filings with the PSC on the DSIPs can be found at dps.ny.gov, Case # 16-M-0411.

emissions. SEQR requires assessment of both the direct impacts of project operation, in this case resulting from onsite fossil fuel combustion, as well as all secondary, or indirect, impacts that are "reasonably foreseeable" and "likely the result of the action".[9]

In the case of the proposed project, a significant indirect emission impact will result from leakage of methane from the natural gas production, transmission, and distribution system, upstream from project operation. According to the 2014 New York State GHG Inventory, leakage from the natural gas transmission and distribution system makes up about 11% of methane emissions, and about 1% of all NYS greenhouse gas emissions. Because methane is such a potent greenhouse gas and especially accelerates near-term climate warming, New York State has prioritized tracking and reduction of methane emissions.[10]

The following procedure should be used to assess greenhouse gas emissions impacts. In laying out this procedure, CLP notes that SEQR guidance states that anticipated levels of fossil energy consumption "should be quantified or estimated as accurately as possible given available information."[11]

a. Direct combustion emissions

Step 1: Clearly establish the project's carbon dioxide (CO2) emissions rate per megawatt-hour (MWh) produced

The applicant has made a variety of statements regarding the project's anticipated CO2 emissions rate. In a personal communication with CLP member Evelyn Wright[12], the applicant stated that the rate would be 800-850 pounds of CO2 per MWh (lbs/MWh). Natural gas has a carbon content of 117 pounds CO2 per million BTU (MMBTU) natural gas combusted.[13] A rate of 800-850 lbs/MWh thus corresponds to a heat rate of 6838-7265 BTU/KWh or an efficiency of 47-50 percent. This would make it approximately 20% more efficient than the most efficient reciprocating engine plant in the country – according to the US EPA National Electric Energy Data System[14] – the Rubart facility in Kansas, consisting of twelve 9-MW engines with a heat rate of 8500 BTU/KWh. CLP thus views the estimate of 800-850 lbs/MWh as unlikely without further supporting documentation.

The corrected slides from the January 17, 2018 forum posted on the project website[15] state the projected emissions rate as simply "<950" lbs/MWh. 950 lbs/MWh corresponds to a heat rate of 8120 BTU/KWh, or an efficiency of 42%, still 5 percent higher than Rubart, but well within recent developments in reciprocating engine technology. Thus far the applicant has not provided any specifications for the proposed engine. As discussed further in Section 5 of these comments below, in order to support further claims about the carbon emissions rate, as well as to enable proper assessment other emissions and noise and other impacts, the applicant must provide equipment specifications from the manufacturer.

[9] NYS DEC, *The SEQR Handbook*, 2010, p 129, available at http://www.dec.ny.gov/docs/permits_ej_operations_pdf/seqrhandbook.pdf.
[10] New York State *Methane Reduction Plan*, May 2017, https://www.dec.ny.gov/docs/administration_pdf/mrpfinal.pdf.
[11] SEQR Handbook, p 129
[12] Phone call February 2, 2018
[13] https://www.eia.gov/environment/emissions/co2_vol_mass.php
[14] https://www.epa.gov/airmarkets/power-sector-modeling-platform-v515
[15] https://www.dropbox.com/s/o00ycwxjy08ypr2/20180201%20-%20GlidePath%20NY%20Introduction%20%20Rev2.pdf?dl=0

The emissions rates discussed so far apply when the project is operating on natural gas fuel. A different rate will apply when the engine is burning diesel. Diesel has a carbon content of 161 lbs/MMBTU.[16] The engine may also have a different heat rate when burning diesel, which must be documented. In addition, if the heat rate varies significantly during start-up and shut-down, this should also be addressed.

Step 2: Estimate annual emissions

Having established all the necessary emissions rates, annual emissions may be calculated by projecting the number of hours per year the project is expected to run at each rate. Here again the applicant has made various statements projecting operating hours. At the January 17, 2018 forum, the applicant stated that the generator was projected to run an average of 4 to 6 hours per day. The Draft Scope states 6 to 14 hours per day. In order to calculate total annual emissions, the fraction of hours operating on diesel versus natural gas must be estimated, perhaps based upon historical data on service interruptions for regional gas customers on interruptible contracts. Any hours in which the generator would be operating at a different emissions rate (such as start-up/shut-down) or under partial load should also be estimated. The estimated run time(s), engine capacity, capacity factor, and emissions rate(s) can then be multiplied to get total annual emissions.

As a simple example, a 20 MW facility running 6 hours per day at an emissions rate of 950 lbs/MWh would produce 20*6*365*950 = 41,610,000 lbs CO2 per year, or about 19,000 metric tons. At 14 hours per day, total emissions would be 97,090,000, or about 44,000 metric tons. This simple illustrative calculation assumes 100 percent operation on natural gas and no periods of partial load or compromised heat rates. The full calculation in the EIS should take all of these other complications into account.

b. Upstream methane emissions

Estimates of rates of methane leakage from oil and gas production, transmission, and distribution infrastructure vary across sites and measurements and range from 1 percent to as much as 9 percent of total consumption. As reported in the journal *Nature*[17], at rates above 3.2 percent, combustion of natural gas becomes more damaging to the climate than coal combustion, because methane is such a potent climate forcer. The EIS should estimate carbon dioxide equivalents using a range of methane leakage rates supported by the literature, including EPA's 2009 estimate of 2.4 percent.

Continuing the illustrative example above, at this leakage rate and a 20-year CO2 equivalent factor of 86, upstream methane emissions increase CO2-equivalent emissions by about 76 percent, increasing the total CO2-equivalent emissions estimate to 33,000 to 78,000 metric tons.

c. Place emissions estimates in a regional context

In order to enable evaluation of emissions estimates, it is necessary to place them in the context of current emissions. To that end, CLP notes that the Mid-Hudson Regional Greenhouse Gas Emissions Inventory[18] estimates that the total 2010 greenhouse emissions in the Town of Ulster were 179,266 metric tons CO2-equivalent, with 30,184 metric tons from households, 53,564 tons from businesses, 80,940 tons from mobile sources, 4,075 tons from energy supply, and the rest from solid waste, agriculture, industry, and wastewater.

[16] https://www.eia.gov/environment/emissions/co2_vol_mass.php
[17] https://www.nature.com/news/methane-leaks-erode-green-credentials-of-natural-gas-1.12123#/ref-link-5
[18] Available at http://www.dec.ny.gov/docs/administration_pdf/midhudghginventory.pdf

Thus under the illustrative estimates calculated above, the proposed project would increase the Town's total emissions by about 20 to more than 40 percent, or by roughly the amount of total household emissions at the low end to nearly the total mobile emissions at the high end.

Total 2010 CO2-equivalent emissions in Ulster County were estimated to be 2,052,894 metric tons, meaning that the project as estimated above would raise total Ulster County emissions by 1.6 to 3.8 percent. These comparisons should be refined after more precise estimates are calculated for the draft EIS.

4. Alternatives analysis

The Scoping Document must require the applicant to consider all viable alternatives and must contain an evaluation of "alternatives to the proposed action.[19] The analysis of alternatives has been called the **"driving spirit"** of the SEQRA process.[20] The "range of alternatives must include the no-action alternative," and "may also include, as appropriate, alternative:

- sites;
- technology;
- scale or magnitude;
- design;
- timing;
- use;"

In addition to the No Build alternative, the Draft Scope calls for discussion of the availability of different sites and of alternative site plans and facility designs (Section IX). More detailed guidance on the alternatives to be analyzed needs to be provided, as follows.

Because – as noted above – the proposed project is designed to serve needs and provide system benefits primarily further downstate, options to site the project in alternative locations in areas that require additional peak capacity should be analyzed. The applicant has stated at the January 17, 2018 public forum that proximity to natural gas and electricity transmission lines was a primary criterion for site selection. The applicant should provide a list of alternative sites that meet this criterion in locations that require peaking capacity services, and provide an assessment of the balancing of risks, harms, and benefits under those alternatives.

More important is the analysis of alternative technology designs. Siting the proposed project under its current design in a location closer to where it will serve grid system needs has the potential to better balance impacts and benefits. However, it does not by itself reduce the risks and harms. An alternative technology design that eliminates the fossil fuel combustion component of the project design has the potential to greatly reduce or eliminate many of the proposed project's most significant impacts, including noise, water, air, and greenhouse pollution, impacts on the housing prices of neighboring homes, visual impacts from the smokestacks, and impact on the community character.

The SEQR Handbook states that:
"A discussion of alternative technologies is appropriate when:

[19] ECL §8- 0109(2)
[20] ***Citizens for the Preservation of Windsor Terrace et al., Petitioners, v. Charles M. Smith, as Commissioner of the New York City Department of Buildings, et al., Respondents.*** **130 Misc.2d 967 (1986)** https://www.leagle.com/decision/19861097130misc2d9671906

- The alternative technology has the ability to avoid or significantly reduce potential environmental impacts;
- The cost of the alternative technology is not prohibitive, *where prohibitive does not mean merely less profitable;"*[21]

In particular, the SEQR handbook and DEC EIS Greenhouse Gas guidance[22] specify that the EIS must discuss "alternatives and mitigation which could reduce energy and fuel demands during construction and long-term operation."[23]

Accordingly, the EIS should contain an analysis of a project design that eliminates the gas/diesel generator and includes only the storage component of the project and/or pairs the storage component with a non-fossil generator. (This pairing might take place on site, or the storage might be paired with a non-fossil generator on another site.)

Storage-only and storage-plus-renewables projects are increasingly becoming cost competitive with fossil generators and are rapidly being installed by utilities around the country. As described on the company website,[24] the applicant has built several such projects in other locations.

The applicant has stated publicly their concern that NYISO rules are not yet ready to accommodate storage-only projects in the capacity and ancillary services markets in which it plans to participate. However, NYISO has such rules actively under development, with plans to release draft rules this year. A recent decision by the Federal Energy Regulatory Commission (FERC) ensures that these rules will be implemented in a timely fashion. On February 15, 2018 the FERC released rules requiring all transmission system operators, including NYISO, to develop rules enabling any storage project greater than 100 KW in size to offer "all capacity, energy, and ancillary services that it is technically capable of providing." The rules must be published within one year and implemented within two years.[25]

While the applicant has rightly stated that, in general, project developers must plan for current regulatory environments and cannot wait for new rules that might be developed, because these market rules are federally mandated and under active development, it is reasonable to plan based on their roll-out very early in the proposed project's technical lifetime. Indeed, for a project just beginning the environmental review process, CLP does not consider a two-year window before commencing operation to constitute a substantial delay. The SEQR Handbook indicates that alternative project designs to be considered in the EIS may include alternative timings, when "the timing or phasing alternative would not delay the start or extend the overall schedule of a proposed action to the point that project feasibility would be threatened."[26] In the case of this project, CLP is unaware of any immediate, time-sensitive need for the capacity and ancillary services the project proposes to provide or any other window of feasibility that the project must meet. In the absence of any such urgency, the opportunity to entirely avoid several of the most significant adverse impacts by waiting a handful of additional months is worthy of very serious consideration.

[21] SEQR Handbook, p 125
[22] https://www.dec.ny.gov/docs/administration_pdf/eisghgpolicy.pdf
[23] SEQR Handbook, p 129
[24] http://glidepath.net/projects/
[25] https://www.ferc.gov/media/news-releases/2018/2018-1/02-15-18-E-1.asp#.WqRBAGaZMUQ
[26] SEQR Handbook, p 126

In determining whether a battery-only alternative is practical, it is important to note that under SEQR a feasible alternative need not provide precisely the same use or benefits. Under the forthcoming NYISO rules, it may be that a battery-only version of the project would not be able to supply all project services to the same extent as the proposed version. For example, the FERC Order requires, and NYISO plans, rules that permit battery-only projects to participate in all of the capacity and ancillary services markets that the applicant plans to participate in. However, a battery with limited storage capacity will not be able to provide peak power for as long at a given time as a gas/diesel generator. This limitation does not, by itself, preclude the battery-only alternative from consideration. The SEQR Handbook states that even alternatives that entirely change a project's use may be considered, if the environmental benefits are significant:

"Consideration of an entirely different use or action may be reasonable in the following circumstances:

- The alternative action being considered may produce significantly fewer impacts while not significantly compromising the overall objective of the proposed action… or
- The project sponsor has a diverse range of development experience and has demonstrated capability to manage a number of different types of development."[27]

In this case, a battery-only design would modify, but not entirely change, the project's use. The project sponsor has constructed numerous battery-only and battery-plus-renewables projects and has constructed no battery-plus-fossil projects, so a battery-only alternative is well within the applicant's demonstrated capability.

The SEQR Handbook states that the level of detail needed to describe an alternative must be "sufficient for a decision-maker to identify the alternative that minimizes or avoids adverse environmental impacts to the maximum extent practicable," and when comparing alternative technologies, "fully detailed modeling is often the minimum level of information necessary for a comparative assessment."[28] In this case, the opportunity to avoid the most severe adverse impacts through an alternative technology choice is so significant that it warrants a full analysis to determine whether it is a feasible alternative. CLP recommends that a full feasibility study of a battery-only design be conducted, guided by principles and drafts that NYISO has already released.[29] Where there are uncertainties about the ultimate content of these draft rules, multiple scenarios should be used to cover likely alternatives that can be reasonably envisioned, given what NYISO has already made public. Full consideration of these rules will eliminate any possible need for a subsequent supplemental EIS, which might emerge if the new rules are released on schedule later this year as anticipated and they contain new information that would substantially change this feasibility analysis and that was not adequately considered in the draft or final EIS.

As noted above, the analysis of alternatives need not limited to alternatives that provide precisely the same need and benefits. Given the applicant's demonstrated capabilities in battery storage projects, other project designs featuring battery technology but meeting different needs and capturing different value streams could also be analyzed. The battery storage market in New York State is rapidly evolving in response to changing market conditions and state policy. In his 2018 State of the State address, Governor Cuomo announced a target for 1500 MW of battery storage to be deployed in New York State by 2025[30]. The state anticipates

[27] SEQR Handbook, p 126
[28] SEQR Handbook, p 126-127
[29] See, for example, NYISO, *The State of Storage: Energy Storage Resources in New York's Wholesale Electricity Markets*, Dec. 2017, available at https://home.nyiso.com/wp-content/uploads/2017/12/State_of_Storage_Report_Final_1Dec2017.pdf.
[30] https://www.governor.ny.gov/news/governor-cuomo-unveils-20th-proposal-2018-state-state-new-yorks-clean-energy-jobs-and-climate

spending up to $200 million on incentives to meet this target. NYSERDA is in the process of developing a roadmap to meet this target, expected to be released in the second quarter of 2018, after which the Public Service Commission (PSC) expects to begin proceedings to implement it.

Even in advance of this roadmap, to advance state clean energy goals, the PSC has ordered that by December 31, 2018, all utilities must have at least two energy storage projects attached to a distribution substation that offer at minimum two distinct services (like energy, regulation, or capacity)[31]. On February 22, the Public Service Commission approved a demonstration project in Orange County that is being developed by Tesla and Orange and Rockland (OR&) utility. The project has of two components: 2 MW of battery storage alone, to be installed behind the meter at Commercial and Industrial (C&I) customers, and 2 MW of storage plus solar at remote sites. Both components envision a 2-hour capacity for the batteries – less than GlidePath is proposing for the Lincoln Park Grid Support Project.

The Tesla demonstration project specifically combines and seeks to model a suite of grid services and associated value- and revenue-creating possibilities, with financial benefits to be shared among the TESLA, O&R, and participating C&I customers. Community solar (allowing residential or small business customers to enroll in a solar farm, save on bills, and contribute to emissions reduction and grid optimization) is envisioned as a possible part of the second component.

To CLP's knowledge, Central Hudson has not yet identified their required projects, potentially creating another opportunity to investigate a storage-only alternative to the currently proposed project, perhaps providing a somewhat different suite of benefits and earning different value streams.

Finally, CLP notes here that the 14 hours per day projected as the upper end of the range of expected generator operation (Section I.A.2.e of the Draft Scope) would be an extremely large number of hours for a project serving primarily the capacity and ancillary services markets, but not the wholesale energy market, as the applicant has repeatedly stated. Peaking plants serving the capacity market typically run a handful of hours per year. The proposed project may run more than this, since it would be newer than most peaking plants on the New York grid. However, if the applicant anticipates running the project at a 30 to 50 percent or higher capacity factor, the project should perhaps more properly be understood first and foremost as an energy supply project, in which case technology alternatives that can supply energy with lesser impacts should be studied, including renewable options and natural gas combined cycle, which has greater efficiency and tends to operate with capacity factors in this range. These options may not be appropriate for the site and/or may not be within the technical capabilities of the applicant, but should be considered if the primary project activity is energy supply.

5. Supporting documentation and technical review

In closing, CLP notes that the applicant has never built a project including a fossil energy combustion component and appears to lack basic familiarity with the environmental impacts of this technology. This was clearly illustrated during the January 17, 2018, public information meeting, in which **the applicant provided a carbon emissions rate for the proposed project that later turned out to be off by a factor of more than four**.

[31] Order on Distributed System Implementation Plan Filings, State of New York Public Service Commission, 14-M-0101/ 16-M-0411, Mar. 9, 2017.

Owing to recent US Environmental Protection Agency rulemaking processes on emissions rate standards for coal- and gas-fired power plants (the "Clean Power Plan"), everyone who works in the field of environmental impacts from fossil energy power plants has the typical emissions rates of various fossil plant types at their fingertips, and knows in a moment that 195 lbs/MWh is a physically impossible emissions rate for a gas-fired plant. It is concerning to CLP that the applicant has no one on staff with enough experience to recognize this obvious error before publicly presenting it. Furthermore, learning that their proposed facility is not actually five times cleaner than typical gas-fired plants on the New York state grid does not appear to have changed the applicant's evaluation of the environmental impacts of the project, or any of their public statements about the suitability and "greenness" of the project, suggesting that their statements in this regard are vague and empty, rather than based upon technical analysis and fact.

While it is by no means inexcusable to make a simple calculation error, it is of considerable concern that the applicant and its supporting consultants lacked the capability to check their work and correct the error before public presentation. If there had not happened to be an audience member with expertise on power plant carbon emissions rates that night, the error might have continued undetected into further public representations and perhaps even the draft EIS itself, and the public would have continued to have a grossly misleading understanding of these impacts. We can only wonder how many other such errors might be present in other pieces of technical information the applicant has thus far provided.

As a result of this demonstrated inexperience and unfamiliarity with fossil energy production technology and environmental impacts, it is essential that all statements by the applicant regarding the gas/diesel combustion technology components of the project be rigorously supported with technical detail by the applicant and subject to a thorough review by independent consultant(s) with appropriate expertise and experience on behalf of the Lead Agency. The consultant(s) should be experienced in evaluation of power system technologies and be familiar with the operation and regulation of the New York State power grid. They should have, at a minimum, the capabilities to review power system modeling and greenhouse gas emissions calculations, along with all of the other air, water, noise, wildlife, etc. studies required under the scope, and to evaluate fiscal and cost/benefit analysis of the project. Under SEQR, the Lead Agency may charge the applicant a fee of no more than one half of one percent of the total project cost[32] in order to cover its expenses for necessary technical reviews by engineering, planning and environmental consultants.

To support the necessary review, CLP recommends adding, at a minimum, the following appendices to those listed in the draft scope:

- Technical specifications of the proposed reciprocating engine, including manufacturer and model, heat rate, emissions control equipment, and other information sufficient to support descriptions of noise, air, and greenhouse gas emissions impacts.
- Supporting detail for greenhouse gas emissions calculations, including heat rate under natural gas and diesel combustion, projected annual hours of operation using each fuel, and documentation of assumed rate of upstream methane leakage.
- Any detailed calculations and assumptions necessary to support evaluation of the feasibility analysis for the battery-only alternative.

[32] SEQR Handbook, page 156

In addition, if the following information suggested in Section 1 of these comments is provided, the following appendices to support it should be provided:

- Plans and technical specifications for any micro-grid planned to accompany the project.
- Detailed inputs and results for any unit commitment-dispatch modeling to conducted support projections for future use of the project to assist in integrating variable renewable generation. All modeling assumptions and input data for at least two scenarios (with and without the proposed project) should be provided, along with sufficiently detailed results to identify curtailment events in the No Build scenario that are avoided in the Build scenario.

Respectfully submitted,

Evelyn Wright
Citizens for Local Power
PO Box 514
Rosendale, NY 12472