

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE: :
 :
APPLICATION OF NTE CONNECTICUT, LLC : DOCKET NO. 470
FOR A CERTIFICATE OF ENVIRONMENTAL :
COMPATIBILITY AND PUBLIC NEED FOR :
THE CONSTRUCTION, MAINTENANCE AND :
OPERATION OF AN ELECTRIC POWER :
GENERATING FACILITY OFF LAKE ROAD, :
KILLINGLY, CONNECTICUT : OCTOBER 27, 2016

**RESPONSES OF NTE CONNECTICUT, LLC TO
CONNECTICUT SITING COUNCIL PRE-HEARING QUESTIONS, SET TWO**

On October 17, 2016, the Connecticut Siting Council (“Council”) issued Pre-Hearing Questions, Set Two to NTE Connecticut, LLC (“NTE”), relating to the above-captioned docket. Below are NTE’s responses.

Site Questions

Question No. 70

NTE Connecticut, LLC's (NTE or Applicant) response to interrogatory number 1 states that the 63-acre power plant site is located at 180 Lake Road and the 10-acre switchyard site is located at 189 Lake Road. This appears to conflict with page 1 of the Geotechnical Engineering Report (Geo tech Report) under Tab C of Volume II of the Application. In Section 1.4 of the Geo tech Report, it notes that the 63-acre site is 189 Lake Road, and the 10-acre site is 180 Lake Road. Reconcile this information to confirm the correct addresses of each parcel.

Response

The northerly parcel (Assessor Map 83, Lot 6) is comprised of 62.927 acres with the address of 189 Lake Road. The southerly parcel (Assessor Map 83, Lot 11) is comprised of

10.099 acres with the address of 180 Lake Road. An Abutters Map has been provided in Exhibit 70-1.

Question No. 71

The Option Agreement refers to 71.7 acres of combined property area for 180 and 189 Lake Road. However, page 1 of Volume I of the Application (Volume I) notes that it is 63 acres plus 10 acres or a total of 73 acres. Reconcile these numbers.

Response

As a part of its project development effort, NTE updated the site survey which confirmed the total site acreage of the two parcels was 73.026 acres. The acreage in the Option Agreement was taken from an older deed and/or land records information, which is typically not as precise as a site survey.

Notice and Municipal/Public Outreach Questions

Question No. 72

Did NTE enter into a Community Environmental Benefits Agreement (CEBA), or in the alternative, enter into some other type of agreement related to community benefits? If so, provide.

Response

NTE is currently developing and plans to enter into a CEBA with the Town of Killingly. Discussions with the town are ongoing.

Alternative Questions

Question No. 73

Reference NTE's response to Council interrogatory number six. Compare the capacity

factor of the proposed power plant to a typical capacity factor of a solar farm in the Connecticut area. NTE may assume fixed, south-facing solar panels. Is the “load factor” noted in NTE's response to Council interrogatory number 13 equivalent to capacity factor? Explain.

Response

For purposes of clarification, “load factor” and “capacity factor” are interchangeable terms utilized in various responses with the same meaning. “Load factor” and “capacity factor” for a power plant is calculated as the ratio of its actual output over a period of time, to its potential output if it were possible for it to operate at full nameplate capacity continuously over the same period of time.

As stated in NTE’s response to Council interrogatory number 13, the combined cycle portion of Killingly Energy Center (“KEC”) is expected to have an operating load factor/capacity factor in the range of 65% to 80% per year. This expected load factor/capacity factor is based on fully dispatchable resource responding to reliability and market energy conditions in ISO-NE.

As stated by both NREL (National Renewable Energy Laboratory) and EIA (Energy Information Administration), the annual maximum expected load factor/capacity factor for solar energy facilities is in the range of 20% to 25% per year. According to ISO-NE (PV Energy Forecast Update; September 15, 2014), an average solar PV capacity factor in Connecticut is 13.7% (based on DC) or 16% (based on AC). Unlike KEC, solar energy facilities are non-dispatchable resources with energy provided on an as-available resource depending on the availability of the solar energy from the sun. KEC and solar resources are both important generation resources to ISO-NE and Connecticut; however, KEC and solar resources serve a very different generation need in terms of reliability for ISO-NE and Connecticut.

Question No. 74

Depict the proposed site and the two alternative sites noted on Page 176 of Volume I on an aerial photograph.

Response

See Exhibit 74-1 attached.

Construction Questions

Question No. 75

Would NTE own the short transmission interconnection between the Killingly Energy Center (KEC) and the Utility Switchyard (as referenced on page 135 of Volume I)? Where would the demarcation point be located that separates the proposed NTE-owned facility and the future Eversource-owned switching station and transmission facilities, e.g. Eversource's (future) utility switchyard transmission terminal structure?

Response

NTE would construct, own and operate the short transmission interconnection between the proposed KEC facility and the proposed Utility Switchyard. The physical termination of NTE's transmission line will take place at a dead-end structure within the proposed Eversource Utility Switchyard. The physical point at which NTE's transmission line would terminate to the dead-end structure would be considered the point of change of ownership between NTE and Eversource.

Question No. 76

Page 166 of Volume I notes that, "There are four interconnections associated with KEC that are anticipated to be permitted, constructed, owned, and operated by others." (Emphasis

added). Is it NTE's understanding that, if the power plant project is approved by the Council, Eversource would apply for a separate permit for the natural gas pipeline interconnection with the Council and/or the Federal Energy Regulatory Commission, as applicable? Is it also NTE's understanding that, if the power plant project is approved, Eversource would file a Petition for a declaratory ruling with the Council for the transmission interconnection? If the power plant project is approved, would the off-site water piping and wastewater piping require local approval?

Response

Consistent with the Council's past practice, Eversource would be responsible for the permitting through the Council and/or the Federal Energy Regulatory Commission, as necessary, of the natural gas pipeline and electric transmission interconnection (switchyard). Similarly, the water line connection to KEC, as well as the connection of the Brooklyn and Plainfield water systems described in the application, will be the permitting responsibility of the Connecticut Water Company ("CWC"), a public service company under the authority of the Public Utilities Regulatory Authority. The CWC may "consult" with the Town but does not require local approvals for these water line improvements. Wastewater discharge piping associated with the KEC will run within the limits of local roadways and may, pursuant to local regulations, require local approvals.

Power Plant Operations Questions

Question No. 77

Has NTE considered using the waste heat from the power plant for any purpose?

Response

NTE will capture a significant amount of waste heat from the gas turbine exhaust which will be used to generate additional electricity via the steam turbine, thereby increasing efficiency considerably. The remainder of the waste heat contains lower energy which makes it difficult to utilize effectively, practically and economically.

Question No. 78

Does the ramp rate specified in NTE's response to Council interrogatory 18 result in the proposed plant having the capability to change output quickly enough to balance generation from intermittent, renewable power resources?

Response

Yes. The approximate ramp rate of 29 MW per minute is well in the range of industry standard ramp rates for new state-of-the art thermal electric generating resources. This ramp rate is sufficient to allow KEC to participate in the ISO-NE ancillary services market and provide ISO-NE with the generation response needed to balance intermittent renewable power resources. ISO-NE and Connecticut require conventional generators, such as those proposed for KEC, to balance the output of inverter generation from intermittent renewable power resources such as wind and solar. As stated by ISO-NE on page 67 of the 2015 Regional System Plan, "The generating resources that provide operating reserves can respond to contingencies within 10 or 30 minutes and can either be synchronized or not synchronized to the power system."

In addition, ISO-NE, in its 2016 Regional Electricity Outlook states a challenge to the region is "The weather-dependent output from wind and solar resources and the increase in DG add complexity to how the ISO must operate the power system to maintain reliability" and "The ability of many natural-gas-fired power plants to change output quickly helps to balance an

increasing amount of generation from intermittent resources that rely on wind and sun.”

Question No. 79

Based on the power plant MW data on page 39 of Volume I of the Application and the response to interrogatory 16, the following MW data has been noted below. Please provide the missing data to complete the chart. The existing data may be corrected if necessary.

	Natural Gas Summer	Natural Gas Winter	Natural Gas ISO	ULSD Summer	ULSD Winter	ULSD ISO
CTG			301 MW			260 MW
STG with duct firing			248 MW	N/A	N/A	N/A
STG without duct firing			151 MW			123 MW
Parasitic Load (with duct firing for natural gas only)	(13 MW)	(15 MW)	(14 MW)	(10 MW)	(10 MW)	
Net Output (with duct firing for natural gas only)			535 MW			

Response

	Natural Gas Summer	Natural Gas Winter	Natural Gas ISO	ULSD Summer	ULSD Winter	ULSD ISO
CTG	282	313	301 MW	253	255	260 MW
STG with duct firing	224	254	248 MW	N/A	N/A	N/A
STG without duct firing	139	152	151 MW	118	114	123 MW
Parasitic Load (with duct firing for natural gas only)	(13 MW)	(15 MW)	(14 MW)	(10 MW)	(10 MW)	(10 MW)
Net Output (with duct firing for natural gas only)	493	552	535 MW	361	359	373 MW

Electric Energy and Markets Questions

Question No. 80

Would the proposed project qualify for the Tri-State New England Clean Energy RFP (Tri-State RFP)? If so, was the proposed project submitted as a proposal under the Tri-State RFP?

Response

The Tri-State New England Clean Energy RFP solicited proposals from qualified renewable and/or large scale hydropower resources and/or from developers of transmission projects to provide for the delivery of incremental qualified clean energy to the New England system. KEC is not a qualified renewable or large scale hydropower resource and thus did not participate in the Tri-State New England Clean Energy RFP.

Question No. 81

If NTE is not a winning bidder for the KEC project in the ISO-NE England Inc. (ISO-NE) Forward Capacity Auction (FCA) in February 2017, i.e. the project is not selected, will NTE still construct the facility?

Response

Yes. NTE plans to continue with the development and construction of KEC, even if KEC does not clear FCA #11. NTE's analysis indicates that a need exists for KEC in terms of electric system reliability for the State of Connecticut and ISO-NE electric systems. NTE will continue with development and construction of the KEC facility and would anticipate participating in the Annual Reconfiguration Auctions and/or Bi-Lateral Process associated with the 2020/2021 Capacity Commitment Period and Forward Capacity Auctions beginning with FCA #12 and

provide clean reliable dual-fuel electric energy to ISO-NE on a daily basis through the ISO-NE daily energy and ancillary services market design.

Question No. 82

Which regional generation units will be retired or close to retirement when the proposed plant is constructed and ready for operation in 2020?

Response

The following power generation facilities, representing approximately 4,200 MW of non-gas generating capacity, are retired or forecasted to retire by ISO New England by the end of 2020 – representing approximately 15% of the total capacity in ISO New England.

- Norwalk (Retired)
- Bridgeport Harbor 2 (Retired)
- Brayton Point (Retiring by 2017)
- Pilgrim (Retiring by 2019)
- Mt. Tom (Retired)
- Salem Harbor (Retired)
- Vermont Yankee (Retired)

Of these retired power generation facilities, Norwalk and Bridgeport Harbor 2 are located in Connecticut and represent approximately 730 MW of non-gas generating capacity – approximately 10% of the total capacity in Connecticut.

In addition, ISO-NE, has identified the following facilities to be “at-risk of retirement” as soon as 2020. Collectively, these facilities representing more than 6,000 MW of capacity – approximately 20% of the total capacity in ISO New England.

- Bridgeport Harbor 3
- Middletown
- Montville
- New Haven
- Canal
- West Springfield
- Mystic

- Yarmouth
- Merrimack
- Schiller
- Newington

Of these at-risk electric generating facilities, Bridgeport Harbor Unit 3, Montville, New Haven, and Middletown are located in Connecticut and represent approximately 2,000 MW of non-gas generating capacity – approximately 20% of the total capacity in Connecticut.

All total, approximately 35% of ISO-NE's non-generating capacity has retired, is retiring relatively soon, or at risk of retiring by 2020 and approximately 30% of Connecticut's non-gas generating capacity has retired, is retiring relatively soon, or at risk of retiring by 2020.

Question No. 83

Discuss the concept of power pools and how electric generators operate in a regional New England system.

Response

ISO-NE operates as a fully functional Regional Transmission Organization (RTO), coordinating, monitoring, and directing the operation of the market's transmission system as well as its power generation facilities. In the case of ISO-NE, the electricity market covers all or portions of the following states: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

ISO-NE's market design includes the energy market and Forward Capacity Market, described further below.

Energy market: ISO-NE's wholesale electricity marketplace consists of day-ahead and real-time energy market. The markets co-optimize ancillary services with energy, using a Locational Marginal Price (LMP) to reflect the settled price of energy at specific locations and

delivery times. ISO-NE publishes LMPs for specific locations (i.e. nodes) within the transmission system including power generation facility nodes, load nodes, external nodes, load zones, and trading hubs. LMPs are based on bids for electricity generation, actual loads, scheduled bilateral transactions, and transmission congestion. The day-ahead energy market allows participants to buy and sell electricity one day in advance of the operating day. The day-ahead market clears via an automated security constrained unit commitment process conducted by ISO-NE. The real-time energy market allows participants to commit to buy or sell electricity during the operating day, balancing the differences between day-ahead commitments and real-time supply and demand. A power generation facility such as KEC would submit an offer to sell electricity into the day-ahead energy market and would be dispatched in the real-time energy market to generate electricity based on this previously described process.

Forward Capacity Market: ISO-NE procures capacity needed for the reliable operation of the electricity system under the Forward Capacity Market (FCM) construct, approved by FERC in 2006. To date, ISO-NE has conducted ten Forward Capacity Auctions (FCA #1 – FCA#10), each conducted approximately three years prior to the beginning of the 12-month Capacity Commitment Period (CCP). As part of each FCA, ISO-NE determines the minimum amount of capacity to maintain reliability, referred to as the Net Installed Capacity Requirement (NICR). FCAs can, and have historically, procured capacity resources in excess of the NICR. Capacity resources procured in the FCA receive a Capacity Supply Obligation, which requires the capacity resource to bid into the day-ahead energy market for the 12-month CCP. KEC will participate in FCA #11, to be conducted by ISO-NE in February 2017, and is projected to receive a CSO for 2020/2021 Capacity Commitment Period – June 1, 2020 through May 31, 2021.

Question No. 84

Comments have been made that there is not a need for the plant's power output in Connecticut, but that the power is needed to serve Boston and/or eastern New England. Is this correct? If no, why not?

Response

This is incorrect. There are several components to the need for KEC by the state of Connecticut and the wider ISO-NE system, such as:

- supporting future power generation retirements;
- supporting the growth of renewable forms of power generation;
- maintaining the reliability of the electricity system during peak winter conditions;
- and
- contributing to CO₂ emissions reductions.

Power generation retirements: In its 2016 Regional Electricity Outlook, ISO-NE identified more than 6,000 MW of coal and fuel-oil fired power generation at-risk of retirement by 2020, representing approximately 20% of the total capacity within the ISO-NE electricity system. Moreover, of the 6,000 MW approximately 2,000 MW was identified in Connecticut – the Middletown, Montville, New Haven and Bridgeport Harbor Unit 3 facilities. These 4 facilities represent approximately 20% of the total capacity within Connecticut. While new power generation facilities such as Bridgeport Harbor Unit 5 and the Towantic Energy Center will help mitigate a portion of these retirements they make up only a fraction of the at-risk retirements. With 15% of the overall market capacity at risk of retirement and 20% of Connecticut's capacity at risk of retirement, new capacity resources such as KEC are needed to maintain the reliability of the electricity system.

Renewable power generation growth: Driven by Renewable Portfolio Standards within Connecticut and across the New England states, renewable power generation (such as wind and solar) is forecasted to increase in Connecticut and the rest of ISO New England. However, neither wind nor solar are fully dispatchable (i.e. can quickly adjust their output higher/lower) and are considered intermittent resources. As a result of increasing amounts of intermittent wind and solar entering Connecticut and the wider ISO New England electricity system, flexible resources with flexible fuel systems are needed to maintain the reliability of the electricity system. This situation is expected to worsen with the retirement of the Pilgrim nuclear facility in 2019. This view is supported by ISO-NE President and CEO Gordon Van Weilie in a presentation delivered on September 28, 2016. KEC is fully dispatchable with a full load heat rate of approximately 6,500 Btu/kWh (with the ability to operate on either natural gas or ultra-low sulfur diesel (ULSD)) and will represent one of the most flexible and efficient sources of electricity in ISO New England.

Winter weather reliability: With the upcoming retirement of the Brayton Point, Pilgrim, and Bridgeport Harbor 3 facilities by 2020 (representing more than 2,000 MW of capacity), the need for new capacity resources with flexible fuel systems is likely to increase. This view is supported by the 2014 Integrated Resources Plan for Connecticut, where Strategy #4 identifies the need for additional alternative forms of power generation to increase the reliability of the electricity system during cold winter weather. This is further supported by ISO-NE President and CEO Gordon Van Weilie in a presentation delivered on September 28, 2016 in which he characterized the ISO New England's current operating system as "*precarious during the winter time... beyond 2019 it may become unsustainable during extreme cold conditions*". KEC directly addresses these winter reliability issues facing both Connecticut and the wider New

England electricity system by having the ability to operate on either natural gas or ULSD.

CO₂ emissions reductions: KEC is projected to decrease regional CO₂ emissions. This decrease is projected to result from KEC displacing (i.e. operating ahead of) older, more inefficient forms of power generation (e.g. coal and oil-fired generation). Additionally, by reducing regional CO₂ emissions, KEC will be helping the state of Connecticut meet and likely exceed its CO₂ emission reduction targets under the Global Warming Solutions Act.

In addition to the clearly identified need for KEC outlined above, it has clearly been shown that KEC will provide meaningful savings to both the capacity market and energy market in Connecticut and ISO-NE, the effects of both will benefit Connecticut's consumers. Furthermore, KEC will be operated as a merchant plant with all capacity and energy sold directly to ISO-NE placing all of the costs and risks relative to construction and operation of the facility on NTE Energy, and not the ratepayers and consumers of Connecticut and New England. KEC will not be placed in rate base of any electric utility in Connecticut or New England.

Question No. 85

Are there financial penalties associated with ISO-NE's FCA if NTE's plant is called to operate by ISO-NE and cannot operate due to fuel unavailability? If yes, is this part of the reason for ULSD storage, in the event that even "firm gas" is interrupted?

Response

Yes, ISO-NE has instituted a "pay for performance" PFP component to the Forward Capacity Market construct to ensure capacity resources are available during periods of system stress (referred to as Capacity Scarcity Conditions) for a multitude of reasons, including but not limited to fuel availability. The PFP is a two-settlement capacity market design that, starting in 2018, will reward capacity resources that make investments to successfully boost performance

during periods of system stress – for example, by adding dual-fuel technology such as KEC – while resources that don't perform will forfeit capacity revenues.

The ability to utilize ULSD was incorporated into the design of KEC for the purposes of providing the necessary level of reliability needed to support the ISO-NE electricity system as a result of the ISO-NE stated winter reliability concerns, even though KEC has a very reliable firm supply of natural gas fuel. The additional capital investment and operational considerations associated with the use of ULSD at KEC are a result of ISO-NE's winter reliability concerns and how the PFP is having the desired result of ensuring ISO-NE system reliability. It should also be noted that while KEC will have the ability to operate on ULSD, KEC is expected to operate on natural gas in nearly all hours of operation.

Fuel Questions

Question No. 86

Are there any expected natural gas infrastructure expansion/improvements that would benefit facility operation? In particular, are there any improvements that would address reliability risks and price volatility?

Response

KEC is not dependent on any future natural gas infrastructure expansion/improvements for delivery of natural gas fuel to the facility. KEC has contracted for firm natural gas supply based on the delivery infrastructure currently in place and has the capability of utilizing ULSD as a back-up fuel in the unlikely event of a curtailment in firm natural gas deliveries, pipeline operational outages, or during periods of extreme demand.

Air Emissions Questions

Question No. 87

Reference NTE's response to Council interrogatory number 50. If 150 feet is not the minimum height to achieve compliance with air quality standards, what would be the pros and cons of a shorter stack height?

Response

Advantages of a stack height lower than the proposed 150 feet would include slightly reducing visual impacts of the KEC facility on the community.

Disadvantages would include increased air quality and noise impacts as well as technical challenges associated with the location of the continuous emissions monitoring (CEMS) and stack sampling ports. Although demonstration of compliance with National Ambient Air Quality Standards would be possible with stack heights lower than 150 feet, any appreciable reduction in stack height would likely result in modeled impacts greater than the Significant Impact Level for annual NO₂ and annual PM_{2.5}, necessitating additional cumulative impact analyses for those standards. Reducing the stack height would also limit the amount of stack silencing that can be installed, potentially increasing noise impacts. Finally, the location of stack sampling and CEMS ports must be located sufficiently downstream from the last point of turbulence (where the exhaust from the heat recovery steam generator enters the stack) to ensure collection of an accurate sample.

The applicant believes the proposed stack height best balances these factors.

Wildlife Questions

Question No. 88

As an update, to date, has NTE received any follow-up correspondence from the Connecticut Department of Energy and Environmental Protection (DEEP) regarding Natural Diversity Database species?

Response

No additional correspondence has been received.

Other Environmental Questions

Question No. 89

As an update, to date, has NTE received a response from any of the Tribal Historic Preservation Offices (THPO) regarding the proposed project? If yes, provide a copy of such response(s).

Response

No additional correspondence has been received.

Power Plant Safety Questions

Question No. 90

Specifically, would the hydrogen be used to cool the stators, i.e. the fixed portion of both generators?

Response

NTE has received confirmation from Siemens that the generators will be totally-enclosed water-to-air cooled units, therefore eliminating the need for any hydrogen on-site for the purposes of generator cooling.

Question No. 91

Reference NTE's response to Council interrogatory number 64. What are the pros and cons of a lined containment area versus a double-walled tank for the storage of ULSD?

Response

A lined spill containment area is less costly and allows easier inspection and maintenance on the tank, pumps and related equipment. However, a lined spill containment area is more space intensive than a double-walled tank.

CERTIFICATION OF SERVICE

I hereby certify that on this 27th day of October, 2016, a copy of the foregoing was sent via first class mail, postage prepaid, to the following:

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Kenneth C. Baldwin

Killingly Energy Center Abutters Map



- 1: Edith Garvey, 295 Lake Rd.
- 2: Maureen Lannon, 251 Lake Rd.
- 3: Rocky River Realty (CL&P), 209 Lake Rd.
- 4: Conn Light and Power, 199 Lake Rd.
- 5: Wyndham Land Trust, 161 Lake Rd.
- 6: Judith Jackson, 115 Lake Rd.
- 7: Elaine and Paul Gazzola, 131 Lake Rd.
- 8: Norman and Terry Ross, 149 Lake Rd.
- 9: Pauline Lemieux, 154 Lake Rd.
- 10: Carl and Charlotte Desautels, 144 Lake Rd.
- 11: Donald and Brunet Skinner, 137 Lake Rd.

Killingly Energy Center - Alternative Sites

