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February 5, 2021

Katherine M. Dykes, Commissioner
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127
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Re: Petition for Declaratory Ruling

Dear Commissioner Dykes,

Attached hereto is a notice of petition, affidavit of service and petition for declaratory rulings for review and revocation of permit no. 089-0107 being submitted on behalf of Allco Renewable Energy Limited and Windham Solar LLC related to *NTE Connecticut LLC, Application for Stationary Sources of Air Pollution Permit No. 089-0107*.

Please feel free to contact me with any questions regarding the petition.

Respectfully submitted,

/s/Thomas Melone
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Cc: NTE Connecticut LLC
Members of the CGA Energy and Technology Committee
Members of the CGA Environment Committee
Members of the CGA Public Health Committee
Members of the CGA that were Signatories to the Letter to Governor Lamont of
9/25/2019
Martha Klein, Sierra Club Connecticut
CTLCV Executive Director Lori Brown

IN RE NTE Connecticut LLC, Application) **STATE OF CONNECTICUT**
for Stationary Sources of Air Pollution)
Permit No. 089-0107) **DEPARTMENT OF ENERGY AND**
) **ENVIRONMENTAL PROTECTION**
))
) Petition No. _____
))
) February 5, 2021
)

PETITION FOR DECLARATORY RULINGS FOR REVIEW AND REVOCATION
OF AIR PERMIT NO. 089-0107 FOR THE KILLINGLY ENERGY CENTER

Pursuant to Connecticut General Statutes (“CGS”) § 4-176 and section 22a-3a-4 of the Regulations of Connecticut State Agencies (“RCSA”), Allco Renewable Energy Limited and Windham Solar LLC (collectively, “Allco”) hereby petition the Commissioner of the Connecticut Department of Energy and Environmental Protection (“DEEP”) for declaratory rulings regarding the review and revocation of Permit No. 089-0107 (the “Permit”). This petition requests the following declaratory rulings:

1. DEEP has erred by not re-reviewing Permit No. 089-0107 as required by CGS § 22a-174-3a(f).
2. NTE Connecticut LLC (“NTE”) has breached Part VIII, Paragraph G of Permit No. 089-0107.
3. Permit Applications for Stationary Sources of Air Pollution New Source Review, Application Nos. 201605089, 201605092, 201605093, 201605094, 201605095, and 201605097 failed to comply with RCSA 22a-174-3a(1)(2).
4. DEEP erred when it issued Permit No. 089-0107.
5. DEEP should revoke Permit No. 089-0107 in accordance with CGS § 22a-174-3a(f).

EXECUTIVE SUMMARY

DEEP issued NTE Permit Number 089-0107 for the construction and operation of the Killingly Energy Center (the “Facility” or “KEC”), a 650-megawatt combined-cycle natural gas

electric generating facility in Killingly, Connecticut. The Facility was issued an initial permit by DEEP on June 30, 2017, and modifications to the Permit were issued by DEEP on March 16, 2018, and December 10, 2018.

CGS § 22a-174-3a(f) provides that the Commissioner “shall” review any permit where the construction authorized by the permit has not commenced within eighteen (18) months from the date of issuance, or such other period, as the permit provides, whichever is later. Permit No. 089-0107, issued as modified on December 10, 2018, does not contain a later date. Construction has not commenced within the 18-month period. As a result, Sec. 22a-174-3a(f) requires the Commissioner to review the permit. As part of that review, the Commissioner may revoke the permit. As part of the Commissioner’s mandatory review, the Commissioner should revoke the permit for the reasons stated herein.

RCSA 22a-174-3a(1)(2) requires, as part of the review of an air permit application, that a robust environmental impact analysis must be performed and that analysis must demonstrate that the benefits of a project “would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed.” Such an analysis was never done in connection with the issuance of the initial permit or the two modifications. For that reason, DEEP erred when it issued the Permit, and the Permit should be revoked.

Now that a re-review of the permit is required by CGS § 22a-174-3a(f), the analysis required by RCSA 22a-174-3a(1)(2) must be performed. The Petitioners submit that the permit applicant simply cannot meet the high threshold that the benefits of the Facility substantially outweigh the adverse environmental, adverse health, adverse economic and adverse social impacts from the Facility, and that therefore the Permit must be revoked.

The Permit should be revoked for an additional reason. Permit Section VIII, Para. G

requires that “[w]ithin 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.” The “analysis” that NTE submitted with the application with regard to the requirements of RCSA 22a-174-3a(1)(2) was both inaccurate and misleading. The information submitted has also changed. The NTE “analysis” utterly fails to account for the adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed. The “analysis” has also failed to account for abundance of new information regarding the adverse consequences of the Facility and the lack of benefits. NTE has failed to correct the submittals with accurate information and has thus breached section VIII, para. G of the Permit.

A. Introduction.

“Climate change poses an existential threat to humanity.” William Tong, *State of Connecticut v. Exxon Mobil Corp.*, HHD-CV20-6132568-S (Conn. Sup. Ct. filed Sept. 14, 2020) No. 100.31 at P1. Connecticut is already suffering from “sea level rise, flooding, drought, increases in extreme temperatures and severe storms, decreases in air quality, contamination of drinking water, increases in the spread of diseases, and severe economic consequences.” *Id.* at P17. “[C]limate change will continue to have increasingly serious, life-threatening, and financially burdensome impacts on the people of Connecticut and the lands, waters, coastline, species, natural resources, critical ecosystems, infrastructure and other assets owned by the State and its political subdivisions.” *Id.* at P23. “Credible scientific evidence indicates-especially considering recent extreme weather events-that the catastrophic effects of climate change are occurring sooner than anticipated.” *Id.* at P172. “Climate change has negatively impacted, is negatively impacting, and

will continue to negatively impact Connecticut's people, lands, waters, coastline, infrastructure, fish and wildlife, natural resources, critical ecosystems, and other assets owned by or held in the public trust by the state of Connecticut and/or its municipalities.” *Id.* at 173. “Climate change has caused, is causing, and will cause sea level rise, flooding, drought, an increase in extreme temperatures, a decrease in air quality, an increase in severe storms, contamination of drinking water, and an increase in certain disease-transmitting species.” *Id.* at 174. “As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause an increase in illness, infectious disease and death.” *Id.* at 175. “As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause serious damage to existing infrastructure, including but not limited to coastal and inland development, roadways, railways, dams, water and sewer systems, and other utilities.” *Id.* at 176. “As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause serious detrimental economic impacts on the State of Connecticut, its people, businesses and municipalities, including but not limited to heat-related productivity losses, increased energy cost and consumption, and agriculture, tourism, and recreation losses.” *Id.* at 177.

Yet NTE wants to bring more of the same adverse effects to Connecticut. Despite overwhelming scientific data that the current pace of human-caused carbon emissions is increasingly likely to trigger irreversible damage to the planet,¹ a situation described by NASA scientists as the equivalent of a “five-alarm fire” for the planet, *id.*, entities like NTE continue to seek to build new climate and health destroying projects, such as the proposed project.

The adverse health impacts of NTE’s project are felt especially hard by children. Last week, at a White House Press Briefing, Special Presidential Envoy for Climate John Kerry, stated

¹ “Major new climate study rules out less severe global warming scenarios...” Washington Post, July 22, 2020, <https://www.washingtonpost.com/weather/2020/07/22/climate-sensitivity-co2/>.

that climate destruction from fossil fuel use is “the greatest cause of children being hospitalized every summer in the United States—we spent \$55 billion a year on it—is environmentally induced asthma.”

Buried deep in DEEP’s current draft integrated resources plan (“IRP”) (at p.107), there is a brief acknowledgement of the severe adverse health effects in Connecticut from fossil fuel generators such as NTE’s proposed facility. “Connecticut experiences some of the worst ozone pollution in the United States. Exposure to unhealthy levels of air pollution contributes to acute and chronic respiratory problems such as asthma, Chronic Obstructive Pulmonary Disease, and other lung diseases. A recent national report, *Asthma Capitals 2019*, ranked New Haven (#11) and Hartford (#13) among the 100 largest U.S. cities where it is most challenging to live with asthma.”

Earth’s climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities. The impacts of global climate change are already being felt in the United States and are projected to intensify in the future—but the severity of future impacts will depend largely on actions taken to reduce greenhouse gas emissions. *See*, *Climate Report*,² Vol. II, Overview at 2 and the *IPCC Special Report*.³

Changing climate threatens the health and well-being of people in the Northeast through more extreme weather, warmer temperatures, degradation of air and water quality, and sea level

² *Fourth National Climate Assessment* (the “Climate Report”) published by the United States Global Change Research Program and the United States Government Printing Office pursuant to the Global Change Research Act of 1990, judicial notice of which is requested. The full report is available at <https://nca2018.globalchange.gov/> (last visited September 30, 2019), USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA. [doi:10.7930/NCA4.2018](https://doi.org/10.7930/NCA4.2018).

³ Intergovernmental Panel on Climate Change (IPCC) (“IPCC Special Report”): “*Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*,” judicial notice of which is requested. The full report is available at <https://www.ipcc.ch/sr15/> (last visited September 30, 2019).

rise. These environmental changes are expected to lead to health-related impacts and costs, including additional deaths, emergency room visits and hospitalizations, and a lower quality of life. Health impacts are expected to vary by location, age, current health, and other characteristics of individuals and communities. *See*, Climate Report, Vol. II, Ch. 18, at 117 and the *IPCC Special Report*.

The continued use of fossil fuels endangers the public health, safety and welfare of Connecticut and the Northeastern United States. *See*, Climate Report, Vol. II, Ch. 18, at 117 and the *IPCC Special Report*. The continued injection of carbon-dioxide into the atmosphere from fossil-fuel electricity production harms the public health, safety and welfare. *See, e.g.*, Climate Report Chapter 14, KM1 and KM2:

The health and well-being of Americans are already affected by climate change, with the adverse health consequences projected to worsen with additional climate change. Climate change affects human health by altering exposures to heat waves, floods, droughts, and other extreme events; vector-, food- and waterborne infectious diseases; changes in the quality and safety of air, food, and water; and stresses to mental health and well-being.... People and communities are differentially exposed to hazards and disproportionately affected by climate-related health risks. Populations experiencing greater health risks include children, older adults, low-income communities, and some communities of color.

Reducing greenhouse gas emissions would benefit the health of Americans in the near and long term. By the end of this century, thousands of American lives could be saved and hundreds of billions of dollars in health-related economic benefits gained each year under a pathway of lower greenhouse gas emissions. *See*, Climate Report, Chapter 14, KM4 and the *IPCC Special Report*. “Current and future emissions of greenhouse gases, and thus emission mitigation actions, are crucial for determining future risks and impacts of climate change to society.... Climate change is projected to significantly damage human health, the economy, and the environment in the United States, particularly under a future with high greenhouse gas emissions.... Research supports that

early and substantial mitigation offers a greater chance of avoiding increasingly adverse impacts.”
Climate Report, Chapter 29 at 1348.

B. Petitioners.

Allco Renewable Energy Limited is a Delaware corporation, with an office at 157 Church Street, 19th floor, New Haven, Connecticut 06510. Windham Solar LLC is a Connecticut limited liability company, with an office at 157 Church Street, 19th floor, New Haven, Connecticut 06510. Allco is a developer of solar projects in Connecticut and other ISO-NE States. Allco’s corporate mission is to combat climate change, enforce laws that benefit developers of solar energy on a broad scale, and open up markets broadly to solar development. Allco’s mission includes fighting the devastating environmental impacts from burning fossil fuels, including, without limitation, the adverse effects that continued use of fossil-fuel generation will have on endangered species.

I. Has DEEP erred by not re-reviewing Permit No. 089-0107 as required by CGS § 22a-174-3a(f)?

Short Answer: Yes.

CGS § 22a-174-3a(f) provides that the Commissioner “shall” review any permit where the construction authorized by the permit has not commenced within eighteen (18) months from the date of issuance, or such other period, as the permit provides, whichever is later. Permit No. 089-0107, issued as modified on December 10, 2018, does not contain a later date. Construction has not commenced within the 18-month period. As a result, Sec. 22a-174-3a(f) requires the Commissioner to review the permit. As part of that review, the Commissioner may revoke the permit.

II. Has NTE breached Part VIII, Paragraph G of Permit No. 089-0107?

Short Answer: Yes

Part VIII of the permit contains additional terms and conditions.⁴ Paragraph G states: “Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.”

RCSA 22a-174-3a(1)(2) requires, as part of the review of an air permit application, that a robust environmental impact analysis must be performed, and be submitted by the Permittee. That analysis must demonstrate that the benefits of a project “would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed.” The analysis submitted by NTE is attached as Exhibit A.

There are several statements in the analysis submitted by NTE that qualify as inaccurate, misleading and missing relevant information, which required NTE to correct and supplement its application under Permit condition section VIII, para. G.

1. *“Renewable resources, such as wind and solar ... cannot meet any of the Project’s three primary objectives (flexible, reliable, baseload power). Solar and wind facilities generate energy only intermittently, depending upon the availability of the resource. Energy storage solutions do not yet allow for reliable power generation across the potential demand*

⁴ Paragraph A states that: “Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.” Paragraph C states: “This permit may be revoked, suspended, modified or transferred in accordance with applicable law.” Paragraph D states: “This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.” Paragraph E states: “Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: ‘I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute.’” Paragraph F states: “Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.”

spectrum. Given this, efficient baseload generating sources are needed to augment the growing focus on renewables to the energy mix.”

That statement is inaccurate, misleading and omits any relevant information. *First of all*, it presumes that there is a benefit to the “*Project’s three primary objectives (flexible, reliable, baseload power).*” While those three attributes are important elements of the electric grid, there is no reason to believe that the KEC is needed to provide those attributes. *Second*, States like Vermont and Massachusetts are adding storage, not building gas plants. Other States, like Hawaii and California have also chosen to add battery storage peakers instead of new gas plants. For example, in 2019 “a curious thing [] happened in Southern California. One of the largest utilities in the country scrapped a proposal to build a new peaker plant, opting instead to build a battery system that could store excess electricity from solar and wind when conditions are good and cleanly dispatch it when needed.” *See, Where Batteries Are Replacing Power Plants*, U.S. News and World Report, May 21, 2019, available at: <https://www.usnews.com/news/national-news/articles/2019-05-21/why-california-nixed-a-natural-gas-power-plant-in-favor-of-batteries>.

“In as soon as seven years, with no significant change to battery prices, close to a third of the market for new peakers will be threatened by batteries, consulting firm Wood Mackenzie found in an analysis. And if battery prices fall even modestly, as much as 82% of new peaker capacity could instead be replaced by batteries.” *Id.* “In a handful of states, including some that are perhaps unexpected – Arkansas, Colorado, Georgia, Hawaii, Minnesota, Nevada and Texas – new solar-plus-storage projects that are effectively replacing certain gas-fired baseload power plants.” *Id.* *Third*, it is clear that solar and wind with battery storage can provide KEC’s alleged three primary objectives (flexible, reliable, baseload power). The question of the economic cost of choosing that alternative is a separate question. But in order to choose KEC, DEEP would need to put a price on human life, human health, the climate and all the damage and adverse consequences that

Attorney General Tong detailed in his complaint against ExxonMobil. Petitioners assert that it is not even a close question. The destruction that the KEC seeks to inflict on Connecticut is not worth maybe savings pennies on an ISO-New England spot energy rate.

2. *“In addition, land requirements for solar and wind projects are highly dependent on the “resource” available at a given site, as well as topographic and other factors. The National Renewable Energy Laboratory (NREL) identifies solar energy production in its June 2013 report Land-Use Requirements for Solar Power Plants in the United States of approximately 5.9 acres per MW. A 70-acre site would, therefore, result in solar generation of approximately 12 MW. In reality, significant portions of the site would not be used due to wetlands or other constraints, and energy generation from a solar installation at this site would be even less. Similarly, wind energy facilities vary in the amount of land area required. Using NREL’s August 2009 Land-Use Requirements of Modern Wind Power Plants in the United States, which indicates a dramatic range from approximately 22 acres per MW to 250 acres per MW; even assuming the more productive end of the range, just over 3 MW of generation would result. In general, New England is not among the areas with a strong on-shore wind regime, due to variable wind direction and lower speeds except on certain ridgelines. Therefore, a solar or wind installation would be expected to result in considerably lower energy production than the technology proposed.”*

That statement is inaccurate, misleading and omits any relevant information. In NTE’s view, a death machine in a small package is better than a clean solar farm in a large package where sheep can graze and the soil can be used to store carbon. That statement also presumes without evidence or analysis that that the fact that the KEC would have a footprint that is only a small fraction of a solar farm or offshore wind facility is in fact an advantage. Those statements also fail to account for off-shore wind which uses little on-shore land.

3. *“The proposed Project has a new and clean net heat rate at full load under ISO conditions of 6,529 Btu/kWh (HHV, net).”*

That statement is inaccurate, misleading and omits any relevant information. There is nothing “clean” about the KEC.

4. *“Combined cycle technology utilizing natural gas as its primary fuel remains the most favorable option today from a market point of view. This was recently demonstrated by ISO-NE’s choice of a gas-fired combined cycle facility as the forward capacity market’s proxy unit. This technology also maximizes energy efficiency and minimizes air emissions.”*

That statement is inaccurate, misleading and omits any relevant information. *First*, as explained above, it is clear that solar and wind with battery storage can provide KEC's alleged three primary objectives (flexible, reliable, baseload power). *Second*, that statement assigns a cost of zero to the human and environmental destruction that the KEC would wreak. So when KEC speaks of "a market point of view," what market is it talking about? As far as ISO-NE is concerned, being selected in the FCM merely means that it blocks out more environmentally friendly options, such as renewable energy and battery storage. It also means that ISO-NE refuses to recognize the economic, health and environmental destruction that natural gas plants cause. It also means that it puts more economic pressure on other zero-carbon resources such as the Millstone nuclear plant, which, in turn, can result in additional costs to Connecticut ratepayers in order to keep Millstone afloat, far off-setting a project's allegation that it provides any benefit.

Moreover, "market" on which NTE presumably relies is described by DEEP's current draft as "a broken market design ... unresponsive to State needs." IRP at 80.⁵ KEC will also exacerbate the "pay twice" problem that DEEP discusses in the draft Integrated Resources Plan, adding more costs to already over-burdened Connecticut ratepayers. DEEP has made the point numerous times that the ISO-NE capacity market procures capacity that is simply not needed because the fossil-fuel centric focus of ISO-NE refuses to accord capacity credit to State-supported resources, and ignores the true cost of fossil fuels.

5. *"The Project conducted a robust and thorough consideration of a range of alternatives."*

That statement is inaccurate, misleading and omits any relevant information. The entire, albeit brief, section on alternatives is inaccurate, misleading and omits any relevant information and under section VIII, para. G, NTE had and has an obligation to correct it. Through omission,

⁵ Available at: <https://portal.ct.gov/DEEP/Energy/Integrated-Resource-Planning/Integrated-Resource-Planning>.

the NTE analysis is misleading because it pretends there are no “adverse environmental impacts” of the Project. Through omission, the NTE analysis is misleading because it pretends there are no “secondary impacts,” “cumulative impacts,” or “social costs imposed.” The NTE analysis is inaccurate because it does not review the “adverse environmental impacts” of “secondary impacts,” “cumulative impacts,” or “social costs imposed.” The NTE analysis omits relevant information in the form of the “adverse environmental impacts,” “secondary impacts,” “cumulative impacts,” and “social costs imposed” of the facility.

A. NTE Must Correct Its Omission Of The Displacement Effect It Will Have On Renewable Energy.

NTE’s statements are inaccurate, misleading and omit relevant information for among other reasons that NTE will displace renewable energy. But for the KEC and ones like it, Massachusetts, Rhode Island and Connecticut and ISO-NE would turn to onshore solar electricity projects with storage, which create more of a positive economic impact, none of the adverse moderate and major consequences of the KEC and have a tiny fraction of the climatic impacts that the KEC has.

Electricity from the KEC directly competes with other forms of renewable energy resources in the generation of electricity, such as Petitioners’ solar projects. Economists measure how coal, natural gas, and other fuels act as substitutes in the electricity market by analyzing “cross-price elasticity” (that is, how responsive producers are in swapping inputs when relative prices change). *See* Mankiw, *supra* at 99. For example, the United States Energy Information Administration (“EIA”) found that for the U.S. market, a ten-percent increase in the ratio of the price of coal to the price of natural gas leads to a 1.4-percent increase in the use of natural gas over coal. EIA, *Fuel Competition in Power Generation and Elasticities of Substitution* 1 (2012). In other words, in that example, the cross-price elasticity of demand for natural gas is 0.14 with

respect to coal's price. *Id.* Other economists reach similar conclusions. James Ko & Carol Dahl, *Interfuel Substitution in U.S. Electricity Generation*, 33 APPLIED ECONOMICS 1833, 1835 (2001) (analyzing "average" cross-price elasticity). *See also* Nate Blair et al., *Long-Term National Impacts of State-Level Policies* (Nat'l Renewable Energy Lab. Conf. Paper 620-40105, June 2006) (discussing how "higher coal prices would dramatically increase" use of renewable wind energy). These estimates represent short-run elasticities; over time, substitution effects become more pronounced as power plants make technological changes that facilitate fuel-switching, and as long-term investments favor renewable energy. *See* Mankiw, *supra* at 105–106.

Changes in the relative amounts of coal, natural gas, renewable sources, and nuclear energy used to generate electricity—as well as changes in total energy demand—would, in turn, change total greenhouse gases emissions. In short, NTE's unexamined and unsupported assumption that the KEC would have no effect on onshore solar energy is contradicted by fundamental economics and market analyses. Considering the size and nature of the KEC, it is a fallacy to assume that without KEC there would be no substitution with no effect on price, consumption, or emissions.

Moving beyond theory to the specific proposed project at issue, given the size and characteristics of the KEC and the ISO-New England market, it is clear error to not analyze the substitutions that would occur if the KEC was not built. NTE's assumption that there would be no substitution by onshore solar simply bears no relationship to reality. The KEC represents an enormous amount of energy that has a major effect on resources. If the KEC's permit is revoked, utilities in ISO-New England will acquire renewable energy production with storage to satisfy their respective renewable energy goals and standards, and therefore, lower greenhouse gas emissions. In the No-KEC alternative, any renewable energy substituting for the KEC will provide a more positive impact on emissions and climate change. In short, NTE's flawed economic

assumptions render its alternatives analysis ineffective and misleading, and a breach of section VIII, para. G of the Permit.

NTE's flawed, misleading and inaccurate conclusions are laid bare by environmental reviews under the National Environmental Policy Act ("NEPA") for over the past 35 years. In such reviews, the Department of the Interior (the "Interior") has consistently understood that a decision to take or not to take action related to energy production will affect that energy resource's supply and price and thus trigger other actions. The Interior has further analyzed how such triggered actions generate different consequences for air pollution, climate change, and overall environmental quality. The U.S. Court of Appeals for the D.C. Circuit has praised the Interior's analysis of these substitution effects. As far back as 1979, the Interior has assessed the different environmental effects of energy substitutes under a no-action alternative—including different levels of carbon dioxide emissions.

Other agencies, such as the Surface Transportation Board, the United States Forest Service ("USFS"), the State Department, the Office of Surface Mining Reclamation and Enforcement (an Interior sub-agency), the FERC, and the Nuclear Regulatory Commission, have also properly analyzed the effects of their energy management decisions in NEPA reviews, consistent with federal court precedent.

NTE's mistaken assumption that its Project, compared to a denial of its Project, would have no net negative effects on renewable energy, greenhouse gas emissions, fisheries, endangered species, marine mammals and other resource values is contrary to a 35-year history of proper analysis by federal agencies in conducting similar environmental analyses.

i. Federal Agencies Analyze The Connections Between Supply, Price, Substitutes, Conservation, And Emissions.

Before the 1982 creation of a sub-agency within Interior responsible for offshore resources, the Office of the Secretary of the Interior developed the federal offshore oil and gas leasing program, and the Bureau of Land Management (“BLM”) prepared environmental impact statements on leasing actions (then called simply “environmental statements”). In BLM’s 1979 Final Environmental Statement on a proposed lease sale off the coast of Southern California, the agency analyzed the No-Action Alternative of withdrawing the sale:

[I]f the subject sale were cancelled, the following energy actions or sources might be used as substitutes: Energy Conservation; Conventional oil and gas supplies; Coal; Nuclear power; Oil shale; Hydroelectric power; Solar energy; Energy imports; . . . Vigorous energy conservation is an alternative that warrants serious consideration. The Project Independence Report of the Federal Energy Administration claims that energy conservation alone can reduce energy demand growth by 0.7 to 1.2 percent depending on the world price of oil. . . . The environmental impacts of a vigorous energy conservation program will be primarily beneficial.

Final Environmental Statement, OCS Sale No. 48, Proposed 1979 Outer Continental Shelf Oil and Gas Lease Sale Offshore Southern California, 1508–09 (1979). See also BLM, Draft Environmental Statement, Proposed Five-Year OCS Oil and Gas Lease Sale Schedule 63 (1980) (“An alternative . . . to cease leasing . . . would result in the need to meet national energy needs through other sources, or to reduce energy consumption . . .”).

Thus, as early as 1979, Interior recognized that canceling even a single oil and gas lease would cause the market to respond by substituting not just oil and gas from other sources, but alternative fuel types as well as increased energy conservation. BLM further recognized that the extent of energy conservation as a response depended on the price of the resource being replaced. BLM explained in 1979 to decision-makers and the public, over the course of 25 pages of analysis,

how each possible substitute for the foregone offshore leasing carried its own environmental effects: net beneficial to the extent increased energy conservation or renewable energy offset the lost offshore oil and gas; a more mixed or net negative effect on environmental quality with switches to other types and sources of fossil fuels. BLM, *Final Env'tl. Stmt. on Sale No. 48, supra* at 1508– 1532. BLM even noted in this 1979 analysis that different energy substitutes generated different carbon dioxide emissions: “A number of gases are associated with geothermal systems and may pose health and pollution problems. These gases include . . . carbon dioxide However, adverse air quality impacts are generally less than those associated with fossil-fuel plants.” *Id.* at 1525.

ii. BOEM Has Used Sophisticated Tools To Assess The Environmental Consequences Of Substitutes, And The D.C. Circuit Has Praised Its Modeling.

The Bureau of Ocean Energy Management (“BOEM”) develops Five-Year Programs to manage the leasing of offshore (or “Outer Continental Shelf” (“OCS”)) oil and gas resources. Its recent past program covered the years 2012–2017; development of that program and the related Environmental Impact Statement first began in 2009. *See* BOEM, *Outer Continental Shelf Oil and Gas Leasing Program: 2012–2017—Final Programmatic Environmental Impact Statement*, 8-1 (2012). In the decision document for that offshore program, BOEM explained:

In an environment of strong worldwide demand for oil and natural gas, a domestic supply cut equivalent to the production anticipated to result from a new Five Year Program would lead to a slight increase in world oil prices and a relatively larger increase in U.S. natural gas prices. All other things being equal, this would lead to a market response providing . . . a slight reduction in oil and natural gas consumed, a substantial increase in oil imports, and added supplies provided by onshore hydrocarbon resources.

BOEM uses its *Market Simulation Model (MarketSim)* to estimate the amount and percentage of substitutes that the economy would adopt should a particular program area not be

offered to lease. MarketSim is based on authoritative and publicly available estimates of price elasticities of supply and demand and substitution effects. . . .

[I]n the event the NAA [No-Action Alternative] were implemented. . . . 68 percent of the oil and natural gas production foregone from this program would be replaced by greater imports, 16 percent by increased onshore production, [10 percent by other energy sources] . . . and 6 percent by a reduction in consumption.

BOEM, *Proposed Final Outer Continental Shelf Oil & Gas Leasing Program 2012–2017*, 110 (2012)13; *see also* BOEM, *2012–2017 Final Programmatic Environmental Impact Statement*, *supra* at 4-643 (“With less oil and gas available from the OCS under the No-Action Alternative, consumers could obtain oil and gas from other sources, substitute to other types of energy, or consume less energy overall.”).

BOEM explained in its Final Environmental Impact Statement that, compared to leasing offshore oil and gas, the energy substitutes anticipated under a No-Action Alternative will have different environmental consequences, including for climate change. For example, BOEM detailed how “Coal consumed in place of gas under the No Action Alternative will result in environmental costs The combustion of coal in power plants or industrial boilers produces higher emissions . . . than the combustion of natural gas and results in greater CO₂ [carbon dioxide] emissions.” *Id.* at 4-647. Similarly, BOEM’s Economic Analysis Methodology calculates:

[T]he emissions for carbon dioxide and nitrous oxide [another greenhouse gas] are greater under the NSOs [No-Sale Options] than from the program. However, there is more methane from the program than the NSOs. Though these impacts are not monetized, *they are not identical between having an OCS program and having the impacts of the NSOs.*

BOEM, *Economic Analysis Methodology for the Five Year OCS Oil and Gas Leasing Program for 2012–2017*, 29–30 (2012) (emphasis added).

In a recent case challenging Interior’s 2012–2017 offshore oil and gas leasing program, the D.C. Circuit favorably reviewed Interior’s modeling of how “forgoing additional leasing on the

OCS would cause an increase in the use of substitute fuels . . . and a reduction in overall domestic energy consumption from greater efforts to conserve in the face of higher prices.” *Ctr. for Sustainable Economy v. Jewell*, 779 F.3d 588, 609 (D.C. Cir. 2015). Importantly, nothing in BOEM’s modeling is unique to the offshore oil and gas context. According to BOEM, “MarketSim’s economics-based model representation of U.S. energy markets . . . simulates end-use domestic consumption of oil, natural gas, coal and electricity in four sectors (residential, commercial, industrial and transportation); primary energy production; and the transformation of primary energy into electricity.” BOEM, *The Revised Market Simulation Model (MarketSim): Model Description 2* (2012).

Interior’s sophisticated modeling of the environmental effects of energy substitutes under No-Action Alternatives (here not approving the Project) is the culmination of 35 years of analysis. Interior has used the MarketSim model since at least its 2002–2007 Program for offshore leasing. *See*, Minerals Mgmt. Serv. (“MMS”), *Energy Alternatives and the Environment*, 10 (2001)16 (“MMS employs the MktSim2000 model to evaluate the impact of decreased OCS production resulting from no action.”). Since at least the 1990s, Interior’s Environmental Impact Statements have calculated the percentage of offshore production expected to be substituted by various energy alternatives under a No-Action scenario. MMS *Energy Alternatives and the Environment*, 13 (1996)17 (“[F]or each unit of OCS gas not produced because of no action . . . conservation will account for about 0.14 units”); *see also id.* at 15 (“Significant environmental impacts associated with expanded importation of oil include: the generation of greenhouse gases”). And going back to the first Five-Year Program in 1980 (when BLM prepared the Environmental Statements), Interior has recognized that not all sources of the same fuel type present the same

environmental effects—for example, offshore oil drilling presents lower spill risks than imported oil substituted under the no-action alternative. Interior, *5-Year OCS Leasing Program* 13b (1980).

Similarly, in a 2001 report on its offshore oil leasing program, Interior declared in no uncertain terms that “Examining other energy sources is an important aspect of the No Action Alternative” under NEPA reviews. MMS, *Energy Alternatives and the Environment* 1 (2001). The key is foreseeability and it is clearly foreseeable that the issuance of the KEC will adversely impact solar production and development, and hence result in more climate-destroying fossil fuels.

B. NTE Ignores Potential Effects On Endangered Species And Water Quality Impacts From The Project And Climate Change.

The Facility would, *inter alia*, result in a significant reduction in renewable energy generation with storage, which in turn, will result in an increase of fossil fuel generation over what would otherwise occur. The result would be the acceleration of climate change and reducing the ability to avert the most severe devastation from climate change. That will in turn adversely affect critical habitat of endangered species and accelerate the extinction of those species.

Amongst many threatened and endangered species the KEC will impact the Piping Plover⁶ and North Atlantic Right Whale.⁷ North Atlantic right whales primarily migrate into the waters off Massachusetts and engage in short-term feeding before moving onto feeding grounds throughout the Gulf of Maine. See, <https://www.boem.gov/press10252016/> (last visited January 19, 2020). The recent study, *Rapid Climate-Driven Circulation Changes Threaten Conservation of Endangered North Atlantic Right Whales*, by Nicholas R. Record, et al (the “Record Paper”),⁸ indicates that the right whales’ food supply is already endangered by the warming ocean.

⁶ <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B079>

⁷ <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A02R>

⁸ Available at https://www.researchgate.net/publication/333539035_Rapid_Climate-Driven_Circulation_Changes_Threaten_Conservation_of_Endangered_North_Atlantic_Right_Whales (last visited January 19, 2020).

If the right whales' food supply off the coast of Massachusetts is diminished further, it would adversely affect the right whales' ability to continue their journey to the Gulf of Maine. This area was already designated as a critical habitat for the right whale by the National Marine Fisheries Service in 1994. *See* Designated Critical Habitat; Northern Right Whale, 59 Fed. Reg. 106 (June 3, 1994). Further warming will be caused by the increased fossil fuel use that would occur as a result of the KEC.

About two-thirds of America's birds will be threatened with extinction if global warming rises by 5.4 degrees Fahrenheit by 2100, according to a report from the National Audubon Society. About 389 out of 604 species are at risk of extinction from climate change. <https://www.audubon.org/climate/survivalbydegrees>. The KEC will adversely affect critical habitat for those species by accelerating the devastation from climate change.

According to the US Fish and Wildlife Service “[i]n the southeastern United States, changes to the climate are having profound impacts on our nation’s wildlife and habitats. In aquatic environments, evidence is growing that higher water temperatures resulting from climate change are negatively impacting cold- and cool-water fish populations across the country.” <https://www.fws.gov/southeast/our-changing-climate/>. The KEC will adversely affect critical habitat for those species by accelerating the devastation from climate change.

Similarly, five ESA-listed species of sea turtles may occur in the U.S. northwest Atlantic Ocean: leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), Kemp’s ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), and hawksbill (*Eretmochelys imbricate*). All of these sea turtles are migratory and enter New England waters primarily in the summer and fall. The KEC will adversely affect critical habitat for those species by accelerating the devastation from climate change and result in continuing temporary to permanent impacts (disturbance,

displacement, injury, mortality, reduced reproductive success, habitat degradation, habitat conversion) to those species by, among other things, acceleration of the warming of the Atlantic.

NTE's omission of those facts is a breach of its Permit, section VIII, para. G.

C. NTE's Failure To Update Its Application With The "Secondary Impacts," "Cumulative Impacts," and "Social Costs Imposed" is a Breach of Section VIII, para. G of the Permit.

The NTE analysis is inaccurate and misleading because it does not review the "adverse environmental impacts" of "secondary impacts," "cumulative impacts," or "social costs imposed." The NTE analysis omits relevant information in the form of the "adverse environmental impacts," "secondary impacts," "cumulative impacts," and "social costs imposed" of the facility. NTE's omissions are a breach of its Permit, section VIII, para. G.

For example, NTE's application is inaccurate and misleading in that it omits the adverse health impacts of NTE's project on children. Last week, at a White House Press Briefing, Special Presidential Envoy for Climate John Kerry, stated that climate destruction from fossil fuel use is "the greatest cause of children being hospitalized every summer in the United States—we spent \$55 billion a year on it—is environmentally induced asthma." "Connecticut experiences some of the worst ozone pollution in the United States. Exposure to unhealthy levels of air pollution contributes to acute and chronic respiratory problems such as asthma, Chronic Obstructive Pulmonary Disease, and other lung diseases. A recent national report, *Asthma Capitals 2019*, ranked New Haven (#11) and Hartford (#13) among the 100 largest U.S. cities where it is most challenging to live with asthma." IRP at 107. NTE does not discuss any of the social, health and environmental, and economic adverse effects that would be caused by the KEC, and which are discussed above.

D. NTE OMITTS TO DISCLOSE ITS POTENTIAL LIABILITY UNDER THE MMPA.

Section 101(a) of the Marine Mammal Protection Act (“MMPA”) (16 U.S.C. §1361) prohibits persons subject to the jurisdiction of the United States from taking any marine mammal in waters or on lands under the jurisdiction of the United States or on the high seas (16 U.S.C. §1372(a) (1), (a)(2)). Sections 101(a)(5)(A) and (D) of the MMPA provide exceptions to the prohibition on take, which give NMFS the authority to authorize the incidental but not intentional take of small numbers of marine mammals, provided certain findings are made and statutory and regulatory procedures are met. ITAs may be issued as either (1) regulations and associated Letters of Authorization or (2) an Incidental Harassment Authorization (“IHA”).

Letters of Authorizations may be issued for up to a maximum period of 5 years, and IHAs may be issued for a maximum period of 1 year. NMFS has also promulgated regulations to implement the provisions of the MMPA governing the taking and importing of marine mammals (50 C.F.R. §216) and has published application instructions that prescribe the procedures necessary to apply for an Incidental Take Authorization (“ITA”). U.S. citizens seeking to obtain authorization for the incidental take of marine mammals under NMFS's jurisdiction must comply with these regulations and application instructions in addition to the provisions of the MMPA.

Once NMFS determines an application is adequate and complete, NMFS has a corresponding duty to determine whether and how to authorize take of marine mammals incidental to the activities described in the application. To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific information to determine whether the take would have a negligible impact on the affected marine mammal species or stocks and an immitigable impact on their availability for taking for subsistence uses. NMFS must also prescribe the “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat,

and on the availability of those species or stocks for subsistence uses, as well as monitoring and reporting requirements.

The term “take” means “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 USC §1362(3)(13)). The incidental take of a marine mammal falls under three categories: mortality, serious injury, or harassment (i.e., injury and/or disruption of behavioral patterns). Harassment, as defined in the MMPA for non-military readiness activities (Section 3(8)(A)), is any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment) or any act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns (Level B harassment). Disruption of behavioral patterns includes, but is not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant).

An IHA is appropriate if the proposed action would result in harassment only (i.e., injury or disturbance) and is not planned for multiple years. A LOA is required if the actions will result in harassment only (i.e., injury or disturbance) and is planned for multiple years.

The warming caused by the KEC itself will constitute ongoing take for the life of the Facility. The impact from the KEC-caused warming results in the acceleration of disruption of behavioral patterns including, but is not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

III. Did Permit Applications for Stationary Sources of Air Pollution New Source Review, Application Nos. 201605089, 201605092, 201605093, 201605094, 201605095, and 201605097 fail to comply with RCSA 22a-174-3a(1)(2)?

Short Answer: Yes

RCSA 22a-174-3a(1)(2) provides:

(2) Analysis of alternatives.

(A) An owner or operator of the subject source or modification shall include an analysis of alternative sites for the proposed activity, alternative sizes for the subject source or modification, alternative production processes, and all environmental control techniques and technologies which are available for such major stationary source or major modification;

(B) Such analysis shall demonstrate whether the benefits of the subject source or modification would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed as a result of the location, construction or modification;

(C) The owner or operator of the subject source or modification shall submit such analysis prior to the issuance of any tentative determination on a permit application under this section.

The analysis performed by DEEP addressing the requirements of RCSA 22a-174-3a(1)(2) is restated in full below in order to show the utter failure to adhere to the mandate of RCSA 22a-174-3a(1)(2) that the analysis must demonstrate that the benefits of a project “would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed”:

Analysis of Alternatives

Pursuant to RCSA §22a-174-3a(1)(2), as part of the non-attainment review, the Applicant is required to submit an “Analysis of Alternatives”. The analysis must contain an evaluation of alternative sites, sizes, production processes and all environmental control technologies for the proposed source. The analysis must demonstrate that the proposed project’s benefits outweigh the adverse environmental impacts, including secondary/cumulative impacts, and social costs imposed as a result of the location and construction of the project.

This site is located in an area with a primary fuel source (natural gas pipeline), nearby electrical transmission line, properly zoned land suitable for a plant of this size, along with water/sewer utilities.

NTE reviewed alternate sites in Wallingford, Danbury, Milford, East Granby,

Berlin, Waterbury, Pomfret and Putnam. The Wallingford and Danbury sites did not have adequate land size in the Town's industrial zoned area. In Milford, Putnam and another site in Killingly, property owners were not willing to sell their property. The Waterbury site would have required significant transmission line infrastructure development because it was more than seven miles from the nearest transmission line. The Berlin, Pomfret and East Granbury sites did not have industrial areas for a power generation facility. The Killingly site was selected because the existing infrastructure and physical characteristics of the property would cause the least adverse impact to the public and the environment.

The proposed project's primary objectives are to provide flexible, reliable and baseload power. Alternate generation (i.e. solar or wind) do not generate on a reliable basis and there is no viable energy storage technology available to make wind or solar a viable baseload generation alternative at this time. Additionally, wind and solar require significantly larger footprints to generate the same amount of electricity. The Colebrook Wind Farm has a capacity of 5 MW and requires 80 acres of land. The Fusion Solar Center in Sprague has a capacity of 20 MW on 170+ acres, the Somers Solar Center in Somers has a capacity of 5 MW on 50 acres, and the Simsbury Solar Farm in Simsbury has a capacity of 26 MW on 153 acres. These examples show that wind and solar can only generate about 0.1 - 0.2 MW/acre on an intermittent basis, which would only yield about 10 MW under ideal conditions at the proposed 70 acre Killingly site. Another example, the energy density for large scale solar generation when compared to fossil fuels is the Ivanpah solar array in California where 344 MW requires approximately 4,000 acres of land use. Other fossil fuels such as coal or oil fired electrical generating units (EGU) would have greater air emissions and be less efficient on a Btu/kW-hr basis (heat rate). The proposed project's primary source of fuel is pipeline natural gas and there is a pipeline nearby to the premises that will have limited impact on the surrounding area when compared to other fossil fuels. The project is required to have some backup fuel and the selection of ULSD fuel oil is the lowest emitting fuel available for that purpose.

The BACT/LAER review for this project requires the use of the most advanced pollution control systems available at this time.

The Applicant has demonstrated that the project, as proposed, will use the most fuel efficient generating technology available at this time, have limited secondary and cumulative impacts when compared to other technologies, and use the cleanest fuels practicably available along with state-of-art pollution control technologies.

A. The Analysis Failed to Justify Any Benefit of the Project.

The only purported "benefit" of the project is to provide "flexible, reliable, baseload power" in what DEEP describes as "a broken market design ... unresponsive to State needs," IRP at 80, that results in building of unneeded electrical generation such as KEC. Merely alleging

that the “benefit” of the project is “flexible, reliable, baseload power” is an insufficient quantification of the benefits of project RCSA 22a-174-3a(1)(2). There has been no evidentiary showing that ISO-NE needs this Project to provide reliable service. Nor has there been any showing that alternatives such as battery storage from renewable energy projects could not provide the same alleged reliability. *See, e.g.,* <https://energynews.us/digests/in-california-battery-storage-is-the-new-peaker-plant/> (“Battery storage, only recently considered an unattainable ‘holy grail,’ is already providing electricity to California’s grid equivalent to a mid-sized power plant.”); “*NextEra: Gas-fired peaker plants cannot compete with new battery storage resources,*” available at: <https://ieefa.org/nextera-gas-fired-peaker-plants-cannot-compete-with-new-battery-storage-resources/>. *See also, supra.*

While subsequent to DEEP’s analysis, NTE was selected in the ISO-NE Forward Capacity Market, the ISO-NE’s capacity auction system such a fact merely means that it blocks out more environmentally friendly options, such as renewable energy and battery storage. It also means that it puts more economic pressure on other zero-carbon resources such as the Millstone nuclear plant, which, in turn, can result in additional costs to Connecticut ratepayers in order to keep Millstone afloat, far off-setting a project’s allegation that it provides any benefit.

Moreover, the purported benefit of the Project is not really a benefit at all. Rather, it would exacerbate the “pay twice” problem that DEEP discusses in the draft Integrated Resources Plan, adding more costs to already over-burdened Connecticut ratepayers.⁹ DEEP has made the point numerous times that the ISO-NE capacity market procures capacity that is simply not needed because the fossil-fuel centric focus of ISO-NE refuses to accord capacity credit to State-supported resources and is “a broken market design ... unresponsive to State needs.” IRP at 80.

⁹ Available at: <https://portal.ct.gov/DEEP/Energy/Integrated-Resource-Planning/Integrated-Resource-Planning>.

Characterizing the Project as a justified bridge to a zero-carbon electric grid ignores science and economics. It is simply a tobacco-industry-style marketing ploy that makes it sound like more gas plants are needed, when we know they are not. States like Vermont and Massachusetts are adding storage, not building gas plants. Other States, like Hawaii and California have also chosen to add battery storage peakers instead of new gas plants as discussed above.

B. The Analysis Failed to Analyze the “adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed.”

DEEP’s “analysis” utterly ignored the requirement that it analyze the “adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed” and show that those adverse impacts are *significantly* outweighed by the alleged “benefit” of the project. The analysis failed to discuss the adverse economic, health, environmental and social effects described above.

The KEC will also cause unreasonable pollution, impairment or destruction of the air, water and other natural resources of the state of Connecticut, and is prohibited by Conn. Gen. Stat. §22a-16.

RCSA 22a-174-3a(1)(2) requires that the Project be evaluated in a manner that fully reflects the climate destroying carbon dioxide (“CO₂”) emissions and other emissions it would cause over its lifetime. Such an analysis would reach the same result as the analysis under Conn. Gen. Stat. § 22a-16—that the KEC would expose the air, water and other natural resources of the state to unreasonable pollution, impairment or destruction.¹⁰

¹⁰ “Where the activity challenged may have an environmental impact, [an agency] has the additional responsibility under General Statutes § 22a-19 (b) to consider that impact. Under that statute the agency ‘shall consider the alleged unreasonable pollution, impairment or destruction of the public trust in the air, water or other natural resources . . . and no conduct shall be authorized or approved which does, or is reasonably likely to, have such effect’” *Mystic Marinelife Aquarium, Inc. v. Gill*, 175 Conn. 483 (1978).

A natural gas fueled generator, such as KEC, emits climate destroying CO2 emissions, and creates further demand for fracking. Fracking results in the release a methane, more than 80 times worse than CO2 for the climate. Fossil fuel generation not only is destroying the planet, but is responsible for the pre-mature death of countless Americans, and the raft of adverse consequences described by Attorney General Tong and discussed above.

IV. Did DEEP err in issuing Permit No. 089-0107?

Short Answer: Yes.

For the reasons discussed above, DEEP erred in issuing Permit No. 089-0107.

V. Should DEEP revoke Permit No. 089-0107 (the “Permit”) in accordance with CGS § 22a-174-3a(f)?

Short Answer: Yes

As discussed above, the Section VIII, para. G has been breached. Further, as discussed above, CGS § 22a-174-3a(f) provides that the Commissioner “shall” review any permit where the construction authorized by the permit has not commenced within eighteen (18) months from the date of issuance, or such other period, as the permit provides, whichever is later. Permit No. 089-0107, issued as modified on December 10, 2018, does not contain a later date. Construction has not commenced within the 18-month period. As a result, Sec. 22a-174-3a(f) requires the Commissioner to review the permit. As part of that review, the Commissioner may revoke the permit. As part of the Commissioner’s mandatory review, the Commissioner should revoke the permit for the reasons stated herein.

Conclusion

NTE wholly ignores the direct and indirect consequences and social costs of its Project. Such an approach is deeply-flawed, ignores science and economics, and simply does not pass the muster of informed decision making, and surely does not meet RCSA 22a-174-3a(1)(2)’s

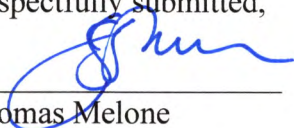
requirement that the “adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed” be analyzed and be shown to be significantly outweighed by the purported benefit of the Project. NTE’s omissions are also a breach of the Permit.

For the reasons stated above, Allco requests that the Commissioner declare:

1. DEEP has erred by not re-reviewing Permit No. 089-0107 as required by CGS § 22a-174-3a(f).
2. NTE Connecticut LLC has breached Part VIII, Paragraph G of Permit No. 089-0107.
3. Permit Applications for Stationary Sources of Air Pollution New Source Review, Application Nos. 201605089, 201605092, 201605093, 201605094, 201605095, and 201605097 failed to comply with RCSA 22a-174-3a(l)(2).
4. DEEP erred when it issued Permit No. 089-0107.
5. DEEP should revoke Permit No. 089-0107 in accordance with CGS § 22a-174-3a(f).

Dated: February 5, 2021

Respectfully submitted,



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EXHIBIT A

ATTACHMENT 215-B ANALYSIS OF ALTERNATIVES

This attachment provides an analysis of alternatives for the Killingly Energy Center (the Project) proposed by NTE Connecticut, LLC (NTE). The Project is currently proposed as an approximately 550-megawatt (MW) electric generating facility primarily fueled by natural gas. The Project will utilize a single combustion turbine generator (CTG) in a 1x1x1 configuration, with a heat recovery steam generator (HRSG), steam turbine generator (STG), and an air-cooled condenser (ACC). Alternatives for the Project will also be reviewed by the Connecticut Siting Council (CSC) to confirm that the Project provided an appropriate balance of environmental and community impacts with the need for a reliable and efficient source of energy.

The following sections consider alternatives to the Project as currently proposed, addressing the extent to which the benefits outweigh adverse environmental impacts, including secondary impacts and cumulative impacts, as well as social costs. As required by the Connecticut Department of Energy and Environmental Protection (DEEP), consideration of alternative Project sites, sizes, and production processes are discussed. Lastly, environmental control techniques and technology are summarized, with cross-referencing to Attachment G, which includes a detailed demonstration of Lowest Achievable Emission Rate (LAER) and Best Available Control Technology (BACT) for the Project.

ALTERNATIVE SITES

Over the course of several months, NTE researched numerous prospective sites for the Project throughout Connecticut. NTE's initial site search prioritized areas with nearby natural gas and electric transmission infrastructure, adequately sized parcels within existing or planned industrial areas, and communities that would benefit significantly from a substantial increase in tax revenue, job growth and other economic impacts.

In addition to a thorough desktop analysis utilizing geographic information system (GIS) mapping software, NTE conducted numerous site diligence trips and met with several towns in Connecticut to discuss general interest level in this Project, prospective site locations within the town, and infrastructure capabilities.

NTE weighed initial siting prospects on a set of criteria which narrowed down viable site locations. These criteria included community long-term plans/interest and proximity to required infrastructure. Due to the Town of Killingly's strong surrounding infrastructure and interest in the strong economic benefits the Project would bring, the Town of Killingly became the top contender for the Project. Other locations of interest would have required extensive infrastructure additions, like the development of lengthy transmission lines, or lacked adequate acreage.

Once Killingly was defined as the target area for the Project, several sites in close proximity to the required infrastructure were further assessed. Research identified the Town of Killingly's *Plan of Conservation and Development: 2010 - 2020* which detailed intentions to expand the industrial zoned area towards the west of the current industrial zoned area (see Figure 1). The industrial areas of the Future Land Use Map are primarily where NTE identified prospective sites within the Town of Killingly.

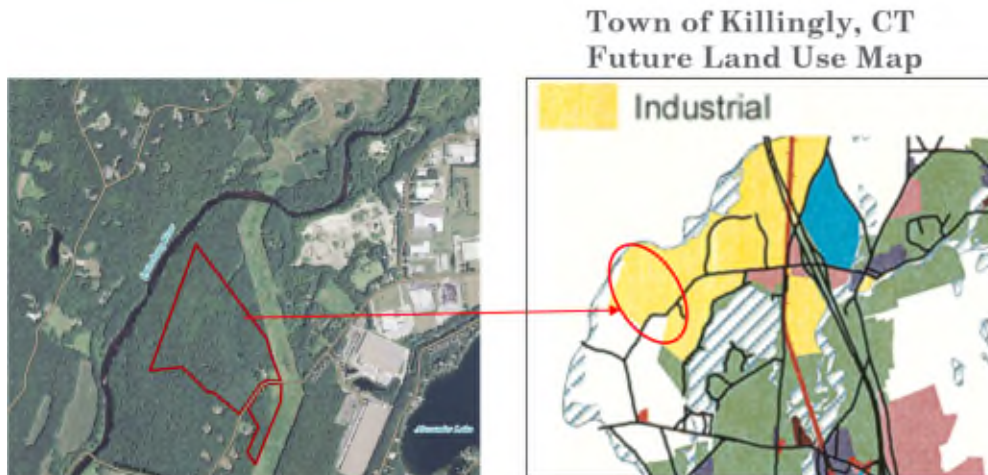


Figure 1: Town of Killingly Future Land Use Map

The sites in Killingly were closely assessed and weighted. Criteria for assessment included size of parcel, ability to minimize wetland disturbance, surrounding buffer to minimize visual impact, favorable elevation to minimize visual impact, and proximity to required infrastructure.

An assessment of critical issues was compiled for each prospective Killingly site, including a preliminary evaluation of air quality, noise, water supply, visibility, protected species, and land use and zoning. Once these assessments were compiled and sites were further narrowed down, NTE reached out to property owners and executed a site option for the 180/189 Lake Road parcels.

The combination of adequate parcel size, surrounding infrastructure, site buffering capabilities, ability to avoid wetland disturbance, and the town's future land use intentions made this site the top candidate for the Killingly Energy Center.

ALTERNATIVE SIZES OR ALTERNATIVE PROCESSES

Alternative Size/Project Output

As noted above, the proposed Project reflects a 550-MW generating capability utilizing efficient, state-of-the-art technology. The generating capacity was selected as consistent with market needs for a flexible base load plant in this location. Other factors that influenced the optimal generating capacity were energy efficiency and system reliability from both a natural gas and electrical perspective. The proposed 550-MW plant utilizes an advanced class gas turbine resulting in a very high combined cycle efficiency. Providing less generating capacity would considerably reduce the plant's overall efficiency. Adding additional capacity beyond the proposed 550 MW would result in addition of a considerable amount of power to the ISO-NE grid in a particular location, and would most likely require substantial system upgrades to protect system reliability. Additionally, drawing the needed amount of natural gas to operate a larger facility would likely trigger the need for similar upgrades to the natural gas pipeline that provides fuel for the infrastructure.

Alternative Generation Technologies

NTE considered the range of potential generation technologies, and affirmed that a combined cycle combustion turbine utilizing natural gas as its primary fuel not only presented economic and efficiency advantages demonstrated in practice, but was a favorable option from a reliability, environmental, and acceptability perspective.

The Project's purpose is to provide a reliable, baseload energy facility to serve the ISO-NE market. Renewable resources, such as wind and solar, are an important component of the electrical grid. However, they cannot meet

any of the Project's three primary objectives (flexible, reliable, baseload power). Solar and wind facilities generate energy only intermittently, depending upon the availability of the resource. Energy storage solutions do not yet allow for reliable power generation across the potential demand spectrum. Given this, efficient baseload generating sources are needed to augment the growing focus on renewables to the energy mix.

In addition, land requirements for solar and wind projects are highly dependent on the "resource" available at a given site, as well as topographic and other factors. The National Renewable Energy Laboratory (NREL) identifies solar energy production in its June 2013 report *Land-Use Requirements for Solar Power Plants in the United States* of approximately 5.9 acres per MW. A 70-acre site would, therefore, result in solar generation of approximately 12 MW. In reality, significant portions of the site would not be used due to wetlands or other constraints, and energy generation from a solar installation at this site would be even less. Similarly, wind energy facilities vary in the amount of land area required. Using NREL's August 2009 *Land-Use Requirements of Modern Wind Power Plants in the United States*, which indicates a dramatic range from approximately 22 acres per MW to 250 acres per MW; even assuming the more productive end of the range, just over 3 MW of generation would result. In general, New England is not among the areas with a strong on-shore wind regime, due to variable wind direction and lower speeds except on certain ridgelines. Therefore, a solar or wind installation would be expected to result in considerably lower energy production than the technology proposed.

Advanced combined cycle combustion turbine technology with natural gas firing is much more efficient than other types of technology utilized in current non-renewable electric power generation projects. The Energy Information Administration (EIA) publication entitled *Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants* (April 2013) provides a comparison of heat rates for various electric utility scale generating technologies. The listed heat rate for other fossil fuel generating technologies, as listed in that source, are:

- Coal-fired boilers/IGCC – 8,700 to 12,000 Btu/kWh
- Simple-cycle combustion turbines – 9,750 to 10,850 Btu/kWh
- Biomass boilers – 12,350 to 13,500 Btu/kWh
- Fuel cells – 9,500 Btu/kWh

The proposed Project has a new and clean net heat rate at full load under ISO conditions of 6,529 Btu/kWh (HHV, net).

Natural gas-fired combined cycle technology, as proposed, also facilitates flexible operation. This will allow ISO-NE to select the most appropriate generating source during periods of energy demand.

Combined cycle technology utilizing natural gas as its primary fuel remains the most favorable option today from a market point of view. This was recently demonstrated by ISO-NE's choice of a gas-fired combined cycle facility as the forward capacity market's proxy unit. This technology also maximizes energy efficiency and minimizes air emissions.

ALTERNATIVE FUELS

NTE considered fuel alternatives for the Project before selecting natural gas as the primary fuel source, with limited capabilities to fire ultra-low sulfur distillate (ULSD) oil as backup.

Natural gas, the preferred fuel source for the Project, is the cleanest burning fossil fuel. Burning alternative fossil fuels, such as coal and oil, result in greater pollutant emissions, and potentially introduce additional, complicating social and environmental impacts associated with fuel delivery and storage. NTE identified the following three fuel options to assure the lowest emitting scenario was selected that would best meet the Project purpose and need: 1) natural gas as the sole fuel; 2) natural gas as primary fuel with liquefied natural gas (LNG) as backup; and 3) natural gas as the primary fuel with ULSD as backup.

The Algonquin Gas Transmission natural gas pipeline (Algonquin pipeline) will supply natural gas to the Project. Natural gas, delivered via the Algonquin pipeline, located approximately 2 miles north of the site, eliminates the need for road or rail delivery, and provides efficient combustion in combined cycle mode resulting in the lowest emissions for all fossil fuels. Natural gas will be fired in the CTG at all times when it is available. However, the Algonquin pipeline may become constrained during periods of peak demand, preventing the Project from securing an uninterruptible supply contract for natural gas delivery. Given the infrastructure and anticipated resource limitations, natural gas as the sole fuel source was deemed technically infeasible for Project reliability and ability to meet contractual commitments.

Natural gas as the primary fuel with the installation of LNG storage to supply backup fuel could create a dedicated fuel supply; however, securing the necessary approvals and constructing LNG storage at the proposed Project site was considered infeasible. There is not sufficient space on the site to build an LNG storage terminal as well as the Project, even without consideration for the additional space requirements associated with the need for an exclusion zone around LNG storage tanks. This fuel alternative was, therefore, considered infeasible.

The use of ULSD presents the lowest emitting option of liquid fuels available, and is able to be utilized by the same combustion process and equipment. Because the emissions are higher for certain parameters than natural gas, the Project's use of ULSD has been restricted to no more than 720 hours per year. This will be sufficient support for Project reliability, and allow for appropriate fuel flexibility without the need for substantial additional infrastructure or equipment. There are no unacceptable collateral environmental impacts associated with use of 720 hours per year of ULSD firing.

The selection of natural gas as the primary fuel, with ULSD for limited use as backup was determined to be the appropriate fuel scenario for the Project.

ALTERNATIVE COOLING TECHNOLOGIES

A natural gas-fired combined cycle electric generating facility requires cooling, particularly for the condensing of turbine exhaust steam in the steam turbine condensers. A range of cooling technologies was evaluated, including once-through cooling, conventional "wet" cooling towers, and air cooling. The technology that is most appropriate for a given project is dependent on a site-specific balancing of a number of technical, economic, and environmental factors. For this Project, air cooling has been selected as the most appropriate cooling technology. Information regarding each alternative is provided below.

Once-Through Cooling

Many larger electric generating facilities located near surface water bodies have historically utilized once-through cooling technology. Once-through cooling systems circulate water from a nearby surface waterbody through the steam surface condensers. Heat from the steam condensers is transferred to the cooler circulating water. The same quantity of water is then returned directly to the surface water body after exiting the condensers, although at an increased temperature. The higher temperature is the result of the water having absorbed the latent heat of vaporization associated with the condensing turbine exhaust steam back to a liquid state. The name of this system is derived from the fact that cooling water is passed through the condenser just one time before being returned to the water source. With the issuance of USEPA's 2014 §316(b) Final Rule covering cooling water intake structures, presumptive Best Technology Available (BTA) has been defined as a withdrawal rate equivalent to mechanical draft wet cooling towers. For this reason, once-through cooling was rejected.

Mechanical Draft (Wet) Cooling

In a mechanical draft or wet cooling tower system, water is circulated in a loop through the steam surface condensers and the cooling tower. The circulating water serves as the intermediary heat transfer medium between the steam surface condenser and ambient air. Cooling is achieved through evaporation of the water circulating

through the system and through direct contact with the air as the water cascades down through the cooling tower fill. Air is moved through the cooling tower through the use of fans. A supply of water is required to make up for evaporation losses. In addition, a smaller quantity of water, known as blowdown, is discharged from the system to limit the build-up of dissolved solids that are concentrated in the remaining circulating water during the evaporation process. The blowdown water must also be replaced with makeup water.

Although water cooling is more efficient than the use of air, local concerns regarding water and water use were a key factor for this site. Although the Quinebaug River reflects a potential surface water source, and potential groundwater resources are also available, it was determined that the Project should select the technology that required the least possible water demand.

Air-Cooled Condenser Cooling

An air-cooled condenser relies only on ambient air as a direct steam-cycle heat sink, without the use of any water or other intermediary heat transfer medium. Steam is routed from the turbine exhaust through ducts to a series of finned tube heat exchangers. The steam flows through, and condenses inside the tubes while air flows over the outer, finned tube surface. Condensate is discharged from the air-cooled condenser and supplied back to the HRSGs after the latent heat of vaporization is transferred from the turbine steam directly to the air stream. Air is moved through the air-cooled condensers by a series of fans, with the warmer air discharged from the tops of the condenser. Air has a lower heat adsorption/exchange rate than water that affects the size of the cooling system.

Selection of air cooling reduces the Project's water requirements by over 95% as compared to wet cooling, and was thus determined to be most appropriate for the Project in this location.

ENVIRONMENTAL CONTROL TECHNIQUE AND TECHNOLOGY REVIEW

A detailed LAER/BACT demonstration analysis is provided in Section G of this application. As outlined in that section, the Project has selected advanced pollution control technologies and add-on controls to achieve low levels of emissions when operating both with its primary fuel (natural gas) and its backup source (ULSD).

The proposed Project considered various alternative NO_x emission control technologies, and proposes to install DLN combustors and SCR technology to control NO_x emissions during natural gas firing. Water injection will be used with SCR to minimize NO_x emissions during ULSD firing. As discussed in Attachment G, this represents LAER, which is equivalent to the lowest emission rates achieved in practice. NTE evaluated alternative technologies, including SNCR and EM_xTM. SNCR requires exhaust temperatures much higher than produced by a combustion turbine to be effective and typically achieves NO_x reductions of 50% or less. For these reasons, SNCR was eliminated as technically infeasible. EM_xTM has never been installed on a CTG larger than 43 MW and has not demonstrated NO_x control levels greater than SCR. For these reasons, EM_xTM was eliminated as technically infeasible.

Good combustion controls and an oxidation catalyst will be used to control CO and VOC emissions; as discussed in Attachment G, this represents BACT for these two pollutants. No other emission control technologies are available to achieve further reductions for these two pollutants.

Emissions of SO₂, H₂SO₄ and PM/PM_{2.5}/PM₁₀ will be controlled by good combustion practices and use of low sulfur fuels. The Project will fire natural gas as the primary fuel, with a maximum sulfur content of 0.5 gr/100 scf. ULSD, with a maximum sulfur content of 15 ppmw, will be the backup fuel, limited to times when natural gas is not reasonably available and in no case for more than 720 hours per year. Post-combustion emissions controls such as fabric filters, electrostatic precipitators, and scrubbers, which are commonly used on solid-fuel boilers, are not technically feasible for CTGs, given the low emission rates and the large amount of excess air inherent in combustion turbine technology. There are no known combined cycle CTGs with post combustion controls for SO₂, H₂SO₄ and PM/PM_{2.5}/PM₁₀.

Emissions of GHGs, primarily CO₂, are related to carbon content of the fuel and heat rate of the technology. Due to relatively low carbon content of natural gas on a heat content basis, and the low heat rate of the combined cycle technology, the Project will have less than half of the CO₂ emissions of existing coal-fired boiler plants with steam turbines. Post-combustion controls (CCS), while theoretically feasible, are not commercially available and cost prohibitive. BACT for GHGs was determined to be use of natural gas as the primary fuel with limited use of ULSD as the backup fuel.

SUMMARY AND CONCLUSION

The Project conducted a robust and thorough consideration of a range of alternatives. The Project as proposed reflects the use of an appropriate site, the most efficient generating technology, clean fuels, and state-of-the-art emission controls. The Project is the optimal size for successful participation in the current New England forward capacity and energy markets. Air quality impacts associated with the Project will comply with National Ambient Air Quality Standards and PSD Increments, which have been established for the protection of the most sensitive members of the population. Beneficial cumulative air quality effects will result from displacement of older, less efficient, higher emitting generating units. The Project will be a source of efficient, reliable energy production, as well as employment opportunities associated with its construction and operation; both of which will result in significant secondary economic impacts throughout the local community. The Project will also contribute substantial financial support to the local community as one of the largest taxpayers. The Project has incorporated the best available alternatives in order to balance its impacts and create a beneficial source of electrical generation.

AFFIDAVIT OF SERVICE OF MAILING


STATE OF NEW YORK)
COUNTY OF NEW YORK) SS.:

Thomas Melone, being duly sworn, says:

On the 5th day of February, 2021, I sent a true copy of the annexed NOTICE OF PETITION AND PETITION FOR A DECLARATORY RULING by mailing the same in a sealed envelope, with postage prepaid thereon, via United States Postal Service priority mail, and also by email, addressed to:

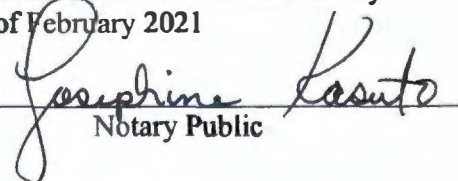
NTE Connecticut, LLC,
24 Cathedral Place, Suite 300
Saint Augustine, FL 32084
Attn: Brian Romeo
bromero@nteenergy.com

and by email to the attached distribution list.



Thomas Melone

Sworn to before me this 5th day
of February 2021



Notary Public



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Service List via email

Members of the CGA Energy and Technology Committee

Members of the CGA Environment Committee

Members of the CGA Public Health Committee

Members of the CGA that were Signatories to the Letter to Governor Lamont of 9/25/2019

Martha Klein Sierra Club Connecticut puckyshouse@gmail.com

CTLCV Exec Dir Lori Brown <ctlcv@ctlcv.org> lori.brown@ctlcv.org



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February 5, 2021

NTE Connecticut, LLC,
24 Cathedral Place, Suite 300
Saint Augustine, FL 32084
Brian Romeo
bromero@nteenergy.com
Via Email and First class mail

The Attached Distribution List
Via Email

NOTICE OF PETITION for Declaratory Ruling
IN RE NTE Connecticut LLC, Application for Stationary Sources of Air Pollution
Permit No. 089-0107
For Declaratory Rulings For Review And Revocation Of The
Air Permit For The Killingly Energy Center

Attached hereto is a petition for declaratory ruling being submitted on behalf of Allco Renewable Energy Limited and Windham Solar LLC related to *NTE Connecticut LLC, Application for Stationary Sources of Air Pollution Permit No. 089-0107*.

Pursuant to RCSA Section 22a-3a-4(a)(3), you are being provided with notice of a petition for declaratory ruling ("Petition") submitted to the Connecticut Department of Energy and Environmental Protection ("DEEP"). You have an interest in the subject matter of the Petition. A copy of the Petition is attached hereto. You and other interested persons have the opportunity to file comments and to request intervenor or party status in this matter under RCSA Section 22a-3a-4(c)(1).

Please feel free to contact me with any questions regarding the Petition.

Very truly yours,
/s/Thomas Melone
Thomas Melone
Juris No. 438879
Allco Renewable Energy Limited
157 Church St., 19th floor
New Haven, CT 06510
Phone: (212) 681-1120
Email: Thomas.Melone@AllcoUS.com

IN RE NTE Connecticut LLC, Application) **STATE OF CONNECTICUT**
for Stationary Sources of Air Pollution)
Permit No. 089-0107) **DEPARTMENT OF ENERGY AND**
) **ENVIRONMENTAL PROTECTION**
))
) Petition No. _____
))
) February 5, 2021
)

PETITION FOR DECLARATORY RULINGS FOR REVIEW AND REVOCATION
OF AIR PERMIT NO. 089-0107 FOR THE KILLINGLY ENERGY CENTER

Pursuant to Connecticut General Statutes (“CGS”) § 4-176 and section 22a-3a-4 of the Regulations of Connecticut State Agencies (“RCSA”), Allco Renewable Energy Limited and Windham Solar LLC (collectively, “Allco”) hereby petition the Commissioner of the Connecticut Department of Energy and Environmental Protection (“DEEP”) for declaratory rulings regarding the review and revocation of Permit No. 089-0107 (the “Permit”). This petition requests the following declaratory rulings:

1. DEEP has erred by not re-reviewing Permit No. 089-0107 as required by CGS § 22a-174-3a(f).
2. NTE Connecticut LLC (“NTE”) has breached Part VIII, Paragraph G of Permit No. 089-0107.
3. Permit Applications for Stationary Sources of Air Pollution New Source Review, Application Nos. 201605089, 201605092, 201605093, 201605094, 201605095, and 201605097 failed to comply with RCSA 22a-174-3a(1)(2).
4. DEEP erred when it issued Permit No. 089-0107.
5. DEEP should revoke Permit No. 089-0107 in accordance with CGS § 22a-174-3a(f).

EXECUTIVE SUMMARY

DEEP issued NTE Permit Number 089-0107 for the construction and operation of the Killingly Energy Center (the “Facility” or “KEC”), a 650-megawatt combined-cycle natural gas

electric generating facility in Killingly, Connecticut. The Facility was issued an initial permit by DEEP on June 30, 2017, and modifications to the Permit were issued by DEEP on March 16, 2018, and December 10, 2018.

CGS § 22a-174-3a(f) provides that the Commissioner “shall” review any permit where the construction authorized by the permit has not commenced within eighteen (18) months from the date of issuance, or such other period, as the permit provides, whichever is later. Permit No. 089-0107, issued as modified on December 10, 2018, does not contain a later date. Construction has not commenced within the 18-month period. As a result, Sec. 22a-174-3a(f) requires the Commissioner to review the permit. As part of that review, the Commissioner may revoke the permit. As part of the Commissioner’s mandatory review, the Commissioner should revoke the permit for the reasons stated herein.

RCSA 22a-174-3a(1)(2) requires, as part of the review of an air permit application, that a robust environmental impact analysis must be performed and that analysis must demonstrate that the benefits of a project “would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed.” Such an analysis was never done in connection with the issuance of the initial permit or the two modifications. For that reason, DEEP erred when it issued the Permit, and the Permit should be revoked.

Now that a re-review of the permit is required by CGS § 22a-174-3a(f), the analysis required by RCSA 22a-174-3a(1)(2) must be performed. The Petitioners submit that the permit applicant simply cannot meet the high threshold that the benefits of the Facility substantially outweigh the adverse environmental, adverse health, adverse economic and adverse social impacts from the Facility, and that therefore the Permit must be revoked.

The Permit should be revoked for an additional reason. Permit Section VIII, Para. G

requires that “[w]ithin 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.” The “analysis” that NTE submitted with the application with regard to the requirements of RCSA 22a-174-3a(1)(2) was both inaccurate and misleading. The information submitted has also changed. The NTE “analysis” utterly fails to account for the adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed. The “analysis” has also failed to account for abundance of new information regarding the adverse consequences of the Facility and the lack of benefits. NTE has failed to correct the submittals with accurate information and has thus breached section VIII, para. G of the Permit.

A. Introduction.

“Climate change poses an existential threat to humanity.” William Tong, *State of Connecticut v. Exxon Mobil Corp.*, HHD-CV20-6132568-S (Conn. Sup. Ct. filed Sept. 14, 2020) No. 100.31 at P1. Connecticut is already suffering from “sea level rise, flooding, drought, increases in extreme temperatures and severe storms, decreases in air quality, contamination of drinking water, increases in the spread of diseases, and severe economic consequences.” *Id.* at P17. “[C]limate change will continue to have increasingly serious, life-threatening, and financially burdensome impacts on the people of Connecticut and the lands, waters, coastline, species, natural resources, critical ecosystems, infrastructure and other assets owned by the State and its political subdivisions.” *Id.* at P23. “Credible scientific evidence indicates-especially considering recent extreme weather events-that the catastrophic effects of climate change are occurring sooner than anticipated.” *Id.* at P172. “Climate change has negatively impacted, is negatively impacting, and

will continue to negatively impact Connecticut's people, lands, waters, coastline, infrastructure, fish and wildlife, natural resources, critical ecosystems, and other assets owned by or held in the public trust by the state of Connecticut and/or its municipalities.” *Id.* at 173. “Climate change has caused, is causing, and will cause sea level rise, flooding, drought, an increase in extreme temperatures, a decrease in air quality, an increase in severe storms, contamination of drinking water, and an increase in certain disease-transmitting species.” *Id.* at 174. “As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause an increase in illness, infectious disease and death.” *Id.* at 175. “As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause serious damage to existing infrastructure, including but not limited to coastal and inland development, roadways, railways, dams, water and sewer systems, and other utilities.” *Id.* at 176. “As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause serious detrimental economic impacts on the State of Connecticut, its people, businesses and municipalities, including but not limited to heat-related productivity losses, increased energy cost and consumption, and agriculture, tourism, and recreation losses.” *Id.* at 177.

Yet NTE wants to bring more of the same adverse effects to Connecticut. Despite overwhelming scientific data that the current pace of human-caused carbon emissions is increasingly likely to trigger irreversible damage to the planet,¹ a situation described by NASA scientists as the equivalent of a “five-alarm fire” for the planet, *id.*, entities like NTE continue to seek to build new climate and health destroying projects, such as the proposed project.

The adverse health impacts of NTE’s project are felt especially hard by children. Last week, at a White House Press Briefing, Special Presidential Envoy for Climate John Kerry, stated

¹ “Major new climate study rules out less severe global warming scenarios...” Washington Post, July 22, 2020, <https://www.washingtonpost.com/weather/2020/07/22/climate-sensitivity-co2/>.

that climate destruction from fossil fuel use is “the greatest cause of children being hospitalized every summer in the United States—we spent \$55 billion a year on it—is environmentally induced asthma.”

Buried deep in DEEP’s current draft integrated resources plan (“IRP”) (at p.107), there is a brief acknowledgement of the severe adverse health effects in Connecticut from fossil fuel generators such as NTE’s proposed facility. “Connecticut experiences some of the worst ozone pollution in the United States. Exposure to unhealthy levels of air pollution contributes to acute and chronic respiratory problems such as asthma, Chronic Obstructive Pulmonary Disease, and other lung diseases. A recent national report, *Asthma Capitals 2019*, ranked New Haven (#11) and Hartford (#13) among the 100 largest U.S. cities where it is most challenging to live with asthma.”

Earth’s climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities. The impacts of global climate change are already being felt in the United States and are projected to intensify in the future—but the severity of future impacts will depend largely on actions taken to reduce greenhouse gas emissions. *See*, *Climate Report*,² Vol. II, Overview at 2 and the *IPCC Special Report*.³

Changing climate threatens the health and well-being of people in the Northeast through more extreme weather, warmer temperatures, degradation of air and water quality, and sea level

² *Fourth National Climate Assessment* (the “Climate Report”) published by the United States Global Change Research Program and the United States Government Printing Office pursuant to the Global Change Research Act of 1990, judicial notice of which is requested. The full report is available at <https://nca2018.globalchange.gov/> (last visited September 30, 2019), USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA. [doi:10.7930/NCA4.2018](https://doi.org/10.7930/NCA4.2018).

³ Intergovernmental Panel on Climate Change (IPCC) (“IPCC Special Report”): “*Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*,” judicial notice of which is requested. The full report is available at <https://www.ipcc.ch/sr15/> (last visited September 30, 2019).

rise. These environmental changes are expected to lead to health-related impacts and costs, including additional deaths, emergency room visits and hospitalizations, and a lower quality of life. Health impacts are expected to vary by location, age, current health, and other characteristics of individuals and communities. *See*, Climate Report, Vol. II, Ch. 18, at 117 and the *IPCC Special Report*.

The continued use of fossil fuels endangers the public health, safety and welfare of Connecticut and the Northeastern United States. *See*, Climate Report, Vol. II, Ch. 18, at 117 and the *IPCC Special Report*. The continued injection of carbon-dioxide into the atmosphere from fossil-fuel electricity production harms the public health, safety and welfare. *See, e.g.*, Climate Report Chapter 14, KM1 and KM2:

The health and well-being of Americans are already affected by climate change, with the adverse health consequences projected to worsen with additional climate change. Climate change affects human health by altering exposures to heat waves, floods, droughts, and other extreme events; vector-, food- and waterborne infectious diseases; changes in the quality and safety of air, food, and water; and stresses to mental health and well-being.... People and communities are differentially exposed to hazards and disproportionately affected by climate-related health risks. Populations experiencing greater health risks include children, older adults, low-income communities, and some communities of color.

Reducing greenhouse gas emissions would benefit the health of Americans in the near and long term. By the end of this century, thousands of American lives could be saved and hundreds of billions of dollars in health-related economic benefits gained each year under a pathway of lower greenhouse gas emissions. *See*, Climate Report, Chapter 14, KM4 and the *IPCC Special Report*. “Current and future emissions of greenhouse gases, and thus emission mitigation actions, are crucial for determining future risks and impacts of climate change to society.... Climate change is projected to significantly damage human health, the economy, and the environment in the United States, particularly under a future with high greenhouse gas emissions.... Research supports that

early and substantial mitigation offers a greater chance of avoiding increasingly adverse impacts.”
Climate Report, Chapter 29 at 1348.

B. Petitioners.

Allco Renewable Energy Limited is a Delaware corporation, with an office at 157 Church Street, 19th floor, New Haven, Connecticut 06510. Windham Solar LLC is a Connecticut limited liability company, with an office at 157 Church Street, 19th floor, New Haven, Connecticut 06510. Allco is a developer of solar projects in Connecticut and other ISO-NE States. Allco’s corporate mission is to combat climate change, enforce laws that benefit developers of solar energy on a broad scale, and open up markets broadly to solar development. Allco’s mission includes fighting the devastating environmental impacts from burning fossil fuels, including, without limitation, the adverse effects that continued use of fossil-fuel generation will have on endangered species.

I. Has DEEP erred by not re-reviewing Permit No. 089-0107 as required by CGS § 22a-174-3a(f)?

Short Answer: Yes.

CGS § 22a-174-3a(f) provides that the Commissioner “shall” review any permit where the construction authorized by the permit has not commenced within eighteen (18) months from the date of issuance, or such other period, as the permit provides, whichever is later. Permit No. 089-0107, issued as modified on December 10, 2018, does not contain a later date. Construction has not commenced within the 18-month period. As a result, Sec. 22a-174-3a(f) requires the Commissioner to review the permit. As part of that review, the Commissioner may revoke the permit.

II. Has NTE breached Part VIII, Paragraph G of Permit No. 089-0107?

Short Answer: Yes

Part VIII of the permit contains additional terms and conditions.⁴ Paragraph G states: “Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.”

RCSA 22a-174-3a(1)(2) requires, as part of the review of an air permit application, that a robust environmental impact analysis must be performed, and be submitted by the Permittee. That analysis must demonstrate that the benefits of a project “would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed.” The analysis submitted by NTE is attached as Exhibit A.

There are several statements in the analysis submitted by NTE that qualify as inaccurate, misleading and missing relevant information, which required NTE to correct and supplement its application under Permit condition section VIII, para. G.

1. *“Renewable resources, such as wind and solar ... cannot meet any of the Project’s three primary objectives (flexible, reliable, baseload power). Solar and wind facilities generate energy only intermittently, depending upon the availability of the resource. Energy storage solutions do not yet allow for reliable power generation across the potential demand*

⁴ Paragraph A states that: “Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.” Paragraph C states: “This permit may be revoked, suspended, modified or transferred in accordance with applicable law.” Paragraph D states: “This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.” Paragraph E states: “Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: ‘I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute.’” Paragraph F states: “Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.”

spectrum. Given this, efficient baseload generating sources are needed to augment the growing focus on renewables to the energy mix.”

That statement is inaccurate, misleading and omits any relevant information. *First of all*, it presumes that there is a benefit to the “*Project’s three primary objectives (flexible, reliable, baseload power).*” While those three attributes are important elements of the electric grid, there is no reason to believe that the KEC is needed to provide those attributes. *Second*, States like Vermont and Massachusetts are adding storage, not building gas plants. Other States, like Hawaii and California have also chosen to add battery storage peakers instead of new gas plants. For example, in 2019 “a curious thing [] happened in Southern California. One of the largest utilities in the country scrapped a proposal to build a new peaker plant, opting instead to build a battery system that could store excess electricity from solar and wind when conditions are good and cleanly dispatch it when needed.” *See, Where Batteries Are Replacing Power Plants*, U.S. News and World Report, May 21, 2019, available at: <https://www.usnews.com/news/national-news/articles/2019-05-21/why-california-nixed-a-natural-gas-power-plant-in-favor-of-batteries>.

“In as soon as seven years, with no significant change to battery prices, close to a third of the market for new peakers will be threatened by batteries, consulting firm Wood Mackenzie found in an analysis. And if battery prices fall even modestly, as much as 82% of new peaker capacity could instead be replaced by batteries.” *Id.* “In a handful of states, including some that are perhaps unexpected – Arkansas, Colorado, Georgia, Hawaii, Minnesota, Nevada and Texas – new solar-plus-storage projects that are effectively replacing certain gas-fired baseload power plants.” *Id.* *Third*, it is clear that solar and wind with battery storage can provide KEC’s alleged three primary objectives (flexible, reliable, baseload power). The question of the economic cost of choosing that alternative is a separate question. But in order to choose KEC, DEEP would need to put a price on human life, human health, the climate and all the damage and adverse consequences that

Attorney General Tong detailed in his complaint against ExxonMobil. Petitioners assert that it is not even a close question. The destruction that the KEC seeks to inflict on Connecticut is not worth maybe savings pennies on an ISO-New England spot energy rate.

2. *“In addition, land requirements for solar and wind projects are highly dependent on the “resource” available at a given site, as well as topographic and other factors. The National Renewable Energy Laboratory (NREL) identifies solar energy production in its June 2013 report Land-Use Requirements for Solar Power Plants in the United States of approximately 5.9 acres per MW. A 70-acre site would, therefore, result in solar generation of approximately 12 MW. In reality, significant portions of the site would not be used due to wetlands or other constraints, and energy generation from a solar installation at this site would be even less. Similarly, wind energy facilities vary in the amount of land area required. Using NREL’s August 2009 Land-Use Requirements of Modern Wind Power Plants in the United States, which indicates a dramatic range from approximately 22 acres per MW to 250 acres per MW; even assuming the more productive end of the range, just over 3 MW of generation would result. In general, New England is not among the areas with a strong on-shore wind regime, due to variable wind direction and lower speeds except on certain ridgelines. Therefore, a solar or wind installation would be expected to result in considerably lower energy production than the technology proposed.”*

That statement is inaccurate, misleading and omits any relevant information. In NTE’s view, a death machine in a small package is better than a clean solar farm in a large package where sheep can graze and the soil can be used to store carbon. That statement also presumes without evidence or analysis that the fact that the KEC would have a footprint that is only a small fraction of a solar farm or offshore wind facility is in fact an advantage. Those statements also fail to account for off-shore wind which uses little on-shore land.

3. *“The proposed Project has a new and clean net heat rate at full load under ISO conditions of 6,529 Btu/kWh (HHV, net).”*

That statement is inaccurate, misleading and omits any relevant information. There is nothing “clean” about the KEC.

4. *“Combined cycle technology utilizing natural gas as its primary fuel remains the most favorable option today from a market point of view. This was recently demonstrated by ISO-NE’s choice of a gas-fired combined cycle facility as the forward capacity market’s proxy unit. This technology also maximizes energy efficiency and minimizes air emissions.”*

That statement is inaccurate, misleading and omits any relevant information. *First*, as explained above, it is clear that solar and wind with battery storage can provide KEC's alleged three primary objectives (flexible, reliable, baseload power). *Second*, that statement assigns a cost of zero to the human and environmental destruction that the KEC would wreak. So when KEC speaks of "a market point of view," what market is it talking about? As far as ISO-NE is concerned, being selected in the FCM merely means that it blocks out more environmentally friendly options, such as renewable energy and battery storage. It also means that ISO-NE refuses to recognize the economic, health and environmental destruction that natural gas plants cause. It also means that it puts more economic pressure on other zero-carbon resources such as the Millstone nuclear plant, which, in turn, can result in additional costs to Connecticut ratepayers in order to keep Millstone afloat, far off-setting a project's allegation that it provides any benefit.

Moreover, "market" on which NTE presumably relies is described by DEEP's current draft as "a broken market design ... unresponsive to State needs." IRP at 80.⁵ KEC will also exacerbate the "pay twice" problem that DEEP discusses in the draft Integrated Resources Plan, adding more costs to already over-burdened Connecticut ratepayers. DEEP has made the point numerous times that the ISO-NE capacity market procures capacity that is simply not needed because the fossil-fuel centric focus of ISO-NE refuses to accord capacity credit to State-supported resources, and ignores the true cost of fossil fuels.

5. *"The Project conducted a robust and thorough consideration of a range of alternatives."*

That statement is inaccurate, misleading and omits any relevant information. The entire, albeit brief, section on alternatives is inaccurate, misleading and omits any relevant information and under section VIII, para. G, NTE had and has an obligation to correct it. Through omission,

⁵ Available at: <https://portal.ct.gov/DEEP/Energy/Integrated-Resource-Planning/Integrated-Resource-Planning>.

the NTE analysis is misleading because it pretends there are no “adverse environmental impacts” of the Project. Through omission, the NTE analysis is misleading because it pretends there are no “secondary impacts,” “cumulative impacts,” or “social costs imposed.” The NTE analysis is inaccurate because it does not review the “adverse environmental impacts” of “secondary impacts,” “cumulative impacts,” or “social costs imposed.” The NTE analysis omits relevant information in the form of the “adverse environmental impacts,” “secondary impacts,” “cumulative impacts,” and “social costs imposed” of the facility.

A. NTE Must Correct Its Omission Of The Displacement Effect It Will Have On Renewable Energy.

NTE’s statements are inaccurate, misleading and omit relevant information for among other reasons that NTE will displace renewable energy. But for the KEC and ones like it, Massachusetts, Rhode Island and Connecticut and ISO-NE would turn to onshore solar electricity projects with storage, which create more of a positive economic impact, none of the adverse moderate and major consequences of the KEC and have a tiny fraction of the climatic impacts that the KEC has.

Electricity from the KEC directly competes with other forms of renewable energy resources in the generation of electricity, such as Petitioners’ solar projects. Economists measure how coal, natural gas, and other fuels act as substitutes in the electricity market by analyzing “cross-price elasticity” (that is, how responsive producers are in swapping inputs when relative prices change). *See* Mankiw, *supra* at 99. For example, the United States Energy Information Administration (“EIA”) found that for the U.S. market, a ten-percent increase in the ratio of the price of coal to the price of natural gas leads to a 1.4-percent increase in the use of natural gas over coal. EIA, *Fuel Competition in Power Generation and Elasticities of Substitution* 1 (2012). In other words, in that example, the cross-price elasticity of demand for natural gas is 0.14 with

respect to coal's price. *Id.* Other economists reach similar conclusions. James Ko & Carol Dahl, *Interfuel Substitution in U.S. Electricity Generation*, 33 APPLIED ECONOMICS 1833, 1835 (2001) (analyzing "average" cross-price elasticity). *See also* Nate Blair et al., *Long-Term National Impacts of State-Level Policies* (Nat'l Renewable Energy Lab. Conf. Paper 620-40105, June 2006) (discussing how "higher coal prices would dramatically increase" use of renewable wind energy). These estimates represent short-run elasticities; over time, substitution effects become more pronounced as power plants make technological changes that facilitate fuel-switching, and as long-term investments favor renewable energy. *See* Mankiw, *supra* at 105–106.

Changes in the relative amounts of coal, natural gas, renewable sources, and nuclear energy used to generate electricity—as well as changes in total energy demand—would, in turn, change total greenhouse gases emissions. In short, NTE's unexamined and unsupported assumption that the KEC would have no effect on onshore solar energy is contradicted by fundamental economics and market analyses. Considering the size and nature of the KEC, it is a fallacy to assume that without KEC there would be no substitution with no effect on price, consumption, or emissions.

Moving beyond theory to the specific proposed project at issue, given the size and characteristics of the KEC and the ISO-New England market, it is clear error to not analyze the substitutions that would occur if the KEC was not built. NTE's assumption that there would be no substitution by onshore solar simply bears no relationship to reality. The KEC represents an enormous amount of energy that has a major effect on resources. If the KEC's permit is revoked, utilities in ISO-New England will acquire renewable energy production with storage to satisfy their respective renewable energy goals and standards, and therefore, lower greenhouse gas emissions. In the No-KEC alternative, any renewable energy substituting for the KEC will provide a more positive impact on emissions and climate change. In short, NTE's flawed economic

assumptions render its alternatives analysis ineffective and misleading, and a breach of section VIII, para. G of the Permit.

NTE's flawed, misleading and inaccurate conclusions are laid bare by environmental reviews under the National Environmental Policy Act ("NEPA") for over the past 35 years. In such reviews, the Department of the Interior (the "Interior") has consistently understood that a decision to take or not to take action related to energy production will affect that energy resource's supply and price and thus trigger other actions. The Interior has further analyzed how such triggered actions generate different consequences for air pollution, climate change, and overall environmental quality. The U.S. Court of Appeals for the D.C. Circuit has praised the Interior's analysis of these substitution effects. As far back as 1979, the Interior has assessed the different environmental effects of energy substitutes under a no-action alternative—including different levels of carbon dioxide emissions.

Other agencies, such as the Surface Transportation Board, the United States Forest Service ("USFS"), the State Department, the Office of Surface Mining Reclamation and Enforcement (an Interior sub-agency), the FERC, and the Nuclear Regulatory Commission, have also properly analyzed the effects of their energy management decisions in NEPA reviews, consistent with federal court precedent.

NTE's mistaken assumption that its Project, compared to a denial of its Project, would have no net negative effects on renewable energy, greenhouse gas emissions, fisheries, endangered species, marine mammals and other resource values is contrary to a 35-year history of proper analysis by federal agencies in conducting similar environmental analyses.

i. Federal Agencies Analyze The Connections Between Supply, Price, Substitutes, Conservation, And Emissions.

Before the 1982 creation of a sub-agency within Interior responsible for offshore resources, the Office of the Secretary of the Interior developed the federal offshore oil and gas leasing program, and the Bureau of Land Management (“BLM”) prepared environmental impact statements on leasing actions (then called simply “environmental statements”). In BLM’s 1979 Final Environmental Statement on a proposed lease sale off the coast of Southern California, the agency analyzed the No-Action Alternative of withdrawing the sale:

[I]f the subject sale were cancelled, the following energy actions or sources might be used as substitutes: Energy Conservation; Conventional oil and gas supplies; Coal; Nuclear power; Oil shale; Hydroelectric power; Solar energy; Energy imports; . . . Vigorous energy conservation is an alternative that warrants serious consideration. The Project Independence Report of the Federal Energy Administration claims that energy conservation alone can reduce energy demand growth by 0.7 to 1.2 percent depending on the world price of oil. . . . The environmental impacts of a vigorous energy conservation program will be primarily beneficial.

Final Environmental Statement, OCS Sale No. 48, Proposed 1979 Outer Continental Shelf Oil and Gas Lease Sale Offshore Southern California, 1508–09 (1979). See also BLM, Draft Environmental Statement, Proposed Five-Year OCS Oil and Gas Lease Sale Schedule 63 (1980) (“An alternative . . . to cease leasing . . . would result in the need to meet national energy needs through other sources, or to reduce energy consumption . . .”).

Thus, as early as 1979, Interior recognized that canceling even a single oil and gas lease would cause the market to respond by substituting not just oil and gas from other sources, but alternative fuel types as well as increased energy conservation. BLM further recognized that the extent of energy conservation as a response depended on the price of the resource being replaced. BLM explained in 1979 to decision-makers and the public, over the course of 25 pages of analysis,

how each possible substitute for the foregone offshore leasing carried its own environmental effects: net beneficial to the extent increased energy conservation or renewable energy offset the lost offshore oil and gas; a more mixed or net negative effect on environmental quality with switches to other types and sources of fossil fuels. BLM, *Final Env'tl. Stmt. on Sale No. 48, supra* at 1508– 1532. BLM even noted in this 1979 analysis that different energy substitutes generated different carbon dioxide emissions: “A number of gases are associated with geothermal systems and may pose health and pollution problems. These gases include . . . carbon dioxide However, adverse air quality impacts are generally less than those associated with fossil-fuel plants.” *Id.* at 1525.

ii. BOEM Has Used Sophisticated Tools To Assess The Environmental Consequences Of Substitutes, And The D.C. Circuit Has Praised Its Modeling.

The Bureau of Ocean Energy Management (“BOEM”) develops Five-Year Programs to manage the leasing of offshore (or “Outer Continental Shelf” (“OCS”)) oil and gas resources. Its recent past program covered the years 2012–2017; development of that program and the related Environmental Impact Statement first began in 2009. *See* BOEM, *Outer Continental Shelf Oil and Gas Leasing Program: 2012–2017—Final Programmatic Environmental Impact Statement*, 8-1 (2012). In the decision document for that offshore program, BOEM explained:

In an environment of strong worldwide demand for oil and natural gas, a domestic supply cut equivalent to the production anticipated to result from a new Five Year Program would lead to a slight increase in world oil prices and a relatively larger increase in U.S. natural gas prices. All other things being equal, this would lead to a market response providing . . . a slight reduction in oil and natural gas consumed, a substantial increase in oil imports, and added supplies provided by onshore hydrocarbon resources.

BOEM uses its *Market Simulation Model (MarketSim)* to estimate the amount and percentage of substitutes that the economy would adopt should a particular program area not be

offered to lease. MarketSim is based on authoritative and publicly available estimates of price elasticities of supply and demand and substitution effects. . . .

[I]n the event the NAA [No-Action Alternative] were implemented. . . . 68 percent of the oil and natural gas production foregone from this program would be replaced by greater imports, 16 percent by increased onshore production, [10 percent by other energy sources] . . . and 6 percent by a reduction in consumption.

BOEM, *Proposed Final Outer Continental Shelf Oil & Gas Leasing Program 2012–2017*, 110 (2012)13; *see also* BOEM, *2012–2017 Final Programmatic Environmental Impact Statement*, *supra* at 4-643 (“With less oil and gas available from the OCS under the No-Action Alternative, consumers could obtain oil and gas from other sources, substitute to other types of energy, or consume less energy overall.”).

BOEM explained in its Final Environmental Impact Statement that, compared to leasing offshore oil and gas, the energy substitutes anticipated under a No-Action Alternative will have different environmental consequences, including for climate change. For example, BOEM detailed how “Coal consumed in place of gas under the No Action Alternative will result in environmental costs The combustion of coal in power plants or industrial boilers produces higher emissions . . . than the combustion of natural gas and results in greater CO₂ [carbon dioxide] emissions.” *Id.* at 4-647. Similarly, BOEM’s Economic Analysis Methodology calculates:

[T]he emissions for carbon dioxide and nitrous oxide [another greenhouse gas] are greater under the NSOs [No-Sale Options] than from the program. However, there is more methane from the program than the NSOs. Though these impacts are not monetized, *they are not identical between having an OCS program and having the impacts of the NSOs.*

BOEM, *Economic Analysis Methodology for the Five Year OCS Oil and Gas Leasing Program for 2012–2017*, 29–30 (2012) (emphasis added).

In a recent case challenging Interior’s 2012–2017 offshore oil and gas leasing program, the D.C. Circuit favorably reviewed Interior’s modeling of how “forgoing additional leasing on the

OCS would cause an increase in the use of substitute fuels . . . and a reduction in overall domestic energy consumption from greater efforts to conserve in the face of higher prices.” *Ctr. for Sustainable Economy v. Jewell*, 779 F.3d 588, 609 (D.C. Cir. 2015). Importantly, nothing in BOEM’s modeling is unique to the offshore oil and gas context. According to BOEM, “MarketSim’s economics-based model representation of U.S. energy markets . . . simulates end-use domestic consumption of oil, natural gas, coal and electricity in four sectors (residential, commercial, industrial and transportation); primary energy production; and the transformation of primary energy into electricity.” BOEM, *The Revised Market Simulation Model (MarketSim): Model Description 2* (2012).

Interior’s sophisticated modeling of the environmental effects of energy substitutes under No-Action Alternatives (here not approving the Project) is the culmination of 35 years of analysis. Interior has used the MarketSim model since at least its 2002–2007 Program for offshore leasing. *See*, Minerals Mgmt. Serv. (“MMS”), *Energy Alternatives and the Environment*, 10 (2001)16 (“MMS employs the MktSim2000 model to evaluate the impact of decreased OCS production resulting from no action.”). Since at least the 1990s, Interior’s Environmental Impact Statements have calculated the percentage of offshore production expected to be substituted by various energy alternatives under a No-Action scenario. MMS *Energy Alternatives and the Environment*, 13 (1996)17 (“[F]or each unit of OCS gas not produced because of no action . . . conservation will account for about 0.14 units”); *see also id.* at 15 (“Significant environmental impacts associated with expanded importation of oil include: the generation of greenhouse gases”). And going back to the first Five-Year Program in 1980 (when BLM prepared the Environmental Statements), Interior has recognized that not all sources of the same fuel type present the same

environmental effects—for example, offshore oil drilling presents lower spill risks than imported oil substituted under the no-action alternative. Interior, *5-Year OCS Leasing Program* 13b (1980).

Similarly, in a 2001 report on its offshore oil leasing program, Interior declared in no uncertain terms that “Examining other energy sources is an important aspect of the No Action Alternative” under NEPA reviews. MMS, *Energy Alternatives and the Environment* 1 (2001). The key is foreseeability and it is clearly foreseeable that the issuance of the KEC will adversely impact solar production and development, and hence result in more climate-destroying fossil fuels.

B. NTE Ignores Potential Effects On Endangered Species And Water Quality Impacts From The Project And Climate Change.

The Facility would, *inter alia*, result in a significant reduction in renewable energy generation with storage, which in turn, will result in an increase of fossil fuel generation over what would otherwise occur. The result would be the acceleration of climate change and reducing the ability to avert the most severe devastation from climate change. That will in turn adversely affect critical habitat of endangered species and accelerate the extinction of those species.

Amongst many threatened and endangered species the KEC will impact the Piping Plover⁶ and North Atlantic Right Whale.⁷ North Atlantic right whales primarily migrate into the waters off Massachusetts and engage in short-term feeding before moving onto feeding grounds throughout the Gulf of Maine. See, <https://www.boem.gov/press10252016/> (last visited January 19, 2020). The recent study, *Rapid Climate-Driven Circulation Changes Threaten Conservation of Endangered North Atlantic Right Whales*, by Nicholas R. Record, et al (the “Record Paper”),⁸ indicates that the right whales’ food supply is already endangered by the warming ocean.

⁶ <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B079>

⁷ <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A02R>

⁸ Available at https://www.researchgate.net/publication/333539035_Rapid_Climate-Driven_Circulation_Changes_Threaten_Conservation_of_Endangered_North_Atlantic_Right_Whales (last visited January 19, 2020).

If the right whales' food supply off the coast of Massachusetts is diminished further, it would adversely affect the right whales' ability to continue their journey to the Gulf of Maine. This area was already designated as a critical habitat for the right whale by the National Marine Fisheries Service in 1994. *See* Designated Critical Habitat; Northern Right Whale, 59 Fed. Reg. 106 (June 3, 1994). Further warming will be caused by the increased fossil fuel use that would occur as a result of the KEC.

About two-thirds of America's birds will be threatened with extinction if global warming rises by 5.4 degrees Fahrenheit by 2100, according to a report from the National Audubon Society. About 389 out of 604 species are at risk of extinction from climate change. <https://www.audubon.org/climate/survivalbydegrees>. The KEC will adversely affect critical habitat for those species by accelerating the devastation from climate change.

According to the US Fish and Wildlife Service “[i]n the southeastern United States, changes to the climate are having profound impacts on our nation’s wildlife and habitats. In aquatic environments, evidence is growing that higher water temperatures resulting from climate change are negatively impacting cold- and cool-water fish populations across the country.” <https://www.fws.gov/southeast/our-changing-climate/>. The KEC will adversely affect critical habitat for those species by accelerating the devastation from climate change.

Similarly, five ESA-listed species of sea turtles may occur in the U.S. northwest Atlantic Ocean: leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), Kemp’s ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), and hawksbill (*Eretmochelys imbricate*). All of these sea turtles are migratory and enter New England waters primarily in the summer and fall. The KEC will adversely affect critical habitat for those species by accelerating the devastation from climate change and result in continuing temporary to permanent impacts (disturbance,

displacement, injury, mortality, reduced reproductive success, habitat degradation, habitat conversion) to those species by, among other things, acceleration of the warming of the Atlantic.

NTE's omission of those facts is a breach of its Permit, section VIII, para. G.

C. NTE's Failure To Update Its Application With The "Secondary Impacts," "Cumulative Impacts," and "Social Costs Imposed" is a Breach of Section VIII, para. G of the Permit.

The NTE analysis is inaccurate and misleading because it does not review the "adverse environmental impacts" of "secondary impacts," "cumulative impacts," or "social costs imposed." The NTE analysis omits relevant information in the form of the "adverse environmental impacts," "secondary impacts," "cumulative impacts," and "social costs imposed" of the facility. NTE's omissions are a breach of its Permit, section VIII, para. G.

For example, NTE's application is inaccurate and misleading in that it omits the adverse health impacts of NTE's project on children. Last week, at a White House Press Briefing, Special Presidential Envoy for Climate John Kerry, stated that climate destruction from fossil fuel use is "the greatest cause of children being hospitalized every summer in the United States—we spent \$55 billion a year on it—is environmentally induced asthma." "Connecticut experiences some of the worst ozone pollution in the United States. Exposure to unhealthy levels of air pollution contributes to acute and chronic respiratory problems such as asthma, Chronic Obstructive Pulmonary Disease, and other lung diseases. A recent national report, *Asthma Capitals 2019*, ranked New Haven (#11) and Hartford (#13) among the 100 largest U.S. cities where it is most challenging to live with asthma." IRP at 107. NTE does not discuss any of the social, health and environmental, and economic adverse effects that would be caused by the KEC, and which are discussed above.

D. NTE OMITTS TO DISCLOSE ITS POTENTIAL LIABILITY UNDER THE MMPA.

Section 101(a) of the Marine Mammal Protection Act (“MMPA”) (16 U.S.C. §1361) prohibits persons subject to the jurisdiction of the United States from taking any marine mammal in waters or on lands under the jurisdiction of the United States or on the high seas (16 U.S.C. §1372(a) (1), (a)(2)). Sections 101(a)(5)(A) and (D) of the MMPA provide exceptions to the prohibition on take, which give NMFS the authority to authorize the incidental but not intentional take of small numbers of marine mammals, provided certain findings are made and statutory and regulatory procedures are met. ITAs may be issued as either (1) regulations and associated Letters of Authorization or (2) an Incidental Harassment Authorization (“IHA”).

Letters of Authorizations may be issued for up to a maximum period of 5 years, and IHAs may be issued for a maximum period of 1 year. NMFS has also promulgated regulations to implement the provisions of the MMPA governing the taking and importing of marine mammals (50 C.F.R. §216) and has published application instructions that prescribe the procedures necessary to apply for an Incidental Take Authorization (“ITA”). U.S. citizens seeking to obtain authorization for the incidental take of marine mammals under NMFS's jurisdiction must comply with these regulations and application instructions in addition to the provisions of the MMPA.

Once NMFS determines an application is adequate and complete, NMFS has a corresponding duty to determine whether and how to authorize take of marine mammals incidental to the activities described in the application. To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific information to determine whether the take would have a negligible impact on the affected marine mammal species or stocks and an immitigable impact on their availability for taking for subsistence uses. NMFS must also prescribe the “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat,

and on the availability of those species or stocks for subsistence uses, as well as monitoring and reporting requirements.

The term “take” means “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 USC §1362(3)(13)). The incidental take of a marine mammal falls under three categories: mortality, serious injury, or harassment (i.e., injury and/or disruption of behavioral patterns). Harassment, as defined in the MMPA for non-military readiness activities (Section 3(8)(A)), is any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment) or any act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns (Level B harassment). Disruption of behavioral patterns includes, but is not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant).

An IHA is appropriate if the proposed action would result in harassment only (i.e., injury or disturbance) and is not planned for multiple years. A LOA is required if the actions will result in harassment only (i.e., injury or disturbance) and is planned for multiple years.

The warming caused by the KEC itself will constitute ongoing take for the life of the Facility. The impact from the KEC-caused warming results in the acceleration of disruption of behavioral patterns including, but is not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

III. Did Permit Applications for Stationary Sources of Air Pollution New Source Review, Application Nos. 201605089, 201605092, 201605093, 201605094, 201605095, and 201605097 fail to comply with RCSA 22a-174-3a(1)(2)?

Short Answer: Yes

RCSA 22a-174-3a(1)(2) provides:

(2) Analysis of alternatives.

(A) An owner or operator of the subject source or modification shall include an analysis of alternative sites for the proposed activity, alternative sizes for the subject source or modification, alternative production processes, and all environmental control techniques and technologies which are available for such major stationary source or major modification;

(B) Such analysis shall demonstrate whether the benefits of the subject source or modification would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed as a result of the location, construction or modification;

(C) The owner or operator of the subject source or modification shall submit such analysis prior to the issuance of any tentative determination on a permit application under this section.

The analysis performed by DEEP addressing the requirements of RCSA 22a-174-3a(1)(2) is restated in full below in order to show the utter failure to adhere to the mandate of RCSA 22a-174-3a(1)(2) that the analysis must demonstrate that the benefits of a project “would significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed”:

Analysis of Alternatives

Pursuant to RCSA §22a-174-3a(1)(2), as part of the non-attainment review, the Applicant is required to submit an “Analysis of Alternatives”. The analysis must contain an evaluation of alternative sites, sizes, production processes and all environmental control technologies for the proposed source. The analysis must demonstrate that the proposed project’s benefits outweigh the adverse environmental impacts, including secondary/cumulative impacts, and social costs imposed as a result of the location and construction of the project.

This site is located in an area with a primary fuel source (natural gas pipeline), nearby electrical transmission line, properly zoned land suitable for a plant of this size, along with water/sewer utilities.

NTE reviewed alternate sites in Wallingford, Danbury, Milford, East Granby,

Berlin, Waterbury, Pomfret and Putnam. The Wallingford and Danbury sites did not have adequate land size in the Town's industrial zoned area. In Milford, Putnam and another site in Killingly, property owners were not willing to sell their property. The Waterbury site would have required significant transmission line infrastructure development because it was more than seven miles from the nearest transmission line. The Berlin, Pomfret and East Granbury sites did not have industrial areas for a power generation facility. The Killingly site was selected because the existing infrastructure and physical characteristics of the property would cause the least adverse impact to the public and the environment.

The proposed project's primary objectives are to provide flexible, reliable and baseload power. Alternate generation (i.e. solar or wind) do not generate on a reliable basis and there is no viable energy storage technology available to make wind or solar a viable baseload generation alternative at this time. Additionally, wind and solar require significantly larger footprints to generate the same amount of electricity. The Colebrook Wind Farm has a capacity of 5 MW and requires 80 acres of land. The Fusion Solar Center in Sprague has a capacity of 20 MW on 170+ acres, the Somers Solar Center in Somers has a capacity of 5 MW on 50 acres, and the Simsbury Solar Farm in Simsbury has a capacity of 26 MW on 153 acres. These examples show that wind and solar can only generate about 0.1 - 0.2 MW/acre on an intermittent basis, which would only yield about 10 MW under ideal conditions at the proposed 70 acre Killingly site. Another example, the energy density for large scale solar generation when compared to fossil fuels is the Ivanpah solar array in California where 344 MW requires approximately 4,000 acres of land use. Other fossil fuels such as coal or oil fired electrical generating units (EGU) would have greater air emissions and be less efficient on a Btu/kW-hr basis (heat rate). The proposed project's primary source of fuel is pipeline natural gas and there is a pipeline nearby to the premises that will have limited impact on the surrounding area when compared to other fossil fuels. The project is required to have some backup fuel and the selection of ULSD fuel oil is the lowest emitting fuel available for that purpose.

The BACT/LAER review for this project requires the use of the most advanced pollution control systems available at this time.

The Applicant has demonstrated that the project, as proposed, will use the most fuel efficient generating technology available at this time, have limited secondary and cumulative impacts when compared to other technologies, and use the cleanest fuels practicably available along with state-of-art pollution control technologies.

A. The Analysis Failed to Justify Any Benefit of the Project.

The only purported "benefit" of the project is to provide "flexible, reliable, baseload power" in what DEEP describes as "a broken market design ... unresponsive to State needs," IRP at 80, that results in building of unneeded electrical generation such as KEC. Merely alleging

that the “benefit” of the project is “flexible, reliable, baseload power” is an insufficient quantification of the benefits of project RCSA 22a-174-3a(1)(2). There has been no evidentiary showing that ISO-NE needs this Project to provide reliable service. Nor has there been any showing that alternatives such as battery storage from renewable energy projects could not provide the same alleged reliability. *See, e.g.,* <https://energynews.us/digests/in-california-battery-storage-is-the-new-peaker-plant/> (“Battery storage, only recently considered an unattainable ‘holy grail,’ is already providing electricity to California’s grid equivalent to a mid-sized power plant.”); “*NextEra: Gas-fired peaker plants cannot compete with new battery storage resources,*” available at: <https://ieefa.org/nextera-gas-fired-peaker-plants-cannot-compete-with-new-battery-storage-resources/>. *See also, supra.*

While subsequent to DEEP’s analysis, NTE was selected in the ISO-NE Forward Capacity Market, the ISO-NE’s capacity auction system such a fact merely means that it blocks out more environmentally friendly options, such as renewable energy and battery storage. It also means that it puts more economic pressure on other zero-carbon resources such as the Millstone nuclear plant, which, in turn, can result in additional costs to Connecticut ratepayers in order to keep Millstone afloat, far off-setting a project’s allegation that it provides any benefit.

Moreover, the purported benefit of the Project is not really a benefit at all. Rather, it would exacerbate the “pay twice” problem that DEEP discusses in the draft Integrated Resources Plan, adding more costs to already over-burdened Connecticut ratepayers.⁹ DEEP has made the point numerous times that the ISO-NE capacity market procures capacity that is simply not needed because the fossil-fuel centric focus of ISO-NE refuses to accord capacity credit to State-supported resources and is “a broken market design ... unresponsive to State needs.” IRP at 80.

⁹ Available at: <https://portal.ct.gov/DEEP/Energy/Integrated-Resource-Planning/Integrated-Resource-Planning>.

Characterizing the Project as a justified bridge to a zero-carbon electric grid ignores science and economics. It is simply a tobacco-industry-style marketing ploy that makes it sound like more gas plants are needed, when we know they are not. States like Vermont and Massachusetts are adding storage, not building gas plants. Other States, like Hawaii and California have also chosen to add battery storage peakers instead of new gas plants as discussed above.

B. The Analysis Failed to Analyze the “adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed.”

DEEP’s “analysis” utterly ignored the requirement that it analyze the “adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed” and show that those adverse impacts are *significantly* outweighed by the alleged “benefit” of the project. The analysis failed to discuss the adverse economic, health, environmental and social effects described above.

The KEC will also cause unreasonable pollution, impairment or destruction of the air, water and other natural resources of the state of Connecticut, and is prohibited by Conn. Gen. Stat. §22a-16.

RCSA 22a-174-3a(1)(2) requires that the Project be evaluated in a manner that fully reflects the climate destroying carbon dioxide (“CO₂”) emissions and other emissions it would cause over its lifetime. Such an analysis would reach the same result as the analysis under Conn. Gen. Stat. § 22a-16—that the KEC would expose the air, water and other natural resources of the state to unreasonable pollution, impairment or destruction.¹⁰

¹⁰ “Where the activity challenged may have an environmental impact, [an agency] has the additional responsibility under General Statutes § 22a-19 (b) to consider that impact. Under that statute the agency ‘shall consider the alleged unreasonable pollution, impairment or destruction of the public trust in the air, water or other natural resources . . . and no conduct shall be authorized or approved which does, or is reasonably likely to, have such effect’” *Mystic Marinelife Aquarium, Inc. v. Gill*, 175 Conn. 483 (1978).

A natural gas fueled generator, such as KEC, emits climate destroying CO2 emissions, and creates further demand for fracking. Fracking results in the release a methane, more than 80 times worse than CO2 for the climate. Fossil fuel generation not only is destroying the planet, but is responsible for the pre-mature death of countless Americans, and the raft of adverse consequences described by Attorney General Tong and discussed above.

IV. Did DEEP err in issuing Permit No. 089-0107?

Short Answer: Yes.

For the reasons discussed above, DEEP erred in issuing Permit No. 089-0107.

V. Should DEEP revoke Permit No. 089-0107 (the “Permit”) in accordance with CGS § 22a-174-3a(f)?

Short Answer: Yes

As discussed above, the Section VIII, para. G has been breached. Further, as discussed above, CGS § 22a-174-3a(f) provides that the Commissioner “shall” review any permit where the construction authorized by the permit has not commenced within eighteen (18) months from the date of issuance, or such other period, as the permit provides, whichever is later. Permit No. 089-0107, issued as modified on December 10, 2018, does not contain a later date. Construction has not commenced within the 18-month period. As a result, Sec. 22a-174-3a(f) requires the Commissioner to review the permit. As part of that review, the Commissioner may revoke the permit. As part of the Commissioner’s mandatory review, the Commissioner should revoke the permit for the reasons stated herein.

Conclusion

NTE wholly ignores the direct and indirect consequences and social costs of its Project. Such an approach is deeply-flawed, ignores science and economics, and simply does not pass the muster of informed decision making, and surely does not meet RCSA 22a-174-3a(1)(2)’s

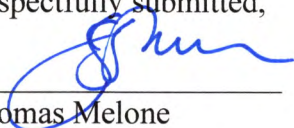
requirement that the “adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed” be analyzed and be shown to be significantly outweighed by the purported benefit of the Project. NTE’s omissions are also a breach of the Permit.

For the reasons stated above, Allco requests that the Commissioner declare:

1. DEEP has erred by not re-reviewing Permit No. 089-0107 as required by CGS § 22a-174-3a(f).
2. NTE Connecticut LLC has breached Part VIII, Paragraph G of Permit No. 089-0107.
3. Permit Applications for Stationary Sources of Air Pollution New Source Review, Application Nos. 201605089, 201605092, 201605093, 201605094, 201605095, and 201605097 failed to comply with RCSA 22a-174-3a(l)(2).
4. DEEP erred when it issued Permit No. 089-0107.
5. DEEP should revoke Permit No. 089-0107 in accordance with CGS § 22a-174-3a(f).

Dated: February 5, 2021

Respectfully submitted,



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EXHIBIT A

ATTACHMENT 215-B ANALYSIS OF ALTERNATIVES

This attachment provides an analysis of alternatives for the Killingly Energy Center (the Project) proposed by NTE Connecticut, LLC (NTE). The Project is currently proposed as an approximately 550-megawatt (MW) electric generating facility primarily fueled by natural gas. The Project will utilize a single combustion turbine generator (CTG) in a 1x1x1 configuration, with a heat recovery steam generator (HRSG), steam turbine generator (STG), and an air-cooled condenser (ACC). Alternatives for the Project will also be reviewed by the Connecticut Siting Council (CSC) to confirm that the Project provided an appropriate balance of environmental and community impacts with the need for a reliable and efficient source of energy.

The following sections consider alternatives to the Project as currently proposed, addressing the extent to which the benefits outweigh adverse environmental impacts, including secondary impacts and cumulative impacts, as well as social costs. As required by the Connecticut Department of Energy and Environmental Protection (DEEP), consideration of alternative Project sites, sizes, and production processes are discussed. Lastly, environmental control techniques and technology are summarized, with cross-referencing to Attachment G, which includes a detailed demonstration of Lowest Achievable Emission Rate (LAER) and Best Available Control Technology (BACT) for the Project.

ALTERNATIVE SITES

Over the course of several months, NTE researched numerous prospective sites for the Project throughout Connecticut. NTE's initial site search prioritized areas with nearby natural gas and electric transmission infrastructure, adequately sized parcels within existing or planned industrial areas, and communities that would benefit significantly from a substantial increase in tax revenue, job growth and other economic impacts.

In addition to a thorough desktop analysis utilizing geographic information system (GIS) mapping software, NTE conducted numerous site diligence trips and met with several towns in Connecticut to discuss general interest level in this Project, prospective site locations within the town, and infrastructure capabilities.

NTE weighed initial siting prospects on a set of criteria which narrowed down viable site locations. These criteria included community long-term plans/interest and proximity to required infrastructure. Due to the Town of Killingly's strong surrounding infrastructure and interest in the strong economic benefits the Project would bring, the Town of Killingly became the top contender for the Project. Other locations of interest would have required extensive infrastructure additions, like the development of lengthy transmission lines, or lacked adequate acreage.

Once Killingly was defined as the target area for the Project, several sites in close proximity to the required infrastructure were further assessed. Research identified the Town of Killingly's *Plan of Conservation and Development: 2010 - 2020* which detailed intentions to expand the industrial zoned area towards the west of the current industrial zoned area (see Figure 1). The industrial areas of the Future Land Use Map are primarily where NTE identified prospective sites within the Town of Killingly.

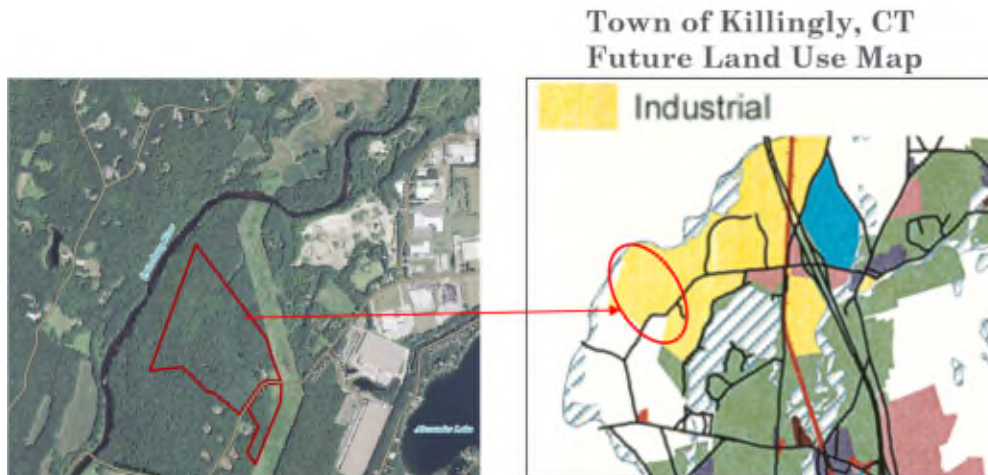


Figure 1: Town of Killingly Future Land Use Map

The sites in Killingly were closely assessed and weighted. Criteria for assessment included size of parcel, ability to minimize wetland disturbance, surrounding buffer to minimize visual impact, favorable elevation to minimize visual impact, and proximity to required infrastructure.

An assessment of critical issues was compiled for each prospective Killingly site, including a preliminary evaluation of air quality, noise, water supply, visibility, protected species, and land use and zoning. Once these assessments were compiled and sites were further narrowed down, NTE reached out to property owners and executed a site option for the 180/189 Lake Road parcels.

The combination of adequate parcel size, surrounding infrastructure, site buffering capabilities, ability to avoid wetland disturbance, and the town's future land use intentions made this site the top candidate for the Killingly Energy Center.

ALTERNATIVE SIZES OR ALTERNATIVE PROCESSES

Alternative Size/Project Output

As noted above, the proposed Project reflects a 550-MW generating capability utilizing efficient, state-of-the-art technology. The generating capacity was selected as consistent with market needs for a flexible base load plant in this location. Other factors that influenced the optimal generating capacity were energy efficiency and system reliability from both a natural gas and electrical perspective. The proposed 550-MW plant utilizes an advanced class gas turbine resulting in a very high combined cycle efficiency. Providing less generating capacity would considerably reduce the plant's overall efficiency. Adding additional capacity beyond the proposed 550 MW would result in addition of a considerable amount of power to the ISO-NE grid in a particular location, and would most likely require substantial system upgrades to protect system reliability. Additionally, drawing the needed amount of natural gas to operate a larger facility would likely trigger the need for similar upgrades to the natural gas pipeline that provides fuel for the infrastructure.

Alternative Generation Technologies

NTE considered the range of potential generation technologies, and affirmed that a combined cycle combustion turbine utilizing natural gas as its primary fuel not only presented economic and efficiency advantages demonstrated in practice, but was a favorable option from a reliability, environmental, and acceptability perspective.

The Project's purpose is to provide a reliable, baseload energy facility to serve the ISO-NE market. Renewable resources, such as wind and solar, are an important component of the electrical grid. However, they cannot meet

any of the Project's three primary objectives (flexible, reliable, baseload power). Solar and wind facilities generate energy only intermittently, depending upon the availability of the resource. Energy storage solutions do not yet allow for reliable power generation across the potential demand spectrum. Given this, efficient baseload generating sources are needed to augment the growing focus on renewables to the energy mix.

In addition, land requirements for solar and wind projects are highly dependent on the "resource" available at a given site, as well as topographic and other factors. The National Renewable Energy Laboratory (NREL) identifies solar energy production in its June 2013 report *Land-Use Requirements for Solar Power Plants in the United States* of approximately 5.9 acres per MW. A 70-acre site would, therefore, result in solar generation of approximately 12 MW. In reality, significant portions of the site would not be used due to wetlands or other constraints, and energy generation from a solar installation at this site would be even less. Similarly, wind energy facilities vary in the amount of land area required. Using NREL's August 2009 *Land-Use Requirements of Modern Wind Power Plants in the United States*, which indicates a dramatic range from approximately 22 acres per MW to 250 acres per MW; even assuming the more productive end of the range, just over 3 MW of generation would result. In general, New England is not among the areas with a strong on-shore wind regime, due to variable wind direction and lower speeds except on certain ridgelines. Therefore, a solar or wind installation would be expected to result in considerably lower energy production than the technology proposed.

Advanced combined cycle combustion turbine technology with natural gas firing is much more efficient than other types of technology utilized in current non-renewable electric power generation projects. The Energy Information Administration (EIA) publication entitled *Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants* (April 2013) provides a comparison of heat rates for various electric utility scale generating technologies. The listed heat rate for other fossil fuel generating technologies, as listed in that source, are:

- Coal-fired boilers/IGCC – 8,700 to 12,000 Btu/kWh
- Simple-cycle combustion turbines – 9,750 to 10,850 Btu/kWh
- Biomass boilers – 12,350 to 13,500 Btu/kWh
- Fuel cells – 9,500 Btu/kWh

The proposed Project has a new and clean net heat rate at full load under ISO conditions of 6,529 Btu/kWh (HHV, net).

Natural gas-fired combined cycle technology, as proposed, also facilitates flexible operation. This will allow ISO-NE to select the most appropriate generating source during periods of energy demand.

Combined cycle technology utilizing natural gas as its primary fuel remains the most favorable option today from a market point of view. This was recently demonstrated by ISO-NE's choice of a gas-fired combined cycle facility as the forward capacity market's proxy unit. This technology also maximizes energy efficiency and minimizes air emissions.

ALTERNATIVE FUELS

NTE considered fuel alternatives for the Project before selecting natural gas as the primary fuel source, with limited capabilities to fire ultra-low sulfur distillate (ULSD) oil as backup.

Natural gas, the preferred fuel source for the Project, is the cleanest burning fossil fuel. Burning alternative fossil fuels, such as coal and oil, result in greater pollutant emissions, and potentially introduce additional, complicating social and environmental impacts associated with fuel delivery and storage. NTE identified the following three fuel options to assure the lowest emitting scenario was selected that would best meet the Project purpose and need: 1) natural gas as the sole fuel; 2) natural gas as primary fuel with liquefied natural gas (LNG) as backup; and 3) natural gas as the primary fuel with ULSD as backup.

The Algonquin Gas Transmission natural gas pipeline (Algonquin pipeline) will supply natural gas to the Project. Natural gas, delivered via the Algonquin pipeline, located approximately 2 miles north of the site, eliminates the need for road or rail delivery, and provides efficient combustion in combined cycle mode resulting in the lowest emissions for all fossil fuels. Natural gas will be fired in the CTG at all times when it is available. However, the Algonquin pipeline may become constrained during periods of peak demand, preventing the Project from securing an uninterruptible supply contract for natural gas delivery. Given the infrastructure and anticipated resource limitations, natural gas as the sole fuel source was deemed technically infeasible for Project reliability and ability to meet contractual commitments.

Natural gas as the primary fuel with the installation of LNG storage to supply backup fuel could create a dedicated fuel supply; however, securing the necessary approvals and constructing LNG storage at the proposed Project site was considered infeasible. There is not sufficient space on the site to build an LNG storage terminal as well as the Project, even without consideration for the additional space requirements associated with the need for an exclusion zone around LNG storage tanks. This fuel alternative was, therefore, considered infeasible.

The use of ULSD presents the lowest emitting option of liquid fuels available, and is able to be utilized by the same combustion process and equipment. Because the emissions are higher for certain parameters than natural gas, the Project's use of ULSD has been restricted to no more than 720 hours per year. This will be sufficient support for Project reliability, and allow for appropriate fuel flexibility without the need for substantial additional infrastructure or equipment. There are no unacceptable collateral environmental impacts associated with use of 720 hours per year of ULSD firing.

The selection of natural gas as the primary fuel, with ULSD for limited use as backup was determined to be the appropriate fuel scenario for the Project.

ALTERNATIVE COOLING TECHNOLOGIES

A natural gas-fired combined cycle electric generating facility requires cooling, particularly for the condensing of turbine exhaust steam in the steam turbine condensers. A range of cooling technologies was evaluated, including once-through cooling, conventional "wet" cooling towers, and air cooling. The technology that is most appropriate for a given project is dependent on a site-specific balancing of a number of technical, economic, and environmental factors. For this Project, air cooling has been selected as the most appropriate cooling technology. Information regarding each alternative is provided below.

Once-Through Cooling

Many larger electric generating facilities located near surface water bodies have historically utilized once-through cooling technology. Once-through cooling systems circulate water from a nearby surface waterbody through the steam surface condensers. Heat from the steam condensers is transferred to the cooler circulating water. The same quantity of water is then returned directly to the surface water body after exiting the condensers, although at an increased temperature. The higher temperature is the result of the water having absorbed the latent heat of vaporization associated with the condensing turbine exhaust steam back to a liquid state. The name of this system is derived from the fact that cooling water is passed through the condenser just one time before being returned to the water source. With the issuance of USEPA's 2014 §316(b) Final Rule covering cooling water intake structures, presumptive Best Technology Available (BTA) has been defined as a withdrawal rate equivalent to mechanical draft wet cooling towers. For this reason, once-through cooling was rejected.

Mechanical Draft (Wet) Cooling

In a mechanical draft or wet cooling tower system, water is circulated in a loop through the steam surface condensers and the cooling tower. The circulating water serves as the intermediary heat transfer medium between the steam surface condenser and ambient air. Cooling is achieved through evaporation of the water circulating

through the system and through direct contact with the air as the water cascades down through the cooling tower fill. Air is moved through the cooling tower through the use of fans. A supply of water is required to make up for evaporation losses. In addition, a smaller quantity of water, known as blowdown, is discharged from the system to limit the build-up of dissolved solids that are concentrated in the remaining circulating water during the evaporation process. The blowdown water must also be replaced with makeup water.

Although water cooling is more efficient than the use of air, local concerns regarding water and water use were a key factor for this site. Although the Quinebaug River reflects a potential surface water source, and potential groundwater resources are also available, it was determined that the Project should select the technology that required the least possible water demand.

Air-Cooled Condenser Cooling

An air-cooled condenser relies only on ambient air as a direct steam-cycle heat sink, without the use of any water or other intermediary heat transfer medium. Steam is routed from the turbine exhaust through ducts to a series of finned tube heat exchangers. The steam flows through, and condenses inside the tubes while air flows over the outer, finned tube surface. Condensate is discharged from the air-cooled condenser and supplied back to the HRSGs after the latent heat of vaporization is transferred from the turbine steam directly to the air stream. Air is moved through the air-cooled condensers by a series of fans, with the warmer air discharged from the tops of the condenser. Air has a lower heat adsorption/exchange rate than water that affects the size of the cooling system.

Selection of air cooling reduces the Project's water requirements by over 95% as compared to wet cooling, and was thus determined to be most appropriate for the Project in this location.

ENVIRONMENTAL CONTROL TECHNIQUE AND TECHNOLOGY REVIEW

A detailed LAER/BACT demonstration analysis is provided in Section G of this application. As outlined in that section, the Project has selected advanced pollution control technologies and add-on controls to achieve low levels of emissions when operating both with its primary fuel (natural gas) and its backup source (ULSD).

The proposed Project considered various alternative NO_x emission control technologies, and proposes to install DLN combustors and SCR technology to control NO_x emissions during natural gas firing. Water injection will be used with SCR to minimize NO_x emissions during ULSD firing. As discussed in Attachment G, this represents LAER, which is equivalent to the lowest emission rates achieved in practice. NTE evaluated alternative technologies, including SNCR and EM_xTM. SNCR requires exhaust temperatures much higher than produced by a combustion turbine to be effective and typically achieves NO_x reductions of 50% or less. For these reasons, SNCR was eliminated as technically infeasible. EM_xTM has never been installed on a CTG larger than 43 MW and has not demonstrated NO_x control levels greater than SCR. For these reasons, EM_xTM was eliminated as technically infeasible.

Good combustion controls and an oxidation catalyst will be used to control CO and VOC emissions; as discussed in Attachment G, this represents BACT for these two pollutants. No other emission control technologies are available to achieve further reductions for these two pollutants.

Emissions of SO₂, H₂SO₄ and PM/PM_{2.5}/PM₁₀ will be controlled by good combustion practices and use of low sulfur fuels. The Project will fire natural gas as the primary fuel, with a maximum sulfur content of 0.5 gr/100 scf. ULSD, with a maximum sulfur content of 15 ppmw, will be the backup fuel, limited to times when natural gas is not reasonably available and in no case for more than 720 hours per year. Post-combustion emissions controls such as fabric filters, electrostatic precipitators, and scrubbers, which are commonly used on solid-fuel boilers, are not technically feasible for CTGs, given the low emission rates and the large amount of excess air inherent in combustion turbine technology. There are no known combined cycle CTGs with post combustion controls for SO₂, H₂SO₄ and PM/PM_{2.5}/PM₁₀.

Emissions of GHGs, primarily CO₂, are related to carbon content of the fuel and heat rate of the technology. Due to relatively low carbon content of natural gas on a heat content basis, and the low heat rate of the combined cycle technology, the Project will have less than half of the CO₂ emissions of existing coal-fired boiler plants with steam turbines. Post-combustion controls (CCS), while theoretically feasible, are not commercially available and cost prohibitive. BACT for GHGs was determined to be use of natural gas as the primary fuel with limited use of ULSD as the backup fuel.

SUMMARY AND CONCLUSION

The Project conducted a robust and thorough consideration of a range of alternatives. The Project as proposed reflects the use of an appropriate site, the most efficient generating technology, clean fuels, and state-of-the-art emission controls. The Project is the optimal size for successful participation in the current New England forward capacity and energy markets. Air quality impacts associated with the Project will comply with National Ambient Air Quality Standards and PSD Increments, which have been established for the protection of the most sensitive members of the population. Beneficial cumulative air quality effects will result from displacement of older, less efficient, higher emitting generating units. The Project will be a source of efficient, reliable energy production, as well as employment opportunities associated with its construction and operation; both of which will result in significant secondary economic impacts throughout the local community. The Project will also contribute substantial financial support to the local community as one of the largest taxpayers. The Project has incorporated the best available alternatives in order to balance its impacts and create a beneficial source of electrical generation.