DOCKET NO. 470 – NTE Connecticut, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a 550-megawatt dual-fuel combined cycle electric generating facility and associated electrical interconnection switchyard located at 180 and 189 Lake Road, Killingly, Connecticut.

Surrebuttal Testimony of Robert Fagan, Synapse Energy Economics

Prepared on Behalf of Not Another Power Plant and Sierra Club

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Q. Are you the same Robert Fagan who filed Direct Testimony in this proceeding on November 15, 2016?

A. Yes.

Q. What is the purpose of this Surrebuttal Testimony?

A. This testimony is a direct response to the Rebuttal Testimony of Mr. Ethan Paterno of PA Consulting, and Mr. Michael Bradley of NTE Energy, filed on December 8, 2016 in this case.

Q. Which areas does this testimony address?

A. This testimony responds to statements made by Mr. Paterno and Mr. Bradley regarding five specific areas: 1) Forward Capacity Market (FCM) design, intent, and purpose; 2) retirement of so-called "at-risk" resources; 3) winter reliability needs; 4) integration needs for variable output resources; and 5) carbon dioxide (CO_2) emissions.

Q. With regard to my Direct Testimony, Mr. Paterno states that "The testimony misunderstands the design, intent, and purpose of the forward capacity auction."[1] Please respond.

A. My testimony does not misunderstand the design, intent or purpose of the FCA. The distinction between the intricacies of the procurement process (FCM mechanism), and the actual reliability need (Net Installed Capacity Requirement or NICR) is important, and is addressed directly in my testimony, but not in Mr. Paterno's testimony. From a resource adequacy perspective, NICR is the determinant of reliability need, and capacity held above NICR is "excess" supply from that resource adequacy perspective. The three-year forward capacity auction itself is part of a multi-step process that aims to economically procure desired levels of

[1] Paterno Rebuttal at page 3.

resources. The recent changes to the shape of the demand curve do not alter the underlying calculation of NICR or the shape of the supply curve; they merely alter the amount of capacity that ISO NE elects to clear in a given auction based on economic preferences.

Moreover, contrary to Mr. Paterno's assertion that clearing capacity in excess of the NICR lowers total capacity costs, the opposite is true. Given that the supply curve is non-declining, capacity procured in excess of the NICR will always clear at a price at least as high as capacity cleared at the level of the NICR. Consequently, clearing "excess" capacity will necessarily result in ratepayers paying more for more, not less for more.

Ultimately, Mr. Paterno's testimony ignores many important intricacies of the FCM procurement process including, for example, the presence of multiple reconfiguration auctions, updating of the NICR estimate in each successive auction, and the ability for a winning supplier of newly cleared capacity to lock in a fixed capacity price for seven years even if capacity prices were to decline in subsequent forward capacity auctions.[2]

Q. Mr. Paterno states, in regards to my Direct Testimony, "The testimony does not consider the reliability and ratepayer impacts of the 6,000 MW of at-risk retirements identified by ISO-NE."[3] Please respond.

A. My testimony actually does directly consider and discuss the reliability impacts of the units in question,[4] and contrary to Mr. Paterno's assertion[5] my testimony does include analysis 1) that shows energy efficiency and behind-the-meter solar PV providing 4,672 MW in peak

[2] ISO NE Market Rule Section III.13.1.1.2.2.4.
[3] Paterno Rebuttal at page 9.
[4] See Fagan Direct Testimony at pages 6, 7, 9-10, 20, 21, 25-27, 60, 78.
[5] Paterno Rebuttal at page 9, "Mr. Fagan provided no quantitative analysis back up his claims that sufficient energy efficiency, renewable generation and energy storage capacity is available…."

load reduction by 2025,[6] with 2,410 MW of those resources coming online between 2016 and 2025,[7] and 1,226 MW of the 2,410 MW coming online between 2016 and 2020[8]; 2) that addresses the presence of more than 2,000 MW of Canadian Hydro resource potential which is intended for operation in 2019[9]; 3) that indicates a projection of utility-scale solar PV resource installation of 965 MW by 2025,[10] and 4) that demonstrates a current surplus of projected resources above NICR that ranges from 1,939 MW to 2,162 MW in 2020.[11]

Mr. Paterno's testimony ignores all temporal aspects of the roughly 5,600 MW of so-called "at-risk" of retiring generation resources, when he describes them as representing a "material" risk in his rebuttal,[12] and he does not address the fundamental factors that would drive their retirement. They will retire if the combination of FCM prices and peak period energy prices are too low to support their own going forward operating costs. But these circumstances – low FCM and energy prices – are to be expected only when sufficient new supply and/or lower peak demand is present. This market-based feedback directly mitigates the risk associated with their potential retirement. At a high level, new renewable supply, a current

[6] Fagan Direct Testimony at pages 37-38, Table 6 and Figure 4.
[7] Fagan Direct Testimony at page 37, Table 6. The difference between gross and net peak load in New England reflected in the 2016 CELT projections in Figure 4 is seen directly in Table 6. For 2016, this difference is 2,262 MW (gross peak of 28,966 minus net peak of 26,704 equals 2,262 MW), and for 2025 this difference is 4,672 MW (gross peak of 31,794 minus net peak of 27,122 equals 4,672 MW). This directly implies an increase in these resources equal to 2,410 MW between 2016 and 2025 (4,672 MW minus the 2016 baseline of 2,262 MW).
[8] See Fagan Direct Testimony at page 37, Table 6. The difference between gross peak load and net peak load projected for 2020 is 3,488 MW (30,276 minus 26,788 MW). Compared to the 2016 baseline difference between gross and net peak load of 2,262 MW, this directly implies an increase of 1,226 MW between 2016 and 2020.
[9] Fagan Direct Testimony at pages 27-28. The Massachusetts law "*An Act Relative to Energy Diversity*" (H. 4568), passed in August 2016, further increases the likelihood that Canadian hydro resources will flow into the region. Massachusetts is currently soliciting input to inform the RFP process; solicitations must be made by April 1, 2017 to secure roughly 9.45 million MWh per year, which would be equivalent to roughly 1,100 MW if the energy was provided on a round-the-clock basis.
[10] Fagan Direct Testimony, Exhibit 12, ISO NE PV Forecast, slide 26.
[11] Fagan Direct Testimony, page 20, Table 3.
[12] Paterno Rebuttal at 9:14.

surplus of capacity resources, and declining net peak loads all mitigate against the potential economic retirement of 5,600 MW. ISO NE also has policies in place that permit the use of reliability must run (RMR) contracts with generators, to secure system reliability over the short-term, until transmission improvements can be completed.

Q. Mr. Bradley states that you "…incorrectly asserts 'there is no winter reliability need' for KEC because the region has 'plentiful winter capacity reserves.'"[13] Please respond.

A. Mr. Bradley disagrees with my testimony where I state that there is no winter reliability need for the proposed new generator. He emphasizes ISO NE's concerns about winter fuel supplies, and notes ISO NE's statements on the desirability of increased natural gas supplies for New England.[14] Mr. Bradley's response, however, fails to identify a winter reliability need for any additional generation in New England and therefore fails to rebut my core points.

As the ISO NE documents referenced by Mr. Bradley make clear, winter reliability issues are premised on fuel availability and procurement concerns, and do not point to a need for construction of new generation assets. Securing fossil fuel supplies – oil or natural gas or liquefied natural gas (LNG) – for existing New England regional generation is not before the Council in this case. Moreover, ISO NE has taken, and continues to take, steps to ensure fuel availability to the existing generation base, which is more than sufficient to provide winter electricity as long as it has fuel.[15] ISO NE's Pay for Performance mechanism, for example, which will go into effect in winter 2018/2019, is planned as the market-based incentive to achieve

[13] Bradley Rebuttal at page 3.
[14] Bradley Rebuttal at pages 3-4.
[15] Fagan Direct Testimony at page 50.

winter reliability aims.

And my testimony also attaches and draws upon the Analysis Group report, which focused on New England winter reliability issues.[16] This report clearly describes these fuel concerns, and notes the set of solutions available to mitigate against even the most severe winter stresses. But none of those solutions involve new gas-fired generation. Rather, they involve some combination of increased energy efficiency, demand response, new Canadian hydro supplies, and/or increased dual fuel capability at existing fossil stations and/or increased LNG usage. Based on Analysis Group's findings, all of these solutions offer a less costly means to secure winter reliability than building KEC, a new gas-fired generator whose output is not needed for winter reliability.

Q. Mr. Bradley states "It is clear that Mr. van Welie considers existing supply options insufficient" in the section of his Rebuttal Testimony concerning renewable integration need.[17] Please respond.

A. Mr. Bradley's interpretation that Mr. van Welie's remarks regarding requirements for a flexible fleet support the addition of the KEC facility is difficult to square with their broader context, ISO NE's substantive recommendation, or with real world evidence regarding levels of flexible resources to balance renewables in places like California. Renewable integration requires a flexible fleet because sufficient operating reserves are needed to balance the system; but KEC is not needed to provide this requirement over any time horizon. The existing fleet is more than sufficient for the period well into the next decade, and increases in dispatchable

[16] Fagan Direct Testimony at page 50, and Exhibit 7 to my testimony.
[17] Bradley Rebuttal at pages 6-7.

renewable supply, expected storage resources, and improved forecasting along with the existing fleet will support New England's renewable integration needs over the longer time horizon.

ISO NE does make recommendations for addressing the anticipated increase in renewable generation resources, but these do not include constructing new resources at this time. Rather, ISO NE has indicated that transmission support and better forecasting is required, in addition to a flexible fleet.[18] ISO NE also references a potential need to increase levels of operating reserves, but increases in operating reserves – which provide "flexibility" – can come from existing resources, in addition to new storage and Canadian hydro resources likely to be in place during the 2020's when higher levels of renewable generation are on the system. Mr. Bradley's Rebuttal Testimony states that KEC "will help address" the renewable integration need in New England,[19] but he provides no evidence (nor does the NTE application itself) that KEC's capabilities are needed, on top of existing and other planned resources for New England, to effectively integrate increasing levels of renewables in the region.

By way of example, in the California ISO region, which includes roughly 80% of the State's load, the resource adequacy requirements include minimum levels of "effective flexible capacity" (EFC) from dispatchable resources to integrate roughly 15,000 MW of ISO region renewable resources, and those levels of "EFC" (for 2017) range from roughly 10,000 to 15,000 MW over the seasons.[20] The New England region has far fewer solar and wind resources than

[18] Fagan Direct Testimony at page 62.
[19] Bradley Rebuttal at page 6.
[20] See California ISO, "Final Flexible Capacity Needs Assessment for 2017", April 29, 2016, pages 8, 13. Available at https://www.caiso.com/Documents/FinalFlexibleCapacityNeedsAssessmentFor2017.pdf.

California, and has about one-half of the peak load of the California ISO region. But its level of existing flexible, dispatchable capacity – provided by gas, hydro, certain imports, oil, and dual-fuel capable units, along with some demand response – is of the same order of magnitude as California's EFC needs at this point,[21] and is clearly sufficient to meet integration needs well into the next decade.

Q. Mr. Bradley asserts "KEC will help address [CO_2 emission reduction] need."[22] Please respond.

A. Mr. Bradley provides no quantitative support for his assertions that KEC will help meet Connecticut's 2050 GWSA goals. The applicant only modeled (or only reported the modeling results for) the first five years of KEC operation. In addressing future years, when substantial CO_2 emission reductions will be required from the generation sector, Mr. Bradley simply states that KEC's capacity factor is "expected to decrease between 2020 and 2050…."[23] The mere fact that the facility is expected to run less in the future does not make it an effective greenhouse gas mitigation strategy. Moreover, ISO NE's capacity procurement construct on which supply decisions are made does not perform a multi-year optimization or fully incorporate carbon constraints under GWSA. And the existence of the Regional Greenhouse Gas Initiative (RGGI) does not mitigate concerns regarding the facility's CO_2 emissions; RGGI has not yet

[21] See, for example, Page 1.3.1 of the 2016 CELT Report, included as part of Exhibit 1 to my Direct Testimony. In the summer of 2016, there was 16,711 MW of dispatchable resources available from these existing, flexible units: hydro pondage, hydro pumped storage, gas and gas/oil combined cycle, and gas and gas/oil and oil combustion turbine. This total excludes any capacity still currently available from oil, gas or coal steam units (which while not inherently flexible, are still dispatchable), and excludes capacity available from New England's 4,000 MW of interconnections and multiple hundreds of MW of dispatchable demand response.
[22] Bradley Rebuttal at page 7.
[23] Bradley Rebuttal at page 8:21-23.

incorporated emissions targets that align with CT GWSA long-term goals, meaning that facilities in Connecticut could fully comply with the requirements of RGGI and Connecticut could still fail to achieve its GWSA goals. Ultimately, as I show in Table 9 of my testimony, given the facility's modest near-term and nonexistent future CO_2 benefits, KEC would be dramatically less effective than renewable energy and energy efficiency alternatives at reducing CO_2 emissions.

Q. Does this conclude your testimony?

A. Yes.