ADDENDUM TO THE KILLINGLY ENERGY CENTER: AN ANALYSIS OF NEED AND ECONOMIC & ENVIRONMENTAL IMPACTS

In recognition of the comments and feedback NTE Connecticut ("NTE") and PA Consulting Group ("PA") have received from residents of the Town of Killingly related to PA's report entitled, ***Killingly Energy Center: An Analysis of Need and Economic & Environmental Impacts****, PA has prepared the following addendum. This addendum does not change the analysis nor findings presented in the original PA report. Rather, this addendum provides additional detail on the models used (IMPLAN and JEDI), inputs that were used to develop PA's estimate of economic impacts resulting from the Killingly Energy Center's ("KEC") construction and ongoing operations, and additional detail on PA's findings.*

The models that PA used in its economic impacts analysis are the IMPLAN – Impact Analysis for Planning – and JEDI – Jobs and Economic Development Impacts – models. Both are industry standard models used to analyze economic impacts resulting from capital projects, such as building and operating a power plant. The IMPLAN model was used to assess the economic impacts resulting from the Killingly Energy Center's ("KEC") effect on wholesale electricity costs to Connecticut ratepayers. The JEDI model was used to assess the economic impacts from KEC's construction and operations.

PA's modeling methodology analyzed economic impacts across three categories: direct, indirect and induced impacts. Direct impacts reflect those effects resulting from KEC's direct expenditures. (For example, KEC hiring workers.) Indirect impacts reflect supply chain effects from KEC's direct expenditures. (For example, KEC workers buying groceries, eating at restaurants, staying at hotels, etc.) Lastly, induced impacts reflect effects from increased household income due to direct and indirect impacts, and wholesale electricity cost savings. (For example, spending by employees of a grocery store, restaurant, hotel, and/or spending by Connecticut electricity ratepayers etc.)

IMPLAN has been in use for more than 30 years and was originally commercialized by the Agricultural Department at the University of Minnesota. IMPLAN is used to assess economic impacts related to a wide variety of capital projects by federal and state agencies and private industry, including the U.S. Department of Agriculture, U.S. Department of Interior, U.S. Army Corps of Engineers, and U.S. Coast Guard. In addition to being used to assess the economic impacts of power plants, IMPLAN has also been used to assess impacts from baseball stadiums, forestry, factories (e.g. Tesla's 'Gigafactory'), etc.

JEDI was developed by the National Renewable Energy Laboratory ("NREL"), a Department of Energy laboratory. JEDI was created specifically to assess the economic impacts of power plant construction and operations, and has been in use by the power industry for 15 years.

The primary inputs to the JEDI model – projected expenditures (i.e. costs) in Connecticut – are summarized below for the construction (Table 1) and operations (Table 2) phases. As discussed in PA's original report, KEC's total equipment and construction costs are projected to be $537 million. Of that amount $142 million, 26% of the total project cost, is projected to be spent in Connecticut – as shown in Table 1.

Table 1: Connecticut Share of Total Expected Construction Costs

Expenditure Type	Connecticut Share of Total Cost ($millions)	Connecticut Share of Total Cost (%)
Materials	**$10**	**5%**
Power Generation	$0	0%
Plant Equipment	$10	5%
Plant Construction Labor	**$104**	**65%**
Other[1]	**$28**	**43%**
Total	**$142**	**26%**

Tables 1 and 2 present the Connecticut share of KEC's construction and operations costs in both dollars, 'Connecticut Share of Total Cost ($millions)', and as a percentage of the total cost, 'Connecticut Share of

[1] Includes costs associated with general facilities, engineering/design, construction insurance, land, permitting fees, transmission grid connection, spare parts, and sales tax (materials and equipment purchases).

Total Cost (%)'. For example, PA's analysis does not assume any of KEC's power generation equipment (e.g. combustion and steam turbines) is purchased in Connecticut. Therefore, the 'Connecticut Share of Total Cost (%)' is zero, and there is no direct impact to the state of Connecticut from KEC's power generation equipment purchases. However, direct onsite labor is expected to be primarily performed by Connecticut-based workers, which is reflected in the $104 million in labor costs shown in Table 1. This $104 million value represents 65% of KEC's total costs for plant construction labor. Similarly, in Table 2, 85% of KEC's costs associated with 'Labor (incl. Services)' are projected to be spent in Connecticut. Based on PA's discussions with NTE Connecticut, the expectation is that many of the onsite jobs associated with this labor expenditure will be filled by residents of the Town of Killingly and the neighboring towns.

Table 2: Connecticut Share of Annual Expected Fixed Operation Costs

Expenditure Type	Connecticut Share of Total Cost ($millions)	Connecticut Share of Total Cost (%)
Labor (incl. Services)[2]	$5	85%
Total	**$5**	**85%**

The primary input to the IMPLAN model is the projected electricity cost savings to Connecticut ratepayers from KEC's operations. PA's analysis projects KEC's operations to result in an annual average decrease of approximately 10% in wholesale electricity costs, all else equal, during the initial five years of KEC's operations. This equates to an average of approximately $215 million per year in wholesale electricity cost savings to Connecticut ratepayers.

The economic impacts of the expenditures presented in Table 1 (Connecticut Share of Total Expected Construction Costs) and Table 2 **(**Connecticut Share of Annual Expected Fixed Operation Costs), and the wholesale electricity cost savings to ratepayers as discussed above, is shown in Table 3 on the following page. Table 3 is the same as Table 2-3 in PA's original report (page 8), and illustrates the total economic impacts in terms of: (i) Employment (i.e. jobs), (ii) Earnings (i.e. wages); and (iii) economic output attributable to KEC to the state of Connecticut. These impacts are presented for both the construction period (2017 through mid-2020), and the initial five years of KEC's operations (mid-2020 through 2024)

For each category below (i.e. Employment Impact' (i.e. jobs created), 'Earnings Impact' (i.e. wages created), and 'Economic Output') the economic impacts from the expenditures presented in Table 1 are reflected in the 'Construction Period' lines. Similarly, the economic impacts from the expenditures presented in Table 2 are reflected in the 'Facility Operations' line items. The economic impacts from the wholesale electricity cost savings are reflected in the 'Cost Savings to Customer' line items. (The "Total Impacts', 'Total Outputs' lines in Table 3 reflect direct, indirect and induced impacts.)

[2] Includes $2-3 million in annual services costs.

Table 3: Total Economic Impacts on the State of Connecticut – Direct, Indirect and Induced

	2017	2018	2019	2020	2021	2022	2023	2024
Employment Impact (FTEs per year)								
Construction Period	180	515	386	51	-	-	-	-
Facility Operations	-	-	-	62	74	74	74	74
Cost Savings to Customer	-	-	-	291	956	1,200	1,319	1,300
Total Employment Impact	**180**	**515**	**386**	**404**	**1,030**	**1,274**	**1,393**	**1,374**
Earnings Impact ($ - millions)								
Construction Period	25	73	56	8	-	-	-	-
Facility Operations	-	-	-	6	7	8	8	8
Cost Savings to Customer	-	-	-	18	62	79	89	90
Total Earnings Impact	**25**	**73**	**56**	**32**	**69**	**87**	**97**	**98**
Economic Output ($ - millions)								
Construction Period	36	106	82	11	-	-	-	-
Facility Operations	-	-	-	13	17	17	17	18
Cost Savings to Customer	-	-	-	50	166	213	240	241
Total Economic Output	**36**	**106**	**82**	**74**	**183**	**230**	**257**	**259**

As discussed in PA's original report, KEC is projected to contribute to more than $1 billion of increased economic output from 2017-24. The $1 billion reflects the sum of the values in the 'Total Economic Output' line item in Table 3 above, beginning with $36 million in 2017 and ending with $259 million in 2024. The $215 million per year in electricity cost savings to Connecticut ratepayers is projected to result in an average of $180 million per year in increased economic output during KEC's first five years of operations. (PA's analysis assumes that electricity cost savings represent an increase in household income, and that for every $1.00 increase in household income Connecticut electricity ratepayers will spend approximately $0.85. This is why $215 million in electricity cost savings results in a slightly lower economic output of $180 million.) The average of $180 million per year is based on annual economic output (as shown in the 'Cost Savings to Customer' line item) of $50 million in 2020, $166 million in 2021, $213 million in 2022, $240 million in 2023 and $241 million in 2024.

Table 4: Construction Period and Facility Operations: Breakout of Jobs and Earnings Impacts – Direct, Indirect and Induced

	2017	2018	2019	2020	2021	2022	2023	2024
Direct Employment Impact (FTEs per year)								
Construction Period	95	273	204	27	-	-	-	-
Facility Operations	-	-	-	23	28	28	28	28
Indirect & Induced Employment Impact (FTEs per year)								
Construction Period	85	242	181	24	-	-	-	-
Facility Operations	-	-	-	38	46	46	46	46
Total Employment Impact	**180**	**515**	**386**	**113**	**74**	**74**	**74**	**74**
Direct Earnings Impact ($ - millions)								
Construction Period	18	53	40	5	-	-	-	-
Facility Operations	-	-	-	2	3	3	3	3
Indirect & Induced Earnings Impact ($ - millions)								
Construction Period	7	21	16	2	-	-	-	-
Facility Operations	-	-	-	4	5	5	5	5
Total Earnings Impact	**25**	**73**	**56**	**14**	**7**	**8**	**8**	**8**

As presented in PA's original report, in addition to the economic impacts on the state of Connecticut, KEC will also have economic impacts in and around the Town of Killingly. Table 4 is the same as Table 2-4 in PA's original report (page 9), and the values in Table 4 are included in the values presented in Table 3. (Similarly, Table 2-4 values in PA's original report are included in the values presented in Table 2-3.) The purpose of Table 4 is to highlight the direct employment and earnings impacts from KEC's construction and operations, which will originate in the Town of Killingly. These impacts will be driven by the direct onsite jobs created during construction and operations, illustrated in the upper portion of Table 4 under the 'Direct Employment Impact (FTEs per year)' heading. Construction jobs are projected to average 240 during the

height of construction (2018-19), with 25-30 long-term jobs created to support KEC's operations. These direct employment impacts result in associated wage creation and impacts, labeled as 'Direct Earnings Impact ($ - millions)' in Table 4, of $130 million from 2017 through 2024, with those impacts projected to be realized in and around the Town of Killingly. (The $130 million is based on $18 million of 'Construction Period' earnings in 2017 and ending with $3 million of 'Facility Operations' earnings in 2024.)

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