INDIRECT BENEFITS OF KINGSTON SOLAR

EXHIBIT GPP-2

OCTOBER 31, 2022

PREPARED FOR

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CapEx	capital expenditures
COD	commercial operation date
FTE	full-time equivalent
FTE-year	full-time equivalent job year
MRIO	Multi-Regional Input-Output
NAICS	North American Industry Classification System
OpEx	operating and maintenance expenses
PV	present value
RFP	request for proposals

DISCLAIMER

The analyses supporting the results presented here involve the use of assumptions and projections with respect to conditions that may exist or events that may occur in the future. Although Daymark Energy Advisors has applied assumptions and projections that are believed to be reasonable, they are subjective and may differ from those that might be used by other economic or industry experts to perform similar analysis. In addition, actual future outcomes are dependent upon future events that are outside Daymark Energy Advisors' control. Daymark Energy Advisors cannot, and does not, accept liability under any theory for losses suffered, whether direct or consequential, arising from any reliance on this presentation, and cannot be held responsible if any conclusions drawn from this presentation should prove to be inaccurate.

I. EXECUTIVE SUMMARY

Daymark was retained by Unitil Energy Systems, Inc. ("Unitil") to quantify the indirect benefits of the proposed Kingston Solar facility (the "Kingston Solar Project" or the "Project"). This study is meant to complement a separate analysis conducted by Unitil of the Project's direct benefits. The direct benefits are the benefits that will accrue directly to Unitil's customers, such as avoided energy and capacity costs. The indirect benefits, which are the focus of this report, are benefits that flow to society more broadly including the larger body of electricity customers in New Hampshire and New Hampshire residents.

Our analysis focuses on three categories of indirect benefits: economic benefits, environmental benefits, and demand reduction induced price effects ("DRIPE"). This report quantifies the indirect Project benefits during the presumed 30-year operating life in addition to the development and construction activities.

A. Project Description

The proposed Project is a 4.99 MWac utility-scale solar generating facility that will be located in Kingston, New Hampshire. Unitil plans to deploy single axis tracking technology and the Project will be operated as a "load reducer," meaning the energy produced by the facility will offset energy that would otherwise be received by Unitil from the transmission system.

B. Economic Benefits Summary

Project Expenditures

Table 1below lists the breakdown of total project expenditure assumptions provided by Unitil for Daymark's efforts. Efforts were made to make accurate and reasonable assumptions on the percentage of local content and sourcing for each budgeted item, with Daymark only analyzing impacts on the New Hampshire economy.

Table 1 - Total Expenditure of Kingston Solar (2023$)

	Total Expenditure	Assumed Local Content
Development and Construction	$14,336,043	$4,671,897
Operation and Maintenance	$2,213,280	$1,715,465
Total	**$16,549,323**	**$6,387,362**

Economic Benefits Results Summary

The economic benefits of the Project are summarized in Table 2 below. The annual totals for each benefit category are provided in Appendix A.

Table 2 – Total Economic Benefits of Kingston Solar (2023$ PV)

Description			Total
Direct Impact			
	Employment (Job Years)		54
	Labor Income, PV $	$	4,901,038
	Output, PV $	$	5,774,872
Indirect Impact			
	Employment (Job Years)		10
	Labor Income, PV $	$	748,405
	Output, PV $	$	1,943,423
Induced Impacts			
	Employment (Job Years)		23
	Labor Income, PV $	$	1,232,450
	Output, PV $	$	3,478,635
Total Direct, Indirect, and Induced Impacts			
	Employment (Job Years)		87
	Labor Income, PV $	$	6,881,893
	Output, PV $	$	11,196,930

The economic benefits estimated in this report are gross benefits, not net benefits. The results show total benefits in terms of economic output and employment resulting from the proposed investments. Most of the estimated gross benefits and employment numbers are most properly interpreted as "*supported*" impacts rather than "*created*," as detailed further in Section IIIA.

As depicted in Table 2, the Kingston Solar Project is expected to generate approximately $5.8 million in direct benefits, approximately $1.9 million in indirect benefits, and approximately $3.5 million in induced benefits. The economic impact is expressed in 2023$ present value ("PV"). The Project is expected to support around 54 job-years directly, with 10 indirect job-years supported and 23 induced job-years of employment.

Daymark separately used the IMPLAN model to estimate the potential state, county, and municipal tax benefits of the Project's development, construction, and assumed 30-year operations phases. Tax results include a myriad of taxes including sales, property, excise, personal income, corporate profits, and other special taxes.[1] Tax benefits are embedded in the overall economic benefits listed in Table 2 and are separately presented below in Table 3.

Table 3 – Total Tax Benefit of Kingston Solar (2023$ PV)

	Description	Total
Direct Impact		
	State Tax	-$19,812
	County Tax	$3,255
	Municipal Tax	$64,573
	Sub-Total	$48,017
Indirect Impact		
	State Tax	$40,452
	County Tax	$2,895
	Municipal Tax	$56,954
	Sub-Total	$100,300
Induced Impact		
	State Tax	$79,760
	County Tax	$6,081
	Municipal Tax	$106,643
	Sub-Total	$192,484
	Total, PV $	$340,801

C. Emissions Benefit Summary

Adding solar generation to the New Hampshire electric grid will displace emitting resources on the grid. Displacing emitting resources results in reduced emissions and benefits to New Hampshire residents. We have calculated the benefit of emissions reductions for both CO_2 and NOx emissions. We have largely followed the methodology used in the 2021 Avoided Energy Supply Components in New England Report (the "AESC Report").

The results of this analysis showing both total emissions reductions and the Net Present Value of these reductions are shown in Table 4 below.

[1] The tax portion of the IMPLAN output is discussed here in more detail: https://support.implan.com/hc/en-us/articles/360041584233-Taxes-Where-s-the-Tax.

Table 4 - Emissions Benefit Summary

	Total Emissions Savings (tons)	Net Present Value ("NPV") Emissions Savings ($)
CO_2	57,300	$1,775,800
NO_x	0.15	$ 44,100

D. Demand Reduction Induce Price Effect ("DRIPE") Summary

Operating the Kingston Solar Project as a load reducer will bring benefits to the ISO-NE system as a reduction in market demand inherently reduces market prices, all other variables being equal. The DRIPE calculations include price reduction induced effects for both energy and capacity. Daymark's analysis relied on the 2021 AESC Report, ISO-NE market futures, ISO-NE capacity clearing prices, and the ISO-NE 2022 CELT report.

Daymark's DRIPE analysis shows an estimated aggregate benefit to New Hampshire load of approximately $566,963 on a net present value basis. When allocated across New Hampshire load, this equates to a $0.0067/MWh reduction in locational marginal pricing ("LMP") pricing in New Hampshire.

II. INTRODUCTION

Daymark was engaged to study the indirect benefits of the proposed Kingston Solar Project. This study is meant to complement a separate analysis conducted by Unitil of the Project's direct benefits. The direct benefits are the benefits that will accrue directly to Unitil's customers, such as avoided energy and capacity costs, which are discussed in Exhibit FDGP-1. The indirect benefits, which are the focus of this report, are benefits that flow to society more broadly including the larger body of electricity customers in New Hampshire and New Hampshire residents.

We calculated three categories of indirect benefits:

- **Economic impact benefits.** The economic impact benefits of the Project are the value to New Hampshire of the economic activity associated with building and operating the Project.

- **Environmental benefits.** The environmental benefits are related to the emissions reductions that occur when emitting resources are displaced by the addition of the Project. These are quantified in both tons of emissions avoided and the value to society of avoiding those emissions.
- **Demand Reduction Induced Price Effects (DRIPE).** DRIPE is the amount of price reduction in the wholesale capacity and energy market resulting from either reduced load or new capacity added.

This report quantifies the Kingston Solar Project benefits during the presumed 30-year operating life in addition to the development and construction activities.

III. PROJECT DESCRIPTION

The proposed Project is a 4.99 MWac utility-scale solar generating facility that will be located in Kingston, New Hampshire. Unitil plans to deploy single axis tracking technology and the Project will be operated as a "load reducer," meaning the energy produced by the facility will offset energy that would otherwise be received by Unitil from the transmission system.

IV. ECONOMIC BENEFITS

A. Analysis Method

IMPLAN

Daymark used the IMPLAN model,[2] an input/output model developed by the IMPLAN Group to estimate the direct and indirect economic impacts to New Hampshire resulting from the development, construction, and operation of the Kingston Solar Project.

Impacts from the analysis are broken into three categories: (1) direct benefits, (2) indirect benefits, and (3) induced benefits. This nomenclature should not be confused with direct benefits as described by Unitil in Exhibit FDGP-1. These three subtypes are all indirect benefits and are not easily ascribed only to Unitil's customers but rather to the state. Direct economic benefits are realized directly from Unitil's investment in New Hampshire-based businesses to complete the solar facility and maintain the site. Indirect economic benefits arise from the business-to-business

[2] IMPLAN, "*What is IMPLAN?,*" August 13, 2018, accessed October, 2022, available at: https://blog.implan.com/what-is-implan#:~:text=IMPLAN%20is%20a%20platform%20that,system%20that%20is%20fully%20customizable.

transactions that are inherent within an industry's supply chain (for example, should a developer hire a contractor, and the contractor in turn leases a crane, that lease would be considered an indirect benefit). IMPLAN also reports induced economic benefits, which are driven by household spending resulting from the direct investment in labor and wages. Categories of spending supported by induced benefits include consumer goods such as groceries and clothing or services such as childcare and healthcare. While induced benefits are included in this report, they are harder to track, measure, and verify, and they should therefore be viewed as less precise estimates than direct or indirect benefits. This does not diminish their importance or real-life impact.

All benefit types from IMPLAN are further broken down as shown in Figure 1. Intermediate Inputs are defined by IMPLAN as "purchases of non-durable goods and services such as energy, materials, and purchased services that are used for the production of other goods and services, rather than for final consumption."[3] Daymark primarily reports Output and Labor Income in this report, as well as the job-years associated with the Project.

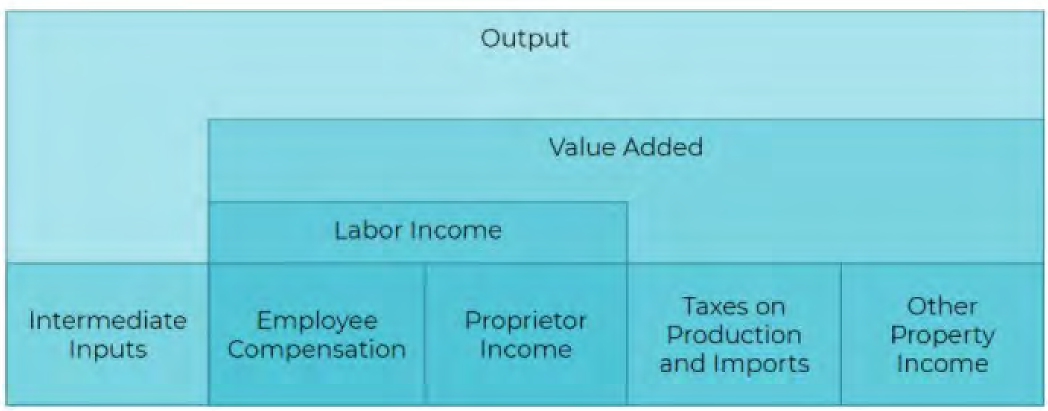

Figure 1. Components of output for a given industry[4]

The IMPLAN model reports employment output in two ways: "job years" and "employment compensation." If a worker is employed by a company in one position for 12 months, that is considered one job-year. If the same employee holds the same position for 24 months, that is considered two job-years. Additionally, if one employee

[3] IMPLAN, "*Understanding Intermediate Inputs (II)*," February 26, 2020, accessed October 2022, available at: https://support.implan.com/hc/en-us/articles/360044176233-Understanding-Intermediate-Inputs-II.

[4] IMPLAN, "*Understanding Output*," accessed October 2022, available at: https://implanhelp.zendesk.com/hc/en-us/articles/360035998833-Understanding-Output.

holds two positions for the same 12 months, that is considered two job-years. IMPLAN provides ratios to determine full-time equivalents ("FTEs") based on these job-years. The use of FTEs makes understanding employment figures easier – a person working one year for 35 hours a week, or more, is considered one FTE, while a second individual working half-time for the same year would be considered 0.5 FTEs. Employment compensation is simpler to understand, as it is the dollar value of the labor supported by the investment in a project. Unitil did not provide Daymark with FTE estimates, the employment figures reported here are generated from the IMPLAN model.

IMPLAN, like any input/output model, considers gross benefits only, not net benefits. It is difficult to determine exactly how much of the gross results are "new" jobs for example, and how much the Project can be supported by any existing margins or "slack" in the industry. This holds truer for indirect and induced benefits and employment, where the jobs and industries impacted are best described as "supported" rather than "created."[5] In other words, the results estimate the jobs and output necessary to complete the project and does not attribute their creation or current existence.

For this analysis, results generated by IMPLAN are reported in 2023 dollars. To estimate present value, Daymark discounted future years at a real discount rate of 2.39%, which is the current yield of a 20-year, investment-class New Hampshire General Obligation bond issued in 2022.[6] Daymark has chosen the New Hampshire state bond as Daymark believes it best approximates the social discount rate for the state.

Multi-Regional Input-Output ("MRIO")

Using IMPLAN, Daymark performed a Multi-Regional Input-Output (MRIO)[7] analysis to estimate economic impact at the county-level and to capture any incremental economic activities occurring within New Hampshire. Due to regional business-to-business trade and worker commuting, the significant investment considered by the Project will impact not only the county where the activities occur, but also the neighboring counties in New Hampshire. Neighboring states, including Massachusetts, Maine, and the broader New England region, will also see some economic benefits from the Project due to the geographic proximity, but are not studied in this scope.

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[5] IMPLAN, "*Employment Data Details*," accessed October 2022 available at: https://implanhelp.zendesk.com/hc/en-us/articles/115009510967-Employment-Data-Details.

[6] Electronic Municipal Market Access (EMMA) website, available at: https://emma.msrb.org/IssueView/Details/P2414760.

[7] IMPLAN, "*MRIO: Introduction to Multi-Regional Input-Output Analysis*," accessed October 2022, available at: https://implanhelp.zendesk.com/hc/en-us/articles/115009713448-Introduction-to-MRIO.

When assigning costs to specific regions for the MRIO analysis, Daymark was specific to allocate investments to Rockingham County where the Project will be located. The economic analysis considered all capital and operational expenses in this county. To track all relevant supply chain impacts and minimize leakage[8] (via indirect benefits), Daymark grouped the remaining New Hampshire counties into a study sub-region. While other states will likely receive some spill-over benefits, they are small and not within scope of the study.

The resulting regions (Rockingham County and Rest-of-NH) balance precision and accuracy in the MRIO analysis without overwhelming the model by inputting each county individually.

Mapping to industry categories

Unitil provided Daymark with expected New Hampshire-specific spending by year and by category. The analysis requires defining how payments would be made, to whom they would go, and a breakdown of services, labor, and materials. Certain categories of spending such as direct reimbursement payments or real estate costs are not included in the analysis because they provide no economic benefit, despite providing a financial benefit.[9]

After receiving an understanding of planned direct investment in New Hampshire, Daymark mapped each investment to a North American Industry Classification System ("NAICS") code. NAICS codes are detailed industry standard categories commonly understood across the fields of public policy and economics.

Daymark used the IMPLAN model for the analysis. IMPLAN has its own industry categorization system. IMPLAN produces a "bridge" document that links NAICS industries directly to the appropriate IMPLAN category, as determined by IMPLAN's in-house economists.

[8] A leakage is indirect or induced economic activity that occurs outside of the study region. For example, if an employee living in New Hampshire earns income via the Project, but their closest grocery store is in Massachusetts, their grocery spending is an induced benefits leakage that will not be captured in the current model due to the omission of Massachusetts.

[9] Direct payments are transfers of funds from one entity to another that add no value to the economy because no products are created, and no services are provided. Real estate is best described as an asset swap, with no production related to the value of the land itself being transacted.

B. Economic Impact

Daymark considered direct, indirect, and induced benefits estimated via IMPLAN in this economic impact analysis. Daymark presents economic impacts, both output and employment benefits, at the overall investment levels.

As discussed earlier in this report, the economic benefits estimated in this analysis are gross impacts. The results show overall benefits – both in terms of output and employment – to the economy as a result of the proposed investments. For example, the job numbers estimated in this analysis are labor necessary to complete various activities planned in each investment category. The analysis does not quantify net gain in economic impacts, rather, these estimates should be interpreted as supported impacts and not necessarily created impacts.

The Kingston Solar Project is expected to generate approximately $5.8 million in direct benefits, approximately $1.9 million in indirect benefits, and approximately $3.5 million in induced benefits in New Hampshire over the development, construction, and 30-year operational phase assumed in this study. The economic impact is expressed in 2023$ NPV.

The Project is also estimated to support a total of 87 job-years of employment, with 54 of these being direct job-year benefits, 10 indirect job-years, and 23 job-years of induced benefits. Again, these figures assume a 30-year operational period.

Table 5 – Total Economic Impact of Kingston Solar (2023$ PV)

Description			Total
Direct Impact			
	Employment (Job Years)		54
	Labor Income, PV $	$	4,901,038
	Output, PV $	$	5,774,872
Indirect Impact			
	Employment (Job Years)		10
	Labor Income, PV $	$	748,405
	Output, PV $	$	1,943,423
Induced Impacts			
	Employment (Job Years)		23
	Labor Income, PV $	$	1,232,450
	Output, PV $	$	3,478,635
Total Direct, Indirect, and Induced Impacts			
	Employment (Job Years)		87
	Labor Income, PV $	$	6,881,893
	Output, PV $	$	11,196,930

Tax benefits

The Project will provide tax revenue benefits to local municipalities, counties, and to the State of New Hampshire. The IMPLAN model reports tax benefits accruing to various taxing authorities and jurisdictions based on historical relationships between the impacted industries and tax revenue in the assigned locations. Table 6 breaks down the tax impact to the State of New Hampshire, county governments, and various municipalities from the Kingston Solar Project.

It is important to note a couple of items. First, municipal tax benefits have been combined with sub-municipal and special tax districts, such as school districts. Second, negative state tax arising from direct investment occurs because of historical data. In this example, the IMPLAN results report negative Other Property Income in the base data year for certain industries utilized in the analysis (2019), and therefore do not owe corporate profit taxes to the state, a major source of state taxes. IMPLAN runs impacts based on the base year relationships between industries – this does not mean that corporate profits in the region will not improve and generate additional corporate profit tax in future years.

Table 6 - Total Tax Benefits of Kingston Solar (2023$ PV)

	Description	Total
Direct Impact		
	State Tax	-$19,812
	County Tax	$3,255
	Municipal Tax	$64,573
	Sub-Total	$48,017
Indirect Impact		
	State Tax	$40,452
	County Tax	$2,895
	Municipal Tax	$56,954
	Sub-Total	$100,300
Induced Impact		
	State Tax	$79,760
	County Tax	$6,081
	Municipal Tax	$106,643
	Sub-Total	$192,484
	Total, PV $	$340,801

Impacted industries

The IMPLAN model also provides as output impacted industries in terms of both Output and Employment figures, for direct, indirect, and induced benefits. It is perhaps unsurprising that IMPLAN reports the largest direct impact on output and employment to industries such as Construction of New Power Structures, Industrial Machinery Repair, Construction of New Nonresidential Structures, and Architectural, Engineering, and Related Services.

Indirect impacts arise from business-to-business spending stemming from direct impacts. Industries at the top of the indirect output benefits are Architectural, engineering, and related services, Other Real Estate, industrial machinery repair, and wholesale durable goods.

Induced impacts arise from labor incomes and the choices employees make as a result of the direct spending. We see this reflected in the industries receiving the most induced output benefits, such as Owner-occupied dwellings, Hospitals, Other Real Estate, and Offices of Physicians.

V. ENVIRONMENTAL BENEFITS

Adding solar generation to the New Hampshire electric grid has the impact of displacing emitting resources on the grid. Displacing emitting resources results in reduced emissions and benefits to New Hampshire residents. We have calculated the benefit of emission reductions for both CO_2 and NOx emission. We have largely followed the methodology used in the 2021 AESC Report. This report was developed to help energy efficiency program administrators in New England understand the benefits of their initiatives and is a respected publicly available source on this topic.

There are two steps to calculating the emissions benefit of the Project. The first step is calculating the amount of emissions that will be avoided by the Project and the second step is calculating the value of the avoided emissions. The AESC Report combines these steps and calculates a per kWh benefit for each unit of energy. We have calculated both the amount of emissions expected to be avoided by the Project and the dollar benefit.

A. Avoided Emissions

The supporting spreadsheets to the AESC Report include an estimate of the marginal emissions savings for years 2021-2035 for both CO_2 and NO_x emissions. These are shown below in Table 7 for the years 2024-2035. We assumed the avoided emissions in years 2036+ would be the average per MWh avoided emissions over the years 2031-2035.

Table 7 - Marginal Emissions (lbs./MWh)

	CO_2				NO_X			
	WINTER		SUMMER		WINTER		SUMMER	
	ON PEAK	OFF PEAK	ON PEAK	OFF PEAK	OFF PEAK	OFF PEAK	ON PEAK	OFF PEAK
2024	785	863	761	960	0.10	0.08	0.12	0.10
2025	791	875	807	959	0.07	0.07	0.12	0.10
2026	751	872	767	932	0.07	0.07	0.11	0.09
2027	677	819	755	923	0.06	0.08	0.11	0.09
2028	681	729	759	816	0.07	0.07	0.12	0.09
2029	697	713	747	788	0.08	0.07	0.11	0.08
2030	632	664	727	754	0.06	0.06	0.09	0.07
2031	643	688	718	763	0.06	0.06	0.09	0.07
2032	640	715	681	769	0.06	0.06	0.09	0.07
2033	648	697	732	783	0.06	0.06	0.08	0.07
2034	673	688	746	764	0.06	0.06	0.08	0.07
2035	686	685	755	787	0.06	0.05	0.07	0.06
2036+	658	695	727	773	0.06	0.06	0.08	0.07

Using the figures in Table 7, we determined that the Project would avoid about 57,000 tons of CO_2 and about .15 tons of NO_x over its 30-year life.

B. Avoided CO_2 Emissions Benefit

The AESC Report discussed several methods of valuing the benefits of avoiding carbon emissions:

- **Damage cost.** A damage cost is based on the damage that carbon emissions cause or the marginal abatement cost. This would be approximated by the social cost of carbon ("SCC"). The Biden administration is currently utilizing a SCC methodology in its analysis.
- **Global marginal abatement cost.** This would be the cost to abate carbon on a global scale. The AESC Report equates this to the cost of large-scale carbon capture and storage and estimates the cost at about $92/short ton of carbon equivalent.
- **Electric sector New England marginal abatement costs.** The AESC Report equates this to be equivalent to the cost of offshore wind and estimates this at about $125 per short ton of carbon equivalent.

- **Multi-sector New England marginal abatement costs.** This method assumes a cost of abating carbon in multiple sectors and is based on the future cost trajectory of RNG derived from power to gas technology. The AESC Report gives a value of $493 per short ton of carbon equivalent for this methodology.[10]

Based on our review of these methodologies we determined that a methodology based on the SCC was most applicable to New Hampshire. This decision was primarily based on the fact that the Biden Administration is currently using this methodology.

The federal government first opined on the SCC during the Obama administration. That administration established an Inter-agency Working Group ("IWG") to develop a recommended SCC for the purpose of evaluating benefits and costs of proposed regulatory actions. The IWG issued a technical support document dated August 2016.[11] The report monetized damages associated with CO_2 emissions, including (but not limited to):

- Changes in net agricultural productivity.
- Human health.
- Property damages from increased flood risk.
- Value of ecosystem services due to climate change.[12]

The 2016 IWG report presented a distribution of cost estimates based on a variety of quantified sources of uncertainty, including discount rate. The IWG recommended the central value, or the best point estimate, to be the average of estimates using a 3% discount rate. This average estimate was equivalent to $49 per short ton (2021$) of CO_2 in 2021.

During the Trump administration, the federal IWG was disbanded and the SCC was reduced to $1. In February 2021, the Biden Administration reverted to the Obama era SCC of $49 per short ton in 2021, reconvened the IWG, and began a process to update the SCC by 2022.[13] At this point, the update has not yet been released.

[10] https://www.synapse-energy.com/sites/default/files/AESC%202021_20-068.pdf. Page 172

[11] Interagency Working Group on Social Cost of Greenhouse Gases. August 2016. Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866. Available at https://www.epa.gov/sites/default/files/2016-12/documents/sc_co2_tsd_august_2016.pdf.

[12] Ibid.

[13] https://www.synapse-energy.com/sites/default/files/AESC_2021_Supplemental_Study-Update_to_Social%20Cost_of_Carbon_Recommendation.pdf page 3-4.

Some portion of the social benefit of carbon reduction is already captured in Unitil's avoided energy direct benefit calculation. This is because wholesale energy prices in ISO NE include the cost of Regional Greenhouse Gas Initiative ("RGGI") Allowances. The value of these allowances is subtracted from the SCC to determine the non-embedded CO_2 benefit.

Table 8 - Non-Embedded CO_2 Benefit[14]

	SCC	RGGI COMPLIANCE COST	NON-EMBEDDED BENEFIT
2024	$51.22	$6.93	$44.30
2025	$52.21	$7.26	$44.95
2026	$53.20	$7.62	$45.58
2027	$54.19	$7.99	$46.20
2028	$55.18	$8.38	$46.79
2029	$56.16	$8.79	$47.37
2030	$57.15	$9.22	$47.93
2031	$58.21	$9.67	$48.54
2032	$59.27	$10.15	$49.12
2033	$60.33	$10.64	$49.68
2034	$61.39	$11.16	$50.22
2035	$62.44	$11.71	$50.73

The AESC report provides a spreadsheet that allows the user to select location, CO_2 price assumption preference, etc. The spreadsheet incorporates the marginal emissions rate and non-embedded CO_2 benefit shown in Table 7 and Table 8, respectively. We used this spreadsheet to calculate the CO_2 benefit per kWh over the life of the Project and multiplied this benefit by the expected generation of the Project to calculate the total benefit.

C. Avoided NO_x Emissions Reduction Benefit

We have utilized the NO_x emission benefit as calculated in the 2021 AESC Report. That benefit was $14,700/ton.[15] Similar to the CO_2 benefit, we used the same AESC

[14] AESC User Interface – All-in climate policy, sheet "NonEmbedded_Calcs" 3% SCC case selected. Downloaded here: https://synapseenergyeconomics.app.box.com/s/xl54ic73lox3i6w4g11ygoax2gomdp8g

[15] https://www.synapse-energy.com/sites/default/files/AESC%202021_20-068.pdf, pp. 186-187.

spreadsheet to calculate the NO_x benefit per kWh benefit and multiplied that by the expected project generation.

D. Total Avoided Emissions Benefit

The per-kWh avoided emissions benefit of both CO_2 and NO_x is shown below in Table 9.

Table 9 - Avoided Emissions Benefits ($/kWh)

	Non-Embedded CO_2					Non-Embedded NOx				
	Annual	Winter		Summer		Annual	Winter		Summer	
	Average	On-Peak	Off-Peak	On-Peak	Off-Peak	Average	On-Peak	Off-Peak	On-Peak	Off-Peak
2024	0.01963	0.01846	0.02028	0.01789	0.02256	0.00076	0.00078	0.00066	0.00094	0.00074
2025	0.02066	0.01923	0.02129	0.01962	0.02333	0.00068	0.00059	0.00058	0.00093	0.00077
2026	0.02072	0.01890	0.02194	0.01929	0.02346	0.00066	0.00055	0.00060	0.00089	0.00075
2027	0.02025	0.01762	0.02129	0.01963	0.02401	0.00068	0.00054	0.00062	0.00092	0.00078
2028	0.01973	0.01831	0.01960	0.02040	0.02194	0.00070	0.00063	0.00056	0.00099	0.00075
2029	0.02017	0.01933	0.01979	0.02074	0.02188	0.00069	0.00066	0.00056	0.00094	0.00072
2030	0.01949	0.01809	0.01902	0.02081	0.02161	0.00058	0.00053	0.00050	0.00075	0.00062
2031	0.02046	0.01903	0.02034	0.02124	0.02256	0.00060	0.00056	0.00053	0.00077	0.00064
2032	0.02117	0.01953	0.02182	0.02081	0.02348	0.00063	0.00057	0.00058	0.00078	0.00067
2033	0.02211	0.02040	0.02196	0.02307	0.02466	0.00060	0.00056	0.00054	0.00074	0.00063
2034	0.02296	0.02187	0.02235	0.02424	0.02483	0.00062	0.00060	0.00054	0.00079	0.00064
2035	0.02396	0.02297	0.02294	0.02529	0.02635	0.00058	0.00055	0.00052	0.00071	0.00062
2036	0.02495	0.02409	0.02375	0.02639	0.02737	0.00058	0.00056	0.00053	0.00071	0.00062
2037	0.02599	0.02527	0.02458	0.02754	0.02843	0.00059	0.00056	0.00053	0.00071	0.00061
2038	0.02707	0.02651	0.02544	0.02874	0.02954	0.00059	0.00057	0.00053	0.00070	0.00061
2039	0.02819	0.02780	0.02634	0.03000	0.03068	0.00059	0.00058	0.00053	0.00070	0.00061
2040	0.02937	0.02916	0.02726	0.03131	0.03187	0.00059	0.00058	0.00054	0.00069	0.00061
2041	0.03058	0.03059	0.02822	0.03267	0.03310	0.00059	0.00059	0.00054	0.00069	0.00061
2042	0.03186	0.03208	0.02921	0.03410	0.03438	0.00059	0.00059	0.00054	0.00069	0.00061
2043	0.03318	0.03365	0.03023	0.03559	0.03571	0.00060	0.00060	0.00054	0.00068	0.00060
2044	0.03456	0.03530	0.03129	0.03714	0.03710	0.00060	0.00061	0.00055	0.00068	0.00060
2045	0.03599	0.03702	0.03239	0.03876	0.03853	0.00060	0.00062	0.00055	0.00067	0.00060
2046	0.03749	0.03883	0.03353	0.04045	0.04003	0.00060	0.00062	0.00055	0.00067	0.00060
2047	0.03905	0.04073	0.03471	0.04222	0.04158	0.00060	0.00063	0.00055	0.00067	0.00060
2048	0.04067	0.04273	0.03592	0.04406	0.04319	0.00060	0.00064	0.00056	0.00066	0.00060
2049	0.04236	0.04482	0.03718	0.04598	0.04486	0.00061	0.00064	0.00056	0.00066	0.00060
2050	0.04412	0.04701	0.03849	0.04799	0.04660	0.00061	0.00065	0.00056	0.00065	0.00059
2051	0.04595	0.04931	0.03984	0.05008	0.04840	0.00061	0.00066	0.00057	0.00065	0.00059
2052	0.04786	0.05172	0.04124	0.05227	0.05028	0.00061	0.00067	0.00057	0.00065	0.00059
2053	0.04985	0.05425	0.04268	0.05455	0.05222	0.00061	0.00067	0.00057	0.00064	0.00059
2054	0.05192	0.05690	0.04418	0.05693	0.05424	0.00062	0.00068	0.00057	0.00064	0.00059
2055	0.05407	0.05968	0.04573	0.05941	0.05635	0.00062	0.00069	0.00058	0.00063	0.00059

Multiplying these benefits by the expected output of the Kingston Solar Project yields annual benefits of approximately $112,000 and $4,500 for CO_2 and NO_x, respectively, in 2024. The annual benefits over the life of the Project are shown below in Figure 2.

Discounting these benefits over the life of the project at the Company's WACC yields a NPV of approximately $1.8 Million.

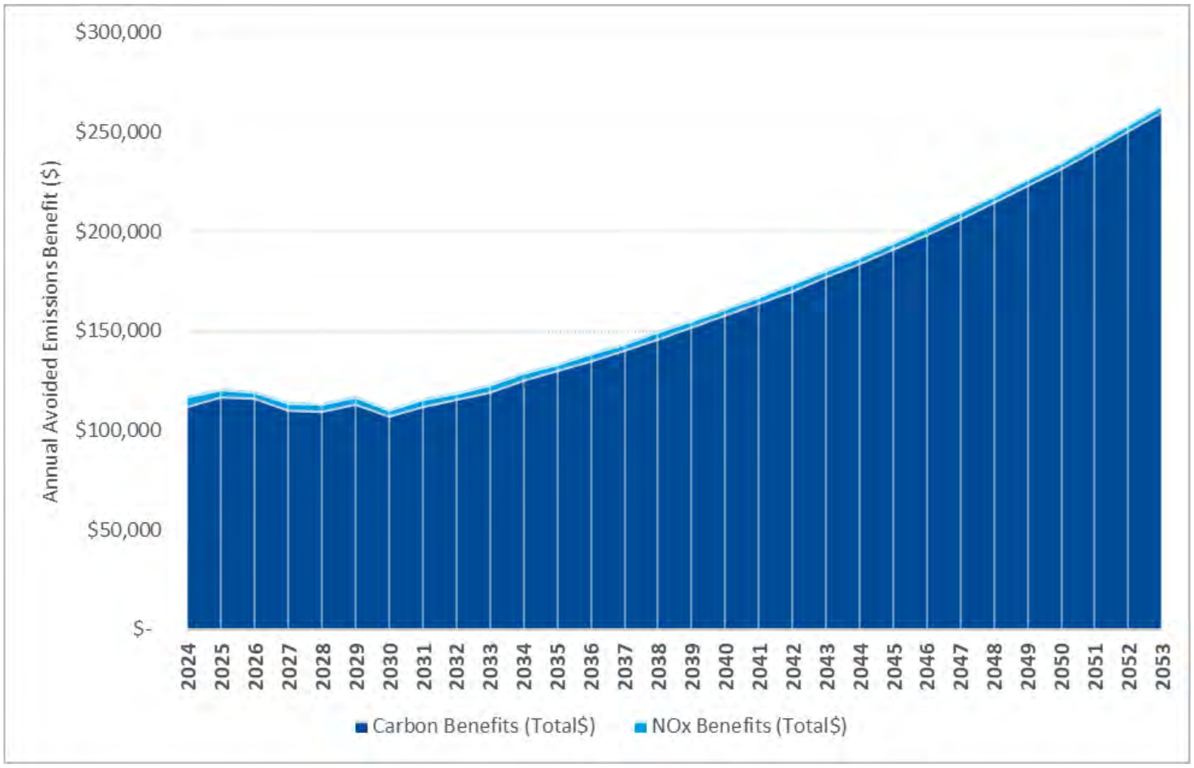

Figure 2: Annual Emissions Benefit ($)

VI. DEMAND REDUCTION INDUCED PRICE EFFECT ("DRIPE") BENEFITS

A. Introduction

Demand Reduction Induced Price Effects, or DRIPE, is the amount of price reduction in the wholesale capacity and energy market resulting from either reduced load or new capacity added. The AESC Report compiled by Synapse every three years estimates DRIPE resulting from energy efficiency measures. The analysis of DRIPE is a very detailed statistical exercise examining the hourly energy market and yearly capacity market supply curves either with actual market data or in hourly energy market simulations. Daymark's DRIPE analysis builds off the AESC DRIPE results for energy efficiency and makes several adjustments for solar. Two aspects of the AESC methodology that were preserved in the Daymark study are that the AESC methodology accounts for the temporal effects of the market price suppression and the estimates for the portion of load in New Hampshire and ISO-NE whose prices do not vary directly with changes in ISO-NE market clearing prices. There were three primary adjustments required to build off the 2021 AESC DRIPE analysis.

1. Capture the impact of the difference in energy, peak demand, and capacity characteristics from operating a load reducer as compared to energy efficiency,
2. Extend the analysis reflecting installations of solar facilities in 2024 rather than two years of energy efficiency which was the focus of the 2021 AESC Report, and
3. Update the DRIPE findings to account for the more current outlooks Daymark developed for the ISO-NE energy and capacity markets.

B. Capturing Impacts of Energy, Peak Demand, and Capacity for Solar

Since solar is an intermittent resource, unlike energy efficiency, several additional factors were accounted for. These included a New Hampshire solar capacity factor, the number of months that solar is allowed in the Forward Capacity Market ("FCM"), and the seasonal ratio of solar generation in the winter versus summer. For the solar capacity factor, the Project-specific solar capacity factor, as provided by Unitil based on vendor response to a preliminary Request for Proposals, was used. This capacity factor was used to discount the capacity DRIPE, since solar is only awarded capacity revenues based on their actual generation, not nameplate (unlike energy efficiency).

We also discounted capacity DRIPE by the number of months that solar typically clears the capacity market. Typically, solar only clears for the designated summer months, which is 4 months total.

For our energy DRIPE calculation, we only included DRIPE from winter and summer peak hours, not off-peak. Since solar does not generate energy overnight, we decided it was more accurate to leave out off-peak effects. We further multiplied the summer and winter peak DRIPE by the ratio of how much solar is produced during winter peak versus summer peak, to account for the fact that the majority of solar output occurs during summer peak hours.

C. Include Effects of Installation in 2024

The AESC report only analyzes the effect of energy efficiency installed for two years. For the purposes of analyzing the effect of the New Hampshire solar project beginning in

2024, the 2024 DRIPE benefits were utilized. As the AESC analysis showed, installing energy efficiency (or in our case, solar) in a single year has price effects that cascade for several years afterwards. The AESC provides more detail on these cascading effects but basically, prices decrease due to a decrease in load. Eventually, both the market and consumer behavior adjust to these lowered prices and the DRIPE effects decay. For the purposes of our analysis, Daymark assumed that the Project will be placed into service in 2024, and used the figures from that year to quantify the DRIPE benefit.

D. Update Energy and Capacity Outlook

The most recent AESC Report was produced in 2021 and utilized pricing for energy that is not reflective of recent market developments, which have led to increased price volatility and overall energy costs. In order to reflect these changes, Daymark updated both the energy and capacity price outlooks using more recent data. This was done by creating a ratio of the prices used in the 2021 AESC Report compared to the current forward pricing. The same methodology was used with the 2021 AESC capacity pricing and the current forward clearing pricing. We substituted these prices into our analysis.

E. Results of DRIPE Analysis

Looking at the benefits of the Project over the lifetime of the project, the overall DRIPE benefit to New Hampshire load is approximately $700,000 nominal or $566,963 NPV as shown on the table below. The DRIPE effect falls off after 8 years due to the above-mentioned cascading effects of DRIPE. If this $700,000 benefit is allocated based on the Project’s contribution to New Hampshire forecast load as laid out in the 2022 CELT Report, the Project would account for a $0.0067/MWh reduction in LMP pricing in New Hampshire.

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Table 10 - Intrastate DRIPE Benefits of Kingston Solar

Intrastate DRIPE Benefits			
	Unitil Solar Project Output (MWh)	DRIPE Benefit ($/MWh)	Benefits to NH Load (Nominal; $)
2024	9,617	15.56	149,675
2025	9,569	12.68	121,316
2026	9,521	10.83	103,155
2027	9,472	11.04	104,591
2028	9,424	7.56	71,220
2029	9,376	7.47	70,081
2030	9,328	6.47	60,395
2031	9,280	3.14	29,145
2032	9,232	-	-
2033	9,184	-	-
2034	9,136	-	-
2035	9,088	-	-
2036	9,040	-	-
2037	8,992	-	-
2038	8,944	-	-
2039	8,895	-	-
2040	8,847	-	-
2041	8,799	-	-
2042	8,751	-	-
2043	8,703	-	-
2044	8,655	-	-
2045	8,607	-	-
2046	8,559	-	-
2047	8,511	-	-
Total:			***709,578***
NPV:			***566,963***

APPENDIX A: DETAILED ECONOMIC BENEFIT RESULTS

Annual Results (2023$ PV)

Description		Total	2022	2023	2024	2025	2026	2027	2028	2029	2030
Direct Impact											
	Employment (Job Years)	54	1	20	20	0	0	0	0	0	0
	Labor Income, PV $	$ 4,901,038	$ 66,049	$2,058,137	$1,822,571	$ 30,964	$ 30,997	$ 31,031	$ 31,064	$ 31,097	$ 31,131
	Output, PV $	$ 5,774,872	$ 127,988	$2,493,778	$2,041,234	$ 36,077	$ 36,116	$ 36,155	$ 36,194	$ 36,233	$ 36,272
Indirect Impact											
	Employment (Job Years)	10	0	4	4	0	0	0	0	0	0
	Labor Income, PV $	$ 748,405	$ 20,872	$ 348,008	$ 290,022	$ 2,905	$ 2,908	$ 2,911	$ 2,914	$ 2,917	$ 2,920
	Output, PV $	$ 1,943,423	$ 47,355	$ 904,593	$ 756,352	$ 7,631	$ 7,639	$ 7,647	$ 7,655	$ 7,663	$ 7,672
Induced Impacts											
	Employment (Job Years)	23	0	9	8	0	0	0	0	0	0
	Labor Income, PV $	$ 1,232,450	$ 18,584	$ 517,694	$ 463,497	$ 7,551	$ 7,559	$ 7,567	$ 7,575	$ 7,583	$ 7,591
	Output, PV $	$ 3,478,635	$ 52,673	$1,460,514	$1,307,557	$ 21,350	$ 21,372	$ 21,395	$ 21,418	$ 21,441	$ 21,464
Total Direct, Indirect, and Induced Impacts											
	Employment (Job Years)	87	1	34	31	0	0	0	1	1	1
	Labor Income, PV $	$ 6,881,893	$ 105,505	$2,923,839	$2,576,090	$ 41,419	$ 41,464	$ 41,508	$ 41,553	$ 41,597	$ 41,642
	Output, PV $	$ 11,196,930	$ 228,015	$4,858,885	$4,105,142	$ 65,058	$ 65,127	$ 65,197	$ 65,267	$ 65,338	$ 65,408

Description		2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Direct Impact											
	Employment (Job Years)	0	0	0	0	0	0	0	0	0	0
	Labor Income, PV $	$ 31,164	$ 31,198	$ 31,231	$ 31,265	$ 31,298	$ 31,332	$ 31,365	$ 36,836	$ 36,743	$ 31,467
	Output, PV $	$ 36,311	$ 36,350	$ 36,389	$ 36,428	$ 36,467	$ 36,506	$ 36,545	$ 42,919	$ 42,810	$ 36,663
Indirect Impact											
	Employment (Job Years)	0	0	0	0	0	0	0	0	0	0
	Labor Income, PV $	$ 2,923	$ 2,926	$ 2,930	$ 2,933	$ 2,936	$ 2,939	$ 2,942	$ 3,448	$ 3,440	$ 2,952
	Output, PV $	$ 7,680	$ 7,688	$ 7,696	$ 7,705	$ 7,713	$ 7,721	$ 7,730	$ 9,055	$ 9,032	$ 7,755
Induced Impacts											
	Employment (Job Years)	0	0	0	0	0	0	0	0	0	0
	Labor Income, PV $	$ 7,599	$ 7,608	$ 7,616	$ 7,624	$ 7,632	$ 7,640	$ 7,649	$ 8,968	$ 8,946	$ 7,673
	Output, PV $	$ 21,488	$ 21,511	$ 21,534	$ 21,557	$ 21,580	$ 21,603	$ 21,626	$ 25,356	$ 25,293	$ 21,696
Total Direct, Indirect, and Induced Impacts											
	Employment (Job Years)	1	1	1	1	1	1	1	1	1	1
	Labor Income, PV $	$ 41,687	$ 41,732	$ 41,777	$ 41,821	$ 41,866	$ 41,911	$ 41,956	$ 49,252	$ 49,128	$ 42,092
	Output, PV $	$ 65,478	$ 65,548	$ 65,619	$ 65,689	$ 65,760	$ 65,831	$ 65,901	$ 77,329	$ 77,135	$ 66,114

Description		2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Direct Impact											
	Employment (Job Years)	0	0	0	0	0	0	1	1	1	1
	Labor Income, PV $	$ 31,500	$ 31,534	$ 31,568	$ 31,602	$ 31,636	$ 31,670	$ 31,704	$ 31,738	$ 31,772	$ 31,806
	Output, PV $	$ 36,703	$ 36,742	$ 36,781	$ 36,821	$ 36,861	$ 36,900	$ 36,940	$ 36,979	$ 37,019	$ 37,059
Indirect Impact											
	Employment (Job Years)	0	0	0	0	0	0	0	0	0	0
	Labor Income, PV $	$ 2,955	$ 2,958	$ 2,961	$ 2,964	$ 2,968	$ 2,971	$ 2,974	$ 2,977	$ 2,980	$ 2,984
	Output, PV $	$ 7,763	$ 7,771	$ 7,780	$ 7,788	$ 7,796	$ 7,805	$ 7,813	$ 7,821	$ 7,830	$ 7,838
Induced Impacts											
	Employment (Job Years)	0	0	0	0	0	0	0	0	0	0
	Labor Income, PV $	$ 7,682	$ 7,690	$ 7,698	$ 7,706	$ 7,715	$ 7,723	$ 7,731	$ 7,739	$ 7,748	$ 7,756
	Output, PV $	$ 21,720	$ 21,743	$ 21,766	$ 21,790	$ 21,813	$ 21,836	$ 21,860	$ 21,883	$ 21,907	$ 21,930
Total Direct, Indirect, and Induced Impacts											
	Employment (Job Years)	1	1	1	1	1	1	1	1	1	1
	Labor Income, PV $	$ 42,137	$ 42,182	$ 42,227	$ 42,273	$ 42,318	$ 42,364	$ 42,409	$ 42,455	$ 42,500	$ 42,546
	Output, PV $	$ 66,185	$ 66,256	$ 66,327	$ 66,398	$ 66,470	$ 66,541	$ 66,613	$ 66,684	$ 66,756	$ 66,828

Description		2051	2052	2053	2054
Direct Impact					
	Employment (Job Years)	1	1	1	1
	Labor Income, PV $	$ 31,841	$ 31,875	$ 31,909	$ 31,943
	Output, PV $	$ 37,099	$ 37,139	$ 37,179	$ 37,218
Indirect Impact					
	Employment (Job Years)	0	0	0	0
	Labor Income, PV $	$ 2,987	$ 2,990	$ 2,993	$ 2,996
	Output, PV $	$ 7,847	$ 7,855	$ 7,864	$ 7,872
Induced Impacts					
	Employment (Job Years)	0	0	0	0
	Labor Income, PV $	$ 7,764	$ 7,773	$ 7,781	$ 7,789
	Output, PV $	$ 21,954	$ 21,978	$ 22,001	$ 22,025
Total Direct, Indirect, and Induced Impacts					
	Employment (Job Years)	1	1	1	1
	Labor Income, PV $	$ 42,592	$ 42,638	$ 42,683	$ 42,729
	Output, PV $	$ 66,899	$ 66,971	$ 67,043	$ 67,115

DAYMARK
ENERGY ADVISORS

Carolyn Gilbert

Managing Consultant

Carrie works closely with policymakers, regulators, renewable energy developers, and large C&I customers engaged in renewable energy markets. She is an expert on state and regional renewable energy policy and economics, and she provides strategic and technical advice to clients pursuing decarbonization and sustainability goals. Carrie has appeared as an expert before regulatory agencies in Arkansas, Maryland, Georgia, North Carolina, and Rhode Island.

INDUSTRY EXPERIENCE

Daymark Energy Advisors | www.daymarkea.com | Portland, ME

Daymark Energy Advisors is a consultancy that bring deep knowledge of energy infrastructure, regulation, and markets to help our clients make well-informed business, capital investment, and policy decisions in the face of uncertainty.

Managing Consultant | 2021–Present
Senior Consultant | 2014–2021
Consultant | 2008–2014
Specialist | 2007–2008

Consulting practice includes:

- Distributed energy resources valuation
- Energy infrastructure and asset valuation
- Renewable energy policy and market forecasting
- Renewable energy contracting, and competitive solicitation processes
- Integrated resource planning
- Cost-benefit analysis, economic evaluations, and investment decision support

Independent Consultant | Boston, MA

Consultant | 2006–2007

Consulting practice included:

- Strategy consulting to Emerging Energy Research, Keystone Strategy, and Esty Environmental Partners

Camp Dresser and McKee, Inc. | Cambridge, MA

Environmental Engineer | 2000–2004

Tellus Institute | Boston, MA

Research Analyst | 1998–2000

TESTIMONY, PRESENTATIONS & PUBLICATIONS

Expert Testimony

FORUM	ON BEHALF OF	MATTER
Arkansas Public Service Commission	Commission General Staff	Reviewed utility power purchase agreement. Docket 22-003-U. Ongoing.
Arkansas Public Service Commission	Commission General Staff	Reviewed utility acquisition of Build Own Transfer Solar Facility Docket 22-013-U. 2022.
Arkansas Public Service Commission	Commission General Staff	Reviewed Green Tariff Proposal Docket 21-054-TF. 2022.
Arkansas Public Service Commission	Commission General Staff	Reviewed utility acquisition of Build Own Transfer Solar Facility Docket 20-067-U. July 2021.
Rhode Island Public Utilities Commission	Rhode Island Division of Public Utilities and Carriers	Review of Purchase of Receivables Program Docket 5073. 2021
Rhode Island Public Utilities Commission	Rhode Island Division of Public Utilities and Carriers	Retail Rate Filing Dockets 5005, 5127, and 5234. 2020 -2022
Rhode Island Public Utilities Commission	Rhode Island Division of Public Utilities and Carriers	Renewable Energy Standard Charge and Reconciliation Filing Dockets 4935, 5096, and 5190. 2020 - 2022.
Federal Energy Regulatory Commission	New England Power Pool	NEPOOL's proposed Offer Review Trigger Prices and Related Tariff Provisions Docket ER21-1637-000. April 2021.
Arkansas Public Service Commission	Commission General Staff	Reviewed utility acquisition of Build Own Transfer Solar Facility Docket 20-052-U. April 2021.
Rhode Island Public Utilities Commission	Rhode Island Division of Public Utilities and Carriers	Ceiling prices for the Renewable Energy Growth program. Dockets 4983, 4774, 4672, 4589-B, 4536-B, and 4983. 2015-2018, 2020.
Arkansas Public Service Commission	Commission General Staff	Reviewed utility acquisition of Build Own Transfer Solar Facility Docket 19-019-U.
Maryland Public Service Commission	Commission Staff	Transforming Maryland's Electric Grid; prepared report *Benefits and Costs of Utility Scale and Behind the Meter Solar Resources in Maryland* and presented in a public hearing session. Docket PC44. April 2019.
Rhode Island Public Utilities Commission	Rhode Island Division of Public Utilities and Carriers	Proposed wind power purchase agreement between National Grid and Copenhagen Wind, LLC. Docket 4574. September, October 2015.
Georgia Public Service Commission	Commission Staff	Georgia Power Company's application for the certification of power purchase agreements for wind resources from Blue Canyon II and Blue Canyon VI wind farms. Docket No. 37854. March 2014.

FORUM	ON BEHALF OF	MATTER
Rhode Island Public Utilities Commission	Rhode Island Division of Public Utilities and Carriers	Proposed wind power purchase agreement between National Grid and Champlain Wind, LLC for the Bowers wind project. Docket 4437. October 2013.
North Carolina Utilities Commission	Southern Environmental Law Center and Environmental Defense Fund	Review and analysis of the proposed registration of Buck and Lee Steam Stations as Renewable Energy Facilities Docket Nos. E-7, sub 939, and E-7, sub 940. June 2010.

Industry Leadership

Maine Climate Council | climatecouncil.maine.gov

On June 26, 2019, the Governor and Legislature created the Maine Climate Council, an assembly of scientists, industry leaders, bipartisan local and state officials, and engaged citizens to develop a four-year plan to put Maine on a trajectory to reduce emissions by 45% by 2030 and at least 80% by 2050. By Executive Order of Gov. Mills, the state must also achieve carbon neutrality by 2045.

Member, Energy Working Group | 2019–Present
The Energy Working Group will evaluate and recommend short- and long-term mitigation strategies to reduce gross and net annual greenhouse gas emissions from Maine's energy sector, as well as evaluate and recommend short- and long-term strategies and actions for adaptation and resiliency to climate change.

Invited Speaker & Conference Presentations

- *Blueprint for a Zero Carbon Economy: Achieving Maine's Climate Goals,* panel moderator for virtual event hosted by the Environmental and Energy Technology Council of Maine (E2Tech), June 2020.
- *Energy Storage: Lessons Learned & Opportunities Ahead,* moderated panel at Renewable Energy Vermont, October 2018.
- *Generation Drivers in New England,* presented at the American Wind Energy Association's (AWEA) Wind Energy Regional Conference 2018 – Northeast, June 2018.
- *The Role of Large-Scale Renewables in Meeting the Region's Carbon Reduction Targets,* presented at the Northeast Energy and Commerce Association's Renewable Energy Conference, February 2018.
- *Financing Infrastructure in New England: Can it be done?,* moderated panel at the Northeast Energy and Commerce Association and the Connecticut Power and Energy Society's 22nd Annual New England Energy Conference and Exposition, May 2015.
- *Incorporating Wind Power in Portfolio Planning*, presented at Renewable Energy Vermont, October 2012.
- *New England Renewable Outlook: 2012 at the Crossroads,* presented at the Northeast Energy and Commerce Association's Renewable Energy Conference, February 2012.

Publications

- *Costs and Benefits of Maine's Net Energy Billing Program,* report prepared for the Coalition for Community Solar Access. March 11, 2021. Lead Author.
- *Alternative Energy Portfolio Standard Review,* report prepared for the Massachusetts Department of Energy Resources. October 30, 2020. Lead Author.
- *Benefits and Costs of Utility Scale and Behind the Meter Solar Resources in Maryland,* report prepared for the Maryland Public Service Commission regarding an independent analysis of the benefits and costs of solar within each investor owned utility's service territory. November 2, 2018. Lead author.
- *Value of Solar Report*, report prepared for the Maryland Public Service Commission regarding an independent assessment of the value of distributed solar in the service territories of the two largest Maryland electric cooperatives, and developing rate design options that facilitate solar development with minimum impact to non-participating ratepayers. February 24, 2017. Lead author.
- *The Economic, Utility Portfolio, and Rate Impact of Clean Energy Development in North Carolina,* report prepared for the North Carolina Sustainable Energy Association. February 15, 2013. Contributing author.
- *NYSERDA's Renewable Portfolio Standard 2013 Program Review Main Tier Evaluation,* prepared for the New York State Energy Research and Development Authority. September 2013. Contributing author.
- *New York solar study: An analysis of the benefits and costs of increasing generation from photovoltaic devices in New York,* prepared for the New York State Energy Research and Development Authority. January 2012. Contributing author.

EDUCATION

M.B.A. | University of Michigan, Ann Arbor, MI | 2006

B.E. Engineering | Dartmouth College, Thayer School of Engineering, Hanover, NH | 1998

B.A. Engineering Sciences, Environmental Earth Sciences | Dartmouth College, Hanover, NH | 1997

DAYMARK
ENERGY ADVISORS

AREAS OF EXPERTISE

Regulatory advisory services

Financial evaluation of energy assets

Rate design

Economic analysis, particularly in the area of cost-benefit and cost-effectiveness testing

Clean energy strategy and policy

BACKGROUND

Daymark Energy Advisors
2019 - Present

Maine International Trade Center
2018

EDUCATION

M.A., Law and Diplomacy
The Fletcher School at Tufts University

B.A., Political Science
University of Maine

Kevin Pierce

Senior Consultant

Kevin works with project developers, utilities, and regulators. He helps clients navigate interconnection processes, facilitates competitive procurement of energy, capacity, and renewable attributes, and supports long-term planning, load forecasting, production cost modeling, and economic impact analysis.

SELECTED EXPERIENCE

- Evaluated the cost effectiveness and deliverability of Efficiency Manitoba's initial 3-year plan as part of the Independent Expert Consultant team.
- Developed a supply and demand model to forecast the price of Connecticut Class II Renewable Energy Credits for the Materials Innovation and Recycling Authority's trash-to-energy generation in order to value their output.
- Previously engaged in an independent corporate separation audit of First Energy's affiliated electric distribution companies operating in Ohio on behalf of the Public Utilities Commission of Ohio (PUCO); initial results include recommendations to both the regulatory commission and First Energy designed to improve reporting and enhance transparency.
- Drafted and filed seasonal cost of gas documentation for Blackstone Gas Company with the Massachusetts Department of Public Utilities as well as preparing monthly compliance filings.
- Analyzed load patterns and authored a load research report as part of a team developing allocated cost of service rate structures for Kaua'i Island Utility Cooperative.
- Operated PCI GenTrader modelling software for Kaua'i Island Utility Cooperative to determine optimal dispatch and fuel costs in support of annual regulatory filings with the Hawaii PUC.
- Developed regression models to perform load forecast modeling for Southern Louisiana Electric Membership Corporation for use in evaluating resource supply options as part of the development of a power supply RFP.
- Assisted the Massachusetts Department of Energy Resources in developing renewable thermal technology models and adoption rate forecasts as part of our assessment of the long-term efficacy of the Massachusetts Alternative Portfolio Standard; as part of this effort, researched the costs of a variety of alternative equipment for thermal heating in order to support the financial model development that assesses the relative benefits of many thermal heating systems.