



MAINE CENTER FOR BUSINESS
AND ECONOMIC RESEARCH

University of Southern Maine

THE ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE NEW ENGLAND CLEAN ENERGY CONNECTION

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Central Maine Power

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ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE NECEC PROJECT

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Substantial employment benefits are expected across New England (Table 1.1). The average annual compensation for jobs created in New England for the first year of the simulation () is \$65,170. Similar to Massachusetts, employment impacts are expected to be spread across the major industry sectors reflecting the overall industrial composition of the New England economy.

Table 1.1: Employment Impacts from Ratepayer Savings, Massachusetts and New England Total

State	Category	Annual average for each period				
Massachusetts	Direct	733	633	404	265	509
	Indirect and Induced	1,597	1,626	1,387	1,151	1,440
	Total Employment	2,330	2,260	1,791	1,416	1,949
New England Total	Direct	1,500	1,324	858	551	1,058
	Indirect and Induced	2,629	2,660	2,233	1,808	2,332
	Total Employment	4,129	3,984	3,091	2,358	3,391

Note: New England total includes Massachusetts. Jobs are reported as the average annual for each 5-year cohort over the 20 year simulation period and as an average annual across the full 20 year period. Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs.

Investments in the NECEC Project transmission infrastructure will have economic impacts primarily affecting Maine during the development and construction phase of the project (Table 1.2).

The average annual compensation for jobs each year varies by whether jobs are concentrated in professional and technical services and management, which tend to pay higher rates of compensation, relative to jobs in construction.

Table 1.2: Employment Impacts in Maine from NECEC Project Transmission Infrastructure Investments

Category	Development		Construction				Total	Annual Average
Construction	-	205	391	1,581	1,582	693	4,453	742
Professional & Technical Svcs	48	18	59	26	18	3	172	29
Management	-	58	119	168	211	26	581	97
Direct Total	48	281	569	1,775	1,811	723	5,206	868
Indirect & Induced	67	252	585	1,517	1,695	824	4,941	824
Total Employment	115	533	1,154	3,292	3,506	1,547	10,147	1,691
Average Annual Compensation	\$51,210	\$41,353	\$45,599	\$40,219	\$42,954	\$46,652	-	-

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Note: Jobs are reported as the average annual supported each year and include full-time and part-time jobs. Average annual compensation includes wages and benefits and is reported in current (nominal dollars).

During project operations, a total of 37 jobs will be supported in Maine over the 20 year project contract period. Of these, an average of 21 jobs per year will directly support the maintenance and operations of the NECEC in Maine over the 20 year contract period and beyond, while 16 jobs will be indirectly supported and induced on average per year.

Other Economic Development Impacts

Gross Domestic Product

The overall economic impacts of the NECEC Project measured by gross domestic product (GDP) are estimated to be significant and robust.⁶ The NECEC Project is estimated to support \$4.2 billion in GDP in Massachusetts and \$6.6 billion in GDP across all of New England during the 20 year operations period [REDACTED]. The project will support \$64 million in GDP in Maine over the development and construction period ([REDACTED]).

Municipal Tax Revenues

Transmission infrastructure investments on the NECEC Project are expected to increase municipal property valuations approximate to the cost of the investment expenditures. Based on existing mill rates and an [REDACTED], a total of \$18 million of additional municipal tax revenue resulting from NECEC Project infrastructure is estimated to be contributed on an annual basis beginning in [REDACTED].⁷ This will largely depend upon the choice made by the municipality, which could alternatively decide to decrease mill rates as a result of additional valuation, or some combination of mill rate reduction and additional tax revenue. Decreased mill rates will provide benefits to property tax owners in the form of lower tax payments. Since transmission infrastructure is located in Maine, these property tax benefits are expected to accrue there. These data are estimates only and will change based on final total capital expenditures of the project.

⁶ Gross domestic product (GDP) is a standard economic measure used to indicate the size of an economy. GDP measures the market value of all final goods and services in the economy, in this case we measure the change or addition to GDP to the Massachusetts and New England economies. GDP in this report are reported in millions of chained 2009 dollars, consistent with US Bureau of Economic Analysis reporting. Dollars can be adjusted to any period using an inflation index, such as the CPI.

⁷ This depends upon when the valuation will kick in and may be different for different municipalities based on municipal assessments. [REDACTED]

[REDACTED] Furthermore, our estimates are based on 2016-2017 the most recent mill rates and state valuations, which will likely change based on circumstances unrelated to the NECEC Project. However, this estimate gives our best approximation of the magnitude and potential tax revenue the NECEC Project may contribute on an annual basis in total.

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE NECEC PROJECT

2. Introduction

2.1. Project Overview

The Global Warming Solutions Act (“the GWSA”) requires the Commonwealth of Massachusetts (“the Commonwealth”) to set and achieve incremental greenhouse gas emissions reduction targets through 2050.⁸ In 2016, the Commonwealth passed the Energy Diversity Act (EDA), which includes amendments to the 2008 Green Communities Act (GCA), establishing Section 83D of Chapter 169. Section 83D (“Section 83D” or “83D”) provides policy directives to procure Clean Energy Generation that assists achieving emissions reduction targets established under the GWSA. Pursuant to the statutory requirements under Section 83D of the Energy Diversity Act, Massachusetts Electric Distribution Companies (“Distribution Companies”),⁹ in collaboration with the Massachusetts Department of Energy Resources (DOER), have issued a request for proposals (RFP) to procure incremental clean energy generation and other environmental attributes, under long-term contracts for an annual amount of electricity of approximately 9.45 GWh. The RFP seeks projects that facilitate the generation of clean energy, including the necessary transmission to deliver the generation to Massachusetts’ ratepayers and other potential customers in New England.

To contribute to these goals, Central Maine Power (CMP) is proposing the NECEC Project that will allow the procurement of renewable hydroelectric power generated in Quebec Province, Canada and facilitate the delivery of electric power to markets in Massachusetts and southern New England (NE).

The project includes approximately 200 miles of new transmission lines (HVDC, 345 kV AC and 115 kV AC), a HVDC converter station and certain upgrades to existing substations.

The additional supply of renewable clean power is expected to provide wholesale electricity cost reductions to Massachusetts and New England ratepayers resulting in significant positive economic benefits to businesses and residential customers over the long term. The economic benefits provided by the NECEC Project will enhance the competitiveness of industry in the Commonwealth and other New England states through lower operating costs which may result in increased investments and profitability. Furthermore, residential ratepayers will have more expendable income due to lower electric bills. This will fundamentally lead to the creation of jobs, increased economic activity, and other benefits for the Commonwealth and New England. In addition, infrastructure investments of the NECEC Project will have similar short-term economic benefits by supporting jobs, additional spending, and increases in tax revenues for associated municipalities in Maine.

⁸ The GWSA requires a reduction of greenhouse gas emissions in the Commonwealth of 80% below 1990 levels by the year 2050.

⁹ The distribution companies include Fitchburg Gas & Electric Light Company d/b/a Unitil, Massachusetts Electric Company and Nantucket Company d/b/a National Grid, and NSTAR Electric Company and Western Massachusetts Electric Company d/b/a Eversource, all investor-owned electric distribution companies serving customers in Massachusetts. In addition, Massachusetts may also consider participation in procurement by other New England states. As of the date of the RFP, both Rhode Island and Connecticut have expressed interest in considering potential projects under the RFP.

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Section 83D of the GCA requires that a proposed project demonstrate the creation of additional employment and economic development opportunities in Massachusetts.¹⁰ The RFP submission instructions outlining the components that should address the “Contribution to employment and economic development and other direct and indirect benefits” detailed in the RFP under Section 13 of the submission instructions are included reported in Appendix A.¹¹

To evaluate the contribution to employment and economic development of the NECEC Project, CMP commissioned the Maine Center for Business and Economic Research (MCBER) at the University of Southern Maine (USM) to carry out an evaluation of those potential economic benefits. The goals of this analysis are outlined in the next section and are derived directly from the RFP submission instructions outlined in the RFP.

¹⁰ RFP page 28, Section 2.2.2.9.

¹¹ RFP page B21-22. We exclude Section 13.5 (A) in the RFP Submission Instructions as it is assumed these impacts are addressed elsewhere in the proposal response and are in regard to winter price spikes and delivery. We also exclude Section 13.4 which instructs to address factors listed in Section 2.2.2.9. not addressed elsewhere in the response. All pertinent factors identified in Section 2.2.2.9. of the RFP are discussed here. Section 13.5 (B) regarding impacts to low-income populations is not applicable.

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3. Estimation Methodology

3.1. Estimation Overview

The employment and economic development impacts of the NECEC Project were estimated using economic models of the Massachusetts and New England state economies developed by Regional Economic Models Inc. (REMI), a Massachusetts company based in Amherst.¹² Including a wide range of policy variables, the REMI model provides a comprehensive representation of regional economies and is considered among the most sophisticated economic models available for simulating the effects of complex economic events over time. The REMI model provides a number of advantages over other types of methods that are based primarily on input-output models, such as IMPLAN or the US BEA RIMS II. Most input-output models are static, in that impacts are based on a point in time. However, economies are complex and driven by constantly changing factors. The REMI model allows simulations of these interconnected factors in a dynamic fashion by incorporating aspects of four modeling approaches that include General Equilibrium, Econometric, Economic Geography and Input-Output.¹³ Simulations of economic events or policy changes are compared against a control forecast to determine the differences, which we interpret as the “impacts.” MCBER has maintained and employed the REMI model across a wide range of economic studies for over 20 years.

Impacts are reported in two primary components 1) those resulting from the development, construction, and operations maintenance of NECEC Project transmission infrastructure, and 2) impacts resulting from electricity cost savings to ratepayers during generation and operations of the project. Impacts are reported by geography and location. Specifically, we break down simulations and report on impacts based on the following:

Component 1: Employment and Economic Impacts from Ratepayer Electricity Cost Reductions

- Operation phase generation impacts from LMP reductions (Massachusetts and New England wide)

Component 2: Employment Impacts from NECEC Project Transmission Infrastructure Investments

- Development and project planning expenditures (based in Maine)
- Construction expenditures (based in Maine)
- Operations and maintenance (based in Maine)

Component 1: Employment and Economic Impacts from Ratepayer Electricity Cost Reductions

Component 1 is focused on the employment and economic impacts resulting from electricity cost reductions to ratepayers. We analyze impacts across three major energy sectors: commercial, industrial, and residential. These impacts from electricity cost reductions are expected to produce the most widespread and

¹² This analysis uses two sets of REMI PI+ (Policy Insight) models based on Version 2.1, the most recent version available. The first set is a 6 region, 20-sector model of the 6 New England States, procured from REMI to undertake this analysis. The number of sectors refers to the level of industry detail included in the model. The 20-sector model includes all major industry sectors (plus state and local government) and are reported on in this report. The second set of models is a 7 region model of the Maine economy in which the regions are based on aggregates of the state’s 16 counties. These models are maintained by MCBER and USM and used primarily to estimate impacts resulting from the development, construction, and operation expenditures of the NECEC Project.

¹³ For more information on the REMI PI+ models visit <http://www.remi.com/products/pi>.

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permanent impacts of the NECEC Project extending over the 20 project period. The employment and economic development impacts of energy cost savings are modeled for the Commonwealth of Massachusetts and for each of the New England states. While we model the wholesale electricity cost savings to customers in each of the New England states, the REMI model captures indirect and induced spending impacts that may occur across state lines. For instance, direct impact in Massachusetts will result in indirect and induced benefits in other New England states and vice versa.

[REDACTED]

This analysis does not account for direct contract benefits that may be above and beyond the costs of the contract to ratepayers and assumes that direct contract benefits are exactly equivalent to contract costs. This assumption is conservative because the direct contract benefits of the NECEC Project are likely to exceed direct contract costs. For that reason, the analysis presented here may understate, perhaps substantially, the employment and related economic benefit of the NECEP Project related to wholesale electricity cost reductions.

[REDACTED]

The employment and other economic development impacts or ratepayer cost savings are modeled beginning in [REDACTED] and are estimated for 20 years through [REDACTED]. Energy cost savings by year are simulated as reductions in electricity productions costs for both the commercial and industrial sectors in the REMI model and are entered as nominal amounts. Residential sector savings are entered as reductions in consumer spending on electricity in the residential sector by year and are entered as nominal amounts.

Component 2: Employment Impacts from NECEC Transmission Infrastructure Investments

For simulations under component 2, detailed data on expenditures for the development and construction of the transmission line and facility upgrades and estimated jobs to support operations and maintenance were

¹⁴ [REDACTED]

¹⁵ [REDACTED]

¹⁶ The transportation sector is excluded from this analysis given the minimal share the transportation sector comprises of most state electricity profiles.

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provided by CMP and the project team. A significant portion of total project capital investment will be made directly in the state of Maine where transmission infrastructure will be developed. Expenditures on substations and other reactive device equipment not built in Maine are excluded from the analysis because they are assumed to have no direct employment impact in the state. However, labor associated with their installation and maintenance is included in the Maine based expenditures.

⁷ Expenditures during development and construction are modeled as ‘exogenous industry sales’ in the REMI model for each respective year and industry, while we model the estimated number of direct jobs to support operations and maintenance. Simulation impacts are reported by the regions in the Maine REMI model maintained by MCBER.

3.2. Evaluation Criteria

Pursuant to submission instructions criteria provided in the RFP, this analysis provides an estimation of the economic development benefits of the NECEC Project for each of the simulations above for the following measures of the project across the operations, construction, and development periods of the project:

- Direct employment
- Indirect and induced employment
- General description of types of jobs
- Average annual compensation of jobs
- Industry and location of jobs
- Other economic development impacts include GDP and municipal tax revenues

Direct employment impacts include initial rounds of spending relating to project investments (primarily during development and construction) and/or cost savings from electricity price (LMP) reductions by businesses. Indirect impacts result from additional rounds of spending that occur by those businesses on purchases of materials, supplies, and services from other businesses that support production and operations activities. Impacts from workers and residential customer spending are primarily captured within the induced impacts, or ‘local consumption demand’ that occurs when people spend money in the local economy on goods and services, such as food, housing, and other goods and services, which in turn support other jobs in the economy. We also simulate and report on the industry sectors in which jobs will likely be created and supported throughout the project, which largely reflect the existing and forecasted industry composition of each region. Employment reported here is comprised of the number of jobs, both full-time and part-time, and includes wage and salaried employees, sole proprietors, and active partners. The REMI model, like other input-output models, counts full-time and part-time jobs with equal weight.

Other economic development impacts are reported on two measures typically standard in impact studies: gross state product, a measure of all final goods and services in a region and a standard measure of overall economic activity; and personal income, a measure of total compensation supported by the NECEC Project. Total compensation should not be interpreted as ‘in addition to’ GDP. GDP is measured as the ‘value added’ in a region calculated as total sales or output minus the cost/sales of intermediate inputs. Personal income is a broad measure that captures income received by persons from all sources, included income received from participation in production, as well as business and government transfer payments.

¹⁷ Transmission infrastructure expenditures are reported in Table B-1 in Appendix B.

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4. Employment and Economic Development Impacts from Ratepayer Savings

4.1. Contribution to Employment

The addition of NECEC Project generation will provide benefits to ratepayers which will have significant economic development impacts felt primarily in Massachusetts, but also in all New England States, extending well into the future. Our estimation considered impacts over a 20 year period and are summarized in 5 year annual average increments and an annual average for the entire simulation period.

Table 4.1 presents the impacts broken down by direct, indirect, and induced employment. In the Commonwealth, total employment over the 20 year forecast period is estimated to average 1,949 jobs per year, of which 509 are expected to be direct and another 1,440 indirect and induced. Impacts are estimated to average the highest over the first five years of the simulation period (██████) at 2,330 jobs per year supported. The average annual compensation of these jobs based on the first year of the simulation (██████) is \$72,900.¹⁸

The total employment impact for all New England states is estimated to support an average of 3,391 jobs per year over the 20 year forecast period (Table 4.1).¹⁹ The average annual compensation for jobs created in New England for the first year of the simulation (██████) is \$65,170.

Table 4.1: Massachusetts and New England Employment Impacts from Ratepayer Savings

State	Category	Annual average for each period				
		██████	██████	██████	██████	██████
Massachusetts	Direct	733	633	404	265	509
	<u>Indirect and Induced</u>	<u>1,597</u>	<u>1,626</u>	<u>1,387</u>	<u>1,151</u>	<u>1,440</u>
	Total Employment	2,330	2,260	1,791	1,416	1,949
New England Total	Direct	1,500	1,324	858	551	1,058
	<u>Indirect and Induced</u>	<u>2,629</u>	<u>2,660</u>	<u>2,233</u>	<u>1,808</u>	<u>2,332</u>
	Total Employment	4,129	3,984	3,091	2,358	3,391

Note: New England total includes Massachusetts. Jobs are reported as the average annual for each 5-year cohort over the 20 year simulation period and as an average annual across the full 20 year period. Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs.

Employment impacts are expected to have different effects across industry sectors depending on production inputs and other differences in business operations. Table 4.2 illustrates the total employment impacts by major industry sector in Massachusetts.²⁰ The largest share of employment impacts are expected in healthcare and retail trade. The utilities sector shows an average loss of jobs across the simulation period, although small. The models interpret the reduction in spending in the sector, resulting from ratepayer cost savings, which will result in a small decline in employment in the industry.

¹⁸ Annual compensation includes wages and salaries and worker benefits and is a blended rate between full-time and part-time jobs. Dollars reported in current (nominal).

¹⁹ State breakdown of employment impacts for each New England state are reported in Table B-2 in Appendix B.

²⁰ Industry employment impacts for all of New England are reported in Table B-3 in Appendix B.

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Table 4.2: Massachusetts Private Sector Industry Employment, Average per Period

Category	Annual average for each period				
Health Care and Social Assistance	344	352	311	271	319
Retail Trade	294	298	251	207	262
Construction	386	231	61	(7)	168
Accommodation and Food Services	162	174	145	111	148
Manufacturing	127	151	138	116	133
Other Services, except Public Administration	160	149	122	99	133
Professional, Scientific, and Technical Services	120	128	112	98	115
Administrative and Waste Management Services	100	100	82	65	87
Finance and Insurance	88	83	72	65	77
Real Estate and Rental and Leasing	97	87	59	37	70
Arts, Entertainment, and Recreation	70	68	56	44	60
Wholesale Trade	64	67	58	49	59
Educational Services; private	78	66	38	13	49
Transportation and Warehousing	52	53	47	42	49
Information	40	41	36	31	37
Management of Companies and Enterprises	27	31	29	26	28
Forestry, Fishing, and Related Activities	5	5	5	5	5
Mining	2	2	2	1	2
Utilities	(24)	(23)	(20)	(18)	(21)
All Industries	2,193	2,063	1,605	1,255	1,779

Note: Employment reported in job years. Includes only private sector employment and does not include state and local government employment, which averaged about 210 jobs over the 20 year period.

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4.2. Other Economic Contributions

Accompanying employment impacts, the NECEC Project is expected to support significant overall economic activity in the Commonwealth and New England measured by gross domestic product (GDP)²¹ and total compensation (Table 4.3).²²

Table 4.3: Other Economic Development Impacts in Massachusetts and New England from Ratepayer Savings

State	Category	Annual average for each period				
Massachusetts	GDP (M\$)	\$218.5	\$257.1	\$251.7	\$245.5	\$243.2
	Total Compensation (M\$)	\$195.6	\$233.6	\$219.3	\$204.3	\$213.2
New England	GDP (M\$)	\$365.1	\$432.2	\$421.3	\$406.9	\$406.4
Total	Total Compensation (M\$)	\$309.8	\$369.0	\$341.0	\$308.3	\$332.0

Note: GDP in millions of chained 2009 dollars. Total compensation reported in millions of current (nominal) \$ and includes wages and benefits.

²¹ Gross domestic product (GDP) is a standard economic measure used to indicate the size of an economy of economic activity. GDP measures the market value of all final goods and services in the economy. In this case we measure the change or addition to GDP to the Massachusetts and New England economies.

²² State breakdown of GDP and total compensation impacts for all New England states are reported in Table B-4 in Appendix B.

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5. Employment and Economic Impacts of NECEC Project Transmission Expenditures

5.1. Employment Contributions

Capital expenditures made to build the NECEC Project, as well as ongoing maintenance during operations, will have significant economic impacts. Since NECEC Project infrastructure will be based in Maine, the associated impacts resulting from capital expenditures during the development, construction, and operations maintenance will occur in Maine. For that reason, all impacts reported in this section are estimated to occur in Maine.

We report employment impacts during development and construction first and report operational maintenance jobs separately.

Table 5.1 shows the employment and economic development impacts estimated to occur during the project development and construction.²³

Table 5.1: Employment and Economic Impacts during Development and Construction

Category	Development		Construction				Total	Annual Average
Construction	-	205	391	1,581	1,582	693	4,453	742
Professional & Technical Svcs	48	18	59	26	18	3	172	29
Management	-	58	119	168	211	26	581	97
Direct Total	48	281	569	1,775	1,811	723	5,206	868
Indirect & Induced	67	252	585	1,517	1,695	824	4,941	824
Total Employment	115	533	1,154	3,292	3,506	1,547	10,147	1,691
Average Annual Compensation	\$51,210	\$41,353	\$45,599	\$40,219	\$42,954	\$46,652	-	-

Note: Jobs are reported as the average annual supported each year and include full-time and part-time jobs. Average annual compensation includes wages and benefits and is reported in current (nominal dollars).

Direct spending is estimated to support 4,877 jobs and additional 4,622 indirectly and induced over the four-year period.

Average annual compensation during construction is shown in Table 5.1.

²³ The economic impacts by region in Maine based on the regions in the REMI model are reported in Table B-5 in Appendix B.

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During project operations, a total of 37 jobs will be supported in Maine over the 20 year project contract period. Of these, an average of 21 jobs per year will directly support the maintenance and operations of the NECEC in Maine over the 20 year contract period and beyond, while 16 jobs will be indirectly supported and induced on average per year.

5.2. Other Economic Contributions

In addition to the employment impacts, infrastructure investments are expected to support approximately \$564 million in GDP²⁴ over the development and construction periods. Likewise, total compensation is estimated to total \$436 million over the 6 year period (Table 5.2). Total GDP supported during the operations and maintenance phase of the project is estimated to total \$134 million over the 20 year project period (██████████).

Table 5.2: Other Economic Contributions of Infrastructure Investments

Category	Development		Construction				Total	Annual Average
	██████████	██████████	██████████	██████████	██████████	██████████		
GDP (Millions \$)	\$8.8	\$30.0	\$69.0	\$177.4	\$194.2	\$85.3	\$564.8	\$94.1
Total Compensation (Millions \$)	\$5.9	\$22.0	\$52.6	\$132.4	\$150.6	\$72.2	\$435.7	\$72.6

Note: GDP in millions of chained 2009 dollars. Total compensation reported in millions of current (nominal) \$ and includes wages and benefits.

Municipal Tax Revenues

Transmission infrastructure investments on the NECEC Project are expected to increase municipal property valuations approximate to the cost of the investment expenditures. Based on existing mill rates and an ██████████, a total of \$18 million of additional municipal tax revenue resulting from NECEC Project infrastructure is estimated to be contributed on an annual basis ██████████. ²⁵ This will largely depend upon the choice made by the municipality, which could alternatively decide to decrease mill rates as a result of additional valuation, or some combination of mill rate reduction and additional tax revenue. Decreased mill rates will provide benefits to property tax owners in the form of lower tax payments. Since transmission infrastructure is located in Maine, these property tax benefits are expected to accrue there. These data are estimates only and will change based on final total capital expenditures of the project.

²⁴ GDP is reported in chained 2009 dollars.

²⁵ This depends upon when the valuation will kick in and may be different for different municipalities based on municipal assessments. We use the first year of NECEC Project operations as a proxy. Furthermore, our estimates are based on 2016-2017 the most recent mill rates and state valuations, which will likely change based on circumstances unrelated to the NECEC Project. However, this estimates gives our best approximation of the magnitude and potential tax revenue the NECEC Project may contribute on an annual basis in total.

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6. Appendix A

RFP Language Regarding Employment and Economic Development Impacts

13. CONTRIBUTION TO EMPLOYMENT AND ECONOMIC DEVELOPMENT AND OTHER DIRECT AND INDIRECT BENEFITS

13.1 Please provide an estimate of the number of jobs to be created directly during project development and construction (for a project that includes new facilities or capital investment), and during operations, and a general description of the types of jobs created, estimated annual compensation, the employer(s) for such jobs, and the location. Please treat the development, construction, and operation periods separately in your response.

13.2 Please provide the same information as provided in response to question 13.1 above but with respect to jobs that would be indirectly created as a result of the proposed project.

13.3 Please describe any other economic development impacts (either positive or negative) that could result from the proposed project, such as creating property tax revenues or purchasing capital equipment, materials or services for New England businesses. Please provide the location(s) where these economic development benefits are expected to occur.

13.4 To the extent not already specified elsewhere in your response, please address the factors listed in Section 2.2.2.9 and describe any benefits or impacts associated with the proposed project.

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7. Appendix B

Table B.1: NECEC Project Transmission Infrastructure Expenditures in Maine

Direct Expenditure Category	Project						
	Total						
Development and Planning Phase	\$7.2	\$7.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Construction Phase	\$554.7	\$0.0	\$29.9	\$66.5	\$183.5	\$198.3	\$76.5
Total	\$561.9	\$7.2	\$29.9	\$66.5	\$183.5	\$198.3	\$76.5

Note: In millions of \$.

Table B-2: Employment Impacts from Ratepayer Savings for New England States

State	Category	Annual average for each period				
Massachusetts	Direct	733	633	404	265	509
	Indirect and Induced	1,597	1,626	1,387	1,151	1,440
	Total Employment	2,330	2,260	1,791	1,416	1,949
Connecticut	Direct	246	217	142	86	173
	Indirect and Induced	391	377	300	222	322
	Total Employment	636	594	442	308	495
Maine	Direct	127	115	72	43	89
	Indirect and Induced	192	198	167	135	173
	Total Employment	319	313	240	179	262
New Hampshire	Direct	197	174	113	77	141
	Indirect and Induced	206	206	166	131	177
	Total Employment	404	381	279	208	318
Rhode Island	Direct	126	115	83	58	95
	Indirect and Induced	162	167	142	116	147
	Total Employment	288	281	225	174	242
Vermont	Direct	72	69	43	21	51
	Indirect and Induced	81	87	72	53	73
	Total Employment	153	156	115	74	125
New England Total	Direct	1,500	1,324	858	551	1,058
	Indirect and Induced	2,629	2,660	2,233	1,808	2,332
	Total Employment	4,129	3,984	3,091	2,358	3,391

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE NECEC PROJECT

Table B-3: Summary of New England Industry Employment, Average per Period

Category	Annual average for each period				
Health Care and Social Assistance	592	603	526	448	542
Retail Trade	571	570	469	373	496
Construction	690	399	77	(58)	277
Accommodation and Food Services	304	327	270	201	275
Other Services, except Public Administration	303	283	232	187	251
Manufacturing	241	287	260	215	251
Professional, Scientific, and Technical Services	189	199	172	147	177
Administrative and Waste Management Services	174	175	141	108	149
Finance and Insurance	147	139	120	107	128
Real Estate and Rental and Leasing	171	149	96	53	117
Arts, Entertainment, and Recreation	125	122	100	78	106
Wholesale Trade	110	114	98	81	101
Transportation and Warehousing	85	88	78	70	80
Educational Services; private	113	91	45	3	63
Information	59	60	52	43	54
Management of Companies and Enterprises	46	54	50	44	49
Forestry, Fishing, and Related Activities	12	14	13	11	13
Mining	4	4	3	2	3
Utilities	(58)	(54)	(47)	(41)	(50)
All Industries	3,879	3,626	2,755	2,073	3,083

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE NECEC PROJECT

Table B-4: Other Economic Development Impacts for New England from Electricity Cost Reductions

State	Category	Annual average for each period				
		2010-2014	2015-2019	2020-2024	2025-2029	2030-2034
Massachusetts	Employment	2,330	2,260	1,791	1,416	1,949
	GDP (M\$)	\$218.5	\$257.1	\$251.7	\$245.5	\$243.2
	Total Compensation (M\$)	\$195.6	\$233.6	\$219.3	\$204.3	\$213.2
Connecticut	Employment	636	594	442	308	495
	GDP (M\$)	\$59.4	\$70.0	\$67.9	\$63.8	\$65.3
	Total Compensation (M\$)	\$46.6	\$54.3	\$48.5	\$40.3	\$47.4
Maine	Employment	319	313	240	179	262
	GDP (M\$)	\$20.5	\$25.3	\$24.7	\$23.9	\$23.6
	Total Compensation (M\$)	\$16.1	\$19.5	\$17.7	\$15.4	\$17.2
New Hampshire	Employment	404	381	279	208	318
	GDP (M\$)	\$32.0	\$37.4	\$35.2	\$33.6	\$34.6
	Total Compensation (M\$)	\$25.6	\$30.3	\$26.8	\$23.7	\$26.6
Rhode Island	Employment	288	281	225	174	242
	GDP (M\$)	\$25.1	\$29.3	\$28.9	\$28.1	\$27.9
	Total Compensation (M\$)	\$18.5	\$22.0	\$20.7	\$18.8	\$20.0
Vermont	Employment	153	156	115	74	125
	GDP (M\$)	\$9.6	\$13.0	\$12.9	\$12.0	\$11.9
	Total Compensation (M\$)	\$7.3	\$9.4	\$8.1	\$5.9	\$7.7
New England Total	Employment	4,129	3,984	3,091	2,358	3,391
	GDP (M\$)	\$365.1	\$432.2	\$421.3	\$406.9	\$406.4
	Total Compensation (M\$)	\$309.8	\$369.0	\$341.0	\$308.3	\$332.0

GDP in millions of chained 2009 dollars. Total compensation reported in millions of current (nominal) \$.

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE NECEC PROJECT

Table B-5: Employment and Economic Development Impacts during Development and Construction Expenditures of the NECEC Project, by Maine Region

REMI Region	Category							Total	Annual Average
Androscoggin-Franklin-Oxford	Employment	4	350	505	1,152	1,316	690	4,017	669
	GDP (M\$)	\$0.2	\$16.6	\$25.1	\$56.2	\$65.4	\$32.7	\$196.2	\$32.7
	Total Compensation (M\$)	\$0.2	\$12.6	\$20.0	\$45.4	\$55.1	\$30.4	\$163.6	\$27.3
Cumberland	Employment	99	76	347	440	379	140	1,482	247
	GDP (M\$)	\$7.9	\$6.0	\$24.1	\$31.0	\$28.4	\$11.6	\$109.0	\$18.2
	Total Compensation (M\$)	\$5.4	\$4.2	\$18.4	\$24.0	\$22.2	\$9.6	\$83.8	\$14.0
Kennebec-Somerset	Employment	2	59	185	743	919	511	2,419	403
	GDP (M\$)	\$0.1	\$4.5	\$12.6	\$43.2	\$54.6	\$29.0	\$144.1	\$24.0
	Total Compensation (M\$)	\$0.1	\$3.3	\$9.4	\$32.0	\$41.5	\$22.5	\$108.7	\$18.1
Waldo-Knox/Lincoln-Sagadahoc	Employment	3	31	70	835	752	132	1,823	304
	GDP (M\$)	\$0.1	\$1.9	\$4.3	\$39.3	\$36.9	\$7.3	\$89.7	\$15.0
	Total Compensation (M\$)	\$0.1	\$1.4	\$3.2	\$26.4	\$26.4	\$6.5	\$63.9	\$10.7
Maine Residual	Employment	7	18	47	122	140	73	407	68
	GDP (M\$)	\$0.4	\$1.1	\$2.9	\$7.7	\$8.9	\$4.8	\$25.8	\$4.3
	Total Compensation (M\$)	\$0.2	\$0.6	\$1.7	\$4.6	\$5.5	\$3.2	\$15.8	\$2.6

GDP in millions of chained 2009 dollars. Personal income reported in millions of current (nominal) \$. "Maine Residual" refers to indirect and induced impacts that occur in other REMI model regions of Maine not listed in the summary table. REMI regions include York, Aroostook, and Hancock-Washington/Penobscot-Piscataquis.