



MAINE CENTER FOR BUSINESS
AND ECONOMIC RESEARCH

University of Southern Maine

THE ECONOMIC AND EMPLOYMENT
CONTRIBUTIONS OF THE
MAINE CLEAN POWER CONNECTION

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Central Maine Power

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ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE MCPC PROJECT

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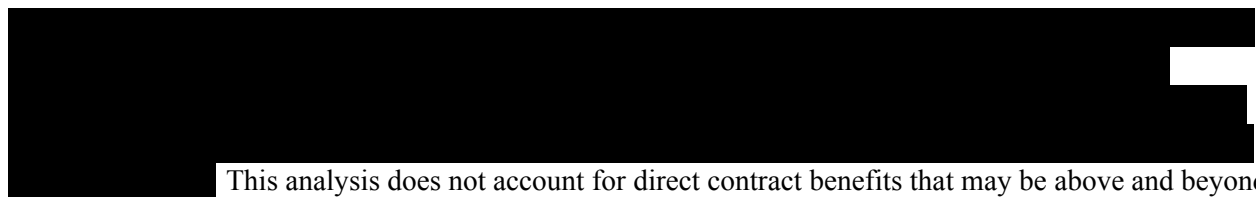
1. Executive Summary

In response to a request for proposals (RFP) by the Massachusetts Department of Energy Resources and Massachusetts Electric Distribution Companies, Central Maine Power is proposing the Maine Clean Power Connection (MCPC) project which will expand transmission system capabilities across central Maine to facilitate the reliable access of clean energy to markets in New England. The development, construction, and operations of the MCPC will support significant employment and other economic development impacts in Massachusetts as well as all other New England states.¹

CMP commissioned the Maine Center for Business and Economic Research (MCBER) at the University of Southern Maine to estimate the employment and other economic development impacts provided by the MCPC Project in direct response to the submission instructions and requirements outlined in the RFP.² MCBER uses common modeling methodology to simulate the economic impacts of the MCPC Project by employing economic models of the Massachusetts and New England state economies developed by Regional Economic Models Inc. (REMI). The report that follows presents the results of our analysis and the methodology employed to simulate the employment and economic impacts. Because the RFP response is directed at the Commonwealth of Massachusetts (“the Commonwealth”), our presentation of results focuses on the impacts in the Commonwealth. However, we also provide results of impacts estimated to occur in other New England states from cost savings to ratepayers and from investments in transmission infrastructure, the latter of which will primarily occur in Maine.

Summary of Employment Impacts

The reduction in wholesale electricity costs paid by ratepayers in Massachusetts and New England is expected to provide significant benefits to business and residential customers. The employment impacts as a result of the reduction in electricity costs of the MCPC Project in Massachusetts are presented in Table 1.1, which shows annual averages for the respective periods.³ The average annual compensation of these jobs based on the first year of the service (██████) is \$70,214.⁴ Jobs will be created across virtually all major industry sectors with the health care, retail trade, manufacturing, accommodations and food services, and professional, scientific, and technical services sectors experiencing the largest average employment gains.⁵



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

¹ The other New England states include Connecticut, Maine, New Hampshire, Rhode Island, and Vermont.

² Information on the employment and economic development impacts requested is described in Section 13 of the RFP under submission instructions. Sections 13.4 and 13.5 are not relevant to this analysis and are not include here.

³ Employment reported as the number of jobs ‘supported’ in each year. Employment includes full-time and part-time jobs treated with equal weight.

⁴ 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).

⁵ Specific industry sector employment is reported in Section 3 of this report.

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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 \$62,933. 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	349	189	121	129	190
	Indirect and Induced	750	520	487	465	544
	Total Employment	1,100	710	608	594	734
New England Total	Direct	711	403	264	265	396
	Indirect and Induced	1,230	855	790	737	882
	Total Employment	1,941	1,259	1,054	1,002	1,278

Note: New England total includes Massachusetts. Jobs are reported as the average annual for each 5-year cohort over the 21 year simulation period and as an average annual across the full 21 year period. Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs.

Investments in the MCPC 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 MCPC Project Transmission Infrastructure Investments

Category	Development		Construction				Total	Annual Average
Construction	-	4	166	2,561	952	-	3,682	614
Professional & Technical Svcs	28	49	81	40	6	-	204	34
Management	-	79	140	119	105	8	450	75
Direct Total	28	132	387	2,720	1,062	8	4,337	723
Indirect & Induced	39	186	477	2,184	1,185	267	4,337	723
Total Employment	66	318	864	4,904	2,247	276	8,674	1,446
Average Annual Compensation	\$51,209	\$53,599	\$49,770	\$38,803	\$44,067	\$70,856	-	-

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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 9 jobs will be supported in Maine over the 21 year project contract period. Of these, an average of 5 jobs per year will directly support the maintenance and operations of the MCPC in Maine over the 21 year contract period and beyond, while and estimated 4 jobs will be indirectly supported and induced on average per year.

Other Economic Development Impacts

Gross Domestic Product

The overall economic impacts of the MCPC Project measured by gross domestic product (GDP) are estimated to be significant and robust.⁶ The MCPC Project is estimated to support \$1.9 billion in GDP in Massachusetts and \$3.2 billion in GDP across all of New England during the 21 year operations period [REDACTED]. The project will support \$485 million in GDP in Maine over the development and construction period ([REDACTED]).

Municipal Tax Revenues

Transmission infrastructure investments on the MCPC Project are expected to increase municipal property valuations approximate to the cost of the investment expenditures. Based on existing mill rates and an [REDACTED], approximately \$12 million of additional municipal tax revenue resulting from MCPC 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] Furthermore, our assumptions are based on 2016-2017 the most recent mill rates and state valuations, which will likely change based on circumstances unrelated to the MCPC Project. However, this estimates gives our best approximation of the magnitude and potential tax revenue the MCPC Project may contribute on an annual basis in total.

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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 Maine Clean Power Connection (MCPC) Project that will expand the transmission system capabilities across central Maine to facilitate the transport of up to 1,110MW of clean, renewable power generated in Maine to markets in New England.

The total transmission corridor extends from Skinner Township near the Canadian border to Lewiston, ME, with investments slated for new transmission lines (345 kv), new substations, and upgrades to existing lines and 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 MCPC 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 MCPC 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 MCPC 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 MCPC 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 MCPC 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 MCPC 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 MCPC 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 MCPC Project extending over the 21 year 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 assumption is conservative because the direct contract benefits of the MCPC 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 21 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 MCPC 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.

¹⁷ 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 MCPC 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 MCPC 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 MCPC 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 21 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 21 year forecast period is estimated to average 734 jobs per year, of which 190 are expected to be direct and another 544 indirect and induced. Impacts are estimated to average the highest over the first five years of the simulation period (██████) at 1,100 jobs per year supported. The average annual compensation of these jobs based on the first year of the simulation (██████) is \$72,214.¹⁸

The total employment impact for all New England states is estimated to support an average of 1,278 jobs per year over the 21 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 \$62,933.

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

State	Category	Annual average for each period				
		██████	██████	██████	██████	██████
Massachusetts	Direct	349	189	121	129	190
	<u>Indirect and Induced</u>	<u>750</u>	<u>520</u>	<u>487</u>	<u>465</u>	<u>544</u>
	Total Employment	1,100	710	608	594	734
New England Total	Direct	711	403	264	265	396
	<u>Indirect and Induced</u>	<u>1,230</u>	<u>855</u>	<u>790</u>	<u>737</u>	<u>882</u>
	Total Employment	1,941	1,259	1,054	1,002	1,278

Note: New England total includes Massachusetts. Jobs are reported as the average annual for each 5-year cohort over the 21 year simulation period and as an average annual across the full 21 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				
	2000-2004	2005-2009	2010-2014	2015-2019	2020-2024
Health Care and Social Assistance	160	110	111	109	120
Retail Trade	138	95	88	84	99
Construction	183	51	8	19	61
Accommodation and Food Services	76	58	50	44	56
Manufacturing	61	54	47	45	51
Other Services, except Public Administration	75	46	44	41	50
Professional, Scientific, and Technical Services	57	41	38	40	43
Administrative and Waste Management Services	47	32	28	27	33
Finance and Insurance	41	26	26	26	29
Real Estate and Rental and Leasing	46	26	20	17	26
Arts, Entertainment, and Recreation	33	21	20	18	22
Wholesale Trade	30	22	20	20	22
Transportation and Warehousing	25	17	16	17	19
Educational Services; private	37	19	13	7	18
Information	19	13	13	12	14
Management of Companies and Enterprises	13	11	10	10	11
Forestry, Fishing, and Related Activities	2	2	2	2	2
Mining	1	1	1	1	1
Utilities	(11)	(7)	(8)	(7)	(8)
All Industries	1,033	638	547	532	669

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 21 year period.

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4.2. Other Economic Contributions

Accompanying employment impacts, the MCPC 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				
		2010-2011	2012-2013	2014-2015	2016-2017	2018-2019
Massachusetts	GDP (M\$)	\$101.6	\$83.6	\$85.0	\$96.9	\$91.1
	Total Compensation (M\$)	\$88.9	\$71.5	\$70.1	\$82.6	\$77.2
New England	GDP (M\$)	\$169.5	\$141.4	\$142.6	\$161.4	\$152.5
Total	Total Compensation (M\$)	\$140.4	\$113.3	\$109.2	\$125.8	\$120.4

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 MCPC Project Transmission Expenditures

5.1. Employment Contributions

Capital expenditures made to build the MCPC Project, as well as ongoing maintenance during operations, will have significant economic impacts. Since MCPC 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	-	4	166	2,561	952	-	3,682	614
Professional & Technical Svcs	28	49	81	40	6	-	204	34
Management	-	79	140	119	105	8	450	75
Direct Total	28	132	387	2,720	1,062	8	4,337	723
Indirect & Induced	39	186	477	2,184	1,185	267	4,337	723
Total Employment	66	318	864	4,904	2,247	276	8,674	1,446
Average Annual Compensation	\$51,209	\$53,599	\$49,770	\$38,803	\$44,067	\$70,856	-	-

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).

to support 4,177 jobs and additional 4,113 indirectly and induced over the four-year period.

average annual compensation during construction is shown in Table 5.1.

During project operations, a total of 9 jobs will be supported in Maine over the 21 year project contract period. Of these, an average of 5 jobs per year will directly support the maintenance and operations of the

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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MCPC in Maine over the 21 year contract period and beyond, while and estimated 4 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 \$485 million in GDP²⁴ over the development and construction periods. Likewise, total compensation is estimated to total \$372 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 \$34 million over the 21 year project period (██████████).

Table 5.2: Other Economic Contributions of Infrastructure Investments

Category	Development		Construction				Total
	██████████	██████████	██████████	██████████	██████████	██████████	
GDP (Millions \$)	\$5.0	\$23.4	\$57.4	\$257.2	\$124.4	\$18.1	\$485.6
Total Compensation (Millions \$)	\$3.4	\$17.0	\$43.0	\$190.3	\$99.0	\$19.5	\$372.2

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 MCPC Project are expected to increase municipal property valuations approximate to the cost of the investment expenditures. Based on existing mill rates and an ██████████, approximately \$12 million of additional municipal tax revenue resulting from MCPC 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 MCPC 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 MCPC Project. However, this estimates gives our best approximation of the magnitude and potential tax revenue the MCPC 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.

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE MCPC PROJECT

7. Appendix B

Table B-1: MCPC Project Transmission Infrastructure Expenditures in Maine

Direct Expenditure Category	Project						
	Total						
Development and Planning Phase	\$4.1	\$4.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Construction Phase	\$467.1	\$0.0	\$22.4	\$55.4	\$272.1	\$115.3	\$1.8
Total	\$471.2	\$4.1	\$22.4	\$55.4	\$272.1	\$115.3	\$1.8

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	349	189	121	129	190
	<u>Indirect and Induced</u>	<u>750</u>	<u>520</u>	<u>487</u>	<u>465</u>	<u>544</u>
	Total Employment	1,100	710	608	594	734
Connecticut	Direct	117	65	43	43	65
	<u>Indirect and Induced</u>	<u>182</u>	<u>116</u>	<u>106</u>	<u>93</u>	<u>121</u>
	Total Employment	298	181	149	136	186
Maine	Direct	58	37	25	21	34
	<u>Indirect and Induced</u>	<u>84</u>	<u>70</u>	<u>64</u>	<u>57</u>	<u>67</u>
	Total Employment	142	107	89	77	101
New Hampshire	Direct	93	54	36	36	53
	<u>Indirect and Induced</u>	<u>96</u>	<u>68</u>	<u>59</u>	<u>54</u>	<u>67</u>
	Total Employment	188	121	95	90	120
Rhode Island	Direct	61	35	26	26	36
	<u>Indirect and Induced</u>	<u>80</u>	<u>52</u>	<u>49</u>	<u>46</u>	<u>55</u>
	Total Employment	141	87	74	72	91
Vermont	Direct	34	23	13	10	19
	<u>Indirect and Induced</u>	<u>38</u>	<u>30</u>	<u>25</u>	<u>21</u>	<u>28</u>
	Total Employment	71	52	38	31	47
New England Total	Direct	711	403	264	265	396
	<u>Indirect and Induced</u>	<u>1,230</u>	<u>855</u>	<u>790</u>	<u>737</u>	<u>882</u>
	Total Employment	1,941	1,259	1,054	1,002	1,278

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE MCPC PROJECT

Note: Jobs are reported as the average annual for each 5-year cohort over the 21 year simulation period and as an average annual across the full 21 year period. Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs.

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

Category	Annual average for each period				
	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034
Health Care and Social Assistance	274	190	190	181	204
Retail Trade	267	182	165	154	187
Accommodation and Food Services	143	110	94	81	104
Construction	326	86	2	17	100
Manufacturing	116	102	89	85	96
Other Services, except Public Administration	142	89	84	77	96
Professional, Scientific, and Technical Services	89	65	59	60	67
Administrative and Waste Management Services	82	56	49	45	56
Finance and Insurance	69	43	43	44	49
Real Estate and Rental and Leasing	81	45	32	25	44
Arts, Entertainment, and Recreation	58	39	36	32	40
Wholesale Trade	52	37	34	33	38
Transportation and Warehousing	40	29	27	28	31
Educational Services; private	53	26	15	4	23
Information	28	19	18	17	20
Management of Companies and Enterprises	22	18	17	18	19
Forestry, Fishing, and Related Activities	6	5	5	4	5
Mining	2	1	1	1	1
Utilities	(27)	(17)	(18)	(16)	(19)
All Industries	1,820	1,127	943	890	1,161

Note: Jobs are reported as the average annual for each 5-year cohort over the 21 year simulation period and as an average annual across the full 21 year period. Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs.

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE MCPC 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	1,100	710	608	594	734
	GDP (M\$)	\$101.6	\$83.6	\$85.0	\$96.9	\$91.1
	Total Compensation (M\$)	\$88.9	\$71.5	\$70.1	\$82.6	\$77.2
Connecticut	Employment	298	181	149	136	186
	GDP (M\$)	\$27.5	\$22.7	\$22.6	\$25.6	\$24.4
	Total Compensation (M\$)	\$21.0	\$16.3	\$15.3	\$17.1	\$17.1
Maine	Employment	142	107	89	77	101
	GDP (M\$)	\$9.1	\$8.8	\$9.0	\$9.7	\$9.1
	Total Compensation (M\$)	\$6.9	\$6.5	\$6.2	\$6.4	\$6.4
New Hampshire	Employment	188	121	95	90	120
	GDP (M\$)	\$14.7	\$12.3	\$12.1	\$13.4	\$13.0
	Total Compensation (M\$)	\$11.5	\$9.4	\$8.7	\$9.7	\$9.7
Rhode Island	Employment	141	87	74	72	91
	GDP (M\$)	\$12.0	\$9.5	\$9.6	\$11.0	\$10.4
	Total Compensation (M\$)	\$8.7	\$6.6	\$6.4	\$7.6	\$7.2
Vermont	Employment	71	52	38	31	47
	GDP (M\$)	\$4.4	\$4.6	\$4.3	\$4.7	\$4.5
	Total Compensation (M\$)	\$3.3	\$3.1	\$2.5	\$2.4	\$2.7
New England Total	Employment	1,941	1,259	1,054	1,002	1,278
	GDP (M\$)	\$169.5	\$141.4	\$142.6	\$161.4	\$152.5
	Total Compensation (M\$)	\$140.4	\$113.3	\$109.2	\$125.8	\$120.4

Note: Jobs are reported as the average annual for each 5-year cohort over the 21 year simulation period and as an average annual across the full 21 year period. Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs. GDP in millions of chained 2009 dollars. Total compensation reported in millions of current (nominal) \$.

ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF THE MCPC PROJECT

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

REMI Region	Category							Total	Annual Average
Androscoggin-Franklin-Oxford	Employment	3	79	171	1,861	888	56	3,058	510
	GDP (M\$)	\$0.1	\$5.3	\$10.9	\$87.4	\$43.2	\$2.8	\$149.7	\$24.9
	Total Compensation (M\$)	\$0.1	\$4.1	\$8.7	\$69.0	\$37.5	\$5.6	\$125.0	\$20.8
Cumberland	Employment	57	120	300	508	218	52	1,254	209
	GDP (M\$)	\$4.5	\$9.5	\$22.1	\$37.4	\$16.9	\$4.3	\$94.8	\$15.8
	Total Compensation (M\$)	\$3.1	\$6.7	\$16.6	\$27.9	\$13.4	\$4.2	\$71.9	\$12.0
Kennebec-Somerset	Employment	1	67	220	1,556	726	88	2,658	443
	GDP (M\$)	\$0.1	\$5.4	\$14.9	\$83.5	\$41.8	\$6.1	\$151.7	\$25.3
	Total Compensation (M\$)	\$0.0	\$4.0	\$11.1	\$61.5	\$32.0	\$5.3	\$114.0	\$19.0
Waldo-Knox/Lincoln-Sagadahoc	Employment	2	35	129	812	309	49	1,336	223
	GDP (M\$)	\$0.1	\$2.2	\$7.0	\$38.3	\$15.8	\$2.9	\$66.3	\$11.0
	Total Compensation (M\$)	\$0.1	\$1.7	\$5.0	\$25.6	\$11.8	\$3.0	\$47.1	\$7.9
Maine Residual	Employment	4	16	43	167	105	32	367	61
	GDP (M\$)	\$0.2	\$1.0	\$2.6	\$10.6	\$6.7	\$2.1	\$23.2	\$3.9
	Total Compensation (M\$)	\$0.1	\$0.5	\$1.5	\$6.3	\$4.2	\$1.5	\$14.2	\$2.4

Note: Jobs are reported as the average annual employment supported each year and include full-time and part-time jobs. 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.