

Refined Economic Impact Analysis for the Greenhouse Gas Emissions Reduction Act 2012 Plan

Prepared for
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Acronyms and Abbreviations

BGE	Baltimore Gas and Electric
BWI	Baltimore/Washington International Thurgood Marshall Airport
CAP	Climate Action Plan
CAFE	Corporate Average Fuel Economy
DBED	Department of Business and Economic Development
DGS	Department of General Services
DHCD	Department of Housing and Community Development
DHMH	Department of Health and Mental Hygiene
DNR	Department of Natural Resources
EPA	U.S. Environmental Protection Agency
GGRA	Greenhouse Gas Emissions Reduction Act
GHG	Greenhouse Gas
IMPLAN	Impact Analysis for Planning
MACT	Maximum Achievable Control Technology
MARC	Maryland Area Regional Commuter
MDA	Maryland Department of Agriculture
MDOT	Maryland Department of Transportation
MDP	Maryland Department of Planning
MEA	Maryland Energy Administration
MIA	Maryland Insurance Administration
MDE	Maryland Department of the Environment
NAICS	North American Industrial Classification System
PAYD	Pay-As-You-Drive®
PEPCO	Potomac Electric Power Company
RECs	Renewable Energy Credits
RESI	Regional Economic Studies Institute of Towson University
REMI	Regional Economic Models, Inc.
RGGI	Regional Greenhouse Gas Initiative
SAM	Social Accounting Matrix
SMECO	Southern Maryland Electric Cooperative

1.0 Executive Summary

1.1 Introduction

Climate change and mitigation strategies are important factors for many elements of the economy and society in general: the rising costs of energy and transportation, threats to the environment, and the health of the greater population (and, by extension, the labor pool). Energy, transportation, agriculture and forestry, recycling, buildings, land use, and many other areas are affected by climate change. As such, mitigating climate change is a vital concern.

Maryland State government agencies are doing their part to mitigate the negative effects of climate change by creating and implementing climate change mitigation strategies designed to reduce GHG emissions in The State. The GGRA strategies under various state government agencies have been organized into eight subject areas: energy, transportation, agriculture and forestry, recycling, multi-sector, buildings, land use, and innovative initiatives.

This report is a refinement of RESI's 2014 results, taking into account the short-term job creation, economic activity, and wage effects from these GGRA strategies and potential enhancements of some programs. The 2014 report was a preliminary analysis of the potential economic impacts of mitigation strategies for the 2012 GGRA report. During this refinement, RESI used a dynamic model known as the REMI model PI+ to assist in determining cumulative benefits and annual impacts to the region. This model allowed RESI to review the interactions among agencies within the region from the strategies and changes that would result from the interaction of those agencies. The results of this report are considered to be a more accurate representation of the possible outcomes from these reduction strategies and provide a potential estimation of economic activity through 2020.

This report includes refined data from agencies that outlined spending on programs, and allocation of funds to different industries. Additionally, areas such as *Transportation* were refined with agency coordination to determine the impact from these programs directly associated with greenhouse gas reduction, and the categories of spending such as architecture, planning, land acquisition, and construction. This report highlights how the GGRA will benefit Maryland in job creation across all economic groups, as well as retain Maryland's currently highly educated workforce through programs associated with the green economy.

1.2 Summary of Findings

RESI analyzed data collected in collaboration with state agencies and MDE in order to estimate the economic impacts of climate action strategies and their subprograms. Using data contained in strategy write-ups provided by MDE as well as external research from a variety of sources, including the implementing agencies, RESI estimated the impacts of each strategy and subprogram.

RESI coordinated with state agencies to develop a methodology. The agencies assisted in the development and finalization of all assumptions used in the economic modeling for RESI's

analysis. Through this coordinated effort, RESI built upon their original design in 2011 creating an investment and operation phase. A detailed explanation of the investment and operation phases and what they entail can be found in Appendix B.1 of Appendix E of the GGRA plan.

To quantify the economic and fiscal impacts of climate action strategies and their subprograms, RESI utilized the REMI PI+ input/output model. For more information regarding REMI PI+, please refer to Appendix B.2 of Appendix E, which presents *The Economic Impact Analysis Revision for the Greenhouse Gas Emissions Reduction Act 2012 Plan* hereafter referred to as the full report in this Chapter.

A summary of RESI's findings, including the total economic impacts (employment, output, and total net benefits) of all strategies within a subject area can be found in Figure 1. Figure 2 presents the total fiscal impacts (state and local tax revenues) resulting from the investment and operation phases of the strategies. The total wage impacts can be found in Figures 3 and 4. Total net benefits can be found in Figures 5 and 6.

RESI reviewed findings for both status quo program spending and enhancement spending. Although the enhancements are not guaranteed funding, the potential to reduce more greenhouse gases and increase jobs within the state was analyzed. Enhanced programs ranged from energy, transportation, land use, and innovative initiatives. The agencies provided the potential costs to achieve these new GHG targets under the enhanced scenarios of specific strategies, and RESI used this data to create a secondary analysis.

This update provides updated costs and benefits associated with GGRA policies as analyzed in the 2014 report. In addition to updated annual data, RESI received detailed data regarding funding of programs, spending, and how programs would be implemented if enhanced GGRA reductions were approved.

For more detailed impacts and further explanation, please refer to Section 3.0 and Appendix A of the full report. Information regarding the modeling assumptions and procedures used to derive impacts for each strategy within the subject areas can be found in Appendix C of the full report. Appendix D provides a discussion of the general occupations most likely to be associated with each subject area.

Figure 1: Total Annual Economic Impacts by Strategy Subject Area—Investment and Operation Phases, 2010–2020¹²

Subject Area	Jobs ³	Output	Total Cost	Total Net Benefit
Energy				
Status Quo	12,156.0	\$14,039,556,803	\$14,983,805,248	-\$944,248,445
Enhancement	14,058.1	\$15,448,356,592	\$16,729,297,904	-\$1,280,941,312
Transportation				
Status Quo	3,099.7	\$3,491,312,335	\$2,206,654,201	\$1,284,658,134
Enhancement	6,267.7	\$8,383,504,300	\$4,244,515,129	\$4,138,989,171
Agriculture				
Status Quo	-298.2	\$2,099,151,612	\$632,038,070	\$1,467,113,542
Enhancement	-297.7	\$2,104,949,646	\$760,708,403	\$1,344,241,243
Recycling				
Status Quo	325.5	\$303,588,867	\$9,257,145	\$294,331,722
Enhancement	558.0	\$419,730,048	\$15,869,391	\$403,860,657
Buildings				
Status Quo	726.8	\$357,208,252	\$7,873,194	\$349,335,058
Enhancement	N/A	N/A	N/A	N/A
Land Use				
Status Quo	6,748.1	\$15,258,536,194	\$15,564,480,642	-\$305,944,448
Enhancement	8,522.9	\$21,967,353,014	\$23,832,525,089	-\$1,865,172,075
Innovative Initiatives				
Status Quo	3,564.2	\$602,800,640	\$213,878,700	\$388,921,940
Enhancement	3,572.4	\$616,880,934	\$228,332,229	\$388,548,705
Outreach				
Status Quo	0.1	\$152,588	\$22,500	\$130,088
Enhancement	N/A	N/A	N/A	N/A
Total				
Status Quo	26,322.2	\$36,152,307,291	\$33,618,009,700	\$2,534,297,591
Enhancement	33,442.8	\$49,298,135,374	\$45,819,143,839	\$3,478,991,535

Source: REMI PI+, RESI

¹ The *Transportation* and *Innovative Initiatives* subject areas exhibit impacts from 2020 to 2025. However, those impacts were excluded in Figure 1 and Figure 2. For the specific distribution of impacts over time, refer to Section 3.0 of the full report. In addition, summed impacts throughout the report may not add up exactly to totals due to rounding.

² All dollar values are reported in 2015 dollars.

³ Jobs figures reflect net job impacts in the year 2020.

As shown in the figure above, during the investment and operation phases of these strategies, the total economic benefits would include approximately 26,322 jobs maintained in 2020 and \$36.2 billion in output between 2010 and 2020 for the status quo. The total cost of all strategies in all subject areas is approximately \$33.6 billion, for the status quo. The expected net benefits under the enhanced scenarios would be \$3.5 billion in net benefit with 33.4 thousand jobs maintained in 2020. The net benefit includes public and private costs. It is important to note that employment impacts are not cumulative, and therefore annual impacts are jobs created above the baseline forecast. For more information on interpreting the results, please review the REMI PI+ model overview in Appendix B.2. All employment impacts in this report represent the number of jobs created or maintained in a given year as compared to the baseline.

A summary of the wage impacts is represented in Figure 2 and 3. The investment phase generates more jobs than the operation phase because the public and private sectors must hire workers to implement the strategies. However, once policies are in place, growth stabilizes, and maintenance and monitoring are the primary employment needs of a program.

Figure 2: Wage Impact by Strategy Subject Area—Investment Phase, 2010–2020⁴

Subject Area	Jobs⁵	Wages
Energy		
Status Quo	9,019.5	\$4,651,750,397
Enhancement	10,041.5	\$7,761,206,051
Transportation		
Status Quo	2,490.0	\$1,439,102,172
Enhancement	5,018.7	\$2,980,082,579
Agriculture		
Status Quo	498.4	\$59,032,440
Enhancement	498.9	\$61,617,397
Recycling		
Status Quo	773.1	\$292,888,641
Enhancement	1,325.3	\$414,719,170
Buildings		
Status Quo	18.6	\$10,284,424
Enhancement	N/A	N/A
Land Use		
Status Quo	4,920.9	\$4,744,735,057
Enhancement	5,652.4	\$8,053,793,823
Innovative Initiatives		
Status Quo	361.1	\$228,725,433
Enhancement	368.3	\$236,843,110
Outreach		
Status Quo	0.0	\$0
Enhancement	N/A	N/A
Total		
Status Quo	18,081.6	\$11,426,518,564
Enhancement	22,923.6	\$19,518,546,554

Source: REMI PI+, RESI

⁴ All dollar values are reported in 2015 dollars.

⁵ Job figures reflect net job impacts in the year 2020.

Figure 3: Wage Impact by Strategy Subject Area—Operation Phase, 2010–2020⁶

Subject Area	Jobs⁷	Wages
Energy		
Status Quo	3,136.4	\$1,273,496,043
Enhancement	4,051.2	\$1,932,556,944
Transportation		
Status Quo	609.8	\$131,679,378
Enhancement	1,249.0	\$247,501,555
Agriculture		
Status Quo	-796.6	\$698,379,517
Enhancement	-796.6	\$698,379,517
Recycling		
Status Quo	-447.6	-\$169,242,859
Enhancement	-767.3	-\$238,978,248
Buildings		
Status Quo	708.2	\$54,687,500
Enhancement	N/A	N/A
Land Use		
Status Quo	1,827.2	\$1,601,903,602
Enhancement	2,870.5	\$2,488,973,900
Innovative Initiatives		
Status Quo	3,203.1	\$181,956,159
Enhancement	3,204.0	\$182,612,688
Outreach		
Status Quo	0.1	\$61,035
Enhancement	N/A	N/A
Total		
Status Quo	8,240.7	\$3,772,920,375
Enhancement	10,519.2	\$5,365,794,892

Source: REMI PI+, RESI

As shown in the figures above, these strategies result in a wage impact that ranges from of \$11.4 to \$19.5 billion in the investment phase for status quo and enhancement, respectively. In the operation phase, wage impacts range from \$3.8 to \$5.4 billion for status quo and enhancements, respectively. The strategies generate approximately 18.1 to 22.9 thousand jobs in the investment phase and 8.2 to 10.5 thousand jobs in the operation phase for status quo and enhancements, respectively.

⁶ All dollar values are reported in 2015 dollars.

⁷ Jobs figures reflect net job impacts in the year 2020.

RESI also calculated the total net benefits from these strategies. A summary of these findings can be found in Figures 4 and 5. Although some of these policies may generate negative net impacts, the programs are still generating other benefits that are not accounted for in the market. These benefits include environmental improvements to ecosystems and improvements to human health from reduced pollution and greenhouse gases. Additionally, the program as a whole has net economic benefits.

Figure 4: Total Net Benefit by Strategy Subject Area—Investment Phase, 2010–2020⁸

Subject Area	Output	Total Cost	Total Net Benefit
Energy			
Status Quo	\$11,154,722,778	\$13,097,859,286	-\$2,197,436,981
Enhancement	\$12,316,690,319	\$13,881,581,739	-\$1,783,499,402
Transportation			
Status Quo	\$3,270,160,599	\$2,206,654,201	\$1,056,522,384
Enhancement	\$7,990,266,382	\$4,244,515,129	\$313,182,368
Agriculture			
Status Quo	\$65,643,311	\$214,057,002	-\$148,867,164
Enhancement	\$71,441,345	\$222,727,335	-\$151,285,990
Recycling			
Status Quo	\$719,085,693	\$9,257,145	\$709,828,548
Enhancement	\$990,256,168	\$15,869,391	\$974,386,777
Buildings			
Status Quo	\$17,364,502	\$7,688,994	\$9,675,508
Enhancement	N/A	N/A	N/A
Land Use			
Status Quo	\$9,780,953,979	\$15,230,800,642	-\$1,133,515,000
Enhancement	\$15,158,674,064	\$22,837,241,668	-\$974,355,000
Innovative Initiatives			
Status Quo	\$301,666,260	\$213,878,700	\$176,430,870
Enhancement	\$393,191,252	\$228,332,229	\$175,316,299
Outreach			
Status Quo	\$0	\$0	\$0
Enhancement	N/A	N/A	N/A
Total			
Status Quo	\$25,309,597,123	\$30,980,195,969	-\$5,670,598,846
Enhancement	\$36,937,884,032	\$41,437,956,486	-\$4,500,072,454

Source: REMI PI+, RESI

⁸ All dollar values are reported in 2015 dollars.

Figure 5: Total Net Benefit by Strategy Subject Area—Operation Phase, 2010–2020⁹

Subject Area	Output	Total Cost	Total Net Benefit
Energy			
Status Quo	\$2,884,834,025	\$1,885,945,962	\$963,202,841
Enhancement	\$3,131,666,273	\$2,847,716,165	\$226,564,081
Transportation			
Status Quo	\$221,151,736	\$0	\$106,127,930
Enhancement	\$393,237,918	\$0	\$202,999,028
Agriculture			
Status Quo	\$2,033,508,301	\$417,981,068	\$1,514,239,386
Enhancement	\$2,033,508,301	\$537,981,068	\$854,071,331
Recycling			
Status Quo	-\$415,496,826	\$0	-\$415,496,826
Enhancement	-\$570,526,120	\$0	-\$570,526,120
Buildings			
Status Quo	\$339,843,750	\$184,200	\$339,659,550
Enhancement	N/A	N/A	N/A
Land Use			
Status Quo	\$5,477,582,215	\$333,680,000	\$1,165,863,599
Enhancement	\$6,808,678,950	\$995,283,421	\$820,949,641
Innovative Initiatives			
Status Quo	\$301,134,380	\$0	\$223,458,425
Enhancement	\$223,689,682	\$0	\$223,277,695
Outreach			
Status Quo	\$152,588	\$22,500	\$130,088
Enhancement	N/A	N/A	N/A
Total			
Status Quo	\$10,842,710,169	\$2,637,813,730	\$8,204,896,439
Enhancement	\$12,360,251,342	\$4,381,187,354	\$7,979,063,988

Source: REMI PI+, RESI

As shown in Figures 4 and 5, total net benefit during the investment phase totals a negative \$5.7 billion and a positive \$7.9 billion during the operation phase for the status quo. For enhancements, as shown in Figures 4 and 5 the total net benefit during the investment phase totals a negative \$4.5 billion and a positive \$8.0 billion during the operation phase. Total net benefit is the difference between output impact and total cost. Total net benefit is analogous to “profit” in the business sense. Positive total net benefit values recognize desirable policy

⁹ All dollar values are reported in 2015 dollars.

outcomes for Marylanders. The total net benefit from both the investment and operation phases totals \$2.3 billion for status quo, a desirable outcome. An additional net benefit of \$3.5 billion can be claimed in enhancement programs are considered into Maryland's GGRA initiatives.

2.0 Introduction

2.1 Overview

Climate change and mitigation strategies are important factors for many elements of the economy and society in general: the rising costs of energy and transportation, threats to the environment, and the health of the greater population (and, by extension, the labor pool). Energy, transportation, agriculture and forestry, recycling, buildings, land use, and many other areas are affected by climate change. As such, mitigating climate change is a vital concern.

Maryland state government agencies are doing their part to mitigate the negative effects of climate change by creating and implementing climate change mitigation strategies designed to reduce GHG emissions in the State. The strategies under various state government agencies have been organized into seven subject areas: energy, transportation, agriculture and forestry, recycling buildings, land use, and innovative initiatives.

RESI conducted an analysis of the potential economic impacts of mitigation strategies for the 2014 GGRA report. This report estimated the job creation, economic activity, and wage effects of these strategies and their subprograms in development or already enacted. The findings within the 2014 report were a revised analysis of these strategies from the 2013 report, providing an estimate of the economic impact these strategies would have in Maryland.

This report is a refinement of RESI's 2014 results, with more complete data about historical, current, and projected budget expenditures associated with programs. Additionally, RESI created a preliminary analysis of a selection of strategies designated for potential enhancement. Enhanced programs are those currently in the GGRA, but could be expanded to further decrease GHG output within Maryland. During this refinement, RESI used a dynamic model known as the REMI model PI+ to assist in determining net benefits and annual impacts to the region. This model allowed RESI to review the interactions among agencies within the region from the strategies. The results of this report are considered to be a more accurate representation (than the 2014 RESI report) of the possible outcomes from these reduction strategies and provide a potential estimation of economic activity through 2020 for an enhanced GGRA.

2.2 Methodology

RESI analyzed data collected by state agencies and their contractors in order to quantify the economic impacts of climate action strategies and their subprograms. Each program was assessed at the status quo and enhanced levels. Under the status quo, the programs were assessed using the historical, current, and projected budgeting data provided in cooperation with the agencies. Enhanced programs were then identified, and agencies were asked to provide further data regarding the expenditures and potential changes for those programs highlighted for enhancements. RESI in some cases used external data to determine potential outcomes from status quo and enhanced programs during investment and operational phases when agency level data was not readily available.

The impacts were modeled for two phases: an investment phase and an operation phase. The investment phase refers to the entire period during which a strategy and its subprograms are being developed, invested in, and implemented. The operation phase refers to the period during which a strategy and its subprograms have already been implemented and the “end user” cost savings are being realized. A detailed explanation of the investment and operation phases and what they entail can be found in Appendix B.1.

To quantify the economic and fiscal impacts of climate action strategies under both status quo and enhanced scenarios, RESI used the REMI PI+ input/output model. This model enumerates the economic and fiscal impacts of each dollar earned and spent by the following: employees associated with the strategies, other supporting vendors (business services, retail, etc.), each dollar spent by these vendors on other firms, and each dollar spent by the households associated with the strategies’ employees, other vendors’ employees, and other businesses’ employees. For more information regarding REMI PI+ and how to interpret the results, please refer to Appendix B.2.

The strategies have been organized into seven subject areas: energy, transportation, agriculture and forestry, recycling, buildings, land use, and innovative initiatives. RESI’s report is similarly organized, with each subject area separated into a different section. The economic impacts are broken down by year from 2010 through 2020. Figure 6 outlines the strategies under each sector that were analyzed for potential enhancements.

Figure 6: Listing of Enhanced Programs for 2015 Report

Subject Area	Program Name
Energy	Regional Greenhouse Gas Initiative EmPOWER: Energy Efficiency in the Residential Sector EmPOWER: Energy Efficiency in the Commercial and Industrial Sector EmPOWER: Energy Efficiency in the Power Sector—General Maryland Renewable Energy Portfolio Standard BeSMART (Mainstreet Initiatives) Weatherization and Energy Efficiency for Low-Income Homes
Transportation	Transportation Technologies Public Transportation Initiatives Intercity Transportation Initiatives Pricing Initiatives Bike and Pedestrian Initiatives
Agriculture	Nutrient Trading for GHG Benefits
Zero Waste	Zero Waste
Land Use	Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits) Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)
Innovative Initiatives	Lead-by-Example: State of Maryland Initiatives and Carbon Footprint

Source: MDE, RESI

3.0 Findings

RESI's findings show that all strategies and subprograms will have net positive significant economic impact. The direct, spinoff, and average annual economic impacts (jobs, output, and wages) for each strategy and subprogram for the investment phase and the operation phase were calculated. It is important to note that job impacts associated for any subject area or strategy do not indicate cumulative job creation. The job impacts are differences based on the current baseline for Maryland based on BEA historical data. Each year reflects new jobs or job loss difference from the baseline. This applies throughout the report for jobs. In regard to wages and output, each year's results indicate the modeled difference between the relevant policy scenario and the baseline scenario for that year. For more information on how to interpret the results please review Appendix B.2.

For more detailed economic impacts of all the programs, please refer to Appendix A. Information regarding the modeling assumptions and procedures used to derive impacts for each strategy within the subject areas can be found in Appendix C. A discussion of the general occupations most likely to be associated with each subject area is in Appendix D.

3.1 Energy

3.1.1 Regional Greenhouse Gas Initiative (RGGI)

Maryland is one of nine Northeast and Mid-Atlantic States that participate in the Regional Greenhouse Gas Initiative (RGGI) – a regional market-based cap-and-trade program to reduce CO₂ emissions from fossil-fuel fired power plants in the region.¹⁰ RGGI reduces emissions through an emissions cap applied to the nine-state geographic region. Under the initiative, the participating states issue “allowances” equal to the number of tons of CO₂ emissions allowed under the regional cap. A single allowance permits a source to emit one ton of carbon dioxide.

Investment Phase – Status Quo

The average annual economic impacts of the investment phase of the *Regional Greenhouse Gas Initiative* strategy can be found in Figure 7.

¹⁰ Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont currently participate in RGGI.

Figure 7: Regional Greenhouse Gas Initiative—Investment Phase¹¹

Year	Jobs	Output	Wages
2010	8.0	\$640,869	\$320,435
2011	8.6	\$671,387	\$320,435
2012	8.7	\$671,387	\$350,952
2013	8.3	\$640,869	\$366,211
2014	8.4	\$701,904	\$366,211
2015	7.8	\$610,352	\$396,729
2016	7.8	\$671,387	\$411,987
2017	8.6	\$671,387	\$457,764
2018	8.9	\$732,422	\$503,540
2019	7.7	\$732,422	\$442,505
2020	8.0	\$732,422	\$473,022
Average	8.3	\$679,710	\$400,890

Source: REMI PI+, RESI

As shown in the figure above, during the investment phase of this strategy's implementation will maintain approximately 8 jobs by 2020, and generate \$679,710 in output and \$400,890 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *State government*, primarily due to the expectation that government sources would be used to maintain records and manage the RGGI markets. This could include additional administration to manage dissemination of funds, oversight, and budgeting.

Investment Phase – Enhanced

The average annual economic impacts of the investment phase of the *Regional Greenhouse Gas Initiative* strategy can be found in Figure 8.

¹¹ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 8: Regional Greenhouse Gas Initiative—Investment Phase¹²

Year	Jobs	Output	Wages
2010	8.0	\$640,869	\$320,435
2011	8.6	\$671,387	\$320,435
2012	8.7	\$671,387	\$350,952
2013	8.3	\$640,869	\$366,211
2014	8.4	\$701,904	\$366,211
2015	7.8	\$610,352	\$396,729
2016	7.8	\$671,387	\$411,987
2017	8.6	\$671,387	\$457,764
2018	8.9	\$732,422	\$503,540
2019	7.7	\$732,422	\$442,505
2020	8.0	\$732,422	\$473,022
Average	8.3	\$679,710	\$400,890

Source: REMI PI+, RESI

As shown in the figure above, during the investment phase of this strategy's enhanced implementation will remain unchanged. Under the enhanced scenario for RGGI, allowance prices will increase and therefore the more impacts would be associated with the operational side of RGGI. During the enhancement phase, this strategy will maintain approximately 8 jobs by 2020, and generate \$679,710 in output and \$400,890 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *State government*, primarily due to the expectation that government sources would be used to maintain records and manage the RGGI markets. This could include additional administration to manage dissemination of funds, oversight, and budgeting.

Operation Phase – Status Quo

The average annual economic impacts of the operation phase of the Regional Greenhouse Gas Initiative strategy for status quo can be found in Figure 9.

¹² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 9: Regional Greenhouse Gas Initiative—Operation Phase¹³

Year	Jobs	Output	Wages
2010	298.4	\$20,874,023	\$11,260,986
2011	266.1	\$17,211,914	\$11,245,728
2012	230.4	\$13,671,875	\$11,016,846
2013	196.7	\$10,437,012	\$10,604,858
2014	167.8	\$7,965,088	\$10,330,200
2015	143.0	\$5,798,340	\$10,101,318
2016	123.1	\$4,150,391	\$9,811,401
2017	108.3	\$2,929,688	\$9,719,849
2018	96.7	\$1,953,125	\$9,658,813
2019	90.1	\$1,403,809	\$9,689,331
2020	87.7	\$1,098,633	\$9,872,437
Average	164.4	\$7,953,991	\$10,301,070

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 88 jobs by 2020, and generate \$8.0 million in output and \$10.3 million in wages on average each year once in operation. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Administrative and waste management services*.

Operation Phase – Enhanced

The average annual economic impacts of the operation phase of the Regional Greenhouse Gas Initiative strategy for enhanced scenario can be found in Figure 10.

¹³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 10: Regional Greenhouse Gas Initiative—Operation Phase¹⁴

Year	Jobs	Output	Wages
2010	298.4	\$20,874,023	\$11,260,986
2011	266.1	\$17,211,914	\$11,245,728
2012	230.4	\$13,671,875	\$11,016,846
2013	196.7	\$10,437,012	\$10,604,858
2014	1,583.0	\$75,118,832	\$97,424,232
2015	1,390.6	\$56,369,964	\$98,202,411
2016	1,234.0	\$41,595,422	\$98,330,355
2017	1,137.1	\$30,745,488	\$102,004,563
2018	1,044.1	\$21,087,148	\$104,282,539
2019	1,004.7	\$15,656,495	\$108,063,850
2020	1,006.8	\$12,617,314	\$113,380,590
Average	853.8	\$28,671,408	\$69,619,723

Source: REMI PI+, RESI

As shown in Figure 10, the strategy will maintain approximately 1,007 jobs by 2020, and generate \$28.7 million in output and \$69.7 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Professional, scientific, and technical services*.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$173,947 for the investment phase and \$9,185,320 for the operation phase under the status quo.

If the program were enhanced, total state and local tax revenues would increase by approximately \$626,208 for the investment phase and \$33,067,152 for the operation phase.

3.1.2 GHG Reductions from Imported Power

Through the 2008 Climate Action Plan, a generation performance standard was set for load-serving entities, including electricity providers. The promotion of energy and capacity from low-carbon or renewable sources through the policy aim to reduce the amount of energy imported annually, specifically for those states in which electricity generators primarily produce electricity using a higher concentration of coal in their fuel mixtures. The policy's goal is to enact a standard of no more than 1,125 pounds of GHGs per megawatt-hour by 2013.

¹⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding.

Investment Phase

The total economic impacts of the investment phase of the *GHG Reductions from Imported Power* strategy can be found in Figure 11.

Figure 11: GHG Reductions from Imported Power—Investment Phase¹⁵

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	-\$15,259
2012	0.1	\$0	\$0
2013	-0.5	-\$30,518	\$0
2014	0.1	\$61,035	\$15,259
2015	-0.3	\$0	\$15,259
2016	0.0	\$0	\$0
2017	0.0	\$0	\$30,518
2018	-0.1	-\$61,035	\$0
2019	-0.5	\$0	\$0
2020	-1.0	-\$61,035	-\$15,259
Average	-0.2	-\$8,323	\$2,774

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will result in one forgone job by 2020, approximately \$8,323 in forgone output and generate \$2,774 in wages on average each year. It should be noted that the investment phase for this strategy does not have much cost associated with the policy and any loss would result in the private sector for implementation procedures. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Protective service occupations*, primarily due to the expectation that the demand for low-carbon and renewable energy technologies would increase. Therefore, companies may wish to hire additional security personnel to ensure safety during expansion periods. Companies involved in the development of such technologies are a part of this industry.

Operation Phase

The average annual economic impacts of the operation phase of the *GHG Reductions from Imported Power* strategy can be found in Figure 12.

¹⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 12: GHG Reductions from Imported Power—Operation Phase¹⁶

Year	Jobs	Output	Wages
2010	3.8	\$457,764	\$106,812
2011	6.9	\$732,422	\$183,105
2012	9.1	\$946,045	\$274,658
2013	11.3	\$1,159,668	\$350,952
2014	12.3	\$1,373,291	\$396,729
2015	12.2	\$1,342,773	\$427,246
2016	13.5	\$1,464,844	\$488,281
2017	15.0	\$1,647,949	\$549,316
2018	15.6	\$1,647,949	\$610,352
2019	15.3	\$1,770,020	\$625,610
2020	13.7	\$1,647,949	\$595,093
Average	11.7	\$1,290,061	\$418,923

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 14 jobs by 2020, and generate \$1.3 million in output and \$0.4 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction, extraction occupations* primarily due to the expectation that utilities switching from fossil fuel-based imported electricity to renewable energy sources would experience a net fuel cost savings after they recoup the upfront cost of fuel switching.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$155 for the investment phase and \$261,882 for the operation phase.

3.1.3 Federal New Source Performance Standard

The U.S. Environmental Protection Agency (EPA) is using the New Source Performance Standard authority under the federal Clean Air Act to promulgate new regulations to reduce GHG emissions from fossil fuel-fired power plants. The performance standards, which are expected to become final in early 2013, will apply to new electricity generating units and will be based on existing technologies. EPA is coordinating this action on GHGs with a number of other required regulatory actions for other pollutants, thereby enabling electricity generating units to develop multi-pollutant strategies to reduce pollutants in a more efficient and cost-effective way than would be possible by addressing multiple pollutants separately.

¹⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

The average annual economic impacts of the investment phase of the *Federal New Source Performance Standard* strategy can be found in Figure 13.

Figure 13: Federal New Source Performance Standard—Investment Phase¹⁷

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	18.2	\$1,403,809	\$701,904
2014	17.9	\$1,434,326	\$732,422
2015	17.2	\$1,403,809	\$808,716
2016	16.8	\$1,342,773	\$854,492
2017	16.4	\$1,342,773	\$885,010
2018	15.9	\$1,342,773	\$930,786
2019	15.6	\$1,342,773	\$961,304
2020	14.4	\$1,281,738	\$900,269
Average	12.0	\$990,434	\$615,900

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 14 jobs by 2020, and generate \$1.0 million in output and \$0.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Sales, office, administrative occupations*, primarily due to the expectation that sources subject to the standard will seek out cost-effective measures to reduce air pollutants. Business entities providing such services are within this industry.

Operation Phase

The average annual economic impacts of the operation phase of the *Federal New Source Performance Standard* strategy can be found in Figure 14.

¹⁷ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 14: Federal New Source Performance Standard—Operation Phase¹⁸

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	7.4	\$823,975	\$183,105
2012	11.9	\$1,312,256	\$350,952
2013	16.2	\$1,739,502	\$488,281
2014	18.8	\$2,075,195	\$579,834
2015	20.6	\$2,258,301	\$686,646
2016	23.4	\$2,563,477	\$793,457
2017	24.7	\$2,746,582	\$915,527
2018	26.3	\$2,868,652	\$1,007,080
2019	26.3	\$2,929,688	\$1,022,339
2020	25.9	\$2,929,688	\$1,037,598
Average	18.3	\$2,022,483	\$642,256

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 26 jobs by 2020, and generate \$2.0 million in output and \$0.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction, extraction occupations*, primarily due to the expectation that sources subject to the standard will switch from fossil fuel use in order to reduce air pollution and will experience cost savings from cost-effective, cleaner fuels and technologies in the long run as a result.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$245,308 for the investment phase and \$6,296,959 for the operation phase.

3.1.4 MACT

EPA has adopted new air emissions requirements for industrial, commercial, and institutional boilers under two separate rulemakings.¹⁹ The first, which took effect January 31, 2013, establishes national emission standards for Hazardous Air Pollutants (HAPs) for major sources.²⁰

¹⁸ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

¹⁹ Boilers burn fuel, including natural gas, fuel oil, coal, biomass (e.g., wood), or other gas to produce steam or hot water. The steam is used to produce electricity, drive an industrial process, or provide heat. Emissions from burning the fuel can include toxic air pollutants like mercury, lead and particle pollution.

²⁰ "National Emission Standards for Hazardous Air Pollutants for Major sources: Industrial, Commercial, and Institutional Boilers and Process Heaters", 78 Fed. Reg. 7138 (January 31, 2103).

The rule affects thousands of boilers and process heaters at facilities nationwide which are considered as major sources of HAPs. These facilities also emit GHGs.

The Boiler MACT rule applies to any stationary source with a boiler or group of stationary sources with boilers that emit 10 tons per year of any single HAP or 25 tons per year of any combination of HAPs. The rule requires each boiler to meet pollution emission limits on an annual and continuous basis.

EPA also issued a Boiler MACT rule for smaller “area sources”, which took effect February 1, 2013.²¹

Among other things, the Boiler MACT rules require operators to conduct a boiler tune-up to improve efficiency, minimize fuel consumption and reduce emissions. EPA estimates there will be a one percent fuel savings due to the tune-ups, which equates to an equivalent one percent reduction in GHG emissions.

Investment Phase

The average annual economic impacts of the investment phase of the *MACT* strategy can be found in Figure 15.

Figure 15: MACT—Investment Phase²²

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	1.5	\$33,086	\$61,035
2013	1.3	\$24,815	\$45,776
2014	1.0	\$33,086	\$45,776
2015	1.0	\$16,543	\$45,776
2016	1.5	\$33,086	\$76,294
2017	1.0	\$33,086	\$61,035
2018	1.5	\$16,543	\$61,035
2019	0.6	\$33,086	\$61,035
2020	0.5	\$16,543	\$45,776
Average	0.9	\$80,455	\$45,776

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy’s implementation will maintain approximately less than one job by 2020, and generate \$80,455 in output and \$45,776

²¹ “National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, commercial, and Institutional Boilers”. 78 Fed. Reg. 7488 (February 1, 2013).

²² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that professionals such as environmental consultants in this field would be contracted to develop and implement the technologies associated with MACT.

Operation Phase

The total economic impacts of the operation phase of the *MACT* strategy can be found in Figure 16.

Figure 16: MACT—Operation Phase²³

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	256.7	\$18,157,959	\$10,208,130
2013	227.0	\$14,801,025	\$10,177,612
2014	196.7	\$11,962,891	\$10,040,283
2015	168.1	\$9,338,379	\$9,826,660
2016	143.3	\$7,080,078	\$9,536,743
2017	123.4	\$5,432,129	\$9,307,861
2018	106.3	\$3,906,250	\$9,094,238
2019	94.6	\$2,929,688	\$8,941,650
2020	88.6	\$2,258,301	\$8,941,650
Average	127.7	\$6,896,973	\$7,824,984

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 89 jobs by 2020, and generate \$6.9 million in output and \$7.8 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Protective services occupation*. Utilities and energy producing entities within the industry which house boilers subject to the strategy will reduce boiler fuel consumption in order to decrease pollutants. This will result in cost savings. This cost savings could result in additional expansion or investment which may require additional security personnel during these periods.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$17,022 for the investment phase and \$2,087,507 for the operation phase.

²³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

3.1.5 Energy Efficiency in the Residential Sector

The State's residential energy efficiency initiatives are part of the EmPOWER Maryland suite of energy efficiency programs administered primarily by MEA using SEIF revenues. Together with programs implemented by the utilities, the State's programs in all sectors, including residential, commercial and industrial, are intended to achieve the EmPOWER Maryland goal of a 15 percent reduction in per capita energy use by 2015. Programs funded and administered through other State agencies, including the DHCD, contribute to the EmPOWER goal, as do federally-funded energy efficiency programs.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Energy Efficiency in the Residential Sector* strategy under status quo can be found in Figure 17.

Figure 17: Energy Efficiency in the Residential Sector Status Quo—Investment Phase²⁴

Year	Jobs	Output	Wages
2010	6,518.9	\$419,799,805	\$151,763,916
2011	3,512.2	\$221,282,959	\$90,087,891
2012	3,987.3	\$246,856,689	\$103,271,484
2013	3,641.8	\$220,733,643	\$98,907,471
2014	3,466.9	\$207,427,979	\$99,273,682
2015	3,007.0	\$175,659,180	\$91,278,076
2016	363.5	\$4,150,391	\$20,736,694
2017	60.0	-\$16,052,246	\$7,400,513
2018	-75.2	-\$24,841,309	-\$808,716
2019	-100.7	-\$25,939,941	-\$4,898,071
2020	-71.7	-\$23,315,430	-\$6,210,327
Average	2,210.0	\$127,796,520	\$59,163,874

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will result in approximately 72 forgone jobs by 2020, and generate \$127.8 million in output and \$59.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. Newly created programs to promote energy efficiency within the residential sector include incentives for households to replace current appliances for Energy Star equivalents. These consumer purchases being offset by some of the energy efficiency programs, help to drive employment within the retail sales industry.

²⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase—Enhanced

The average annual economic impacts of the investment phase of the *Energy Efficiency in the Residential Sector* strategy under enhanced scenario can be found in Figure 18.

Figure 18: Energy Efficiency in the Residential Sector Enhanced—Investment Phase²⁵

Year	Jobs	Output	Wages
2010	6,518.9	\$419,799,805	\$151,763,916
2011	3,512.2	\$221,282,959	\$90,087,891
2012	3,987.3	\$246,856,689	\$103,271,484
2013	3,641.8	\$220,733,643	\$98,907,471
2014	3,466.9	\$207,427,979	\$99,273,682
2015	3,010.6	\$175,868,279	\$91,386,731
2016	363.9	\$4,155,331	\$20,761,379
2017	60.1	-\$16,071,354	\$7,409,322
2018	-75.3	-\$24,870,879	-\$809,678
2019	-100.8	-\$25,970,819	-\$4,903,902
2020	-71.8	-\$23,343,184	-\$6,217,720
Average	2,210.3	\$127,806,223	\$59,175,507

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's enhanced implementation will result in approximately 72 forgone jobs by 2020, and generate \$127.8 million in output and \$59.2 million in wages on average each year. Although the difference is minimal, the change would help to reduce current greenhouse gas emissions between FY 2014 and FY 2020. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. The program does not change the current structure but rather increase the incentives available to individuals to offset their current energy consumption within Maryland.

Operation Phase—Status Quo

The total economic impacts of the operation phase of the *Energy Efficiency in the Residential Sector* strategy under the status quo can be found in Figure 19.

²⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 19: Energy Efficiency in the Residential Sector—Operation Phase²⁶

Year	Jobs	Output	Wages
2010	134.2	-\$2,471,924	\$1,235,962
2011	113.7	-\$3,631,592	\$961,304
2012	98.9	-\$4,455,566	\$747,681
2013	88.1	-\$5,035,400	\$564,575
2014	83.1	-\$5,249,023	\$457,764
2015	79.8	-\$5,371,094	\$442,505
2016	77.5	-\$5,432,129	\$381,470
2017	77.2	-\$5,432,129	\$442,505
2018	75.7	-\$5,493,164	\$396,729
2019	74.1	-\$5,432,129	\$411,987
2020	76.6	-\$5,310,059	\$534,058
Average	89.0	-\$4,846,746	\$597,867

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 77 jobs by 2020, approximately \$4.8 million in forgone output and generate \$0.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*, which is driven by indirect and induced job creation in reallocation of consumer spending away from utility costs.

Operation Phase—Enhanced

The total economic impacts of the operation phase of the *Energy Efficiency in the Residential Sector* strategy under the enhanced scenario can be found in Figure 20.

²⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 20: Energy Efficiency in the Residential Sector—Operation Phase²⁷

Year	Jobs	Output	Wages
2010	134.2	-\$2,471,924	\$1,235,962
2011	113.7	-\$3,631,592	\$961,304
2012	98.9	-\$4,455,566	\$747,681
2013	88.1	-\$5,035,400	\$564,575
2014	83.1	-\$5,249,023	\$457,764
2015	79.8	-\$5,377,487	\$443,032
2016	77.6	-\$5,438,595	\$381,924
2017	77.2	-\$5,438,595	\$443,032
2018	75.8	-\$5,499,703	\$397,201
2019	74.2	-\$5,438,595	\$412,478
2020	76.7	-\$5,316,380	\$534,693
Average	89.0	-\$4,850,260	\$598,149

Source: REMI PI+, RESI

As shown in the Figure 20, the strategy maintain approximately 77 jobs by 2020, approximately \$4.8 million in forgone output and generate \$0.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*, which is driven by indirect and induced job creation as a result of increased household disposable income from reduced energy costs.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$54,053,314 for the investment phase and \$6,436,360 for the operation phase.

If the program were enhanced, the total state and local tax revenues would increase by approximately \$54,061,382 for the investment phase and \$6,437,321.

3.1.6 Energy Efficiency in the Commercial and Industrial Sectors

MEA's commercial and industrial energy efficiency programs support or compliment the EmPOWER Maryland suite of energy efficiency programs. MEA administers four programs that target energy efficiency improvements in the commercial and industrial sectors, which represent approximately 58 percent of electricity consumption in Maryland. These programs offer incentives for energy audits and funding for upgrades. The four programs are: 1) DOE Save Energy Now; 2) the Lawton Loan Program; 3) C/I Deep Retrofits; and 4) the State Agencies Loan Program.

²⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Energy Efficiency in the Commercial and Industrial Sectors is a key program under “EmPOWER Maryland” and when enhanced in tandem with RGGI will provide additional benefits to Maryland.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Energy Efficiency in the Commercial and Industrial Sectors* strategy for status quo can be found in Figure 21.

Figure 21: Energy Efficiency in the Commercial and Industrial Sectors—Investment Phase²⁸

Year	Jobs	Output	Wages
2010	3,255.3	\$250,244,141	\$115,112,305
2011	2,318.3	\$175,872,803	\$86,654,663
2012	2,916.2	\$221,466,064	\$111,816,406
2013	2,929.6	\$220,489,502	\$115,234,375
2014	3,127.8	\$236,877,441	\$127,502,441
2015	3,173.4	\$240,844,727	\$133,666,992
2016	5,666.1	\$442,443,848	\$244,918,823
2017	5,755.8	\$448,913,574	\$259,140,015
2018	5,789.3	\$453,735,352	\$271,255,493
2019	5,788.6	\$453,735,352	\$278,015,137
2020	5,807.6	\$455,505,371	\$284,301,758
Average	4,229.8	\$327,284,379	\$184,328,946

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy’s implementation will maintain approximately 5,808 jobs by 2020, and generate \$327.3 million in output and \$184.3 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. Energy efficiency technologies and improvements create additional savings for the commercial industry allowing for potential expansion and investments from increased energy saving incentives.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Energy Efficiency in the Commercial and Industrial Sectors* strategy for the enhanced scenario can be found in Figure 22.

²⁸ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 22: Energy Efficiency in the Commercial and Industrial Sectors—Investment Phase²⁹

Year	Jobs	Output	Wages
2010	3,255.3	\$250,244,141	\$115,112,305
2011	2,318.3	\$175,872,803	\$86,654,663
2012	2,916.2	\$221,466,064	\$111,816,406
2013	2,929.6	\$220,489,502	\$115,234,375
2014	3,127.8	\$236,877,441	\$127,502,441
2015	3,210.1	\$243,631,055	\$135,213,383
2016	5,731.7	\$447,562,472	\$247,752,285
2017	5,822.4	\$454,107,047	\$262,138,001
2018	5,856.3	\$458,984,607	\$274,393,643
2019	5,855.5	\$458,984,607	\$281,231,489
2020	5,874.8	\$460,775,104	\$287,590,840
Average	4,263.5	\$329,908,622	\$185,876,348

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's enhanced implementation will maintain approximately 5,875 jobs by 2020, and generate \$329.9 million in output and \$185.9 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. Energy efficiency technologies and improvements create additional savings for the commercial industry allowing for potential expansion and investments from increased energy saving incentives.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Energy Efficiency in the Commercial and Industrial Sectors* strategy under status quo can be found in Figure 23.

²⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 23: Energy Efficiency in the Commercial and Industrial Sectors—Operation Phase³⁰

Year	Jobs	Output	Wages
2010	311.1	\$24,017,334	\$5,981,445
2011	755.8	\$60,852,051	\$15,258,789
2012	1,330.7	\$111,175,537	\$28,121,948
2013	2,043.9	\$177,398,682	\$44,662,476
2014	2,918.9	\$264,007,568	\$67,230,225
2015	3,894.8	\$365,783,691	\$94,390,869
2016	4,398.8	\$436,523,438	\$112,808,228
2017	4,730.0	\$494,140,625	\$127,365,112
2018	4,907.5	\$542,053,223	\$138,671,875
2019	4,933.5	\$575,622,559	\$143,676,758
2020	4,880.0	\$601,684,570	\$145,629,883
Average	3,191.4	\$332,114,480	\$83,981,601

Source: REMI PI+, RESI

As shown in the figure above, the strategy under status quo will maintain approximately 4,880 jobs by 2020, and generate \$332.1 million in output and \$84.0 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. It is expected that businesses in the commercial and industrial sectors will benefit from energy efficiency after implementation in the form of operation cost savings, among other benefits.

Operation Phase—Enhanced

The average annual economic impacts of the operation phase of the *Energy Efficiency in the Commercial and Industrial Sectors* strategy under enhanced scenario can be found in Figure 24.

³⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 24: Energy Efficiency in the Commercial and Industrial Sectors—Operation Phase³¹

Year	Jobs	Output	Wages
2010	311.1	\$24,017,334	\$5,981,445
2011	755.8	\$60,852,051	\$15,258,789
2012	1,330.7	\$111,175,537	\$28,121,948
2013	2,043.9	\$177,398,682	\$44,662,476
2014	2,918.9	\$264,007,568	\$67,230,225
2015	3,939.9	\$370,015,436	\$95,482,875
2016	4,449.7	\$441,573,569	\$114,113,304
2017	4,784.8	\$499,857,329	\$128,838,597
2018	4,964.3	\$548,324,226	\$140,276,167
2019	4,990.6	\$582,281,925	\$145,338,952
2020	4,936.4	\$608,645,448	\$147,314,672
Average	3,220.6	\$335,286,282	\$84,783,586

Source: REMI PI+, RESI

As shown in the figure above, the strategy under the enhanced scenario will maintain approximately 4,936 jobs by 2020, and generate \$335.3 million in output and \$84.8 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. It is expected that businesses in the commercial and industrial sectors will benefit from energy efficiency after implementation in the form of operation cost savings, among other benefits.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$3,191,579,250 for the investment phase and \$67,256,829 for the operation phase.

If this strategy were enhanced, the total state and local tax revenues would increase by approximately \$3,217,007,455 for the investment phase and \$67,792,683 for the operation phase.

3.1.7 Energy Efficiency—Appliances and Other Products

MEA administers several appliance and equipment rebate programs for homeowners. It also administers low-interest loans for residential and commercial energy efficiency improvements, which may include appliances, equipment and lighting.

³¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

The average annual economic impacts of the investment phase of the *Energy Efficiency – Appliances and Other Products* strategy can be found in Figure 25.

Figure 25: Energy Efficiency – Appliances and Other Products—Investment Phase³²

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	-25.4	-\$1,647,949	-\$595,093
2012	-60.9	-\$3,875,732	-\$1,464,844
2013	-94.6	-\$5,950,928	-\$2,380,371
2014	-124.9	-\$7,812,500	-\$3,372,192
2015	-158.3	-\$9,887,695	-\$4,486,084
2016	-185.5	-\$11,535,645	-\$5,584,717
2017	-183.4	-\$11,230,469	-\$5,874,634
2018	-165.7	-\$10,070,801	-\$5,706,787
2019	-140.2	-\$8,361,816	-\$5,096,436
2020	-114.3	-\$6,713,867	-\$4,348,755
Average	-113.9	-\$7,007,946	-\$3,537,265

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will result in approximately 114 forgone jobs by 2020, approximately \$7.0 million in forgone output and \$3.5 million in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Transportation and Warehousing*. The increased demand for appliances related to energy efficiency may increase consumable good shipments within the region. Although this is a small economic benefit, this is still a positive benefit.

Operation Phase

The average annual economic impacts of the operation phase of the *Energy Efficiency – Appliances and Other Products* strategy can be found in Figure 26.

³² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 26: Energy Efficiency – Appliances and Other Products—Operation Phase³³

Year	Jobs	Output	Wages
2010	52.1	-\$946,045	\$488,281
2011	45.0	-\$1,373,291	\$396,729
2012	38.7	-\$1,739,502	\$305,176
2013	35.0	-\$1,922,607	\$244,141
2014	32.1	-\$2,075,195	\$167,847
2015	29.8	-\$2,197,266	\$137,329
2016	29.7	-\$2,136,230	\$167,847
2017	29.5	-\$2,136,230	\$198,364
2018	29.3	-\$2,136,230	\$198,364
2019	29.5	-\$2,014,160	\$213,623
2020	29.4	-\$2,075,195	\$244,141
Average	34.6	-\$1,886,541	\$251,076

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 29 jobs by 2020, approximately \$1.9 million in forgone output and generate \$0.3 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are those (such as *Sales, office, and administrative occupations*) providing the goods and services that will be in demand as households have more disposable income from the energy savings.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would decrease by approximately \$1,609,349 for the investment phase and increase by \$5,810,761 for the operation phase.

3.1.8 Energy Efficiency in the Power Sector – General

EmPOWER Maryland mandated that the PSC require each utility to propose cost-effective energy efficiency, conservation, and demand response programs designed to achieve targeted per capita energy reductions of at least five percent by the end of 2011 and at least 10 percent by the end of 2015, in addition to a 15 percent per capita peak demand reduction.

The five participating utilities are Potomac Edison (formerly known as Allegheny Power); Baltimore Gas and Electric (BGE); Delmarva Power and Light; Potomac Electric Power Company (Pepco); and Southern Maryland Electric Cooperative (SMECO). These utilities are responsible for two thirds of the EmPOWER 15 percent energy consumption reduction goal and all of the

³³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

peak demand reduction goal. Energy savings targets are spread amongst all customer classes, including low-to-moderate income customers.

Energy Efficiency in the Power Sector—General is a key program under “EmPOWER Maryland” and when enhanced in tandem with RGGI will provide additional benefits to Maryland.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Energy Efficiency in the Power Sector – General* strategy under the status quo can be found in Figure 27.

Figure 27: Energy Efficiency in the Power Sector – General—Investment Phase³⁴

Year	Jobs	Output	Wages
2010	-1,119.4	-\$129,150,391	-\$30,853,271
2011	-1,448.5	-\$159,973,145	-\$40,802,002
2012	-2,032.4	-\$221,435,547	-\$58,685,303
2013	-2,504.6	-\$269,531,250	-\$74,111,938
2014	-3,116.7	-\$338,714,600	-\$96,710,205
2015	-3,385.5	-\$366,760,254	-\$109,954,834
2016	-3,562.0	-\$386,657,715	-\$121,063,232
2017	-3,690.0	-\$402,465,820	-\$130,783,081
2018	-3,763.7	-\$414,916,992	-\$139,404,297
2019	-3,765.3	-\$420,776,367	-\$143,554,688
2020	-3,747.1	-\$424,865,723	-\$146,286,011
Average	-2,921.4	-\$321,386,164	-\$99,291,715

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy’s implementation will result in approximately 3,747 forgone jobs by 2020, approximately \$321.4 million in forgone output and \$99.3 million in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Computer, math, architect, engineer occupations*, primarily due to the expectation that the power sector will contract with professional consultants to implement energy efficiency improvements.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Energy Efficiency in the Power Sector – General* strategy under the enhanced scenario can be found in Figure 28.

³⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 28: Energy Efficiency in the Power Sector – General—Investment Phase³⁵

Year	Jobs	Output	Wages
2010	-1,119.4	-\$129,150,391	-\$30,853,271
2011	-1,448.5	-\$159,973,145	-\$40,802,002
2012	-2,032.4	-\$221,435,547	-\$58,685,303
2013	-2,504.6	-\$269,531,250	-\$74,111,938
2014	-3,116.7	-\$338,714,600	-\$96,710,205
2015	-3,394.3	-\$367,710,997	-\$110,239,867
2016	-3,571.2	-\$387,660,037	-\$121,377,061
2017	-3,699.5	-\$403,509,122	-\$131,122,107
2018	-3,773.5	-\$415,992,571	-\$139,765,671
2019	-3,775.1	-\$421,867,135	-\$143,926,821
2020	-3,756.8	-\$425,967,091	-\$146,665,224
Average	-2,926.5	-\$321,955,626	-\$99,478,134

Source: REMI PI+, RESI

As shown in the figure above, the investment phase under the enhanced scenario of this strategy's implementation will result in approximately 3,757 forgone jobs by 2020, approximately \$322.0 million in forgone output and \$99.5 million in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Professional, scientific, and technical services*, primarily due to the expectation that the power sector will contract with professional consultants to implement energy efficiency improvements.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Energy Efficiency in the Power Sector – General* strategy under the status quo scenario can be found in Figure 29.

³⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 29: Energy Efficiency in the Power Sector – General—Operation Phase³⁶

Year	Jobs	Output	Wages
2010	80.3	\$9,246,826	\$2,197,266
2011	142.3	\$15,899,658	\$3,967,285
2012	218.8	\$23,925,781	\$6,301,880
2013	340.2	\$37,200,928	\$10,040,283
2014	510.8	\$56,365,967	\$15,762,329
2015	723.2	\$80,139,160	\$23,376,465
2016	711.8	\$77,026,367	\$24,124,146
2017	723.4	\$78,552,246	\$25,741,577
2018	720.9	\$79,223,633	\$26,947,021
2019	705.7	\$78,979,492	\$27,221,680
2020	690.5	\$78,491,211	\$27,328,491
Average	506.2	\$55,913,752	\$17,546,220

Source: REMI PI+, RESI

As shown in the figure above, the strategy under the status quo will maintain approximately 691 jobs by 2020, and generate \$55.9 million in output and \$17.5 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction, extraction occupations*. Energy efficiency improvements implemented during the investment phase will result in cost savings for power generating entities within the industry, which may then expand employment or operations. Other top gaining industries reflect the increased household spending resulting from new households established due to direct and indirect job creation and wage generation in the *Construction, extraction occupations* industry.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Energy Efficiency in the Power Sector – General* strategy under the enhanced scenario can be found in Figure 30.

³⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 30: Energy Efficiency in the Power Sector – General—Operation Phase³⁷

Year	Jobs	Output	Wages
2010	80.3	\$9,246,826	\$2,197,266
2011	142.3	\$15,899,658	\$3,967,285
2012	218.8	\$23,925,781	\$6,301,880
2013	340.2	\$37,200,928	\$10,040,283
2014	510.8	\$56,365,967	\$15,762,329
2015	725.1	\$80,346,903	\$23,437,063
2016	713.6	\$77,226,041	\$24,186,682
2017	725.2	\$78,755,875	\$25,808,306
2018	722.7	\$79,429,002	\$27,016,876
2019	707.5	\$79,184,229	\$27,292,246
2020	692.3	\$78,694,682	\$27,399,334
Average	507.2	\$56,025,081	\$17,582,686

Source: REMI PI+, RESI

As shown in the figure above, the strategy under the enhanced scenario will maintain approximately 692 jobs by 2020, and generate \$56.0 million in output and \$17.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is the *Construction* sector. Energy efficiency improvements implemented during the investment phase will result in cost savings for power generating entities within the industry, which may then expand employment or operations. Other top gaining industries reflect the increased household spending resulting from new households established due to direct and indirect job creation and wage generation in the *Construction, extraction occupations* industry.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$4,494,845 for the investment phase and \$18,514,443 for the operation phase.

If the strategy was enhanced, the total state and local tax revenues would increase by approximately \$4,502,692 for the investment phase and \$18,546,764 for the operation phase.

3.1.9 Maryland Renewable Energy Portfolio Standard Subprogram

The RPS is implemented through the creation, sale and transfer of RECs. Each REC represents one megawatt of renewably generated electricity. Electricity suppliers are required to purchase RECs to demonstrate they have obtained specified percentages of their energy supply from renewable resources. Sources are classified as Tier 1 and Tier 2. Tier 1 sources consist of:

³⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

solar; wind; qualifying biomass; qualifying methane; geothermal; ocean; qualifying fuel cell, qualifying hydroelectric power, poultry litter-to-energy; waste-to-energy; and refuse-derived fuel. Non-solar Tier 1 requirements gradually increase to 18 percent in 2020, and then peak in 2022 at 20 percent and are subsequently maintained at that level. Tier 1 includes a solar set-aside requirement which gradually increases until it peaks at two percent in 2020. Maryland's Tier 2 source (eligible hydroelectric power) requirement remains constant at 2.5 percent through 2018, after which it sunsets. The development of renewable energy sources is further promoted by requiring electricity suppliers to pay a financial penalty for failing to acquire sufficient RECs to satisfy the RPS. The penalty is used to support the development of new Tier 1 renewable sources in the State.

The RPS is designed to create a stable and predictable market for renewable energy and to foster additional development and growth in the renewable energy industry.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Maryland Renewable Energy Portfolio Standard Subprogram* strategy for status quo can be found in Figure 31.

Figure 31: Maryland Renewable Energy Portfolio Standard Subprogram—Investment Phase³⁸

Year	Jobs	Output	Wages
2010	487.1	\$28,045,654	\$10,894,775
2011	7,249.2	\$417,968,750	\$167,144,775
2012	2,698.3	\$154,144,287	\$73,776,245
2013	6,441.0	\$365,722,656	\$166,763,306
2014	3,769.0	\$210,906,982	\$111,907,959
2015	10,887.4	\$616,149,902	\$305,389,404
2016	7,282.8	\$406,311,035	\$229,507,446
2017	40,462.6	\$2,299,865,723	\$1,203,445,435
2018	39,924.7	\$2,203,369,141	\$1,289,352,417
2019	17,769.5	\$998,352,051	\$682,495,117
2020	6,427.2	\$324,462,891	\$315,597,534
Average	13,036.3	\$729,572,643	\$414,206,765

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation under status quo will maintain approximately 6,427 jobs by 2020, and generate \$729.6 million in output and \$414.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Professional, scientific, and technical services*, primarily due to the expectation that those

³⁸ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

entities implementing renewable energy would seek outside contractors and purchasers to assist in acquiring the investment materials.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Maryland Renewable Energy Portfolio Standard Subprogram* strategy for status quo can be found in Figure 32.

Figure 32: Maryland Renewable Energy Portfolio Standard Subprogram—Investment Phase³⁹

Year	Jobs	Output	Wages
2010	487.1	\$28,045,654	\$10,894,775
2011	7,249.2	\$417,968,750	\$167,144,775
2012	2,698.3	\$154,144,287	\$73,776,245
2013	6,441.0	\$365,722,656	\$166,763,306
2014	3,769.0	\$210,906,982	\$111,907,959
2015	11,197.9	\$633,720,958	\$314,098,347
2016	7,490.5	\$417,898,010	\$236,052,425
2017	41,616.5	\$2,365,452,146	\$1,237,764,691
2018	41,063.2	\$2,266,203,722	\$1,326,121,526
2019	18,276.2	\$1,026,822,556	\$701,958,172
2020	6,610.5	\$333,715,761	\$324,597,587
Average	13,354.5	\$747,327,408	\$424,643,619

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation under enhancement will maintain approximately 6,611 jobs by 2020, and generate \$747.3 million in output and \$424.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Professional, scientific, and technical services*, primarily due to the expectation that those entities implementing renewable energy would seek outside contractors and purchasers to assist in acquiring the investment materials.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Maryland Renewable Energy Portfolio Standard Subprogram* strategy under status quo can be found in Figure 33.

³⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 33: Maryland Renewable Energy Portfolio Standard Subprogram—Operation Phase⁴⁰

Year	Jobs	Output	Wages
2010	-346.5	-\$37,506,104	-\$4,730,225
2011	-625.6	-\$64,453,125	-\$12,374,878
2012	-845.9	-\$85,723,877	-\$18,737,793
2013	-1,025.7	-\$103,485,107	-\$24,505,615
2014	-1,134.5	-\$116,333,008	-\$29,296,875
2015	-1,193.0	-\$126,831,055	-\$27,175,903
2016	-1,275.8	-\$137,268,066	-\$31,311,035
2017	-1,819.9	-\$192,749,023	-\$50,506,592
2018	-2,451.1	-\$257,324,219	-\$74,386,597
2019	-2,877.8	-\$303,710,938	-\$92,620,850
2020	-3,154.6	-\$337,524,414	-\$106,216,431
Average	-1,522.8	-\$160,264,449	-\$42,896,618

Source: REMI PI+, RESI

As shown in the figure above, the strategy under status quo will result in approximately 3,155 forgone jobs by 2020, approximately \$160.3 million in forgone output and \$42.9 million in forgone wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are those (such as *Farm, fishing, and forestry occupations*) which provide goods and services that households demand. New households are likely to be created due to the development of a renewable energy industry in Maryland as a result of job creation and wage generation in industries—such as *Farm, fishing, and forestry occupations*—associated with RPS.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Maryland Renewable Energy Portfolio Standard Subprogram* strategy under enhancements can be found in Figure 34.

⁴⁰ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 34: Maryland Renewable Energy Portfolio Standard Subprogram—Operation Phase⁴¹

Year	Jobs	Output	Wages
2010	-346.5	-\$37,506,104	-\$4,730,225
2011	-625.6	-\$64,453,125	-\$12,374,878
2012	-845.9	-\$85,723,877	-\$18,737,793
2013	-1,025.7	-\$103,485,107	-\$24,505,615
2014	-1,134.5	-\$116,333,008	-\$29,296,875
2015	-1,227.0	-\$130,447,959	-\$27,950,892
2016	-1,312.2	-\$141,182,609	-\$32,203,948
2017	-1,871.8	-\$198,245,744	-\$51,946,914
2018	-2,521.0	-\$264,662,462	-\$76,507,917
2019	-2,959.9	-\$312,372,014	-\$95,262,165
2020	-3,244.6	-\$347,149,767	-\$109,245,458
Average	-1,555.9	-\$163,778,343	-\$43,887,516

Source: REMI PI+, RESI

As shown in the figure above, the strategy under enhancement will result in approximately 3,245 forgone jobs by 2020, approximately \$163.8 million in forgone output and \$43.9 million in forgone wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are those (such as *Farm, fishing, and forestry occupations*) which provide goods and services that households demand. New households are likely to be created due to the development of a renewable energy industry in Maryland as a result of job creation and wage generation in industries—such as *Farm, fishing, and forestry occupations*—associated with RPS.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$184,296,290 for the investment phase and decrease by \$23,268,807 for the operation phase.

If the strategy was enhanced, the total state and local tax revenues would increase by approximately \$188,794,735 in the investment phase and decrease by \$23,836,770 in the operation phase.

3.1.10 Incentives and Grant Subprograms to Support Renewable Energy

MEA administers a number of incentives and grant programs to promote and accelerate the development of renewable energy production in Maryland, from utility scale facilities to on-site distributed generation.

⁴¹ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

This is a voluntary incentive based program. Funding for the incentive and grant programs comes from the Strategic Energy Investment Fund.

Investment Phase

The average annual economic impacts of the investment phase of the *Incentives and Grant Subprograms to Support Renewable Energy* strategy can be found in Figure 35.

Figure 35: Incentives and Grant Subprograms to Support Renewable Energy—Investment Phase⁴²

Year	Jobs	Output	Wages
2010	241.4	\$18,615,723	\$8,682,251
2011	323.8	\$26,702,881	\$14,129,639
2012	5.1	\$4,638,672	\$5,615,234
2013	-254.2	-\$12,451,172	-\$1,464,844
2014	-320.0	-\$16,235,352	-\$3,784,180
2015	-330.3	-\$16,135,742	-\$4,456,848
2016	-355.5	-\$18,543,091	-\$7,043,121
2017	-285.0	-\$13,598,267	-\$5,611,725
2018	-244.8	-\$11,255,981	-\$5,400,269
2019	-170.7	-\$6,246,094	-\$3,188,110
2020	-107.0	-\$2,016,968	-\$1,073,547
Average	-136.1	-\$4,229,581	-\$326,865

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will result in approximately 107 forgone jobs by 2020, approximately \$4.2 million in forgone output and \$0.3 million in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of the government spending associated with this strategy is *Protective services* occupations, which results from the government spending associated with the grant program.

Operation Phase

The average annual economic impacts of the operation phase of the *Incentives and Grant Subprograms to Support Renewable Energy* strategy can be found in Figure 36.

⁴² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 36: Incentives and Grant Subprograms to Support Renewable Energy—Operation Phase⁴³

Year	Jobs	Output	Wages
2010	-23.7	-\$6,317,139	-\$4,211,426
2011	25.0	-\$2,014,160	-\$3,524,780
2012	64.0	\$1,708,984	-\$2,868,652
2013	93.3	\$4,882,813	-\$2,319,336
2014	114.8	\$7,568,359	-\$1,907,349
2015	119.2	\$9,007,080	-\$1,659,119
2016	128.3	\$10,717,285	-\$1,366,333
2017	133.0	\$12,142,456	-\$1,171,143
2018	132.0	\$13,168,579	-\$1,138,611
2019	125.5	\$13,795,654	-\$1,301,270
2020	117.6	\$14,194,702	-\$1,577,789
Average	93.5	\$7,168,601	-\$2,095,073

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 118 jobs by 2020, generate \$7.2 million in output and result in \$2.1 million in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Building, grounds, personal care, and service occupations*. A wide variety of business are expected to take advantage of the commercial grants and would therefore experience cost savings as a result. These cost savings could be used for business growth. Similar effects would be experienced by residential consumers under the residential programs, and household spending on a variety of goods and sectors would increase as a result.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would decrease by \$564,654 for the investment phase and increase by \$6,604,798 for the operation phase.

3.1.11 Offshore Wind Initiatives to Support Renewable Energy

Maryland waters are part of the Mid-Atlantic Bight region, a coastal area spanning from North Carolina to Massachusetts with substantial wind resources located in close proximity to coastal population centers. In fact, this area has the greatest renewable energy potential relative to other U.S. offshore regions in the Gulf of Mexico, Pacific, and Alaska. Research indicates that the potential power supply available from offshore wind substantially exceeds the region's current energy use. Maryland, therefore, has the potential to access large energy resources off

⁴³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

the coast that could contribute to meeting future energy demands while simultaneously displacing fossil fuel generation.

Maryland has taken a lead among Mid-Atlantic States working to harness offshore wind resources. We are moving forward expeditiously to put in place financial support, regulatory parameters, lease conditions, and data-gathering initiatives to support the deployment of a first-phase major offshore wind project in the Maryland Wind Energy Area (WEA) by 2018.

Investment Phase

The average annual economic impacts of the investment phase of the *Offshore Wind Initiatives to Support Renewable Energy* strategy can be found in Figure 37.

Figure 37: Offshore Wind Initiatives to Support Renewable Energy—Investment Phase⁴⁴

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	2,167.9	\$88,134,766	\$56,182,861
2018	25.9	\$1,159,668	\$3,005,981
2019	-7.7	-\$1,037,598	\$1,098,633
2020	-25.1	-\$2,258,301	-\$137,329
Average	540.2	\$21,499,634	\$15,037,537

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will result in approximately 25 forgone jobs by 2020, and generate \$21.5 million in output and \$15.0 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that the expertise of environmental consultants and engineers would be in demand as offshore wind is established and in need of proper development and management.

Operation Phase

The average annual economic impacts of the operation phase of the *Offshore Wind Initiatives to Support Renewable Energy* strategy can be found in Figure 38.

⁴⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 38: Offshore Wind Initiatives to Support Renewable Energy—Operation Phase⁴⁵

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	281.8	\$16,662,598	\$37,902,832
2019	291.2	\$17,333,984	\$39,627,075
2020	290.2	\$17,333,984	\$40,908,813
Average	287.7	\$17,110,189	\$39,479,574

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 290 jobs by 2020, and generate \$17.1 million in output and \$39.5 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Sales, office, and administrative occupations*. A wide variety of businesses will benefit positively from the need for management and maintenance of offshore wind once implemented, and may hire additional employees.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by \$2,388,305 for the investment phase and \$10,175,236 for the operation phase.

3.1.12 Title V Permits for GHG Sources

The Title V operating permits program was established through the Clean Air Act amendments of 1990. Before 1990, states were required to issue air pollution permits to businesses which created new pollution sources or modified existing pollution sources. Title V of the amendments required all states to develop and implement permit programs for sources already in operation. The program is achieving enhanced compliance with industrial and commercial air pollution requirements. The Title V Program does not establish any new emissions limitations, standards, or work practices on an affected facility. However, there may be additional recordkeeping, monitoring, or reporting requirements. EPA granted Maryland final full approval for its Title V permit program in February 2003.

⁴⁵ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Investment Phase

The average annual economic impacts of the investment phase of the *Title V Permits for GHG Sources* strategy can be found in Figure 39.

Figure 39: Title V Permits for GHG Sources—Investment Phase⁴⁶

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	1.5	\$122,070	\$61,035
2013	1.3	\$91,553	\$45,776
2014	1.0	\$122,070	\$45,776
2015	1.0	\$61,035	\$45,776
2016	1.5	\$122,070	\$76,294
2017	1.0	\$122,070	\$61,035
2018	1.5	\$61,035	\$61,035
2019	0.6	\$122,070	\$61,035
2020	0.5	\$61,035	\$45,776
Average	0.9	\$80,455	\$45,776

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately one job by 2020, and generate \$80,455 in output and \$45,776 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. The companies and enterprises required to purchase Title V permits are likely to demand services in this industry relating to energy efficiency and emissions reductions to lower the amount of permits they need to purchase through auctions. This industry will also benefit from auction proceeds being invested into various energy efficiency programs relating to the services provided within this industry.

Operation Phase

The average annual economic impacts of the operation phase of the *Title V Permits for GHG Sources* strategy can be found in Figure 40.

⁴⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 40: Title V Permits for GHG Sources—Operation Phase⁴⁷

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	8.2	\$549,316	\$289,917
2012	7.1	\$457,764	\$305,176
2013	6.2	\$335,693	\$305,176
2014	5.4	\$335,693	\$289,917
2015	3.4	\$122,070	\$259,399
2016	3.2	\$122,070	\$244,141
2017	3.0	\$122,070	\$274,658
2018	2.9	\$122,070	\$274,658
2019	2.1	\$122,070	\$228,882
2020	2.0	\$61,035	\$259,399
Average	4.0	\$213,623	\$248,302

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 2 jobs by 2020, and generate \$0.2 million in output and \$0.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment from this phase of the strategy is *Protective service occupations* and *Sales, office, and administrative occupations*, primarily due to the expectation that the ongoing permit auctions and the resulting proceeds will need to be administered and monitored by individuals employed by the state government.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$17,022 for the investment phase and \$6,597,563 for the operation phase.

3.1.13 BeSMART

The Department of Housing and Community Development (DHCD) has pursued new opportunities to help people and communities through energy efficiency retrofits for homes and small businesses. With a “Main Street” approach, DHCD competed for and won an award of \$20 million from the U.S. Department of Energy’s (DOE) Better Buildings/EECBG program. This Recovery Act-funded award was a three-year commitment that funded energy efficiency retrofits through a new DHCD program called BeSMART. The BeSMART investments and initiatives subsequently provided the foundation for DHCD’s newly created Housing and Building Energy unit, which was launched in 2012.

⁴⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

BeSMART has been identified as a program that could increase GHG benefits to Maryland if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *BeSMART* strategy can be found in Figure 41.

Figure 41: BeSMART—Investment Phase⁴⁸

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	966.9	\$49,652,100	\$20,587,921
2012	2,515.1	\$130,035,400	\$56,217,194
2013	2,288.5	\$120,269,775	\$55,957,794
2014	2,750.0	\$145,202,637	\$70,240,021
2015	7,222.5	\$380,615,234	\$182,254,791
2016	3,306.3	\$178,222,656	\$99,102,020
2017	3,202.0	\$171,569,824	\$98,339,081
2018	902.5	\$47,119,141	\$38,482,666
2019	-291.4	-\$20,141,602	\$1,190,186
2020	689.0	\$31,433,105	\$23,464,203
Average	2,141.0	\$112,179,843	\$58,712,352

Source: REMI PI+, RESI

As shown in the figure above, investment phase of this strategy's implementation will maintain approximately 689 jobs by 2020, and generate \$112.2 million in output and \$58.7 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*. This industry would be in higher demand to equip and accommodate energy reduction measures in households and businesses.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *BeSMART* strategy can be found in Figure 42.

⁴⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 42: BeSMART—Investment Phase⁴⁹

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	966.9	\$49,652,100	\$20,587,921
2012	2,515.1	\$130,035,400	\$56,217,194
2013	2,288.5	\$120,269,775	\$55,957,794
2014	4,914.2	\$257,751,465	\$120,670,319
2015	13,037.6	\$686,706,543	\$325,931,549
2016	6,032.0	\$325,500,488	\$178,768,158
2017	5,859.6	\$314,941,406	\$178,955,078
2018	1,723.1	\$91,125,488	\$72,177,887
2019	-435.8	-\$30,395,508	\$5,409,241
2020	1,320.4	\$61,950,684	\$45,745,850
Average	3,474.7	\$182,503,440	\$96,401,908

Source: REMI PI+, RESI

As shown in the figure above, investment phase of this strategy's implementation will maintain approximately 1,320 jobs by 2020, and generate \$182.5 million in output and \$96.4 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*. This industry would be in higher demand to equip and accommodate energy reduction measures in households and businesses.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *BeSMART* strategy can be found in Figure 43.

⁴⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 43: BeSMART—Operation Phase⁵⁰

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.1	\$0	-\$3,815
2012	-0.1	\$0	\$0
2013	0.5	\$30,518	\$7,629
2014	0.5	\$61,035	\$0
2015	0.5	\$0	\$19,073
2016	0.6	\$0	\$19,073
2017	0.5	\$0	\$15,259
2018	1.3	\$122,070	\$34,332
2019	1.8	\$61,035	\$49,591
2020	1.2	\$61,035	\$26,703
Average	0.6	\$30,518	\$15,259

Source: REMI PI+, RESI

As shown in Figure 43, the strategy will maintain approximately one job by 2020, and generate \$30,518 in output and \$15,259 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Management of companies and enterprises*, primarily due to the expectation that operation of this strategy will likely require management of funds distributed through the Energy Efficiency and Conservation Block Program. Another top-gaining industry is *Health care and social assistance*, which is driven by indirect and induced job creation in healthcare associated with the relatively high job creation from *Management of companies and enterprises* and other industries. The new employees and households directly associated with this policy as well as the indirect beneficiaries of the grant program will increase demand for healthcare.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *BeSMART* strategy can be found in Figure 44.

⁵⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 44: BeSMART—Operation Phase⁵¹

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.1	\$0	-\$3,815
2012	0.0	\$0	\$0
2013	0.9	\$30,518	\$15,259
2014	1.0	\$61,035	\$15,259
2015	0.7	\$0	\$19,073
2016	1.2	\$61,035	\$30,518
2017	1.0	\$61,035	\$30,518
2018	2.1	\$183,105	\$53,406
2019	2.4	\$122,070	\$68,665
2020	2.1	\$122,070	\$57,220
Average	1.0	\$58,261	\$26,009

Source: REMI PI+, RESI

As shown in Figure 44, the strategy will maintain approximately 2 jobs by 2020, and generate \$58,261 in output and \$26,009 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Management of companies and enterprises*, primarily due to the expectation that operation of this strategy will likely require management of funds distributed through the Energy Efficiency and Conservation Block Program. Another top-gaining industry is *Health care and social assistance*, which is driven by indirect and induced job creation in healthcare associated with the relatively high job creation from *Management of companies and enterprises* and other industries. The new employees and households directly associated with this policy as well as the indirect beneficiaries of the grant program will increase demand for healthcare.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$1,688,278,413 for the investment phase, and \$2,142 for the operation phase.

If this strategy was enhanced, the total state and local tax revenues would increase by approximately \$2,739,963,103 for the investment phase and \$3,571 for the operation phase.

3.1.14 Weatherization and Energy Efficiency for Low-Income Houses

Since inception of the federally-funded Weatherization Assistance Program (WAP) in the seventies, more than seven million homes have been weatherized across the nation. Scientific Studies and the energy industry recognize that energy efficiency is among the most viable

⁵¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

options for decreasing fossil fuel consumption and consequently reducing GHG emissions. Energy-efficiency is cost-effective and can be implemented quickly. A weatherized household can realize up to \$400 in first-year energy savings and an annual CO2 reduction of 2.65 metric tons on average.⁵² WAP is designed to help eligible low income households with the installation of energy conservation materials to reduce the consumption of energy and the cost of maintenance. The U.S. Department of Energy (DOE) has funded WAP since 1976, with major funding increases to the program under the American Recovery and Reinvestment Act of 2009.

Weatherization and Energy Efficiency for Low-Income Houses is a strategy that has been identified as providing greater GHG benefits for Maryland if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Weatherization and Energy Efficiency for Low-Income Houses* strategy can be found in Figure 45.

Figure 45: Weatherization and Energy Efficiency for Low-Income Houses—Investment Phase⁵³

Year	Jobs	Output	Wages
2010	685.4	\$15,014,648	\$7,980,347
2011	1,602.1	\$36,254,883	\$19,676,208
2012	1,790.5	\$42,388,916	\$24,169,922
2013	837.2	\$21,575,928	\$14,179,230
2014	1,479.3	\$35,644,531	\$21,942,139
2015	1,789.6	\$43,395,996	\$27,004,242
2016	1,796.6	\$44,311,523	\$28,453,827
2017	1,242.1	\$30,883,789	\$21,354,675
2018	208.6	\$3,906,250	\$5,245,209
2019	157.1	\$183,105	\$1,724,243
2020	137.6	-\$1,281,738	-\$362,396
Average	1,066.0	\$24,752,530	\$15,578,877

Source: REMI PI+, RESI

As shown in Figure 45, the investment phase of this strategy's implementation will maintain approximately 138 jobs by 2020, and generate \$24.8 million in output and \$15.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Other services except Public Administration*, primarily due to the expectation that the policy will drive increased demand for energy auditing services, which are contained within this industry. Another top-gaining industry is *Construction*, which includes repair and maintenance associated with weatherization.

⁵² U.S. Department of Energy, Oak Ridge National Laboratory, "Weatherization Assistance Program Technical Memorandum Background Data and Statistics," <http://energy.gov>, March 2010

⁵³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Weatherization and Energy Efficiency for Low-Income Houses* strategy can be found in Figure 46.

Figure 46: Weatherization and Energy Efficiency for Low-Income Houses—Investment Phase⁵⁴

Year	Jobs	Output	Wages
2010	685.4	\$15,014,648	\$7,980,347
2011	1,602.1	\$36,254,883	\$19,676,208
2012	1,790.5	\$42,388,916	\$24,169,922
2013	837.2	\$21,575,928	\$14,179,230
2014	2,915.2	\$69,458,008	\$40,481,567
2015	3,578.4	\$88,012,695	\$53,150,177
2016	3,607.3	\$91,064,453	\$57,529,449
2017	2,498.8	\$64,392,090	\$44,193,268
2018	422.2	\$9,887,695	\$12,279,510
2019	310.9	\$2,014,160	\$5,302,429
2020	261.9	-\$1,586,914	\$1,052,856
Average	1,682.7	\$39,861,506	\$25,454,088

Source: REMI PI+, RESI

As shown in Figure 46, the investment phase of this strategy's implementation will maintain approximately 262 jobs by 2020, and generate \$39.9 million in output and \$25.5 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Other services except Public Administration*, primarily due to the expectation that the policy will drive increased demand for energy auditing services, which are contained within this industry. Another top-gaining industry is *Construction*, which includes repair and maintenance associated with weatherization.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Weatherization and Energy Efficiency for Low-Income Houses* strategy can be found in Figure 47.

⁵⁴ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 47: Weatherization and Energy Efficiency for Low-Income Houses—Operation Phase⁵⁵

Year	Jobs	Output	Wages
2010	3.6	\$30,518	\$49,591
2011	3.9	\$30,518	\$53,406
2012	2.8	-\$30,518	\$38,147
2013	4.2	\$30,518	\$61,035
2014	3.3	\$0	\$49,591
2015	3.0	-\$61,035	\$49,591
2016	2.3	-\$61,035	\$57,220
2017	2.9	-\$61,035	\$49,591
2018	3.6	\$61,035	\$72,479
2019	4.8	\$0	\$95,367
2020	3.7	\$0	\$72,479
Average	3.5	-\$5,549	\$58,954

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 4 jobs by 2020, result in approximately \$5,549 in forgone output and generate \$58,954 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are *Health Care and Social Assistance*. It is expected that households receiving weatherization services as a result of this policy will save on energy costs and experience an increase in disposable income, which will be spent on a wide variety of goods and services in such industries.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Weatherization and Energy Efficiency for Low-Income Houses* strategy can be found in Figure 48.

⁵⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 48: Weatherization and Energy Efficiency for Low-Income Houses—Operation Phase⁵⁶

Year	Jobs	Output	Wages
2010	3.6	\$30,518	\$49,591
2011	3.9	\$30,518	\$53,406
2012	2.8	-\$30,518	\$38,147
2013	4.2	\$30,518	\$61,035
2014	7.1	\$0	\$118,256
2015	6.2	-\$61,035	\$99,182
2016	5.1	-\$122,070	\$83,923
2017	5.6	-\$122,070	\$91,553
2018	5.7	-\$61,035	\$99,182
2019	6.2	-\$122,070	\$110,626
2020	5.9	-\$122,070	\$106,812
Average	5.1	-\$49,938	\$82,883

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 6 jobs by 2020, result in approximately \$49,938 in forgone output and generate \$82,883 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are *Health Care and Social Assistance*. It is expected that households receiving weatherization services as a result of this policy will save on energy costs and experience an increase in disposable income, which will be spent on a wide variety of goods and services in such industries.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$748,166,237 during the investment phase and \$1,657 during the operation phase.

If the strategy is enhanced, the total state and local tax revenues would accumulate to approximately \$1,180,993,740 for the investment phase and \$2,414 during the operation phase.

3.1.15 GHG Prevention of Significant Deterioration Permitting Program

The Prevention of Significant Deterioration (PSD) program is a federal preconstruction review and permitting program applicable to new major stationary sources and major modifications at existing major stationary sources. It requires the application of Best Available Control Technology (BACT) to control emissions of certain pollutants, which now include GHGs. A BACT determination is based on consideration of a number of factors, including the cost-

⁵⁶ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

effectiveness of the controls and the energy and environmental impacts. The BACT requirements apply to all new major sources of GHG emissions and major modifications at GHG emitting facilities. This means that GHG sources subject to the requirements must evaluate and apply currently available measures (and later technology as it develops) to reduce GHG emissions.

Investment Phase

The average annual economic impacts of the investment phase of the *Prevention of Significant Deterioration* strategy can be found in Figure 49.

Figure 49: Prevention of Significant Deterioration—Investment Phase⁵⁷

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	1.5	\$122,070	\$61,035
2013	1.3	\$91,553	\$45,776
2014	1.0	\$122,070	\$45,776
2015	1.0	\$61,035	\$45,776
2016	1.5	\$122,070	\$76,294
2017	1.0	\$122,070	\$61,035
2018	1.5	\$61,035	\$61,035
2019	0.6	\$122,070	\$61,035
2020	0.5	\$61,035	\$45,776
Average	0.9	\$80,455	\$45,776

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately one job by 2020, and generate \$80,455 in output and \$45,776 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that processing and management will be required for tracking stationary sources subject to preconstruction reviews.

Operation Phase

The total economic impacts of the operation phase of the *Prevention of Significant Deterioration* strategy can be found in Figure 50.

⁵⁷ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 50: Prevention of Significant Deterioration—Operation Phase⁵⁸

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	2.7	\$183,105	\$106,812
2013	2.4	\$152,588	\$106,812
2014	2.1	\$152,588	\$76,294
2015	0.6	\$0	\$76,294
2016	0.5	\$0	\$76,294
2017	0.4	\$0	\$61,035
2018	0.5	\$0	\$76,294
2019	0.0	\$61,035	\$76,294
2020	-0.1	\$0	\$61,035
Average	0.8	\$49,938	\$65,197

Source: REMI PI+, RESI

As shown in Figure 50, the strategy will result in less than one forgone job by 2020, and generate \$49,938 in output and \$65,197 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that public administration will conduct the preconstruction reviews during operation of the strategy.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$17,022 for the investment phase and \$6,545,005 for the operation phase.

3.2 Transportation

3.2.1 Transportation Technology Initiatives

This suite of programs reduces GHG emissions in several ways. “Upstream” fuel standards, such as the federal Renewable Fuels Standard, require transportation fuel producers to blend renewable fuels into their petroleum products. Depending on manufacturers’ choices of renewable fuels, this program has the potential to reduce the per unit carbon intensity of their product inventory over time. The Maryland Clean Cars Program requires car manufacturers to meet a fleet-wide average GHG emissions standard for vehicles sold in the State. The national CAFE standards for light-duty vehicles and medium and heavy-duty vehicle standards require car and truck manufacturers to both reduce GHG emissions and increase the fuel efficiency (i.e., more miles per gallon) of their vehicle fleets over time. Maryland, California and other leadership states have played a key role in advancing more stringent national standards. In

⁵⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

addition to achieving significant GHG reductions over time, these programs will produce public health, air quality, water quality and economic benefits for Marylanders.

Transportation technologies include both a current status quo scenario and an enhanced scenario.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Transportation Technology Initiatives* strategy during status quo can be found in Figure 51.

Figure 51: Transportation Technology Initiatives—Investment Phase⁵⁹

Year	Jobs	Output	Wages
2010	517.6	\$65,845,850	\$25,296,600
2011	548.0	\$70,135,500	\$28,805,575
2012	555.4	\$72,308,700	\$31,217,325
2013	547.7	\$72,487,750	\$32,634,925
2014	532.7	\$71,648,375	\$33,352,875
2015	737.6	\$97,142,425	\$44,357,650
2016	727.3	\$97,170,075	\$46,059,275
2017	711.7	\$96,306,975	\$47,099,150
2018	692.5	\$94,797,500	\$47,631,675
2019	673.8	\$93,433,625	\$48,019,325
2020	655.2	\$92,129,300	\$48,255,650
Average	627.2	\$83,946,007	\$39,339,093

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 655 jobs by 2020, and generate \$83.9 million in output and \$39.3 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*, due to the needed labor to complete transportation roadway programs through 2020. Other sectors include *Professional, scientific, and technical services*, as the program would require land planning and architecture expertise to complete.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Transportation Technology Initiatives* strategy during enhancement can be found in Figure 52.

⁵⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 52: Transportation Technology Initiatives—Investment Phase⁶⁰

Year	Jobs	Output	Wages
2010	569.4	\$72,430,435	\$27,826,260
2011	602.8	\$77,149,050	\$31,686,133
2012	610.9	\$79,539,570	\$34,339,058
2013	602.5	\$79,736,525	\$35,898,418
2014	586.0	\$78,813,213	\$36,688,163
2015	811.3	\$106,856,668	\$48,793,415
2016	800.0	\$106,887,083	\$50,665,203
2017	782.8	\$105,937,673	\$51,809,065
2018	761.7	\$104,277,250	\$52,394,843
2019	741.1	\$102,776,988	\$52,821,258
2020	720.7	\$101,342,230	\$53,081,215
Average	689.9	\$92,340,608	\$43,273,003

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 721 jobs by 2020, and generate \$92.3 million in output and \$42.3 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*, due to the needed labor to complete transportation roadway programs through 2020. Other sectors include *Professional, scientific, and technical services*, as the program would require land planning and architecture expertise to complete.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Transportation Technology Initiatives* strategy during the status quo can be found in Figure 53.

⁶⁰ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 53: Transportation Technology Initiatives—Operation Phase⁶¹

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	457.2	\$24,060,060	\$10,354,615
2013	470.9	\$24,609,377	\$11,549,376
2014	458.3	\$23,730,469	\$12,098,693
2015	434.9	\$22,192,384	\$12,222,292
2016	413.6	\$20,654,298	\$12,222,292
2017	394.6	\$19,335,938	\$12,181,090
2018	390.2	\$19,116,212	\$12,387,085
2019	384.8	\$18,237,305	\$12,593,077
2020	375.8	\$17,358,397	\$12,716,676
Average	343.7	\$17,208,585	\$9,847,745

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 376 jobs by 2020, and generate \$17.2 million in output and \$9.8 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Health Care and Social Assistance*. The increase in this sector may be reflective of the newly employed transit workers, and an increase in potential population needs through 2020.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Transportation Technology Initiatives* strategy during the enhancement can be found in Figure 54.

⁶¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 54: Transportation Technology Initiatives—Operation Phase⁶²

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	502.9	\$26,466,066	\$11,390,077
2013	518.0	\$27,070,314	\$12,704,314
2014	504.1	\$26,103,516	\$13,308,562
2015	478.4	\$24,411,622	\$13,444,521
2016	455.0	\$22,719,728	\$13,444,521
2017	434.0	\$21,269,532	\$13,399,199
2018	429.3	\$21,027,834	\$13,625,794
2019	423.3	\$20,061,035	\$13,852,385
2020	413.4	\$19,094,237	\$13,988,344
Average	462.0	\$23,135,987	\$13,239,746

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 413 jobs by 2020, and generate \$23.1 million in output and \$13.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Health Care and Social Assistance*. The increase in this sector may be reflective of the newly employed transit workers, and an increase in potential population needs through 2020.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$8,849,380 for the investment phase and \$5,299,912 for the operation phase.

If this strategy was enhanced, the total state and local tax revenues would increase by approximately \$11,504,194 in the investment phase and \$7,600,903 during the operation phase.

3.2.2 Public Transportation Initiatives

For several decades, vehicle miles traveled (VMT) has risen faster than the increase in population, in Maryland and nationwide. Land use development over the past 40 to 50 years has put more people living beyond the reach of easy access to transit facilities, increasing automobile driving and tailpipe emissions of GHGs and other air pollutants. This program is designed to advance the effort to meet a goal set by the O'Malley-Brown Administration of doubling transit ridership by 2020 and the continuation of that same growth rate beyond 2020. In order to achieve this growth, actions are needed to increase the availability, attractiveness

⁶² Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

and convenience of public transportation, improve the operational efficiency of the system, and increase system capacity. Actions related to land use planning, pricing disincentives for driving cars, and bike and pedestrian access improvements, addressed in other sections of this Chapter, are also necessary to achieve the ridership goal.

Public Transportation Initiatives is another program that has great potential to increase GHG reduction benefits if an enhanced scenario is pursued.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Public Transportation Initiatives* strategy during status quo can be found in Figure 55.

Figure 55: Public Transportation Initiatives—Investment Phase⁶³

Year	Jobs	Output	Wages
2010	868.7	\$105,544,450	\$39,934,150
2011	903.6	\$110,690,500	\$45,252,650
2012	905.5	\$113,008,900	\$49,022,400
2013	887.6	\$112,705,950	\$51,384,225
2014	861.0	\$111,164,125	\$52,747,475
2015	816.6	\$106,163,400	\$51,892,325
2016	789.8	\$104,092,125	\$52,167,975
2017	764.6	\$102,040,450	\$52,273,250
2018	741.1	\$100,045,075	\$52,276,000
2019	720.8	\$98,620,850	\$52,436,250
2020	702.2	\$97,478,350	\$52,642,600
Average	814.7	\$105,595,834	\$50,184,482

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 702 jobs by 2020, and generate \$105.6 million in output and \$50.2 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*, as the additional labor in this industry will be needed to complete projects associated with this strategy.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Public Transportation Initiatives* strategy during enhancement can be found in Figure 56.

⁶³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 56: Public Transportation Initiatives—Investment Phase⁶⁴

Year	Jobs	Output	Wages
2010	1,737.5	\$211,088,900	\$79,868,300
2011	1,807.2	\$221,381,000	\$90,505,300
2012	1,811.0	\$226,017,800	\$98,044,800
2013	1,775.3	\$225,411,900	\$102,768,450
2014	1,722.0	\$222,328,250	\$105,494,950
2015	1,633.2	\$212,326,800	\$103,784,650
2016	1,579.6	\$208,184,250	\$104,335,950
2017	1,529.2	\$204,080,900	\$104,546,500
2018	1,482.1	\$200,090,150	\$104,552,000
2019	1,441.7	\$197,241,700	\$104,872,500
2020	1,404.5	\$194,956,700	\$105,285,200
Average	1,629.4	\$211,191,668	\$100,368,964

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 1,405 jobs by 2020, and generate \$211.2 million in output and \$100.4 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*, as the additional labor in this industry will be needed to complete additional projects associated with this strategy.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Public Transportation Initiatives* strategy during status quo can be found in Figure 57.

⁶⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 57: Public Transportation Initiatives—Operation Phase⁶⁵

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	52.9	\$966,796	\$611,800
2018	112.3	\$2,175,293	\$1,450,196
2019	168.5	\$3,383,788	\$2,364,120
2020	224.7	\$4,350,587	\$3,368,683
Average	139.6	\$2,719,116	\$1,948,700

Source: REMI PI+, RESI

As shown in Figure 57, the strategy will maintain approximately 225 jobs by 2020, and generate \$2.7 million in output and \$1.9 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are *Transportation and Warehousing*, as new occupations will arise from more public transit offerings.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Public Transportation Initiatives* strategy during enhancement can be found in Figure 58.

⁶⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 58: Public Transportation Initiatives—Operation Phase⁶⁶

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	105.7	\$1,933,593	\$1,223,600
2018	224.5	\$4,350,587	\$2,900,391
2019	337.0	\$6,767,577	\$4,728,240
2020	449.5	\$8,701,173	\$6,737,366
Average	279.2	\$5,438,232	\$3,897,399

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 450 jobs by 2020, and generate \$5.4 million in output and \$3.9 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are *Transportation and Warehousing*, as new occupations will arise from more public transit offerings.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by \$40,562,409 for the investment phase and decrease by \$287,587 for the operation phase.

If the strategy was enhanced, the total state and local tax revenues would increase by \$52,895,164 during the investment phase and decrease by \$779,438 for the operation phase.

3.2.3 Intercity Transportation Initiatives

Traffic congestion along the I-95 corridor between the Wilmington region, Baltimore and Washington, D.C. has been steadily increasing over the past few decades. The State is implementing strategies to reduce congestion and mobile emissions, including GHGs, by providing alternatives to single occupant vehicle use as well as improvements to Maryland's transportation systems. These strategies enhance connectivity and reliability of non-automobile intercity passenger options through infrastructure and technology investments. This includes expansion of intercity passenger rail and bus services as well as improved connections between air, rail, intercity bus, and regional or local transit systems.

⁶⁶ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Intercity Transportation Initiatives is a strategy that has been identified as providing more GHG benefits if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Intercity Transportation Initiatives* strategy during the status quo can be found in Figure 59.

Figure 59: Intercity Transportation Initiatives—Investment Phase⁶⁷

Year	Jobs	Output	Wages
2010	125.2	\$15,191,250	\$5,744,500
2011	130.2	\$15,933,000	\$6,510,250
2012	130.5	\$16,267,750	\$7,053,250
2013	127.9	\$16,224,000	\$7,393,250
2014	124.1	\$16,001,250	\$7,589,250
2015	126.2	\$16,885,250	\$8,278,000
2016	122.3	\$16,609,750	\$8,395,000
2017	118.6	\$16,317,000	\$8,472,000
2018	115.0	\$16,023,250	\$8,523,500
2019	111.9	\$15,805,750	\$8,589,250
2020	91.4	\$12,596,250	\$7,080,750
Average	120.3	\$15,804,955	\$7,602,636

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately 91 jobs by 2020, and generate \$15.8 million in output and \$7.6 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*, as a result of the Department of Transportation's goal to complete intercity projects associated with increasing public transportation.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Intercity Transportation Initiatives* strategy during the enhancement can be found in Figure 60.

⁶⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 60: Intercity Transportation Initiatives—Investment Phase⁶⁸

Year	Jobs	Output	Wages
2010	156.5	\$18,989,063	\$7,180,625
2011	162.8	\$19,916,250	\$8,137,813
2012	163.1	\$20,334,688	\$8,816,563
2013	159.9	\$20,280,000	\$9,241,563
2014	155.1	\$20,001,563	\$9,486,563
2015	157.7	\$21,106,563	\$10,347,500
2016	152.9	\$20,762,188	\$10,493,750
2017	148.2	\$20,396,250	\$10,590,000
2018	143.8	\$20,029,063	\$10,654,375
2019	139.8	\$19,757,188	\$10,736,563
2020	114.2	\$15,745,313	\$8,850,938
Average	150.4	\$19,756,193	\$9,503,295

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately 114 jobs by 2020, and generate \$19.8 million in output and \$9.5 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*, as a result of increased transportation construction projects in the region.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Intercity Transportation Initiatives* strategy during the status quo can be found in Figure 61.

⁶⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 61: Intercity Transportation Initiatives—Operation Phase⁶⁹

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	7.9	\$109,863	\$96,131
2013	9.4	\$164,795	\$130,462
2014	8.1	\$109,863	\$130,462
2015	8.8	\$109,863	\$157,928
2016	8.3	\$109,863	\$164,795
2017	9.7	\$219,726	\$185,395
2018	10.1	\$329,589	\$226,593
2019	10.6	\$219,726	\$247,192
2020	10.1	\$219,726	\$205,994
Average	9.2	\$177,002	\$171,661

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 10 jobs by 2020, and generate \$0.2 million in output and \$0.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Transportation and Warehousing*, primarily due to the expectation that this strategy will encourage increased ridership. Publicly managed transportation providers such as MARC will likely require increased staff to manage increased demand for these transit systems.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Intercity Transportation Initiatives* strategy during the enhancement can be found in Figure 62.

⁶⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 62: Intercity Transportation Initiatives—Operation Phase⁷⁰

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	9.9	\$137,329	\$120,164
2013	11.7	\$205,994	\$163,078
2014	10.1	\$137,329	\$163,078
2015	11.0	\$137,329	\$197,411
2016	10.4	\$137,329	\$205,994
2017	12.2	\$274,658	\$231,743
2018	12.6	\$411,986	\$283,241
2019	13.3	\$274,658	\$308,990
2020	12.6	\$274,658	\$257,492
Average	11.5	\$221,252	\$214,577

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 13 jobs by 2020, and generate \$0.2 million in output and \$0.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Transportation and Warehousing*, primarily due to the expectation that this strategy will encourage increased ridership. Publicly managed transportation providers such as MARC will likely require increased staff to manage increased demand for these transit systems.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$13,666,556 for the investment phase and \$13,583 for the operation phase.

If the strategy is enhanced, the total state and local tax revenues would increase by approximately \$14,417,582 during the investment phase and \$16,087 for the operation phase.

3.2.4 Pricing Initiatives

This program includes transportation pricing disincentives and travel demand management incentive programs. Projects are tied to commute alternatives and programs including ride sharing (Commuter Connections), guaranteed ride home, transportation demand program management and marketing, outreach and education programs (Clean Air Partners), parking cash-out subsidies, transportation information kiosks, local car sharing programs, telework partnerships, parking fees, and vanpool programs.

⁷⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Pricing Initiatives is a strategy that has been identified as providing a greater GHG benefit if enhancement was pursued.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Pricing Initiatives* strategy during status quo can be found in Figure 63.

Figure 63: Pricing Initiatives—Investment Phase⁷¹

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the investment of strategy implementation will have no discernable economic impact under status quo. At the current time, this program does not have any funds associated with GHG reduction.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Pricing Initiatives* strategy during enhancement can be found in Figure 64.

⁷¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 64: Pricing Initiatives—Investment Phase⁷²

Year	Jobs	Output	Wages
2010	1,874.6	\$226,861,000	\$85,268,250
2011	1,959.6	\$239,203,500	\$96,962,750
2012	1,969.9	\$244,996,750	\$105,147,750
2013	1,934.3	\$244,679,500	\$110,123,250
2014	1,877.5	\$241,410,750	\$112,843,000
2015	251.4	\$30,442,000	\$26,925,250
2016	129.5	\$13,628,500	\$14,974,750
2017	60.4	\$3,866,250	\$6,806,000
2018	32.2	-\$259,500	\$1,861,500
2019	25.3	-\$1,270,250	-\$924,500
2020	31.5	-\$301,000	-\$2,063,000
Average	922.4	\$113,023,409	\$50,720,455

Source: REMI PI+, RESI

As shown in the figure above, the investment of strategy implementation will maintain approximately 32 jobs by 2020, and generate \$113.0 million in output and \$50.7 million in wages on average each year. The sector experiencing the most significant gains for this strategy is *Construction*. A vital sector in completing programs to would increase public transportation and reduce congestion along Maryland roadways.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Pricing Initiatives* strategy can be found in Figure 65.

⁷² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 65: Pricing Initiatives—Operation Phase⁷³

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the investment of strategy implementation will have no discernable impact on the economy under status quo. At the current time, this program does not have any funds associated with GHG reduction.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Pricing Initiatives* strategy can be found in Figure 66.

⁷³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 66: Pricing Initiatives—Operation Phase⁷⁴

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	375.6	\$7,250,977	\$4,446,030
2013	382.7	\$7,594,299	\$5,278,587
2014	385.4	\$7,662,964	\$5,893,135
2015	384.4	\$7,443,237	\$6,305,122
2016	381.1	\$7,086,182	\$6,574,631
2017	379.4	\$6,811,524	\$6,801,224
2018	377.7	\$6,564,331	\$6,967,735
2019	375.3	\$6,207,275	\$7,105,064
2020	373.5	\$5,960,083	\$7,245,827
Average	379.4	\$6,953,430	\$6,290,817

Source: REMI PI+, RESI

As shown in Figure 66, the investment of strategy implementation will maintain approximately 374 jobs by 2020, and generate \$7.0 million in output and \$6.3 million in wages on average each year. The sector with the most significant job growth for this strategy is *Transportation and Warehousing*. As increased mobility within the region becomes easier, industries that rely on fast and safe roadways with minimal congestion can flourish.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$0 for the investment phase and \$0 for the operation phase.

If the strategy is enhanced, the total state and local tax revenues would increase by approximately \$22,080,096 during the investment phase and decrease by \$2,490,073 during the operation phase.

3.2.5 Bike and Pedestrian Initiatives

This program is part of the State's effort to reduce GHG and other motor vehicle emissions from cars by providing alternatives to single occupant vehicle use. Building appropriate infrastructure for additional bicycle and pedestrian travel in urban areas increases access to and use of public transit and supports the State's 2020 transit ridership goal.

Bike and Pedestrian Initiatives is a strategy that has been identified as providing greater GHG benefits to Maryland if enhanced.

⁷⁴ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Bike and Pedestrian Initiatives* strategy can be found in Figure 67.

Figure 67: Bike and Pedestrian Initiatives—Investment Phase⁷⁵

Year	Jobs	Output	Wages
2010	347.4	\$60,563,443	\$10,017,395
2011	568.9	\$91,360,906	\$14,820,645
2012	1,870.4	\$284,397,672	\$46,240,126
2013	1,317.2	\$193,626,186	\$34,671,237
2014	1,229.2	\$68,994,140	\$34,078,217
2015	1,181.2	\$65,588,378	\$34,263,610
2016	1,133.8	\$62,402,344	\$34,263,610
2017	1,103.2	\$60,095,214	\$34,442,138
2018	1,079.8	\$58,337,402	\$34,641,266
2019	1,056.6	\$56,579,589	\$34,881,592
2020	1,041.1	\$55,480,957	\$35,327,911
Average	1,084.4	\$96,129,658	\$31,604,341

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 1,041 jobs by 2020, and generate \$96.1 million in output and \$31.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*. The development and creation of bike and pedestrian paths will likely require engineers, planners, and construction workers within this industry.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Bike and Pedestrian Initiatives* strategy can be found in Figure 68.

⁷⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 68: Bike and Pedestrian Initiatives—Investment Phase⁷⁶

Year	Jobs	Output	Wages
2010	347.4	\$60,563,443	\$10,017,395
2011	568.9	\$91,360,906	\$14,820,645
2012	1,870.4	\$284,397,672	\$46,240,126
2013	1,317.2	\$193,626,186	\$34,671,237
2014	1,268.3	\$185,079,518	\$35,160,065
2015	3,135.0	\$452,746,585	\$90,969,087
2016	3,017.4	\$431,323,246	\$91,129,302
2017	2,930.1	\$414,184,571	\$91,312,407
2018	2,859.3	\$400,854,496	\$91,701,507
2019	2,793.6	\$388,476,566	\$92,182,158
2020	2,747.7	\$380,383,302	\$93,223,572
Average	2,077.8	\$298,454,226	\$62,857,046

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 2,748 jobs by 2020, and generate \$298.5 million in output and \$62.9 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Construction*. The development and creation of bike and pedestrian paths will likely require engineers, planners, and construction workers within this industry.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Bike and Pedestrian Initiatives* strategy can be found in Figure 69.

⁷⁶ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 69: Bike and Pedestrian Initiatives—Operation Phase⁷⁷

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.9	\$0	\$0
2014	0.2	\$0	\$0
2015	0.0	\$0	\$0
2016	-0.5	\$0	-\$6,867
2017	0.5	\$0	\$27,466
2018	0.0	\$0	-\$6,867
2019	0.7	\$0	\$27,466
2020	-0.9	\$0	-\$27,466
Average	0.0	\$0	\$2,746

Source: REMI PI+, RESI

As shown in the figure above, the strategy will result in less than one forgone job by 2020, and generate \$0 in output and \$2,746 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Accommodation and Food Services*; primarily due to the expectation that one of the reasons households will increase use of bike and pedestrian paths is transportation cost savings. The increase in disposable income may result in households eating out more, or taking increased family trips.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Bike and Pedestrian Initiatives* strategy can be found in Figure 70.

⁷⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 70: Bike and Pedestrian Initiatives—Operation Phase⁷⁸

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.9	\$0	\$0
2014	0.3	\$0	\$0
2015	1.6	\$0	\$15,260
2016	-1.2	\$0	-\$15,260
2017	0.0	\$0	\$0
2018	0.0	\$0	-\$15,260
2019	1.2	\$0	\$30,516
2020	0.0	\$0	\$0
Average	0.3	\$0	\$1,387

Source: REMI PI+, RESI

As shown in the figure above, the strategy will result in no additional jobs by 2020, and generate \$0 in output and \$1,387 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Accommodation and Food Services*; primarily due to the expectation that one of the reasons households will increase use of bike and pedestrian paths is transportation cost savings. The increase in disposable income may result in households eating out more, or taking increased family trips.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$19,085,227 for the investment phase and \$5,769 for the operation phase.

If the strategy was enhanced, the total state and local tax revenues would increase by approximately \$30,365,541 during the investment phase and \$5,362 during the operation phase.

3.3 Agriculture and Forestry

3.3.1 Creating Ecosystem Markets to Encourage GHG Emissions Reductions

Increased attention to the benefits and cost efficiencies that ecosystem markets could provide has spurred evaluation of the potential its programs and policies may have for fostering carbon market development. Maryland's Forest Conservation Act and Critical Area Act require

⁷⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

mitigation for natural resource impacts generated through land development, and mitigation banking is an option to address these mitigation requirements

The goal of this program is the establishment of ecosystem markets, creation of a tracking mechanism and the development of protocols to assess/quantify GHG benefits of individual markets. However, no quantification target has been assigned.

Investment Phase

The average annual economic impacts of the investment phase of the *Creating Ecosystem Markets to Encourage GHG Emissions Reductions* strategy can be found in Figure 71.

Figure 71: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Investment Phase⁷⁹

Year	Jobs	Output	Wages
2010	1.6	\$122,070	\$61,035
2011	2.1	\$122,070	\$45,776
2012	1.7	\$122,070	\$76,294
2013	1.8	\$122,070	\$91,553
2014	1.6	\$183,105	\$76,294
2015	1.6	\$122,070	\$76,294
2016	1.6	\$122,070	\$76,294
2017	1.5	\$122,070	\$122,070
2018	1.6	\$122,070	\$91,553
2019	1.3	\$122,070	\$76,294
2020	0.6	\$61,035	\$76,294
Average	1.5	\$122,070	\$79,068

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately one job by 2020, and generate \$0.1 million in output and \$79,068 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment resulting from this phase of the strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that trained experts in the financial services industry will implement and manage the various ecosystem markets.

Operation Phase

The average annual economic impacts of the operation phase of the *Creating Ecosystem Markets to Encourage GHG Emissions Reductions* strategy can be found in Figure 72.

⁷⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 72: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Operation Phase⁸⁰

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	420.6	\$85,632,324	\$49,926,758
2014	-284.6	\$68,695,068	\$49,041,748
2015	-822.1	\$55,847,168	\$47,042,847
2016	-1,237.8	\$46,325,684	\$44,494,629
2017	-1,489.9	\$41,748,047	\$42,602,539
2018	-1,581.2	\$42,114,258	\$42,053,223
2019	-1,691.6	\$40,893,555	\$41,198,730
2020	-1,758.1	\$40,832,520	\$40,939,331
Average	-1,055.6	\$52,761,078	\$44,662,476

Source: REMI PI+, RESI

As shown in the figure above, the strategy will result in 1,758 forgone jobs by 2020, and generate \$52.8 million in output and \$44.7 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Protective service occupations*. A wide variety of business types will be motivated by market compliance to engage in best practices which benefit both the environment and their bottom line. As companies seek enter the market or expand, an increase in protective workforce may be necessary to ensure employee safety during expansionary periods.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$28,821 for the investment phase, and \$10,557,326 for the operation phase.

3.3.2 Nutrient Trading for GHG Benefits

Since many of the agronomic, land use, and structural practices promoted by the Maryland Nutrient Trading Program administered by MDA also store carbon and lower other GHG emissions, the existing nutrient marketplace could provide a platform for the addition of a voluntary carbon component. Just like the nutrient and sediment markets, carbon trading offers entities under regulatory requirements a potentially more cost-effective means to meet their obligations while giving farmers and landowners the opportunity to receive compensation for implementing and maintaining conservation practices. MDA will add carbon credits and

⁸⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

enhanced nutrient credits to the Maryland Nutrient Trading Program. Carbon and enhanced nutrient credits would be “stacked” onto existing nutrient and sediment credits as tradable commodities, thereby increasing the potential value of the total credit package and taking another incremental step toward building a comprehensive environmental marketplace. Encouraging trades between nonpoint sources, such as agricultural operations, and point sources, such as wastewater treatment plants, and industrial facilities, or other nonpoint sources, such as highway contract and development projects, would not only create new possibilities for GHG reductions, but also improve water quality, reduce fertilizer use and soil erosion, restore wetlands and wildlife habitat, provide supplemental income for farmers and foresters, and promote Smart Growth goals by preserving agricultural and forested lands.

Nutrient Trading for GHG Benefits is a strategy that has been identified to provide greater GHG benefit under an enhanced scenario.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Nutrient Trading for GHG Benefits* strategy can be found in Figure 73.

Figure 73: Nutrient Trading for GHG Benefits—Investment Phase⁸¹

Year	Jobs	Output	Wages
2010	2.5	\$183,105	\$80,109
2011	2.9	\$213,623	\$95,367
2012	3.1	\$213,623	\$91,553
2013	5.1	\$305,176	\$156,403
2014	0.1	\$0	\$3,815
2015	-0.2	\$0	\$0
2016	-0.2	\$0	\$0
2017	-0.4	-\$61,035	-\$22,888
2018	0.4	\$61,035	\$0
2019	0.2	\$0	\$0
2020	0.1	\$0	\$3,815
Average	1.2	\$83,230	\$37,107

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy’s implementation will maintain approximately less than one job by 2020, and generate \$83,230 in output and \$37,107 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Agriculture, forestry, fishing, and hunting*. Nutrient trading program will provide incremental revenues to farmers and

⁸¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

landowners allowing them to expand their business. The strategy will also generate employment opportunities in industries facilitating the credit-trading market, such as in *Management, business, and financial occupations* and *Professional, scientific, and technical services*.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Nutrient Trading for GHG Benefits* strategy can be found in Figure 75.

Figure 74: Nutrient Trading for GHG Benefits—Investment Phase⁸²

Year	Jobs	Output	Wages
2010	15.6	\$1,159,607	\$507,328
2011	18.3	\$1,352,875	\$603,962
2012	19.9	\$1,352,875	\$579,803
2013	32.5	\$1,932,678	\$990,498
2014	0.9	\$0	\$24,158
2015	-1.0	\$0	\$0
2016	-1.5	\$0	\$0
2017	-2.6	-\$386,536	-\$144,951
2018	2.5	\$386,536	\$0
2019	1.4	\$0	\$0
2020	0.5	\$0	\$24,158
Average	7.9	\$527,094	\$234,996

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately one job by 2020, and generate \$0.5 million in output and \$0.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Professional, Scientific, and Technical Services*. As the program begins to take shape, increased need for technical assistance to create the exchange will be needed.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Nutrient Trading for GHG Benefits* strategy can be found in Figure 76.

⁸² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 75: Nutrient Trading for GHG Benefits—Operation Phase⁸³

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the strategy will have no discernable impact on the economy during the operation phase.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Nutrient Trading for GHG Benefits* strategy can be found in Figure 77.

⁸³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 76: Nutrient Trading for GHG Benefits—Operation Phase⁸⁴

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the strategy will have no discernable impact during the operation phase.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$22,127 for the investment phase and experience no change for the operation phase.

If the strategy is enhanced, the total state and local tax revenues would accumulate to approximately \$145,669 during the investment phase and experience no change during the operation phase.

3.3.3 Managing Forests to Capture Carbon

Managing forests to capture carbon will promote sustainable forestry management practices in existing Maryland forests on both public and private lands. The enhanced productivity resulting from enrolling unmanaged forests into management regimes will increase rates of carbon dioxide sequestration in forest biomass, increase amounts of carbon stored in harvested, durable wood products which will result in economic benefits, and increased availability of renewable biomass for energy production.

The goals of this program are to improve sustainable forest management on 30,000 acres of private land annually and on 100 percent of State-owned resource lands, and ensure 50 percent of State-owned forest lands will be third-party certified as sustainably managed.

⁸⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

From 2010 to 2020 a total of \$37.7 million was allocated to the *Managing Forests to Capture Carbon* strategy. The average annual economic impacts of the investment phase of the strategy can be found in Figure 78.

Figure 77: Managing Forests to Capture Carbon—Investment Phase⁸⁵

Year	Jobs	Output	Wages
2010	387.8	\$2,227,783	\$1,617,432
2011	383.4	\$2,258,301	\$1,892,090
2012	377.5	\$2,136,230	\$2,059,937
2013	371.4	\$1,953,125	\$2,182,007
2014	362.7	\$1,739,502	\$2,227,783
2015	353.4	\$1,464,844	\$2,258,301
2016	346.3	\$1,220,703	\$2,304,077
2017	339.5	\$1,098,633	\$2,273,560
2018	331.9	\$976,563	\$2,319,336
2019	328.1	\$915,527	\$2,258,301
2020	324.3	\$732,422	\$2,212,524
Average	355.1	\$1,520,330	\$2,145,941

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 324 jobs by 2020, and generate \$1.5 million in output and \$2.1 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. Sustainable forest management will be carried out by professionals in this industry. To a lesser extent, environmental consultants or management firms within the industry will likely be needed to determine and advise on best practices in sustainable forest management.

Operation Phase

The average annual economic impacts of the operation phase of the *Managing Forests to Capture Carbon* strategy can be found in Figure 79.

⁸⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 78: Managing Forests to Capture Carbon—Operation Phase⁸⁶

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	47.8	\$1,403,809	\$350,952
2013	48.7	\$1,403,809	\$427,246
2014	48.5	\$1,464,844	\$457,764
2015	47.6	\$1,342,773	\$518,799
2016	47.0	\$1,281,738	\$534,058
2017	46.9	\$1,281,738	\$564,575
2018	46.1	\$1,220,703	\$564,575
2019	45.0	\$1,281,738	\$579,834
2020	43.9	\$1,159,668	\$534,058
Average	46.8	\$1,315,647	\$503,540

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 44 jobs by 2020, and generate \$1.3 million in output and \$0.5 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Farming, fishing, and forestry*. It is expected that the implementation of sustainable forest management is likely to have ripple effects for a wide variety of businesses which may be contracted to facilitate management.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$1,005,298 for the investment phase and \$208,681 for the operation phase.

3.3.4 Increasing Urban Trees to Capture Carbon

Trees in urban areas directly impact Maryland's carbon budget by absorbing GHG emissions from power production and vehicles, reducing heating and cooling costs and energy demand by moderating temperatures around buildings, and slowing the formation of ground level ozone as well as the evaporation of fuel from motor vehicles. Implementation of this program is supported by several other Maryland laws and programs that include outreach and technical assistance for municipalities to assess and evaluate their urban tree canopy goals, and plant trees to meet those goals.

⁸⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

The goals of this program are to plant 12.5 million trees in urban areas through the Forest Conservation Act, Marylanders Plant Trees, Tree-Mendous Maryland, and 5-103 State Highway Reforestation Act planting programs.

Investment Phase

The average annual economic impacts of the investment phase of the *Increasing Urban Trees to Capture Carbon* strategy can be found in Figure 80.

Figure 79: Increasing Urban Trees to Capture Carbon—Investment Phase⁸⁷

Year	Jobs	Output	Wages
2010	5.5	\$91,553	\$61,035
2011	5.6	\$91,553	\$45,776
2012	5.3	\$91,553	\$45,776
2013	5.7	\$122,070	\$76,294
2014	5.4	\$152,588	\$76,294
2015	4.7	\$61,035	\$45,776
2016	4.9	\$122,070	\$45,776
2017	4.4	\$61,035	\$61,035
2018	5.1	\$61,035	\$61,035
2019	4.8	\$122,070	\$61,035
2020	3.8	\$61,035	\$61,035
Average	5.0	\$94,327	\$58,261

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately 4 jobs by 2020, and generate \$94,327 in output and \$58,261 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*. This strategy will require cooperation between local community organizers and governments in planning and implementation, and funds will be passed through to this industry for administration purposes.

Operation Phase

The average annual economic impacts of the operation phase of the *Increasing Urban Trees to Capture Carbon* strategy can be found in Figure 81.

⁸⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 80: Increasing Urban Trees to Capture Carbon—Operation Phase⁸⁸

Year	Jobs	Output	Wages
2010	234.2	\$10,406,494	\$3,814,697
2011	292.2	\$15,594,482	\$5,294,800
2012	336.0	\$19,866,943	\$6,561,279
2013	363.7	\$23,132,324	\$7,476,807
2014	381.2	\$26,031,494	\$8,346,558
2015	390.5	\$28,259,277	\$9,124,756
2016	396.9	\$30,273,438	\$9,704,590
2017	396.9	\$31,799,316	\$10,208,130
2018	394.1	\$33,203,125	\$10,620,117
2019	383.2	\$33,996,582	\$10,635,376
2020	371.5	\$34,545,898	\$10,589,600
Average	358.2	\$26,100,852	\$8,397,883

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 372 jobs by 2020, and generate \$26.1 million in output and \$8.4 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that a wide variety of businesses in the urban areas where trees are being planted will experience benefits in terms of building operation costs as carbon capture lowers ambient temperature.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$33,062 for the investment phase, and \$5,328,250 for the operation phase.

3.3.5 Creating and Protecting Wetlands and Waterway Borders to Capture Carbon

In addition to forests, wetlands and marshlands are known to be very efficient at sequestering carbon. Therefore, DNR is planting forested stream buffers and pursuing the creation, protection and restoration of wetlands to promote carbon sequestration through several means, including undertaking on-the-ground wetland restoration projects through its Coastal Wetlands Initiative, the development of a terrestrial carbon sequestration protocol; a DNR Power Plant Research Project wetland study in Dorchester County, and the Sea Level Affecting Marshes Model.

⁸⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

The goals of this program are the restoration of 1,142 acres of wetlands on state and public land and planting 645 acres of streamside forest buffers on state and public lands.

Investment Phase

The average annual economic impacts of the investment phase of the *Creating and Protecting Wetlands and Waterway Borders to Capture Carbon* strategy can be found in Figure 82.

Figure 81: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—Investment Phase⁸⁹

Year	Jobs	Output	Wages
2010	2.1	\$61,035	\$15,259
2011	2.1	\$61,035	\$15,259
2012	2.2	\$30,518	\$15,259
2013	18.2	\$396,729	\$183,105
2014	18.3	\$457,764	\$183,105
2015	18.1	\$366,211	\$213,623
2016	18.7	\$366,211	\$213,623
2017	18.9	\$427,246	\$259,399
2018	18.9	\$366,211	\$244,141
2019	18.9	\$427,246	\$259,399
2020	17.7	\$366,211	\$228,882
Average	14.0	\$302,401	\$166,460

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 18 jobs by 2020, and generate \$0.3 million in output and \$0.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Sales, office, and administrative occupations*. It is expected that creating and protecting wetland and waterway borders will require planning and supervision from experts knowledgeable in land management.

Operation Phase

The average annual economic impacts of the operation phase of the *Creating and Protecting Wetlands and Waterway Borders to Capture Carbon* strategy can be found in Figure 83.

⁸⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

**Figure 82: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—
Operation Phase⁹⁰**

Year	Jobs	Output	Wages
2010	152.9	\$4,119,873	\$1,632,690
2011	151.8	\$4,150,391	\$1,770,020
2012	149.8	\$4,119,873	\$1,922,607
2013	200.9	\$5,462,646	\$2,593,994
2014	52.2	\$1,373,291	\$976,563
2015	47.6	\$1,098,633	\$823,975
2016	45.1	\$915,527	\$701,904
2017	44.9	\$976,563	\$717,163
2018	44.3	\$976,563	\$686,646
2019	44.7	\$1,098,633	\$701,904
2020	44.4	\$1,098,633	\$686,646
Average	89.0	\$2,308,239	\$1,201,283

Source: REMI PI+, RESI

As shown in the previous figure, the strategy will maintain approximately 44 jobs by 2020, and generate \$2.3 million in output and \$1.2 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are mostly service-based sectors such as *Food preparation, serving related occupations* and *Sales, office, and administrative occupations*, primarily due to the expectation that the expanded wetlands resulting from implementation of this strategy will create tourism opportunities and increase overall household spending on a variety of both necessary and desired services (healthcare, retail, food, etc.) as a result.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$75,431 for the investment phase, and \$556,621 for the operation phase.

3.3.6 Geological Opportunities to Store Carbon

Geological carbon sequestration differs from other discussed sequestration methods as it captures carbon at the source, transports it to the sequestration site, and then sequesters it. Maryland is one of eight partner states in the Midwest Region Carbon Sequestration Partnership whose role is to identify, locate, and characterize potential geologic storage levels. More than 10 gigatonnes of storage capacity has been identified to be available within Maryland (103 years of storage capacity at current CO₂ estimated production rate of 97 million metric tons per year).

⁹⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

The goal of this program is to identify and assess geologic storage opportunities. However, no quantification target has been assigned.

Investment Phase

From 2010 to 2020 a total of four state employees were allocated to the *Geological Opportunities to Store Carbon* strategy. The average annual economic impacts of the investment phase of the strategy can be found in Figure 84.

Figure 83: Geological Opportunities to Store Carbon—Investment Phase⁹¹

Year	Jobs	Output	Wages
2010	0.4	\$30,518	\$0
2011	0.4	\$0	-\$15,259
2012	0.0	\$0	\$0
2013	0.1	\$0	\$15,259
2014	0.4	\$61,035	\$0
2015	0.0	\$0	\$0
2016	0.5	\$0	\$15,259
2017	0.0	\$61,035	\$15,259
2018	0.5	\$0	\$0
2019	0.5	\$61,035	\$30,518
2020	0.5	\$61,035	\$15,259
Average	0.3	\$24,969	\$6,936

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately one job by 2020, and generate \$24,969 in output and \$6,936 in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Sales, office, and administrative occupations*, mainly from the expectation that environmental and geological consultants within this industry will be needed to help with development, planning, and implementation of carbon sequestration associated with this strategy.

Operation Phase

The average annual economic impacts of the operation phase of the *Geological Opportunities to Store Carbon* strategy can be found in Figure 85.

⁹¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 84: Geological Opportunities to Store Carbon—Operation Phase⁹²

Year	Jobs	Output	Wages
2010	138.6	\$12,237,549	\$2,761,841
2011	193.4	\$18,524,170	\$4,089,355
2012	226.6	\$23,132,324	\$5,081,177
2013	243.0	\$26,397,705	\$5,661,011
2014	250.4	\$28,930,664	\$6,072,998
2015	251.0	\$30,822,754	\$6,378,174
2016	248.2	\$32,287,598	\$6,484,985
2017	244.6	\$33,630,371	\$6,607,056
2018	236.0	\$34,606,934	\$6,546,021
2019	225.7	\$35,278,320	\$6,347,656
2020	217.2	\$35,888,672	\$6,088,257
Average	225.0	\$28,339,733	\$5,647,139

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 217 jobs by 2020, and generate \$28.3 million in output and \$5.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Sales, office, and administrative occupations*. Companies will attempt to harness carbon sequestration associated with natural geologic reservoirs because carbon dioxide injections into these reservoirs and the resulting creation, extraction, and consumption of shale and natural gas could potentially offset higher costs associated with energy generation. Savings resulting from decreased energy costs should be passed on to consumers, who will then have more disposable income to spend on a variety of goods and services in many other industries.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$9,101 for the investment phase and \$4,576,841 for the operation phase.

3.3.7 Planting Forests in Maryland

Planting trees expands forest cover and associated carbon stocks by regenerating or establishing healthy, functional forests through practices such as soil preparation, erosion control, and supplemental planting, to ensure optimum conditions to support forest growth. By 2020, the implementation goal of this program is to achieve the afforestation and/or reforestation of 43,030 acres in Maryland.

⁹² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

From 2010 to 2020 a total of \$7.7 million was allocated to the *Planting Forests in Maryland* strategy. The average annual economic impacts of the investment phase of the strategy can be found in Figure 86.

Figure 85: Planting Forests in Maryland—Investment Phase⁹³

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	190.3	\$2,258,301	\$1,632,690
2012	190.3	\$2,380,371	\$1,983,643
2013	99.8	\$1,190,186	\$1,373,291
2014	107.8	\$1,190,186	\$1,419,067
2015	103.4	\$915,527	\$1,419,067
2016	100.7	\$793,457	\$1,419,067
2017	97.2	\$671,387	\$1,388,550
2018	95.4	\$610,352	\$1,419,067
2019	93.7	\$610,352	\$1,373,291
2020	91.9	\$488,281	\$1,358,032
Average	106.4	\$1,009,854	\$1,344,161

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately 92 jobs by 2020, and generate \$1.0 million in output and \$1.3 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Farming, fishing, and forestry occupations*, primarily due to the expectation that the implementation of this strategy will require planning from experts in forestry-related areas such as soil preparation, erosion control, and supplemental planting.

Operation Phase

The average annual economic impacts of the operation phase of the *Planting Forests in Maryland* strategy can be found in Figure 87.

⁹³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 86: Planting Forests in Maryland—Operation Phase⁹⁴

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.8	\$0	\$0
2012	0.9	\$0	\$15,259
2013	0.3	-\$30,518	\$0
2014	0.3	\$0	\$0
2015	0.0	\$0	\$0
2016	0.7	\$0	\$15,259
2017	0.5	\$0	\$30,518
2018	0.4	\$0	\$0
2019	0.0	\$0	\$15,259
2020	0.0	\$0	\$0
Average	0.4	-\$2,774	\$6,936

Source: REMI PI+, RESI

As shown in the figure above, the strategy will result in no additional jobs by 2020, approximately \$2,774 in forgone output and generate \$6,936 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are those (such as *Sales, office, and administrative occupations* and *Healthcare occupations*) providing goods and services in demand by households. It is likely that private landowners will experience economic benefits from effective management and operation of this strategy, which will encourage increased household spending as a result.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$673,447 for the investment phase and \$2,689 for the operation phase.

3.3.8 Biomass for Energy Production

Maryland is working to promote the use of locally produced woody biomass for generation of thermal energy and electricity. Energy from forest by-products can be used to offset fossil fuel-based energy production and associated GHG emissions. There are many end users that could potentially benefit from such a program, including Maryland's public schools which could enjoy wood heating and cooling; hospitals which could utilize wood as primary heating/cooling source; municipalities which could utilize local fuel markets as key component of their urban tree management programs; and all rural landowners which would have access to a wood fuel market.

⁹⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

The goal of this program is to develop policies that recognize wood as a preferred renewable energy source, recognize wood as the largest source of energy consumption in Maryland, and offer incentives to utilize locally produced wood to meet thermal energy needs.

Investment Phase

From 2010 to 2020 a total of \$100.0 million was allocated to the *Biomass for Energy Production* strategy. The average annual economic impacts of the investment phase of the strategy can be found in Figure 88.

Figure 87: Biomass for Energy Production—Investment Phase⁹⁵

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	38.1	\$1,708,984	\$869,751
2014	57.0	\$2,502,441	\$1,358,032
2015	56.3	\$2,380,371	\$1,449,585
2016	37.1	\$1,464,844	\$1,022,339
2017	36.1	\$1,403,809	\$1,037,598
2018	36.0	\$1,342,773	\$1,052,856
2019	36.2	\$1,403,809	\$1,098,633
2020	35.8	\$1,342,773	\$1,098,633
Average	30.3	\$1,231,800	\$817,039

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 36 jobs by 2020, and generate \$1.2 million in output and \$0.8 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment resulting from this strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that the creation of woody biomass will be carried out by professionals in this industry. Environmental consultants and experts within the industry will also likely be contracted to provide guidance in the implementation and organization of sustainable woody biomass production.

Operation Phase

The average annual economic impacts of the operation phase of the *Biomass for Energy Production* strategy can be found in Figure 89.

⁹⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 88: Biomass for Energy Production—Operation Phase⁹⁶

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	5.3	\$579,834	\$152,588
2014	8.9	\$976,563	\$259,399
2015	11.1	\$1,159,668	\$381,470
2016	13.0	\$1,403,809	\$473,022
2017	15.2	\$1,647,949	\$564,575
2018	16.2	\$1,770,020	\$610,352
2019	16.3	\$1,892,090	\$671,387
2020	15.6	\$1,892,090	\$656,128
Average	9.2	\$1,029,275	\$342,629

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 16 jobs by 2020, and generate \$1.0 million in output and \$0.3 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Construction*, primarily from the expectation that the use of woody biomass which was produced during implementation of this strategy will benefit energy-producing entities which switch to this type of fuel as it is more energy efficient. Other industries will experience slight gains from the energy cost savings passed on by utilities, and residential consumers also experiencing these energy cost savings will spend more on other goods and services.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$368,176 for the investment phase, and \$210,694 for the operation phase.

3.3.9 Conservation of Agricultural Land for GHG Benefits

MDA is working to safeguard Maryland's network of natural areas, agricultural lands, and coastal lands through its established conservation programs and practices. MDA will decrease the conversion and development of agricultural lands through the protection of productive farmland and will continue to pursue policies and programs that complement those of DNR and MDP by preserving or promoting forested, grassed, and wetland areas on agricultural land.

The Maryland Agricultural Land Preservation Foundation (MALPF), which was established in 1977, is one of the first and most successful programs of its kind in the country. Besides

⁹⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

maintaining prime farmland and woodland as a viable local base of food and fiber production in the state, the preservation of agricultural land curbs the expansion of random urban development, safeguards wildlife habitat, and enhances the ecology of the Chesapeake Bay and its tributaries. The state's forward reaching goal is to protect 962,000 acres from commercial, residential, or industrial development by 2020.

Since 1997, Maryland has partnered with the USDA in the Conservation Reserve Enhancement Program (CREP) to offer rental payments for leased easements along with other incentives to encourage agricultural producers to protect environmentally sensitive lands, improve wildlife habitat, and reduce sediment and nutrient loss. If fully implemented at its authorized 100,000 acres, CREP has the potential to plant up to 16,000 acres of marginal land into grass, shrubs, and trees, establish 77,000 acres of grassland and forest buffers and 5,000 acres of water and wetland habitat, and restore 2,000 acres of habitat for declining, threatened, or endangered species.

Investment Phase

The average annual economic impacts of the investment phase of the *Conservation of Agricultural Land for GHG Benefits* strategy can be found in Figure 90.

Figure 89: Conservation of Agricultural Land for GHG Benefits—Investment Phase⁹⁷

Year	Jobs	Output	Wages
2010	44.5	\$2,349,854	\$850,677
2011	45.5	\$2,410,889	\$911,713
2012	42.8	\$2,288,818	\$911,713
2013	32.7	\$1,708,984	\$747,681
2014	31.4	\$1,647,949	\$751,495
2015	29.5	\$1,525,879	\$724,792
2016	27.4	\$1,403,809	\$698,090
2017	25.6	\$1,281,738	\$667,572
2018	25.7	\$1,342,773	\$671,387
2019	24.1	\$1,159,668	\$644,684
2020	23.7	\$1,159,668	\$656,128
Average	32.1	\$1,661,821	\$748,721

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 24 jobs by 2020, and generate \$1.7 million in output and \$0.7 million in wages on average each year. The industry experiencing the greatest positive economic impacts

⁹⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

in terms of employment due to this strategy is *Construction*. It is expected that new employees will be hired to manage and track the conservation and development of agricultural lands.

Operation Phase

The total economic impacts of the operation phase of the *Conservation of Agricultural Land for GHG Benefits* strategy can be found in Figure 91.

Figure 90: Conservation of Agricultural Land for GHG Benefits—Operation Phase⁹⁸

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	600.3	\$122,802,734	\$15,861,511
2012	609.2	\$123,626,709	\$19,195,557
2013	597.1	\$122,833,252	\$21,171,570
2014	434.8	\$91,918,945	\$18,211,365
2015	387.9	\$88,745,117	\$17,253,876
2016	348.3	\$85,998,535	\$16,269,684
2017	320.4	\$84,045,410	\$15,361,786
2018	298.6	\$82,519,531	\$14,526,367
2019	281.9	\$81,237,793	\$13,854,980
2020	269.0	\$80,322,266	\$13,286,591
Average	377.0	\$87,640,936	\$14,999,390

Source: REMI PI+, RESI

As shown in Figure 91, the strategy will maintain approximately 269 jobs by 2020, and generate \$87.6 million in output and \$15.0 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment resulting from this strategy is *Farm, fishing, and forestry occupations*, primarily due to the increased demand for individuals familiar with agricultural land and productive uses.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$204,733 for the investment phase and \$14,106,601 for the operation phase.

3.4 Zero Waste

3.4.1 Zero Waste

In Maryland, waste diversion is defined as the volume of waste that is diverted from entering the waste stream through recycling or source reduction activities. Source reduction activities are those that reduce or prevent the creation of waste. Maryland estimates the source

⁹⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

reduction rate using a checklist for counties to document their source reduction activities, including backyard composting, reuse programs, and technical assistance. The counties' responses are tallied and correspond with a source reduction credit, up to a maximum of 5%, which is added to the recycling rate to produce the waste diversion rate.

Reducing the generation and disposal of waste has many benefits. It saves energy and natural resources, preserves the capacity of existing solid waste disposal facilities and reduces greenhouse gases and other pollutants generated by landfills and manufacturing processes.

Zero Waste is a strategy that has been identified as providing greater GHG benefits if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Recycling and Source Reduction* strategy can be found in Figure 92.

Figure 91: Recycling and Source Reduction—Investment Phase⁹⁹

Year	Jobs	Output	Wages
2010	873.3	\$67,474,365	\$21,640,778
2011	891.6	\$68,328,857	\$23,357,391
2012	891.6	\$68,481,445	\$24,765,015
2013	882.6	\$68,023,682	\$25,863,647
2014	867.6	\$67,138,672	\$26,699,066
2015	847.6	\$65,856,934	\$27,278,900
2016	826.9	\$64,636,230	\$27,748,108
2017	810.3	\$63,537,598	\$28,175,354
2018	795.6	\$62,622,070	\$28,598,785
2019	782.8	\$61,767,578	\$29,094,696
2020	773.1	\$61,218,262	\$29,666,901
Average	840.3	\$65,371,427	\$26,626,240

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 773 jobs by 2020, and generate \$65.4 million in output and \$26.6 million in wages on average each year. The industry with the most significant employment gains during this time period is *Administrative and Waste Management Services*. This industry may see growth over the time period associated with new recycling facilities and collection routes being added to meet the *Zero Waste* requirements.

⁹⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *Recycling and Source Reduction* strategy can be found in Figure 93.

Figure 92: Recycling and Source Reduction—Investment Phase¹⁰⁰

Year	Jobs	Output	Wages
2010	873.3	\$67,474,365	\$21,640,778
2011	891.6	\$68,328,857	\$23,357,391
2012	891.6	\$68,481,445	\$24,765,015
2013	882.6	\$68,023,682	\$25,863,647
2014	867.6	\$67,138,672	\$26,699,066
2015	1,452.9	\$112,897,600	\$46,763,828
2016	1,417.5	\$110,804,966	\$47,568,185
2017	1,389.1	\$108,921,595	\$48,300,606
2018	1,364.0	\$107,352,120	\$49,026,489
2019	1,341.9	\$105,887,276	\$49,876,621
2020	1,325.3	\$104,945,591	\$50,857,544
Average	1,154.3	\$90,023,288	\$37,701,743

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 1,325 jobs by 2020, and generate \$90.0 million in output and \$37.7 million in wages on average each year. The industry with the most significant employment gains during this time period is *Administrative and Waste Management Services*. This industry may see growth over the time period associated with new recycling facilities and collection routes being added to meet the *Zero Waste* requirements.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Recycling and Source Reduction* strategy can be found in Figure 94.

¹⁰⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 93: Recycling and Source Reduction—Operation Phase¹⁰¹

Year	Jobs	Output	Wages
2010	-515.8	-\$39,764,404	-\$12,779,236
2011	-527.0	-\$40,344,238	-\$13,813,019
2012	-525.6	-\$40,252,686	-\$14,583,588
2013	-512.6	-\$39,520,264	-\$15,064,240
2014	-497.7	-\$38,574,219	-\$15,373,230
2015	-485.1	-\$37,719,727	-\$15,632,629
2016	-474.8	-\$36,987,305	-\$15,922,546
2017	-462.7	-\$36,193,848	-\$16,078,949
2018	-453.7	-\$35,522,461	-\$16,296,387
2019	-449.0	-\$35,339,355	-\$16,624,451
2020	-447.6	-\$35,278,320	-\$17,074,585
Average	-486.5	-\$37,772,439	-\$15,385,714

Source: REMI PI+, RESI

As shown Figure 94, the strategy will result in approximately 448 forgone jobs by 2020, approximately \$37.8 million in forgone output and \$15.4 million in forgone wages on average each year. The industry experiencing the greatest decline is *Administrative and Waste Management Services*. This would likely occur with the reduction from current waste management practices and purchases of landfill space within the state. The result may see a shift of these employees to recycling facilities and land acquisition to expand current recycling operations within the State.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *Recycling and Source Reduction* strategy can be found in Figure 95.

¹⁰¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 94: Recycling and Source Reduction—Operation Phase¹⁰²

Year	Jobs	Output	Wages
2010	-515.8	-\$39,764,404	-\$12,779,236
2011	-527.0	-\$40,344,238	-\$13,813,019
2012	-525.6	-\$40,252,686	-\$14,583,588
2013	-512.6	-\$39,520,264	-\$15,064,240
2014	-497.7	-\$38,574,219	-\$15,373,230
2015	-831.5	-\$64,662,388	-\$26,798,793
2016	-813.9	-\$63,406,808	-\$27,295,794
2017	-793.2	-\$62,046,595	-\$27,563,912
2018	-777.8	-\$60,895,647	-\$27,936,663
2019	-769.7	-\$60,581,752	-\$28,499,058
2020	-767.3	-\$60,477,120	-\$29,270,717
Average	-666.6	-\$51,866,011	-\$21,725,295

Source: REMI PI+, RESI

As shown Figure 95, the strategy will result in approximately 767 forgone jobs by 2020, approximately \$51.9 million in forgone output and \$21.7 million in forgone wages on average each year. The industry experiencing the greatest decline is *Administrative and Waste Management Services*. This would likely occur with the reduction from current waste management practices and purchases of landfill space within the state. The result may see a shift of these employees to recycling facilities and land acquisition to expand current recycling operations within the State.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues will increase by approximate \$12,713,231 for the investment phase, and will decrease by \$7,415,429 for the operation phase.

If the strategy is enhanced, the total state and local tax revenues will increase by approximately \$21,793,894 during the investment phase and decrease by \$12,712,164 during the operation phase.

3.5 Buildings

3.5.1 Building Codes

Given the long lifetime of buildings, updating state and local building codes on a periodic basis will provide long-term greenhouse gas emissions reductions. The statewide building code in Maryland is adopted by the Maryland Codes Administration, which is within the Department of Housing and Community Development (DHCD). The statewide building code is called the

¹⁰² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Maryland Building Performance Standards (MBPS) and is updated every three years following the International Codes Council (ICC) cycle.

The MBPS is based primarily on the international codes books (I-Codes) published by the ICC; the core code books adopted by Maryland are the International Building Code (IBC), the International Residential Code (IRC), and the International Energy Conservation Code (IECC). In January of each third year, the Maryland Codes Administration adopts the latest codes into the MBPS, as required by law; subsequently, the local building code authorities must adopt and implement the MBPS by July of that same year. Local code authorities may amend the MBPS to meet the specific conditions and needs of their jurisdiction – with a few exceptions. For example, the energy code (IECC) and the accessibility code (Maryland Accessibility Code or MAC) cannot be weakened. Other codes, such as the recently authorized International Green Construction Code (IgCC), are a voluntary option for local jurisdictions.

Investment Phase

The average annual economic impacts of the investment phase of the *Building Codes* strategy can be found in Figure 96.

Figure 95: Building Codes—Investment Phase¹⁰³

Year	Jobs	Output	Wages
2010	19.5	\$1,495,361	\$671,387
2011	23.1	\$1,739,502	\$839,233
2012	21.7	\$1,647,949	\$869,751
2013	21.4	\$1,617,432	\$915,527
2014	20.5	\$1,647,949	\$915,527
2015	18.9	\$1,525,879	\$930,786
2016	19.3	\$1,525,879	\$976,563
2017	18.8	\$1,525,879	\$976,563
2018	19.2	\$1,525,879	\$1,052,856
2019	18.3	\$1,586,914	\$1,068,115
2020	18.6	\$1,525,879	\$1,068,115
Average	19.9	\$1,578,591	\$934,948

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 19 jobs by 2020, and generate \$1.6 million in output and \$0.9 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are *Sales, office, and administrative occupations*, primarily due to the expectation that implementation of new building codes will

¹⁰³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

result in the need for new training associated with repair and maintenance and new construction projects which will require building code inspectors, construction workers, site managers, architects, engineers, and other building professionals in these two industries.

Operation Phase

The average annual economic impacts of the operation phase of the *Building Codes* strategy can be found in Figure 96.

Figure 96: Building Codes—Operation Phase¹⁰⁴

Year	Jobs	Output	Wages
2010	30.8	\$2,441,406	-\$1,861,572
2011	91.3	\$6,896,973	-\$2,506,256
2012	167.7	\$12,542,725	-\$2,109,528
2013	265.0	\$19,744,873	-\$1,098,633
2014	359.1	\$26,733,398	\$1,091,003
2015	446.4	\$33,386,230	\$3,620,148
2016	525.6	\$39,489,746	\$6,374,359
2017	587.3	\$44,311,523	\$9,071,350
2018	638.6	\$48,461,914	\$11,680,603
2019	677.7	\$51,635,742	\$14,091,492
2020	708.2	\$54,199,219	\$16,334,534
Average	408.9	\$30,894,886	\$4,971,591

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 708 jobs by 2020, and generate \$30.9 million in output and \$5.0 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Professional, Scientific, and Technical Services*. The increased level of skilled individuals in energy efficiency code knowledge, may help to foster competition within the region and support a growing green industry.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$398,903 for the investment phase and \$4,189,647 for the operation phase.

¹⁰⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

3.6 Land Use

3.6.1 Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits)

This program reduces Marylanders' dependence on motor vehicle travel, especially single occupant vehicles, by developing incentives and requirements for development projects and regional land use patterns that achieve land use/location efficiency with regard to transportation. The purpose is to reduce VMT and the combustion of fossil fuels. Land use/location efficiency means that residences, jobs, shopping, schools, and recreational opportunities are in close proximity to each other and that alternative transportation modes (walking, biking and mass transit) are convenient and easily accessed. The Smart Growth development pattern, together with land use/location efficiency, results in shorter trip lengths, less need for automobile and truck travel, and greater use of alternative transportation modes.

Existing state laws and initiatives that support the P.1 strategy include the Maryland Sustainable Growth Commission, Smart Growth Subcabinet, Sustainable Communities Act of 2010, 2009 planning legislation, MDP data analysis and forecasting, and MDP indicator development.

This strategy has been identified as one that can provide greater GHG benefits if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Reducing Transportation Issues through Smart Growth* strategy can be found in Figure 97.

**Figure 97: Reducing Emissions through Smart Growth and Land Use/Location Efficiency
(Include Land Use Planning and Growth Boundary GHG Benefits)—Investment Phase¹⁰⁵**

Year	Jobs	Output	Wages
2010	1,783.2	\$379,758,400	\$40,000,000
2011	4,443.2	\$439,290,496	\$101,600,000
2012	2,836.0	\$469,038,548	\$72,000,000
2013	2,592.8	\$478,150,758	\$70,400,000
2014	2,016.0	\$476,456,226	\$56,960,000
2015	1,588.5	\$468,789,351	\$46,784,000
2016	1,471.0	\$459,195,129	\$45,152,000
2017	1,369.3	\$449,400,783	\$43,520,000
2018	1,284.4	\$440,178,997	\$41,888,000
2019	1,208.8	\$433,341,910	\$40,800,000
2020	1,144.6	\$414,922,431	\$39,168,000
Average	2,586.7	\$446,229,366	\$54,388,364

Source: REMI PI+, RESI

As shown in the figure above, under the investment phase this strategy will maintain approximately 2,587 jobs by 2020, and generate \$446.2 million in output and \$54.4 million in wages on average each year. The industry that gained the most from this strategy was *Construction*. This program seeks to enable individuals within the state to pursue energy efficiency through a tax credit incentive. The current tax credit does have a sunset year, and if not expand may disinterest individuals from continuing to invest in energy efficient measures for their home or business.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase under the enhanced scenario of the *Reducing Transportation Issues through Smart Growth* strategy can be found in Figure 98.

¹⁰⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

**Figure 98: Reducing Emissions through Smart Growth and Land Use/Location Efficiency
(Include Land Use Planning and Growth Boundary GHG Benefits)—Investment Phase¹⁰⁶**

Year	Jobs	Output	Wages
2010	2,828.1	\$446,774,588	\$174,015,076
2011	3,217.6	\$516,812,348	\$213,975,528
2012	3,357.7	\$551,810,056	\$240,745,148
2013	3,355.1	\$562,530,304	\$257,496,068
2014	3,280.2	\$560,536,736	\$267,339,804
2015	3,172.1	\$551,516,884	\$272,467,868
2016	3,057.6	\$540,229,564	\$275,314,124
2017	2,947.3	\$528,706,804	\$276,989,524
2018	2,844.9	\$517,857,644	\$278,132,008
2019	2,755.0	\$509,814,012	\$279,818,128
2020	2,659.9	\$488,144,037	\$265,026,315
Average	3,043.2	\$524,975,725	\$254,665,417

Source: REMI PI+, RESI

As shown in the figure above, under the investment phase this strategy will maintain approximately 2,660 jobs by 2020, and generate \$525.0 million in output and \$254.7 million in wages on average each year. The industry that gained the most from this strategy was *Construction*. This program seeks to enable individuals within the state to pursue energy efficiency through a tax credit incentive. Under this scenario, RESI assumes that the tax credit is extended through 2020 to help offset costs associated with the smart growth initiatives. The continued tax credit past the sunset year does assist in smart growth initiatives, however, the tax credit does indicate that there could be a potential decline in some areas of employment specifically government and private consumption may decline of households.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Reducing Transportation Issues through Smart Growth* strategy can be found in Figure 99.

¹⁰⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 99: Reducing Transportation Issues through Smart Growth—Operation Phase¹⁰⁷

Year	Jobs	Output	Wages
2010	733.1	\$139,545,931	\$42,727,625
2011	824.8	\$160,052,214	\$49,769,910
2012	867.0	\$171,800,520	\$53,594,770
2013	870.3	\$174,957,962	\$54,288,564
2014	852.6	\$173,351,448	\$53,037,899
2015	825.7	\$169,266,828	\$50,646,357
2016	798.3	\$164,610,222	\$47,898,859
2017	772.3	\$159,923,499	\$45,087,497
2018	747.8	\$155,360,603	\$42,370,042
2019	727.3	\$151,908,068	\$40,056,723
2020	710.8	\$149,479,231	\$38,228,325
Average	793.6	\$160,932,412	\$47,064,234

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 711 jobs by 2020, and generate \$160.9 million in output and \$47.1 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment from this strategy is *Retail Trade*. Increased savings in energy may allow smaller businesses within the region to expand operations or offer better deals to customers thus increasing their level of employment through 2020.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase under the enhanced scenario of the *Reducing Transportation Issues through Smart Growth* strategy can be found in Figure 100.

¹⁰⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 100: Reducing Transportation Issues through Smart Growth—Operation Phase¹⁰⁸

Year	Jobs	Output	Wages
2010	1,127.8	\$187,850,292	\$82,168,510
2011	1,268.9	\$215,454,904	\$95,711,365
2012	1,333.8	\$231,269,931	\$103,066,865
2013	1,338.9	\$235,520,334	\$104,401,085
2014	1,311.6	\$233,357,719	\$101,995,960
2015	1,270.4	\$227,859,191	\$97,396,840
2016	1,228.2	\$221,590,684	\$92,113,190
2017	1,188.1	\$215,281,633	\$86,706,725
2018	1,150.4	\$209,139,273	\$81,480,850
2019	1,118.9	\$204,491,630	\$77,032,160
2020	1,093.5	\$201,222,042	\$73,516,010
Average	1,221.0	\$216,639,785	\$90,508,142

Source: REMI PI+, RESI

As shown in the Figure 100, the strategy will maintain approximately 1,094 jobs by 2020, and generate \$216.6 million in output and \$90.5 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment from this strategy is *Retail Trade*. Increased savings in energy may allow smaller businesses within the region to expand operations or offer better deals to customers thus increasing their level of employment through 2020.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$123,807,254 during the investment phase and \$41,269,085 during the operation phase.

If this strategy is enhanced, additional tax revenues would accumulate to approximately \$160,949,430 during the investment phase and \$41,433,728 during the operation phase.

3.6.2 Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)

Maryland has established Priority Funding Areas to preserve existing communities, to target State resources to build on past investments, and to reduce development pressure on critical farmland and natural resource areas. By encouraging projects in already developed areas, PFAs reduce the GHG emissions associated with sprawl. Priority Funding Areas are geographic growth areas defined under Maryland law and designated by local jurisdictions to provide a map for targeting State investment in infrastructure. Maryland law directs the use of State

¹⁰⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

funding for roads, water and sewer plants, economic development and other growth-related needs toward Priority Funding Areas, recognizing that these investments are the most important tool the State has to influence smarter, more sustainable growth and development. This strategy has been identified as one that can provide greater GHG benefits if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)* strategy can be found in Figure 101.

Figure 101: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)—Investment Phase¹⁰⁹

Year	Jobs	Output	Wages
2010	2,828.1	\$376,966,059	\$146,825,220
2011	3,217.6	\$436,060,419	\$180,541,852
2012	3,357.7	\$465,589,735	\$203,128,719
2013	3,355.1	\$474,634,944	\$217,262,307
2014	3,280.2	\$472,952,871	\$225,567,960
2015	3,172.1	\$465,342,371	\$229,894,764
2016	3,057.6	\$455,818,695	\$232,296,292
2017	2,947.3	\$446,096,366	\$233,709,911
2018	2,844.9	\$436,942,387	\$234,673,882
2019	2,755.0	\$430,155,573	\$236,096,546
2020	2,659.9	\$411,871,531	\$223,615,953
Average	3,043.2	\$442,948,268	\$214,873,946

Source: REMI PI+, RESI

As shown in the figure above, under the investment phase this strategy will maintain approximately 2,660 jobs by 2020, and generate \$442.9 million in output and \$214.9 million in wages on average each year. The industry that gained the most from this strategy was *Construction*. This program seeks to decrease the issue of rural sprawl from residential construction. The increasing construction activity in areas that happen to be more urbanized have a two-fold effect. The first effect is increased employment to residential/mixed-use developments. A secondary construction impact can be attributed to the increase for transportation and regional amenities such as expanding or retrofitted septic systems.

¹⁰⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase—Enhancement

The average annual economic impacts of the investment phase under the enhanced scenario of the *Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)* strategy can be found in Figure 102.

Figure 102: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)—Investment Phase¹¹⁰

Year	Jobs	Output	Wages
2010	3,181.6	\$726,008,706	\$326,278,268
2011	3,619.8	\$839,820,066	\$401,204,115
2012	3,777.4	\$896,691,341	\$451,397,153
2013	3,774.5	\$914,111,744	\$482,805,128
2014	3,690.3	\$910,872,196	\$501,262,133
2015	3,568.6	\$896,214,937	\$510,877,253
2016	3,439.8	\$877,873,042	\$516,213,983
2017	3,315.7	\$859,148,557	\$519,355,358
2018	3,200.5	\$841,518,672	\$521,497,515
2019	3,099.4	\$828,447,770	\$524,658,990
2020	2,992.4	\$793,234,059	\$496,924,340
Average	3,423.6	\$853,085,553	\$477,497,657

Source: REMI PI+, RESI

As shown in the figure above, under the investment phase this strategy will maintain approximately 2,992 jobs by 2020, and generate \$853.1 million in output and \$447.5 million in wages on average each year. The industry that gained the most from this strategy was *Construction*. This program seeks to decrease the issue of rural sprawl by incentivizing residential construction in urbanized regions. However, during the enhancement investment phase of this program, RESI saw some declines due to supply constraints. *Construction* remained the top gaining sector for this strategy.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)* strategy can be found in Figure 103.

¹¹⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 103: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)—Operation Phase¹¹¹

Year	Jobs	Output	Wages
2010	1,151.4	\$292,241,383	\$89,481,507
2011	1,295.5	\$335,186,272	\$104,229,676
2012	1,361.8	\$359,789,935	\$112,239,816
2013	1,367.0	\$366,402,348	\$113,692,782
2014	1,339.1	\$363,037,937	\$111,073,600
2015	1,297.0	\$354,483,799	\$106,065,159
2016	1,253.9	\$344,731,793	\$100,311,264
2017	1,213.0	\$334,916,712	\$94,423,624
2018	1,174.5	\$325,360,955	\$88,732,646
2019	1,142.4	\$318,130,550	\$83,888,022
2020	1,116.4	\$313,044,005	\$80,058,935
Average	1,246.5	\$337,029,608	\$98,563,366

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 1,116 jobs by 2020, and generate \$337.0 million in output and \$98.6 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment from this strategy is *Construction*. Increased urbanized populations continue to require more amenities such as transportation and sewage/waste collection services. To accommodate some of these services, RESI expects that state government may make strategic investments to meet the growing population needs.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase under the enhanced scenario of the *Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)* strategy can be found in Figure 104.

¹¹¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 104: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)—Operation Phase¹¹²

Year	Jobs	Output	Wages
2010	1,832.7	\$348,864,828	\$123,252,765
2011	2,062.0	\$400,130,536	\$143,567,048
2012	2,167.5	\$429,501,300	\$154,600,298
2013	2,175.8	\$437,394,906	\$156,601,628
2014	2,131.4	\$433,378,621	\$152,993,940
2015	2,064.3	\$423,167,069	\$146,095,260
2016	1,995.8	\$411,525,556	\$138,169,785
2017	1,930.7	\$399,808,747	\$130,060,088
2018	1,869.5	\$388,401,507	\$122,221,275
2019	1,818.3	\$379,770,170	\$115,548,240
2020	1,777.0	\$373,698,078	\$110,274,015
Average	1,984.1	\$402,331,029	\$135,762,213

Source: REMI PI+, RESI

As shown in the Figure 104, the strategy will maintain approximately 1,777 jobs by 2020, and generate \$402.3 million in output and \$135.8 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment from this strategy is *Construction*. As the increased urban population begins to grow, RESI expects the state will invest more into amenities such as water, public transportation, and sewage/trash collection.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$96,183,876 during the investment phase and \$68,925,313 during the operation phase.

If this strategy is enhanced, additional tax revenues would accumulate to approximately \$125,039,038 during the investment phase and \$89,602,906 during the operation phase.

3.7 Innovative Initiatives

3.7.1 Buy Local for GHG Benefits

Although farm stands and farmers markets are not new, the phenomenal surge in the locally grown movement has been fueled by not only by an increased awareness of the benefits of fresh, healthful foods, but also the fears raised by well publicized episodes of product contamination and foodborne illness. MDA's "Buy Local" campaign continues to be highly successful in promoting local farms as preferred sources of food for Marylanders by helping

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agricultural producers market their products directly to supermarket, food service, institutional, and other wholesale buyers, as well as consumers.

MDA will promote the sustainable production and consumption of local agricultural goods and thereby help to displace the production and consumption of products transported from other states and countries. In addition to the energy savings and GHG reductions resulting from decreased transportation emissions, greater demand for local products preserves the agricultural landscape, supports agro-biodiversity, and encourages beneficial environmental practices. MDA will work with farmers, local governments, restaurants, food distributors and retailers, value-added producers, public and private institutions, and trade associations to maintain and expand its popular “Buy Local” program. By 2020, MDA aims to raise the number of farmers markets by 20 percent, establish a state farmers market association, and increase direct sales (buyer/grower) by 20 percent.

Investment Phase

The total economic impacts of the investment phase of the *Buy Local for GHG Benefits* strategy can be found in Figure 105.

Figure 105: Buy Local for GHG Benefits—Investment Phase¹¹³

Year	Jobs	Output	Wages
2010	83.9	\$1,068,115	\$823,975
2011	83.8	\$1,098,633	\$953,674
2012	80.3	\$1,037,598	\$1,007,080
2013	29.7	\$396,729	\$541,687
2014	27.0	\$244,141	\$457,764
2015	26.1	\$244,141	\$434,875
2016	24.8	\$183,105	\$385,284
2017	24.0	\$122,070	\$350,952
2018	24.8	\$305,176	\$358,582
2019	23.6	\$122,070	\$339,508
2020	22.8	\$122,070	\$312,805
Average	41.0	\$449,441	\$542,381

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy’s implementation will maintain approximately 23 jobs by 2020, and generate \$0.4 million in output and \$0.5 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment as a result of this strategy is *Forestry, fishing, and related activities*,

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primarily due to the expectation that as popularity for buying local continues, Maryland may need to increase assistance to farmers in expanding their local farms to accommodate demand.

Operation Phase

The average annual economic impacts of the operation phase of the *Buy Local for GHG Benefits* strategy can be found in Figure 106.

Figure 106: Buy Local for GHG Benefits—Operation Phase¹¹⁴

Year	Jobs	Output	Wages
2010	6.0	\$1,190,186	\$152,588
2011	7.5	\$1,281,738	\$209,808
2012	6.0	\$1,220,703	\$198,364
2013	6.4	\$1,190,186	\$225,067
2014	6.4	\$1,159,668	\$240,326
2015	5.7	\$1,098,633	\$221,252
2016	4.2	\$1,037,598	\$205,994
2017	4.4	\$1,037,598	\$202,179
2018	5.9	\$1,159,668	\$240,326
2019	5.2	\$1,037,598	\$205,994
2020	4.6	\$1,037,598	\$198,364
Average	5.7	\$1,131,925	\$209,115

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 5 jobs by 2020, and generate \$1.1 million in output and \$0.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Farming, fishing, and forestry occupations*. As buying locally continues to be encouraged, more retailers will begin to purchase Maryland-sourced goods to meet increased demand.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate approximately \$412,148 for the investment phase and \$269,554 for the operation phase.

3.7.2 Voluntary Stationary Source Reductions

GGRA provides two paths for sources in the State's manufacturing sector to follow to potentially get credit for any voluntary programs that they are implementing. Either companies may simply take totally voluntary action and provide a good faith estimate of potential

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reductions, which if appropriate, included in the plan as a reduction, or a company can implement an early voluntary GHG emissions reduction plan, which must be approved by MDE before January 1, 2012 and secure a formal “credit.”

Investment Phase

The average annual economic impacts of the investment phase of the *Voluntary Stationary Source Reductions* strategy can be found in Figure 107.

Figure 107: Voluntary Stationary Source Reductions—Investment Phase¹¹⁵

Year	Jobs	Output	Wages
2010	0.8	\$61,035	\$15,259
2011	0.7	\$30,518	\$15,259
2012	0.4	\$30,518	\$0
2013	0.3	\$30,518	\$15,259
2014	0.6	\$61,035	\$15,259
2015	0.3	\$0	\$15,259
2016	1.0	\$61,035	\$30,518
2017	0.4	\$0	\$30,518
2018	0.0	\$0	\$15,259
2019	0.7	\$61,035	\$30,518
2020	-0.3	\$0	\$30,518
Average	0.4	\$30,518	\$19,420

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy’s implementation will result in less than one forgone job by 2020, and generate \$30,518 in output and \$19,420 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy are *Sales, office, and administrative occupations*. Some sources are likely to take advantage of voluntary early reductions and develop plans to retrofit or construct new, energy-efficient facilities. These actions will require engineers, planners, and construction workers within these two industries.

Operation Phase

The average annual economic impacts of the operation phase of the *Voluntary Stationary Source Reductions* strategy can be found in Figure 108.

¹¹⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 108: Voluntary Stationary Source Reductions—Operation Phase¹¹⁶

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	2.0	\$183,105	\$45,776
2012	2.7	\$305,176	\$76,294
2013	3.4	\$366,211	\$122,070
2014	4.9	\$518,799	\$137,329
2015	4.2	\$488,281	\$152,588
2016	5.4	\$549,316	\$183,105
2017	5.2	\$549,316	\$213,623
2018	5.3	\$610,352	\$183,105
2019	5.4	\$671,387	\$228,882
2020	4.3	\$549,316	\$228,882
Average	3.9	\$435,569	\$142,878

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 4 jobs by 2020, and generate \$0.4 million in output and \$0.1 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment from this phase of the strategy is *Construction and extraction occupations*, primarily due to the expectation that sources which pursue voluntary early reductions have successfully implemented retrofitting or construct new, energy-efficient facilities. These facilities generate operating cost savings which are passed on to a wide variety of companies and enterprises. Positive impacts occur in other industries as these cost savings allow companies and enterprises to hire additional workers (who then spend in the economy) or increase spending with other vendors.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$5,776 during the investment phase, and \$6,622,774 during the operation phase.

3.7.3 PAYD Insurance in Maryland

Pay-As-You-Drive® automobile insurance is also known as use-based insurance. Generally, use-based insurance plans are designed to align the amount of premium paid with actual vehicle usage. The distance an automobile is driven, the speed at which it is driven, and the time of day it is driven all are factors that can be used to determine premiums under a use-based plan.

¹¹⁶ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Investment Phase

The average annual economic impacts of the investment phase of the *PAYD Insurance in Maryland* strategy can be found in Figure 109.

Figure 109: PAYD Insurance in Maryland—Investment Phase¹¹⁷

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will have discernable impact on the economy.

Operation Phase

The average annual economic impacts of the operation phase of the *PAYD* strategy can be found in Figure 110.

¹¹⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 110: PAYD Insurance in Maryland—Operation Phase¹¹⁸

Year	Jobs	Output	Wages
2010	-0.5	-\$30,518	-\$15,259
2011	-0.1	-\$30,518	-\$15,259
2012	-0.5	-\$61,035	-\$15,259
2013	-0.7	-\$61,035	\$0
2014	0.3	\$0	\$15,259
2015	-0.1	-\$61,035	\$0
2016	0.6	\$0	\$15,259
2017	-0.2	\$0	\$15,259
2018	0.0	\$0	\$0
2019	0.1	\$61,035	\$15,259
2020	0.6	\$61,035	\$15,259
Average	0.0	-\$11,444	\$11,444

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately one job by 2020, result in approximately \$11,444 in forgone output and generate \$11,444 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy are those (such as *Management, business, and financial occupations*) associated with the spending patterns of households experiencing increased income. This is due to those households taking advantage of PAYD as the policyholders tend to drive less than the average Maryland resident.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would not be impacted during the investment phase, and would decrease by \$19,002 for the operation phase.

3.7.4 Leadership-by-Example – Local Government

Maryland county and municipal governments, together with State agencies, are adopting policies and practices to obtain high performance and energy-efficient buildings, facilities and vehicle fleets, and reduce the carbon footprint in purchasing, procurement and other government operations. Some jurisdictions have conducted GHG inventories, adopted climate action plans and targets, and implemented tracking protocol, such as those provided by the International Council for Local Environmental Initiatives.

¹¹⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

The average annual economic impacts of the investment phase of the *Leadership-by-Example – Local Government* strategy can be found in Figure 111.

Figure 111: Leadership-by-Example – Local Government—Investment Phase¹¹⁹

Year	Jobs	Output	Wages
2010	168.6	\$13,031,006	\$6,072,998
2011	172.5	\$13,244,629	\$6,637,573
2012	170.4	\$13,153,076	\$6,988,525
2013	167.2	\$12,908,936	\$7,217,407
2014	162.4	\$12,725,830	\$7,492,065
2015	157.2	\$12,512,207	\$7,720,947
2016	153.6	\$12,329,102	\$7,934,570
2017	151.0	\$12,268,066	\$8,148,193
2018	148.4	\$12,207,031	\$8,377,075
2019	145.7	\$12,207,031	\$8,544,922
2020	144.5	\$12,207,031	\$8,682,251
Average	158.3	\$12,617,631	\$7,619,684

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately 145 jobs by 2020, and generate \$12.6 million in output and \$7.6 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are *Sales, office, and administrative occupations*, primarily due to the expectation that state government must lead by example by obtaining high performance and energy-efficient buildings, among other measures.

Environmental consultants will also likely be contracted to assist in the creation of GHG inventories, climate action plans and targets, and inventory and emissions tracking protocols.

Operation Phase

The average annual economic impacts of the operation phase of the *Leadership-by-example – Local Government* strategy can be found in Figure 112.

¹¹⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 112: Leadership-by-Example – Local Government—Operation Phase¹²⁰

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	1,837.4	\$109,313,965	\$103,195,190
Average	1,837.4	\$109,313,965	\$103,195,190

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 1,837 jobs by 2020, and generate \$109.3 million in output and \$103.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Sales, office, and administrative occupations*. Leading by example will result in higher efficiency and subsequent cost savings for local governments, which will in turn be able to support additional employment. Other industry sectors will benefit from the ongoing sustainable procurement activities of local governments.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by approximately \$3,140,436 during the investment phase, and \$20,478,272 for the operation phase.

3.7.5 Leadership-by-Example – Federal Government

Federal agencies with facilities located in Maryland are implementing suites of lead-by-example programs to improve efficiency, reduce waste, and integrate renewable energy and sustainable practices into their operations, facilities and fleets. These programs include tools to benchmark and track energy use and GHG emissions in order to report progress. Examples of programs include energy reduction in public buildings, facilities and lands, improved efficiencies in fleet vehicles and fuels, water conservation, waste reduction and recycling, purchasing of products and services with lower life-cycle impacts, and greater use of renewable energy.

¹²⁰ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

The average annual economic impacts of the investment phase of the *Leadership-by-Example – Federal Government* strategy can be found in Figure 113.

Figure 113: Leadership-by-Example – Federal Government—Investment Phase¹²¹

Year	Jobs	Output	Wages
2010	105.9	\$8,178,711	\$3,814,697
2011	108.0	\$8,300,781	\$4,135,132
2012	106.8	\$8,239,746	\$4,394,531
2013	105.2	\$8,117,676	\$4,547,119
2014	102.5	\$8,056,641	\$4,745,483
2015	98.2	\$7,812,500	\$4,837,036
2016	96.6	\$7,751,465	\$4,989,624
2017	94.1	\$7,690,430	\$5,142,212
2018	91.9	\$7,629,395	\$5,279,541
2019	90.3	\$7,629,395	\$5,355,835
2020	88.5	\$7,507,324	\$5,416,870
Average	98.9	\$7,901,278	\$4,787,098

Source: REMI PI+, RESI

As shown in the previous figure, the investment phase of this strategy's implementation will maintain approximately 87 jobs by 2020, and generate \$7.9 million in output and \$4.8 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment from this strategy are *Sale, office, and administrative occupations*, primarily due to the expectation that federal government must lead by example by obtaining high performance and energy-efficient buildings, among other measures. Environmental consultants will also likely be contracted to assist and advise in the planning and implementation of efficiency improvements, waste reduction, water conservation, renewable energy use, and other measures.

Operation Phase

The average annual economic impacts of the operation phase of the *Leadership-by-Example – Federal Government* strategy can be found in Figure 114.

¹²¹ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 114: Leadership-by-Example – Federal Government—Operation Phase¹²²

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	1,258.4	\$92,102,051	\$68,771,362
Average	1,258.4	\$92,102,051	\$68,771,362

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 1,258 jobs by 2020, and generate \$92.1 million in output and \$68.8 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this strategy is *Sales, office, and administrative occupations*, primarily due to the expectation that leading by example will result in higher efficiency and subsequent cost savings for federal governments, which will in turn be able to hire additional employees. Other industry sectors will benefit from the ongoing sustainable procurement activities of federal governments which are continuing implementation and operation of this strategy.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$1,957,467 for the investment phase and \$14,969,077 for the operation phase.

3.7.6 Lead-by-Example: State of Maryland Initiatives and Carbon Footprint

Through lead-by-example programs, state government in Maryland aims to improve energy efficiency, reduce waste, and integrate renewable energy practices in all of its agencies' operations and facilities, as well as their purchasing practices. DGS currently manages the following lead-by-example programs:

- Maryland Green Building Council,
- Maryland Green Purchasing Committee,
- State Energy Database, and,
- Renewable Energy Portfolio.

¹²² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

This strategy is one that has been identified as providing greater GHG reductions if enhanced.

Investment Phase—Status Quo

The average annual economic impacts of the investment phase of the *State of Maryland Initiatives to Lead by Example* strategy can be found in Figure 115.

Figure 115: State of Maryland Initiatives to Lead by Example—Investment Phase¹²³

Year	Jobs	Output	Wages
2010	87.1	\$4,913,330	\$2,006,531
2011	30.3	\$1,678,467	\$804,901
2012	47.8	\$2,655,029	\$1,239,777
2013	172.5	\$9,735,107	\$4,325,867
2014	171.1	\$9,399,414	\$4,604,340
2015	167.5	\$9,277,344	\$4,817,963
2016	163.2	\$9,033,203	\$4,951,477
2017	158.9	\$8,666,992	\$5,001,068
2018	166.9	\$9,155,273	\$5,390,167
2019	24.3	\$427,246	\$1,266,479
2020	19.9	\$122,070	\$896,454
Average	110.0	\$5,914,862	\$3,209,548

Source: REMI PI+, RESI

As in Figure 115, the investment phase of this strategy's implementation will maintain approximately 20 jobs by 2020, and generate \$5.9 million in output and \$3.2 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Construction*. Part of this strategy's implementation is to increase state building's energy efficiency. This sector may see an increase in demand to meet these specialized retrofits and assessments.

Investment Phase—Enhancement

The average annual economic impacts of the investment phase of the *State of Maryland Initiatives to Lead by Example* strategy can be found in Figure 116.

¹²³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 116: State of Maryland Initiatives to Lead by Example—Investment Phase¹²⁴

Year	Jobs	Output	Wages
2010	87.1	\$4,913,330	\$2,006,531
2011	30.3	\$1,678,467	\$804,901
2012	47.8	\$2,655,029	\$1,239,777
2013	172.5	\$9,735,107	\$4,325,867
2014	171.1	\$9,399,414	\$4,604,340
2015	228.4	\$12,650,924	\$6,569,949
2016	222.6	\$12,318,005	\$6,752,014
2017	216.7	\$11,818,626	\$6,819,639
2018	227.6	\$12,484,464	\$7,350,228
2019	33.1	\$582,608	\$1,727,018
2020	27.1	\$166,460	\$1,222,437
Average	133.1	\$7,127,494	\$3,947,518

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 27 jobs by 2020, and generate \$7.1 million in output and \$3.9 million in wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Construction*. Part of this strategy's implementation is to increase state building's energy efficiency. This sector may see an increase in demand to meet these specialized retrofits and assessments.

Operation Phase—Status Quo

The average annual economic impacts of the operation phase of the *State of Maryland Initiatives to Lead by Example* strategy can be found in Figure 117.

¹²⁴ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

Figure 117: State of Maryland Initiatives to Lead by Example—Operation Phase¹²⁵

Year	Jobs	Output	Wages
2010	0.7	\$0	\$7,629
2011	0.0	-\$30,518	-\$3,815
2012	0.1	\$0	\$0
2013	0.9	-\$61,035	-\$3,815
2014	2.8	-\$183,105	\$11,444
2015	1.1	-\$183,105	-\$19,073
2016	0.0	-\$183,105	-\$15,259
2017	0.8	-\$183,105	-\$3,815
2018	1.4	-\$122,070	\$0
2019	-0.2	-\$183,105	-\$19,073
2020	0.1	-\$122,070	-\$7,629
Average	0.7	-\$113,747	-\$4,855

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain less than one job by 2020, result in approximately \$0.1 million in forgone output and \$4,855 in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Accommodations and Food Services*. The increased income to those in the region from reduced energy consumption by larger government buildings may be an indirect impact to the households' utility bill over time.

Operation Phase—Enhancement

The average annual economic impacts of the operation phase of the *State of Maryland Initiatives to Lead by Example* strategy can be found in Figure 118.

¹²⁵ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 118: State of Maryland Initiatives to Lead by Example—Operation Phase¹²⁶

Year	Jobs	Output	Wages
2010	0.7	\$0	\$7,629
2011	0.0	-\$30,518	-\$3,815
2012	0.1	\$0	\$0
2013	0.9	-\$61,035	-\$3,815
2014	2.8	-\$183,105	\$11,444
2015	1.6	-\$249,689	-\$26,009
2016	0.0	-\$249,689	-\$20,807
2017	1.1	-\$249,689	-\$5,202
2018	1.9	-\$166,460	\$0
2019	-0.3	-\$249,689	-\$26,009
2020	0.1	-\$166,460	-\$10,404
Average	0.8	-\$146,030	-\$6,999

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain less than one job by 2020, result in approximately \$0.1 million in forgone output and \$6,999 in forgone wages on average each year. The industry experiencing the greatest positive economic impacts in terms of employment due to this phase of the strategy is *Accommodations and Food Services*. The increased income to those in the region from reduced energy consumption by larger government buildings may be an indirect impact to the households' utility bill over time.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$1,863,783 during the investment phase and decrease by \$17,999 during the operation phase.

If the strategy is enhanced, the total state and local tax revenues would increase by \$2,539,828 during the investment phase and decrease by \$25,713 during the operation phase.

3.7.7 Leadership-by-Example – Maryland University Lead-by-Example Initiatives

In Maryland, the presidents' of 23 colleges and universities—including all USM schools, Morgan, SMCM, 4 community colleges and 4 independent institutions— have signed the American College and University Presidents Climate Commitment, which requires each school to complete a GHG inventory, develop a climate action plan and implement strategies to reduce GHG emissions to achieve a set target. Schools are encouraged to commit to become climate neutral by a certain date, meaning GHG emissions sourced from the school be reduced or

¹²⁶ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

mitigated from a base year, with remaining emissions offset by purchasing carbon credits or other means.

Investment Phase

The average annual economic impacts of the investment phase of the *Leadership-by-Example – Maryland University Lead-by-Example Initiatives* strategy can be found in Figure 119.

Figure 119: Leadership-by-Example – Maryland University Lead-by-Example Initiatives—Investment Phase¹²⁷

Year	Jobs	Output	Wages
2010	101.9	\$7,843,018	\$3,677,368
2011	104.3	\$8,026,123	\$3,967,285
2012	102.9	\$7,934,570	\$4,226,685
2013	101.9	\$7,843,018	\$4,409,790
2014	99.1	\$7,781,982	\$4,562,378
2015	95.0	\$7,568,359	\$4,684,448
2016	93.0	\$7,446,289	\$4,791,260
2017	91.0	\$7,385,254	\$4,943,848
2018	89.4	\$7,385,254	\$5,096,436
2019	86.5	\$7,324,219	\$5,157,471
2020	85.8	\$7,263,184	\$5,249,023
Average	95.5	\$7,618,297	\$4,615,090

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 86 jobs by 2020, and generate \$7.6 million in output and \$4.6 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are *Sales, office, and administrative occupations*. Universities must lead by example by obtaining high performance and energy-efficient buildings, and fleet vehicles among other measures. Environmental consultants will likely be contracted to assist and advise in the planning and implementation of building efficiency, efficient appliance purchasing, optimized operations, waste minimization, and other measures.

Operation Phase

The average annual economic impacts of the operation phase of the *Leadership-by-Example – Maryland University Lead-by-Example Initiatives* strategy can be found in Figure 120.

¹²⁷ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

**Figure 120: Leadership-by-Example – Maryland University Lead-by-Example Initiatives—
Operation Phase¹²⁸**

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	96.0	\$5,615,234	\$5,386,353
Average	96.0	\$5,615,234	\$5,386,353

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain approximately 96 jobs by 2020, and generate \$5.6 million in output and \$5.4 million in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are *Sales, office, and administrative occupations* and *Construction and extraction occupations*. Leading by example will result in higher efficiency and subsequent cost savings for universities within Maryland’s higher education system, which will in turn be able to support additional employment. Other industry sectors will benefit from the ongoing sustainable purchasing by universities which are continuing implementation and operation of this strategy.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would accumulate to approximately \$1,886,382 during the investment phase and \$1,064,665 during the operation phase.

3.7.8 Transportation and Climate Initiative

The Transportation and Climate Initiative (TCI) is a regional effort of Maryland and 10 other Northeast and Mid-Atlantic states and Washington, D.C.¹ to reduce GHG emissions in the region’s transportation sector, minimize the transportation system’s reliance on high-carbon fuels, promote sustainable growth to address the challenges of vehicle-miles traveled, and help build the clean energy economy across the region.

¹²⁸ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Investment Phase

The average annual economic impacts of the investment phase of the *Transportation and Climate Initiative* strategy can be found in Figure 121.

Figure 121: Transportation and Climate Initiative—Investment Phase¹²⁹

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will not have an impact on jobs, output or wages. To date, there has been no investment phase costs or benefits associated with this strategy.

Operation Phase

The average annual economic impacts of the operation phase of the *Transportation and Climate Initiative* strategy can be found in Figure 122.

¹²⁹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 122: Transportation and Climate Initiative—Operation Phase¹³⁰

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	1.4	\$87,194	\$87,194
2014	1.7	\$174,386	\$43,597
2015	0.9	\$0	\$43,597
2016	2.6	\$174,386	\$130,789
2017	1.7	\$174,386	\$174,386
2018	0.6	\$0	\$43,597
2019	0.9	\$174,386	\$87,194
2020	0.6	\$0	\$87,194
Average	1.3	\$98,092	\$87,194

Source: REMI PI+, RESI

As shown in Figure 122, the strategy will maintain approximately one job by 2020, and generate \$98,092 in output and \$87,194 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment as a result of this strategy are those with goods and services demanded by new employees and households directly related to the strategic efforts of TCI to reduce GHGs in the transportation sector.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would not be impacted during the operation phase and increase by \$5,867,295 for the investment phase.

3.8.1 Greenhouse Gas Emissions Inventory Development

Emissions inventories are essential to developing environmental policies. The quality of a state-specific inventory is vital to the process if Maryland expects to set and achieve realistic pollution reduction goals. A baseline GHG inventory will pinpoint the business sectors that contribute to Maryland's GHG emissions, identifying where priorities should be placed in the development of climate policies. It also is necessary to determine what Maryland's future GHG emissions will be through the use of a forecast and modeling. Since GHG emissions may increase in the future, Maryland can take advantage of any cost-effective opportunities for early GHG reductions that may exist.

¹³⁰ Values are adjusted for inflation. Summed impacts throughout the report may not add up exactly to totals due to rounding.

The GGRA identified 2006 as the base year for Maryland's process and as the year for the first compliance-quality inventory. Since Maryland GHG data existed for 2006, using 2006 as the base year for Maryland's GHG inventory made sense from a resource perspective

Investment Phase

The average annual economic impacts of the investment phase of the *Greenhouse Gas Emission Inventory and Development* strategy can be found in Figure 123.

Figure 123: Greenhouse Gas Emissions Inventory Development —Investment Phase¹³¹

Year	Jobs	Output	Wages
2010	22.2	\$1,708,984	\$793,457
2011	23.2	\$1,739,502	\$854,492
2012	23.0	\$1,800,537	\$946,045
2013	22.5	\$1,739,502	\$976,563
2014	22.2	\$1,770,020	\$991,821
2015	20.9	\$1,647,949	\$1,022,339
2016	20.4	\$1,647,949	\$1,037,598
2017	20.0	\$1,647,949	\$1,083,374
2018	20.6	\$1,647,949	\$1,129,150
2019	20.0	\$1,708,984	\$1,144,409
2020	19.3	\$1,647,949	\$1,129,150
Average	21.3	\$1,700,661	\$1,009,854

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will maintain approximately 19 jobs by 2020, and generate \$1.7 million in output and \$1.0 million in wages on average each year. Overall, the most significant gains for this strategy were recorded in the *Professional, scientific, and technical services* sector. The strategy's reliance on a well maintained and coordinated database would require skilled individuals within this sector to provide services.

Operation Phase

The average annual economic impacts of the operation phase of the *Transportation and Climate Initiative* strategy can be found in Figure 124.

¹³¹ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 124: Transportation and Climate Initiative—Operation Phase¹³²

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in Figure 124, the strategy will have no discernable impact on the economy.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues would increase by \$428,591 during the investment phase and have no impact during the operation phase.

3.8 Outreach

3.8.1 Outreach and Public Education

State-sponsored public education and outreach combined with community actions form the foundation for behavioral and life style changes necessary to reduce GHG emissions. This program is designed to promote new actions and encourage continuation of existing efforts such as the educational efforts and action campaigns of State agencies, such as MDE, DNR, Maryland State Department of Education, and University of Maryland; electric utilities; non-profit organizations; faith communities; and others. This combination of efforts insures that scientifically based factual information is made available through public education and outreach efforts and reaches all segments of the public.

Investment Phase

The average annual economic impacts of the investment phase of the *Outreach and Public Education* strategy can be found in Figure 125.

¹³² Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 125: Outreach and Public Education—Investment Phase¹³³

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.0	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$0	\$0
2015	0.0	\$0	\$0
2016	0.0	\$0	\$0
2017	0.0	\$0	\$0
2018	0.0	\$0	\$0
2019	0.0	\$0	\$0
2020	0.0	\$0	\$0
Average	0.0	\$0	\$0

Source: REMI PI+, RESI

As shown in the figure above, the investment phase of this strategy's implementation will have no discernable impact on the economy.

Operation Phase

The average annual economic impacts of the operation phase of the *Outreach and Public Education* strategy can be found in Figure 126.

¹³³ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

Figure 126: Outreach and Public Education—Operation Phase¹³⁴

Year	Jobs	Output	Wages
2010	0.0	\$0	\$0
2011	0.0	\$0	\$0
2012	0.1	\$0	\$0
2013	0.0	\$0	\$0
2014	0.0	\$30,518	\$0
2015	0.0	\$0	\$0
2016	-0.1	\$0	\$0
2017	0.4	\$0	\$15,259
2018	0.4	\$0	\$0
2019	0.3	\$61,035	\$30,518
2020	0.1	\$61,035	\$15,259
Average	0.1	\$13,872	\$5,549

Source: REMI PI+, RESI

As shown in the figure above, the strategy will maintain less than one job by 2020, and generate \$13,872 in output and \$5,549 in wages on average each year. The industries experiencing the greatest positive economic impacts in terms of employment due to this strategy are primarily those industries (such as *Sales, office, and administrative occupations* and *Management, business, and financial occupations*) which will experience increased consumption of goods and services as successful outreach and education create some change in consumption behavior and spending patterns for both businesses and consumers.

Fiscal Impacts

As a result of the previously discussed activities contributing to the economic impacts of the strategy, the total state and local tax revenues not be impacted during the investment phase, and would increase by \$6,541,298 during the operation phase.

¹³⁴ Values are adjusted for inflation Summed impacts throughout the report may not add up exactly to totals due to rounding

**Refined Economic Impact Analysis for the Greenhouse Gas Emissions Reduction Act 2012 Plan
– Appendices A through B**

Prepared for
Maryland Department of the Environment

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Regional Economic Studies Institute



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Appendix A—Detailed Impacts

A.1 Energy

Figure 1: Regional Greenhouse Gas Initiative Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	6.1	1.9	8.0
2011	6.3	2.2	8.6
2012	6.4	2.3	8.7
2013	6.1	2.2	8.3
2014	6.4	2.0	8.4
2015	5.9	1.9	7.8
2016	6.1	1.7	7.8
2017	6.4	2.2	8.6
2018	6.6	2.3	8.9
2019	5.9	1.8	7.7
2020	6.2	1.9	8.0
Average	6.2	2.0	8.3

Sources: RESI, REMI PI+

Figure 2: Regional Greenhouse Gas Initiative Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$483,305	\$157,564	\$640,869
2011	\$506,319	\$165,067	\$671,387
2012	\$506,319	\$165,067	\$671,387
2013	\$483,305	\$157,564	\$640,869
2014	\$529,334	\$172,570	\$701,904
2015	\$460,290	\$150,061	\$610,352
2016	\$506,319	\$165,067	\$671,387
2017	\$506,319	\$165,067	\$671,387
2018	\$552,348	\$180,073	\$732,422
2019	\$552,348	\$180,073	\$732,422
2020	\$552,348	\$180,073	\$732,422
Average	\$512,596	\$167,114	\$679,710

Source: RESI, REMI PI+

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Figure 3: Regional Greenhouse Gas Initiative Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$241,652	\$78,782	\$320,435
2011	\$241,652	\$78,782	\$320,435
2012	\$264,667	\$86,285	\$350,952
2013	\$276,174	\$90,037	\$366,211
2014	\$276,174	\$90,037	\$366,211
2015	\$299,189	\$97,540	\$396,729
2016	\$310,696	\$101,291	\$411,987
2017	\$345,218	\$112,546	\$457,764
2018	\$379,740	\$123,801	\$503,540
2019	\$333,710	\$108,794	\$442,505
2020	\$356,725	\$116,297	\$473,022
Average	\$302,327	\$98,563	\$400,890

Source: RESI, REMI PI+

Figure 4: Regional Greenhouse Gas Initiative Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	6.1	1.9	8.0
2011	6.3	2.2	8.6
2012	6.4	2.3	8.7
2013	6.1	2.2	8.3
2014	6.4	2.0	8.4
2015	5.9	1.9	7.8
2016	6.1	1.7	7.8
2017	6.4	2.2	8.6
2018	6.6	2.3	8.9
2019	5.9	1.8	7.7
2020	6.2	1.9	8.0
Average	6.2	2.0	8.3

Source: RESI, REMI PI+

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Figure 5: Regional Greenhouse Gas Initiative Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$483,305	\$157,564	\$640,869
2011	\$506,319	\$165,067	\$671,387
2012	\$506,319	\$165,067	\$671,387
2013	\$483,305	\$157,564	\$640,869
2014	\$529,334	\$172,570	\$701,904
2015	\$460,290	\$150,061	\$610,352
2016	\$506,319	\$165,067	\$671,387
2017	\$506,319	\$165,067	\$671,387
2018	\$552,348	\$180,073	\$732,422
2019	\$552,348	\$180,073	\$732,422
2020	\$552,348	\$180,073	\$732,422
Average	\$512,596	\$167,114	\$679,710

Sources: RESI, REMI PI+

Figure 6: Regional Greenhouse Gas Initiative Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$241,652	\$78,782	\$320,435
2011	\$241,652	\$78,782	\$320,435
2012	\$264,667	\$86,285	\$350,952
2013	\$276,174	\$90,037	\$366,211
2014	\$276,174	\$90,037	\$366,211
2015	\$299,189	\$97,540	\$396,729
2016	\$310,696	\$101,291	\$411,987
2017	\$345,218	\$112,546	\$457,764
2018	\$379,740	\$123,801	\$503,540
2019	\$333,710	\$108,794	\$442,505
2020	\$356,725	\$116,297	\$473,022
Average	\$302,327	\$98,563	\$400,890

Sources: RESI, REMI PI+

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Figure 7: Regional Greenhouse Initiative Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	228.6	69.8	298.4
2011	211.5	54.7	266.1
2012	192.7	37.7	230.4
2013	174.8	21.8	196.7
2014	158.9	8.9	167.8
2015	145.1	-2.0	143.0
2016	133.6	-10.5	123.1
2017	125.2	-16.9	108.3
2018	118.2	-21.5	96.7
2019	114.4	-24.3	90.1
2020	113.1	-25.4	87.7
Average	156.0	8.4	164.4

Sources: RESI, REMI PI+

Figure 8: Regional Greenhouse Initiative Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$19,808,280	\$1,065,743	\$20,874,023
2011	\$16,333,143	\$878,771	\$17,211,914
2012	\$12,973,844	\$698,031	\$13,671,875
2013	\$9,904,140	\$532,872	\$10,437,012
2014	\$7,558,423	\$406,665	\$7,965,088
2015	\$5,502,300	\$296,040	\$5,798,340
2016	\$3,938,488	\$211,902	\$4,150,391
2017	\$2,780,109	\$149,578	\$2,929,688
2018	\$1,853,406	\$99,719	\$1,953,125
2019	\$1,332,136	\$71,673	\$1,403,809
2020	\$1,042,541	\$56,092	\$1,098,633
Average	\$7,547,892	\$406,099	\$7,953,991

Sources: RESI, REMI PI+

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Figure 9: Regional Greenhouse Initiative Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$10,686,046	\$574,941	\$11,260,986
2011	\$10,671,566	\$574,161	\$11,245,728
2012	\$10,454,370	\$562,476	\$11,016,846
2013	\$10,063,417	\$541,441	\$10,604,858
2014	\$9,802,782	\$527,418	\$10,330,200
2015	\$9,585,586	\$515,733	\$10,101,318
2016	\$9,310,471	\$500,931	\$9,811,401
2017	\$9,223,592	\$496,256	\$9,719,849
2018	\$9,165,673	\$493,140	\$9,658,813
2019	\$9,194,633	\$494,698	\$9,689,331
2020	\$9,368,390	\$504,047	\$9,872,437
Average	\$9,775,139	\$525,931	\$10,301,070

Sources: RESI, REMI PI+

Figure 10: Regional Greenhouse Initiative Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	228.6	69.8	298.4
2011	211.5	54.7	266.1
2012	192.7	37.7	230.4
2013	174.8	21.8	196.7
2014	1,498.6	84.3	1,583.0
2015	1,410.1	-19.5	1,390.6
2016	1,339.3	-105.3	1,234.0
2017	1,314.0	-177.0	1,137.1
2018	1,275.8	-231.6	1,044.1
2019	1,276.0	-271.3	1,004.7
2020	1,298.9	-292.0	1,006.8
Average	929.1	-75.3	853.8

Sources: RESI, REMI PI+

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Figure 11: Regional Greenhouse Initiative Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$19,808,280	\$1,065,743	\$20,874,023
2011	\$16,333,143	\$878,771	\$17,211,914
2012	\$12,973,844	\$698,031	\$13,671,875
2013	\$9,904,140	\$532,872	\$10,437,012
2014	\$71,283,567	\$3,835,265	\$75,118,832
2015	\$53,491,941	\$2,878,023	\$56,369,964
2016	\$39,471,728	\$2,123,694	\$41,595,422
2017	\$29,175,748	\$1,569,741	\$30,745,488
2018	\$20,010,524	\$1,076,625	\$21,087,148
2019	\$14,857,137	\$799,357	\$15,656,495
2020	\$11,973,125	\$644,189	\$12,617,314
Average	\$27,207,562	\$1,463,846	\$28,671,408

Sources: RESI, REMI PI+

Figure 12: Regional Greenhouse Initiative Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$10,686,046	\$574,941	\$11,260,986
2011	\$10,671,566	\$574,161	\$11,245,728
2012	\$10,454,370	\$562,476	\$11,016,846
2013	\$10,063,417	\$541,441	\$10,604,858
2014	\$92,450,143	\$4,974,088	\$97,424,232
2015	\$93,188,592	\$5,013,819	\$98,202,411
2016	\$93,310,004	\$5,020,351	\$98,330,355
2017	\$96,796,621	\$5,207,942	\$102,004,563
2018	\$98,958,293	\$5,324,246	\$104,282,539
2019	\$102,546,545	\$5,517,304	\$108,063,850
2020	\$107,591,834	\$5,788,756	\$113,380,590
Average	\$66,065,221	\$3,554,502	\$69,619,723

Sources: RESI, REMI PI+

Figure 13: GHG Reductions from Imported Power—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.1	0.0	0.1
2013	-0.2	-0.3	-0.5
2014	0.1	0.1	0.1
2015	-0.2	-0.1	-0.3
2016	0.0	0.0	0.0
2017	0.0	-0.1	0.0
2018	0.0	-0.1	-0.1
2019	-0.2	-0.3	-0.5
2020	-0.5	-0.5	-1.0
Average	-0.1	-0.1	-0.2

Sources: RESI, REMI PI+

Figure 14: GHG Reductions from Imported Power—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	-\$11,813	-\$18,704	-\$30,518
2014	\$23,627	\$37,409	\$61,035
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	-\$23,627	-\$37,409	-\$61,035
2019	\$0	\$0	\$0
2020	-\$23,627	-\$37,409	-\$61,035
Average	-\$3,222	-\$5,101	-\$8,323

Sources: RESI, REMI PI+

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Figure 15: GHG Reductions from Imported Power—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$5,907	-\$9,352	-\$15,259
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$5,907	\$9,352	\$15,259
2015	\$5,907	\$9,352	\$15,259
2016	\$0	\$0	\$0
2017	\$11,813	\$18,704	\$30,518
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	-\$5,907	-\$9,352	-\$15,259
Average	\$1,074	\$1,700	\$2,774

Sources: RESI, REMI PI+

Figure 16: GHG Reductions from Imported Power—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	2.1	1.7	3.8
2011	3.7	3.2	6.9
2012	4.9	4.3	9.1
2013	5.9	5.4	11.3
2014	6.7	5.6	12.3
2015	6.5	5.7	12.2
2016	7.2	6.3	13.5
2017	8.1	6.9	15.0
2018	8.3	7.3	15.6
2019	8.2	7.1	15.3
2020	7.4	6.3	13.7
Average	6.3	5.4	11.7

Sources: RESI, REMI PI+

Figure 17: GHG Reductions from Imported Power—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$245,803	\$211,961	\$457,764
2011	\$393,285	\$339,137	\$732,422
2012	\$507,993	\$438,052	\$946,045
2013	\$622,701	\$536,967	\$1,159,668
2014	\$737,409	\$635,882	\$1,373,291
2015	\$721,023	\$621,751	\$1,342,773
2016	\$786,570	\$678,274	\$1,464,844
2017	\$884,891	\$763,058	\$1,647,949
2018	\$884,891	\$763,058	\$1,647,949
2019	\$950,439	\$819,581	\$1,770,020
2020	\$884,891	\$763,058	\$1,647,949
Average	\$692,718	\$597,343	\$1,290,061

Sources: RESI, REMI PI+

Figure 18: GHG Reductions from Imported Power—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$57,354	\$49,457	\$106,812
2011	\$98,321	\$84,784	\$183,105
2012	\$147,482	\$127,176	\$274,658
2013	\$188,449	\$162,503	\$350,952
2014	\$213,029	\$183,699	\$396,729
2015	\$229,416	\$197,830	\$427,246
2016	\$262,190	\$226,091	\$488,281
2017	\$294,964	\$254,353	\$549,316
2018	\$327,738	\$282,614	\$610,352
2019	\$335,931	\$289,679	\$625,610
2020	\$319,544	\$275,549	\$595,093
Average	\$224,947	\$193,976	\$418,923

Sources: RESI, REMI PI+

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Figure 19: Federal New Source Performance Standard—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	12.9	5.2	18.2
2014	13.1	4.8	17.9
2015	12.5	4.7	17.2
2016	12.3	4.5	16.8
2017	12.1	4.3	16.4
2018	11.8	4.1	15.9
2019	11.5	4.1	15.6
2020	11.0	3.4	14.4
Average	8.8	3.2	12.0

Sources: RESI, REMI PI+

Figure 20: Federal New Source Performance Standard—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$1,031,574	\$372,234	\$1,403,809
2014	\$1,054,000	\$380,326	\$1,434,326
2015	\$1,031,574	\$372,234	\$1,403,809
2016	\$986,723	\$356,050	\$1,342,773
2017	\$986,723	\$356,050	\$1,342,773
2018	\$986,723	\$356,050	\$1,342,773
2019	\$986,723	\$356,050	\$1,342,773
2020	\$941,872	\$339,866	\$1,281,738
Average	\$727,810	\$262,624	\$990,434

Sources: RESI, REMI PI+

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Figure 21: Federal New Source Performance Standard—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$515,787	\$186,117	\$701,904
2014	\$538,213	\$194,209	\$732,422
2015	\$594,277	\$214,439	\$808,716
2016	\$627,915	\$226,577	\$854,492
2017	\$650,340	\$234,669	\$885,010
2018	\$683,979	\$246,807	\$930,786
2019	\$706,404	\$254,900	\$961,304
2020	\$661,553	\$238,715	\$900,269
Average	\$452,588	\$163,312	\$615,900

Sources: RESI, REMI PI+

Figure 22: Federal New Source Performance Standard—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	4.0	3.4	7.4
2012	6.3	5.5	11.9
2013	8.5	7.7	16.2
2014	10.1	8.6	18.8
2015	11.0	9.6	20.6
2016	12.5	10.9	23.4
2017	13.3	11.4	24.7
2018	14.1	12.2	26.3
2019	14.1	12.2	26.3
2020	13.9	12.0	25.9
Average	9.8	8.5	18.3

Sources: RESI, REMI PI+

Figure 23: Federal New Source Performance Standard—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$441,510	\$382,465	\$823,975
2012	\$703,145	\$609,111	\$1,312,256
2013	\$932,076	\$807,426	\$1,739,502
2014	\$1,111,950	\$963,245	\$2,075,195
2015	\$1,210,064	\$1,048,237	\$2,258,301
2016	\$1,373,586	\$1,189,891	\$2,563,477
2017	\$1,471,699	\$1,274,883	\$2,746,582
2018	\$1,537,108	\$1,331,544	\$2,868,652
2019	\$1,569,812	\$1,359,875	\$2,929,688
2020	\$1,569,812	\$1,359,875	\$2,929,688
Average	\$1,083,706	\$938,777	\$2,022,483

Sources: RESI, REMI PI+

Figure 24: Federal New Source Performance Standard—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$98,113	\$84,992	\$183,105
2012	\$188,050	\$162,902	\$350,952
2013	\$261,635	\$226,646	\$488,281
2014	\$310,692	\$269,142	\$579,834
2015	\$367,925	\$318,721	\$686,646
2016	\$425,158	\$368,299	\$793,457
2017	\$490,566	\$424,961	\$915,527
2018	\$539,623	\$467,457	\$1,007,080
2019	\$547,799	\$474,540	\$1,022,339
2020	\$555,975	\$481,622	\$1,037,598
Average	\$344,140	\$298,117	\$642,256

Sources: RESI, REMI PI+

Figure 25: MACT—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	1.0	0.4	1.5
2013	0.8	0.4	1.3
2014	0.8	0.2	1.0
2015	0.8	0.3	1.0
2016	1.0	0.5	1.5
2017	0.8	0.2	1.0
2018	1.0	0.5	1.5
2019	0.5	0.1	0.6
2020	0.5	0.0	0.5
Average	0.7	0.2	0.9

Sources: RESI, REMI PI+

Figure 26: MACT—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$88,984	\$33,086	\$122,070
2013	\$66,738	\$24,815	\$91,553
2014	\$88,984	\$33,086	\$122,070
2015	\$44,492	\$16,543	\$61,035
2016	\$88,984	\$33,086	\$122,070
2017	\$88,984	\$33,086	\$122,070
2018	\$44,492	\$16,543	\$61,035
2019	\$88,984	\$33,086	\$122,070
2020	\$44,492	\$16,543	\$61,035
Average	\$58,649	\$21,807	\$80,455

Sources: RESI, REMI PI+

Figure 27: MACT—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$44,492	\$16,543	\$61,035
2013	\$33,369	\$12,407	\$45,776
2014	\$33,369	\$12,407	\$45,776
2015	\$33,369	\$12,407	\$45,776
2016	\$55,615	\$20,679	\$76,294
2017	\$44,492	\$16,543	\$61,035
2018	\$44,492	\$16,543	\$61,035
2019	\$44,492	\$16,543	\$61,035
2020	\$33,369	\$12,407	\$45,776
Average	\$33,369	\$12,407	\$45,776

Sources: RESI, REMI PI+

Figure 28: MACT—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	196.4	60.4	256.7
2013	180.3	46.7	227.0
2014	163.8	32.9	196.7
2015	148.0	20.1	168.1
2016	134.2	9.1	143.3
2017	123.2	0.2	123.4
2018	113.4	-7.1	106.3
2019	107.1	-12.5	94.6
2020	103.9	-15.4	88.6
Average	115.5	12.2	127.7

Sources: RESI, REMI PI+

Figure 29: MACT—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$16,420,106	\$1,737,853	\$18,157,959
2013	\$13,384,456	\$1,416,570	\$14,801,025
2014	\$10,817,952	\$1,144,939	\$11,962,891
2015	\$8,444,626	\$893,753	\$9,338,379
2016	\$6,402,461	\$677,617	\$7,080,078
2017	\$4,912,233	\$519,896	\$5,432,129
2018	\$3,532,392	\$373,858	\$3,906,250
2019	\$2,649,294	\$280,393	\$2,929,688
2020	\$2,042,164	\$216,136	\$2,258,301
Average	\$6,236,880	\$660,092	\$6,896,973

Sources: RESI, REMI PI+

Figure 30: MACT—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$9,231,135	\$976,995	\$10,208,130
2013	\$9,203,538	\$974,074	\$10,177,612
2014	\$9,079,353	\$960,931	\$10,040,283
2015	\$8,886,175	\$940,485	\$9,826,660
2016	\$8,624,005	\$912,738	\$9,536,743
2017	\$8,417,029	\$890,832	\$9,307,861
2018	\$8,223,851	\$870,387	\$9,094,238
2019	\$8,085,867	\$855,783	\$8,941,650
2020	\$8,085,867	\$855,783	\$8,941,650
Average	\$7,076,075	\$748,910	\$7,824,984

Sources: RESI, REMI PI+

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Figure 31: Energy Efficiency in the Residential Sector Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	3,483.3	3,035.6	6,518.9
2011	1,854.8	1,657.3	3,512.2
2012	2,071.4	1,916.0	3,987.3
2013	1,889.8	1,752.0	3,641.8
2014	1,799.8	1,667.1	3,466.9
2015	1,561.6	1,445.4	3,007.0
2016	190.3	173.2	363.5
2017	32.2	27.8	60.0
2018	-38.7	-36.5	-75.2
2019	-52.4	-48.3	-100.7
2020	-37.6	-34.1	-71.7
Average	1,159.5	1,050.5	2,210.0

Sources: RESI, REMI PI+

Figure 32: Energy Efficiency in the Residential Sector Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$220,251,963	\$199,547,842	\$419,799,805
2011	\$116,098,210	\$105,184,749	\$221,282,959
2012	\$129,515,711	\$117,340,978	\$246,856,689
2013	\$115,810,006	\$104,923,636	\$220,733,643
2014	\$108,829,063	\$98,598,915	\$207,427,979
2015	\$92,161,260	\$83,497,919	\$175,659,180
2016	\$2,177,542	\$1,972,849	\$4,150,391
2017	-\$8,421,964	-\$7,630,282	-\$16,052,246
2018	-\$13,033,229	-\$11,808,080	-\$24,841,309
2019	-\$13,609,637	-\$12,330,304	-\$25,939,941
2020	-\$12,232,662	-\$11,082,768	-\$23,315,430
Average	\$67,049,660	\$60,746,859	\$127,796,520

Sources: RESI, REMI PI+

Figure 33: Energy Efficiency in the Residential Sector Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$79,624,383	\$72,139,533	\$151,763,916
2011	\$47,265,469	\$42,822,421	\$90,087,891
2012	\$54,182,367	\$49,089,117	\$103,271,484
2013	\$51,892,746	\$47,014,725	\$98,907,471
2014	\$52,084,882	\$47,188,800	\$99,273,682
2015	\$47,889,911	\$43,388,165	\$91,278,076
2016	\$10,879,704	\$9,856,990	\$20,736,694
2017	\$3,882,749	\$3,517,763	\$7,400,513
2018	-\$424,300	-\$384,415	-\$808,716
2019	-\$2,569,820	-\$2,328,252	-\$4,898,071
2020	-\$3,258,307	-\$2,952,020	-\$6,210,327
Average	\$31,040,889	\$28,122,984	\$59,163,874

Sources: RESI, REMI PI+

Figure 34: Energy Efficiency in the Residential Sector Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	3,483.3	3,035.6	6,518.9
2011	1,854.8	1,657.3	3,512.2
2012	2,071.4	1,916.0	3,987.3
2013	1,889.8	1,752.0	3,641.8
2014	1,799.8	1,667.1	3,466.9
2015	1,563.4	1,447.1	3,010.6
2016	190.5	173.4	363.9
2017	32.3	27.8	60.1
2018	-38.8	-36.6	-75.3
2019	-52.4	-48.4	-100.8
2020	-37.6	-34.2	-71.8
Average	1,159.7	1,050.7	2,210.3

Sources: RESI, REMI PI+

Figure 35: Energy Efficiency in the Residential Sector Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$220,251,963	\$199,547,842	\$419,799,805
2011	\$116,098,210	\$105,184,749	\$221,282,959
2012	\$129,515,711	\$117,340,978	\$246,856,689
2013	\$115,810,006	\$104,923,636	\$220,733,643
2014	\$108,829,063	\$98,598,915	\$207,427,979
2015	\$92,270,966	\$83,597,313	\$175,868,279
2016	\$2,180,134	\$1,975,197	\$4,155,331
2017	-\$8,431,989	-\$7,639,365	-\$16,071,354
2018	-\$13,048,743	-\$11,822,136	-\$24,870,879
2019	-\$13,625,838	-\$12,344,982	-\$25,970,819
2020	-\$12,247,223	-\$11,095,960	-\$23,343,184
Average	\$67,054,751	\$60,751,472	\$127,806,223

Sources: RESI, REMI PI+

Figure 36: Energy Efficiency in the Residential Sector Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$79,624,383	\$72,139,533	\$151,763,916
2011	\$47,265,469	\$42,822,421	\$90,087,891
2012	\$54,182,367	\$49,089,117	\$103,271,484
2013	\$51,892,746	\$47,014,725	\$98,907,471
2014	\$52,084,882	\$47,188,800	\$99,273,682
2015	\$47,946,918	\$43,439,813	\$91,386,731
2016	\$10,892,655	\$9,868,724	\$20,761,379
2017	\$3,887,371	\$3,521,951	\$7,409,322
2018	-\$424,806	-\$384,873	-\$809,678
2019	-\$2,572,879	-\$2,331,023	-\$4,903,902
2020	-\$3,262,186	-\$2,955,534	-\$6,217,720
Average	\$31,046,993	\$28,128,514	\$59,175,507

Sources: RESI, REMI PI+

Figure 37: Energy Efficiency in the Residential Sector Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	66.3	67.9	134.2
2011	55.8	57.9	113.7
2012	48.3	50.6	98.9
2013	42.7	45.4	88.1
2014	40.3	42.8	83.1
2015	38.6	41.2	79.8
2016	37.4	40.1	77.5
2017	37.5	39.7	77.2
2018	36.7	39.0	75.7
2019	35.8	38.2	74.1
2020	37.3	39.3	76.6
Average	43.3	45.6	89.0

Sources: RESI, REMI PI+

Figure 38: Energy Efficiency in the Residential Sector Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$1,203,874	-\$1,268,050	-\$2,471,924
2011	-\$1,768,654	-\$1,862,938	-\$3,631,592
2012	-\$2,169,945	-\$2,285,621	-\$4,455,566
2013	-\$2,452,335	-\$2,583,065	-\$5,035,400
2014	-\$2,556,374	-\$2,692,650	-\$5,249,023
2015	-\$2,615,824	-\$2,755,270	-\$5,371,094
2016	-\$2,645,549	-\$2,786,580	-\$5,432,129
2017	-\$2,645,549	-\$2,786,580	-\$5,432,129
2018	-\$2,675,275	-\$2,817,889	-\$5,493,164
2019	-\$2,645,549	-\$2,786,580	-\$5,432,129
2020	-\$2,586,099	-\$2,723,960	-\$5,310,059
Average	-\$2,360,457	-\$2,486,289	-\$4,846,746

Sources: RESI, REMI PI+

Figure 39: Energy Efficiency in the Residential Sector Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$601,937	\$634,025	\$1,235,962
2011	\$468,173	\$493,131	\$961,304
2012	\$364,135	\$383,546	\$747,681
2013	\$274,959	\$289,616	\$564,575
2014	\$222,940	\$234,824	\$457,764
2015	\$215,508	\$226,997	\$442,505
2016	\$185,783	\$195,687	\$381,470
2017	\$215,508	\$226,997	\$442,505
2018	\$193,214	\$203,514	\$396,729
2019	\$200,646	\$211,342	\$411,987
2020	\$260,096	\$273,961	\$534,058
Average	\$291,173	\$306,695	\$597,867

Sources: RESI, REMI PI+

Figure 40: Energy Efficiency in the Residential Sector Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	66.3	67.9	134.2
2011	55.8	57.9	113.7
2012	48.3	50.6	98.9
2013	42.7	45.4	88.1
2014	40.3	42.8	83.1
2015	38.6	41.2	79.8
2016	37.4	40.2	77.6
2017	37.5	39.7	77.2
2018	36.7	39.0	75.8
2019	35.9	38.3	74.2
2020	37.3	39.3	76.7
Average	43.4	45.7	89.0

Sources: RESI, REMI PI+

Figure 41: Energy Efficiency in the Residential Sector Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$1,203,874	-\$1,268,050	-\$2,471,924
2011	-\$1,768,654	-\$1,862,938	-\$3,631,592
2012	-\$2,169,945	-\$2,285,621	-\$4,455,566
2013	-\$2,452,335	-\$2,583,065	-\$5,035,400
2014	-\$2,556,374	-\$2,692,650	-\$5,249,023
2015	-\$2,618,938	-\$2,758,549	-\$5,377,487
2016	-\$2,648,699	-\$2,789,897	-\$5,438,595
2017	-\$2,648,699	-\$2,789,897	-\$5,438,595
2018	-\$2,678,459	-\$2,821,244	-\$5,499,703
2019	-\$2,648,699	-\$2,789,897	-\$5,438,595
2020	-\$2,589,177	-\$2,727,202	-\$5,316,380
Average	-\$2,362,168	-\$2,488,092	-\$4,850,260

Sources: RESI, REMI PI+

Figure 42: Energy Efficiency in the Residential Sector Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$601,937	\$634,025	\$1,235,962
2011	\$468,173	\$493,131	\$961,304
2012	\$364,135	\$383,546	\$747,681
2013	\$274,959	\$289,616	\$564,575
2014	\$222,940	\$234,824	\$457,764
2015	\$215,765	\$227,267	\$443,032
2016	\$186,004	\$195,920	\$381,924
2017	\$215,765	\$227,267	\$443,032
2018	\$193,444	\$203,756	\$397,201
2019	\$200,884	\$211,593	\$412,478
2020	\$260,406	\$274,288	\$534,693
Average	\$291,310	\$306,839	\$598,149

Sources: RESI, REMI PI+

Figure 43: Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	2,362.8	892.4	3,255.3
2011	1,666.3	652.0	2,318.3
2012	2,099.2	817.0	2,916.2
2013	2,107.1	822.5	2,929.6
2014	2,248.7	879.1	3,127.8
2015	2,277.2	896.2	3,173.4
2016	4,058.1	1,608.0	5,666.1
2017	4,097.4	1,658.4	5,755.8
2018	4,107.6	1,681.7	5,789.3
2019	4,106.2	1,682.4	5,788.6
2020	4,117.3	1,690.3	5,807.6
Average	3,022.5	1,207.3	4,229.8

Sources: RESI, REMI PI+

Figure 44: Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$178,819,309	\$71,424,832	\$250,244,141
2011	\$125,675,082	\$50,197,720	\$175,872,803
2012	\$158,255,088	\$63,210,976	\$221,466,064
2013	\$157,557,257	\$62,932,245	\$220,489,502
2014	\$169,267,741	\$67,609,701	\$236,877,441
2015	\$172,102,681	\$68,742,045	\$240,844,727
2016	\$316,161,261	\$126,282,587	\$442,443,848
2017	\$320,784,394	\$128,129,180	\$448,913,574
2018	\$324,229,937	\$129,505,415	\$453,735,352
2019	\$324,229,937	\$129,505,415	\$453,735,352
2020	\$325,494,756	\$130,010,615	\$455,505,371
Average	\$233,870,677	\$93,413,703	\$327,284,379

Sources: RESI, REMI PI+

Figure 45: Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$82,256,882	\$32,855,423	\$115,112,305
2011	\$61,921,637	\$24,733,026	\$86,654,663
2012	\$79,901,701	\$31,914,705	\$111,816,406
2013	\$82,344,111	\$32,890,264	\$115,234,375
2014	\$91,110,619	\$36,391,823	\$127,502,441
2015	\$95,515,680	\$38,151,313	\$133,666,992
2016	\$175,013,947	\$69,904,877	\$244,918,823
2017	\$185,176,117	\$73,963,898	\$259,140,015
2018	\$193,833,589	\$77,421,905	\$271,255,493
2019	\$198,663,891	\$79,351,246	\$278,015,137
2020	\$203,156,181	\$81,145,577	\$284,301,758
Average	\$131,717,668	\$52,611,278	\$184,328,946

Sources: RESI, REMI PI+

Figure 46: Energy Efficiency in the Commercial and Industrial Sectors Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	2,362.8	892.4	3,255.3
2011	1,666.3	652.0	2,318.3
2012	2,099.2	817.0	2,916.2
2013	2,107.1	822.5	2,929.6
2014	2,248.7	879.1	3,127.8
2015	2,303.6	906.5	3,210.1
2016	4,105.1	1,626.6	5,731.7
2017	4,144.8	1,677.6	5,822.4
2018	4,155.2	1,701.2	5,856.3
2019	4,153.7	1,701.8	5,855.5
2020	4,164.9	1,709.9	5,874.8
Average	3,046.5	1,217.0	4,263.5

Sources: RESI, REMI PI+

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Figure 47: Energy Efficiency in the Commercial and Industrial Sectors Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$178,819,309	\$71,424,832	\$250,244,141
2011	\$125,675,082	\$50,197,720	\$175,872,803
2012	\$158,255,088	\$63,210,976	\$221,466,064
2013	\$157,557,257	\$62,932,245	\$220,489,502
2014	\$169,267,741	\$67,609,701	\$236,877,441
2015	\$174,093,734	\$69,537,321	\$243,631,055
2016	\$319,818,925	\$127,743,548	\$447,562,472
2017	\$324,495,543	\$129,611,504	\$454,107,047
2018	\$327,980,947	\$131,003,660	\$458,984,607
2019	\$327,980,947	\$131,003,660	\$458,984,607
2020	\$329,260,399	\$131,514,705	\$460,775,104
Average	\$235,745,906	\$94,162,716	\$329,908,622

Sources: RESI, REMI PI+

Figure 48: Energy Efficiency in the Commercial and Industrial Sectors Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$82,256,882	\$32,855,423	\$115,112,305
2011	\$61,921,637	\$24,733,026	\$86,654,663
2012	\$79,901,701	\$31,914,705	\$111,816,406
2013	\$82,344,111	\$32,890,264	\$115,234,375
2014	\$91,110,619	\$36,391,823	\$127,502,441
2015	\$96,620,699	\$38,592,684	\$135,213,383
2016	\$177,038,680	\$70,713,605	\$247,752,285
2017	\$187,318,416	\$74,819,584	\$262,138,001
2018	\$196,076,046	\$78,317,597	\$274,393,643
2019	\$200,962,229	\$80,269,259	\$281,231,489
2020	\$205,506,491	\$82,084,349	\$287,590,840
Average	\$132,823,410	\$53,052,938	\$185,876,348

Sources: RESI, REMI PI+

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Figure 49: Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	164.4	146.7	311.1
2011	399.4	356.4	755.8
2012	703.3	627.4	1,330.7
2013	1,080.7	963.3	2,043.9
2014	1,547.3	1,371.6	2,918.9
2015	2,069.8	1,825.0	3,894.8
2016	2,346.7	2,052.1	4,398.8
2017	2,533.1	2,197.0	4,730.0
2018	2,639.2	2,268.3	4,907.5
2019	2,663.4	2,270.1	4,933.5
2020	2,645.3	2,234.7	4,880.0
Average	1,708.4	1,483.0	3,191.4

Sources: RESI, REMI PI+

Figure 50: Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$12,856,996	\$11,160,338	\$24,017,334
2011	\$32,575,413	\$28,276,638	\$60,852,051
2012	\$59,514,658	\$51,660,879	\$111,175,537
2013	\$94,965,333	\$82,433,349	\$177,398,682
2014	\$141,328,934	\$122,678,634	\$264,007,568
2015	\$195,811,883	\$169,971,808	\$365,783,691
2016	\$233,680,392	\$202,843,046	\$436,523,438
2017	\$264,524,113	\$229,616,512	\$494,140,625
2018	\$290,172,757	\$251,880,465	\$542,053,223
2019	\$308,143,145	\$267,479,413	\$575,622,559
2020	\$322,094,701	\$279,589,869	\$601,684,570
Average	\$177,788,030	\$154,326,450	\$332,114,480

Sources: RESI, REMI PI+

Figure 51: Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$3,201,996	\$2,779,449	\$5,981,445
2011	\$8,168,358	\$7,090,431	\$15,258,789
2012	\$15,054,284	\$13,067,664	\$28,121,948
2013	\$23,908,785	\$20,753,691	\$44,662,476
2014	\$35,989,786	\$31,240,438	\$67,230,225
2015	\$50,529,464	\$43,861,405	\$94,390,869
2016	\$60,388,672	\$52,419,555	\$112,808,228
2017	\$68,181,286	\$59,183,826	\$127,365,112
2018	\$74,234,039	\$64,437,836	\$138,671,875
2019	\$76,913,261	\$66,763,497	\$143,676,758
2020	\$77,958,811	\$67,671,072	\$145,629,883
Average	\$44,957,158	\$39,024,442	\$83,981,601

Sources: RESI, REMI PI+

Figure 52: Energy Efficiency in the Commercial and Industrial Sectors Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	164.4	146.7	311.1
2011	399.4	356.4	755.8
2012	703.3	627.4	1,330.7
2013	1,080.7	963.3	2,043.9
2014	1,547.3	1,371.6	2,918.9
2015	2,093.8	1,846.1	3,939.9
2016	2,373.9	2,075.9	4,449.7
2017	2,562.4	2,222.4	4,784.8
2018	2,669.8	2,294.5	4,964.3
2019	2,694.2	2,296.4	4,990.6
2020	2,675.9	2,260.6	4,936.4
Average	1,724.1	1,496.5	3,220.6

Sources: RESI, REMI PI+

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Figure 53: Energy Efficiency in the Commercial and Industrial Sectors Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$12,856,996	\$11,160,338	\$24,017,334
2011	\$32,575,413	\$28,276,638	\$60,852,051
2012	\$59,514,658	\$51,660,879	\$111,175,537
2013	\$94,965,333	\$82,433,349	\$177,398,682
2014	\$141,328,934	\$122,678,634	\$264,007,568
2015	\$198,077,227	\$171,938,209	\$370,015,436
2016	\$236,383,836	\$205,189,733	\$441,573,569
2017	\$267,584,387	\$232,272,942	\$499,857,329
2018	\$293,529,761	\$254,794,466	\$548,324,226
2019	\$311,708,048	\$270,573,878	\$582,281,925
2020	\$325,821,009	\$282,824,439	\$608,645,448
Average	\$179,485,964	\$155,800,319	\$335,286,282

Sources: RESI, REMI PI+

Figure 54: Energy Efficiency in the Commercial and Industrial Sectors Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$3,201,996	\$2,779,449	\$5,981,445
2011	\$8,168,358	\$7,090,431	\$15,258,789
2012	\$15,054,284	\$13,067,664	\$28,121,948
2013	\$23,908,785	\$20,753,691	\$44,662,476
2014	\$35,989,786	\$31,240,438	\$67,230,225
2015	\$51,114,038	\$44,368,837	\$95,482,875
2016	\$61,087,308	\$53,025,996	\$114,113,304
2017	\$68,970,074	\$59,868,523	\$128,838,597
2018	\$75,092,852	\$65,183,316	\$140,276,167
2019	\$77,803,069	\$67,535,882	\$145,338,952
2020	\$78,860,715	\$68,453,957	\$147,314,672
Average	\$45,386,479	\$39,397,108	\$84,783,586

Sources: RESI, REMI PI+

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Figure 55: Energy Efficiency – Appliances and Other Products—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	-13.2	-12.2	-25.4
2012	-31.6	-29.3	-60.9
2013	-49.1	-45.4	-94.6
2014	-64.7	-60.2	-124.9
2015	-82.1	-76.2	-158.3
2016	-96.3	-89.2	-185.5
2017	-95.2	-88.3	-183.4
2018	-86.0	-79.7	-165.7
2019	-72.9	-67.4	-140.2
2020	-59.4	-55.0	-114.3
Average	-59.1	-54.8	-113.9

Sources: RESI, REMI PI+

Figure 56: Energy Efficiency – Appliances and Other Products—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$855,257	-\$792,692	-\$1,647,949
2012	-\$2,011,438	-\$1,864,294	-\$3,875,732
2013	-\$3,088,429	-\$2,862,499	-\$5,950,928
2014	-\$4,054,553	-\$3,757,947	-\$7,812,500
2015	-\$5,131,543	-\$4,756,152	-\$9,887,695
2016	-\$5,986,801	-\$5,548,844	-\$11,535,645
2017	-\$5,828,420	-\$5,402,049	-\$11,230,469
2018	-\$5,226,572	-\$4,844,229	-\$10,070,801
2019	-\$4,339,639	-\$4,022,178	-\$8,361,816
2020	-\$3,484,381	-\$3,229,486	-\$6,713,867
Average	-\$3,637,003	-\$3,370,943	-\$7,007,946

Sources: RESI, REMI PI+

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Figure 57: Energy Efficiency – Appliances and Other Products—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$308,843	-\$286,250	-\$595,093
2012	-\$760,229	-\$704,615	-\$1,464,844
2013	-\$1,235,372	-\$1,145,000	-\$2,380,371
2014	-\$1,750,110	-\$1,622,083	-\$3,372,192
2015	-\$2,328,200	-\$2,157,884	-\$4,486,084
2016	-\$2,898,372	-\$2,686,345	-\$5,584,717
2017	-\$3,048,834	-\$2,825,800	-\$5,874,634
2018	-\$2,961,724	-\$2,745,063	-\$5,706,787
2019	-\$2,644,962	-\$2,451,473	-\$5,096,436
2020	-\$2,256,929	-\$2,091,826	-\$4,348,755
Average	-\$1,835,779	-\$1,701,485	-\$3,537,265

Sources: RESI, REMI PI+

Figure 58: Energy Efficiency – Appliances and Other Products—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	25.8	26.4	52.1
2011	22.2	22.8	45.0
2012	19.0	19.8	38.7
2013	17.0	18.0	35.0
2014	15.6	16.5	32.1
2015	14.5	15.4	29.8
2016	14.4	15.3	29.7
2017	14.3	15.2	29.5
2018	14.2	15.1	29.3
2019	14.3	15.3	29.5
2020	14.3	15.0	29.4
Average	16.9	17.7	34.6

Sources: RESI, REMI PI+

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Figure 59: Energy Efficiency – Appliances and Other Products—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$461,593	-\$484,452	-\$946,045
2011	-\$670,054	-\$703,237	-\$1,373,291
2012	-\$848,735	-\$890,767	-\$1,739,502
2013	-\$938,076	-\$984,532	-\$1,922,607
2014	-\$1,012,526	-\$1,062,669	-\$2,075,195
2015	-\$1,072,086	-\$1,125,179	-\$2,197,266
2016	-\$1,042,306	-\$1,093,924	-\$2,136,230
2017	-\$1,042,306	-\$1,093,924	-\$2,136,230
2018	-\$1,042,306	-\$1,093,924	-\$2,136,230
2019	-\$982,746	-\$1,031,414	-\$2,014,160
2020	-\$1,012,526	-\$1,062,669	-\$2,075,195
Average	-\$920,478	-\$966,063	-\$1,886,541

Sources: RESI, REMI PI+

Figure 60: Energy Efficiency – Appliances and Other Products—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$238,241	\$250,040	\$488,281
2011	\$193,571	\$203,157	\$396,729
2012	\$148,901	\$156,275	\$305,176
2013	\$119,121	\$125,020	\$244,141
2014	\$81,895	\$85,951	\$167,847
2015	\$67,005	\$70,324	\$137,329
2016	\$81,895	\$85,951	\$167,847
2017	\$96,786	\$101,579	\$198,364
2018	\$96,786	\$101,579	\$198,364
2019	\$104,231	\$109,392	\$213,623
2020	\$119,121	\$125,020	\$244,141
Average	\$122,505	\$128,572	\$251,076

Sources: RESI, REMI PI+

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Figure 61: Energy Efficiency in the Power Sector – General Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-606.5	-512.9	-1,119.4
2011	-780.2	-668.3	-1,448.5
2012	-1,090.6	-941.9	-2,032.4
2013	-1,340.2	-1,164.3	-2,504.6
2014	-1,668.9	-1,447.7	-3,116.7
2015	-1,813.4	-1,572.1	-3,385.5
2016	-1,909.2	-1,652.8	-3,562.0
2017	-1,979.0	-1,711.0	-3,690.0
2018	-2,020.8	-1,742.9	-3,763.7
2019	-2,023.2	-1,742.1	-3,765.3
2020	-2,014.9	-1,732.2	-3,747.1
Average	-1,567.9	-1,353.5	-2,921.4

Sources: RESI, REMI PI+

Figure 62: Energy Efficiency in the Power Sector – General Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$69,315,368	-\$59,835,023	-\$129,150,391
2011	-\$85,858,024	-\$74,115,120	-\$159,973,145
2012	-\$118,845,064	-\$102,590,483	-\$221,435,547
2013	-\$144,658,159	-\$124,873,091	-\$269,531,250
2014	-\$181,789,052	-\$156,925,547	-\$338,714,600
2015	-\$196,841,232	-\$169,919,022	-\$366,760,254
2016	-\$207,520,253	-\$179,137,461	-\$386,657,715
2017	-\$216,004,507	-\$186,461,313	-\$402,465,820
2018	-\$222,687,085	-\$192,229,907	-\$414,916,992
2019	-\$225,831,828	-\$194,944,540	-\$420,776,367
2020	-\$228,026,596	-\$196,839,127	-\$424,865,723
Average	-\$172,488,833	-\$148,897,330	-\$321,386,164

Sources: RESI, REMI PI+

Figure 63: Energy Efficiency in the Power Sector – General Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$16,559,035	-\$14,294,236	-\$30,853,271
2011	-\$21,898,546	-\$18,903,456	-\$40,802,002
2012	-\$31,496,563	-\$27,188,740	-\$58,685,303
2013	-\$39,776,080	-\$34,335,858	-\$74,111,938
2014	-\$51,904,632	-\$44,805,573	-\$96,710,205
2015	-\$59,013,060	-\$50,941,774	-\$109,954,834
2016	-\$64,974,968	-\$56,088,264	-\$121,063,232
2017	-\$70,191,637	-\$60,591,444	-\$130,783,081
2018	-\$74,818,668	-\$64,585,629	-\$139,404,297
2019	-\$77,046,194	-\$66,508,494	-\$143,554,688
2020	-\$78,512,102	-\$67,773,909	-\$146,286,011
Average	-\$53,290,135	-\$46,001,580	-\$99,291,715

Sources: RESI, REMI PI+

Figure 64: Energy Efficiency in the Power Sector – General Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-606.5	-512.9	-1,119.4
2011	-780.2	-668.3	-1,448.5
2012	-1,090.6	-941.9	-2,032.4
2013	-1,340.2	-1,164.3	-2,504.6
2014	-1,668.9	-1,447.7	-3,116.7
2015	-1,818.1	-1,576.2	-3,394.3
2016	-1,914.2	-1,657.0	-3,571.2
2017	-1,984.1	-1,715.4	-3,699.5
2018	-2,026.1	-1,747.4	-3,773.5
2019	-2,028.4	-1,746.7	-3,775.1
2020	-2,020.1	-1,736.7	-3,756.8
Average	-1,570.7	-1,355.9	-2,926.5

Sources: RESI, REMI PI+

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Figure 65: Energy Efficiency in the Power Sector – General Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$69,315,368	-\$59,835,023	-\$129,150,391
2011	-\$85,858,024	-\$74,115,120	-\$159,973,145
2012	-\$118,845,064	-\$102,590,483	-\$221,435,547
2013	-\$144,658,159	-\$124,873,091	-\$269,531,250
2014	-\$181,789,052	-\$156,925,547	-\$338,714,600
2015	-\$197,351,498	-\$170,359,499	-\$367,710,997
2016	-\$208,058,203	-\$179,601,835	-\$387,660,037
2017	-\$216,564,450	-\$186,944,672	-\$403,509,122
2018	-\$223,264,351	-\$192,728,220	-\$415,992,571
2019	-\$226,417,245	-\$195,449,889	-\$421,867,135
2020	-\$228,617,703	-\$197,349,388	-\$425,967,091
Average	-\$172,794,465	-\$149,161,161	-\$321,955,626

Sources: RESI, REMI PI+

Figure 66: Energy Efficiency in the Power Sector – General Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$16,559,035	-\$14,294,236	-\$30,853,271
2011	-\$21,898,546	-\$18,903,456	-\$40,802,002
2012	-\$31,496,563	-\$27,188,740	-\$58,685,303
2013	-\$39,776,080	-\$34,335,858	-\$74,111,938
2014	-\$51,904,632	-\$44,805,573	-\$96,710,205
2015	-\$59,166,038	-\$51,073,829	-\$110,239,867
2016	-\$65,143,401	-\$56,233,660	-\$121,377,061
2017	-\$70,373,593	-\$60,748,513	-\$131,122,107
2018	-\$75,012,618	-\$64,753,053	-\$139,765,671
2019	-\$77,245,918	-\$66,680,902	-\$143,926,821
2020	-\$78,715,627	-\$67,949,597	-\$146,665,224
Average	-\$53,390,187	-\$46,087,947	-\$99,478,134

Sources: RESI, REMI PI+

Figure 67: Energy Efficiency in the Power Sector – General Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	43.5	36.8	80.3
2011	76.8	65.6	142.3
2012	117.4	101.4	218.8
2013	182.0	158.2	340.2
2014	273.7	237.2	510.8
2015	387.5	335.7	723.2
2016	381.1	330.7	711.8
2017	387.6	335.7	723.4
2018	386.8	334.1	720.9
2019	378.9	326.8	705.7
2020	371.3	319.2	690.5
Average	271.5	234.7	506.2

Sources: RESI, REMI PI+

Figure 68: Energy Efficiency in the Power Sector – General Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$4,959,962	\$4,286,864	\$9,246,826
2011	\$8,528,515	\$7,371,143	\$15,899,658
2012	\$12,833,697	\$11,092,085	\$23,925,781
2013	\$19,954,434	\$17,246,494	\$37,200,928
2014	\$30,234,487	\$26,131,480	\$56,365,967
2015	\$42,986,336	\$37,152,824	\$80,139,160
2016	\$41,316,646	\$35,709,721	\$77,026,367
2017	\$42,135,121	\$36,417,125	\$78,552,246
2018	\$42,495,251	\$36,728,382	\$79,223,633
2019	\$42,364,294	\$36,615,198	\$78,979,492
2020	\$42,102,382	\$36,388,829	\$78,491,211
Average	\$29,991,920	\$25,921,831	\$55,913,752

Sources: RESI, REMI PI+

Figure 69: Energy Efficiency in the Power Sector – General Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,178,605	\$1,018,661	\$2,197,266
2011	\$2,128,036	\$1,839,249	\$3,967,285
2012	\$3,380,304	\$2,921,576	\$6,301,880
2013	\$5,385,569	\$4,654,714	\$10,040,283
2014	\$8,454,852	\$7,307,477	\$15,762,329
2015	\$12,539,045	\$10,837,419	\$23,376,465
2016	\$12,940,098	\$11,184,047	\$24,124,146
2017	\$13,807,683	\$11,933,895	\$25,741,577
2018	\$14,454,278	\$12,492,743	\$26,947,021
2019	\$14,601,604	\$12,620,076	\$27,221,680
2020	\$14,658,897	\$12,669,594	\$27,328,491
Average	\$9,411,725	\$8,134,496	\$17,546,220

Sources: RESI, REMI PI+

Figure 70: Energy Efficiency in the Power Sector – General Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	43.5	36.8	80.3
2011	76.8	65.6	142.3
2012	117.4	101.4	218.8
2013	182.0	158.2	340.2
2014	273.7	237.2	510.8
2015	388.5	336.5	725.1
2016	382.1	331.5	713.6
2017	388.6	336.6	725.2
2018	387.8	334.9	722.7
2019	379.9	327.7	707.5
2020	372.3	320.0	692.3
Average	272.0	235.1	507.2

Sources: RESI, REMI PI+

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Figure 71: Energy Efficiency in the Power Sector – General Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$4,959,962	\$4,286,864	\$9,246,826
2011	\$8,528,515	\$7,371,143	\$15,899,658
2012	\$12,833,697	\$11,092,085	\$23,925,781
2013	\$19,954,434	\$17,246,494	\$37,200,928
2014	\$30,234,487	\$26,131,480	\$56,365,967
2015	\$43,097,768	\$37,249,135	\$80,346,903
2016	\$41,423,750	\$35,802,291	\$77,226,041
2017	\$42,244,347	\$36,511,528	\$78,755,875
2018	\$42,605,410	\$36,823,592	\$79,429,002
2019	\$42,474,114	\$36,710,114	\$79,184,229
2020	\$42,211,523	\$36,483,158	\$78,694,682
Average	\$30,051,637	\$25,973,444	\$56,025,081

Sources: RESI, REMI PI+

Figure 72: Energy Efficiency in the Power Sector – General Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,178,605	\$1,018,661	\$2,197,266
2011	\$2,128,036	\$1,839,249	\$3,967,285
2012	\$3,380,304	\$2,921,576	\$6,301,880
2013	\$5,385,569	\$4,654,714	\$10,040,283
2014	\$8,454,852	\$7,307,477	\$15,762,329
2015	\$12,571,550	\$10,865,513	\$23,437,063
2016	\$12,973,643	\$11,213,039	\$24,186,682
2017	\$13,843,476	\$11,964,831	\$25,808,306
2018	\$14,491,748	\$12,525,128	\$27,016,876
2019	\$14,639,455	\$12,652,791	\$27,292,246
2020	\$14,696,897	\$12,702,437	\$27,399,334
Average	\$9,431,285	\$8,151,401	\$17,582,686

Sources: RESI, REMI PI+

Figure 73: Maryland Renewable Energy Portfolio Standard Program Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	239.4	247.6	487.1
2011	3,563.5	3,685.7	7,249.2
2012	1,329.9	1,368.5	2,698.3
2013	3,160.6	3,280.4	6,441.0
2014	1,848.7	1,920.4	3,769.0
2015	5,333.8	5,553.6	10,887.4
2016	3,565.3	3,717.6	7,282.8
2017	19,821.4	20,641.3	40,462.6
2018	18,972.4	20,952.2	39,924.7
2019	8,713.6	9,055.9	17,769.5
2020	3,108.6	3,318.6	6,427.2
Average	6,332.5	6,703.8	13,036.3

Sources: RESI, REMI PI+

Figure 74: Maryland Renewable Energy Portfolio Standard Program Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$13,623,408	\$14,422,246	\$28,045,654
2011	\$203,031,768	\$214,936,982	\$417,968,750
2012	\$74,876,859	\$79,267,428	\$154,144,287
2013	\$177,652,797	\$188,069,859	\$365,722,656
2014	\$102,449,806	\$108,457,176	\$210,906,982
2015	\$299,299,898	\$316,850,005	\$616,149,902
2016	\$197,368,937	\$208,942,098	\$406,311,035
2017	\$1,117,178,746	\$1,182,686,977	\$2,299,865,723
2018	\$1,070,304,735	\$1,133,064,405	\$2,203,369,141
2019	\$484,957,744	\$513,394,307	\$998,352,051
2020	\$157,610,526	\$166,852,365	\$324,462,891
Average	\$354,395,929	\$375,176,714	\$729,572,643

Sources: RESI, REMI PI+

Figure 75: Maryland Renewable Energy Portfolio Standard Program Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,292,227	\$5,602,548	\$10,894,775
2011	\$81,191,953	\$85,952,822	\$167,144,775
2012	\$35,837,420	\$37,938,825	\$73,776,245
2013	\$81,006,651	\$85,756,654	\$166,763,306
2014	\$54,360,214	\$57,547,745	\$111,907,959
2015	\$148,345,422	\$157,043,982	\$305,389,404
2016	\$111,485,135	\$118,022,311	\$229,507,446
2017	\$584,583,547	\$618,861,888	\$1,203,445,435
2018	\$626,313,572	\$663,038,845	\$1,289,352,417
2019	\$331,527,633	\$350,967,484	\$682,495,117
2020	\$153,304,106	\$162,293,429	\$315,597,534
Average	\$201,204,353	\$213,002,412	\$414,206,765

Sources: RESI, REMI PI+

Figure 76: Maryland Renewable Energy Portfolio Standard Program Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	239.4	247.6	487.1
2011	3,563.5	3,685.7	7,249.2
2012	1,329.9	1,368.5	2,698.3
2013	3,160.6	3,280.4	6,441.0
2014	1,848.7	1,920.4	3,769.0
2015	5,485.9	5,712.0	11,197.9
2016	3,666.9	3,823.6	7,490.5
2017	20,386.6	21,229.9	41,616.5
2018	19,513.5	21,549.7	41,063.2
2019	8,962.1	9,314.1	18,276.2
2020	3,197.3	3,413.2	6,610.5
Average	6,486.8	6,867.7	13,354.5

Sources: RESI, REMI PI+

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Figure 77: Maryland Renewable Energy Portfolio Standard Program Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$13,623,408	\$14,422,246	\$28,045,654
2011	\$203,031,768	\$214,936,982	\$417,968,750
2012	\$74,876,859	\$79,267,428	\$154,144,287
2013	\$177,652,797	\$188,069,859	\$365,722,656
2014	\$102,449,806	\$108,457,176	\$210,906,982
2015	\$307,835,183	\$325,885,775	\$633,720,958
2016	\$202,997,406	\$214,900,605	\$417,898,010
2017	\$1,149,037,892	\$1,216,414,254	\$2,365,452,146
2018	\$1,100,827,152	\$1,165,376,571	\$2,266,203,722
2019	\$498,787,527	\$528,035,030	\$1,026,822,556
2020	\$162,105,184	\$171,610,578	\$333,715,761
Average	\$363,020,453	\$384,306,955	\$747,327,408

Sources: RESI, REMI PI+

Figure 78: Maryland Renewable Energy Portfolio Standard Program Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,292,227	\$5,602,548	\$10,894,775
2011	\$81,191,953	\$85,952,822	\$167,144,775
2012	\$35,837,420	\$37,938,825	\$73,776,245
2013	\$81,006,651	\$85,756,654	\$166,763,306
2014	\$54,360,214	\$57,547,745	\$111,907,959
2015	\$152,575,863	\$161,522,484	\$314,098,347
2016	\$114,664,413	\$121,388,012	\$236,052,425
2017	\$601,254,409	\$636,510,282	\$1,237,764,691
2018	\$644,174,470	\$681,947,056	\$1,326,121,526
2019	\$340,981,973	\$360,976,200	\$701,958,172
2020	\$157,675,956	\$166,921,632	\$324,597,587
Average	\$206,274,141	\$218,369,478	\$424,643,619

Sources: RESI, REMI PI+

Figure 79: Maryland Renewable Energy Portfolio Standard Program Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-186.6	-159.9	-346.5
2011	-334.9	-290.7	-625.6
2012	-451.3	-394.6	-845.9
2013	-546.3	-479.4	-1,025.7
2014	-604.9	-529.6	-1,134.5
2015	-638.0	-555.0	-1,193.0
2016	-683.3	-592.5	-1,275.8
2017	-972.7	-847.3	-1,819.9
2018	-1,309.0	-1,142.1	-2,451.1
2019	-1,536.6	-1,341.2	-2,877.8
2020	-1,685.3	-1,469.3	-3,154.6
Average	-813.5	-709.2	-1,522.8

Sources: RESI, REMI PI+

Figure 80: Maryland Renewable Energy Portfolio Standard Program Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$20,037,125	-\$17,468,978	-\$37,506,104
2011	-\$34,433,205	-\$30,019,920	-\$64,453,125
2012	-\$45,796,815	-\$39,927,062	-\$85,723,877
2013	-\$55,285,510	-\$48,199,597	-\$103,485,107
2014	-\$62,149,326	-\$54,183,682	-\$116,333,008
2015	-\$67,757,765	-\$59,073,290	-\$126,831,055
2016	-\$73,333,596	-\$63,934,470	-\$137,268,066
2017	-\$102,973,542	-\$89,775,481	-\$192,749,023
2018	-\$137,471,962	-\$119,852,257	-\$257,324,219
2019	-\$162,253,435	-\$141,457,503	-\$303,710,938
2020	-\$180,317,824	-\$157,206,590	-\$337,524,414
Average	-\$85,619,100	-\$74,645,348	-\$160,264,449

Sources: RESI, REMI PI+

Figure 81: Maryland Renewable Energy Portfolio Standard Program Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$2,527,058	-\$2,203,166	-\$4,730,225
2011	-\$6,611,110	-\$5,763,768	-\$12,374,878
2012	-\$10,010,411	-\$8,727,382	-\$18,737,793
2013	-\$13,091,791	-\$11,413,824	-\$24,505,615
2014	-\$15,651,457	-\$13,645,418	-\$29,296,875
2015	-\$14,518,356	-\$12,657,547	-\$27,175,903
2016	-\$16,727,494	-\$14,583,541	-\$31,311,035
2017	-\$26,982,459	-\$23,524,133	-\$50,506,592
2018	-\$39,740,027	-\$34,646,570	-\$74,386,597
2019	-\$49,481,428	-\$43,139,421	-\$92,620,850
2020	-\$56,744,682	-\$49,471,748	-\$106,216,431
Average	-\$22,916,934	-\$19,979,683	-\$42,896,618

Sources: RESI, REMI PI+

Figure 82: Maryland Renewable Energy Portfolio Standard Program Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-186.6	-159.9	-346.5
2011	-334.9	-290.7	-625.6
2012	-451.3	-394.6	-845.9
2013	-546.3	-479.4	-1,025.7
2014	-604.9	-529.6	-1,134.5
2015	-656.2	-570.8	-1,227.0
2016	-702.8	-609.4	-1,312.2
2017	-1,000.4	-871.4	-1,871.8
2018	-1,346.3	-1,174.7	-2,521.0
2019	-1,580.4	-1,379.5	-2,959.9
2020	-1,733.4	-1,511.2	-3,244.6
Average	-831.2	-724.7	-1,555.9

Sources: RESI, REMI PI+

Figure 83: Maryland Renewable Energy Portfolio Standard Program Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$20,037,125	-\$17,468,978	-\$37,506,104
2011	-\$34,433,205	-\$30,019,920	-\$64,453,125
2012	-\$45,796,815	-\$39,927,062	-\$85,723,877
2013	-\$55,285,510	-\$48,199,597	-\$103,485,107
2014	-\$62,149,326	-\$54,183,682	-\$116,333,008
2015	-\$69,690,047	-\$60,757,913	-\$130,447,959
2016	-\$75,424,887	-\$65,757,722	-\$141,182,609
2017	-\$105,910,090	-\$92,335,653	-\$198,245,744
2018	-\$141,392,318	-\$123,270,144	-\$264,662,462
2019	-\$166,880,497	-\$145,491,517	-\$312,372,014
2020	-\$185,460,038	-\$161,689,729	-\$347,149,767
Average	-\$87,496,351	-\$76,281,992	-\$163,778,343

Sources: RESI, REMI PI+

Figure 84: Maryland Renewable Energy Portfolio Standard Program Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$2,527,058	-\$2,203,166	-\$4,730,225
2011	-\$6,611,110	-\$5,763,768	-\$12,374,878
2012	-\$10,010,411	-\$8,727,382	-\$18,737,793
2013	-\$13,091,791	-\$11,413,824	-\$24,505,615
2014	-\$15,651,457	-\$13,645,418	-\$29,296,875
2015	-\$14,932,384	-\$13,018,508	-\$27,950,892
2016	-\$17,204,521	-\$14,999,427	-\$32,203,948
2017	-\$27,751,932	-\$24,194,982	-\$51,946,914
2018	-\$40,873,313	-\$35,634,603	-\$76,507,917
2019	-\$50,892,515	-\$44,369,650	-\$95,262,165
2020	-\$58,362,899	-\$50,882,559	-\$109,245,458
Average	-\$23,446,308	-\$20,441,208	-\$43,887,516

Sources: RESI, REMI PI+

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Figure 85: Incentives and Grant Programs to Support Renewable Energy—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	176.1	65.3	241.4
2011	262.4	61.4	323.8
2012	68.5	-63.3	5.1
2013	-77.6	-176.6	-254.2
2014	-112.2	-207.7	-320.0
2015	-114.8	-215.4	-330.3
2016	-144.4	-211.1	-355.5
2017	-108.2	-176.8	-285.0
2018	-94.7	-150.1	-244.8
2019	-56.4	-114.3	-170.7
2020	-23.3	-83.7	-107.0
Average	-20.4	-115.7	-136.1

Sources: RESI, REMI PI+

Figure 86: Incentives and Grant Programs to Support Renewable Energy—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$2,532,324	\$16,083,399	\$18,615,723
2011	\$3,632,431	\$23,070,450	\$26,702,881
2012	\$631,005	\$4,007,667	\$4,638,672
2013	-\$1,693,751	-\$10,757,421	-\$12,451,172
2014	-\$2,208,518	-\$14,026,833	-\$16,235,352
2015	-\$2,194,968	-\$13,940,774	-\$16,135,742
2016	-\$2,522,443	-\$16,020,647	-\$18,543,091
2017	-\$1,849,792	-\$11,748,475	-\$13,598,267
2018	-\$1,531,167	-\$9,724,814	-\$11,255,981
2019	-\$849,665	-\$5,396,429	-\$6,246,094
2020	-\$274,371	-\$1,742,597	-\$2,016,968
Average	-\$575,356	-\$3,654,225	-\$4,229,581

Sources: RESI, REMI PI+

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Figure 87: Incentives and Grant Programs to Support Renewable Energy—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,181,059	\$7,501,192	\$8,682,251
2011	\$1,922,075	\$12,207,564	\$14,129,639
2012	\$763,848	\$4,851,386	\$5,615,234
2013	-\$199,265	-\$1,265,579	-\$1,464,844
2014	-\$514,767	-\$3,269,412	-\$3,784,180
2015	-\$606,271	-\$3,850,577	-\$4,456,848
2016	-\$958,086	-\$6,085,035	-\$7,043,121
2017	-\$763,371	-\$4,848,354	-\$5,611,725
2018	-\$734,606	-\$4,665,662	-\$5,400,269
2019	-\$433,683	-\$2,754,427	-\$3,188,110
2020	-\$146,036	-\$927,511	-\$1,073,547
Average	-\$44,464	-\$282,401	-\$326,865

Sources: RESI, REMI PI+

Figure 88: Incentives and Grant Programs to Support Renewable Energy—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-54.2	30.5	-23.7
2011	-28.5	53.5	25.0
2012	-7.9	72.0	64.0
2013	7.6	85.7	93.3
2014	19.9	94.9	114.8
2015	25.7	93.5	119.2
2016	31.4	96.9	128.3
2017	34.7	98.3	133.0
2018	34.8	97.2	132.0
2019	31.8	93.7	125.5
2020	28.2	89.4	117.6
Average	11.2	82.3	93.5

Sources: RESI, REMI PI+

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Figure 89: Incentives and Grant Programs to Support Renewable Energy—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$796,737	-\$5,520,402	-\$6,317,139
2011	-\$254,032	-\$1,760,128	-\$2,014,160
2012	\$215,542	\$1,493,442	\$1,708,984
2013	\$615,835	\$4,266,977	\$4,882,813
2014	\$954,544	\$6,613,815	\$7,568,359
2015	\$1,136,000	\$7,871,080	\$9,007,080
2016	\$1,351,696	\$9,365,589	\$10,717,285
2017	\$1,531,443	\$10,611,013	\$12,142,456
2018	\$1,660,861	\$11,507,718	\$13,168,579
2019	\$1,739,950	\$12,055,705	\$13,795,654
2020	\$1,790,279	\$12,404,424	\$14,194,702
Average	\$904,126	\$6,264,476	\$7,168,601

Sources: RESI, REMI PI+

Figure 90: Incentives and Grant Programs to Support Renewable Energy—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$531,158	-\$3,680,268	-\$4,211,426
2011	-\$444,556	-\$3,080,224	-\$3,524,780
2012	-\$361,803	-\$2,506,849	-\$2,868,652
2013	-\$292,522	-\$2,026,814	-\$2,319,336
2014	-\$240,561	-\$1,666,788	-\$1,907,349
2015	-\$209,253	-\$1,449,866	-\$1,659,119
2016	-\$172,326	-\$1,194,007	-\$1,366,333
2017	-\$147,708	-\$1,023,435	-\$1,171,143
2018	-\$143,605	-\$995,006	-\$1,138,611
2019	-\$164,120	-\$1,137,149	-\$1,301,270
2020	-\$198,996	-\$1,378,794	-\$1,577,789
Average	-\$264,237	-\$1,830,836	-\$2,095,073

Sources: RESI, REMI PI+

Figure 91: Offshore Wind Initiatives to Support Renewable Energy—Investment Phase, Employment Impacts¹

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	751.8	1,416.1	2,167.9
2018	14.0	11.9	25.9
2019	-3.6	-4.1	-7.7
2020	-12.6	-12.6	-25.1
Average	187.4	352.8	540.2

Sources: RESI, REMI PI+

Figure 92: Offshore Wind Initiatives to Support Renewable Energy—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$30,574,595	\$57,560,171	\$88,134,766
2018	\$402,297	\$757,371	\$1,159,668
2019	-\$359,950	-\$677,647	-\$1,037,598
2020	-\$783,421	-\$1,474,880	-\$2,258,301
Average	\$7,458,380	\$14,041,254	\$21,499,634

Sources: RESI, REMI PI+

¹ Offshore Wind according to MEA data is scheduled for the first investment in 2017. This program is therefore defined as having a lifespan from 2017-2020. Averages are done over this period of time.

Figure 93: Offshore Wind Initiatives to Support Renewable Energy Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$19,490,246	\$36,692,616	\$56,182,861
2018	\$1,042,797	\$1,963,184	\$3,005,981
2019	\$381,124	\$717,509	\$1,098,633
2020	-\$47,640	-\$89,689	-\$137,329
Average	\$5,216,631	\$9,820,905	\$15,037,537

Sources: RESI, REMI PI+

Figure 94: Offshore Wind Initiatives to Support Renewable Energy—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	146.1	135.7	281.8
2019	150.8	140.3	291.2
2020	150.6	139.6	290.2
Average	149.2	138.5	287.7

Sources: RESI, REMI PI+

Figure 95: Offshore Wind Initiatives to Support Renewable Energy—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$8,639,369	\$8,023,229	\$16,662,598
2019	\$8,987,476	\$8,346,509	\$17,333,984
2020	\$8,987,476	\$8,346,509	\$17,333,984
Average	\$8,871,440	\$8,238,749	\$17,110,189

Sources: RESI, REMI PI+

Figure 96: Offshore Wind Initiatives to Support Renewable Energy Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$19,652,191	\$18,250,641	\$37,902,832
2019	\$20,546,192	\$19,080,883	\$39,627,075
2020	\$21,210,759	\$19,698,055	\$40,908,813
Average	\$20,469,714	\$19,009,860	\$39,479,574

Sources: RESI, REMI PI+

Figure 97: Title V Permits for GHG Sources—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	1.0	0.4	1.5
2013	0.8	0.4	1.3
2014	0.8	0.2	1.0
2015	0.8	0.3	1.0
2016	1.0	0.5	1.5
2017	0.8	0.2	1.0
2018	1.0	0.5	1.5
2019	0.5	0.1	0.6
2020	0.5	0.0	0.5
Average	0.7	0.2	0.9

Sources: RESI, REMI PI+

Figure 98: Title V Permits for GHG Sources—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$88,984	\$33,086	\$122,070
2013	\$66,738	\$24,815	\$91,553
2014	\$88,984	\$33,086	\$122,070
2015	\$44,492	\$16,543	\$61,035
2016	\$88,984	\$33,086	\$122,070
2017	\$88,984	\$33,086	\$122,070
2018	\$44,492	\$16,543	\$61,035
2019	\$88,984	\$33,086	\$122,070
2020	\$44,492	\$16,543	\$61,035
Average	\$58,649	\$21,807	\$80,455

Sources: RESI, REMI PI+

Figure 99: Title V Permits for GHG Sources—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$44,492	\$16,543	\$61,035
2013	\$33,369	\$12,407	\$45,776
2014	\$33,369	\$12,407	\$45,776
2015	\$33,369	\$12,407	\$45,776
2016	\$55,615	\$20,679	\$76,294
2017	\$44,492	\$16,543	\$61,035
2018	\$44,492	\$16,543	\$61,035
2019	\$44,492	\$16,543	\$61,035
2020	\$33,369	\$12,407	\$45,776
Average	\$33,369	\$12,407	\$45,776

Sources: RESI, REMI PI+

Figure 100: Title V Permits for GHG Sources—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	6.2	2.0	8.2
2012	5.5	1.6	7.1
2013	4.9	1.3	6.2
2014	4.7	0.7	5.4
2015	3.6	-0.2	3.4
2016	3.4	-0.2	3.2
2017	3.3	-0.3	3.0
2018	3.2	-0.3	2.9
2019	2.7	-0.5	2.1
2020	2.7	-0.7	2.0
Average	3.7	0.3	4.0

Sources: RESI, REMI PI+

Figure 101: Title V Permits for GHG Sources—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$507,891	\$41,425	\$549,316
2012	\$423,243	\$34,521	\$457,764
2013	\$310,378	\$25,315	\$335,693
2014	\$310,378	\$25,315	\$335,693
2015	\$112,865	\$9,206	\$122,070
2016	\$112,865	\$9,206	\$122,070
2017	\$112,865	\$9,206	\$122,070
2018	\$112,865	\$9,206	\$122,070
2019	\$112,865	\$9,206	\$122,070
2020	\$56,432	\$4,603	\$61,035
Average	\$197,513	\$16,110	\$213,623

Sources: RESI, REMI PI+

Figure 102: Title V Permits for GHG Sources—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$268,054	\$21,863	\$289,917
2012	\$282,162	\$23,014	\$305,176
2013	\$282,162	\$23,014	\$305,176
2014	\$268,054	\$21,863	\$289,917
2015	\$239,838	\$19,562	\$259,399
2016	\$225,729	\$18,411	\$244,141
2017	\$253,946	\$20,713	\$274,658
2018	\$253,946	\$20,713	\$274,658
2019	\$211,621	\$17,260	\$228,882
2020	\$239,838	\$19,562	\$259,399
Average	\$229,577	\$18,725	\$248,302

Sources: RESI, REMI PI+

Figure 103: BeSMART Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	499.6	467.2	966.9
2012	1,298.8	1,216.3	2,515.1
2013	1,181.9	1,106.5	2,288.5
2014	1,419.6	1,330.4	2,750.0
2015	3,722.3	3,500.2	7,222.5
2016	1,707.1	1,599.2	3,306.3
2017	1,653.0	1,549.1	3,202.0
2018	470.0	432.5	902.5
2019	-144.8	-146.6	-291.4
2020	357.8	331.1	689.0
Average	1,105.9	1,035.1	2,141.0

Sources: RESI, REMI PI+

Figure 104: BeSMART Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$25,647,660	\$24,004,440	\$49,652,100
2012	\$67,169,440	\$62,865,960	\$130,035,400
2013	\$62,125,032	\$58,144,743	\$120,269,775
2014	\$75,004,035	\$70,198,601	\$145,202,637
2015	\$196,605,786	\$184,009,448	\$380,615,234
2016	\$92,060,439	\$86,162,218	\$178,222,656
2017	\$88,623,936	\$82,945,888	\$171,569,824
2018	\$24,339,267	\$22,779,874	\$47,119,141
2019	-\$10,404,091	-\$9,737,511	-\$20,141,602
2020	\$16,236,687	\$15,196,419	\$31,433,105
Average	\$57,946,199	\$54,233,644	\$112,179,843

Sources: RESI, REMI PI+

Figure 105: BeSMART Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$10,634,636	\$9,953,285	\$20,587,921
2012	\$29,038,842	\$27,178,352	\$56,217,194
2013	\$28,904,850	\$27,052,945	\$55,957,794
2014	\$36,282,296	\$33,957,725	\$70,240,021
2015	\$94,143,227	\$88,111,564	\$182,254,791
2016	\$51,190,885	\$47,911,136	\$99,102,020
2017	\$50,796,790	\$47,542,290	\$98,339,081
2018	\$19,878,119	\$18,604,547	\$38,482,666
2019	\$614,787	\$575,398	\$1,190,186
2020	\$12,120,372	\$11,343,831	\$23,464,203
Average	\$30,327,709	\$28,384,643	\$58,712,352

Sources: RESI, REMI PI+

Figure 106: BeSMART Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	499.6	467.2	966.9
2012	1,298.8	1,216.3	2,515.1
2013	1,181.9	1,106.5	2,288.5
2014	2,534.7	2,379.4	4,914.2
2015	6,717.4	6,320.2	13,037.6
2016	3,113.3	2,918.7	6,032.0
2017	3,023.7	2,835.9	5,859.6
2018	895.9	827.2	1,723.1
2019	-215.7	-220.1	-435.8
2020	684.9	635.5	1,320.4
Average	1,794.0	1,680.6	3,474.7

Sources: RESI, REMI PI+

Figure 107: BeSMART Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$25,636,390	\$24,015,709	\$49,652,100
2012	\$67,139,926	\$62,895,474	\$130,035,400
2013	\$62,097,735	\$58,172,041	\$120,269,775
2014	\$133,082,332	\$124,669,133	\$257,751,465
2015	\$354,560,576	\$332,145,967	\$686,706,543
2016	\$168,062,532	\$157,437,956	\$325,500,488
2017	\$162,610,663	\$152,330,743	\$314,941,406
2018	\$47,049,946	\$44,075,543	\$91,125,488
2019	-\$15,693,820	-\$14,701,688	-\$30,395,508
2020	\$31,986,400	\$29,964,284	\$61,950,684
Average	\$94,230,244	\$88,273,197	\$182,503,440

Sources: RESI, REMI PI+

Figure 108: BeSMART Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$10,629,963	\$9,957,958	\$20,587,921
2012	\$29,026,082	\$27,191,111	\$56,217,194
2013	\$28,892,149	\$27,065,645	\$55,957,794
2014	\$62,304,543	\$58,365,775	\$120,670,319
2015	\$168,285,098	\$157,646,451	\$325,931,549
2016	\$92,301,641	\$86,466,517	\$178,768,158
2017	\$92,398,152	\$86,556,926	\$178,955,078
2018	\$37,266,913	\$34,910,974	\$72,177,887
2019	\$2,792,901	\$2,616,340	\$5,409,241
2020	\$23,619,514	\$22,126,336	\$45,745,850
Average	\$49,774,269	\$46,627,639	\$96,401,908

Sources: RESI, REMI PI+

Figure 109: BeSMART Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.1	0.1
2012	0.0	-0.1	-0.1
2013	0.2	0.2	0.5
2014	0.3	0.2	0.5
2015	0.3	0.2	0.5
2016	0.3	0.3	0.6
2017	0.2	0.2	0.5
2018	0.8	0.5	1.3
2019	1.0	0.8	1.8
2020	0.6	0.6	1.2
Average	0.3	0.3	0.6

Sources: RESI, REMI PI+

Figure 110: BeSMART Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$16,809	\$13,709	\$30,518
2014	\$33,618	\$27,418	\$61,035
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$67,235	\$54,835	\$122,070
2019	\$33,618	\$27,418	\$61,035
2020	\$33,618	\$27,418	\$61,035
Average	\$16,809	\$13,709	\$30,518

Sources: RESI, REMI PI+

Figure 111: BeSMART Status Quo—Operation Phase, Wages Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$2,101	-\$1,714	-\$3,815
2012	\$0	\$0	\$0
2013	\$4,202	\$3,427	\$7,629
2014	\$0	\$0	\$0
2015	\$10,505	\$8,568	\$19,073
2016	\$10,505	\$8,568	\$19,073
2017	\$8,404	\$6,854	\$15,259
2018	\$18,910	\$15,422	\$34,332
2019	\$27,314	\$22,277	\$49,591
2020	\$14,708	\$11,995	\$26,703
Average	\$8,404	\$6,854	\$15,259

Sources: RESI, REMI PI+

Figure 112: BeSMART Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.1	0.1
2012	0.0	0.0	0.0
2013	0.5	0.4	0.9
2014	0.5	0.4	1.0
2015	0.5	0.2	0.7
2016	0.5	0.6	1.2
2017	0.5	0.5	1.0
2018	1.1	1.0	2.1
2019	1.3	1.1	2.4
2020	1.1	1.0	2.1
Average	0.6	0.5	1.0

Sources: RESI, REMI PI+

Figure 113: BeSMART Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$16,298	\$14,220	\$30,518
2014	\$32,596	\$28,440	\$61,035
2015	\$0	\$0	\$0
2016	\$32,596	\$28,440	\$61,035
2017	\$32,596	\$28,440	\$61,035
2018	\$97,787	\$85,319	\$183,105
2019	\$65,191	\$56,879	\$122,070
2020	\$65,191	\$56,879	\$122,070
Average	\$31,114	\$27,147	\$58,261

Sources: RESI, REMI PI+

Figure 114: BeSMART Enhanced—Operation Phase, Wages Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$2,037	-\$1,777	-\$3,815
2012	\$0	\$0	\$0
2013	\$8,149	\$7,110	\$15,259
2014	\$8,149	\$7,110	\$15,259
2015	\$10,186	\$8,887	\$19,073
2016	\$16,298	\$14,220	\$30,518
2017	\$16,298	\$14,220	\$30,518
2018	\$28,521	\$24,885	\$53,406
2019	\$36,670	\$31,995	\$68,665
2020	\$30,558	\$26,662	\$57,220
Average	\$13,890	\$12,119	\$26,009

Sources: RESI, REMI PI+

Figure 115: Weatherization and Energy Efficiency for Low-Income Houses Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	348.3	337.1	685.4
2011	814.8	787.4	1,602.1
2012	911.7	878.9	1,790.5
2013	428.3	409.0	837.2
2014	754.2	725.1	1,479.3
2015	912.1	877.6	1,789.6
2016	916.0	880.6	1,796.6
2017	635.0	607.1	1,242.1
2018	110.5	98.1	208.6
2019	83.3	73.8	157.1
2020	72.9	64.7	137.6
Average	544.3	521.7	1,066.0

Sources: RESI, REMI PI+

Figure 116: Weatherization and Energy Efficiency for Low-Income Houses Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$7,665,990	\$7,348,658	\$15,014,648
2011	\$18,510,562	\$17,744,321	\$36,254,883
2012	\$21,642,400	\$20,746,516	\$42,388,916
2013	\$11,015,966	\$10,559,962	\$21,575,928
2014	\$18,198,936	\$17,445,595	\$35,644,531
2015	\$22,156,582	\$21,239,414	\$43,395,996
2016	\$22,624,020	\$21,687,503	\$44,311,523
2017	\$15,768,257	\$15,115,533	\$30,883,789
2018	\$1,994,404	\$1,911,846	\$3,906,250
2019	\$93,488	\$89,618	\$183,105
2020	-\$654,414	-\$627,324	-\$1,281,738
Average	\$12,637,836	\$12,114,695	\$24,752,530

Sources: RESI, REMI PI+

Figure 117: Weatherization and Energy Efficiency for Low-Income Houses Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$4,074,505	\$3,905,842	\$7,980,347
2011	\$10,046,031	\$9,630,177	\$19,676,208
2012	\$12,340,375	\$11,829,547	\$24,169,922
2013	\$7,239,453	\$6,939,777	\$14,179,230
2014	\$11,202,941	\$10,739,198	\$21,942,139
2015	\$13,787,486	\$13,216,756	\$27,004,242
2016	\$14,527,597	\$13,926,230	\$28,453,827
2017	\$10,903,002	\$10,451,674	\$21,354,675
2018	\$2,678,033	\$2,567,176	\$5,245,209
2019	\$880,342	\$843,901	\$1,724,243
2020	-\$185,028	-\$177,369	-\$362,396
Average	\$7,954,067	\$7,624,810	\$15,578,877

Sources: RESI, REMI PI+

Figure 118: Weatherization and Energy Efficiency for Low-Income Houses Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	348.3	337.1	685.4
2011	814.8	787.4	1,602.1
2012	911.7	878.9	1,790.5
2013	428.3	409.0	837.2
2014	1,483.2	1,432.0	2,915.2
2015	1,821.4	1,756.9	3,578.4
2016	1,837.5	1,769.8	3,607.3
2017	1,276.2	1,222.5	2,498.8
2018	222.2	200.0	422.2
2019	163.9	147.0	310.9
2020	137.8	124.1	261.9
Average	858.7	824.0	1,682.7

Sources: RESI, REMI PI+

**Figure 119: Weatherization and Energy Efficiency for Low-Income Houses Enhanced—
Investment Phase, Output Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$7,661,781	\$7,352,868	\$15,014,648
2011	\$18,500,397	\$17,754,486	\$36,254,883
2012	\$21,630,515	\$20,758,401	\$42,388,916
2013	\$11,009,917	\$10,566,011	\$21,575,928
2014	\$35,443,522	\$34,014,486	\$69,458,008
2015	\$44,911,739	\$43,100,957	\$88,012,695
2016	\$46,469,011	\$44,595,442	\$91,064,453
2017	\$32,858,450	\$31,533,640	\$64,392,090
2018	\$5,045,563	\$4,842,132	\$9,887,695
2019	\$1,027,800	\$986,360	\$2,014,160
2020	-\$809,782	-\$777,132	-\$1,586,914
Average	\$20,340,810	\$19,520,695	\$39,861,506

Sources: RESI, REMI PI+

**Figure 120: Weatherization and Energy Efficiency for Low-Income Houses Enhanced—
Investment Phase, Wage Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$4,072,268	\$3,908,079	\$7,980,347
2011	\$10,040,514	\$9,635,694	\$19,676,208
2012	\$12,333,598	\$11,836,324	\$24,169,922
2013	\$7,235,477	\$6,943,752	\$14,179,230
2014	\$20,657,220	\$19,824,348	\$40,481,567
2015	\$27,121,847	\$26,028,330	\$53,150,177
2016	\$29,356,533	\$28,172,916	\$57,529,449
2017	\$22,551,252	\$21,642,015	\$44,193,268
2018	\$6,266,075	\$6,013,435	\$12,279,510
2019	\$2,705,761	\$2,596,668	\$5,302,429
2020	\$537,259	\$515,597	\$1,052,856
Average	\$12,988,891	\$12,465,196	\$25,454,088

Sources: RESI, REMI PI+

**Figure 121: Weatherization and Energy Efficiency for Low-Income Houses Status Quo—
Operation Phase, Employment Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	1.7	1.9	3.6
2011	2.0	2.0	3.9
2012	1.4	1.4	2.8
2013	2.2	2.1	4.2
2014	1.7	1.6	3.3
2015	1.5	1.5	3.0
2016	1.1	1.2	2.3
2017	1.5	1.4	2.9
2018	1.8	1.8	3.6
2019	2.4	2.4	4.8
2020	1.8	1.9	3.7
Average	1.7	1.7	3.5

Sources: RESI, REMI PI+

**Figure 122: Weatherization and Energy Efficiency for Low-Income Houses Status Quo—
Operation Phase, Output Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$15,236	\$15,282	\$30,518
2011	\$15,236	\$15,282	\$30,518
2012	-\$15,236	-\$15,282	-\$30,518
2013	\$15,236	\$15,282	\$30,518
2014	\$0	\$0	\$0
2015	-\$30,472	-\$30,564	-\$61,035
2016	-\$30,472	-\$30,564	-\$61,035
2017	-\$30,472	-\$30,564	-\$61,035
2018	\$30,472	\$30,564	\$61,035
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	-\$2,770	-\$2,779	-\$5,549

Sources: RESI, REMI PI+

**Figure 123: Weatherization and Energy Efficiency for Low-Income Houses Status Quo—
Operation Phase, Wage Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$24,758	\$24,833	\$49,591
2011	\$26,663	\$26,743	\$53,406
2012	\$19,045	\$19,102	\$38,147
2013	\$30,472	\$30,564	\$61,035
2014	\$24,758	\$24,833	\$49,591
2015	\$24,758	\$24,833	\$49,591
2016	\$28,567	\$28,653	\$57,220
2017	\$24,758	\$24,833	\$49,591
2018	\$36,185	\$36,294	\$72,479
2019	\$47,612	\$47,755	\$95,367
2020	\$36,185	\$36,294	\$72,479
Average	\$29,433	\$29,522	\$58,954

Sources: RESI, REMI PI+

**Figure 124: Weatherization and Energy Efficiency for Low-Income Houses Enhanced—
Operation Phase, Employment Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	1.7	1.9	3.6
2011	2.0	2.0	3.9
2012	1.4	1.4	2.8
2013	2.2	2.1	4.2
2014	3.5	3.5	7.1
2015	3.2	3.1	6.2
2016	2.5	2.6	5.1
2017	2.9	2.7	5.6
2018	3.0	2.8	5.7
2019	3.1	3.1	6.2
2020	3.1	2.8	5.9
Average	2.6	2.5	5.1

Sources: RESI, REMI PI+

**Figure 125: Weatherization and Energy Efficiency for Low-Income Houses Enhanced—
Operation Phase, Output Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$15,391	\$15,127	\$30,518
2011	\$15,391	\$15,127	\$30,518
2012	-\$15,391	-\$15,127	-\$30,518
2013	\$15,391	\$15,127	\$30,518
2014	\$0	\$0	\$0
2015	-\$30,782	-\$30,253	-\$61,035
2016	-\$61,564	-\$60,506	-\$122,070
2017	-\$61,564	-\$60,506	-\$122,070
2018	-\$30,782	-\$30,253	-\$61,035
2019	-\$61,564	-\$60,506	-\$122,070
2020	-\$61,564	-\$60,506	-\$122,070
Average	-\$25,185	-\$24,753	-\$49,938

Sources: RESI, REMI PI+

**Figure 126: Weatherization and Energy Efficiency for Low-Income Houses Enhanced—
Operation Phase, Wage Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$25,010	\$24,581	\$49,591
2011	\$26,934	\$26,471	\$53,406
2012	\$19,239	\$18,908	\$38,147
2013	\$30,782	\$30,253	\$61,035
2014	\$59,640	\$58,615	\$118,256
2015	\$50,021	\$49,161	\$99,182
2016	\$42,325	\$41,598	\$83,923
2017	\$46,173	\$45,380	\$91,553
2018	\$50,021	\$49,161	\$99,182
2019	\$55,793	\$54,834	\$110,626
2020	\$53,869	\$52,943	\$106,812
Average	\$41,801	\$41,082	\$82,883

Sources: RESI, REMI PI+

Figure 127: GHG Prevention of Significant Deterioration Permitting Program—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	1.0	0.4	1.5
2013	0.8	0.4	1.3
2014	0.8	0.2	1.0
2015	0.8	0.3	1.0
2016	1.0	0.5	1.5
2017	0.8	0.2	1.0
2018	1.0	0.5	1.5
2019	0.5	0.1	0.6
2020	0.5	0.0	0.5
Average	0.7	0.2	0.9

Sources: RESI, REMI PI+

Figure 128: GHG Prevention of Significant Deterioration Permitting Program—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$88,984	\$33,086	\$122,070
2013	\$66,738	\$24,815	\$91,553
2014	\$88,984	\$33,086	\$122,070
2015	\$44,492	\$16,543	\$61,035
2016	\$88,984	\$33,086	\$122,070
2017	\$88,984	\$33,086	\$122,070
2018	\$44,492	\$16,543	\$61,035
2019	\$88,984	\$33,086	\$122,070
2020	\$44,492	\$16,543	\$61,035
Average	\$58,649	\$21,807	\$80,455

Sources: RESI, REMI PI+

Figure 129: GHG Prevention of Significant Deterioration Permitting Program—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$44,492	\$16,543	\$61,035
2013	\$33,369	\$12,407	\$45,776
2014	\$33,369	\$12,407	\$45,776
2015	\$33,369	\$12,407	\$45,776
2016	\$55,615	\$20,679	\$76,294
2017	\$44,492	\$16,543	\$61,035
2018	\$44,492	\$16,543	\$61,035
2019	\$44,492	\$16,543	\$61,035
2020	\$33,369	\$12,407	\$45,776
Average	\$33,369	\$12,407	\$45,776

Sources: RESI, REMI PI+

Figure 130: GHG Prevention of Significant Deterioration Permitting Program—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	2.0	0.7	2.7
2013	1.7	0.7	2.4
2014	1.7	0.4	2.1
2015	0.9	-0.3	0.6
2016	0.8	-0.4	0.5
2017	0.9	-0.5	0.4
2018	0.8	-0.3	0.5
2019	0.5	-0.5	0.0
2020	0.5	-0.6	-0.1
Average	0.9	-0.1	0.8

Sources: RESI, REMI PI+

Figure 131: GHG Prevention of Significant Deterioration Permitting Program—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$196,503	-\$13,398	\$183,105
2013	\$163,753	-\$11,165	\$152,588
2014	\$163,753	-\$11,165	\$152,588
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$65,501	-\$4,466	\$61,035
2020	\$0	\$0	\$0
Average	\$53,592	-\$3,654	\$49,938

Sources: RESI, REMI PI+

Figure 132: GHG Prevention of Significant Deterioration Permitting Program—Operation Phase, Wages Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$114,627	-\$7,815	\$106,812
2013	\$114,627	-\$7,815	\$106,812
2014	\$81,876	-\$5,582	\$76,294
2015	\$81,876	-\$5,582	\$76,294
2016	\$81,876	-\$5,582	\$76,294
2017	\$65,501	-\$4,466	\$61,035
2018	\$81,876	-\$5,582	\$76,294
2019	\$81,876	-\$5,582	\$76,294
2020	\$65,501	-\$4,466	\$61,035
Average	\$69,967	-\$4,770	\$65,197

Sources: RESI, REMI PI+

A.2 Transportation

Figure 133: Transportation Technology Initiatives, Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	247.3	270.3	517.6
2011	245.4	302.6	548.0
2012	240.2	315.2	555.4
2013	235.1	312.6	547.7
2014	230.0	302.7	532.7
2015	362.2	375.4	737.6
2016	355.4	371.9	727.3
2017	349.1	362.6	711.7
2018	343.2	349.3	692.5
2019	336.8	337.0	673.8
2020	330.2	325.0	655.2
Average	297.7	329.5	627.2

Sources: RESI, REMI PI+

Figure 134: Transportation Technology Initiatives, Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$33,861,075	\$31,984,775	\$65,845,850
2011	\$33,869,600	\$36,265,900	\$70,135,500
2012	\$33,870,800	\$38,437,900	\$72,308,700
2013	\$33,868,450	\$38,619,300	\$72,487,750
2014	\$33,868,600	\$37,779,775	\$71,648,375
2015	\$48,810,475	\$48,331,950	\$97,142,425
2016	\$48,811,675	\$48,358,400	\$97,170,075
2017	\$48,813,900	\$47,493,075	\$96,306,975
2018	\$48,817,350	\$45,980,150	\$94,797,500
2019	\$48,816,250	\$44,617,375	\$93,433,625
2020	\$48,815,625	\$43,313,675	\$92,129,300
Average	\$42,020,346	\$41,925,661	\$83,946,007

Sources: RESI, REMI PI+

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Figure 135: Transportation Technology Initiatives, Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$15,278,276	\$10,018,324	\$25,296,600
2011	\$15,816,456	\$12,989,119	\$28,805,575
2012	\$16,146,135	\$15,071,190	\$31,217,325
2013	\$16,457,136	\$16,177,789	\$32,634,925
2014	\$16,745,708	\$16,607,167	\$33,352,875
2015	\$24,780,045	\$19,577,605	\$44,357,650
2016	\$25,280,921	\$20,778,354	\$46,059,275
2017	\$25,814,223	\$21,284,927	\$47,099,150
2018	\$26,392,854	\$21,238,821	\$47,631,675
2019	\$26,932,728	\$21,086,597	\$48,019,325
2020	\$27,447,197	\$20,808,453	\$48,255,650
Average	\$21,553,789	\$17,785,304	\$39,339,093

Sources: RESI, REMI PI+

Figure 136: Transportation Technology Initiatives, Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	272.0	297.4	569.4
2011	269.9	332.8	602.8
2012	264.2	346.7	610.9
2013	258.6	343.9	602.5
2014	253.0	333.0	586.0
2015	398.4	413.0	811.3
2016	390.9	409.1	800.0
2017	384.0	398.9	782.8
2018	377.5	384.2	761.7
2019	370.5	370.7	741.1
2020	363.2	357.5	720.7
Average	327.5	362.5	689.9

Sources: RESI, REMI PI+

Figure 137: Transportation Technology Initiatives, Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$37,247,183	\$35,183,253	\$72,430,435
2011	\$37,256,560	\$39,892,490	\$77,149,050
2012	\$37,257,880	\$42,281,690	\$79,539,570
2013	\$37,255,295	\$42,481,230	\$79,736,525
2014	\$37,255,460	\$41,557,753	\$78,813,213
2015	\$53,691,523	\$53,165,145	\$106,856,668
2016	\$53,692,843	\$53,194,240	\$106,887,083
2017	\$53,695,290	\$52,242,383	\$105,937,673
2018	\$53,699,085	\$50,578,165	\$104,277,250
2019	\$53,697,875	\$49,079,113	\$102,776,988
2020	\$53,697,188	\$47,645,043	\$101,342,230
Average	\$46,222,380	\$46,118,228	\$92,340,608

Sources: RESI, REMI PI+

Figure 138: Transportation Technology Initiatives, Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$16,806,103	\$11,020,157	\$27,826,260
2011	\$17,398,102	\$14,288,031	\$31,686,133
2012	\$17,760,748	\$16,578,309	\$34,339,058
2013	\$18,102,850	\$17,795,568	\$35,898,418
2014	\$18,420,279	\$18,267,883	\$36,688,163
2015	\$27,258,050	\$21,535,365	\$48,793,415
2016	\$27,809,013	\$22,856,190	\$50,665,203
2017	\$28,395,645	\$23,413,420	\$51,809,065
2018	\$29,032,139	\$23,362,704	\$52,394,843
2019	\$29,626,001	\$23,195,257	\$52,821,258
2020	\$30,191,916	\$22,889,299	\$53,081,215
Average	\$23,709,168	\$19,563,835	\$43,273,003

Sources: RESI, REMI PI+

Figure 139: Transportation Technology Initiatives, Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	236.2	221.0	457.2
2013	243.4	227.5	470.9
2014	236.9	221.4	458.3
2015	224.3	211.0	434.9
2016	212.8	200.9	413.6
2017	203.0	191.5	394.6
2018	200.9	189.7	390.2
2019	197.6	186.8	384.8
2020	193.3	182.5	375.8
Average	177.1	166.6	343.7

Sources: RESI, REMI PI+

Figure 140: Transportation Technology Initiatives, Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$12,399,804	\$11,660,256	\$24,060,060
2013	\$12,682,904	\$11,926,472	\$24,609,377
2014	\$12,229,942	\$11,500,524	\$23,730,469
2015	\$11,437,261	\$10,755,122	\$22,192,384
2016	\$10,644,581	\$10,009,717	\$20,654,298
2017	\$9,965,138	\$9,370,800	\$19,335,938
2018	\$9,851,900	\$9,264,312	\$19,116,212
2019	\$9,398,938	\$8,838,367	\$18,237,305
2020	\$8,945,978	\$8,412,422	\$17,358,397
Average	\$8,868,768	\$8,339,818	\$17,208,585

Sources: RESI, REMI PI+

Figure 141: Transportation Technology Initiatives, Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$5,336,446	\$5,018,170	\$10,354,615
2013	\$5,952,190	\$5,597,190	\$11,549,376
2014	\$6,235,290	\$5,863,403	\$12,098,693
2015	\$6,298,988	\$5,923,303	\$12,222,292
2016	\$6,298,988	\$5,923,303	\$12,222,292
2017	\$6,277,756	\$5,903,338	\$12,181,090
2018	\$6,383,916	\$6,003,169	\$12,387,085
2019	\$6,490,080	\$6,102,997	\$12,593,077
2020	\$6,553,778	\$6,162,898	\$12,716,676
Average	\$5,075,221	\$4,772,525	\$9,847,745

Sources: RESI, REMI PI+

Figure 142: Transportation Technology Initiatives, Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	259.8	243.1	502.9
2013	267.7	250.3	518.0
2014	260.6	243.5	504.1
2015	246.7	232.1	478.4
2016	234.0	221.0	455.0
2017	223.3	210.7	434.0
2018	221.0	208.7	429.3
2019	217.4	205.5	423.3
2020	212.7	200.8	413.4
Average	238.1	224.0	462.0

Sources: RESI, REMI PI+

Figure 143: Transportation Technology Initiatives, Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$13,639,784	\$12,826,282	\$26,466,066
2013	\$13,951,195	\$13,119,120	\$27,070,314
2014	\$13,452,936	\$12,650,576	\$26,103,516
2015	\$12,580,987	\$11,830,635	\$24,411,622
2016	\$11,709,039	\$11,010,689	\$22,719,728
2017	\$10,961,652	\$10,307,880	\$21,269,532
2018	\$10,837,090	\$10,190,743	\$21,027,834
2019	\$10,338,831	\$9,722,204	\$20,061,035
2020	\$9,840,576	\$9,253,665	\$19,094,237
Average	\$11,923,566	\$11,212,421	\$23,135,987

Sources: RESI, REMI PI+

Figure 144: Transportation Technology Initiatives, Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$5,870,090	\$5,519,987	\$11,390,077
2013	\$6,547,409	\$6,156,909	\$12,704,314
2014	\$6,858,819	\$6,449,743	\$13,308,562
2015	\$6,928,887	\$6,515,634	\$13,444,521
2016	\$6,928,887	\$6,515,634	\$13,444,521
2017	\$6,905,531	\$6,493,671	\$13,399,199
2018	\$7,022,308	\$6,603,486	\$13,625,794
2019	\$7,139,088	\$6,713,297	\$13,852,385
2020	\$7,209,156	\$6,779,187	\$13,988,344
Average	\$6,823,353	\$6,416,394	\$13,239,746

Sources: RESI, REMI PI+

Figure 145: Public Transportation Initiatives, Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	533.2	335.5	868.7
2011	529.5	374.1	903.6
2012	518.8	386.7	905.5
2013	508.3	379.4	887.6
2014	497.8	363.2	861.0
2015	459.7	356.9	816.6
2016	451.2	338.6	789.8
2017	443.3	321.3	764.6
2018	435.9	305.2	741.1
2019	427.9	292.9	720.8
2020	419.6	282.6	702.2
Average	475.0	339.7	814.7

Sources: RESI, REMI PI+

Figure 146: Public Transportation Initiatives, Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$63,794,900	\$41,749,550	\$105,544,450
2011	\$63,797,325	\$46,893,175	\$110,690,500
2012	\$63,797,550	\$49,211,350	\$113,008,900
2013	\$63,796,275	\$48,909,675	\$112,705,950
2014	\$63,794,950	\$47,369,175	\$111,164,125
2015	\$59,418,525	\$46,744,875	\$106,163,400
2016	\$59,416,700	\$44,675,425	\$104,092,125
2017	\$59,414,850	\$42,625,600	\$102,040,450
2018	\$59,413,100	\$40,631,975	\$100,045,075
2019	\$59,410,375	\$39,210,475	\$98,620,850
2020	\$59,407,850	\$38,070,500	\$97,478,350
Average	\$61,405,673	\$44,190,161	\$105,595,834

Sources: RESI, REMI PI+

Figure 147: Public Transportation Initiatives, Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$28,565,873	\$11,368,277	\$39,934,150
2011	\$29,685,166	\$15,567,484	\$45,252,650
2012	\$30,422,021	\$18,600,379	\$49,022,400
2013	\$31,127,513	\$20,256,712	\$51,384,225
2014	\$31,788,852	\$20,958,623	\$52,747,475
2015	\$30,265,224	\$21,627,101	\$51,892,325
2016	\$30,900,947	\$21,267,028	\$52,167,975
2017	\$31,576,198	\$20,697,052	\$52,273,250
2018	\$32,306,848	\$19,969,152	\$52,276,000
2019	\$32,993,083	\$19,443,167	\$52,436,250
2020	\$33,648,448	\$18,994,152	\$52,642,600
Average	\$31,207,288	\$18,977,193	\$50,184,482

Sources: RESI, REMI PI+

Figure 148: Public Transportation Initiatives, Enhanced—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1,066.4	671.1	1,737.5
2011	1,059.0	748.2	1,807.2
2012	1,037.7	773.3	1,811.0
2013	1,016.6	758.7	1,775.3
2014	995.5	726.5	1,722.0
2015	919.4	713.8	1,633.2
2016	902.4	677.2	1,579.6
2017	886.6	642.7	1,529.2
2018	871.8	610.3	1,482.1
2019	855.8	585.9	1,441.7
2020	839.2	565.3	1,404.5
Average	950.0	679.4	1,629.4

Sources: RESI, REMI PI+

Figure 149: Public Transportation Initiatives, Enhanced—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$127,589,800	\$83,499,100	\$211,088,900
2011	\$127,594,650	\$93,786,350	\$221,381,000
2012	\$127,595,100	\$98,422,700	\$226,017,800
2013	\$127,592,550	\$97,819,350	\$225,411,900
2014	\$127,589,900	\$94,738,350	\$222,328,250
2015	\$118,837,050	\$93,489,750	\$212,326,800
2016	\$118,833,400	\$89,350,850	\$208,184,250
2017	\$118,829,700	\$85,251,200	\$204,080,900
2018	\$118,826,200	\$81,263,950	\$200,090,150
2019	\$118,820,750	\$78,420,950	\$197,241,700
2020	\$118,815,700	\$76,141,000	\$194,956,700
Average	\$118,827,133	\$83,986,283	\$211,191,668

Sources: RESI, REMI PI+

Figure 150: Public Transportation Initiatives, Enhanced—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$57,131,746	\$22,736,554	\$79,868,300
2011	\$59,370,332	\$31,134,968	\$90,505,300
2012	\$60,844,041	\$37,200,759	\$98,044,800
2013	\$62,255,026	\$40,513,424	\$102,768,450
2014	\$63,577,703	\$41,917,247	\$105,494,950
2015	\$60,530,447	\$43,254,203	\$103,784,650
2016	\$61,801,894	\$42,534,056	\$104,335,950
2017	\$63,152,397	\$41,394,103	\$104,546,500
2018	\$64,613,695	\$39,938,305	\$104,552,000
2019	\$65,986,166	\$38,886,334	\$104,872,500
2020	\$67,296,897	\$37,988,303	\$105,285,200
Average	\$63,896,916	\$40,665,884	\$100,368,964

Sources: RESI, REMI PI+

Figure 151: Public Transportation Initiatives, Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	26.7	26.1	52.9
2018	56.8	55.2	112.3
2019	85.5	83.0	168.5
2020	113.9	110.7	224.7
Average	56.6	55.0	139.6

Sources: RESI, REMI PI+

Figure 152: Public Transportation Initiatives, Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$489,599	\$477,198	\$966,796
2018	\$1,101,599	\$1,073,695	\$2,175,293
2019	\$1,713,599	\$1,670,191	\$3,383,788
2020	\$2,203,197	\$2,147,387	\$4,350,587
Average	\$1,101,599	\$1,073,694	\$2,719,116

Sources: RESI, REMI PI+

Figure 153: Public Transportation Initiatives, Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$309,824	\$301,976	\$611,800
2018	\$734,400	\$715,796	\$1,450,196
2019	\$1,197,225	\$1,166,897	\$2,364,120
2020	\$1,705,948	\$1,662,735	\$3,368,683
Average	\$789,479	\$769,481	\$1,948,700

Sources: RESI, REMI PI+

Figure 154: Public Transportation Initiatives, Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	53.5	52.3	105.7
2018	113.7	110.5	224.5
2019	171.1	165.9	337.0
2020	227.7	221.4	449.5
Average	113.2	110.0	279.2

Sources: RESI, REMI PI+

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Figure 155: Public Transportation Initiatives, Enhanced—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$979,197	\$954,396	\$1,933,593
2018	\$2,203,197	\$2,147,389	\$4,350,587
2019	\$3,427,198	\$3,340,383	\$6,767,577
2020	\$4,406,395	\$4,294,774	\$8,701,173
Average	\$2,203,197	\$2,147,388	\$5,438,232

Sources: RESI, REMI PI+

Figure 156: Public Transportation Initiatives, Enhanced—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$619,649	\$603,951	\$1,223,600
2018	\$1,468,800	\$1,431,591	\$2,900,391
2019	\$2,394,450	\$2,333,794	\$4,728,240
2020	\$3,411,896	\$3,325,469	\$6,737,366
Average	\$1,578,959	\$1,538,961	\$3,897,399

Sources: RESI, REMI PI+

Figure 157: Intercity Transportation Initiatives Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	76.9	48.3	125.2
2011	76.4	53.8	130.2
2012	74.9	55.6	130.5
2013	73.3	54.6	127.9
2014	71.8	52.2	124.1
2015	73.2	53.0	126.2
2016	71.8	50.5	122.3
2017	70.5	48.0	118.6
2018	69.4	45.7	115.0
2019	68.1	43.8	111.9
2020	57.4	34.0	91.4
Average	71.2	49.0	120.3

Sources: RESI, REMI PI+

Figure 158: Intercity Transportation Initiatives Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$9,184,500	\$6,006,750	\$15,191,250
2011	\$9,184,750	\$6,748,250	\$15,933,000
2012	\$9,184,750	\$7,083,000	\$16,267,750
2013	\$9,184,750	\$7,039,250	\$16,224,000
2014	\$9,184,500	\$6,816,750	\$16,001,250
2015	\$9,968,500	\$6,916,750	\$16,885,250
2016	\$9,968,750	\$6,641,000	\$16,609,750
2017	\$9,969,750	\$6,347,250	\$16,317,000
2018	\$9,970,500	\$6,052,750	\$16,023,250
2019	\$9,970,250	\$5,835,500	\$15,805,750
2020	\$8,047,000	\$4,549,250	\$12,596,250
Average	\$9,438,000	\$6,366,955	\$15,804,955

Sources: RESI, REMI PI+

Figure 159: Intercity Transportation Initiatives Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$4,112,060	\$1,632,440	\$5,744,500
2011	\$4,273,508	\$2,236,742	\$6,510,250
2012	\$4,379,894	\$2,673,356	\$7,053,250
2013	\$4,481,803	\$2,911,447	\$7,393,250
2014	\$4,577,343	\$3,011,907	\$7,589,250
2015	\$5,056,758	\$3,221,242	\$8,278,000
2016	\$5,158,044	\$3,236,956	\$8,395,000
2017	\$5,265,911	\$3,206,089	\$8,472,000
2018	\$5,383,036	\$3,140,464	\$8,523,500
2019	\$5,492,137	\$3,097,113	\$8,589,250
2020	\$4,565,525	\$2,515,225	\$7,080,750
Average	\$4,795,093	\$2,807,544	\$7,602,636

Sources: RESI, REMI PI+

Figure 160: Intercity Transportation Initiatives Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	96.2	60.3	156.5
2011	95.5	67.3	162.8
2012	93.6	69.5	163.1
2013	91.7	68.2	159.9
2014	89.8	65.3	155.1
2015	91.5	66.2	157.7
2016	89.8	63.1	152.9
2017	88.2	60.0	148.2
2018	86.7	57.1	143.8
2019	85.1	54.8	139.8
2020	71.7	42.5	114.2
Average	89.1	61.3	150.4

Sources: RESI, REMI PI+

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Figure 161: Intercity Transportation Initiatives Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$11,480,625	\$7,508,438	\$18,989,063
2011	\$11,480,938	\$8,435,313	\$19,916,250
2012	\$11,480,938	\$8,853,750	\$20,334,688
2013	\$11,480,938	\$8,799,063	\$20,280,000
2014	\$11,480,625	\$8,520,938	\$20,001,563
2015	\$12,460,625	\$8,645,938	\$21,106,563
2016	\$12,460,938	\$8,301,250	\$20,762,188
2017	\$12,462,188	\$7,934,063	\$20,396,250
2018	\$12,463,125	\$7,565,938	\$20,029,063
2019	\$12,462,813	\$7,294,375	\$19,757,188
2020	\$10,058,750	\$5,686,563	\$15,745,313
Average	\$11,797,500	\$7,958,693	\$19,756,193

Sources: RESI, REMI PI+

Figure 162: Intercity Transportation Initiatives Enhancement —Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,140,075	\$2,040,550	\$7,180,625
2011	\$5,341,885	\$2,795,928	\$8,137,813
2012	\$5,474,868	\$3,341,695	\$8,816,563
2013	\$5,602,254	\$3,639,309	\$9,241,563
2014	\$5,721,679	\$3,764,883	\$9,486,563
2015	\$6,320,947	\$4,026,553	\$10,347,500
2016	\$6,447,554	\$4,046,196	\$10,493,750
2017	\$6,582,389	\$4,007,611	\$10,590,000
2018	\$6,728,795	\$3,925,580	\$10,654,375
2019	\$6,865,172	\$3,871,391	\$10,736,563
2020	\$5,706,907	\$3,144,031	\$8,850,938
Average	\$5,993,866	\$3,509,430	\$9,503,295

Sources: RESI, REMI PI+

Figure 163: Intercity Transportation Initiatives Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	4.1	3.8	7.9
2013	4.9	4.5	9.4
2014	4.1	4.0	8.1
2015	4.5	4.3	8.8
2016	4.1	4.1	8.3
2017	4.9	4.9	9.7
2018	5.0	5.0	10.1
2019	5.4	5.2	10.6
2020	5.2	4.9	10.1
Average	4.7	4.5	9.2

Sources: RESI, REMI PI+

Figure 164: Intercity Transportation Initiatives Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$56,059	\$53,804	\$109,863
2013	\$84,089	\$80,707	\$164,795
2014	\$56,059	\$53,804	\$109,863
2015	\$56,059	\$53,804	\$109,863
2016	\$56,059	\$53,804	\$109,863
2017	\$112,117	\$107,609	\$219,726
2018	\$168,176	\$161,413	\$329,589
2019	\$112,117	\$107,609	\$219,726
2020	\$112,117	\$107,609	\$219,726
Average	\$90,317	\$86,685	\$177,002

Sources: RESI, REMI PI+

Figure 165: Intercity Transportation Initiatives Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$49,052	\$47,079	\$96,131
2013	\$66,569	\$63,893	\$130,462
2014	\$66,569	\$63,893	\$130,462
2015	\$80,584	\$77,344	\$157,928
2016	\$84,089	\$80,707	\$164,795
2017	\$94,599	\$90,796	\$185,395
2018	\$115,621	\$110,972	\$226,593
2019	\$126,131	\$121,061	\$247,192
2020	\$105,109	\$100,883	\$205,994
Average	\$87,592	\$84,070	\$171,661

Sources: RESI, REMI PI+

Figure 166: Intercity Transportation Initiatives Enhanced—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	5.2	4.7	9.9
2013	6.1	5.6	11.7
2014	5.2	5.0	10.1
2015	5.6	5.4	11.0
2016	5.2	5.2	10.4
2017	6.1	6.1	12.2
2018	6.3	6.3	12.6
2019	6.8	6.5	13.3
2020	6.5	6.1	12.6
Average	5.9	5.7	11.5

Sources: RESI, REMI PI+

Figure 167: Intercity Transportation Initiatives Enhanced —Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$70,074	\$67,255	\$137,329
2013	\$105,111	\$100,883	\$205,994
2014	\$70,074	\$67,255	\$137,329
2015	\$70,074	\$67,255	\$137,329
2016	\$70,074	\$67,255	\$137,329
2017	\$140,146	\$134,512	\$274,658
2018	\$210,220	\$201,767	\$411,986
2019	\$140,146	\$134,512	\$274,658
2020	\$140,146	\$134,512	\$274,658
Average	\$112,896	\$108,356	\$221,252

Sources: RESI, REMI PI+

Figure 168: Intercity Transportation Initiatives Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$61,315	\$58,849	\$120,164
2013	\$83,212	\$79,866	\$163,078
2014	\$83,212	\$79,866	\$163,078
2015	\$100,730	\$96,680	\$197,411
2016	\$105,111	\$100,883	\$205,994
2017	\$118,249	\$113,495	\$231,743
2018	\$144,527	\$138,715	\$283,241
2019	\$157,664	\$151,326	\$308,990
2020	\$131,387	\$126,104	\$257,492
Average	\$109,490	\$105,087	\$214,577

Sources: RESI, REMI PI+

Figure 169: Pricing Initiatives Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 170: Pricing Initiatives Status Quo —Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 171: Pricing Initiatives Status Quo —Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 172: Pricing Initiatives Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1,080.7	793.9	1,874.6
2011	1,073.2	886.4	1,959.6
2012	1,051.6	918.3	1,969.9
2013	1,030.2	904.1	1,934.3
2014	1,008.8	868.7	1,877.5
2015	79.6	171.7	251.4
2016	78.2	51.3	129.5
2017	76.8	-16.4	60.4
2018	75.5	-43.3	32.2
2019	74.1	-48.9	25.3
2020	72.7	-41.2	31.5
Average	518.3	404.1	922.4

Sources: RESI, REMI PI+

Figure 173: Pricing Initiatives Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$129,229,750	\$97,631,250	\$226,861,000
2011	\$129,234,250	\$109,969,250	\$239,203,500
2012	\$129,234,250	\$115,762,500	\$244,996,750
2013	\$129,231,250	\$115,448,250	\$244,679,500
2014	\$129,228,250	\$112,182,500	\$241,410,750
2015	\$10,224,750	\$20,217,250	\$30,442,000
2016	\$10,224,250	\$3,404,250	\$13,628,500
2017	\$10,223,750	-\$6,357,500	\$3,866,250
2018	\$10,223,750	-\$10,483,250	-\$259,500
2019	\$10,223,250	-\$11,493,500	-\$1,270,250
2020	\$10,222,750	-\$10,523,750	-\$301,000
Average	\$64,318,205	\$48,705,205	\$113,023,409

Sources: RESI, REMI PI+

Figure 174: Pricing Initiatives Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$57,863,600	\$27,404,650	\$85,268,250
2011	\$60,131,294	\$36,831,456	\$96,962,750
2012	\$61,624,275	\$43,523,475	\$105,147,750
2013	\$63,053,719	\$47,069,531	\$110,123,250
2014	\$64,393,657	\$48,449,343	\$112,843,000
2015	\$5,210,620	\$21,714,630	\$26,925,250
2016	\$5,320,765	\$9,653,985	\$14,974,750
2017	\$5,437,748	\$1,368,252	\$6,806,000
2018	\$5,564,267	-\$3,702,767	\$1,861,500
2019	\$5,683,229	-\$6,607,729	-\$924,500
2020	\$5,796,890	-\$7,859,890	-\$2,063,000
Average	\$30,916,370	\$19,804,085	\$50,720,455

Sources: RESI, REMI PI+

Figure 175: Pricing Initiatives Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 176: Pricing Initiatives Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 177: Pricing Initiatives Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 178: Pricing Initiatives Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	190.3	185.3	375.6
2013	194.0	188.7	382.7
2014	195.4	189.9	385.4
2015	194.9	189.5	384.4
2016	193.1	187.9	381.1
2017	192.4	187.0	379.4
2018	191.4	186.3	377.7
2019	190.2	185.1	375.3
2020	189.3	184.3	373.5
Average	157.4	153.1	379.4

Sources: RESI, REMI PI+

Figure 179: Pricing Initiatives Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$3,675,466	\$3,575,510	\$7,250,977
2013	\$3,849,494	\$3,744,805	\$7,594,299
2014	\$3,884,300	\$3,778,664	\$7,662,964
2015	\$3,772,922	\$3,670,316	\$7,443,237
2016	\$3,591,933	\$3,494,249	\$7,086,182
2017	\$3,452,711	\$3,358,813	\$6,811,524
2018	\$3,327,411	\$3,236,920	\$6,564,331
2019	\$3,146,422	\$3,060,854	\$6,207,275
2020	\$3,021,122	\$2,938,961	\$5,960,083
Average	\$3,524,642	\$3,428,788	\$6,953,430

Sources: RESI, REMI PI+

Figure 180: Pricing Initiatives Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$2,253,659	\$2,192,370	\$4,446,030
2013	\$2,675,677	\$2,602,911	\$5,278,587
2014	\$2,987,186	\$2,905,949	\$5,893,135
2015	\$3,196,020	\$3,109,103	\$6,305,122
2016	\$3,332,632	\$3,241,999	\$6,574,631
2017	\$3,447,490	\$3,353,734	\$6,801,224
2018	\$3,531,893	\$3,435,842	\$6,967,735
2019	\$3,601,504	\$3,503,560	\$7,105,064
2020	\$3,672,856	\$3,572,971	\$7,245,827
Average	\$2,608,993	\$2,538,040	\$6,290,817

Sources: RESI, REMI PI+

Figure 181: Bike and Pedestrian Initiatives Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	181.5	166.2	347.4
2011	296.2	272.8	568.9
2012	967.4	902.7	1,870.4
2013	680.2	637.2	1,317.2
2014	634.5	594.7	1,229.2
2015	609.1	572.0	1,181.2
2016	584.3	549.5	1,133.8
2017	568.4	534.8	1,103.2
2018	556.2	523.8	1,079.8
2019	544.0	512.6	1,056.6
2020	535.9	505.3	1,041.1
Average	559.8	524.7	1,084.4

Sources: RESI, REMI PI+

Figure 182: Bike and Pedestrian Initiatives Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$31,260,263	\$29,303,180	\$60,563,443
2011	\$47,156,603	\$44,204,308	\$91,360,906
2012	\$146,793,941	\$137,603,729	\$284,397,672
2013	\$99,941,572	\$93,684,614	\$193,626,186
2014	\$35,611,830	\$33,382,310	\$68,994,140
2015	\$33,853,921	\$31,734,457	\$65,588,378
2016	\$32,209,427	\$30,192,917	\$62,402,344
2017	\$31,018,585	\$29,076,629	\$60,095,214
2018	\$30,111,277	\$28,226,126	\$58,337,402
2019	\$29,203,969	\$27,375,620	\$56,579,589
2020	\$28,636,902	\$26,844,055	\$55,480,957
Average	\$49,618,026	\$46,511,632	\$96,129,658

Sources: RESI, REMI PI+

Figure 183: Bike and Pedestrian Initiatives Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,170,552	\$4,846,844	\$10,017,395
2011	\$7,649,783	\$7,170,860	\$14,820,645
2012	\$23,867,179	\$22,372,946	\$46,240,126
2013	\$17,895,813	\$16,775,424	\$34,671,237
2014	\$17,589,721	\$16,488,495	\$34,078,217
2015	\$17,685,414	\$16,578,198	\$34,263,610
2016	\$17,685,414	\$16,578,198	\$34,263,610
2017	\$17,777,561	\$16,664,576	\$34,442,138
2018	\$17,880,343	\$16,760,923	\$34,641,266
2019	\$18,004,388	\$16,877,203	\$34,881,592
2020	\$18,234,760	\$17,093,151	\$35,327,911
Average	\$16,312,812	\$15,291,529	\$31,604,341

Sources: RESI, REMI PI+

Figure 184: Bike and Pedestrian Initiatives Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	181.5	166.2	347.4
2011	296.2	272.8	568.9
2012	967.4	902.7	1,870.4
2013	680.2	637.2	1,317.2
2014	654.7	613.6	1,268.3
2015	1,616.7	1,518.3	3,135.0
2016	1,554.9	1,462.5	3,017.4
2017	1,509.6	1,420.5	2,930.1
2018	1,472.4	1,386.9	2,859.3
2019	1,437.9	1,355.7	2,793.6
2020	1,413.9	1,334.1	2,747.7
Average	1,071.4	1,006.4	2,077.8

Sources: RESI, REMI PI+

Figure 185: Bike and Pedestrian Initiatives Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$31,260,263	\$29,303,180	\$60,563,443
2011	\$47,156,603	\$44,204,308	\$91,360,906
2012	\$146,793,941	\$137,603,729	\$284,397,672
2013	\$99,941,572	\$93,684,614	\$193,626,186
2014	\$95,530,149	\$89,549,374	\$185,079,518
2015	\$233,683,164	\$219,063,421	\$452,746,585
2016	\$222,625,603	\$208,697,642	\$431,323,246
2017	\$213,779,553	\$200,405,018	\$414,184,571
2018	\$206,899,290	\$193,955,206	\$400,854,496
2019	\$200,510,474	\$187,966,085	\$388,476,566
2020	\$196,333,176	\$184,050,126	\$380,383,302
Average	\$154,046,708	\$144,407,519	\$298,454,226

Sources: RESI, REMI PI+

Figure 186: Bike and Pedestrian Initiatives Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,170,552	\$4,846,844	\$10,017,395
2011	\$7,649,783	\$7,170,860	\$14,820,645
2012	\$23,867,179	\$22,372,946	\$46,240,126
2013	\$17,895,813	\$16,775,424	\$34,671,237
2014	\$18,148,125	\$17,011,940	\$35,160,065
2015	\$46,953,294	\$44,015,790	\$90,969,087
2016	\$47,035,989	\$44,093,313	\$91,129,302
2017	\$47,130,498	\$44,181,909	\$91,312,407
2018	\$47,331,330	\$44,370,177	\$91,701,507
2019	\$47,579,418	\$44,602,743	\$92,182,158
2020	\$48,116,937	\$45,106,635	\$93,223,572
Average	\$32,443,538	\$30,413,507	\$62,857,046

Sources: RESI, REMI PI+

Figure 187: Bike and Pedestrian Initiatives Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.6	0.3	0.9
2014	0.0	0.0	0.2
2015	0.0	0.0	0.0
2016	-0.5	0.0	-0.5
2017	0.4	0.2	0.5
2018	0.0	0.0	0.0
2019	0.4	0.2	0.7
2020	-0.4	-0.5	-0.9
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 188: Bike and Pedestrian Initiatives Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

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Figure 189: Bike and Pedestrian Initiatives Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	-\$5,816	-\$1,049	-\$6,867
2017	\$23,265	\$4,201	\$27,466
2018	-\$5,816	-\$1,049	-\$6,867
2019	\$23,265	\$4,201	\$27,466
2020	-\$23,265	-\$4,201	-\$27,466
Average	\$2,327	\$420	\$2,746

Sources: RESI, REMI PI+

Figure 190: Bike and Pedestrian Initiatives Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.6	0.3	0.9
2014	0.0	0.0	0.3
2015	1.2	0.4	1.6
2016	-1.2	0.0	-1.2
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.8	0.4	1.2
2020	0.0	0.0	0.0
Average	0.1	0.1	0.3

Sources: RESI, REMI PI+

Figure 191: Bike and Pedestrian Initiatives Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 192: Bike and Pedestrian Initiatives Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$12,848	\$2,408	\$15,260
2016	-\$12,848	-\$2,408	-\$15,260
2017	\$0	\$0	\$0
2018	-\$12,848	-\$2,408	-\$15,260
2019	\$25,700	\$4,820	\$30,516
2020	\$0	\$0	\$0
Average	\$1,168	\$219	\$1,387

Sources: RESI, REMI PI+

A.3 Agriculture and Forestry

Figure 193: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1.2	0.4	1.6
2011	1.5	0.6	2.1
2012	1.2	0.5	1.7
2013	1.2	0.6	1.8
2014	1.2	0.4	1.6
2015	1.2	0.4	1.6
2016	1.1	0.4	1.6
2017	1.2	0.3	1.5
2018	1.1	0.5	1.6
2019	0.9	0.4	1.3
2020	0.6	0.0	0.6
Average	1.1	0.4	1.5

Sources: RESI, REMI PI+

Figure 194: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$88,819	\$33,252	\$122,070
2011	\$88,819	\$33,252	\$122,070
2012	\$88,819	\$33,252	\$122,070
2013	\$88,819	\$33,252	\$122,070
2014	\$133,228	\$49,877	\$183,105
2015	\$88,819	\$33,252	\$122,070
2016	\$88,819	\$33,252	\$122,070
2017	\$88,819	\$33,252	\$122,070
2018	\$88,819	\$33,252	\$122,070
2019	\$88,819	\$33,252	\$122,070
2020	\$44,409	\$16,626	\$61,035
Average	\$88,819	\$33,252	\$122,070

Sources: RESI, REMI PI+

Figure 195: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$44,409	\$16,626	\$61,035
2011	\$33,307	\$12,469	\$45,776
2012	\$55,512	\$20,782	\$76,294
2013	\$66,614	\$24,939	\$91,553
2014	\$55,512	\$20,782	\$76,294
2015	\$55,512	\$20,782	\$76,294
2016	\$55,512	\$20,782	\$76,294
2017	\$88,819	\$33,252	\$122,070
2018	\$66,614	\$24,939	\$91,553
2019	\$55,512	\$20,782	\$76,294
2020	\$55,512	\$20,782	\$76,294
Average	\$57,530	\$21,538	\$79,068

Sources: RESI, REMI PI+

Figure 196: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	534.1	-113.5	420.6
2014	175.1	-459.7	-284.6
2015	-99.4	-722.7	-822.1
2016	-312.5	-925.3	-1,237.8
2017	-442.5	-1,047.4	-1,489.9
2018	-491.2	-1,090.0	-1,581.2
2019	-547.8	-1,143.8	-1,691.6
2020	-581.1	-1,177.0	-1,758.1
Average	-160.5	-607.2	-1,055.6

Sources: RESI, REMI PI+

Figure 197: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$17,899,855	\$67,732,469	\$85,632,324
2014	\$14,359,434	\$54,335,634	\$68,695,068
2015	\$11,673,818	\$44,173,350	\$55,847,168
2016	\$9,683,528	\$36,642,156	\$46,325,684
2017	\$8,726,658	\$33,021,389	\$41,748,047
2018	\$8,803,207	\$33,311,051	\$42,114,258
2019	\$8,548,042	\$32,345,513	\$40,893,555
2020	\$8,535,284	\$32,297,236	\$40,832,520
Average	\$8,020,893	\$30,350,800	\$52,761,078

Sources: RESI, REMI PI+

Figure 198: Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$10,436,266	\$39,490,492	\$49,926,758
2014	\$10,251,271	\$38,790,477	\$49,041,748
2015	\$9,833,438	\$37,209,409	\$47,042,847
2016	\$9,300,780	\$35,193,849	\$44,494,629
2017	\$8,905,273	\$33,697,266	\$42,602,539
2018	\$8,790,449	\$33,262,774	\$42,053,223
2019	\$8,611,833	\$32,586,897	\$41,198,730
2020	\$8,557,611	\$32,381,720	\$40,939,331
Average	\$6,789,720	\$25,692,080	\$44,662,476

Sources: RESI, REMI PI+

Figure 199: Nutrient Trading for GHG Benefits Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1.3	1.1	2.5
2011	1.6	1.3	2.9
2012	1.7	1.4	3.1
2013	2.9	2.3	5.1
2014	0.1	0.1	0.1
2015	0.0	-0.1	-0.2
2016	-0.2	0.0	-0.2
2017	-0.3	-0.1	-0.4
2018	0.3	0.1	0.4
2019	0.2	0.0	0.2
2020	0.1	0.0	0.1
Average	0.7	0.6	1.2

Sources: RESI, REMI PI+

Figure 200: Nutrient Trading for GHG Benefits Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$101,507	\$81,599	\$183,105
2011	\$118,424	\$95,199	\$213,623
2012	\$118,424	\$95,199	\$213,623
2013	\$169,178	\$135,998	\$305,176
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	-\$33,836	-\$27,200	-\$61,035
2018	\$33,836	\$27,200	\$61,035
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$46,139	\$37,090	\$83,230

Sources: RESI, REMI PI+

Figure 201: Nutrient Trading for GHG Benefits Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$44,409	\$35,700	\$80,109
2011	\$52,868	\$42,499	\$95,367
2012	\$50,753	\$40,799	\$91,553
2013	\$86,704	\$69,699	\$156,403
2014	\$2,115	\$1,700	\$3,815
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	-\$12,688	-\$10,200	-\$22,888
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$2,115	\$1,700	\$3,815
Average	\$20,570	\$16,536	\$37,107

Sources: RESI, REMI PI+

Figure 202: Nutrient Trading for GHG Benefits Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	8.3	7.2	15.6
2011	10.0	8.3	18.3
2012	11.0	8.9	19.9
2013	18.2	14.3	32.5
2014	0.4	0.5	0.9
2015	-0.2	-0.8	-1.0
2016	-1.5	0.0	-1.5
2017	-1.9	-0.7	-2.6
2018	1.7	0.8	2.5
2019	1.5	-0.2	1.4
2020	0.4	0.1	0.5
Average	4.4	3.5	7.9

Sources: RESI, REMI PI+

Figure 203: Nutrient Trading for GHG Benefits Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$642,841	\$516,766	\$1,159,607
2011	\$749,981	\$602,894	\$1,352,875
2012	\$749,981	\$602,894	\$1,352,875
2013	\$1,071,402	\$861,277	\$1,932,678
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	-\$214,280	-\$172,255	-\$386,536
2018	\$214,280	\$172,255	\$386,536
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$292,200	\$234,894	\$527,094

Sources: RESI, REMI PI+

Figure 204: Nutrient Trading for GHG Benefits Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$281,243	\$226,085	\$507,328
2011	\$334,813	\$269,149	\$603,962
2012	\$321,420	\$258,383	\$579,803
2013	\$549,093	\$441,404	\$990,498
2014	\$13,393	\$10,766	\$24,158
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	-\$80,355	-\$64,596	-\$144,951
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$13,393	\$10,766	\$24,158
Average	\$130,273	\$104,723	\$234,996

Sources: RESI, REMI PI+

Figure 205: Nutrient Trading for GHG Benefits Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 206: Nutrient Trading for GHG Benefits Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 207: Nutrient Trading for GHG Benefits Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 208: Nutrient Trading for GHG Benefits Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 209: Nutrient Trading for GHG Benefits Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 210: Nutrient Trading for GHG Benefits Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 211: Managing Forests to Capture Carbon—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	96.1	291.7	387.8
2011	95.3	288.0	383.4
2012	93.4	284.1	377.5
2013	91.1	280.3	371.4
2014	88.3	274.4	362.7
2015	84.7	268.7	353.4
2016	82.4	263.9	346.3
2017	80.0	259.4	339.5
2018	77.8	254.1	331.9
2019	76.0	252.1	328.1
2020	74.9	249.4	324.3
Average	85.5	269.6	355.1

Sources: RESI, REMI PI+

Figure 212: Managing Forests to Capture Carbon—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$536,144	\$1,691,639	\$2,227,783
2011	\$543,488	\$1,714,812	\$2,258,301
2012	\$514,111	\$1,622,120	\$2,136,230
2013	\$470,044	\$1,483,081	\$1,953,125
2014	\$418,633	\$1,320,869	\$1,739,502
2015	\$352,533	\$1,112,311	\$1,464,844
2016	\$293,778	\$926,926	\$1,220,703
2017	\$264,400	\$834,233	\$1,098,633
2018	\$235,022	\$741,540	\$976,563
2019	\$220,333	\$695,194	\$915,527
2020	\$176,267	\$556,155	\$732,422
Average	\$365,887	\$1,154,444	\$1,520,330

Sources: RESI, REMI PI+

Figure 213: Managing Forests to Capture Carbon—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$389,255	\$1,228,176	\$1,617,432
2011	\$455,355	\$1,436,735	\$1,892,090
2012	\$495,750	\$1,564,187	\$2,059,937
2013	\$525,127	\$1,656,879	\$2,182,007
2014	\$536,144	\$1,691,639	\$2,227,783
2015	\$543,488	\$1,714,812	\$2,258,301
2016	\$554,505	\$1,749,572	\$2,304,077
2017	\$547,161	\$1,726,399	\$2,273,560
2018	\$558,177	\$1,761,159	\$2,319,336
2019	\$543,488	\$1,714,812	\$2,258,301
2020	\$532,472	\$1,680,053	\$2,212,524
Average	\$516,448	\$1,629,493	\$2,145,941

Sources: RESI, REMI PI+

Figure 214: Managing Forests to Capture Carbon—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	24.2	23.6	47.8
2013	24.7	24.0	48.7
2014	24.6	23.9	48.5
2015	24.2	23.4	47.6
2016	23.8	23.2	47.0
2017	23.9	23.0	46.9
2018	23.3	22.8	46.1
2019	22.9	22.2	45.0
2020	22.3	21.6	43.9
Average	23.8	23.1	46.8

Sources: RESI, REMI PI+

Figure 215: Managing Forests to Capture Carbon—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$712,505	\$691,304	\$1,403,809
2013	\$712,505	\$691,304	\$1,403,809
2014	\$743,484	\$721,360	\$1,464,844
2015	\$681,527	\$661,247	\$1,342,773
2016	\$650,548	\$631,190	\$1,281,738
2017	\$650,548	\$631,190	\$1,281,738
2018	\$619,570	\$601,134	\$1,220,703
2019	\$650,548	\$631,190	\$1,281,738
2020	\$588,591	\$571,077	\$1,159,668
Average	\$667,758	\$647,888	\$1,315,647

Sources: RESI, REMI PI+

Figure 216: Managing Forests to Capture Carbon—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$178,126	\$172,826	\$350,952
2013	\$216,849	\$210,397	\$427,246
2014	\$232,339	\$225,425	\$457,764
2015	\$263,317	\$255,482	\$518,799
2016	\$271,062	\$262,996	\$534,058
2017	\$286,551	\$278,024	\$564,575
2018	\$286,551	\$278,024	\$564,575
2019	\$294,296	\$285,538	\$579,834
2020	\$271,062	\$262,996	\$534,058
Average	\$255,572	\$247,968	\$503,540

Sources: RESI, REMI PI+

Figure 217: Increasing Urban Trees to Capture Carbon—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1.8	3.7	5.5
2011	1.8	3.8	5.6
2012	1.5	3.7	5.3
2013	1.8	3.8	5.7
2014	1.8	3.6	5.4
2015	1.5	3.1	4.7
2016	1.5	3.4	4.9
2017	1.3	3.1	4.4
2018	1.7	3.4	5.1
2019	1.6	3.3	4.8
2020	1.0	2.8	3.8
Average	1.6	3.4	5.0

Sources: RESI, REMI PI+

Figure 218: Increasing Urban Trees to Capture Carbon—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$28,874	\$62,679	\$91,553
2011	\$28,874	\$62,679	\$91,553
2012	\$28,874	\$62,679	\$91,553
2013	\$38,498	\$83,572	\$122,070
2014	\$48,123	\$104,465	\$152,588
2015	\$19,249	\$41,786	\$61,035
2016	\$38,498	\$83,572	\$122,070
2017	\$19,249	\$41,786	\$61,035
2018	\$19,249	\$41,786	\$61,035
2019	\$38,498	\$83,572	\$122,070
2020	\$19,249	\$41,786	\$61,035
Average	\$29,749	\$64,578	\$94,327

Sources: RESI, REMI PI+

Figure 219: Increasing Urban Trees to Capture Carbon—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$19,249	\$41,786	\$61,035
2011	\$14,437	\$31,340	\$45,776
2012	\$14,437	\$31,340	\$45,776
2013	\$24,061	\$52,233	\$76,294
2014	\$24,061	\$52,233	\$76,294
2015	\$14,437	\$31,340	\$45,776
2016	\$14,437	\$31,340	\$45,776
2017	\$19,249	\$41,786	\$61,035
2018	\$19,249	\$41,786	\$61,035
2019	\$19,249	\$41,786	\$61,035
2020	\$19,249	\$41,786	\$61,035
Average	\$18,374	\$39,887	\$58,261

Sources: RESI, REMI PI+

Figure 220: Increasing Urban Trees to Capture Carbon—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	121.0	113.2	234.2
2011	151.8	140.4	292.2
2012	175.0	161.0	336.0
2013	189.8	173.9	363.7
2014	199.9	181.3	381.2
2015	205.2	185.3	390.5
2016	209.3	187.6	396.9
2017	210.0	186.9	396.9
2018	208.9	185.1	394.1
2019	203.9	179.3	383.2
2020	198.2	173.3	371.5
Average	188.4	169.8	358.2

Sources: RESI, REMI PI+

Figure 221: Increasing Urban Trees to Capture Carbon—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,474,632	\$4,931,862	\$10,406,494
2011	\$8,203,921	\$7,390,561	\$15,594,482
2012	\$10,451,571	\$9,415,373	\$19,866,943
2013	\$12,169,417	\$10,962,907	\$23,132,324
2014	\$13,694,608	\$12,336,886	\$26,031,494
2015	\$14,866,597	\$13,392,681	\$28,259,277
2016	\$15,926,203	\$14,347,234	\$30,273,438
2017	\$16,728,935	\$15,070,381	\$31,799,316
2018	\$17,467,449	\$15,735,676	\$33,203,125
2019	\$17,884,869	\$16,111,713	\$33,996,582
2020	\$18,173,853	\$16,372,046	\$34,545,898
Average	\$13,731,096	\$12,369,756	\$26,100,852

Sources: RESI, REMI PI+

Figure 222: Increasing Urban Trees to Capture Carbon—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$2,006,830	\$1,807,867	\$3,814,697
2011	\$2,785,480	\$2,509,320	\$5,294,800
2012	\$3,451,748	\$3,109,532	\$6,561,279
2013	\$3,933,387	\$3,543,420	\$7,476,807
2014	\$4,390,944	\$3,955,614	\$8,346,558
2015	\$4,800,337	\$4,324,418	\$9,124,756
2016	\$5,105,376	\$4,599,214	\$9,704,590
2017	\$5,370,277	\$4,837,853	\$10,208,130
2018	\$5,587,015	\$5,033,102	\$10,620,117
2019	\$5,595,042	\$5,040,334	\$10,635,376
2020	\$5,570,960	\$5,018,639	\$10,589,600
Average	\$4,417,945	\$3,979,938	\$8,397,883

Sources: RESI, REMI PI+

Figure 223: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.5	1.6	2.1
2011	0.6	1.6	2.1
2012	0.5	1.6	2.2
2013	3.8	14.4	18.2
2014	4.0	14.3	18.3
2015	3.7	14.4	18.1
2016	3.9	14.8	18.7
2017	4.0	14.8	18.9
2018	3.9	15.0	18.9
2019	4.0	14.9	18.9
2020	3.5	14.3	17.7
Average	3.0	11.1	14.0

Sources: RESI, REMI PI+

Figure 224: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$12,868	\$48,167	\$61,035
2011	\$12,868	\$48,167	\$61,035
2012	\$6,434	\$24,084	\$30,518
2013	\$83,643	\$313,086	\$396,729
2014	\$96,511	\$361,253	\$457,764
2015	\$77,209	\$289,002	\$366,211
2016	\$77,209	\$289,002	\$366,211
2017	\$90,077	\$337,169	\$427,246
2018	\$77,209	\$289,002	\$366,211
2019	\$90,077	\$337,169	\$427,246
2020	\$77,209	\$289,002	\$366,211
Average	\$63,756	\$238,646	\$302,401

Sources: RESI, REMI PI+

Figure 225: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$3,217	\$12,042	\$15,259
2011	\$3,217	\$12,042	\$15,259
2012	\$3,217	\$12,042	\$15,259
2013	\$38,604	\$144,501	\$183,105
2014	\$38,604	\$144,501	\$183,105
2015	\$45,038	\$168,585	\$213,623
2016	\$45,038	\$168,585	\$213,623
2017	\$54,689	\$204,710	\$259,399
2018	\$51,472	\$192,668	\$244,141
2019	\$54,689	\$204,710	\$259,399
2020	\$48,255	\$180,626	\$228,882
Average	\$35,095	\$131,365	\$166,460

Sources: RESI, REMI PI+

Figure 226: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	58.2	94.7	152.9
2011	57.9	93.9	151.8
2012	57.0	92.8	149.8
2013	76.1	124.7	200.9
2014	19.7	32.5	52.2
2015	17.3	30.3	47.6
2016	16.0	29.1	45.1
2017	16.0	28.9	44.9
2018	15.7	28.6	44.3
2019	16.0	28.7	44.7
2020	16.1	28.4	44.4
Average	33.3	55.7	89.0

Sources: RESI, REMI PI+

**Figure 227: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—
Operation Phase, Output Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$1,540,927	\$2,578,946	\$4,119,873
2011	\$1,552,341	\$2,598,049	\$4,150,391
2012	\$1,540,927	\$2,578,946	\$4,119,873
2013	\$2,043,155	\$3,419,491	\$5,462,646
2014	\$513,642	\$859,649	\$1,373,291
2015	\$410,914	\$687,719	\$1,098,633
2016	\$342,428	\$573,099	\$915,527
2017	\$365,257	\$611,306	\$976,563
2018	\$365,257	\$611,306	\$976,563
2019	\$410,914	\$687,719	\$1,098,633
2020	\$410,914	\$687,719	\$1,098,633
Average	\$863,334	\$1,444,904	\$2,308,239

Sources: RESI, REMI PI+

**Figure 228: Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—
Operation Phase, Wage Impacts**

Fiscal Year	Direct	Spinoff	Total
2010	\$610,664	\$1,022,027	\$1,632,690
2011	\$662,028	\$1,107,992	\$1,770,020
2012	\$719,099	\$1,203,508	\$1,922,607
2013	\$970,213	\$1,623,781	\$2,593,994
2014	\$365,257	\$611,306	\$976,563
2015	\$308,185	\$515,789	\$823,975
2016	\$262,528	\$439,376	\$701,904
2017	\$268,235	\$448,928	\$717,163
2018	\$256,821	\$429,824	\$686,646
2019	\$262,528	\$439,376	\$701,904
2020	\$256,821	\$429,824	\$686,646
Average	\$449,307	\$751,976	\$1,201,283

Sources: RESI, REMI PI+

Figure 229: Geological Opportunities to Store Carbon—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.2	0.1	0.4
2011	0.3	0.1	0.4
2012	0.0	0.0	0.0
2013	0.0	0.1	0.1
2014	0.3	0.1	0.4
2015	0.0	0.0	0.0
2016	0.2	0.3	0.5
2017	0.1	0.0	0.0
2018	0.2	0.3	0.5
2019	0.3	0.2	0.5
2020	0.3	0.2	0.5
Average	0.2	0.1	0.3

Sources: RESI, REMI PI+

Figure 230: Geological Opportunities to Store Carbon—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$17,386	\$13,131	\$30,518
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$34,772	\$26,263	\$61,035
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$34,772	\$26,263	\$61,035
2018	\$0	\$0	\$0
2019	\$34,772	\$26,263	\$61,035
2020	\$34,772	\$26,263	\$61,035
Average	\$14,225	\$10,744	\$24,969

Sources: RESI, REMI PI+

Figure 231: Geological Opportunities to Store Carbon—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$8,693	-\$6,566	-\$15,259
2012	\$0	\$0	\$0
2013	\$8,693	\$6,566	\$15,259
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$8,693	\$6,566	\$15,259
2017	\$8,693	\$6,566	\$15,259
2018	\$0	\$0	\$0
2019	\$17,386	\$13,131	\$30,518
2020	\$8,693	\$6,566	\$15,259
Average	\$3,951	\$2,984	\$6,936

Sources: RESI, REMI PI+

Figure 232: Geological Opportunities to Store Carbon—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	73.7	64.9	138.6
2011	103.2	90.3	193.4
2012	121.0	105.5	226.6
2013	130.1	113.0	243.0
2014	134.9	115.5	250.4
2015	135.8	115.1	251.0
2016	134.9	113.3	248.2
2017	133.7	110.9	244.6
2018	129.8	106.2	236.0
2019	124.8	101.0	225.7
2020	120.8	96.5	217.2
Average	122.1	102.9	225.0

Sources: RESI, REMI PI+

Figure 233: Geological Opportunities to Store Carbon—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$6,639,031	\$5,598,518	\$12,237,549
2011	\$10,049,605	\$8,474,565	\$18,524,170
2012	\$12,549,590	\$10,582,735	\$23,132,324
2013	\$14,321,102	\$12,076,603	\$26,397,705
2014	\$15,695,265	\$13,235,399	\$28,930,664
2015	\$16,721,749	\$14,101,005	\$30,822,754
2016	\$17,516,446	\$14,771,152	\$32,287,598
2017	\$18,244,918	\$15,385,453	\$33,630,371
2018	\$18,774,716	\$15,832,218	\$34,606,934
2019	\$19,138,952	\$16,139,368	\$35,278,320
2020	\$19,470,076	\$16,418,596	\$35,888,672
Average	\$15,374,677	\$12,965,056	\$28,339,733

Sources: RESI, REMI PI+

Figure 234: Geological Opportunities to Store Carbon—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,498,335	\$1,263,506	\$2,761,841
2011	\$2,218,529	\$1,870,826	\$4,089,355
2012	\$2,756,605	\$2,324,572	\$5,081,177
2013	\$3,071,173	\$2,589,838	\$5,661,011
2014	\$3,294,681	\$2,778,317	\$6,072,998
2015	\$3,460,243	\$2,917,931	\$6,378,174
2016	\$3,518,190	\$2,966,796	\$6,484,985
2017	\$3,584,414	\$3,022,641	\$6,607,056
2018	\$3,551,302	\$2,994,718	\$6,546,021
2019	\$3,443,687	\$2,903,969	\$6,347,656
2020	\$3,302,959	\$2,785,298	\$6,088,257
Average	\$3,063,647	\$2,583,492	\$5,647,139

Sources: RESI, REMI PI+

Figure 235: Planting Forests in Maryland—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	96.0	94.4	190.3
2012	95.9	94.4	190.3
2013	50.3	49.5	99.8
2014	54.4	53.4	107.8
2015	52.1	51.2	103.4
2016	50.8	49.9	100.7
2017	49.1	48.1	97.2
2018	48.0	47.3	95.4
2019	47.1	46.6	93.7
2020	46.4	45.5	91.9
Average	53.6	52.8	106.4

Sources: RESI, REMI PI+

Figure 236: Planting Forests in Maryland—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$1,138,546	\$1,119,755	\$2,258,301
2012	\$1,200,089	\$1,180,282	\$2,380,371
2013	\$600,044	\$590,141	\$1,190,186
2014	\$600,044	\$590,141	\$1,190,186
2015	\$461,573	\$453,955	\$915,527
2016	\$400,030	\$393,427	\$793,457
2017	\$338,487	\$332,900	\$671,387
2018	\$307,715	\$302,636	\$610,352
2019	\$307,715	\$302,636	\$610,352
2020	\$246,172	\$242,109	\$488,281
Average	\$509,129	\$500,726	\$1,009,854

Sources: RESI, REMI PI+

Figure 237: Planting Forests in Maryland—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$823,138	\$809,553	\$1,632,690
2012	\$1,000,074	\$983,569	\$1,983,643
2013	\$692,359	\$680,932	\$1,373,291
2014	\$715,438	\$703,630	\$1,419,067
2015	\$715,438	\$703,630	\$1,419,067
2016	\$715,438	\$703,630	\$1,419,067
2017	\$700,052	\$688,498	\$1,388,550
2018	\$715,438	\$703,630	\$1,419,067
2019	\$692,359	\$680,932	\$1,373,291
2020	\$684,666	\$673,366	\$1,358,032
Average	\$677,673	\$666,488	\$1,344,161

Sources: RESI, REMI PI+

Figure 238: Planting Forests in Maryland—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.5	0.3	0.8
2012	0.5	0.4	0.9
2013	0.0	0.2	0.3
2014	0.2	0.1	0.3
2015	0.0	0.0	0.0
2016	0.5	0.3	0.7
2017	0.2	0.2	0.5
2018	0.2	0.2	0.4
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.2	0.2	0.4

Sources: RESI, REMI PI+

Figure 239: Planting Forests in Maryland—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	-\$16,613	-\$13,904	-\$30,518
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	-\$1,510	-\$1,264	-\$2,774

Sources: RESI, REMI PI+

Figure 240: Planting Forests in Maryland—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$8,307	\$6,952	\$15,259
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$8,307	\$6,952	\$15,259
2017	\$16,613	\$13,904	\$30,518
2018	\$0	\$0	\$0
2019	\$8,307	\$6,952	\$15,259
2020	\$0	\$0	\$0
Average	\$3,776	\$3,160	\$6,936

Sources: RESI, REMI PI+

Figure 241: Biomass for Energy Production—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	13.4	24.7	38.1
2014	20.2	36.8	57.0
2015	19.7	36.6	56.3
2016	12.8	24.3	37.1
2017	12.5	23.7	36.1
2018	12.3	23.7	36.0
2019	12.4	23.8	36.2
2020	12.4	23.5	35.8
Average	10.5	19.7	30.3

Sources: RESI, REMI PI+

Figure 242: Biomass for Energy Production—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$594,315	\$1,114,669	\$1,708,984
2014	\$870,247	\$1,632,194	\$2,502,441
2015	\$827,796	\$1,552,575	\$2,380,371
2016	\$509,413	\$955,431	\$1,464,844
2017	\$488,187	\$915,621	\$1,403,809
2018	\$466,962	\$875,812	\$1,342,773
2019	\$488,187	\$915,621	\$1,403,809
2020	\$466,962	\$875,812	\$1,342,773
Average	\$428,370	\$803,430	\$1,231,800

Sources: RESI, REMI PI+

Figure 243: Biomass for Energy Production—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$302,464	\$567,287	\$869,751
2014	\$472,268	\$885,764	\$1,358,032
2015	\$504,107	\$945,478	\$1,449,585
2016	\$355,528	\$666,811	\$1,022,339
2017	\$360,834	\$676,763	\$1,037,598
2018	\$366,141	\$686,716	\$1,052,856
2019	\$382,060	\$716,573	\$1,098,633
2020	\$382,060	\$716,573	\$1,098,633
Average	\$284,133	\$532,906	\$817,039

Sources: RESI, REMI PI+

Figure 244: Biomass for Energy Production—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	2.9	2.5	5.3
2014	4.8	4.1	8.9
2015	5.9	5.2	11.1
2016	6.9	6.1	13.0
2017	8.2	7.1	15.2
2018	8.6	7.6	16.2
2019	8.7	7.5	16.3
2020	8.4	7.1	15.6
Average	4.9	4.3	9.2

Sources: RESI, REMI PI+

Figure 245: Biomass for Energy Production—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$310,231	\$269,603	\$579,834
2014	\$522,494	\$454,069	\$976,563
2015	\$620,462	\$539,206	\$1,159,668
2016	\$751,085	\$652,724	\$1,403,809
2017	\$881,708	\$766,241	\$1,647,949
2018	\$947,020	\$822,999	\$1,770,020
2019	\$1,012,332	\$879,758	\$1,892,090
2020	\$1,012,332	\$879,758	\$1,892,090
Average	\$550,697	\$478,578	\$1,029,275

Sources: RESI, REMI PI+

Figure 246: Biomass for Energy Production—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$81,640	\$70,948	\$152,588
2014	\$138,787	\$120,612	\$259,399
2015	\$204,099	\$177,371	\$381,470
2016	\$253,083	\$219,939	\$473,022
2017	\$302,067	\$262,508	\$564,575
2018	\$326,559	\$283,793	\$610,352
2019	\$359,215	\$312,172	\$671,387
2020	\$351,051	\$305,077	\$656,128
Average	\$183,318	\$159,311	\$342,629

Sources: RESI, REMI PI+

Figure 247: Conservation of Agricultural Land for GHG Benefits—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	23.0	21.5	44.5
2011	23.4	22.0	45.5
2012	22.1	20.7	42.8
2013	16.8	15.9	32.7
2014	16.2	15.2	31.4
2015	15.2	14.3	29.5
2016	14.1	13.3	27.4
2017	13.2	12.4	25.6
2018	13.2	12.5	25.7
2019	12.3	11.7	24.1
2020	12.2	11.5	23.7
Average	16.5	15.6	32.1

Sources: RESI, REMI PI+

Figure 248: Conservation of Agricultural Land for GHG Benefits—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,209,852	\$1,140,002	\$2,349,854
2011	\$1,241,276	\$1,169,612	\$2,410,889
2012	\$1,178,427	\$1,110,391	\$2,288,818
2013	\$879,892	\$829,092	\$1,708,984
2014	\$848,467	\$799,482	\$1,647,949
2015	\$785,618	\$740,261	\$1,525,879
2016	\$722,769	\$681,040	\$1,403,809
2017	\$659,919	\$621,819	\$1,281,738
2018	\$691,344	\$651,430	\$1,342,773
2019	\$597,070	\$562,598	\$1,159,668
2020	\$597,070	\$562,598	\$1,159,668
Average	\$855,609	\$806,211	\$1,661,821

Sources: RESI, REMI PI+

Figure 249: Conservation of Agricultural Land for GHG Benefits—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$437,982	\$412,695	\$850,677
2011	\$469,407	\$442,306	\$911,713
2012	\$469,407	\$442,306	\$911,713
2013	\$384,953	\$362,728	\$747,681
2014	\$386,917	\$364,578	\$751,495
2015	\$373,169	\$351,624	\$724,792
2016	\$359,420	\$338,669	\$698,090
2017	\$343,708	\$323,864	\$667,572
2018	\$345,672	\$325,715	\$671,387
2019	\$331,924	\$312,760	\$644,684
2020	\$337,816	\$318,312	\$656,128
Average	\$385,488	\$363,233	\$748,721

Sources: RESI, REMI PI+

Figure 250: Conservation of Agricultural Land for GHG Benefits—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	327.8	272.5	600.3
2012	332.6	276.6	609.2
2013	326.2	270.9	597.1
2014	238.6	196.2	434.8
2015	214.0	173.9	387.9
2016	193.1	155.2	348.3
2017	178.5	141.9	320.4
2018	167.1	131.6	298.6
2019	158.3	123.6	281.9
2020	151.2	117.7	269.0
Average	207.9	169.1	377.0

Sources: RESI, REMI PI+

Figure 251: Conservation of Agricultural Land for GHG Benefits—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$67,721,576	\$55,081,158	\$122,802,734
2012	\$68,175,971	\$55,450,738	\$123,626,709
2013	\$67,738,406	\$55,094,846	\$122,833,252
2014	\$50,690,206	\$41,228,740	\$91,918,945
2015	\$48,939,946	\$39,805,171	\$88,745,117
2016	\$47,425,299	\$38,573,236	\$85,998,535
2017	\$46,348,216	\$37,697,194	\$84,045,410
2018	\$45,506,745	\$37,012,786	\$82,519,531
2019	\$44,799,910	\$36,437,883	\$81,237,793
2020	\$44,295,027	\$36,027,239	\$80,322,266
Average	\$48,331,027	\$39,309,908	\$87,640,936

Sources: RESI, REMI PI+

Figure 252: Conservation of Agricultural Land for GHG Benefits—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$8,747,090	\$7,114,421	\$15,861,511
2012	\$10,585,704	\$8,609,853	\$19,195,557
2013	\$11,675,408	\$9,496,161	\$21,171,570
2014	\$10,042,955	\$8,168,410	\$18,211,365
2015	\$9,514,932	\$7,738,944	\$17,253,876
2016	\$8,972,183	\$7,297,501	\$16,269,684
2017	\$8,471,508	\$6,890,278	\$15,361,786
2018	\$8,010,803	\$6,515,564	\$14,526,367
2019	\$7,640,556	\$6,214,425	\$13,854,980
2020	\$7,327,108	\$5,959,483	\$13,286,591
Average	\$8,271,659	\$6,727,731	\$14,999,390

Sources: RESI, REMI PI+

A.4 Zero Waste

Figure 253: Recycling and Source Reduction Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	457.2	416.2	873.3
2011	466.2	425.3	891.6
2012	465.9	425.7	891.6
2013	460.7	421.9	882.6
2014	452.7	414.9	867.6
2015	441.9	405.7	847.6
2016	430.7	396.2	826.9
2017	422.0	388.3	810.3
2018	414.2	381.4	795.6
2019	407.2	375.6	782.8
2020	402.0	371.1	773.1
Average	438.3	402.0	840.3

Sources: RESI, REMI PI+

Figure 254: Recycling and Source Reduction Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$35,192,272	\$32,282,093	\$67,474,365
2011	\$35,637,945	\$32,690,912	\$68,328,857
2012	\$35,717,530	\$32,763,915	\$68,481,445
2013	\$35,478,776	\$32,544,905	\$68,023,682
2014	\$35,017,186	\$32,121,486	\$67,138,672
2015	\$34,348,676	\$31,508,257	\$65,856,934
2016	\$33,712,000	\$30,924,230	\$64,636,230
2017	\$33,138,992	\$30,398,606	\$63,537,598
2018	\$32,661,485	\$29,960,586	\$62,622,070
2019	\$32,215,811	\$29,551,767	\$61,767,578
2020	\$31,929,307	\$29,288,955	\$61,218,262
Average	\$34,095,453	\$31,275,974	\$65,371,427

Sources: RESI, REMI PI+

Figure 255: Recycling and Source Reduction Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$11,287,074	\$10,353,704	\$21,640,778
2011	\$12,182,399	\$11,174,992	\$23,357,391
2012	\$12,916,567	\$11,848,448	\$24,765,015
2013	\$13,489,575	\$12,374,072	\$25,863,647
2014	\$13,925,300	\$12,773,766	\$26,699,066
2015	\$14,227,722	\$13,051,179	\$27,278,900
2016	\$14,472,444	\$13,275,664	\$27,748,108
2017	\$14,695,281	\$13,480,073	\$28,175,354
2018	\$14,916,128	\$13,682,658	\$28,598,785
2019	\$15,174,777	\$13,919,919	\$29,094,696
2020	\$15,473,219	\$14,193,681	\$29,666,901
Average	\$13,887,317	\$12,738,923	\$26,626,240

Sources: RESI, REMI PI+

Figure 256: Recycling and Source Reduction Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	457.2	416.2	873.3
2011	466.2	425.3	891.6
2012	465.9	425.7	891.6
2013	460.7	421.9	882.6
2014	452.7	414.9	867.6
2015	757.5	695.5	1,452.9
2016	738.3	679.1	1,417.5
2017	723.4	665.6	1,389.1
2018	710.1	653.8	1,364.0
2019	698.1	643.8	1,341.9
2020	689.2	636.1	1,325.3
Average	601.8	552.5	1,154.3

Sources: RESI, REMI PI+

Figure 257: Recycling and Source Reduction Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$35,192,272	\$32,282,093	\$67,474,365
2011	\$35,637,945	\$32,690,912	\$68,328,857
2012	\$35,717,530	\$32,763,915	\$68,481,445
2013	\$35,478,776	\$32,544,905	\$68,023,682
2014	\$35,017,186	\$32,121,486	\$67,138,672
2015	\$58,883,445	\$54,014,155	\$112,897,600
2016	\$57,792,000	\$53,012,966	\$110,804,966
2017	\$56,809,700	\$52,111,896	\$108,921,595
2018	\$55,991,116	\$51,361,004	\$107,352,120
2019	\$55,227,105	\$50,660,171	\$105,887,276
2020	\$54,735,954	\$50,209,636	\$104,945,591
Average	\$46,953,003	\$43,070,285	\$90,023,288

Sources: RESI, REMI PI+

Figure 258: Recycling and Source Reduction Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$11,287,074	\$10,353,704	\$21,640,778
2011	\$12,182,399	\$11,174,992	\$23,357,391
2012	\$12,916,567	\$11,848,448	\$24,765,015
2013	\$13,489,575	\$12,374,072	\$25,863,647
2014	\$13,925,300	\$12,773,766	\$26,699,066
2015	\$24,390,380	\$22,373,449	\$46,763,828
2016	\$24,809,904	\$22,758,281	\$47,568,185
2017	\$25,191,909	\$23,108,697	\$48,300,606
2018	\$25,570,504	\$23,455,985	\$49,026,489
2019	\$26,013,904	\$23,862,718	\$49,876,621
2020	\$26,525,518	\$24,332,025	\$50,857,544
Average	\$19,663,912	\$18,037,831	\$37,701,743

Sources: RESI, REMI PI+

Figure 259: Recycling and Source Reduction Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-270.1	-245.7	-515.8
2011	-275.5	-251.5	-527.0
2012	-274.6	-251.0	-525.6
2013	-267.6	-245.0	-512.6
2014	-259.5	-238.1	-497.7
2015	-252.8	-232.2	-485.1
2016	-247.4	-227.4	-474.8
2017	-240.8	-221.9	-462.7
2018	-236.1	-217.6	-453.7
2019	-233.6	-215.4	-449.0
2020	-232.7	-214.9	-447.6
Average	-253.7	-232.8	-486.5

Sources: RESI, REMI PI+

Figure 260: Recycling and Source Reduction Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$20,736,625	-\$19,027,779	-\$39,764,404
2011	-\$21,039,001	-\$19,305,237	-\$40,344,238
2012	-\$20,991,257	-\$19,261,428	-\$40,252,686
2013	-\$20,609,309	-\$18,910,955	-\$39,520,264
2014	-\$20,115,958	-\$18,458,260	-\$38,574,219
2015	-\$19,670,352	-\$18,049,375	-\$37,719,727
2016	-\$19,288,403	-\$17,698,901	-\$36,987,305
2017	-\$18,874,626	-\$17,319,222	-\$36,193,848
2018	-\$18,524,506	-\$16,997,955	-\$35,522,461
2019	-\$18,429,019	-\$16,910,337	-\$35,339,355
2020	-\$18,397,190	-\$16,881,130	-\$35,278,320
Average	-\$19,697,840	-\$18,074,598	-\$37,772,439

Sources: RESI, REMI PI+

Figure 261: Recycling and Source Reduction Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$6,664,207	-\$6,115,029	-\$12,779,236
2011	-\$7,203,311	-\$6,609,707	-\$13,813,019
2012	-\$7,605,153	-\$6,978,434	-\$14,583,588
2013	-\$7,855,807	-\$7,208,433	-\$15,064,240
2014	-\$8,016,942	-\$7,356,288	-\$15,373,230
2015	-\$8,152,215	-\$7,480,414	-\$15,632,629
2016	-\$8,303,403	-\$7,619,143	-\$15,922,546
2017	-\$8,384,965	-\$7,693,984	-\$16,078,949
2018	-\$8,498,356	-\$7,798,031	-\$16,296,387
2019	-\$8,669,437	-\$7,955,014	-\$16,624,451
2020	-\$8,904,176	-\$8,170,409	-\$17,074,585
Average	-\$8,023,452	-\$7,362,262	-\$15,385,714

Sources: RESI, REMI PI+

Figure 262: Recycling and Source Reduction Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-270.1	-245.7	-515.8
2011	-275.5	-251.5	-527.0
2012	-274.6	-251.0	-525.6
2013	-267.6	-245.0	-512.6
2014	-259.5	-238.1	-497.7
2015	-433.4	-398.1	-831.5
2016	-424.1	-389.8	-813.9
2017	-412.9	-380.4	-793.2
2018	-404.8	-373.1	-777.8
2019	-400.4	-369.3	-769.7
2020	-399.0	-368.3	-767.3
Average	-347.4	-319.1	-666.6

Sources: RESI, REMI PI+

Figure 263: Recycling and Source Reduction Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$20,736,625	-\$19,027,779	-\$39,764,404
2011	-\$21,039,001	-\$19,305,237	-\$40,344,238
2012	-\$20,991,257	-\$19,261,428	-\$40,252,686
2013	-\$20,609,309	-\$18,910,955	-\$39,520,264
2014	-\$20,115,958	-\$18,458,260	-\$38,574,219
2015	-\$33,720,603	-\$30,941,785	-\$64,662,388
2016	-\$33,065,834	-\$30,340,974	-\$63,406,808
2017	-\$32,356,501	-\$29,690,095	-\$62,046,595
2018	-\$31,756,296	-\$29,139,351	-\$60,895,647
2019	-\$31,592,604	-\$28,989,148	-\$60,581,752
2020	-\$31,538,039	-\$28,939,081	-\$60,477,120
Average	-\$27,047,457	-\$24,818,554	-\$51,866,011

Sources: RESI, REMI PI+

Figure 264: Recycling and Source Reduction Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$6,664,207	-\$6,115,029	-\$12,779,236
2011	-\$7,203,311	-\$6,609,707	-\$13,813,019
2012	-\$7,605,153	-\$6,978,434	-\$14,583,588
2013	-\$7,855,807	-\$7,208,433	-\$15,064,240
2014	-\$8,016,942	-\$7,356,288	-\$15,373,230
2015	-\$13,975,226	-\$12,823,567	-\$26,798,793
2016	-\$14,234,405	-\$13,061,389	-\$27,295,794
2017	-\$14,374,225	-\$13,189,687	-\$27,563,912
2018	-\$14,568,610	-\$13,368,053	-\$27,936,663
2019	-\$14,861,892	-\$13,637,166	-\$28,499,058
2020	-\$15,264,302	-\$14,006,415	-\$29,270,717
Average	-\$11,329,462	-\$10,395,834	-\$21,725,295

Sources: RESI, REMI PI+

A.5 Buildings

Figure 265: Building Codes—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	14.1	5.4	19.5
2011	16.5	6.6	23.1
2012	15.6	6.1	21.7
2013	15.3	6.1	21.4
2014	14.9	5.6	20.5
2015	14.0	4.9	18.9
2016	14.2	5.1	19.3
2017	14.0	4.9	18.8
2018	14.0	5.2	19.2
2019	13.7	4.6	18.3
2020	13.8	4.8	18.6
Average	14.6	5.4	19.9

Sources: RESI, REMI PI+

Figure 266: Building Codes—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,092,207	\$403,154	\$1,495,361
2011	\$1,270,526	\$468,976	\$1,739,502
2012	\$1,203,657	\$444,293	\$1,647,949
2013	\$1,181,367	\$436,065	\$1,617,432
2014	\$1,203,657	\$444,293	\$1,647,949
2015	\$1,114,497	\$411,382	\$1,525,879
2016	\$1,114,497	\$411,382	\$1,525,879
2017	\$1,114,497	\$411,382	\$1,525,879
2018	\$1,114,497	\$411,382	\$1,525,879
2019	\$1,159,077	\$427,837	\$1,586,914
2020	\$1,114,497	\$411,382	\$1,525,879
Average	\$1,152,998	\$425,593	\$1,578,591

Sources: RESI, REMI PI+

Figure 267: Building Codes—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$490,379	\$181,008	\$671,387
2011	\$612,973	\$226,260	\$839,233
2012	\$635,263	\$234,488	\$869,751
2013	\$668,698	\$246,829	\$915,527
2014	\$668,698	\$246,829	\$915,527
2015	\$679,843	\$250,943	\$930,786
2016	\$713,278	\$263,284	\$976,563
2017	\$713,278	\$263,284	\$976,563
2018	\$769,003	\$283,854	\$1,052,856
2019	\$780,148	\$287,967	\$1,068,115
2020	\$780,148	\$287,967	\$1,068,115
Average	\$682,883	\$252,065	\$934,948

Sources: RESI, REMI PI+

Figure 268: Building Codes—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	16.0	14.8	30.8
2011	47.6	43.7	91.3
2012	87.2	80.4	167.7
2013	137.7	127.3	265.0
2014	186.4	172.8	359.1
2015	231.4	214.9	446.4
2016	272.3	253.3	525.6
2017	304.1	283.2	587.3
2018	330.5	308.0	638.6
2019	350.6	327.1	677.7
2020	366.3	341.9	708.2
Average	211.8	197.0	408.9

Sources: RESI, REMI PI+

Figure 269: Building Codes—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,264,841	\$1,176,565	\$2,441,406
2011	\$3,573,175	\$3,323,797	\$6,896,973
2012	\$6,498,120	\$6,044,605	\$12,542,725
2013	\$10,229,400	\$9,515,473	\$19,744,873
2014	\$13,850,007	\$12,883,391	\$26,733,398
2015	\$17,296,698	\$16,089,532	\$33,386,230
2016	\$20,458,800	\$19,030,946	\$39,489,746
2017	\$22,956,861	\$21,354,663	\$44,311,523
2018	\$25,107,090	\$23,354,824	\$48,461,914
2019	\$26,751,383	\$24,884,359	\$51,635,742
2020	\$28,079,466	\$26,119,753	\$54,199,219
Average	\$16,005,986	\$14,888,901	\$30,894,886

Sources: RESI, REMI PI+

Figure 270: Building Codes—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$964,441	-\$897,131	-\$1,861,572
2011	-\$1,298,438	-\$1,207,818	-\$2,506,256
2012	-\$1,092,902	-\$1,016,626	-\$2,109,528
2013	-\$569,178	-\$529,454	-\$1,098,633
2014	\$565,226	\$525,778	\$1,091,003
2015	\$1,875,522	\$1,744,626	\$3,620,148
2016	\$3,302,420	\$3,071,939	\$6,374,359
2017	\$4,699,674	\$4,371,676	\$9,071,350
2018	\$6,051,473	\$5,629,130	\$11,680,603
2019	\$7,300,503	\$6,790,989	\$14,091,492
2020	\$8,462,576	\$7,871,958	\$16,334,534
Average	\$2,575,676	\$2,395,915	\$4,971,591

Sources: RESI, REMI PI+

A.6 Land Use

Figure 271: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1,020.5	1,383.3	2,403.9
2011	1,016.3	1,718.6	2,734.9
2012	998.7	1,855.4	2,854.1
2013	981.2	1,870.6	2,851.8
2014	963.7	1,824.5	2,788.2
2015	947.8	1,748.6	2,696.3
2016	933.0	1,666.0	2,598.9
2017	919.3	1,585.9	2,505.2
2018	906.7	1,511.5	2,418.2
2019	892.8	1,449.0	2,341.7
2020	854.7	1,406.2	2,261.0
Average	948.6	1,638.1	2,586.7

Sources: RESI, REMI PI+

Figure 272: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$149,267,643	\$230,490,757	\$379,758,400
2011	\$149,267,840	\$290,022,655	\$439,290,496
2012	\$149,267,262	\$319,771,285	\$469,038,548
2013	\$149,265,389	\$328,885,369	\$478,150,758
2014	\$149,262,135	\$327,194,090	\$476,456,226
2015	\$149,257,749	\$319,531,602	\$468,789,351
2016	\$149,252,520	\$309,942,609	\$459,195,129
2017	\$149,246,716	\$300,154,067	\$449,400,783
2018	\$149,240,593	\$290,938,405	\$440,178,997
2019	\$149,234,578	\$284,107,332	\$433,341,910
2020	\$141,775,706	\$273,146,725	\$414,922,431
Average	\$148,576,194	\$297,653,172	\$446,229,366

Sources: RESI, REMI PI+

Figure 273: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$83,839,247	\$64,073,567	\$147,912,815
2011	\$86,706,609	\$95,172,590	\$181,879,199
2012	\$89,558,957	\$115,074,419	\$204,633,376
2013	\$92,887,918	\$125,983,740	\$218,871,658
2014	\$96,485,099	\$130,753,734	\$227,238,833
2015	\$100,229,721	\$131,367,967	\$231,597,688
2016	\$104,223,874	\$129,793,131	\$234,017,005
2017	\$108,458,792	\$126,982,304	\$235,441,095
2018	\$112,935,974	\$123,476,233	\$236,412,207
2019	\$117,515,291	\$120,330,118	\$237,845,409
2020	\$118,392,655	\$106,879,712	\$225,272,367
Average	\$101,021,285	\$115,444,319	\$216,465,605

Sources: RESI, REMI PI+

Figure 274: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1,200.6	1,627.5	2,828.1
2011	1,195.6	2,021.9	3,217.6
2012	1,174.9	2,182.8	3,357.7
2013	1,154.4	2,200.7	3,355.1
2014	1,133.8	2,146.5	3,280.2
2015	1,115.0	2,057.1	3,172.1
2016	1,097.6	1,960.0	3,057.6
2017	1,081.5	1,865.7	2,947.3
2018	1,066.7	1,778.2	2,844.9
2019	1,050.3	1,704.7	2,755.0
2020	1,005.6	1,654.4	2,659.9
Average	1,116.0	1,927.2	3,043.2

Sources: RESI, REMI PI+

Figure 275: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$175,608,992	\$271,165,596	\$446,774,588
2011	\$175,609,224	\$341,203,124	\$516,812,348
2012	\$175,608,544	\$376,201,512	\$551,810,056
2013	\$175,606,340	\$386,923,964	\$562,530,304
2014	\$175,602,512	\$384,934,224	\$560,536,736
2015	\$175,597,352	\$375,919,532	\$551,516,884
2016	\$175,591,200	\$364,638,364	\$540,229,564
2017	\$175,584,372	\$353,122,432	\$528,706,804
2018	\$175,577,168	\$342,280,476	\$517,857,644
2019	\$175,570,092	\$334,243,920	\$509,814,012
2020	\$166,794,949	\$321,349,088	\$488,144,037
Average	\$174,795,522	\$350,180,203	\$524,975,725

Sources: RESI, REMI PI+

Figure 276: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$98,634,409	\$75,380,667	\$174,015,076
2011	\$102,007,775	\$111,967,753	\$213,975,528
2012	\$105,363,479	\$135,381,669	\$240,745,148
2013	\$109,279,904	\$148,216,164	\$257,496,068
2014	\$113,511,881	\$153,827,923	\$267,339,804
2015	\$117,917,319	\$154,550,549	\$272,467,868
2016	\$122,616,323	\$152,697,801	\$275,314,124
2017	\$127,598,579	\$149,390,945	\$276,989,524
2018	\$132,865,851	\$145,266,157	\$278,132,008
2019	\$138,253,283	\$141,564,845	\$279,818,128
2020	\$139,285,476	\$125,740,838	\$265,026,315
Average	\$118,848,571	\$135,816,846	\$254,665,417

Sources: RESI, REMI PI+

Figure 277: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	733.1	733.1
2011	0.0	824.8	824.8
2012	0.0	867.0	867.0
2013	0.0	870.3	870.3
2014	0.0	852.6	852.6
2015	0.0	825.7	825.7
2016	0.0	798.3	798.3
2017	0.0	772.3	772.3
2018	0.0	747.8	747.8
2019	0.0	727.3	727.3
2020	0.0	710.8	710.8
Average	0.0	793.6	793.6

Sources: RESI, REMI PI+

Figure 278: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$139,545,931	\$139,545,931
2011	\$0	\$160,052,214	\$160,052,214
2012	\$0	\$171,800,520	\$171,800,520
2013	\$0	\$174,957,962	\$174,957,962
2014	\$0	\$173,351,448	\$173,351,448
2015	\$0	\$169,266,828	\$169,266,828
2016	\$0	\$164,610,222	\$164,610,222
2017	\$0	\$159,923,499	\$159,923,499
2018	\$0	\$155,360,603	\$155,360,603
2019	\$0	\$151,908,068	\$151,908,068
2020	\$0	\$149,479,231	\$149,479,231
Average	\$0	\$160,932,412	\$160,932,412

Sources: RESI, REMI PI+

Figure 279: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$42,727,625	\$42,727,625
2011	\$0	\$49,769,910	\$49,769,910
2012	\$0	\$53,594,770	\$53,594,770
2013	\$0	\$54,288,564	\$54,288,564
2014	\$0	\$53,037,899	\$53,037,899
2015	\$0	\$50,646,357	\$50,646,357
2016	\$0	\$47,898,859	\$47,898,859
2017	\$0	\$45,087,497	\$45,087,497
2018	\$0	\$42,370,042	\$42,370,042
2019	\$0	\$40,056,723	\$40,056,723
2020	\$0	\$38,228,325	\$38,228,325
Average	\$0	\$47,064,234	\$47,064,234

Sources: RESI, REMI PI+

Figure 280: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	1,127.8	1,127.8
2011	0.0	1,268.9	1,268.9
2012	0.0	1,333.8	1,333.8
2013	0.0	1,338.9	1,338.9
2014	0.0	1,311.6	1,311.6
2015	0.0	1,270.4	1,270.4
2016	0.0	1,228.2	1,228.2
2017	0.0	1,188.1	1,188.1
2018	0.0	1,150.4	1,150.4
2019	0.0	1,118.9	1,118.9
2020	0.0	1,093.5	1,093.5
Average	0.0	1,221.0	1,221.0

Sources: RESI, REMI PI+

Figure 281: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$187,850,292	\$187,850,292
2011	\$0	\$215,454,904	\$215,454,904
2012	\$0	\$231,269,931	\$231,269,931
2013	\$0	\$235,520,334	\$235,520,334
2014	\$0	\$233,357,719	\$233,357,719
2015	\$0	\$227,859,191	\$227,859,191
2016	\$0	\$221,590,684	\$221,590,684
2017	\$0	\$215,281,633	\$215,281,633
2018	\$0	\$209,139,273	\$209,139,273
2019	\$0	\$204,491,630	\$204,491,630
2020	\$0	\$201,222,042	\$201,222,042
Average	\$0	\$216,639,785	\$216,639,785

Sources: RESI, REMI PI+

Figure 282: Reducing GHG Emissions from the Transportation Sector through Land Use and Location Efficiency Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$82,168,510	\$82,168,510
2011	\$0	\$95,711,365	\$95,711,365
2012	\$0	\$103,066,865	\$103,066,865
2013	\$0	\$104,401,085	\$104,401,085
2014	\$0	\$101,995,960	\$101,995,960
2015	\$0	\$97,396,840	\$97,396,840
2016	\$0	\$92,113,190	\$92,113,190
2017	\$0	\$86,706,725	\$86,706,725
2018	\$0	\$81,480,850	\$81,480,850
2019	\$0	\$77,032,160	\$77,032,160
2020	\$0	\$73,516,010	\$73,516,010
Average	\$0	\$90,508,142	\$90,508,142

Sources: RESI, REMI PI+

Figure 283: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1,200.6	1,627.5	2,828.1
2011	1,195.6	2,021.9	3,217.6
2012	1,174.9	2,182.8	3,357.7
2013	1,154.4	2,200.7	3,355.1
2014	1,133.8	2,146.5	3,280.2
2015	1,115.0	2,057.1	3,172.1
2016	1,097.6	1,960.0	3,057.6
2017	1,081.5	1,865.7	2,947.3
2018	1,066.7	1,778.2	2,844.9
2019	1,050.3	1,704.7	2,755.0
2020	1,005.6	1,654.4	2,659.9
Average	1,116.0	1,927.2	3,043.2

Sources: RESI, REMI PI+

Figure 284: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$148,170,087	\$228,795,972	\$376,966,059
2011	\$148,170,283	\$287,890,136	\$436,060,419
2012	\$148,169,709	\$317,420,026	\$465,589,735
2013	\$148,167,849	\$326,467,095	\$474,634,944
2014	\$148,164,620	\$324,788,252	\$472,952,871
2015	\$148,160,266	\$317,182,105	\$465,342,371
2016	\$148,155,075	\$307,663,620	\$455,818,695
2017	\$148,149,314	\$297,947,052	\$446,096,366
2018	\$148,143,236	\$288,799,152	\$436,942,387
2019	\$148,137,265	\$282,018,308	\$430,155,573
2020	\$140,733,238	\$271,138,293	\$411,871,531
Average	\$147,483,722	\$295,464,546	\$442,948,268

Sources: RESI, REMI PI+

Figure 285: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$83,222,782	\$63,602,438	\$146,825,220
2011	\$86,069,061	\$94,472,791	\$180,541,852
2012	\$88,900,435	\$114,228,283	\$203,128,719
2013	\$92,204,919	\$125,057,389	\$217,262,307
2014	\$95,775,650	\$129,792,310	\$225,567,960
2015	\$99,492,738	\$130,402,026	\$229,894,764
2016	\$103,457,522	\$128,838,770	\$232,296,292
2017	\$107,661,301	\$126,048,610	\$233,709,911
2018	\$112,105,562	\$122,568,320	\$234,673,882
2019	\$116,651,208	\$119,445,338	\$236,096,546
2020	\$117,522,121	\$106,093,832	\$223,615,953
Average	\$100,278,482	\$114,595,464	\$214,873,946

Sources: RESI, REMI PI+

Figure 286: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	1,350.7	1,830.9	3,181.6
2011	1,345.1	2,274.7	3,619.8
2012	1,321.8	2,455.6	3,777.4
2013	1,298.7	2,475.8	3,774.5
2014	1,275.5	2,414.8	3,690.3
2015	1,254.4	2,314.3	3,568.6
2016	1,234.8	2,205.0	3,439.8
2017	1,216.7	2,098.9	3,315.7
2018	1,200.0	2,000.5	3,200.5
2019	1,181.6	1,917.7	3,099.4
2020	1,131.3	1,861.2	2,992.4
Average	1,255.5	2,168.1	3,423.6

Sources: RESI, REMI PI+

Figure 287: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$285,364,612	\$440,644,094	\$726,008,706
2011	\$285,364,989	\$554,455,077	\$839,820,066
2012	\$285,363,884	\$611,327,457	\$896,691,341
2013	\$285,360,303	\$628,751,442	\$914,111,744
2014	\$285,354,082	\$625,518,114	\$910,872,196
2015	\$285,345,697	\$610,869,240	\$896,214,937
2016	\$285,335,700	\$592,537,342	\$877,873,042
2017	\$285,324,605	\$573,823,952	\$859,148,557
2018	\$285,312,898	\$556,205,774	\$841,518,672
2019	\$285,301,400	\$543,146,370	\$828,447,770
2020	\$271,041,791	\$522,192,268	\$793,234,059
Average	\$284,042,724	\$569,042,830	\$853,085,553

Sources: RESI, REMI PI+

Figure 288: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$184,939,516	\$141,338,751	\$326,278,268
2011	\$191,264,579	\$209,939,536	\$401,204,115
2012	\$197,556,523	\$253,840,629	\$451,397,153
2013	\$204,899,819	\$277,905,308	\$482,805,128
2014	\$212,834,777	\$288,427,355	\$501,262,133
2015	\$221,094,973	\$289,782,279	\$510,877,253
2016	\$229,905,605	\$286,308,377	\$516,213,983
2017	\$239,247,335	\$280,108,023	\$519,355,358
2018	\$249,123,472	\$272,374,043	\$521,497,515
2019	\$259,224,906	\$265,434,084	\$524,658,990
2020	\$261,160,268	\$235,764,072	\$496,924,340
Average	\$222,841,070	\$254,656,587	\$477,497,657

Sources: RESI, REMI PI+

Figure 289: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	1,151.4	1,151.4
2011	0.0	1,295.5	1,295.5
2012	0.0	1,361.8	1,361.8
2013	0.0	1,367.0	1,367.0
2014	0.0	1,339.1	1,339.1
2015	0.0	1,296.9	1,296.9
2016	0.0	1,253.9	1,253.9
2017	0.0	1,213.0	1,213.0
2018	0.0	1,174.5	1,174.5
2019	0.0	1,142.4	1,142.4
2020	0.0	1,116.4	1,116.4
Average	0.0	1,246.5	1,246.5

Sources: RESI, REMI PI+

Figure 290: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$292,241,383	\$292,241,383
2011	\$0	\$335,186,272	\$335,186,272
2012	\$0	\$359,789,935	\$359,789,935
2013	\$0	\$366,402,348	\$366,402,348
2014	\$0	\$363,037,937	\$363,037,937
2015	\$0	\$354,483,799	\$354,483,799
2016	\$0	\$344,731,793	\$344,731,793
2017	\$0	\$334,916,712	\$334,916,712
2018	\$0	\$325,360,955	\$325,360,955
2019	\$0	\$318,130,550	\$318,130,550
2020	\$0	\$313,044,005	\$313,044,005
Average	\$0	\$337,029,608	\$337,029,608

Sources: RESI, REMI PI+

Figure 291: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$89,481,507	\$89,481,507
2011	\$0	\$104,229,676	\$104,229,676
2012	\$0	\$112,239,816	\$112,239,816
2013	\$0	\$113,692,782	\$113,692,782
2014	\$0	\$111,073,600	\$111,073,600
2015	\$0	\$106,065,159	\$106,065,159
2016	\$0	\$100,311,264	\$100,311,264
2017	\$0	\$94,423,624	\$94,423,624
2018	\$0	\$88,732,646	\$88,732,646
2019	\$0	\$83,888,022	\$83,888,022
2020	\$0	\$80,058,935	\$80,058,935
Average	\$0	\$98,563,366	\$98,563,366

Sources: RESI, REMI PI+

Figure 292: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	1,832.7	1,832.7
2011	0.0	2,062.0	2,062.0
2012	0.0	2,167.5	2,167.5
2013	0.0	2,175.8	2,175.8
2014	0.0	2,131.4	2,131.4
2015	0.0	2,064.3	2,064.3
2016	0.0	1,995.8	1,995.8
2017	0.0	1,930.7	1,930.7
2018	0.0	1,869.4	1,869.4
2019	0.0	1,818.3	1,818.3
2020	0.0	1,777.0	1,777.0
Average	0.0	1,984.1	1,984.1

Sources: RESI, REMI PI+

Figure 293: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$348,864,828	\$348,864,828
2011	\$0	\$400,130,536	\$400,130,536
2012	\$0	\$429,501,300	\$429,501,300
2013	\$0	\$437,394,906	\$437,394,906
2014	\$0	\$433,378,621	\$433,378,621
2015	\$0	\$423,167,069	\$423,167,069
2016	\$0	\$411,525,556	\$411,525,556
2017	\$0	\$399,808,747	\$399,808,747
2018	\$0	\$388,401,507	\$388,401,507
2019	\$0	\$379,770,170	\$379,770,170
2020	\$0	\$373,698,078	\$373,698,078
Average	\$0	\$402,331,029	\$402,331,029

Sources: RESI, REMI PI+

Figure 294: Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$123,252,765	\$123,252,765
2011	\$0	\$143,567,048	\$143,567,048
2012	\$0	\$154,600,298	\$154,600,298
2013	\$0	\$156,601,628	\$156,601,628
2014	\$0	\$152,993,940	\$152,993,940
2015	\$0	\$146,095,260	\$146,095,260
2016	\$0	\$138,169,785	\$138,169,785
2017	\$0	\$130,060,088	\$130,060,088
2018	\$0	\$122,221,275	\$122,221,275
2019	\$0	\$115,548,240	\$115,548,240
2020	\$0	\$110,274,015	\$110,274,015
Average	\$0	\$135,762,213	\$135,762,213

Sources: RESI, REMI PI+

A.7 Innovative Initiatives

Figure 295: Buy Local for GHG Benefits—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	42.2	41.7	83.9
2011	42.4	41.4	83.8
2012	40.6	39.7	80.3
2013	15.0	14.6	29.7
2014	13.8	13.2	27.0
2015	13.2	12.8	26.1
2016	12.6	12.2	24.8
2017	12.1	11.8	24.0
2018	12.5	12.3	24.8
2019	12.1	11.6	23.6
2020	11.6	11.2	22.8
Average	20.7	20.2	41.0

Sources: RESI, REMI PI+

Figure 296: Buy Local for GHG Benefits—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$540,594	\$527,521	\$1,068,115
2011	\$556,039	\$542,593	\$1,098,633
2012	\$525,148	\$512,449	\$1,037,598
2013	\$200,792	\$195,937	\$396,729
2014	\$123,564	\$120,576	\$244,141
2015	\$123,564	\$120,576	\$244,141
2016	\$92,673	\$90,432	\$183,105
2017	\$61,782	\$60,288	\$122,070
2018	\$154,455	\$150,720	\$305,176
2019	\$61,782	\$60,288	\$122,070
2020	\$61,782	\$60,288	\$122,070
Average	\$227,471	\$221,970	\$449,441

Sources: RESI, REMI PI+

Figure 297: Buy Local for GHG Benefits—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$417,030	\$406,945	\$823,975
2011	\$482,673	\$471,001	\$953,674
2012	\$509,703	\$497,377	\$1,007,080
2013	\$274,158	\$267,529	\$541,687
2014	\$231,683	\$226,081	\$457,764
2015	\$220,099	\$214,777	\$434,875
2016	\$195,000	\$190,285	\$385,284
2017	\$177,624	\$173,328	\$350,952
2018	\$181,485	\$177,096	\$358,582
2019	\$171,832	\$167,676	\$339,508
2020	\$158,317	\$154,488	\$312,805
Average	\$274,509	\$267,871	\$542,381

Sources: RESI, REMI PI+

Figure 298: Buy Local for GHG Benefits—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	3.2	2.8	6.0
2011	4.1	3.5	7.5
2012	3.2	2.8	6.0
2013	3.5	2.9	6.4
2014	3.5	2.9	6.4
2015	3.2	2.5	5.7
2016	2.3	1.9	4.2
2017	2.4	2.0	4.4
2018	3.2	2.7	5.9
2019	2.9	2.3	5.2
2020	2.6	2.1	4.6
Average	3.1	2.6	5.7

Sources: RESI, REMI PI+

Figure 299: Buy Local for GHG Benefits—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$648,928	\$541,257	\$1,190,186
2011	\$698,846	\$582,892	\$1,281,738
2012	\$665,567	\$555,136	\$1,220,703
2013	\$648,928	\$541,257	\$1,190,186
2014	\$632,289	\$527,379	\$1,159,668
2015	\$599,011	\$499,622	\$1,098,633
2016	\$565,732	\$471,865	\$1,037,598
2017	\$565,732	\$471,865	\$1,037,598
2018	\$632,289	\$527,379	\$1,159,668
2019	\$565,732	\$471,865	\$1,037,598
2020	\$565,732	\$471,865	\$1,037,598
Average	\$617,163	\$514,762	\$1,131,925

Sources: RESI, REMI PI+

Figure 300: Buy Local for GHG Benefits—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$83,196	\$69,392	\$152,588
2011	\$114,394	\$95,414	\$209,808
2012	\$108,155	\$90,210	\$198,364
2013	\$122,714	\$102,353	\$225,067
2014	\$131,034	\$109,292	\$240,326
2015	\$120,634	\$100,618	\$221,252
2016	\$112,315	\$93,679	\$205,994
2017	\$110,235	\$91,944	\$202,179
2018	\$131,034	\$109,292	\$240,326
2019	\$112,315	\$93,679	\$205,994
2020	\$108,155	\$90,210	\$198,364
Average	\$114,016	\$95,099	\$209,115

Sources: RESI, REMI PI+

Figure 301: Voluntary Stationary Source Reductions—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.5	0.3	0.8
2011	0.5	0.3	0.7
2012	0.2	0.1	0.4
2013	0.2	0.0	0.3
2014	0.5	0.2	0.6
2015	0.2	0.1	0.3
2016	0.7	0.3	1.0
2017	0.5	0.0	0.4
2018	0.2	-0.2	0.0
2019	0.5	0.2	0.7
2020	-0.1	-0.2	-0.3
Average	0.4	0.1	0.4

Sources: RESI, REMI PI+

Figure 302: Voluntary Stationary Source Reductions—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$48,375	\$12,661	\$61,035
2011	\$24,187	\$6,330	\$30,518
2012	\$24,187	\$6,330	\$30,518
2013	\$24,187	\$6,330	\$30,518
2014	\$48,375	\$12,661	\$61,035
2015	\$0	\$0	\$0
2016	\$48,375	\$12,661	\$61,035
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$48,375	\$12,661	\$61,035
2020	\$0	\$0	\$0
Average	\$24,187	\$6,330	\$30,518

Sources: RESI, REMI PI+

Figure 303: Voluntary Stationary Source Reductions—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$12,094	\$3,165	\$15,259
2011	\$12,094	\$3,165	\$15,259
2012	\$0	\$0	\$0
2013	\$12,094	\$3,165	\$15,259
2014	\$12,094	\$3,165	\$15,259
2015	\$12,094	\$3,165	\$15,259
2016	\$24,187	\$6,330	\$30,518
2017	\$24,187	\$6,330	\$30,518
2018	\$12,094	\$3,165	\$15,259
2019	\$24,187	\$6,330	\$30,518
2020	\$24,187	\$6,330	\$30,518
Average	\$15,392	\$4,028	\$19,420

Sources: RESI, REMI PI+

Figure 304: Voluntary Stationary Source Reductions—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	1.2	0.8	2.0
2012	1.4	1.3	2.7
2013	1.7	1.7	3.4
2014	2.7	2.1	4.9
2015	2.3	1.9	4.2
2016	3.0	2.4	5.4
2017	2.9	2.4	5.2
2018	2.8	2.5	5.3
2019	2.8	2.6	5.4
2020	2.3	1.9	4.3
Average	2.1	1.8	3.9

Sources: RESI, REMI PI+

Figure 305: Voluntary Stationary Source Reductions—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$99,292	\$83,814	\$183,105
2012	\$165,486	\$139,690	\$305,176
2013	\$198,583	\$167,628	\$366,211
2014	\$281,326	\$237,473	\$518,799
2015	\$264,777	\$223,504	\$488,281
2016	\$297,875	\$251,442	\$549,316
2017	\$297,875	\$251,442	\$549,316
2018	\$330,972	\$279,380	\$610,352
2019	\$364,069	\$307,318	\$671,387
2020	\$297,875	\$251,442	\$549,316
Average	\$236,194	\$199,376	\$435,569

Sources: RESI, REMI PI+

Figure 306: Voluntary Stationary Source Reductions—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$24,823	\$20,953	\$45,776
2012	\$41,371	\$34,922	\$76,294
2013	\$66,194	\$55,876	\$122,070
2014	\$74,469	\$62,860	\$137,329
2015	\$82,743	\$69,845	\$152,588
2016	\$99,292	\$83,814	\$183,105
2017	\$115,840	\$97,783	\$213,623
2018	\$99,292	\$83,814	\$183,105
2019	\$124,114	\$104,767	\$228,882
2020	\$124,114	\$104,767	\$228,882
Average	\$77,477	\$65,400	\$142,878

Sources: RESI, REMI PI+

Figure 307: PAYD Insurance in Maryland—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 308: PAYD Insurance in Maryland—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 309: PAYD Insurance in Maryland—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 310: PAYD Insurance in Maryland—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-0.2	-0.2	-0.5
2011	0.0	-0.1	-0.1
2012	-0.2	-0.3	-0.5
2013	-0.5	-0.3	-0.7
2014	0.2	0.1	0.3
2015	0.0	-0.1	-0.1
2016	0.2	0.3	0.6
2017	0.0	-0.2	-0.2
2018	0.0	0.0	0.0
2019	0.0	0.1	0.1
2020	0.3	0.3	0.6
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 311: PAYD Insurance in Maryland—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$27,271	-\$3,247	-\$30,518
2011	-\$27,271	-\$3,247	-\$30,518
2012	-\$54,542	-\$6,493	-\$61,035
2013	-\$54,542	-\$6,493	-\$61,035
2014	\$0	\$0	\$0
2015	-\$54,542	-\$6,493	-\$61,035
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$54,542	\$6,493	\$61,035
2020	\$54,542	\$6,493	\$61,035
Average	-\$9,917	-\$1,181	-\$11,097

Sources: RESI, REMI PI+

Figure 312: PAYD Insurance in Maryland—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	-\$13,636	-\$1,623	-\$15,259
2011	-\$13,636	-\$1,623	-\$15,259
2012	-\$13,636	-\$1,623	-\$15,259
2013	\$0	\$0	\$0
2014	\$13,636	\$1,623	\$15,259
2015	\$0	\$0	\$0
2016	\$13,636	\$1,623	\$15,259
2017	\$13,636	\$1,623	\$15,259
2018	\$0	\$0	\$0
2019	\$13,636	\$1,623	\$15,259
2020	\$13,636	\$1,623	\$15,259
Average	\$2,479	\$295	\$2,774

Sources: RESI, REMI PI+

Figure 313: Leadership-by-Example-Local Government—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	123.3	45.3	168.6
2011	125.5	47.0	172.5
2012	124.3	46.1	170.4
2013	122.6	44.7	167.2
2014	120.0	42.4	162.4
2015	116.9	40.3	157.2
2016	114.6	38.9	153.6
2017	113.1	37.9	151.0
2018	111.2	37.1	148.4
2019	109.8	35.9	145.7
2020	109.2	35.3	144.5
Average	117.3	41.0	158.3

Sources: RESI, REMI PI+

Figure 314: Leadership-by-Example-Local Government—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$9,656,407	\$3,374,599	\$13,031,006
2011	\$9,814,709	\$3,429,920	\$13,244,629
2012	\$9,746,865	\$3,406,211	\$13,153,076
2013	\$9,565,949	\$3,342,986	\$12,908,936
2014	\$9,430,262	\$3,295,568	\$12,725,830
2015	\$9,271,960	\$3,240,247	\$12,512,207
2016	\$9,136,273	\$3,192,829	\$12,329,102
2017	\$9,091,044	\$3,177,023	\$12,268,066
2018	\$9,045,815	\$3,161,216	\$12,207,031
2019	\$9,045,815	\$3,161,216	\$12,207,031
2020	\$9,045,815	\$3,161,216	\$12,207,031
Average	\$9,350,083	\$3,267,548	\$12,617,631

Sources: RESI, REMI PI+

Figure 315: Leadership-by-Example-Local Government—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$4,500,293	\$1,572,705	\$6,072,998
2011	\$4,918,662	\$1,718,911	\$6,637,573
2012	\$5,178,729	\$1,809,796	\$6,988,525
2013	\$5,348,338	\$1,869,069	\$7,217,407
2014	\$5,551,869	\$1,940,197	\$7,492,065
2015	\$5,721,478	\$1,999,469	\$7,720,947
2016	\$5,879,780	\$2,054,791	\$7,934,570
2017	\$6,038,081	\$2,110,112	\$8,148,193
2018	\$6,207,690	\$2,169,385	\$8,377,075
2019	\$6,332,070	\$2,212,851	\$8,544,922
2020	\$6,433,836	\$2,248,415	\$8,682,251
Average	\$5,646,439	\$1,973,246	\$7,619,684

Sources: RESI, REMI PI+

Figure 316: Leadership-by-Example-Local Government—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	1,484.9	352.5	1,837.4
Average	1,484.9	352.5	1,837.4

Sources: RESI, REMI PI+

Figure 317: Leadership-by-Example-Local Government—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$79,885,067	\$29,428,898	\$109,313,965
Average	\$79,885,067	\$29,428,898	\$109,313,965

Sources: RESI, REMI PI+

Figure 318: Leadership-by-Example-Local Government—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$75,413,555	\$27,781,635	\$103,195,190
Average	\$75,413,555	\$27,781,635	\$103,195,190

Sources: RESI, REMI PI+

Figure 319: Leadership-by-Example-Federal Government—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	77.3	28.6	105.9
2011	78.5	29.4	108.0
2012	77.9	28.8	106.8
2013	77.0	28.2	105.2
2014	75.4	27.0	102.5
2015	73.0	25.2	98.2
2016	72.0	24.6	96.6
2017	70.6	23.5	94.1
2018	69.1	22.8	91.9
2019	68.1	22.2	90.3
2020	67.3	21.2	88.5
Average	73.3	25.6	98.9

Sources: RESI, REMI PI+

Figure 320: Leadership-by-Example-Federal Government—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$6,061,465	\$2,117,246	\$8,178,711
2011	\$6,151,935	\$2,148,846	\$8,300,781
2012	\$6,106,700	\$2,133,046	\$8,239,746
2013	\$6,016,230	\$2,101,445	\$8,117,676
2014	\$5,970,996	\$2,085,645	\$8,056,641
2015	\$5,790,056	\$2,022,444	\$7,812,500
2016	\$5,744,822	\$2,006,643	\$7,751,465
2017	\$5,699,587	\$1,990,843	\$7,690,430
2018	\$5,654,352	\$1,975,043	\$7,629,395
2019	\$5,654,352	\$1,975,043	\$7,629,395
2020	\$5,563,882	\$1,943,442	\$7,507,324
Average	\$5,855,852	\$2,045,426	\$7,901,278

Sources: RESI, REMI PI+

Figure 321: Leadership-by-Example-Federal Government—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$2,827,176	\$987,521	\$3,814,697
2011	\$3,064,659	\$1,070,473	\$4,135,132
2012	\$3,256,907	\$1,137,625	\$4,394,531
2013	\$3,369,994	\$1,177,125	\$4,547,119
2014	\$3,517,007	\$1,228,476	\$4,745,483
2015	\$3,584,859	\$1,252,177	\$4,837,036
2016	\$3,697,946	\$1,291,678	\$4,989,624
2017	\$3,811,033	\$1,331,179	\$5,142,212
2018	\$3,912,812	\$1,366,729	\$5,279,541
2019	\$3,969,355	\$1,386,480	\$5,355,835
2020	\$4,014,590	\$1,402,280	\$5,416,870
Average	\$3,547,849	\$1,239,249	\$4,787,098

Sources: RESI, REMI PI+

Figure 322: Leadership-by-Example-Federal Government—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	977.8	280.6	1,258.4
Average	977.8	280.6	1,258.4

Sources: RESI, REMI PI+

Figure 323: Leadership-by-Example-Federal Government—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$64,437,579	\$27,664,472	\$92,102,051
Average	\$64,437,579	\$27,664,472	\$92,102,051

Sources: RESI, REMI PI+

Figure 324: Leadership-by-Example-Federal Government—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$48,114,673	\$20,656,689	\$68,771,362
Average	\$48,114,673	\$20,656,689	\$68,771,362

Sources: RESI, REMI PI+

Figure 325: State of Maryland Initiative to Lead by Example Status Quo—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	44.9	42.2	87.1
2011	15.7	14.6	30.3
2012	24.7	23.0	47.8
2013	88.9	83.6	172.5
2014	88.1	83.0	171.1
2015	86.3	81.2	167.5
2016	84.0	79.2	163.2
2017	81.8	77.1	158.9
2018	85.9	81.0	166.9
2019	12.6	11.7	24.3
2020	10.3	9.6	19.9
Average	56.7	53.3	110.0

Sources: RESI, REMI PI+

Figure 326: State of Maryland Initiative to Lead by Example Status Quo—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$2,532,427	\$2,380,903	\$4,913,330
2011	\$865,115	\$813,352	\$1,678,467
2012	\$1,368,454	\$1,286,575	\$2,655,029
2013	\$5,017,666	\$4,717,441	\$9,735,107
2014	\$4,844,643	\$4,554,771	\$9,399,414
2015	\$4,781,726	\$4,495,618	\$9,277,344
2016	\$4,655,891	\$4,377,312	\$9,033,203
2017	\$4,467,138	\$4,199,854	\$8,666,992
2018	\$4,718,808	\$4,436,465	\$9,155,273
2019	\$220,211	\$207,035	\$427,246
2020	\$62,917	\$59,153	\$122,070
Average	\$3,048,636	\$2,866,225	\$5,914,862

Sources: RESI, REMI PI+

Figure 327: State of Maryland Initiative to Lead by Example Status Quo—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,034,205	\$972,325	\$2,006,531
2011	\$414,862	\$390,039	\$804,901
2012	\$639,005	\$600,771	\$1,239,777
2013	\$2,229,637	\$2,096,230	\$4,325,867
2014	\$2,373,167	\$2,231,172	\$4,604,340
2015	\$2,483,273	\$2,334,690	\$4,817,963
2016	\$2,552,089	\$2,399,388	\$4,951,477
2017	\$2,577,649	\$2,423,419	\$5,001,068
2018	\$2,778,198	\$2,611,969	\$5,390,167
2019	\$652,768	\$613,711	\$1,266,479
2020	\$462,050	\$434,404	\$896,454
Average	\$1,654,264	\$1,555,284	\$3,209,548

Sources: RESI, REMI PI+

Figure 328: State of Maryland Initiative to Lead by Example Enhancement—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	44.9	42.2	87.1
2011	15.7	14.6	30.3
2012	24.7	23.0	47.8
2013	88.9	83.6	172.5
2014	88.1	83.0	171.1
2015	117.7	110.7	228.4
2016	114.6	108.0	222.6
2017	111.6	105.1	216.7
2018	117.2	110.4	227.6
2019	17.2	15.9	33.1
2020	14.1	13.0	27.1
Average	68.6	64.5	133.1

Sources: RESI, REMI PI+

Figure 329: State of Maryland Initiative to Lead by Example Enhancement—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$2,532,427	\$2,380,903	\$4,913,330
2011	\$865,115	\$813,352	\$1,678,467
2012	\$1,368,454	\$1,286,575	\$2,655,029
2013	\$5,017,666	\$4,717,441	\$9,735,107
2014	\$4,844,643	\$4,554,771	\$9,399,414
2015	\$6,520,535	\$6,130,388	\$12,650,924
2016	\$6,348,942	\$5,969,062	\$12,318,005
2017	\$6,091,553	\$5,727,073	\$11,818,626
2018	\$6,434,739	\$6,049,725	\$12,484,464
2019	\$300,288	\$282,321	\$582,608
2020	\$85,797	\$80,663	\$166,460
Average	\$3,673,651	\$3,453,843	\$7,127,494

Sources: RESI, REMI PI+

Figure 330: State of Maryland Initiative to Lead by Example Enhancement—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,034,205	\$972,325	\$2,006,531
2011	\$414,862	\$390,039	\$804,901
2012	\$639,005	\$600,771	\$1,239,777
2013	\$2,229,637	\$2,096,230	\$4,325,867
2014	\$2,373,167	\$2,231,172	\$4,604,340
2015	\$3,386,281	\$3,183,668	\$6,569,949
2016	\$3,480,121	\$3,271,893	\$6,752,014
2017	\$3,514,976	\$3,304,663	\$6,819,639
2018	\$3,788,452	\$3,561,776	\$7,350,228
2019	\$890,139	\$836,879	\$1,727,018
2020	\$630,068	\$592,369	\$1,222,437
Average	\$2,034,629	\$1,912,890	\$3,947,518

Sources: RESI, REMI PI+

Figure 331: State of Maryland Initiative to Lead by Example Status Quo—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.2	0.5	0.7
2011	0.0	0.0	0.0
2012	0.0	0.1	0.1
2013	0.4	0.5	0.9
2014	1.4	1.4	2.8
2015	0.6	0.5	1.1
2016	-0.1	0.1	0.0
2017	0.4	0.4	0.8
2018	0.7	0.7	1.4
2019	-0.1	-0.1	-0.2
2020	0.0	0.1	0.1
Average	0.3	0.4	0.7

Sources: RESI, REMI PI+

Figure 332: State of Maryland Initiative to Lead by Example Status Quo—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$13,603	-\$16,914	-\$30,518
2012	\$0	\$0	\$0
2013	-\$27,207	-\$33,828	-\$61,035
2014	-\$81,621	-\$101,484	-\$183,105
2015	-\$81,621	-\$101,484	-\$183,105
2016	-\$81,621	-\$101,484	-\$183,105
2017	-\$81,621	-\$101,484	-\$183,105
2018	-\$54,414	-\$67,656	-\$122,070
2019	-\$81,621	-\$101,484	-\$183,105
2020	-\$54,414	-\$67,656	-\$122,070
Average	-\$50,704	-\$63,043	-\$113,747

Sources: RESI, REMI PI+

Figure 333: State of Maryland Initiative to Lead by Example Status Quo—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$3,401	\$4,229	\$7,629
2011	-\$1,700	-\$2,114	-\$3,815
2012	\$0	\$0	\$0
2013	-\$1,700	-\$2,114	-\$3,815
2014	\$5,101	\$6,343	\$11,444
2015	-\$8,502	-\$10,571	-\$19,073
2016	-\$6,802	-\$8,457	-\$15,259
2017	-\$1,700	-\$2,114	-\$3,815
2018	\$0	\$0	\$0
2019	-\$8,502	-\$10,571	-\$19,073
2020	-\$3,401	-\$4,229	-\$7,629
Average	-\$2,164	-\$2,691	-\$4,855

Sources: RESI, REMI PI+

Figure 334: State of Maryland Initiative to Lead by Example Enhancement—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.2	0.5	0.7
2011	0.0	0.0	0.0
2012	0.0	0.1	0.1
2013	0.4	0.5	0.9
2014	1.4	1.4	2.8
2015	0.8	0.7	1.6
2016	-0.1	0.1	0.0
2017	0.5	0.6	1.1
2018	0.9	1.0	1.9
2019	-0.2	-0.1	-0.3
2020	0.0	0.1	0.1
Average	0.4	0.4	0.8

Sources: RESI, REMI PI+

Figure 335: State of Maryland Initiative to Lead by Example Enhancement—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	-\$13,603	-\$16,914	-\$30,518
2012	\$0	\$0	\$0
2013	-\$27,207	-\$33,828	-\$61,035
2014	-\$81,621	-\$101,484	-\$183,105
2015	-\$111,301	-\$138,388	-\$249,689
2016	-\$111,301	-\$138,388	-\$249,689
2017	-\$111,301	-\$138,388	-\$249,689
2018	-\$74,201	-\$92,259	-\$166,460
2019	-\$111,301	-\$138,388	-\$249,689
2020	-\$74,201	-\$92,259	-\$166,460
Average	-\$65,094	-\$80,936	-\$146,030

Sources: RESI, REMI PI+

Figure 336: State of Maryland Initiative to Lead by Example Enhancement—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$3,401	\$4,229	\$7,629
2011	-\$1,700	-\$2,114	-\$3,815
2012	\$0	\$0	\$0
2013	-\$1,700	-\$2,114	-\$3,815
2014	\$5,101	\$6,343	\$11,444
2015	-\$11,594	-\$14,415	-\$26,009
2016	-\$9,275	-\$11,532	-\$20,807
2017	-\$2,319	-\$2,883	-\$5,202
2018	\$0	\$0	\$0
2019	-\$11,594	-\$14,415	-\$26,009
2020	-\$4,638	-\$5,766	-\$10,404
Average	-\$3,120	-\$3,879	-\$6,999

Sources: RESI, REMI PI+

Economic Impact Analysis for the GGRA 2012 Plan—Appendices A and B
RESI of Towson University

Figure 337: Leadership-by-Example-Maryland Colleges and Universities—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	74.4	27.5	101.9
2011	75.7	28.6	104.3
2012	75.0	27.8	102.9
2013	74.4	27.5	101.9
2014	72.9	26.2	99.1
2015	70.5	24.6	95.0
2016	69.2	23.8	93.0
2017	68.1	22.8	91.0
2018	67.1	22.4	89.4
2019	65.4	21.1	86.5
2020	65.2	20.6	85.8
Average	70.7	24.8	95.5

Sources: RESI, REMI PI+

Figure 338: Leadership-by-Example-Maryland Colleges and Universities—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$5,806,837	\$2,036,180	\$7,843,018
2011	\$5,942,405	\$2,083,718	\$8,026,123
2012	\$5,874,621	\$2,059,949	\$7,934,570
2013	\$5,806,837	\$2,036,180	\$7,843,018
2014	\$5,761,648	\$2,020,335	\$7,781,982
2015	\$5,603,485	\$1,964,874	\$7,568,359
2016	\$5,513,106	\$1,933,183	\$7,446,289
2017	\$5,467,917	\$1,917,337	\$7,385,254
2018	\$5,467,917	\$1,917,337	\$7,385,254
2019	\$5,422,727	\$1,901,491	\$7,324,219
2020	\$5,377,538	\$1,885,646	\$7,263,184
Average	\$5,640,458	\$1,977,839	\$7,618,297

Sources: RESI, REMI PI+

Economic Impact Analysis for the GGRA 2012 Plan—Appendices A and B
RESI of Towson University

Figure 339: Leadership-by-Example-Maryland Colleges and Universities—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$2,722,661	\$954,707	\$3,677,368
2011	\$2,937,311	\$1,029,974	\$3,967,285
2012	\$3,129,366	\$1,097,319	\$4,226,685
2013	\$3,264,934	\$1,144,856	\$4,409,790
2014	\$3,377,907	\$1,184,471	\$4,562,378
2015	\$3,468,286	\$1,216,162	\$4,684,448
2016	\$3,547,367	\$1,243,892	\$4,791,260
2017	\$3,660,341	\$1,283,507	\$4,943,848
2018	\$3,773,314	\$1,323,121	\$5,096,436
2019	\$3,818,504	\$1,338,967	\$5,157,471
2020	\$3,886,288	\$1,362,735	\$5,249,023
Average	\$3,416,934	\$1,198,156	\$4,615,090

Sources: RESI, REMI PI+

Figure 340: Leadership-by-Example-Maryland Colleges and Universities—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	78.0	18.1	96.0
Average	78.0	18.1	96.0

Sources: RESI, REMI PI+

Figure 341: Leadership-by-Example-Maryland Colleges and Universities—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$4,123,262	\$1,491,972	\$5,615,234
Average	\$4,123,262	\$1,491,972	\$5,615,234

Sources: RESI, REMI PI+

Figure 342: Leadership-by-Example-Maryland Colleges and Universities—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$3,955,194	\$1,431,158	\$5,386,353
Average	\$3,955,194	\$1,431,158	\$5,386,353

Sources: RESI, REMI PI+

Figure 343: Transportation Climate Initiative—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 344: Transportation Climate Initiative—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 345: Transportation Climate Initiative—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 346: Transportation Climate Initiative—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.6	0.6	1.4
2014	1.4	0.3	1.7
2015	0.6	0.3	0.9
2016	2.0	0.9	2.6
2017	1.4	0.6	1.7
2018	0.6	0.0	0.6
2019	0.6	0.0	0.9
2020	0.6	0.0	0.6
Average	1.0	0.3	1.3

Sources: RESI, REMI PI+

Figure 347: Transportation Climate Initiative—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$63,960	\$23,231	\$87,194
2014	\$127,920	\$46,466	\$174,386
2015	\$0	\$0	\$0
2016	\$127,920	\$46,466	\$174,386
2017	\$127,920	\$46,466	\$174,386
2018	\$0	\$0	\$0
2019	\$127,920	\$46,466	\$174,386
2020	\$0	\$0	\$0
Average	\$18,316	\$6,653	\$98,092

Sources: RESI, REMI PI+

Figure 348: Transportation Climate Initiative—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$63,960	\$23,231	\$87,194
2014	\$31,980	\$11,617	\$43,597
2015	\$31,980	\$11,617	\$43,597
2016	\$95,940	\$34,849	\$130,789
2017	\$127,920	\$46,466	\$174,386
2018	\$31,980	\$11,617	\$43,597
2019	\$63,960	\$23,231	\$87,194
2020	\$63,960	\$23,231	\$87,194
Average	\$46,516	\$16,896	\$87,194

Sources: RESI, REMI PI+

Figure 349: Greenhouse Gas Emissions Inventory Development—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	16.1	6.1	22.2
2011	16.6	6.5	23.2
2012	16.5	6.5	23.0
2013	16.2	6.3	22.5
2014	16.1	6.0	22.2
2015	15.5	5.4	20.9
2016	15.0	5.3	20.4
2017	14.9	5.1	20.0
2018	15.1	5.4	20.6
2019	14.7	5.2	20.0
2020	14.4	4.9	19.3
Average	15.6	5.7	21.3

Sources: RESI, REMI PI+

Figure 350: Greenhouse Gas Emissions Inventory Development —Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$1,250,023	\$458,961	\$1,708,984
2011	\$1,272,345	\$467,157	\$1,739,502
2012	\$1,316,988	\$483,549	\$1,800,537
2013	\$1,272,345	\$467,157	\$1,739,502
2014	\$1,294,667	\$475,353	\$1,770,020
2015	\$1,205,379	\$442,570	\$1,647,949
2016	\$1,205,379	\$442,570	\$1,647,949
2017	\$1,205,379	\$442,570	\$1,647,949
2018	\$1,205,379	\$442,570	\$1,647,949
2019	\$1,250,023	\$458,961	\$1,708,984
2020	\$1,205,379	\$442,570	\$1,647,949
Average	\$1,243,935	\$456,726	\$1,700,661

Sources: RESI, REMI PI+

Figure 351: Greenhouse Gas Emissions Inventory Development —Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$580,368	\$213,089	\$793,457
2011	\$625,011	\$229,481	\$854,492
2012	\$691,977	\$254,068	\$946,045
2013	\$714,299	\$262,264	\$976,563
2014	\$725,460	\$266,362	\$991,821
2015	\$747,782	\$274,557	\$1,022,339
2016	\$758,942	\$278,655	\$1,037,598
2017	\$792,425	\$290,949	\$1,083,374
2018	\$825,908	\$303,242	\$1,129,150
2019	\$837,069	\$307,340	\$1,144,409
2020	\$825,908	\$303,242	\$1,129,150
Average	\$738,650	\$271,205	\$1,009,854

Sources: RESI, REMI PI+

Figure 352: Greenhouse Gas Emissions Inventory Development —Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 353: Greenhouse Gas Emissions Inventory Development —Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 354: Greenhouse Gas Emissions Inventory Development —Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

A.8 Outreach

Figure 355: Outreach and Public Education—Investment Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.0	0.0	0.0
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.0	0.0	0.0
2018	0.0	0.0	0.0
2019	0.0	0.0	0.0
2020	0.0	0.0	0.0
Average	0.0	0.0	0.0

Sources: RESI, REMI PI+

Figure 356: Outreach and Public Education—Investment Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 357: Outreach and Public Education—Investment Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$0	\$0	\$0
Average	\$0	\$0	\$0

Sources: RESI, REMI PI+

Figure 358: Outreach and Public Education—Operation Phase, Employment Impacts

Fiscal Year	Direct	Spinoff	Total
2010	0.0	0.0	0.0
2011	0.0	0.0	0.0
2012	0.1	0.0	0.1
2013	0.0	0.0	0.0
2014	0.0	0.0	0.0
2015	0.0	0.0	0.0
2016	0.0	-0.1	-0.1
2017	0.3	0.1	0.4
2018	0.3	0.1	0.4
2019	0.0	0.2	0.3
2020	0.1	0.0	0.1
Average	0.1	0.0	0.1

Sources: RESI, REMI PI+

Figure 359: Outreach and Public Education—Operation Phase, Output Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$23,703	\$6,815	\$30,518
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$0	\$0	\$0
2018	\$0	\$0	\$0
2019	\$47,406	\$13,629	\$61,035
2020	\$47,406	\$13,629	\$61,035
Average	\$10,774	\$3,098	\$13,872

Sources: RESI, REMI PI+

Figure 360: Outreach and Public Education—Operation Phase, Wage Impacts

Fiscal Year	Direct	Spinoff	Total
2010	\$0	\$0	\$0
2011	\$0	\$0	\$0
2012	\$0	\$0	\$0
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$11,851	\$3,407	\$15,259
2018	\$0	\$0	\$0
2019	\$23,703	\$6,815	\$30,518
2020	\$11,851	\$3,407	\$15,259
Average	\$4,310	\$1,239	\$5,549

Sources: RESI, REMI PI+

Appendix B—Methodology

B.1 General Overview

Several Maryland state agencies have several strategies and subprograms in place to aid The State in meeting its greenhouse gas emissions reduction goals. In some cases, state government agencies associated with these subject areas are developing enhancements to their strategies and subprograms to bridge the gap between achieved emissions reductions and emissions reduction targets.

Greenhouse gas emission reductions are calculated for each strategy/subprogram, but data is supplied by each state agency that is responsible for the given strategy. As such, RESI, in coordination with MDE, developed a methodology to analyze the reported data. Through this coordinated effort, RESI and MDE determined two phases to be modeled for each strategy and subprogram: an investment phase and an operation phase. For each phase, where applicable, RESI disseminated the data related to a “status quo,” meeting the current baseline reductions, and an “enhanced,” a scenario where Maryland may be able to achieve higher reductions.

Investment Phase

The investment phase refers to the entire period during which a strategy and its subprograms are being developed, invested in, and enacted. In other words, it is the period during which the implementing entity or entities, whether it be state government agency or agencies, a business entity or entities required to comply, and/or some other individual or group(s), will invest funds and effort into the appropriate sector(s) of the economy to achieve the requirements outlined for the strategy and subprograms.

In all cases, the investment values were discussed with state agencies and data was provided that could best describe that period of time. In addition, it should be noted that “investment” is not necessarily modeled as a positive inflow of capital for all industry sectors identified in Section B.3. In some cases, “investment” is the outflow of capital for those industries for which strategy compliance is mandated. This causes an inflow of capital for all industry sectors experiencing a positive change due to other industries’ mandated compliance. In some cases, investment originates in the private sector. This may lead to increases or decreases in employment, output, or wages during the investment phase. Interactions among agencies and their ability to impact Maryland’s economy will determine the level of change to these economic indicators.

In other words, some industry sectors are more responsive to variations in the economy, which determines the degree to which employment, output, and wages are impacted. If a more sensitive sector experiences a negative change (or an outflow of capital), the associated negative impacts outweigh the positive change experienced by a less sensitive, benefitting sector (one experiencing an inflow of capital).

Operation Phase

The operation phase refers to the period during which a strategy and its subprograms have already been implemented and the “end user” cost savings (or other monetary benefits) are being realized. In other words, it is the period during which the goals of the strategy and subprograms have been achieved and individuals and/or business entities are realizing cost savings, increased income, etc.

In most cases, this phase is modeled based on the level of savings, increased earnings, or some other measure as calculated from data included in the strategy write-ups supplied by MDE, the implementing agencies, and external research. Therefore, the economic impacts represented are the total actual annual economic impacts unless otherwise specified.

An example of the steps undertaken by RESI and their results for one strategy with all of its subprograms for both phases can be found in Section B.2.

B.2 REMI PI+ Model

Overview

To achieve the most concise analysis of program interaction and other factors, RESI will use the Regional Economic Models, Inc. (REMI) PI+ model version 1.6 to analyze data for the 2014 report. The REMI model is a dynamic modeling tool used by various government agencies and state departments in economic policy analysis. REMI will help RESI to build from its base model in the previous report to create a sophisticated model that is calibrated to the specific demographic features of Maryland.

The REMI model features the ability to capture price effects, wage changes, and behavioral effects through time. The model will also allow RESI to capture the effects occurring between industries and minimize the potential for double counting in employment, output, and wages. The ability to capture effects across time will give MDE a detailed representation of the GGRA programs and their effects on Maryland in the longer term.

The model details the impacts based on two categories: direct and spinoff effects. The spinoff effects are defined as intermediate effects plus induced effects. REMI defines the intermediate effects as the purchase of intermediate goods associated with production. For example, a company may be hired to manufacture blue recycling bins that will be used in office buildings associated with the *Recycling and Source Reduction* policy. The purchase of the bins would be considered a direct effect, but the purchase of the materials to produce the bins is considered an intermediate effect.

REMI defines the induced effects as the economic effects that occur from the spending of wages. For example, an employee hired under the *Voluntary Stationary Source Reductions* policy earns a wage, and with this new wage may go out to dinner once a week. The spending of the employee’s wage on dinner is considered an induced effect.

Using the REMI model, RESI will create a dynamic impact analysis detailing the levels of employment, output, and wages associated with each policy for each year from 2008 to 2025.

Reading the Results

REMI uses a regional control based on historical Bureau of Economic Analysis data to forecast values for employment, wages, and output. When economic values are decreased or increased based on parameters from the user in the regional simulation, the forecast is then altered to reflect the changes made by the user.

REMI reports cumulative and non-cumulative results based on the different economic factors being reviewed. In REMI, the results that would be reported as non-cumulative would be population and employment. All other results are viewed as cumulative.

For example, for a policy that increases government spending in 2010 and 2011, the results report an increase of 100 jobs in 2010 and 120 jobs in 2011. These new jobs are the difference from the baseline for that year, not the subsequent year. Therefore, the 100 jobs in 2010 are 100 new jobs for 2010, and the 120 jobs in 2011 are 120 new jobs in 2011. The difference, 20 jobs, would be the estimated increase between the years in the simulation. The 100 jobs would be considered retained employment.

Wages and output are cumulative and build from one year to the next in the REMI model. If the previously mentioned policy notes that the wages in 2010 were \$250,000 and then grew to \$500,000 in 2011, this would be an increase of \$500,000 from the previous year. The model has taken into account the change in the wages from the previous year, and the new number reported would be the increase on an annual basis. When reading this result you would say, “Wages in 2011 increased by \$500,000.”

Figure 361: Sampling of REMI PI+ Users

<p>Academic Institutions</p> <p>Arizona State University</p> <p>Ball State University</p> <p>Costal Rivers Water Planning and Policy Center</p> <p>Florida State University</p> <p>Georgia State University</p> <p>Massachusetts Institute of Technology</p> <p>Michigan Small Business & Technology Development Center</p> <p>Michigan Technological University</p> <p>Pennsylvania State University</p> <p>Southwestern Oklahoma State University</p> <p>University of Southern Maine</p> <p>University New Hampshire</p> <p>University of Arkansas at Little Rock</p> <p>University of California, Davis</p> <p>University of Connecticut</p> <p>University of Nevada, Las Vegas</p> <p>University of Pittsburgh</p> <p>University of South Dakota</p> <p>University of Western Florida</p> <p>University South Florida</p> <p>York College of Pennsylvania</p> <p>Federal Government</p> <p>U.S. Army Corps of Engineers</p> <p>U.S. Environmental Protection Agency</p> <p>State Government</p> <p>Arizona Department of Commerce</p> <p>Arizona Department of Planning</p> <p>Arizona Joint Legislative Budget Committee</p>	<p>State Government</p> <p>Connecticut Department of Economic and Community Development</p> <p>District of Columbia</p> <p>Empire State Development Corporation</p> <p>Florida Agency for Workforce Innovation</p> <p>Florida Legislature</p> <p>Hawaii Department of Business, Economic Development & Tourism</p> <p>Illinois Department of Commerce and Economic Opportunity</p> <p>Illinois Department of Revenue</p> <p>Indiana Department of Transportation</p> <p>Iowa Department of Revenue</p> <p>Private Consulting Firms</p> <p>Alliance Transportation Group</p> <p>Bechtel SAIC Company, LLC.</p> <p>Cambridge Systematics, Inc.</p> <p>CSA Planning</p> <p>Economic & Policy Resources</p> <p>Economic Development Research Group</p> <p>Economic Research Associates</p> <p>ERG</p> <p>Ernst & Young</p> <p>HR&A Advisors, Inc.</p> <p>ICF International</p> <p>Kavet, Rockler & Associates, Inc.</p> <p>NERA Economic Consulting</p> <p>Northern Economics</p> <p>REMI-Northwest</p> <p>RKG Associates, Inc.</p> <p>Stratus Consulting</p> <p>Wilbur Smith Associates</p>
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Source: REMI

B.3 REMI PI+ Industry Sectors

RESI determined the industry sectors which would be affected by strategy implementation for both the investment phase and the operation phase for each strategy and subprogram. A complete list of these sectors can be found in Figures 356 and 357.

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Figure 362: REMI PI+ Industry Codes—Investment Phase

Strategy	Subprogram	Code	Description
Energy			
3.1.1	Regional Greenhouse Gas Initiative	63	State Government Spending
3.1.2	Greenhouse Gas Reductions from Imported Power	X7809	Production costs, Electrical power distribution, transmission, and generation
3.1.3	Greenhouse Gas New Source Performance Standard	63	State Government Spending
3.1.4	Maximum Achievable Control Technology (MACT)	63	State Government Spending
3.1.5	EmPOWER Maryland Energy Efficiency in the Residential Sector	98	Investment Spending (Residential)
		63	State Government Spending (Transfer of funds from SEIF)
3.1.6	EmPOWER Energy Efficiency in the Commercial and Industrial Sectors	63	State Government Spending
		98	Investment Spending (Non-residential)
3.1.7	Energy Efficiency Appliances and Other Products	605	Consumer Spending on Household Appliances
3.1.8	Energy Efficiency in the Power Sector – General	X7809	Production costs, Electrical power distribution, transmission, and generation
3.1.9	Maryland Renewable Energy Portfolio Standard	EQP 13	Producer's Durable Equipment Investment, Electric distribution, transmission, and generation
		X7809	Production costs, Electrical power distribution,

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Strategy	Subprogram	Code	Description
			transmission, and generation
3.1.10	Incentives and Grant Subprograms to Support Renewable Energy	98	Investment Spending (Residential)
		99	Investment Spending (Non-residential)
		63	State Government Spending
3.1.11	Offshore Wind Initiatives to Support Renewable Energy	EQP 13	Producer's Durable Equipment Investment, Electric distribution, transmission, and generation
3.1.12	Title V Permits	63	State Government Spending
3.1.13	BeSMART	63	State Government Spending
		98	Investment Spending (Residential)
3.1.14	Weatherization and Energy Efficiency for Low-Income Houses	63	State Government Spending
		98	Investment Spending (Residential)
3.1.15	GHG Prevention of Significant Deterioration Permitting Program	63	State Government Spending
Transportation			
3.2.1	Transportation Technology Initiatives	X3317	Architectural, engineering, and related services
		X3212	Construction
		34	Household disposable income
3.2.2	Public Transportation Initiatives	X3317	Architectural, engineering, and related services
		X3212	Construction

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Strategy	Subprogram	Code	Description
3.2.3	Intercity Transportation Initiatives	34	Household disposable income
		X3317	Architectural, engineering, and related services
		X3212	Construction
		34	Household disposable income
3.2.4	Pricing Initiatives	-	<i>No Investment Spending Specified</i>
3.2.5	Bike and Pedestrian Initiatives	X3317	Architectural, engineering, and related services
		X3212	Construction
		34	Household disposable income
Agriculture			
3.3.1	Creating Ecosystem Markets to Encourage GHG Emissions Reductions	X6532	Exogenous Final Demand (Other professional, scientific, and technical services)
3.3.2	Nutrient Trading for GHG Benefits	X6532	Exogenous Final Demand (Other professional, scientific, and technical services)
3.3.3	Managing Forests to Capture Carbon	X6412	Exogenous Final Demand (Construction)
		X6526	Exogenous Final Demand (Architectural, engineering, and related services)
		X3203	Exogenous Final Demand (Support activities for agriculture)
3.3.4	Increasing Urban Trees to Capture Carbon	X6412	Exogenous Final Demand (Construction)

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Strategy	Subprogram	Code	Description
		X6526	Exogenous Final Demand (Architectural, engineering, and related services)
		X3203	Exogenous Final Demand (Support activities for agriculture)
3.3.5	Creating and Protecting Wetlands and Waterway Borders to Capture Carbon	63	State Government Spending
3.3.6	Geological Opportunities to Store Carbon	X6530	Exogenous Final Demand (Scientific and professional services)
3.3.7	Planting Forests in Maryland	X3203	Industry Sales, Support activities for agriculture
3.3.8	Biomass for Energy Production	99	Investment Spending (Non-residential)
3.3.9	Conservation of Agricultural Land for GHG Benefits	X3203	Industry Sales, Support activities for agriculture
Recycling			
3.4.1	Recycling and Source Reduction	99	Investment Spending (Non-residential)
Buildings			
3.5.1	Building and Trade Codes in Maryland	X4012	Industry Employment (Construction)
Land Use			
3.6.1	Reducing Emissions through Smart Growth and Land Use/Location Efficiency	X6412 DIND15	Exogenous Final Demand (Construction) Detailed Industry Sales (Water,

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Strategy	Subprogram	Code	Description
	(Include Land Use Planning and Growth Boundary GHG Benefits)	99	sewage, and other systems) Investment Spending (Non-residential)
3.6.2	Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)	X6412	Exogenous Final Demand (Construction)
		DIND15	Detailed Industry Sales (Water, sewage, and other systems)
		98	Investment Spending (Residential)
Innovative Initiatives			
3.7.1	Buy Local for GHG Benefits	63 X3203	State Government Spending Industry Sales, Support activities for agriculture
3.7.2	Voluntary Stationary Source Reductions	63	State Government Spending
3.7.3	PAYD Insurance in Maryland	-	No Investment Spending Specified
3.7.4	Leadership-by-Example – Local Government	65	Local Government Spending
3.7.5	Leadership-by-Example – Federal Government	68	Government Spending including Non-Pecuniary (Amenity) Aspects
3.7.6	Lead-by-Example: State of Maryland Initiatives and Carbon Footprint	63	State Government Spending
3.7.7	Leadership-by-Example – Maryland University Lead-by-	X5212	Firm Sales (Construction)

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Strategy	Subprogram	Code	Description
	Example Initiatives		
3.7.8	Transportation and Climate Initiative	-	<i>No investment costs specified</i>
3.7.9	Greenhouse Gas Emissions Inventory Development	X6532	Exogenous Final Demand (Other professional, scientific, and technical services)
Outreach			
3.8.1	Outreach and Public Education	-	<i>No investment costs specified</i>

Sources: REMI PI+, RESI

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Figure 363: REMI PI+ Industry Codes—Operation Phase

Strategy	Subprogram	Code	Description
Energy			
3.1.1	Regional Greenhouse Gas Initiative	X7809	Production costs, Electrical power distribution, transmission, and generation
3.1.2	Greenhouse Gas Reductions from Imported Power	63	State Government Spending
3.1.3	Greenhouse Gas New Source Performance Standard	X7809	Production costs, Electrical power distribution, transmission, and generation
3.1.4	Maximum Achievable Control Technology (MACT)	EQP 13	Producer's Durable Equipment Investment, Electric distribution, transmission, and generation
3.1.5	EmPOWER Maryland Energy Efficiency in the Residential Sector	78	Consumer spending reallocation
		638	Consumer spending electricity
3.1.6	EmPOWER Energy Efficiency in the Commercial and Industrial Sectors	80	Electricity Costs (Industrial Sectors)
		82	Electricity Costs (Commercial Sectors)
3.1.7	Energy Efficiency Appliances and Other Products	78	Consumer spending reallocation
		638	Consumer spending electricity
3.1.8	Energy Efficiency in the Power Sector – General	X7809	Production costs, Electrical power distribution, transmission, and generation
3.1.9	Maryland Renewable Energy Portfolio Standard	X7809	Production costs, Electrical power distribution,

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Strategy	Subprogram	Code	Description
		63	transmission, and generation State Government Spending
3.1.10	Incentives and Grant Subprograms to Support Renewable Energy	80	Electricity Costs (Industrial Sectors)
		82	Electricity Costs (Commercial Sectors)
		78	Consumer spending reallocation
		638	Consumer spending electricity
3.1.11	Offshore Wind Initiatives to Support Renewable Energy	X7809	Production costs, Electrical power distribution, transmission, and generation
3.1.12	Title V Permits	63	State Government Spending
3.1.13	BeSMART	78	Consumer spending reallocation
		638	Consumer spending electricity
3.1.14	Weatherization and Energy Efficiency for Low-Income Houses	78	Consumer spending reallocation
		638	Consumer spending electricity
3.1.15	GHG Prevention of Significant Deterioration Permitting Program	63	State Government Spending
Transportation			
3.2.1	Transportation Technology Initiatives	623	Consumer Spending—Gasoline and oil
		X6495	Transit and ground passenger transportation
		78	Consumption reallocation

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Strategy	Subprogram	Code	Description
3.2.2	Public Transportation Initiatives	623	Consumer Spending—Gasoline and oil
		X6495	Transit and ground passenger transportation
		78	Consumption reallocation
3.2.3	Intercity Transportation Initiatives	623	Consumer Spending—Gasoline and oil
		X6495	Transit and ground passenger transportation
		78	Consumption reallocation
3.2.4	Pricing Initiatives	-	<i>No Operation Spending Specified</i>
3.2.5	Bike and Pedestrian Initiatives	623	Consumer Spending—Gasoline and oil
		78	Consumption reallocation
Agriculture			
3.3.1	Creating Ecosystem Markets to Encourage GHG Emissions Reductions	88	Production costs (Industrial sectors)
		90	Production costs (Commercial sectors)
3.3.2	Nutrient Trading for GHG Benefits	X7801	Production costs (Forestry; fishing; hunting; and trapping)
3.3.3	Managing Forests to Capture Carbon	X3203	Support activities for agriculture
3.3.4	Increasing Urban Trees to Capture Carbon	X3203	Support activities for agriculture
3.3.5	Creating and Protecting Wetlands and Waterway	X3203	Support activities for agriculture

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Strategy	Subprogram	Code	Description
	Borders to Capture Carbon		
3.3.6	Geological Opportunities to Store Carbon	X3203	Support activities for agriculture
3.3.7	Planting Forests in Maryland	X3203	Support activities for agriculture
3.3.8	Biomass for Energy Production	X3203	Support activities for agriculture
3.3.9	Conservation of Agricultural Land for GHG Benefits	X3203	Support activities for agriculture
Recycling			
3.4.1	Recycling and Source Reduction	99	Investment Spending (Non-residential)
Buildings			
3.5.1	Building and Trade Codes in Maryland	X4012	Industry Employment (Construction)
Land Use			
3.6.1	Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits)	45	Investment spending (residential capital)
		623	Consumer spending—Gasoline and oil
		78	Consumption reallocation
3.6.2	Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth)	45	Investment spending (residential capital)
		623	Consumer spending—Gasoline and oil
		78	Consumption reallocation

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Strategy	Subprogram	Code	Description
Innovative Initiatives			
3.7.1	Buy Local for GHG Benefits	617	Consumer spending—Food and nonalcoholic beverages purchased for off-premises consumption
		78	Consumption reallocation
3.7.2	Voluntary Stationary Source Reductions	63	State Government Spending
3.7.3	PAYD Insurance in Maryland	617	Consumer spending—Food and nonalcoholic beverages purchased for off-premises consumption
		78	Consumption reallocation
3.7.4	Leadership-by-Example – Local Government	X6409	Industry demand-Electric power generation, transmission, and distribution
		65	Local Government Spending
3.7.5	Leadership-by-Example – Federal Government	68	Government Spending including Non-Pecuniary (Amenity) Aspects
		X6409	Industry demand-Electric power generation, transmission, and distribution
3.7.6	Lead-by-Example: State of Maryland Initiatives and Carbon Footprint	X6409	Industry demand-Electric power generation, transmission, and distribution
		63	State Government Spending
3.7.7	Leadership-by-Example –	X6409	Industry demand-Electric

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Strategy	Subprogram	Code	Description
	Maryland University Lead-by-Example Initiatives	63	power generation, transmission, and distribution State Government Spending
3.7.8	Transportation and Climate Initiative	63	State Government Spending
3.7.9	Greenhouse Gas Emissions Inventory Development	-	<i>No operation costs specified</i>
Outreach			
3.8.1	Outreach and Public Education	63	State Government Spending

Source: REMI PI+, RESI

B.4 Modeling Example

Overview

For the purpose of providing a transparent and accessible analysis, an example of the steps undertaken by RESI (the modeling assumptions) and their results for one strategy and its subprograms are presented below. First, RESI determined the REMI industry codes which would be affected by the strategy and its subprograms. Next, RESI determined the dollar values to be applied for the investment phase as well as the operation phase. The strategy modeled as an example is “Intercity Transportation Initiatives,” under Transportation.

According to the data provided by MDOT, three subprograms have been designed for this strategy: MARC Station Parking Enhancements, Refurbishing MARC and Other Rail Vehicles, and Update on Maryland High Speed Rail.

Modeling Steps Based on Data Provided

Investment Phase

1. Determine relevant REMI sectors for each program under the policy.
 - a. **Intercity Transportation Initiatives**
 - i. X3317—Architectural, engineering, and related services
 - ii. X3212—Construction
 - iii. 34—Household disposable income
2. Assign data costs per agency provided data to inputs for each program under the policy.
 - a. **Intercity Transportation Initiatives (2010-2014)**
 - i. X3317— \$21,323,000 total from 2010 to 2014
 - ii. X3212— \$267,381,000 total from 2010 to 2014
 - iii. 34— \$1,694,000 total from 2010 to 2014
 - b. **Intercity Transportation Initiatives (2015-2020)**
 - i. X3317— \$92,328,000 total from 2015 to 2020
 - ii. X3212— \$298,480,000 total from 2015 to 2020
 - iii. 34— \$1,100,000 total from 2015 to 2020
3. Input investment by sector into REMI model by year and run impacts.
4. Export impacts and analyze.

Operation Phase

1. Determine relevant REMI sectors.
 - a. **Intercity Transportation Initiatives**
 - i. 623—Consumer Spending—Gasoline and oil
 - ii. X6495—Transit and ground passenger transportation
 - iii. 78—Consumption reallocation
2. Determine part of program to be affected by savings (from strategy write-up).
 - a. **Intercity Transportation Initiatives**
 - i. 623—Reduce fuel spending
 - ii. X6495—Increase public ridership

- iii. 78—Consumption reallocation of spending not used for transit
- 3. Estimate total annual increase in savings/revenue for each program and then calculate for complete study period (2011-2020)
 - a. Intercity Transportation Initiatives**
 - i. 623—\$422,730 per year savings
 - ii. X6495—\$211,365 per year spending on public transit
 - iii. 78—\$211,365 per year reallocation
- 4. Input savings by sector into REMI model and run impacts.
- 5. Export impacts and analyze.

Refined Economic Impact Analysis for the Greenhouse Gas Emissions Reduction Act 2012 Plan—Appendices C through D

Prepared for
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Regional Economic Studies Institute



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Appendix C—Occupational Data

This appendix contains information regarding the five top-gaining industries in terms of total employment for each strategy for both the investment and operation phases. This analysis uses the industry level jobs impacts produced from the REMI PI+ analysis and RESI's Predictive Regional Occupational Matrix (PROM) to assess the top five occupations for each strategy.

These occupations provide examples of some of the jobs which may experience employment gains as a result of investment or operation of each strategy. It is important to note that RESI analyzed the total employment gain rather than the direct employment gain, so some of the occupations listed in this appendix may experience an indirect or induced employment impact. In some cases, some occupations may not experience much impact at all, if any. It is important to note that in some cases, the occupations forgone during the investment phase may be redistributed within the operation phase.

For example, under the policy “Zero Waste,” the reduction in the need for landfill space reduces the need for remediation and waste management personnel. However, the increased demand for recycling and facilities will increase the demand in this field during the operation phase. Therefore the net change in the occupational level jobs results in a gain.

It is also important to note that job creation during the investment phase does not necessarily assure that such jobs will be retained. In some cases, these jobs may only exist during the implementation period. On the other hand, most operational jobs will ultimately be retained rather than created after initial strategy implementation has occurred.

This appendix is meant to act as a guide for understanding the jobs associated with the industries defined in the final report. Some strategies showed gains in or retention of employment within industries which may not seem to have a direct relation to the relevant strategy. In many cases, such impacts were driven primarily by indirect and induced effects.

Industries which saw a gain from many strategies included in this report are Professional, scientific, and technical services and Public administration. Although the types of jobs contained within these sectors may not be as transparent as Construction or Retail trade, RESI used national level BLS data to demonstrate the types of jobs that exist within these industries. For many strategies, one of the goals is to stimulate green job growth. The industries defined by REMI PI+ do not offer much insight into the exact job titles within them, but consider the following: When a company must comply with certain regulations such as GHG emissions targets or caps, they will often need to hire environmental consultants, lawyers, and eventually developers to assist in cost-effective measures while remaining compliant with regulations. These jobs would typically fall under industries such as Professional, scientific and technical services and Construction.

Some strategies' operation phase revealed a significant impact on employment within Health care and social assistance and Retail trade. These total employment impacts were generally driven by either an indirect or induced effect, as mentioned previously, coming from the change in household income. For example, under the Clean Cars Program for Maryland strategy, RESI expects that many households would probably wait until after the strategy had been implemented and new technology had been introduced to purchase a new vehicle. Once the new vehicles that are compliant with the new regulations become available, car dealerships would see an increase in sales during the operation phase of the strategy. Therefore, they would need to hire new sales representatives to meet the increased demand. This would demonstrate a possible direct effect in Retail trade. The indirect effect may be an equal or lesser effect in Health care and social assistance as a new group of people now have either an increased income or a second income and can then allocate more money toward their personal health. In addition, employers would be providing health benefits to a greater number of people. This could lead to a hiring effect in nursing for doctor's offices and hospitals as the demand for healthcare increases. This is just one example of how these strategies may affect sectors which are not directly discussed within the strategy.

The State of Maryland is home to many highly ranked higher educational institutions such as Johns Hopkins University and the University of Maryland. Students and graduates of such institutions are on the forefront of leading technological advances and medical discoveries within The State's borders on a daily basis. Employment related with many of the industries defined throughout the report as benefitting from the strategies discussed would be ideal fields for future Maryland graduates. If students were to graduate and stay within Maryland after graduation because they received a steady position, this could ultimately lead to a positive effect on The State's gross domestic product.

Please refer to the main body of the report for more information regarding impacts by strategy and phase as well as discussion of some of the potential reasons for employment gain in the top-gaining industries presented here. Please refer to Appendix B for a more detail explanation of direct, indirect, and induced impacts. The tables in Appendix C represent the top five gaining industries for each strategy and its phases in the left column, the total employment impact to the industry in the center column, and the five occupations with the highest employment in that industry in the right column.

C.1 Energy

C.1.1 Regional Greenhouse Gas Initiative (RGGI) Status Quo—Investment Phase

Office and Administrative Support Occupations	1.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Postal Service Workers Other Office and Administrative Support Workers Secretaries and Administrative Assistants
Protective Service Occupations	1.1	Law Enforcement Workers Police Officers Police and Sheriff's Patrol Officers Bailiffs, Correctional Officers, and Jailers Correctional Officers and Jailers
Business and Financial Operations Occupations	0.7	Business Operations Specialists Financial Specialists Compliance Officers Management Analysts Accountants and Auditors
Management Occupations	0.5	Top Executives Operations Specialties Managers General and Operations Managers Legislators Other Management Occupations
Community and Social Service Occupations	0.4	Counselors, Social Workers, and Other Community and Social Service Specialists Child, Family, and School Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other

Sources: BLS, REMI PI+, RESI

C.1.2 Regional Greenhouse Gas Initiative (RGGI) Enhancement—Investment Phase

Office and Administrative Support Occupations	1.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Postal Service Workers Other Office and Administrative Support Workers Secretaries and Administrative Assistants
Protective Service Occupations	1.1	Law Enforcement Workers Police Officers Police and Sheriff's Patrol Officers Bailiffs, Correctional Officers, and Jailers Correctional Officers and Jailers
Business and Financial Operations Occupations	0.7	Business Operations Specialists Financial Specialists Compliance Officers Management Analysts Accountants and Auditors
Management Occupations	0.5	Top Executives Operations Specialties Managers General and Operations Managers Legislators Other Management Occupations
Community and Social Service Occupations	0.4	Counselors, Social Workers, and Other Community and Social Service Specialists Child, Family, and School Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other

Sources: BLS, RESI

C.1.3 Regional Greenhouse Gas Initiative (RGGI) Status Quo—Operation Phase

Office and Administrative Support Occupations	31.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Postal Service Workers Other Office and Administrative Support Workers Secretaries and Administrative Assistants
Protective Service Occupations	27.2	Law Enforcement Workers Police Officers Police and Sheriff's Patrol Officers Bailiffs, Correctional Officers, and Jailers Correctional Officers and Jailers
Business and Financial Operations Occupations	14.5	Business Operations Specialists Financial Specialists Compliance Officers Management Analysts Accountants and Auditors
Management Occupations	8.4	Top Executives Operations Specialties Managers General and Operations Managers Legislators Other Management Occupations
Community and Social Service Occupations	6.6	Counselors, Social Workers, and Other Community and Social Service Specialists Child, Family, and School Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other

Sources: BLS, REMI PI+, RESI

C.1.4 Regional Greenhouse Gas Initiative (RGGI) Enhancement—Operation Phase

Office and Administrative Support Occupations	197.3	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Postal Service Workers Other Office and Administrative Support Workers Secretaries and Administrative Assistants
Protective Service Occupations	156.8	Law Enforcement Workers Police Officers Police and Sheriff's Patrol Officers Bailiffs, Correctional Officers, and Jailers Correctional Officers and Jailers
Business and Financial Operations Occupations	83.7	Business Operations Specialists Financial Specialists Compliance Officers Management Analysts Accountants and Auditors
Management Occupations	52.6	Top Executives Operations Specialties Managers General and Operations Managers Legislators Other Management Occupations
Community and Social Service Occupations	43.5	Counselors, Social Workers, and Other Community and Social Service Specialists Child, Family, and School Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other

Sources: BLS, REMI PI+, RESI

C.1.5 GHG Reductions from Imported Power—Investment Phase

Protective service occupations	0.0	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Management, business, financial occupations	0.0	Legislators Advertising, marketing, and sales managers Compliance officers Cost estimators Accountants and auditors
Legal occupations	0.0	Lawyers Judicial law clerks Judges, magistrates, and other judicial workers Paralegals and legal assistants Court reporters
Arts, design, entertainment, sports, media occupations	0.0	Artists and related workers Designers Entertainers and performers Sports and related workers Media and communications workers
Education, training, library occupations	0.0	Postsecondary teachers Preschool, primary, and secondary teachers Special education teachers Librarians Archivists, curators, and museum technicians

Sources: BLS, REMI PI+, RESI

C.1.6 GHG Reductions from Imported Power—Operation Phase

Construction and Extraction Occupations	1.4	Construction Trades Workers Construction Laborers Carpenters Electricians Supervisors of Construction and Extraction Workers
Office and Administrative Support Occupations	1.2	Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Material Recording, Scheduling, Dispatching, and Distributing Workers Office Clerks, General
Personal Care and Service Occupations	0.7	Entertainment Attendants and Related Workers Other Personal Care and Service Workers Recreation and Fitness Workers Amusement and Recreation Attendants Childcare Workers
Sales and Related Occupations	0.6	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Wholesale and Manufacturing
Installation, Maintenance, and Repair Occupations	0.6	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Maintenance and Repair Workers, General Vehicle and Mobile Equipment Mechanics, Installers, and Repairers

Sources: BLS, REMI PI+, RESI

C.1.7 Federal New Source Performance Standard—Investment Phase

Office and Administrative Support Occupations	1.7	Information and Record Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	1.1	Law Enforcement Workers Other Protective Service Workers Fire Fighting and Prevention Workers Supervisors of Protective Service Workers Security Guards
Construction and Extraction Occupations	0.9	Construction Trades Workers Other Construction and Related Workers Supervisors of Construction and Extraction Workers Electricians Highway Maintenance Workers
Business and Financial Operations Occupations	0.7	Business Operations Specialists Financial Specialists Business Operations Specialists, All Other Accountants and Auditors Management Analysts
Personal Care and Service Occupations	0.5	Other Personal Care and Service Workers Entertainment Attendants and Related Workers Recreation and Fitness Workers Amusement and Recreation Attendants Recreation Workers

Sources: BLS, REMI PI+, RESI

C.1.8 Federal New Source Performance Standard—Operation Phase

Construction and Extraction Occupations	2.2	Supervisors of construction trade workers Carpenters Brick masons, block masons, and stonemasons Construction equipment operators Electricians
Office and Administrative Support Occupations	1.8	Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Office Clerks, General Material Recording, Scheduling, Dispatching, and Distributing Workers
Personal Care and Service Occupations	1.1	Entertainment Attendants and Related Workers Other Personal Care and Service Workers Recreation and Fitness Workers Amusement and Recreation Attendants Fitness Trainers and Aerobics Instructors
Sales and Related Occupations	1.0	Cashiers Retail Sales Workers Retail Salespersons Sales Representatives, Services Sales Representatives, Wholesale and Manufacturing
Installation, Maintenance, and Repair Occupations	1.0	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Maintenance and Repair Workers, General Vehicle and Mobile Equipment Mechanics, Installers, and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers

Sources: BLS, REMI PI+, RESI

C.1.9 MACT—Investment Phase

Sales and Related Occupations	0.2	Retail sales workers Advertising sales agents Insurance sales agents Sales representatives in wholesale and manufacturing Models, demonstrators, and product promoters
Protective Service Occupations	0.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	0.1	Legislators Advertising, marketing, and sales managers Compliance officers Cost estimators Accountants and auditors
Healthcare Practitioners and Technical Occupations	0.1	Dentists Dietitians and nutritionists Physicians and surgeons Nurses and home health aides Occupational therapists
Construction and Extraction Occupations	0.1	Actuaries Software developers and programmers Database and system administrators Computer support specialists Aerospace, agricultural, biomedical, and other engineers

Sources: BLS, REMI PI+, RESI

C.1.10 MACT—Operation Phase

Protective Service Occupations	26.4	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Sales and Related Occupations	26.1	Retail sales workers Advertising sales agents Insurance sales agents Sales representatives in wholesale and manufacturing Models, demonstrators, and product promoters
Business and Financial Operations Occupations	13.4	Legislators Advertising, marketing, and sales managers Compliance officers Cost estimators Accountants and auditors
Healthcare Practitioners and Technical Occupations	8.5	Dentists Dietitians and nutritionists Physicians and surgeons Nurses and home health aides Occupational therapists
Building and Grounds Cleaning and Maintenance Occupations	7.8	Supervisors of cleaning and maintenance workers Housekeeping and janitorial workers Pest control workers Landscaping and grounds keeping workers Pesticide handlers, sprayers, and applicators

Sources: BLS, REMI PI+, RESI

C.1.11 Energy Efficiency in the Residential Sector Status Quo—Investment Phase

Construction and Extraction Occupations	502.4	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Personal Care and Service Occupations	245.1	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Office and Administrative Support Occupations	215.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Food Preparation and Serving Related Occupations	154.8	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	129.0	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.12 Energy Efficiency in the Residential Sector Enhancement—Investment Phase

Construction and Extraction Occupations	502.4	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Personal Care and Service Occupations	245.1	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Office and Administrative Support Occupations	215.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Food Preparation and Serving Related Occupations	154.8	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	129.0	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.13 Energy Efficiency in the Residential Sector Status Quo—Operation Phase

Sales and Related Occupations	12.4	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Healthcare Practitioners and Technical Occupations	8.9	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Office and Administrative Support Occupations	5.5	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Food Preparation and Serving Related Occupations	3.6	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Transportation and Material Moving Occupations	2.2	Laborers and Material Movers, Hand Motor Vehicle Operators Laborers and Freight, Stock, and Material Movers, Hand Cleaners of Vehicles and Equipment Light Truck or Delivery Services Drivers

Sources: BLS, REMI PI+, RESI

C.1.12 Energy Efficiency in the Residential Sector Enhancement—Operation Phase

Sales and Related Occupations	12.4	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Healthcare Practitioners and Technical Occupations	8.9	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Office and Administrative Support Occupations	5.5	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Food Preparation and Serving Related Occupations	3.6	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Transportation and Material Moving Occupations	2.2	Laborers and Material Movers, Hand Motor Vehicle Operators Laborers and Freight, Stock, and Material Movers, Hand Cleaners of Vehicles and Equipment Light Truck or Delivery Services Drivers

Sources: BLS, REMI PI+, RESI

C.1.13 Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Investment Phase

Office and Administrative Support Occupations	585.9	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	363.4	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction, extraction occupations	287.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	227.3	Business Operations Specialists Financial Specialists Business Operations Specialists, All Other Accountants and Auditors Management Analysts
Food Preparation and Serving Related Occupations	190.9	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, REMI PI+, RESI

C.1.14 Energy Efficiency in the Commercial and Industrial Sectors Enhancement—Investment Phase

Office and Administrative Support Occupations	587.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	364.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction, extraction occupations	289.3	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	230.1	Business Operations Specialists Financial Specialists Business Operations Specialists, All Other Accountants and Auditors Management Analysts
Food Preparation and Serving Related Occupations	195.4	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, REMI PI+, RESI

3.1.6 Energy Efficiency in the Commercial and Industrial Sectors—Investment Phase

Professional, scientific, and technical services	4.2	Lawyers Accountants and auditors Management analysts Architectural and civil drafters Market research analysts
Retail trade	3.6	Retail salespersons Cashiers Stock clerks and order fillers First-line supervisors/managers of retail sales workers Customer service representatives
Construction	1.1	Construction laborers Carpenters Electricians Operating engineers and other construction equipment operators Construction managers
Health care and social assistance	0.8	Registered nurses Nursing aides, orderlies, and attendants Home health aides Licensed practical and licensed vocational nurses Medical and health services managers
Administrative and support and waste management and remediation services	0.7	Janitors and cleaners, except maids and housekeeping cleaners Security guards Landscaping and grounds keeping workers Laborers and freight, stock, and material movers, hand Office clerks, general

Sources: BLS, RESI

C.1.15 Energy Efficiency in the Commercial and Industrial Sectors Status Quo—Operation Phase

Office and Administrative Support Occupations	308.5	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	222.0	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Food Preparation and Serving Related Occupations	170.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Construction and Extraction Occupations	108.5	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Installation, Maintenance, and Repair Occupations	106.3	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Maintenance and Repair Workers, General Vehicle and Mobile Equipment Mechanics, Installers, and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers

Sources: BLS, REMI PI+, RESI

C.1.16 Energy Efficiency in the Commercial and Industrial Sectors Enhancement—Operation Phase

Office and Administrative Support Occupations	310.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	224.2	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Food Preparation and Serving Related Occupations	171.6	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Construction and Extraction Occupations	110.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Installation, Maintenance, and Repair Occupations	108.3	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Maintenance and Repair Workers, General Vehicle and Mobile Equipment Mechanics, Installers, and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers

Sources: BLS, REMI PI+, RESI

C.1.17 Energy Efficiency—Appliances and Other Products—Investment Phase

Construction and Extraction Occupations	-25.5	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Personal Care and Service Occupations	-12.5	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Office and Administrative Support Occupations	-10.9	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Food Preparation and Serving Related Occupations	-7.5	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	-6.6	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.18 Energy Efficiency—Appliances and Other Products—Operation Phase

Sales and Related Occupations	4.8	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Healthcare Practitioners and Technical Occupations	3.4	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Office and Administrative Support Occupations	2.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Healthcare Support Occupations	1.9	Nursing, Psychiatric, and Home Health Aides Nursing Assistants Home Health Aides Medical Assistants Dental Assistants
Food Preparation and Serving Related Occupations	1.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, REMI PI+, RESI

C.1.19 Energy Efficiency in the Power Sector, General Status Quo—Investment Phase

Construction and Extraction Occupations	-337.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	-287.3	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	-173.5	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Food Preparation and Serving Related Occupations	-156.7	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	-156.5	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.20 Energy Efficiency in the Power Sector, General Enhancement—Investment Phase

Construction and Extraction Occupations	-338.2	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	-288.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	-173.9	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Food Preparation and Serving Related Occupations	-157.4	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	-157.1	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.21 Energy Efficiency in the Power Sector, General Status Quo—Operation Phase

Construction and Extraction Occupations	59.4	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	50.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	30.6	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Food Preparation and Serving Related Occupations	27.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	27.1	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.22 Energy Efficiency in the Power Sector, General Enhancement—Operation Phase

Construction and Extraction Occupations	59.4	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	50.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	30.6	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Food Preparation and Serving Related Occupations	27.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	27.1	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, REMI PI+, RESI

C.1.23 Maryland Renewable Energy Portfolio Standard Status Quo—Investment Phase

Construction and Extraction Occupations	2,238.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	1,178.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	1,110.6	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Sales and Related Occupations	726.6	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Food Preparation and Serving Related Occupations	709.2	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, RESI, REMI PI+

C.1.24 Maryland Renewable Energy Portfolio Standard Enhancement—Investment Phase

Construction and Extraction Occupations	2,242.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	1,179.6	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	1,112.4	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Sales and Related Occupations	728.1	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other
Food Preparation and Serving Related Occupations	711.8	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, RESI, REMI PI+

C.1.25 Maryland Renewable Energy Portfolio Standard Status Quo—Operation Phase

Construction and Extraction Occupations	-220.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	-151.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	-110.4	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Food Preparation and Serving Related Occupations	-86.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	-84.3	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, RESI, REMI PI+

C.1.26 Maryland Renewable Energy Portfolio Standard Enhancement—Operation Phase

Construction and Extraction Occupations	-221.2	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	-151.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	-110.6	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Food Preparation and Serving Related Occupations	-86.7	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	-84.5	Retail Sales Workers Cashiers Retail Salespersons Sales Representatives, Services Sales Representatives, Services, All Other

Sources: BLS, RESI, REMI PI+

C.1.27 Incentives and Grant Subprograms to Support Renewable Energy—Investment Phase

Protective Service Occupations	17.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Office and Administrative Support Occupations	7.8	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	5.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Community and Social Service Occupations	4.2	Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other Educational, Guidance, School, and Vocational Counselors
Healthcare Practitioners and Technical Occupations	4.2	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.1.28 Incentives and Grant Subprograms to Support Renewable Energy—Operation Phase

Food Preparation and Serving Related Occupations	13.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	9.8	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Building and Grounds Cleaning and Maintenance Occupations	4.4	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Personal Care and Service Occupations	2.4	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Transportation and Material Moving Occupations	2.1	Laborers and Material Movers, Hand Motor Vehicle Operators Laborers and Freight, Stock, and Material Movers, Hand Cleaners of Vehicles and Equipment Light Truck or Delivery Services Drivers

Sources: BLS, RESI, REMI PI+

3.1.10 Incentives and Grant Subprograms to Support Renewable Energy—Operation Phase

Building, grounds, personal care, service occupations	16.7	Supervisors of cleaning and maintenance workers Housekeeping and janitorial workers Pest control workers Landscaping and grounds keeping workers Pesticide handlers, sprayers, and applicators
Food preparation, serving related occupations	11.3	Cooks Supervisors of food preparation workers Bartenders Waiters and waitresses Dishwashers
Sales, office, administrative occupations	7.8	Retail sales workers Advertising sales agents Insurance sales agents Sales representatives in wholesale and manufacturing Models, demonstrators, and product promoters
Healthcare occupations	4.9	Dentists Dietitians and nutritionists Physicians and surgeons Nurses and home health aides Occupational therapists
Arts, design, entertainment, sports, media occupations	0.9	Artists and related workers Designers Entertainers and performers Sports and related workers Media and communications workers

Sources: BLS, RESI

C.1.29 Offshore Wind Initiatives to Support Renewable Energy—Investment Phase

Office and Administrative Support Occupations	33.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	19.2	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Business and Financial Operations Occupations	14.9	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Production Occupations	13.6	Other Production Occupations Metal Workers and Plastic Workers Assemblers and Fabricators Team Assemblers Inspectors, Testers, Sorters, Samplers, and Weighers
Computer and Mathematical Occupations	12.8	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers

Sources: BLS, RESI, REMI PI+

C.1.30 Offshore Wind Initiatives to Support Renewable Energy—Operation Phase

Office and Administrative Support Occupations	23.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	19.1	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Business and Financial Operations Occupations	5.6	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Production Occupations	3.6	Other Production Occupations Metal Workers and Plastic Workers Assemblers and Fabricators Team Assemblers Inspectors, Testers, Sorters, Samplers, and Weighers
Computer and Mathematical Occupations	2.8	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers

Sources: BLS, RESI, REMI PI+

C.1.31 Title V Permits for GHG Sources—Investment Phase

Office and Administrative Support Occupations	0.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	0.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	0.1	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	0.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Construction and Extraction Occupations	0.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians

Sources: BLS, RESI, REMI PI+

C.1.32 Title V Permits for GHG Sources—Operation Phase

Protective Service Occupations	0.9	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Office and Administrative Support Occupations	0.8	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	0.4	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Building, grounds, personal care, service occupations	0.3	Building Cleaning and Pest Control Workers Building Cleaning Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers
Healthcare Practitioners and Technical Occupations	0.3	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.1.33 BeSMART Status Quo—Investment Phase

Construction and Extraction Occupations	216.2	Construction Trades Workers Construction Laborers Carpenters Electricians Supervisors of Construction and Extraction Workers
Office and Administrative Support Occupations	174.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	86.1	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Computer and Mathematical Occupations	76.8	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers
Sales and Related Occupations	73.7	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.1.34 BeSMART Enhancement—Investment Phase

Construction and Extraction Occupations	353.1	Construction Trades Workers Construction Laborers Carpenters Electricians Supervisors of Construction and Extraction Workers
Office and Administrative Support Occupations	283.6	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	140.4	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Computer and Mathematical Occupations	124.9	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers
Sales and Related Occupations	119.0	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.1.35 BeSMART Status Quo—Operation Phase

Construction and Extraction Occupations	0.1	Construction Trades Workers Construction Laborers Carpenters Electricians Supervisors of Construction and Extraction Workers
Office and Administrative Support Occupations	0.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Farming, Fishing, and Forestry Occupations	0.0	Farmworkers and Laborers, Crop, Nursery, and Greenhouse Agricultural Workers Farmworkers, Farm, Ranch, and Aquacultural Animals Supervisors of Farming, Fishing, and Forestry Workers Forest, Conservation, and Logging Workers
Sales and Related Occupations	0.0	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	0.0	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General

Sources: BLS, RESI, REMI PI+

C.1.36 BeSMART Enhancement—Operation Phase

Construction and Extraction Occupations	0.1	Construction Trades Workers Construction Laborers Carpenters Electricians Supervisors of Construction and Extraction Workers
Office and Administrative Support Occupations	0.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	0.1	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Food Preparation and Serving Related Occupations	0.1	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Healthcare Practitioners and Technical Occupations	0.0	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.1.37 Weatherization and Energy Efficiency for Low-Income Houses Status Quo—Investment Phase

Office and Administrative Support Occupations	88.7	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	64.8	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Building and Grounds Cleaning and Maintenance Occupations	50.1	Building Cleaning and Pest Control Workers Building Cleaning Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers
Installation, Maintenance, and Repair Occupations	45.0	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	42.6	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.1.38 Weatherization and Energy Efficiency for Low-Income Houses Enhancement—Investment Phase

Office and Administrative Support Occupations	143.5	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	104.3	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Building and Grounds Cleaning and Maintenance Occupations	81.2	Building Cleaning and Pest Control Workers Building Cleaning Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers
Installation, Maintenance, and Repair Occupations	72.8	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	68.3	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.1.39 Weatherization and Energy Efficiency for Low-Income Houses Status Quo—Operation Phase

Healthcare Practitioners and Technical Occupations	0.3	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Food Preparation and Serving Related Occupations	0.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Office and Administrative Support Occupations	0.3	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	0.2	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Healthcare Support Occupations	0.2	Nursing, Psychiatric, and Home Health Aides Nursing Assistants Medical Assistants Dental Assistants Occupational Therapy and Physical Therapist Assistants and Aides

Sources: BLS, RESI, REMI PI+

**C.1.40 Weatherization and Energy Efficiency for Low-Income Houses Enhancement—
Operation Phase**

Healthcare Practitioners and Technical Occupations	0.5	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Food Preparation and Serving Related Occupations	0.4	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Office and Administrative Support Occupations	0.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	0.3	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Healthcare Support Occupations	0.3	Nursing, Psychiatric, and Home Health Aides Nursing Assistants Medical Assistants Dental Assistants Occupational Therapy and Physical Therapist Assistants and Aides

Sources: BLS, RESI, REMI PI+

C.1.41 GHG Prevention of Significant Deterioration Permitting Program—Investment Phase

Office and Administrative Support Occupations	0.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	0.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	0.1	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	0.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Construction and Extraction Occupations	0.1	Construction Trades Workers Construction Laborers Carpenters Electricians Supervisors of Construction and Extraction Workers

Sources: BLS, RESI, REMI PI+

C.1.42 GHG Prevention of Significant Deterioration Permitting Program—Operation Phase

Protective Service Occupations	0.2	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Office and Administrative Support Occupations	0.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	0.1	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	0.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	0.1	Building Cleaning and Pest Control Workers Building Cleaning Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers

Sources: BLS, RESI, REMI PI+

C.2 Transportation

C.2.1 Transportation Technology Initiatives Status Quo—Investment Phase

Construction and Extraction Occupations	183.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	92.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	48.2	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	37.3	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	36.1	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.2 Transportation Technology Initiatives Enhancement—Investment Phase

Construction and Extraction Occupations	219.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	110.5	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	57.9	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	44.8	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	43.3	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.3 Transportation Technology Initiatives Status Quo—Operation Phase

Healthcare Practitioners and Technical Occupations	141.7	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	128.1	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Food Preparation and Serving Related Occupations	41.8	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Education, Training, and Library Occupations	14.7	Preschool, Primary, Secondary, and Special Education School Teachers Other Education, Training, and Library Occupations Other Teachers and Instructors Librarians, Curators, and Archivists Postsecondary Teachers
Community and Social Service Occupations	10.5	Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other Educational, Guidance, School, and Vocational Counselors

Sources: BLS, RESI, REMI PI+

C.2.4 Transportation Technology Initiatives Enhancement—Operation Phase

Healthcare Practitioners and Technical Occupations	152.7	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	133.1	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Food Preparation and Serving Related Occupations	46.2	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Education, Training, and Library Occupations	17.9	Preschool, Primary, Secondary, and Special Education School Teachers Other Education, Training, and Library Occupations Other Teachers and Instructors Librarians, Curators, and Archivists Postsecondary Teachers
Community and Social Service Occupations	12.8	Social Workers Probation Officers and Correctional Treatment Specialists Social and Human Service Assistants Community and Social Service Specialists, All Other Educational, Guidance, School, and Vocational Counselors

Sources: BLS, RESI, REMI PI+

C.2.5 Public Transportation Initiatives Status Quo—Investment Phase

Construction and Extraction Occupations	183.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	92.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	48.2	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	37.3	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	36.1	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.6 Public Transportation Initiatives Enhancement—Investment Phase

Construction and Extraction Occupations	219.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	110.5	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	57.9	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	44.8	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	43.3	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.7 Public Transportation Initiatives Status Quo—Operation Phase

Healthcare Practitioners and Technical Occupations	99.2	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	84.5	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Transportation, material moving occupations	67.3	Aircraft cargo handling supervisors Air traffic controllers Ambulance drivers and attendants Driver/Sales workers and truck drivers Subway and streetcar operators
Food Preparation and Serving Related Occupations	31.2	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Protective Service Occupations	29.9	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators

Sources: BLS, RESI, REMI PI+

C.2.8 Public Transportation Initiatives Enhancement—Operation Phase

Healthcare Practitioners and Technical Occupations	104.5	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	92.6	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Transportation, material moving occupations	74.3	Aircraft cargo handling supervisors Air traffic controllers Ambulance drivers and attendants Driver/Sales workers and truck drivers Subway and streetcar operators
Food Preparation and Serving Related Occupations	42.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Protective Service Occupations	37.8	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators

Sources: BLS, RESI, REMI PI+

C.2.9 Intercity Transportation Initiatives Status Quo—Investment Phase

Construction and Extraction Occupations	45.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	16.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Installation, Maintenance, and Repair Occupations	8.1	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	7.5	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	7.0	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.10 Intercity Transportation Initiatives Enhancement—Investment Phase

Construction and Extraction Occupations	54.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	19.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Installation, Maintenance, and Repair Occupations	9.8	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	9.0	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	8.5	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.11 Intercity Transportation Initiatives Status Quo—Operation Phase

Transportation and Material Moving Occupations	6.5	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand
Office and Administrative Support Occupations	1.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Building and Grounds Cleaning and Maintenance Occupations	0.4	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Healthcare Practitioners and Technical Occupations	0.3	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Business and Financial Operations Occupations	0.2	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents

Sources: BLS, RESI, REMI PI+

C.2.12 Intercity Transportation Initiatives Enhancement—Operation Phase

Transportation and Material Moving Occupations	7.1	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand
Office and Administrative Support Occupations	1.6	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Building and Grounds Cleaning and Maintenance Occupations	0.8	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Healthcare Practitioners and Technical Occupations	0.5	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Business and Financial Operations Occupations	0.4	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents

Sources: BLS, RESI, REMI PI+

C.2.13 Pricing Initiatives Status Quo—Investment Phase

This policy has no investment costs associated with implementation in status quo.

C.2.14 Pricing Initiatives Enhancement—Investment Phase

Construction and Extraction Occupations	423.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	198.9	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	132.2	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	118.3	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	96.6	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.15 Pricing Initiatives Status Quo—Operation Phase

This policy has no operation benefits or costs associated with status quo.

C.2.14 Pricing Initiatives Enhancement—Operation Phase

Healthcare Practitioners and Technical Occupations	172.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	164.2	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Food Preparation and Serving Related Occupations	58.9	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Education, Training, and Library Occupations	19.0	Preschool, Primary, Secondary, and Special Education School Teachers Other Education, Training, and Library Occupations Other Teachers and Instructors Librarians, Curators, and Archivists Postsecondary Teachers
Business and Financial Operations Occupations	18.3	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents

Sources: BLS, RESI, REMI PI+

C.2.15 Bike and Pedestrian Initiatives Status Quo—Investment Phase

Construction and Extraction Occupations	325.9	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	211.7	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	133.8	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	121.1	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	98.7	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.16 Bike and Pedestrian Initiatives Enhancement—Investment Phase

Construction and Extraction Occupations	522.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	326.8	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	210.2	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Installation, Maintenance, and Repair Occupations	189.9	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	114.4	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.2.17 Bike and Pedestrian Initiatives Status Quo—Operation Phase

Healthcare Practitioners and Technical Occupations	0.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	0.0	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Food Preparation and Serving Related Occupations	0.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Education, Training, and Library Occupations	0.0	Preschool, Primary, Secondary, and Special Education School Teachers Other Education, Training, and Library Occupations Other Teachers and Instructors Librarians, Curators, and Archivists Postsecondary Teachers
Business and Financial Operations Occupations	0.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents

Sources: BLS, RESI, REMI PI+

C.2.18 Bike and Pedestrian Initiatives Enhancement—Operation Phase

Healthcare Practitioners and Technical Occupations	0.3	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	0.2	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Food Preparation and Serving Related Occupations	0.1	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Education, Training, and Library Occupations	0.1	Preschool, Primary, Secondary, and Special Education School Teachers Other Education, Training, and Library Occupations Other Teachers and Instructors Librarians, Curators, and Archivists Postsecondary Teachers
Business and Financial Operations Occupations	0.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents

Sources: BLS, RESI, REMI PI+

C.3 Agriculture and Forestry

C.3.1 Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Investment Phase

Office and Administrative Support Occupations	0.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	0.2	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	0.1	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Construction and Extraction Occupations	0.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Healthcare Practitioners and Technical Occupations	0.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.3.2 Creating Ecosystem Markets to Encourage GHG Emissions Reductions—Operation Phase

Protective Service Occupations	84.8	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	46.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	43.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	31.7	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Sales and Related Occupations	25.5	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.3.3 Nutrient Trading for GHG Benefits Status Quo—Investment Phase

Office and Administrative Support Occupations	1.6	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	1.2	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	0.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	0.8	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare occupations	0.4	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.3.4 Nutrient Trading for GHG Benefits Enhancement—Investment Phase

Office and Administrative Support Occupations	3.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	2.3	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	1.6	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	1.5	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare occupations	1.2	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.3.5 Nutrient Trading for GHG Benefits Status Quo—Operation Phase

To date there is a program that duplicates the work of this policy and therefore has no impact in the operation phase.

C.3.6 Nutrient Trading for GHG Benefits Status Quo—Operation Phase

To date there is a program that duplicates the work of this policy and therefore has no impact in the operation phase.

C.3.7 Managing Forests to Capture Carbon—Investment Phase

Farming, Fishing, and Forestry Occupations	45.6	Agricultural Workers Farmworkers and Laborers, Crop, Nursery, and Greenhouse Farmworkers, Farm, Ranch, and Aquacultural Animals Forest, Conservation, and Logging Workers Supervisors of Farming, Fishing, and Forestry Workers
Management Occupations	16.8	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers
Office and Administrative Support Occupations	4.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Transportation and Material Moving Occupations	4.3	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand
Installation, Maintenance, and Repair Occupations	2.2	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General

Sources: BLS, RESI, REMI PI+

C.3.8 Managing Forests to Capture Carbon—Operation Phase

Farming, Fishing, and Forestry Occupations	9.6	Agricultural Workers Farmworkers and Laborers, Crop, Nursery, and Greenhouse Farmworkers, Farm, Ranch, and Aquacultural Animals Forest, Conservation, and Logging Workers Supervisors of Farming, Fishing, and Forestry Workers
Management Occupations	3.6	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers
Office and Administrative Support Occupations	1.2	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Transportation and Material Moving Occupations	1.0	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand
Installation, Maintenance, and Repair Occupations	0.5	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General

Sources: BLS, RESI, REMI PI+

C.3.9 Increasing Urban Trees to Capture Carbon—Investment Phase

Farming, Fishing, and Forestry Occupations	0.9	Agricultural Workers Farmworkers and Laborers, Crop, Nursery, and Greenhouse Farmworkers, Farm, Ranch, and Aquacultural Animals Forest, Conservation, and Logging Workers Supervisors of Farming, Fishing, and Forestry Workers
Management Occupations	0.4	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers
Construction and Extraction Occupations	0.4	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	0.3	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Transportation and Material Moving Occupations	0.3	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand

Sources: BLS, RESI, REMI PI+

C.3.10 Increasing Urban Trees to Capture Carbon—Operation Phase

Office and Administrative Support Occupations	37.8	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Food Preparation and Serving Related Occupations	27.9	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	25.3	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Healthcare Practitioners and Technical Occupations	13.6	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	13.1	Legislators Advertising, marketing, and sales managers Compliance officers Cost estimators Accountants and auditors

Sources: BLS, RESI, REMI PI+

C.3.11 Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—Investment Phase

Office and Administrative Support Occupations	2.9	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	1.7	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Computer and Mathematical Occupations	1.7	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers
Architecture and Engineering Occupations	1.2	Engineers Drafters, Engineering Technicians, and Mapping Technicians Civil Engineers Engineering Technicians, Except Drafters Electrical and Electronics Engineers
Management Occupations	1.0	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

**C.3.12 Creating and Protecting Wetlands and Waterway Borders to Capture Carbon—
Operation Phase**

Food Preparation and Serving Related Occupations	23.1	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Sales and Related Occupations	8.6	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Office and Administrative Support Occupations	6.7	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Personal Care and Service Occupations	5.9	Recreation and Fitness Workers Amusement and Recreation Attendants Personal Care Aides Childcare Workers Supervisors of Personal Care and Service Workers
Building and Grounds Cleaning and Maintenance Occupations	3.6	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers

Sources: BLS, RESI, REMI PI+

C.3.13 Geological Opportunities to Store Carbon—Investment Phase

Office and Administrative Support Occupations	0.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Construction and Extraction Occupations	0.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Food Preparation and Serving Related Occupations	0.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Business and Financial Operations Occupations	0.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Sales and Related Occupations	0.0	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.3.14 Geological Opportunities to Store Carbon—Operation Phase

Office and Administrative Support Occupations	33.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Sales and Related Occupations	27.5	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Food Preparation and Serving Related Occupations	13.2	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Installation, Maintenance, and Repair Occupations	11.4	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Management Occupations	10.5	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.3.15 Planting Forests in Maryland—Investment Phase

Farming, Fishing, and Forestry Occupations	22.4	Agricultural Workers Farmworkers and Laborers, Crop, Nursery, and Greenhouse Farmworkers, Farm, Ranch, and Aquacultural Animals Forest, Conservation, and Logging Workers Supervisors of Farming, Fishing, and Forestry Workers
Business and Financial Operations Occupations	7.3	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Transportation and Material Moving Occupations	7.1	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand
Building and Grounds Cleaning and Maintenance Occupations	5.1	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Office and Administrative Support Occupations	3.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks

Sources: BLS, RESI, REMI PI+

C.3.16 Planting Forests in Maryland—Operation Phase

Office and Administrative Support Occupations	0.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Healthcare Practitioners and Technical Occupations	0.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	0.0	Building Cleaning Workers Maids and Housekeeping Cleaners Janitors and Cleaners, Except Maids and Housekeeping Cleaners Landscaping and Groundskeeping Workers Grounds Maintenance Workers
Food Preparation and Serving Related Occupations	0.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Transportation and Material Moving Occupations	0.0	Motor Vehicle Operators Material Moving Workers Driver/Sales Workers and Truck Drivers Heavy and Tractor-Trailer Truck Drivers Laborers and Freight, Stock, and Material Movers, Hand

Sources: BLS, RESI, REMI PI+

C.3.17 Biomass for Energy Production—Investment Phase

Office and Administrative Support Occupations	41.4	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	30.7	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	20.9	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	20.2	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	12.0	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.3.18 Biomass for Energy Production—Operation Phase

Construction and Extraction Occupations	1.2	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	1.1	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Business and Financial Operations Occupations	0.5	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Installation, Maintenance, and Repair Occupations	0.4	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Computer and Mathematical Occupations	0.3	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers

Sources: BLS, RESI, REMI PI+

C.3.19 Conservation of Agricultural Land for GHG Benefits—Investment Phase

Office and Administrative Support Occupations	8.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	5.3	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	4.0	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	3.2	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Management Occupations	2.3	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.3.20 Conservation of Agricultural Land for GHG Benefits—Operation Phase

Office and Administrative Support Occupations	46.0	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Farming, Fishing, and Forestry Occupations	41.2	Agricultural Workers Farmworkers and Laborers, Crop, Nursery, and Greenhouse Farmworkers, Farm, Ranch, and Aquacultural Animals Forest, Conservation, and Logging Workers Supervisors of Farming, Fishing, and Forestry Workers
Construction and Extraction Occupations	29.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	29.2	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	27.8	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.4 Zero Waste

C.4.1 Recycling and Source Reduction Status Quo—Investment Phase

Office and Administrative Support Occupations	150.5	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Building and Grounds Cleaning and Maintenance Occupations	108.4	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Transportation and Material Moving Occupations	65.4	Material Moving Workers Laborers and Material Movers, Hand Driver/Sales Workers and Truck Drivers Refuse and Recyclable Material Collectors Industrial Truck and Tractor Operators
Construction and Extraction Occupations	62.3	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	61.7	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.4.2 Recycling and Source Reduction Enhancement—Investment Phase

Office and Administrative Support Occupations	200.7	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Building and Grounds Cleaning and Maintenance Occupations	144.5	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Transportation and Material Moving Occupations	87.2	Material Moving Workers Laborers and Material Movers, Hand Driver/Sales Workers and Truck Drivers Refuse and Recyclable Material Collectors Industrial Truck and Tractor Operators
Construction and Extraction Occupations	83.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	82.3	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.4.3 Recycling and Source Reduction Status Quo—Operation Phase

Office and Administrative Support Occupations	-67.7	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Building and Grounds Cleaning and Maintenance Occupations	-48.7	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Transportation and Material Moving Occupations	-29.4	Material Moving Workers Laborers and Material Movers, Hand Driver/Sales Workers and Truck Drivers Refuse and Recyclable Material Collectors Industrial Truck and Tractor Operators
Construction and Extraction Occupations	-28.3	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	-27.8	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.4.4 Recycling and Source Reduction Enhancement—Operation Phase

Office and Administrative Support Occupations	-111.2	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Building and Grounds Cleaning and Maintenance Occupations	-80.0	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Transportation and Material Moving Occupations	-48.3	Material Moving Workers Laborers and Material Movers, Hand Driver/Sales Workers and Truck Drivers Refuse and Recyclable Material Collectors Industrial Truck and Tractor Operators
Construction and Extraction Occupations	-46.5	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	-45.7	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.5 Buildings

C.5.1 Building Codes—Investment Phase

Office and Administrative Support Occupations	3.3	Material Recording, Scheduling, Dispatching, and Distributing Workers Information and Record Clerks Other Office and Administrative Support Workers Secretaries and Administrative Assistants Financial Clerks
Protective Service Occupations	2.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	1.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	1.3	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Management Occupations	0.9	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.5.2 Building Codes—Operation Phase

Office and Administrative Support Occupations	99.0	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Business and Financial Operations Occupations	53.8	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Management Occupations	49.2	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers
Sales and Related Occupations	37.8	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Construction and Extraction Occupations	36.3	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians

Sources: BLS, RESI, REMI PI+

C.6 Land Use

C.6.1 Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits) Status Quo—Investment Phase

Construction and Extraction Occupations	651.4	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	281.9	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Installation, Maintenance, and Repair Occupations	175.7	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	134.6	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	115.1	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.6.2 Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits) Enhancement—Investment Phase

Construction and Extraction Occupations	961.6	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	416.1	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Installation, Maintenance, and Repair Occupations	259.4	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	198.8	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	170.0	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.6.3 Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits) Status Quo—Operation Phase

Office and Administrative Support Occupations	97.0	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Sales and Related Occupations	82.5	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Construction and Extraction Occupations	76.2	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Food Preparation and Serving Related Occupations	51.2	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Healthcare Practitioners and Technical Occupations	36.7	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.6.4 Reducing Emissions through Smart Growth and Land Use/Location Efficiency (Include Land Use Planning and Growth Boundary GHG Benefits) Enhancement—Operation Phase

Office and Administrative Support Occupations	161.6	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Sales and Related Occupations	137.5	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Construction and Extraction Occupations	127.0	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Food Preparation and Serving Related Occupations	85.4	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Healthcare Practitioners and Technical Occupations	61.2	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.6.5 Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Investment Phase

Construction and Extraction Occupations	930.6	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	402.7	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Installation, Maintenance, and Repair Occupations	251.1	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	192.4	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	164.5	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.6.6 Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Investment Phase

Construction and Extraction Occupations	1,054.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Office and Administrative Support Occupations	456.4	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Installation, Maintenance, and Repair Occupations	284.5	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Sales and Related Occupations	218.0	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	186.4	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.6.5 Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Status Quo—Operation Phase

Office and Administrative Support Occupations	177.8	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Sales and Related Occupations	151.3	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Construction and Extraction Occupations	139.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Food Preparation and Serving Related Occupations	106.8	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Healthcare Practitioners and Technical Occupations	67.3	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.6.6 Priority Funding Area (Growth Boundary) Related Benefits (Transportation Sector through Smart Growth) Enhancement—Investment Phase

Office and Administrative Support Occupations	282.9	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Sales and Related Occupations	240.7	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Construction and Extraction Occupations	222.3	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Food Preparation and Serving Related Occupations	149.4	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Healthcare Practitioners and Technical Occupations	107.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.7 Innovative Initiatives

C.7.1 Buy Local for GHG Benefits—Investment Phase

Office and Administrative Support Occupations	7.6	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	5.2	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	3.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	3.1	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Management Occupations	2.1	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.7.2 Buy Local for GHG Benefits—Operation Phase

Office and Administrative Support Occupations	1.0	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Farming, Fishing, and Forestry Occupations	0.9	Agricultural Workers Farmworkers and Laborers, Crop, Nursery, and Greenhouse Farmworkers, Farm, Ranch, and Aquacultural Animals Forest, Conservation, and Logging Workers Supervisors of Farming, Fishing, and Forestry Workers
Construction and Extraction Occupations	0.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	0.6	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Management Occupations	0.6	General and Operations Managers Construction Managers Operations Specialties Managers Advertising, Marketing, Promotions, Public Relations, and Sales Managers Financial Managers

Sources: BLS, RESI, REMI PI+

C.7.3 Voluntary Stationary Source Reductions—Investment Phase

Sales and Related Occupations	0.1	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Protective Service Occupations	0.1	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	0.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Construction and Extraction Occupations	0.0	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Building and Grounds Cleaning and Maintenance Occupations	0.0	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors

Sources: BLS, RESI, REMI PI+

C.7.4 Voluntary Stationary Source Reductions—Operation Phase

Construction and Extraction Occupations	0.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Sales and Related Occupations	0.1	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Business and Financial Operations Occupations	0.2	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Installation, Maintenance, and Repair Occupations	0.2	Other Installation, Maintenance, and Repair Occupations Line Installers and Repairers Electrical Power-Line Installers and Repairers Electrical and Electronic Equipment Mechanics, Installers, and Repairers Maintenance and Repair Workers, General
Computer and Mathematical Occupations	0.1	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers

Sources: BLS, RESI, REMI PI+

C.7.5 PAYD Insurance in Maryland—Investment Phase

There are no specified costs with this policy to date.

C.7.6 PAYD Insurance in Maryland—Operation Phase

Computer and Mathematical Occupations	0.0	Software Developers and Programmers Computer and Information Analysts Computer Systems Analysts Database and Systems Administrators and Network Architects Computer Programmers
Healthcare Practitioners and Technical Occupations	0.0	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	0.0	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Office and Administrative Support Occupations	0.0	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Sales and Related Occupations	0.0	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers

Sources: BLS, RESI, REMI PI+

C.7.7 Leadership-by-Example—Local Government—Investment Phase

Office and Administrative Support Occupations	33.2	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Construction and Extraction Occupations	23.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Protective Service Occupations	18.7	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	14.7	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Food Preparation and Serving Related Occupations	9.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, RESI, REMI PI+

C.7.8 Leadership-by-Example—Local Government—Operation Phase

Office and Administrative Support Occupations	51.2	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Business and Financial Operations Occupations	31.9	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Building and Grounds Cleaning and Maintenance Occupations	26.8	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Food Preparation and Serving Related Occupations	19.4	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Construction and Extraction Occupations	12.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians

Sources: BLS, RESI, REMI PI+

C.7.9 Leadership-by-Example—Federal Government—Investment Phase

Office and Administrative Support Occupations	16.4	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	12.3	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	8.0	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	7.9	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	4.7	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.7.10 Leadership-by-Example—Federal Government—Operation Phase

Office and Administrative Support Occupations	206.2	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	174.9	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	105.3	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Construction and Extraction Occupations	78.5	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Healthcare Practitioners and Technical Occupations	68.8	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.7.11 State of Maryland Initiatives to Lead by Example Status Quo—Investment Phase

Office and Administrative Support Occupations	33.2	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Construction and Extraction Occupations	23.8	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Protective Service Occupations	18.7	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	14.7	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Food Preparation and Serving Related Occupations	9.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, RESI, REMI PI+

C.7.12 State of Maryland Initiatives to Lead by Example Enhancement—Investment Phase

Office and Administrative Support Occupations	36.4	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Construction and Extraction Occupations	26.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Protective Service Occupations	21.2	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	16.8	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Food Preparation and Serving Related Occupations	11.1	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, RESI, REMI PI+

C.7.13 State of Maryland Initiatives to Lead by Example Status Quo—Operation Phase

Office and Administrative Support Occupations	0.7	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Business and Financial Operations Occupations	0.5	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Building and Grounds Cleaning and Maintenance Occupations	0.2	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Food preparation, serving related occupations	0.1	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Construction and Extraction Occupations	0.1	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians

Sources: BLS, RESI, REMI PI+

C.7.14 State of Maryland Initiatives to Lead by Example Enhancement—Operation Phase

Office and Administrative Support Occupations	1.0	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Business and Financial Operations Occupations	0.7	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Building and Grounds Cleaning and Maintenance Occupations	0.6	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors
Food preparation, serving related occupations	0.3	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks
Construction and Extraction Occupations	0.3	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians

Sources: BLS, RESI, REMI PI+

**C.7.15 Leadership-by-Example—Maryland University Lead-by-Example Initiatives—
Investment Phase**

Office and Administrative Support Occupations	15.8	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	11.9	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	7.7	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	7.7	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	4.5	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.7.16 Leadership-by-Example—Maryland University Lead-by-Example Initiatives—Operation Phase

Office and Administrative Support Occupations	16.1	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	15.4	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	8.4	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Healthcare Practitioners and Technical Occupations	5.6	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Building and Grounds Cleaning and Maintenance Occupations	5.0	Building Cleaning and Pest Control Workers Janitors and Cleaners, Except Maids and Housekeeping Cleaners Grounds Maintenance Workers Supervisors of Building and Grounds Cleaning and Maintenance Workers Custodial Supervisors

Sources: BLS, RESI, REMI PI+

C.7.17 Transportation and Climate Initiative—Investment Phase

There are no costs to date associated with the implementation of this program during the investment phase.

C.7.18 Transportation Climate Initiative—Operation Phase

Office and Administrative Support Occupations	4.3	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	2.8	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Business and Financial Operations Occupations	1.7	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Sales and Related Occupations	1.3	Retail Sales Workers Cashiers Counter and Rental Clerks and Parts Salespersons Retail Salespersons Other Sales and Related Workers
Healthcare Practitioners and Technical Occupations	1.1	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons

Sources: BLS, RESI, REMI PI+

C.7.19 GHG Emissions Inventory Development—Investment Phase

Office and Administrative Support Occupations	2.9	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Protective Service Occupations	1.9	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Construction and Extraction Occupations	1.5	Construction Laborers Carpenters Construction Equipment Operators First-Line Supervisors of Construction Trades and Extraction Workers Electricians
Business and Financial Operations Occupations	1.2	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Management Occupations	0.8	Supervisors of construction trade workers Carpenters Brick masons, block masons, and stonemasons Construction equipment operators Electricians

Sources: BLS, RESI, REMI PI+

C.7.20 GHG Prevention of Significant Deterioration Permitting Program—Operation Phase

There is no specified cost or benefit to this program during the operation phase.

C.8 Outreach

C.8.1 Outreach and Public Education—Investment Phase

There are no costs associated with the investment phase of this policy.

C.8.2 Outreach and Public Education—Investment Phase

Office and Administrative Support Occupations	0.0	Information and Record Clerks Other Office and Administrative Support Workers Customer Service Representatives Financial Clerks Material Recording, Scheduling, Dispatching, and Distributing Workers
Business and Financial Operations Occupations	0.0	Business Operations Specialists, All Other Financial Specialists Compliance Officers Management Analysts Tax Examiners and Collectors, and Revenue Agents
Protective Service Occupations	0.0	Fire fighters and inspectors Bailiffs, correctional officers, and jailers Fish and game wardens Animal control workers Private detectives and investigators
Healthcare Practitioners and Technical Occupations	0.0	Health Diagnosing and Treating Practitioners Registered Nurses Health Technologists and Technicians Licensed Practical and Licensed Vocational Nurses Physicians and Surgeons
Food Preparation and Serving Related Occupations	0.0	Food and Beverage Serving Workers Waiters and Waitresses Cooks and Food Preparation Workers Fast Food and Counter Workers Cooks

Sources: BLS, RESI, REMI PI+

Appendix D—References by Subject Area

D.1 Energy

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