

Case 14-M-0094, Proceeding on Motion of the Commission to
Consider a Clean Energy Fund

Clean Energy Fund Investment Plan: Budget Accounting and Benefits Chapter

Submitted by:

The New York State Energy Research and Development Authority

Revised April 29, 2016

Budget Accounting and Benefits

This Budget Accounting and Benefits chapter is intended to provide a current and comprehensive compilation of budgets and benefits for all Market Development and Innovation & Research portfolio initiatives contained within the Clean Energy Fund (CEF) Investment Plan as of April 29, 2016. These are compared to the minimum projected benefits identified in the CEF Order and presented in **Table 1** for the combined four portfolios of the CEF which also includes NY-Sun and NYGB. All dollars and benefits are reflected in the year in which they are anticipated to be committed.

Table 1. CEF Minimum Projected Benefits 2016 - 2025 (in millions)

		Cumulative Annual	Lifetime
Energy Efficiency	MWh	10.6	*
	MMBtu	13.4	*
	MW	*	*
Renewable Energy	MWh	*	88
	MW	*	*
CO2e Emissions Reductions (tons)		*	133
Customer Bill Savings		*	\$39,131
Private Investment		*	\$29,356

** Denotes metric to be tracked and reported*

Table 2 summarizes the progressive budget schedule by portfolio, admin, and evaluation funding. **Table 3** details the budget schedule by all initiatives contained within this Investment Plan.

Table 2. Market Development and Innovation & Research Portfolio Budgets¹

	Program Authorization	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total	% of Program Authorization
Market Development													
Program Funds	\$2,393,728,000	\$234,603,177	\$132,586,178	\$84,119,190	\$14,199,035	\$15,831,790	\$12,391,394	\$8,222,067	\$5,716,900	\$5,455,103	\$3,208,986	\$516,333,820	22.12%
NYS Cost Recovery Fee		\$5,849,990	\$3,394,609	\$2,260,031	\$372,131	\$419,698	\$306,270	\$214,906	\$140,058	\$133,644	\$78,617	\$13,169,954	
Innovation & Research													
Program Funds	\$631,672,000	\$ 9,800,000	\$ 9,250,000	\$ 3,500,000	\$ 3,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 25,550,000	4.15%
NYS Cost Recovery Fee		\$ 244,370	\$ 236,828	\$ 94,035	\$ 78,625	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 653,857	
Administration	\$274,400,000	\$22,161,308	\$13,205,227	\$8,560,240	\$1,639,112	\$1,526,173	\$1,113,710	\$781,476	\$509,301	\$485,978	\$285,878	\$50,268,403	18.32%
Evaluation	\$130,200,000	\$4,357,500	\$6,392,500	\$8,469,500	\$1,200,000	\$1,299,500	\$110,000	\$550,000	\$0	\$0	\$0	\$22,379,000	17.19%
Total	\$3,430,000,000	\$277,016,345	\$165,065,343	\$107,002,996	\$20,488,903	\$19,077,160	\$13,921,374	\$9,768,449	\$6,366,258	\$6,074,724	\$3,573,481	\$628,355,034	18.32%

¹The CEF Order authorized CEF funding and noted that these costs would be funded from the funding authorized for the combined program costs and New York State Cost Recovery Fee (CRF) costs. NYSERDA has revised the presentation in this summary to report CRF separate from program costs, but still subject to the original authorization on a combined basis. This approach improves the transparency of reporting and also recognizes the differences in the timing of commitment/expenditures of program costs vs. CRF costs. The initial budget for CRF assumes the assessment will average 2.2% of funding over the term of the CEF.

Table 3. Market Development and Innovation & Research Budget by Chapter and Initiative

Market Development	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Resource Acquisition Transition Chapter											
Commercial	\$27,000,000	\$10,000,000	\$0								\$37,000,000
Industrial	\$34,200,000	\$7,650,000	\$2,250,000								\$44,100,000
Agriculture	\$1,800,000	\$1,800,000	\$0								\$3,600,000
Multifamily Market Rate	\$3,117,517	\$2,078,345	\$0								\$5,195,862
Single Family Market Rate	\$12,924,640	\$5,965,040	\$0								\$18,889,680
LMI Single Family	\$43,884,580	\$31,742,140	\$31,744,680								\$107,371,400
LMI Multifamily	\$15,576,622	\$7,749,768	\$10,536,110								\$33,862,500
Commercial New Construction	\$13,328,280	\$11,355,695	\$0								\$24,683,975
Low Rise New Construction	\$5,643,750	\$5,192,250	\$0								\$10,836,000
Multifamily New Construction	\$5,835,186	\$4,319,952	\$0								\$10,155,138
Anaerobic Digesters	\$4,050,000	\$4,050,000	\$4,050,000								\$12,150,000
Fuel Cells	\$2,000,000	\$2,000,000	\$2,000,000								\$6,000,000
Small Wind	\$2,030,000	\$2,030,000	\$2,030,000								\$6,090,000
Solar Thermal	\$3,000,000	\$0	\$0								\$3,000,000
Combined Heat & Power	\$26,050,000	\$13,050,000	\$9,450,000								\$48,550,000
Resource Acquisition Transition Chapter Total	\$200,440,575	\$108,983,190	\$62,060,790	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$371,484,555
Market Characterization & Design Chapter											
	\$3,250,000	\$4,750,000	\$2,500,000	\$500,000	\$500,000	\$0	\$0	\$0	\$0	\$0	\$11,500,000
Commercial Chapter											
Real Estate Tenant	\$1,062,475	\$2,121,331	\$2,783,806	\$3,613,234	\$4,042,662	\$3,547,139	\$2,851,617	\$2,166,642	\$2,111,095	\$1,200,000	\$25,500,000
Real Time Energy Management	\$3,061,510	\$5,411,433	\$7,643,157	\$8,053,773	\$9,257,099	\$6,835,269	\$3,361,465	\$1,541,273	\$1,335,023	\$0	\$46,500,000
REV Campus Challenge	\$504,493	\$2,504,493	\$2,532,029	\$2,032,029	\$2,032,029	\$2,008,986	\$2,008,986	\$2,008,986	\$2,008,986	\$2,008,986	\$19,650,000
Commercial Chapter Total	\$4,628,478	\$10,037,256	\$12,958,992	\$13,699,035	\$15,331,790	\$12,391,394	\$8,222,067	\$5,716,900	\$5,455,103	\$3,208,986	\$91,650,000
Industrial Chapter											
Continuous Energy Improvement	\$5,522,739	\$3,442,000	\$1,016,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,980,739
Industrial Chapter Total	\$5,522,739	\$3,442,000	\$1,016,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,980,739
Communities Chapter											
Clean Energy Communities	\$3,261,386	\$5,373,731	\$5,583,409	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,218,526
Communities Chapter Total	\$3,261,386	\$5,373,731	\$5,583,409	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,218,526
Large-Scale Renewables Chapter											
Offshore Wind Master Plan	\$5,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,000,000
Offshore Wind Pre-Development Activities	\$10,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,000,000
Large-Scale Renewables Chapter Total	\$15,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,000,000
REV Technical Assistance Chapter											
REV Connect	\$2,500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,500,000
REV Technical Assistance Chapter Total	\$2,500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,500,000
NYS Cost Recovery Fee	\$5,849,990	\$3,394,609	\$2,260,031	\$372,131	\$419,698	\$306,270	\$214,906	\$140,058	\$133,644	\$78,617	\$13,169,954
Total Market Development	\$240,453,167	\$135,980,787	\$86,379,222	\$14,571,167	\$16,251,487	\$12,697,664	\$8,436,973	\$5,856,958	\$5,588,746	\$3,287,602	\$529,503,774
Innovation & Research											
Market Characterization & Design Chapter											
	\$0	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$250,000
Grid Modernization Chapter											
DER Interconnection	\$3,800,000	\$2,500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,300,000
Grid Modernization Chapter Total	\$3,800,000	\$2,500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,300,000
Innovation Capacity and Business Development Chapter											
CleanTech Startup Growth	\$6,000,000	\$6,500,000	\$3,500,000	\$3,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$19,000,000
Innovation Capacity and Bus. Dev. Chapter Total	\$6,000,000	\$6,500,000	\$3,500,000	\$3,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$19,000,000
NYS Cost Recovery Fee	\$244,370	\$236,828	\$94,035	\$78,625	\$0	\$0	\$0	\$0	\$0	\$0	\$653,857
Total Innovation & Research	\$10,044,370	\$9,486,828	\$3,594,035	\$3,078,625	\$0	\$0	\$0	\$0	\$0	\$0	\$26,203,857
Administration											
	\$22,161,308	\$13,205,227	\$8,560,240	\$1,639,112	\$1,526,173	\$1,113,710	\$781,476	\$509,301	\$485,978	\$285,878	\$50,268,403
Evaluation											
	\$4,357,500	\$6,392,500	\$8,469,500	\$1,200,000	\$1,299,500	\$110,000	\$550,000	\$0	\$0	\$0	\$22,379,000
Total	\$277,016,345	\$165,065,343	\$107,002,996	\$20,488,903	\$19,077,160	\$13,921,374	\$9,768,449	\$6,366,258	\$6,074,724	\$3,573,481	\$628,355,034

Similarly, Tables 4 through 12 present the associated benefits of these investments. Benefits are rounded to three significant figures therefore totals may not sum.² Table 4 includes estimated indirect savings from market effects expected to accrue over the longer term as a result of NYSERDA’s investment and follow on market activity. Indirect impact across NYSERDA initiatives may not be additive due to multiple initiatives operating within market sectors. Therefore, indirect savings shown in Table 4 reflect a 50% discount, as a basis for conservative estimation at this time. The indirect savings will be quantified and reported based on periodic Market Evaluation studies. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA’s programs. For Tables 7 through 10, emissions reductions, energy metrics, and bill savings are measured on a ‘lifetime’ basis to account for the repeating benefits that are realized year-after-year from the implementation of clean energy activity. The carbon benefits are estimated using standard factors to convert electricity, natural gas, and petroleum savings into carbon (1,160 lbs/MWh, 117 lbs/MMBtu, 162 lbs/MMBtu respectively). Estimated bill savings are based on avoided retail rates and include electric, natural gas and petroleum bill savings.

Table 4. Market Development and Innovation & Research Portfolio Energy Efficiency Cumulative First Year Annual Benefits (MWh and MMBtu)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total (Direct)	% of 10 yr Min. Goals (Direct)	Cumulative Annual 2025 Indirect Savings	% of 10 yr Min. Goals (Direct + Indirect)
Market Development														
MWh	620,500	333,000	243,400	87,900	99,600	72,020	41,420	23,620	20,350	7,720	1,550,000	15%	988,000	24%
MMBtu	4,495,000	2,836,000	1,751,000	119,300	126,800	87,900	69,690	58,380	55,770	47,900	9,647,000	72%	1,729,000	85%
Innovation and Research														
MWh	-	-	-	-	-	-	-	-	-	-	-	0%	-	0%
MMBtu	-	-	-	-	-	-	-	-	-	-	-	0%	-	0%
Total MWh	620,500	333,000	243,400	87,900	99,600	72,020	41,420	23,620	20,350	7,720	1,550,000	15%	988,000	24%
Total MMBtu	4,495,000	2,836,000	1,751,000	119,300	126,800	87,900	69,690	58,380	55,770	47,900	9,647,000	72%	1,729,000	85%

² This rounding convention is applied for the first time in this April 29, 2016 filing of the Budget Accounting & Benefits chapter and will be applied on a going forward basis as this chapter is updated. Values in prior filings of the chapter have been adjusted to conform with the convention.

Table 5. Market Development and Innovation & Research Energy Efficiency Cumulative First Year Annual Benefits by Chapter and Initiative (MWh)

Market Development	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Resource Acquisition Transition Chapter											
Commercial	76,800	44,000	-								120,800
Industrial	201,000	64,500	27,200								292,700
Agriculture	6,050	6,050	-								12,100
Multifamily Market Rate	1,300	1,300	-								2,600
Single Family Market Rate	1,330	1,590	-								2,920
LMI Single Family	5,250	5,410	5,410								16,070
LMI Multifamily	20,600	16,000	24,900								61,500
Commercial New Construction	20,500	17,400	-								37,900
Low Rise New Construction	6,080	6,040	-								12,120
Multifamily New Construction	14,200	11,300	-								25,500
Anaerobic Digesters	-	-	-								-
Fuel Cells	-	-	-								-
Small Wind	-	-	-								-
Solar Thermal	-	-	-								-
Combined Heat & Power	175,000	52,000	60,000								287,000
Resource Acquisition Transition Chapter Total	528,100	225,600	117,500	-	-	-	-	-	-	-	871,200
Commercial Chapter											
Real Estate Tenant	5,600	13,100	18,600	22,400	26,100	18,600	11,200	5,600	3,700	-	124,900
Real Time Energy Management	20,500	36,200	51,100	53,900	61,900	45,700	22,500	10,300	8,930	-	311,000
REV Campus Challenge	-	15,400	15,400	11,600	11,600	7,720	7,720	7,720	7,720	7,720	92,630
Commercial Chapter Total	26,100	64,700	85,100	87,900	99,600	72,020	41,420	23,620	20,350	7,720	528,500
Industrial Chapter											
Continuous Energy Improvement	49,500	15,000	12,000	-	-	-	-	-	-	-	76,500
Industrial Chapter Total	49,500	15,000	12,000	-	-	-	-	-	-	-	76,500
Communities Chapter											
Clean Energy Communities	16,800	27,700	28,800	-	-	-	-	-	-	-	73,300
Communities Chapter Total	16,800	27,700	28,800	-	-	-	-	-	-	-	73,300
Large-Scale Renewables Chapter											
Offshore Wind Master Plan	-	-	-	-	-	-	-	-	-	-	-
Offshore Wind Pre-Development Activities	-	-	-	-	-	-	-	-	-	-	-
Large-Scale Renewables Chapter Total	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter											
REV Connect											
REV Technical Assistance Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Market Development	620,500	333,000	243,400	87,900	99,600	72,020	41,420	23,620	20,350	7,720	1,550,000
Innovation and Research											
Grid Modernization Chapter											
DER Interconnection	-	-	-	-	-	-	-	-	-	-	-
Grid Modernization Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Business Development Chapter											
CleanTech Startup Growth	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Bus. Dev. Chapter Tot	-	-	-	-	-	-	-	-	-	-	-
Total Innovation & Research	-	-	-	-	-	-	-	-	-	-	-

Table 6. Market Development and Innovation & Research Energy Efficiency Cumulative First Year Annual Benefits by Chapter and Initiative (MMBtu)

Market Development	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Resource Acquisition Transition Chapter											
<i>Commercial</i>	729,000	384,000	-								1,113,000
<i>Industrial</i>	1,940,000	641,000	276,000								2,857,000
<i>Agriculture</i>	20,500	20,500	-								41,000
<i>Multifamily Market Rate</i>	142,000	167,000	-								309,000
<i>Single Family Market Rate</i>	97,900	118,000	-								215,900
<i>LMI Single Family</i>	152,000	152,000	152,000								456,000
<i>LMI Multifamily</i>	461,000	402,000	517,000								1,380,000
<i>Commercial New Construction</i>	27,100	23,100	-								50,200
<i>Low Rise New Construction</i>	62,700	50,900	-								113,600
<i>Multifamily New Construction</i>	105,000	79,000	-								184,000
<i>Anaerobic Digesters</i>	-	-	-								-
<i>Fuel Cells</i>	-	-	-								-
<i>Small Wind</i>	-	-	-								-
<i>Solar Thermal</i>	-	-	-								-
<i>Combined Heat & Power</i>	(980)	(305)	(335)								(1,620)
Resource Acquisition Transition Chapter Total	3,736,000	2,037,000	944,700	-	-	-	-	-	-	-	6,718,000
Commercial Chapter											
<i>Real Estate Tenant</i>	5,900	13,800	19,700	23,600	27,500	19,700	11,800	5,900	3,900	-	131,800
<i>Real Time Energy Management</i>	9,100	16,100	22,700	23,900	27,500	20,300	9,990	4,580	3,970	-	138,200
<i>REV Campus Challenge</i>	-	95,700	95,700	71,800	71,800	47,900	47,900	47,900	47,900	47,900	574,300
Commercial Chapter Total	15,000	125,600	138,100	119,300	126,800	87,900	69,690	58,380	55,770	47,900	844,300
Industrial Chapter											
<i>Continuous Energy Improvement</i>	442,000	175,000	150,000	-	-	-	-	-	-	-	767,000
Industrial Chapter Total	442,000	175,000	150,000	-	-	-	-	-	-	-	767,000
Communities Chapter											
<i>Clean Energy Communities</i>	302,000	498,000	518,000	-	-	-	-	-	-	-	1,318,000
Communities Chapter Total	302,000	498,000	518,000	-	-	-	-	-	-	-	1,318,000
Large-Scale Renewables Chapter											
<i>Offshore Wind Master Plan</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Offshore Wind Pre-Development Activities</i>	-	-	-	-	-	-	-	-	-	-	-
Large-Scale Renewables Chapter Total	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter											
<i>REV Connect</i>	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Market Development	4,495,000	2,836,000	1,751,000	119,300	126,800	87,900	69,690	58,380	55,770	47,900	9,647,000
Innovation and Research											
Grid Modernization Chapter											
<i>DER Interconnection</i>	-	-	-	-	-	-	-	-	-	-	-
Grid Modernization Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Business Development Chapter											
<i>CleanTech Startup Growth</i>	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Bus. Dev. Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Innovation & Research	-	-	-	-	-	-	-	-	-	-	-

Table 7. Market Development and Innovation & Research Portfolio Lifetime Benefits

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total	% of 10 yr Min. Goals
Market Development												
Renewable Energy (MWh)	676,000	838,000	862,000	16,500	16,500	11,000	11,000	11,000	11,000	11,000	2,464,000	3%
CO2e Reductions (metric tons)	9,237,000	5,561,000	3,606,000	498,000	551,000	393,000	255,900	176,300	161,300	105,000	20,540,000	15%
Customer Bill Savings (\$ million)	\$ 1,504.0	\$ 1,026.0	\$ 696.9	\$ 112.2	\$ 125.1	\$ 89.6	\$ 56.2	\$ 36.8	\$ 33.2	\$ 19.4	\$ 3,699.0	9%
Private Investment (\$ million)	\$ 683.1	\$ 394.6	\$ 336.6	\$ 59.2	\$ 64.0	\$ 61.2	\$ 42.5	\$ 23.6	\$ 15.7	\$ 6.0	\$ 1,687.0	6%
Innovation and Research												
Renewable Energy (MWh)	-	-	-	-	-	-	-	-	-	-	-	0%
CO2e Reductions (metric tons)	-	-	-	-	-	-	-	-	-	-	-	0%
Customer Bill Savings (\$ million)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%
Private Investment (\$ million)	\$ 78.35	\$ 84.98	\$ 37.50	\$ 30.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 230.80	1%
Total Renewable Energy (MWh)	676,000	838,000	862,000	16,500	16,500	11,000	11,000	11,000	11,000	11,000	2,464,000	3%
Total CO2e Reductions (metric tons)	9,237,000	5,561,000	3,606,000	498,000	551,000	393,000	255,900	176,300	161,300	105,000	20,540,000	15%
Total Customer Bill Savings (\$ million)	\$ 1,504.00	\$ 1,026.00	\$ 696.90	\$ 112.20	\$ 125.10	\$ 89.60	\$ 56.20	\$ 36.81	\$ 33.22	\$ 19.40	\$ 3,699.00	9%
Total Private Investment (\$ million)	\$ 761.45	\$ 479.58	\$ 374.10	\$ 89.18	\$ 64.04	\$ 61.19	\$ 42.47	\$ 23.62	\$ 15.70	\$ 5.98	\$ 1,917.80	7%

Table 8. Market Development and Innovation & Research Renewable Energy Lifetime Benefits by Chapter/Initiative (MWh)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Market Development											
Resource Acquisition Transition Chapter											
Commercial	-	-	-								-
Industrial	-	-	-								-
Agriculture	-	-	-								-
Multifamily Market Rate	-	-	-								-
Single Family Market Rate	-	-	-								-
LMI Single Family	-	-	-								-
LMI Multifamily	-	-	-								-
Commercial New Construction	-	-	-								-
Low Rise New Construction	-	-	-								-
Multifamily New Construction	-	-	-								-
Anaerobic Digesters	100,000	100,000	100,000								300,000
Fuel Cells	50,000	50,000	50,000								150,000
Small Wind	46,000	46,000	46,000								138,000
Solar Thermal	104,000	-	-								104,000
Combined Heat & Power	-	-	-								-
Resource Acquisition Transition Chapter Total	300,000	196,000	196,000	-							692,000
Commercial Chapter											
Real Estate Tenant	-	-	-	-	-	-	-	-	-	-	-
Real Time Energy Management	-	-	-	-	-	-	-	-	-	-	-
REV Campus Challenge	-	22,000	22,000	16,500	16,500	11,000	11,000	11,000	11,000	11,000	132,100
Commercial Chapter Total	-	22,000	22,000	16,500	16,500	11,000	11,000	11,000	11,000	11,000	132,100
Industrial Chapter											
Continuous Energy Improvement	-	-	-	-	-	-	-	-	-	-	-
Industrial Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Communities Chapter											
Clean Energy Communities	376,000	620,000	644,000	-	-	-	-	-	-	-	1,640,000
Communities Chapter Total	376,000	620,000	644,000	-	1,640,000						
Large-Scale Renewables Chapter											
Offshore Wind Master Plan	-	-	-	-	-	-	-	-	-	-	-
Offshore Wind Pre-Development Activities	-	-	-	-	-	-	-	-	-	-	-
Large-Scale Renewables Chapter Total	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter											
REV Connect	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Market Development	676,000	838,000	862,000	16,500	16,500	11,000	11,000	11,000	11,000	11,000	2,464,000
Innovation and Research											
Grid Modernization Chapter											
DER Interconnection	-	-	-	-	-	-	-	-	-	-	-
Grid Modernization Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Business Development Chapter											
CleanTech Startup Growth	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Bus. Dev. Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Innovation & Research	-	-	-	-	-	-	-	-	-	-	-

Table 9. Market Development and Innovation & Research Lifetime Benefits by Chapter/Initiative (tons CO2e Reductions)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Market Development											
Resource Acquisition Transition Chapter											
Commercial	1,300,000	714,000	-								2,014,000
Industrial	3,130,000	1,020,000	434,000								4,584,000
Agriculture	64,100	64,100	-								128,200
Multifamily Market Rate	125,000	144,000	-								269,000
Single Family Market Rate	159,000	191,000	-								350,000
LMI Single Family	255,000	257,000	257,000								769,000
LMI Multifamily	524,000	441,000	603,000								1,568,000
Commercial New Construction	244,000	208,000	-								452,000
Low Rise New Construction	131,000	118,000	-								249,000
Multifamily New Construction	261,000	203,000	-								464,000
Anaerobic Digesters	52,500	52,500	52,500								157,500
Fuel Cells	26,000	26,000	26,000								78,000
Small Wind	24,300	24,300	24,300								72,900
Solar Thermal	54,600	-	-								54,600
Combined Heat & Power	1,400,000	405,000	435,000								2,240,000
Resource Acquisition Transition Chapter Total	7,751,000	3,868,000	1,832,000	-	13,450,000						
Commercial Chapter											
Real Estate Tenant	26,000	61,000	87,000	104,000	122,000	87,000	52,000	26,000	17,000	-	582,000
Real Time Energy Management	90,000	159,000	225,000	237,000	272,000	201,000	98,900	45,300	39,300	-	1,368,000
REV Campus Challenge	-	210,000	210,000	157,000	157,000	105,000	105,000	105,000	105,000	105,000	1,257,000
Commercial Chapter Total	116,000	430,000	522,000	498,000	551,000	393,000	255,900	176,300	161,300	105,000	3,207,000
Industrial Chapter											
Continuous Energy Improvement	765,000	267,000	222,000	-	-	-	-	-	-	-	1,254,000
Industrial Chapter Total	765,000	267,000	222,000	-	1,254,000						
Communities Chapter											
Clean Energy Communities	605,000	996,000	1,030,000	-	-	-	-	-	-	-	2,631,000
Communities Chapter Total	605,000	996,000	1,030,000	-	2,631,000						
Large-Scale Renewables Chapter											
Offshore Wind Master Plan	-	-	-	-	-	-	-	-	-	-	-
Offshore Wind Pre-Development Activities	-	-	-	-	-	-	-	-	-	-	-
Large-Scale Renewables Chapter Total	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter											
REV Connect	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Market Development	9,237,000	5,561,000	3,606,000	498,000	551,000	393,000	255,900	176,300	161,300	105,000	20,540,000
Innovation and Research											
Grid Modernization Chapter											
DER Interconnection	-	-	-	-	-	-	-	-	-	-	-
Grid Modernization Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Business Development Chapter											
CleanTech Startup Growth	-	-	-	-	-	-	-	-	-	-	-
Innovation Capacity and Bus. Dev. Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Innovation & Research	-	-	-	-	-	-	-	-	-	-	-

Table 10. Market Development and Innovation & Research Lifetime Benefits by Chapter/Initiative (Customer Bill Savings in \$ million)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Market Development											
Resource Acquisition Transition Chapter											
Commercial	\$ 222.00	\$ 125.00	\$ -								\$ 347.00
Industrial	\$ 175.00	\$ 58.00	\$ 25.00								\$ 258.00
Agriculture	\$ 18.00	\$ 18.00	\$ -								\$ 36.00
Multifamily Market Rate	\$ 34.50	\$ 40.50	\$ -								\$ 75.00
Single Family Market Rate	\$ 40.80	\$ 48.90	\$ -								\$ 89.70
LMI Single Family	\$ 58.20	\$ 58.70	\$ 58.70								\$ 175.60
LMI Multifamily	\$ 150.00	\$ 126.00	\$ 173.00								\$ 449.00
Commercial New Construction	\$ 69.70	\$ 59.40	\$ -								\$ 129.10
Low Rise New Construction	\$ 38.00	\$ 34.00	\$ -								\$ 72.00
Multifamily New Construction	\$ 60.00	\$ 48.00	\$ -								\$ 108.00
Anaerobic Digesters	\$ 3.00	\$ 3.00	\$ 3.00								\$ 9.00
Fuel Cells	\$ 5.00	\$ 5.00	\$ 5.00								\$ 15.00
Small Wind	\$ 8.00	\$ 8.00	\$ 8.00								\$ 24.00
Solar Thermal	\$ 4.72	\$ -	\$ -								\$ 4.72
Combined Heat & Power	\$ 370.00	\$ 96.00	\$ 105.00								\$ 571.00
Resource Acquisition Transition Chapter Total	\$ 1,257.00	\$ 728.50	\$ 377.70	\$ -							\$ 2,363.00
Commercial Chapter											
Real Estate Tenant	\$ 6.21	\$ 14.50	\$ 20.70	\$ 24.80	\$ 29.00	\$ 20.70	\$ 12.40	\$ 6.21	\$ 4.14	\$ -	\$ 138.70
Real Time Energy Management	\$ 22.20	\$ 39.20	\$ 55.40	\$ 58.40	\$ 67.10	\$ 49.50	\$ 24.40	\$ 11.20	\$ 9.68	\$ -	\$ 337.00
REV Campus Challenge	\$ -	\$ 38.70	\$ 38.70	\$ 29.00	\$ 29.00	\$ 19.40	\$ 19.40	\$ 19.40	\$ 19.40	\$ 19.40	\$ 232.30
Commercial Chapter Total	\$ 28.41	\$ 92.40	\$ 114.80	\$ 112.20	\$ 125.10	\$ 89.60	\$ 56.20	\$ 36.81	\$ 33.22	\$ 19.40	\$ 708.00
Industrial Chapter											
Continuous Energy Improvement	\$ 119.00	\$ 41.30	\$ 34.40	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 194.70
Industrial Chapter Total	\$ 119.00	\$ 41.30	\$ 34.40	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 194.70
Communities Chapter											
Clean Energy Communities	\$ 99.60	\$ 164.00	\$ 170.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 433.60
Communities Chapter Total	\$ 99.60	\$ 164.00	\$ 170.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 433.60
Large-Scale Renewables Chapter											
OffShore Wind Master Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Offshore Wind Pre-Development Activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Large-Scale Renewables Chapter Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
REV Technical Assistance Chapter											
REV Connect	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
REV Technical Assistance Chapter Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Market Development	\$ 1,504.00	\$ 1,026.00	\$ 696.90	\$ 112.20	\$ 125.10	\$ 89.60	\$ 56.20	\$ 36.81	\$ 33.22	\$ 19.40	\$ 3,699.00
Innovation and Research											
Grid Modernization Chapter											
DER Interconnection	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grid Modernization Chapter Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Innovation Capacity and Business Development Chapter											
CleanTech Startup Growth	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Innovation Capacity and Bus. Dev. Chapter Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Innovation & Research	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Table 11. Market Development and Innovation & Research Lifetime Benefits by Chapter/Initiative (Private Investment in \$ million)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Market Development											
Resource Acquisition Transition Chapter											
Commercial	\$ 88.00	\$ 36.00	\$ -								\$ 124.00
Industrial	\$ 174.00	\$ 36.20	\$ 8.16								\$ 218.40
Agriculture	\$ 5.43	\$ 5.43	\$ -								\$ 10.86
Multifamily Market Rate	\$ 13.00	\$ 14.00	\$ -								\$ 27.00
Single Family Market Rate	\$ 34.00	\$ 45.40	\$ -								\$ 79.40
LMI Single Family	\$ 7.22	\$ 5.71	\$ 5.71								\$ 18.64
LMI Multifamily	\$ 76.00	\$ 79.00	\$ 146.00								\$ 301.00
Commercial New Construction	\$ 28.60	\$ 24.40	\$ 53.00								\$ 106.00
Low Rise New Construction	\$ 9.24	\$ 8.72	\$ -								\$ 17.96
Multifamily New Construction	\$ 38.30	\$ 29.30	\$ -								\$ 67.60
Anaerobic Digesters	\$ 3.00	\$ 3.00	\$ 3.00								\$ 9.00
Fuel Cells	\$ 4.00	\$ 4.00	\$ 4.00								\$ 12.00
Small Wind	\$ 4.00	\$ 4.00	\$ 4.00								\$ 12.00
Solar Thermal	\$ 7.00	\$ -	\$ -								\$ 7.00
Combined Heat & Power	\$ 98.00	\$ 26.00	\$ 28.00								\$ 152.00
Resource Acquisition Transition Chapter Total	\$ 589.80	\$ 321.20	\$ 251.90								\$ 1,163.00
Commercial Chapter											
Real Estate Tenant	\$ 0.54	\$ 1.27	\$ 1.81	\$ 2.18	\$ 2.54	\$ 1.81	\$ 1.09	\$ 0.54	\$ 0.36	\$ -	\$ 12.15
Real Time Energy Management	\$ 7.36	\$ 25.20	\$ 40.00	\$ 49.90	\$ 54.40	\$ 53.40	\$ 35.40	\$ 17.10	\$ 9.36	\$ -	\$ 292.10
REV Campus Challenge	\$ -	\$ 8.99	\$ 9.10	\$ 7.10	\$ 7.10	\$ 5.98	\$ 5.98	\$ 5.98	\$ 5.98	\$ 5.98	\$ 62.21
Commercial Chapter Total	\$ 7.90	\$ 35.46	\$ 50.91	\$ 59.18	\$ 64.04	\$ 61.19	\$ 42.47	\$ 23.62	\$ 15.70	\$ 5.98	\$ 366.50
Industrial Chapter											
Continuous Energy Improvement	\$ 74.80	\$ 20.20	\$ 15.40	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 110.40
Industrial Chapter Total	\$ 74.80	\$ 20.20	\$ 15.40	\$ -	\$ -	\$ 110.40					
Communities Chapter											
Clean Energy Communities	\$ 10.60	\$ 17.50	\$ 18.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 46.20
Communities Chapter Total	\$ 10.60	\$ 17.50	\$ 18.10	\$ -	\$ -	\$ 46.20					
Large-Scale Renewables Chapter											
Offshore Wind Master Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Offshore Wind Pre-Development Activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Large-Scale Renewables Chapter Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
REV Technical Assistance Chapter											
REV Connect	\$ -	\$ 0.25	\$ 0.25	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.50
REV Technical Assistance Chapter Total	\$ -	\$ 0.25	\$ 0.25	\$ -	\$ -	\$ 0.50					
Total Market Development	\$ 683.10	\$ 394.60	\$ 336.60	\$ 59.18	\$ 64.04	\$ 61.19	\$ 42.47	\$ 23.62	\$ 15.70	\$ 5.98	\$ 1,687.00
Innovation and Research											
Grid Modernization Chapter											
DER Interconnection	\$ 3.35	\$ 2.48	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5.83
Grid Modernization Chapter Total	\$ 3.35	\$ 2.48	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5.83
Innovation Capacity and Business Development Chapter											
CleanTech Startup Growth	\$ 75.00	\$ 82.50	\$ 37.50	\$ 30.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 225.00
Innovation Capacity and Bus. Dev. Chapter Total	\$ 75.00	\$ 82.50	\$ 37.50	\$ 30.00	\$ -	\$ -	\$ 225.00				
Total Innovation & Research	\$ 78.35	\$ 84.98	\$ 37.50	\$ 30.00	\$ -	\$ -	\$ 230.80				

Table 12. Market Development and Innovation & Research Participants

Market Development	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Resource Acquisition Transition Chapter											
<i>Commercial</i>	246	144	-								390
<i>Industrial</i>	370	155	80								605
<i>Agriculture</i>	330	330	-								660
<i>Multifamily Market Rate</i>	38,000	68,000	-								106,000
<i>Single Family Market Rate</i>	4,080	4,896	-								8,976
<i>LMI Single Family</i>	10,146	10,350	10,350								30,846
<i>LMI Multifamily</i>	73,000	70,000	77,000								220,000
<i>Commercial New Construction</i>	54	46	-								100
<i>Low Rise New Construction</i>	2,807	2,605	-								5,412
<i>Multifamily New Construction</i>	7,500	6,000	-								13,500
<i>Anaerobic Digesters</i>	2	2	2								6
<i>Fuel Cells</i>	2	2	2								6
<i>Small Wind</i>	35	35	35								105
<i>Solar Thermal</i>	190	-	-								190
<i>Combined Heat & Power</i>	45	35	30								110
Resource Acquisition Transition Chapter Total	136,800	162,600	87,500	-							386,900
Commercial Chapter											
<i>Real Estate Tenant</i>	46	141	141	152	168	188	178	168	168	-	1,350
<i>Real Time Energy Management</i>	30	40	50	60	80	95	100	115	130	-	700
<i>REV Campus Challenge</i>	40	30	55	8	7	2	2	2	2	2	150
Commercial Chapter Total	116	211	246	220	255	285	280	285	300	2	2,200
Industrial Chapter											
<i>Continuous Energy Improvement</i>	15	25	20	-	-	-	-	-	-	-	60
Industrial Chapter Total	15	25	20	-	60						
Communities Chapter											
<i>Clean Energy Communities</i>	76	126	131	-	-	-	-	-	-	-	333
Communities Chapter Total	76	126	131	-	333						
Large-Scale Renewables Chapter											
<i>Offshore Wind Master Plan</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Offshore Wind Pre-Development Activities</i>	-	-	-	-	-	-	-	-	-	-	-
Large-Scale Renewables Chapter Total	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter											
<i>REV Connect</i>	-	-	-	-	-	-	-	-	-	-	-
REV Technical Assistance Chapter Total	-	-	-	-	-	-	-	-	-	-	-
Total Market Development	137,000	163,000	87,900	220	255	285	280	285	300	2	389,500
Innovation and Research											
Grid Modernization Chapter											
<i>DER Interconnection</i>	3	5	5	-	-	-	-	-	-	-	13
Grid Modernization Chapter Total	3	5	5	-	13						
Innovation Capacity and Business Development Chapter											
<i>CleanTech Startup Growth</i>	32	92	15	16	11	12	13	-	-	-	191
Innovation Capacity and Bus. Dev. Chapter Total	32	92	15	16	11	12	13	-	-	-	191
Total Innovation & Research	35	97	20	16	11	12	13	-	-	-	204