Energy Efficiency Transition Implementation Plan/System Energy Efficiency Plan

PROGRAM YEARS 2019 AND 2020

Submitted by: New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation

Filed on February 19, 2019

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CHAPTER ONE: EXECUTIVE SUMMARY AND PORTFOLIO DESCRIPTION

System Energy Efficiency Plan for Program Years 2019 and 2020

1.1 EXECUTIVE SUMMARY

For over a decade, the New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E") (hereinafter "the Companies"[1]) have delivered cost-effective, energy efficiency programs to their residential, commercial, industrial, municipal, and multifamily customers. The Companies hereby submit this comprehensive and updated Energy Efficiency Transition Implementation Plan ("ETIP") and System Energy Efficiency Plan ("SEEP") for program years 2019 and 2020 ("2019-2020 SEEP"). The Companies are filing this updated 2019-2020 SEEP in compliance with the New York State Public Service Commission's ("Commission") December 13, 2018 "*Order Adopting Accelerated Energy Efficiency Targets*" ("December Order"[2]) and the December 20, 2018 revised fourth version of the New York Department of Public Service Staff's ("Staff") Clean Energy-02 ("CE") Guidance Document ("CE-02 Guidance Document").

On December 22, 2017, the Companies filed their joint and final ETIP for program years 2018-2020 ("2018-2020 ETIP"). The 2018-2020 ETIP outlined the Companies' energy efficiency program designs, estimated energy and demand savings, and planned program budget levels (by

[1] NYSEG and RG&E are the New York-based utility subsidiaries of AVANGRID, the United States based diversified energy company that is majority owned by Iberdrola Group. Iberdrola Group has a goal of being carbon-neutral by 2050.

[2] Case 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*. Order Adopting Accelerated Energy Efficiency Targets, Dec. 13, 2018.

sector) for the three-year period. The Companies must file an annual update with the Commission regarding any modifications needed in implementing energy efficiency programs in their respective service territories. The 2019-2020 SEEP is the modified plan for the next two-year period.

For the 2019 and 2020 program years, the Companies continue to offer programs which have been successful, while also accelerating the deployment of new programs that promote energy-efficient technologies, equipment, and comprehensive building design. Additionally, the Companies will build upon the successes and lessons learned from prior years' energy efficiency programs in order to continuously improve program design and structure, cost-effectiveness, and efficacy. Over the next two-year period, the Companies' Energy Efficiency Portfolios will further drive deep energy savings for the Residential, Non-Residential (commercial, industrial, and municipal customers), and Multifamily sectors, with a special emphasis on reducing the energy burden of low-and-moderate income customers.

In addition to cost savings for customers, energy efficiency programs contribute to positive environmental benefits. The Companies' 2019-2020 Energy Efficiency Portfolios will greatly reduce greenhouse gas ("GHG") emissions across NYSEG's and RG&E's service territories. These reductions in GHG emissions are critical in helping the Companies meet the Reforming the Energy Vision ("REV"), Governor Andrew M. Cuomo's 2015 strategy to focus New York State's energy policy and initiatives on energy efficiency and locally-produced renewable energy. By 2030, New York State's goal is to reduce GHG emissions from buildings, industry, power generation, and transportation by 40 percent from 1990 levels.[3]

1.1.1 Cost Recovery and Program Administration

The Companies' energy efficiency programs are funded through a surcharge called the Energy Efficiency Tracker ("EE Tracker") on qualifying customers' monthly bills. In the REV Framework and Track Two orders, the Commission initiated a process of transitioning utility program cost recovery away from surcharges and through base rates. The Companies will address the

[3] 2015 New York State Energy Plan. Available at: https://energyplan.ny.gov/Plans/2015.aspx.

transition of cost recovery from the current EE Tracker surcharge mechanism to base rates in the upcoming rate case proposal. For the 2019 and 2020 program years, investor-owned utilities in New York are responsible for administering and managing energy efficiency programs statewide and meeting significant energy savings goals and contributing to GHG emission reductions goals.

1.2 DEVELOPMENT OF THE 2019-2020 SEEP

The Companies have developed this 2019-2020 SEEP based on the December Order, the Staff CE-02 Guidance document, REV initiatives, previous Commission energy policy rulemakings, and Staff-sponsored white papers. These guiding documents include the 2015 New York State Energy Plan (the "Plan"), a comprehensive roadmap developed by the Commission to build a clean, resilient, and affordable energy system in New York State. The Plan integrated REV and REV-related initiatives and goals. The concepts detailed in the 2019-2020 SEEP also align with prior Commission Orders[4] and the 2018 *New Efficiency: New York* White Paper ("NENY White Paper"), written by Staff and the New York State Energy Research and Development Authority ("NYSERDA"). The NENY White Paper established an ambitious 2025 customer level energy reduction target of 185 trillion British thermal units ("TBtus") and identified a comprehensive set of actions to meet this energy reduction goal. This reduction in energy consumption is roughly equivalent to powering 1.8 million New York homes annually.

These actions identified in the NENY White Paper are set forth in the Commission's December Order[5] requiring investor-owned utilities in New York to accelerate the deployment of innovative and cost-effective energy efficiency programs. To address the NENY White Paper and December Order, the Companies have developed their 2019-2020 Energy Efficiency Program Portfolios to focus on innovation and investment from all market sectors and will look to leverage the potential of optimal technology or deployment alternatives for specific locations in the Companies' service territories (e.g., large commercial customers being encouraged to participate

[4] New York Public Service Commission, *Order Authorizing the Clean Energy Fund Framework*, Jan. 21, 2016 and New York Public Service Commission, *Order Adopting a Clean Energy Standard*, Aug. 1, 3016.
[5] Case 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*. Order Adopting Accelerated Energy Efficiency Targets, Dec. 13, 2018.

in the Non-Residential Programs to reduce electric demand along a busy circuit). Additionally, throughout 2019 and 2020, the Companies will continue to look for opportunities to streamline program processes and utilize their energy efficiency expertise to improve outcomes and cost-effectiveness.

In addition to the regulatory guidance referenced above, the Companies utilized and considered a number of factors in the development of their 2019-2020 Energy Efficiency Program Portfolios. These include, but are not limited to the following:

- Previous Energy Efficiency Program Portfolio performance, including participation from 2018 and prior years;
- Economic, market, and technical conditions which may affect future program participation;
- Evaluation, Measurement and Verification ("EM&V") reports and evaluation findings regarding an increase or decrease in energy-saving calculations and program implementation costs;
- Studies and evaluations regarding the future energy savings potential for programs, services, incentive structures, and emerging technologies;
- Discussions with other utility program administrators, NYSERDA, and New Efficiency: New York working groups; and
- Internal dialogues with the Companies' personnel who are actively engaged in REV and REV-related proceedings, including Non-Wire Alternatives and Demand Response.

1.2.1 Format of the 2019-2020 SEEP

This 2019-2020 SEEP follows the format of the Staff CE-02 Guidance document. Both NYSEG's and RG&E's proposed Energy Efficiency Program Portfolio descriptions are presented collectively; however, their budgets and energy-saving goals and metrics are presented separately. The budgets and energy-saving goals and metrics tables are presented by specific Company, fuel type (electric or natural gas), Sector levels (Non-Residential/Commercial &

Industrial, Multifamily, and Residential) and by program within each Sector.

1.3 PORTFOLIO DESCRIPTION

The Companies' 2019-2020 Energy Efficiency Program Portfolios include both electric and natural gas programs that serve the Residential, Non-Residential, and Multifamily market sectors. Over the next two years, the Companies plan to continue to offer programs which have been successful, while also accelerating the deployment of comprehensive, innovative energy efficiency programs that are flexible in their structure to help the Companies leverage and respond to emerging technologies, evaluations, federal regulations, new building codes, and changing market demands.

As in prior program years, the Companies have utilized the successes of previous program offerings as the foundation for their future energy-saving efforts. The Companies will also continue to consult with their Affiliates[6] in Connecticut and Massachusetts, which currently have broader program portfolios, to determine how their energy efficiency program offerings could be customized to suit the Companies' large geographic and rural service territories, as well as the New York State marketplace.

For the 2019 and 2020 program years, the Companies will also help reduce energy consumption and GHG emissions through the adoption and support of energy-efficient technologies, high-efficiency equipment, and comprehensive building design.

1.3.1 2019-2020 Priorities

The Companies' top five priorities for their 2019-2020 Energy Efficiency Program Portfolios are:

1. Collaboration. The Companies are continuously working to improve the design and delivery of their energy efficiency programs for the Residential, Non-Residential, and Multifamily Sectors. This includes collaborating with other investor-owned utilities in New York, NYSERDA, and Staff to determine best practices and cost-effective program

[6] Avangrid Networks (Berkshire Gas, The United Illuminating Company, Connecticut Natural Gas, and Southern Connecticut Gas).

designs. This collaboration helps improve the Companies' energy efficiency program offerings, identify emerging technologies, and engage customers with new solutions.

2. Engagement. The Companies have actively engaged with other energy stakeholders, meeting with other investor-owned utilities in New York to request, receive, and respond to critical feedback regarding the Companies' current energy efficiency program offerings. Additionally, the Companies are continuously focused on making their energy efficiency programs customer-centric, engaging customers where they shop (online and brick-and-mortar stores) and introducing new technologies that help customers save energy without significant time investments or disruptions to their daily lives.

3. Innovation. The Companies recognize that, to support REV policies, they must actively deploy innovative energy efficiency programs and incentivize new measures to increase energy savings. The Energy Smart Community ("ESC") in Ithaca, New York is the centerpiece of the Companies' commitment to innovation in energy efficiency programs. This community, where approximately 12,400 smart electric meters and 7,300 natural gas meters were installed, has and will continue to be a testing ground for new technologies, program designs, and products and services.

4. Integration. The Companies are currently designing an integrated technology platform that will provide critical data and operational capabilities across the grid. For the Energy Efficiency Program Portfolios, this integrated platform can help power the Companies to target residential, non-residential, and multifamily customers with targeted information, pertinent energy-saving technologies, and focused solutions.

5. Enhancement. The Companies continuously work to enhance their Energy Efficiency Program Portfolios through new program designs and incentive structures; direct outcomes of the Companies' EM&V activities (See Chapter Three for more information). The Companies recognize that program modifications will enable them to direct customers toward a cleaner and smarter energy future. To further enhance their programs, the Companies leverage the knowledge and lessons learned of their Affiliates

in Connecticut and Massachusetts, in addition to being involved with energy efficiency industry groups, such as E-Source and the Gas Technology Institute ("GTI").

Table 1-A: Two-Year Budgets (NYSEG Electric)

NYSEG			
PORTFOLIO (Electric)	2019	2020	Funding Source
Commercial & Industrial Sector			
C&I Custom Electric			
Incentives & Services	$3,787,351	$3,134,912	ETIP
Program Implementation	$493,363	$428,784	ETIP
Total Budget	$4,280,714	$3,563,696	
C&I Prescriptive Electric			
Incentives & Services	$4,076,258	$3,310,566	ETIP
Program Implementation	$498,381	$427,451	ETIP
Total Budget	$4,574,639	$3,738,017	
Industrial			
Incentives & Services	N/A	$2,946,823	ETIP
Program Implementation	N/A	$35,349	ETIP
Total Budget	N/A	$2,982,172	
Operations and Maintenance			
Incentives & Services	N/A	$368,353	ETIP
Program Implementation	N/A	$4,419	ETIP
Total Budget	N/A	$372,772	
Self-Direct			
Incentives & Services	$78,077	N/A	ETIP
Program Implementation	$2,511	N/A	ETIP
Total Budget	$80,588	N/A	
Small Business Direct Install (SBDI)			
Incentives & Services	$7,760,180	$6,724,057	ETIP
Program Implementation	$98,572	$80,659	ETIP
Total Budget	$7,858,752	$6,804,716	
Residential Sector			
Residential Electric Rebate			
Incentives & Services	$202,050	$232,358	ETIP
Program Implementation	$10,477	$11,883	ETIP
Total Budget	$212,527	$244,241	

Table 1-A: Two-Year Budgets (NYSEG Electric) (continued)

NYSEG			
PORTFOLIO (Electric)	2019	2020	Funding Source
Marketplace Electric			
Incentives & Services	$219,698	$241,667	ETIP
Program Implementation	$53,372	$58,506	ETIP
Total Budget	$273,070	$300,173	
Appliance Recycling Program			
Incentives & Services	$95,685	$127,580	ETIP
Program Implementation	$419,474	$558,834	ETIP
Total Budget	$515,159	$686,414	
ENERGY STAR® Retail Products Platform			
Incentives & Services	$405,788	$529,879	ETIP
Program Implementation	$65,033	$84,505	ETIP
Total Budget	$470,821	$614,384	
Behavior/New Residential Electric Programs			
Incentives & Services	$477,395	$590,644	ETIP
Program Implementation	$304,691	$375,051	ETIP
Total Budget	$782,086	$965,695	
LMI-Residential Electric			
Incentives & Services	$577,216	$722,153	ETIP
Program Implementation	$7,332	$8,663	ETIP
Total Budget	$584,548	$730,816	
Multifamily Sector			
Multifamily Electric			
Incentives & Services	$967,632	$725,286	ETIP
Program Implementation	$12,291	$8,700	ETIP
Total Budget	$979,923	$733,986	
LMI-Multifamily Electric			
Incentives & Services	$384,811	$481,436	ETIP
Program Implementation	$4,888	$5,775	ETIP
Total Budget	$389,699	$487,211	
Portfolio Administration	$68,215	$68,215	ETIP
Portfolio EM&V	$1,108,986	$1,173,290	ETIP
Total Portfolio Budget	**$22,179,728**	**$23,465,797**	
Commission-Authorized Total Budget	**$22,179,728**	**$23,465,797**	

Table 1-B: Two-Year Budgets (NYSEG Natural Gas)

NYSEG			
PORTFOLIO (Electric)	2019	2020	Funding Source
Commercial & Industrial Sector			
C&I Custom Gas			
Incentives & Services	$286,939	$103,079	ETIP
Program Implementation	$96,904	$43,666	ETIP
Total Budget	$383,843	$146,745	
C&I Prescriptive Gas			
Incentives & Services	$220,998	$81,634	ETIP
Program Implementation	$43,971	$19,666	ETIP
Total Budget	$264,969	$101,299	
Industrial			
Incentives & Services	N/A	$122,929	ETIP
Program Implementation	N/A	$1,431	ETIP
Total Budget	N/A	$124,360	
Operations and Maintenance			
Incentives & Services	N/A	$15,366	ETIP
Program Implementation	N/A	$179	ETIP
Total Budget	N/A	$15,545	
Small Business Direct Install (SBDI)			
Incentives & Services	N/A	$249,294	ETIP
Program Implementation	N/A	$2,903	ETIP
Total Budget	N/A	$252,197	
Residential Sector			
Residential Gas Rebate			
Incentives & Services	$678,476	$746,324	ETIP
Program Implementation	$52,550	$56,480	ETIP
Total Budget	$731,026	$802,804	
Marketplace Gas			
Incentives & Services	$53,979	$59,377	ETIP
Program Implementation	$51,366	$56,312	ETIP
Total Budget	$105,345	$115,689	

Table 1-B: Two-Year Budgets (NYSEG Natural Gas) (continued)

NYSEG			
PORTFOLIO (Gas)	2019	2020	Funding Source
Behavior/New Residential Gas Programs			
Incentives & Services	$371,300	$580,958	ETIP
Program Implementation	$235,976	$360,985	ETIP
Total Budget	$607,276	$941,943	
LMI-Residential Gas			
Incentives & Services	$55,015	$96,494	ETIP
Program Implementation	$735	$1,124	ETIP
Total Budget	$55,750	$97,618	
Multifamily Sector			
Multifamily Gas			
Incentives & Services	$204,396	$78,275	ETIP
Program Implementation	$2,732	$911	ETIP
Total Budget	$207,128	$79,186	
LMI-Multifamily Gas			
Incentives & Services	$36,677	$64,330	ETIP
Program Implementation	$490	$749	ETIP
Total Budget	$37,167	$65,079	
Portfolio Administration	$10,408	$10,408	ETIP
Portfolio EM&V	$126,469	$144,888	ETIP
Total Portfolio Budget	**$2,529,384**	**$2,897,761**	
Commission-Authorized Total Budget	**$2,529,384**	**$2,897,761**	

Table 1-C: Two-Year Budgets (RG&E Electric)

RG&E			
PORTFOLIO (Electric)	2019	2020	Funding Source
Commercial & Industrial Sector			
C&I Custom Electric			
Incentives & Services	$2,196,968	$1,909,909	ETIP
Program Implementation	$273,795	$242,060	ETIP
Total Budget	$2,470,763	$2,151,969	
C&I Prescriptive Electric			
Incentives & Services	$2,896,588	$2,466,894	ETIP
Program Implementation	$407,394	$354,871	ETIP
Total Budget	$3,303,982	$2,821,765	
Industrial			
Incentives & Services	N/A	$1,778,919	ETIP
Program Implementation	N/A	$21,892	ETIP
Total Budget	N/A	$1,800,811	
Operations and Maintenance			
Incentives & Services	N/A	$239,176	ETIP
Program Implementation	N/A	$2,943	ETIP
Total Budget	N/A	$242,119	
Self-Direct			
Incentives & Services	$44,333	N/A	ETIP
Program Implementation	$4,628	N/A	ETIP
Total Budget	$48,961	N/A	
Small Business Direct Install (SBDI)			
Incentives & Services	$2,700,029	$2,115,220	ETIP
Program Implementation	$35,068	$26,030	ETIP
Total Budget	$2,735,097	$2,141,250	
Residential Sector			
Residential Electric Rebate			
Incentives & Services	$75,850	$87,227	ETIP
Program Implementation	$8,935	$10,212	ETIP
Total Budget	$84,785	$97,439	

Table 1-C: Two-Year Budgets (RG&E Electric) (continued)

RG&E			
PORTFOLIO (Electric)	2019	2020	Funding Source
Marketplace Electric			
Incentives & Services	$117,784	$135,451	ETIP
Program Implementation	$39,485	$45,289	ETIP
Total Budget	$157,269	$180,741	
Appliance Recycling Program			
Incentives & Services	$71,228	$94,970	ETIP
Program Implementation	$318,571	$424,422	ETIP
Total Budget	$389,799	$519,392	
ENERGY STAR Retail Products Platform			
Incentives & Services	$126,263	$152,478	ETIP
Program Implementation	$61,590	$74,230	ETIP
Total Budget	$187,853	$226,708	
Behavior/New Residential Electric Programs			
Incentives & Services	$504,439	$612,414	ETIP
Program Implementation	$315,510	$381,640	ETIP
Total Budget	$819,949	$994,054	
LMI-Residential Electric			
Incentives & Services	$328,059	$410,419	ETIP
Program Implementation	$4,261	$5,051	ETIP
Total Budget	$332,320	$415,470	
Multifamily Sector			
Multifamily Electric			
Incentives & Services	$1,917,720	$1,502,354	ETIP
Program Implementation	$24,908	$18,488	ETIP
Total Budget	$1,942,628	$1,520,842	
LMI-Multifamily Electric			
Incentives & Services	$218,706	$273,613	ETIP
Program Implementation	$2,841	$3,367	ETIP
Total Budget	$221,547	$276,980	
Portfolio Administration	**$41,386**	**$41,386**	**ETIP**
Portfolio EM&V	**$670,333**	**$706,891**	**ETIP**
Total Portfolio Budget	$13,406,670	$14,137,818	
Commission-Authorized Total Budget	$13,406,670	$14,137,818	

Table 1-D: Two-Year Budgets (RG&E Natural Gas)

RG&E			
PORTFOLIO (GAS)	2019	2020	Funding Source
Commercial & Industrial Sector			
C&I Custom Gas			
Incentives & Services	$400,923	$55,828	ETIP
Program Implementation	$175,535	$40,849	ETIP
Total Budget	$576,458	$96,677	
C&I Prescriptive Gas			
Incentives & Services	$185,753	$124,224	ETIP
Program Implementation	$46,435	$47,167	ETIP
Total Budget	$232,188	$171,391	
Industrial			
Incentives & Services	N/A	$80,696	ETIP
Program Implementation	N/A	$1,233	ETIP
Total Budget	N/A	$81,929	
Operations and Maintenance			
Incentives & Services	N/A	$10,087	ETIP
Program Implementation	N/A	$154	ETIP
Total Budget	N/A	$10,241	
Small Business Direct Install (SBDI)			
Incentives & Services	N/A	$420,276	ETIP
Program Implementation	N/A	$6,424	ETIP
Total Budget	N/A	$426,700	
Residential Sector			
Residential Gas Rebate			
Incentives & Services	$1,358,354	$1,446,647	ETIP
Program Implementation	$117,061	$124,346	ETIP
Total Budget	$1,475,415	$1,570,993	
Marketplace Gas			
Incentives & Services	$26,100	$28,710	ETIP
Program Implementation	$38,467	$42,299	ETIP
Total Budget	$64,567	$71,009	

Table 1-D: Two-Year Budgets (RG&E Natural Gas) (continued)

RG&E			
PORTFOLIO (Gas)	2019	2020	Funding Source
Behavior/New Residential Gas Programs			
Incentives & Services	$73,136	$81,404	ETIP
Program Implementation	$63,577	$69,567	ETIP
Total Budget	$136,713	$150,971	
LMI-Residential Gas			
Incentives & Services	$22,830	$27,404	ETIP
Program Implementation	$354	$419	ETIP
Total Budget	$23,184	$27,822	
Multifamily Sector			
Multifamily Gas			
Incentives & Services	$238,647	$176,168	ETIP
Program Implementation	$3,700	$2,693	ETIP
Total Budget	$242,347	$178,861	
LMI-Multifamily Gas			
Incentives & Services	$15,220	$18,268	ETIP
Program Implementation	$236	$279	ETIP
Total Budget	$15,456	$18,547	
Portfolio Administration	$12,454	$12,454	ETIP
Portfolio EM&V	$146,252	$148,294	ETIP
Total Portfolio Budget	**$2,925,033**	**$2,965,890**	
Commission-Authorized Total Budget	**$2,925,033**	**$2,965,890**	

2.2 USE OF UNSPENT FUNDS

The Companies continuously monitor program expenditures to ensure there are sufficient funds to cover program activities. There are sometimes unspent funds within the Energy Efficiency Program Portfolios at year end. Currently, the Companies are using unspent RG&E funds on a large commercial and industrial project in the Rochester, NY area. The Companies are continuously exploring new program offerings, measures, and programs that can help utilize unspent funds. As the Companies deploy a significant effort for customers to adopt heat pump

technologies, both NYSEG and RG&E will look to apply unspent funds toward residential, non-residential, and multifamily applications of the technology. After 2020, the Companies plan to use the majority of accumulated unspent funds to further expand existing programs and deploy new programs.

Table 2-A: Use of Unspent Funds (NYSEG Electric)

NYSEG Electric	Year In Which Prior-Year Unspent Funds Will Be Used				
Budget Year of Unspent Funds	2017	2018	2019	2020[7]	Beyond 2020
2016				$1,500,000	$7,000,045
2017					$4,079,502
2018					$4,031,691

Table 2-B: Use of Unspent Funds (NYSEG Natural Gas)

NYSEG Gas	Year In Which Prior-Year Unspent Funds Will Be Used				
Budget Year of Unspent Funds	2017	2018	2019	2020	Beyond 2020
2016	$17,550				$943,904
2017					
2018					$531,115

Table 2-C: Use of Unspent Funds (RG&E Electric)

RG&E Electric	Year In Which Prior-Year Unspent Funds Will Be Used				
Budget Year of Unspent Funds	2017	2018	2019	2020[7]	Beyond 2020
2016				$500,000	$5,298,133
2017					$3,104,553
2018					$3,633,462

[7] A portion of electric unspent will be used to accelerate residential heat pump adoption in 2020 to prepare and align the Companies to achieve their share of the statewide 5 TBtus heat pump goal for 2021-2025. Specifics have not been defined as of this filing. The $2 million reflected for NYSEG electric and RG&E electric combined is a high-level estimate. Once finalized, details will be provided in a future ETIP or ETIP update.

Table 2-D: Use of Unspent Funds (RG&E Natural Gas)

RG&E Gas	Year In Which Prior-Year Unspent Funds Will Be Used				
Budget Year of Unspent Funds	2017	2018	2019	2020	Beyond 2020
2016		$122,377			$804,374
2017					$90
2018					$0

2.3 PRIMARY AND SECONDARY PLANS

2.3.1 Rationale for Proposed Secondary Metrics

The CE-02 Guidance Document allows New York State's electric and natural gas utilities to propose Secondary Target Metrics to align with REV-like outcomes. For the 2019-2020 SEEP, the Companies have not submitted any Secondary Target Metrics. However, the Companies will continue to collect and track demand reduction, in megawatts ("MW"), in addition to their primary energy-saving metrics of megawatt-hours ("MWh") for electric measures and one million British thermal units ("MMBtus") for natural gas measures.

Additionally, the Companies are tracking and reporting GHG emission reductions, participant bill savings, and private investment on the Clean Energy Dashboard. The dashboard was developed by NYSERDA to track Primary and Secondary Target metrics. The Companies have adopted this tracking mechanism to prepare for future Commission orders establishing Secondary Target Metrics. The Companies will integrate Secondary Target Metrics into their future SEEP filings. Additionally, the Companies anticipate proposing for Earning Adjustment Mechanisms ("EAMs") in their 2019 rate case filing where proposed metrics will include energy efficiency goals.

Table 3-A: Two-Year Primary and Secondary Plans (NYSEG Electric)

NYSEG		
PORTFOLIO (Electric)	2019	2020
Commercial & Industrial Sector		
C&I Custom Electric		
MWh (Primary)	18,862	16,437
C&I Prescriptive Electric		
MWh (Primary)	18,919	16,583
Industrial		
MWh (Primary)	N/A	7,210
Operations & Maintenance		
MWh (Primary)	N/A	3,605
Self-Direct		
MWh (Primary)	225	N/A
Small Business Direct Install (SBDI)		
MWh (Primary)	29,708	25,717
Residential Sector		
Residential Electric Rebate		
MWh (Primary)	465	535
Marketplace Electric		
MWh (Primary)	1,262	1,389
Appliance Recycling Program		
MWh (Primary)	3,024	4,032
ENERGY STAR Retail Products Platform		
MWh (Primary)	2,954	4,091
Behavior/New Residential Electric Programs		
MWh (Primary)	4,269	5,971
LMI-Residential Electric		
MWh (Primary)	1,071	1,339
Multifamily Sector		
Multifamily Electric		
MWh (Primary)	1,838	1,464
LMI-Multifamily Electric		
MWh (Primary)	714	892
Total Portfolio		
MWh (Primary)	83,311	89,262

Table 3-B: Two Year Primary and Secondary Plans (NYSEG Natural Gas)

NYSEG		
PORTFOLIO (Gas)	2019	2020
Commercial & Industrial Sector		
C&I Custom Gas		
MMBtu (Primary)	20,048	9,163
C&I Prescriptive Gas		
MMBtu (Primary)	8,835	4,038
Industrial		
MWh (Primary)	N/A	3,984
Operations & Maintenance		
MWh (Primary)	N/A	1,992
SBDI		
MWh (Primary)	N/A	6,731
Residential Sector		
Residential Gas Rebate		
MMBtu (Primary)	35,532	39,085
Marketplace Gas		
MMBtu (Primary)	22,895	25,185
Behavior/New Residential Gas Programs		
MMBtu (Primary)	17,761	35,791
LMI-Residential Gas		
MMBtu (Primary)	545	955
Multifamily Sector		
Multifamily Gas		
MMBtu (Primary)	10,022	4,581
LMI-Multifamily Gas		
MMBtu (Primary)	364	636
Total Portfolio		
MMBtu (Primary)	116,003	132,141

Table 3-C: Two-Year Primary and Secondary Plans (RG&E Electric)

RG&E		
PORTFOLIO (Electric)	2019	2020
Commercial & Industrial Sector		
C&I Custom Electric		
MWh (Primary)	10,387	13,752
C&I Prescriptive Electric		
MWh (Primary)	15,660	9,262
Industrial		
MWh (Primary)	N/A	4,027
Operations & Maintenance		
MWh (Primary)	N/A	2,013
Self-Direct		
MWh (Primary)	160	N/A
Small Business Direct Install (SBDI)		
MWh (Primary)	9,784	7,876
Residential Sector		
Residential Electric Rebate		
MWh (Primary)	251	288
Marketplace Electric		
MWh (Primary)	729	839
Appliance Recycling Program		
MWh (Primary)	2,242	2,989
ENERGY STAR Retail Products Platform		
MWh (Primary)	914	1,266
Behavior/New Residential Electric Programs		
MWh (Primary)	4,788	6,562
LMI-Residential Electric		
MWh (Primary)	609	761
Multifamily Sector		
Multifamily Electric		
MWh (Primary)	3,500	2,818
LMI-Multifamily Electric		
MWh (Primary)	406	507
Total Portfolio		
MWh (Primary)	49,430	52,961

Table 3-D: Two-Year Primary and Secondary Plans (RG&E Natural Gas)

RG&E		
PORTFOLIO (Gas)	2019	2020
Commercial & Industrial Sector		
C&I Custom Gas		
MMBtu (Primary)	36,397	8,599
C&I Prescriptive Gas		
MMBtu (Primary)	9,363	9,733
Industrial		
MWh (Primary)	N/A	3,739
Operations & Maintenance		
MWh (Primary)	N/A	1,869
SBDI		
MWh (Primary)	N/A	16,222
Residential Sector		
Residential Gas Rebate		
MMBtu (Primary)	71,509	76,157
Marketplace Gas		
MMBtu (Primary)	11,081	12,190
Behavior/New Residential Gas Programs		
MMBtu (Primary)	8,364	9,569
LMI-Residential Gas		
MMBtu (Primary)	227	272
Multifamily Sector		
Multifamily Gas		
MMBtu (Primary)	14,154	14,714
LMI-Multifamily Gas		
MMBtu (Primary)	151	182
Total Portfolio		
MMBtu (Primary)	151,246	153,246

2.4 FORECASTED PORTFOLIO-LEVEL ACTIVITY

2.4.1 Forecasted Expenditures

Tables 4A-4D detail the forecasted Portfolio-level budgets by program year as requested.

Table 4-A: Forecasted Expenditures (NYSEG Electric)

	Forecasted Expenditures		
Budgets	2019	2020[8]	Total
2019	$22,179,728		$22,179,728
2020		$24,965,797	$24,965,797
Total Portfolio	$22,179,728	$24,965,797	$47,145,525

Table 4-B: Forecasted Expenditures (NYSEG Natural Gas)

	Forecasted Expenditures		
Budgets	2019	2020	Total
2019	$2,529,384		$2,529,384
2020		$2,897,761	$2,897,761
Total Portfolio	$2,529,384	$2,897,761	$5,427,145

Table 4-C: Forecasted Expenditures (RG&E Electric)

	Forecasted Expenditures		
Budgets	2019	Budgets	2019
2019	$13,406,670	$0	$13,406,670
2020	$0	$14,637,818	$14,637,818
Total Portfolio	$13,406,670	$14,637,818	$28,044,488

Table 4-D: Forecasted Expenditures (RG&E Natural Gas)

	Forecasted Expenditures		
Budgets	2019	Budgets	2019
2019	$2,925,033		$2,925,033
2020		$2,965,890	$2,965,890
Total Portfolio	$2,925,033	$2,965,890	$5,890,923

[8] A portion of electric unspent will be used to accelerate residential heat pump adoption in 2020 to prepare and align the Companies to achieve their share of the statewide 5 TBtus heat pump goal for 2021-2025. Specifics have not been defined as of this filing. The $2 million reflected for NYSEG electric and RG&E electric combined is a high-level estimate. Once finalized, details will be provided in a future ETIP or ETIP update.

2.4.2 Forecasted Program Achievements (Primary Metric)

The forecasted Portfolio-level program savings achievements by program year are provided in Tables 5A-5D and represent gross savings figures. Program savings achievements include MWHs and MMBtus achieved.

Table 5-A: Program Achievements (NYSEG Electric)

	Forecasted Achievements		
Plans (MWh)	2019	2020	Total
2019	83,311		**83,311**
2020		89,262	**89,262**
Total Portfolio	83,311	89,262	172,573

Table 5-B: Program Achievements (NYSEG Natural Gas)

	Forecasted Achievements		
Plans (MMBtu)	2019	2020	Total
2019	116,003		**116,003**
2020		132,141	**132,141**
Total Portfolio	116,003	132,141	248,144

Table 5-C: Program Achievements (RG&E Electric)

	Forecasted Achievements		
Plans (MWh)	2019	2020	Total
2019	49,430		**49,430**
2020		52,961	**52,961**
Total Portfolio	49,430	52,961	102,391

Table 5-D: Program Achievements (RG&E Natural Gas)

	Forecasted Achievements		
Plans (MMBtu)	2019	2020	Total
2019	151,246		**151,246**
2020		153,246	**153,246**
Total Portfolio	151,246	153,246	304,492

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CHAPTER THREE: EVALUATION, MEASUREMENT & VERIFICATION

3.1 OBJECTIVES

Evaluation, Measurement, and Verification ("EM&V") is an integral component of the Companies' energy efficiency programs. EM&V achieves multiple objectives for the Companies, including verifying current program energy savings, estimating future energy savings from new programs or newly-incentivized measures, and determining if energy efficiency program processes or procedures can be improved. The Companies utilize their EM&V activities to continuously improve program design and structure, cost-effectiveness, and efficacy.

There are six objectives for the EM&V activities covered by the 2019-2020 SEEP:

1. Process Evaluation and Verification of Portfolio Recordkeeping. Each process evaluation shall assess customer satisfaction, delivery system effectiveness, marketing effectiveness, barriers, and remaining potential to improve programs and increase savings. Each process evaluation will also include a review of the program's project tracking database to verify the accuracy of program and portfolio recordkeeping.

2. Verification of Measure Installations and Energy Savings Reporting. Each impact evaluation shall conduct a sufficient number of on-site visits to verify energy-saving measure installations. Additionally, on-site metering of a statistically significant sample of energy-saving measures and projects shall be conducted to verify energy savings and demand reductions.

3. Determination of Annual and Lifetime Energy Savings, Including Energy Savings Persistence of Individual Measures. Each impact evaluation shall verify the annual and lifetime energy savings based on on-site metering and field studies from a statistically significant sample.

Targeted evaluations will determine annual operating hours and year-over-year measure persistence to verify the savings of measures, programs, and portfolios.

4. Measurement of Demand Reduction Coincident with the Circuit/Substation, Utility System, and New York Independent System Operator ("NYISO") Demand Peaks. Individual measure and total program and portfolio demand reductions will be important components of impact evaluations. All impact evaluations shall include site and measure time-stamped interval metering to develop site and measure coincidence factors for the utility circuit and/or substation feeding the customer, the utility system peak, and NYISO peak.

5. Periodic Assessment of Free-Ridership. Programs will be studied to verify the current levels of free-ridership. The studies will aim to identify the quantity of savings that would have been achieved regardless of the presence of the program.

6. Ex-Post Benefit-Cost Testing of Programs and Portfolios. Both Evaluated Savings[9] and reported program costs will be used to perform the Societal Cost Test, the Utility Cost Test, and the Ratepayer Impact Measure test for each evaluated program. Program test results must be rolled up to a single test result for each company (NYSEG and RG&E) and each portfolio (Electric and Natural Gas).

3.1.1 EM&V Activities

As noted earlier, the Companies' EM&V Activities are critical in the development and implementation of cost-effective, innovative energy efficiency programs across NYSEG's and RG&E's service territories. Below is a listing of these EM&V Activities and a brief description of their purpose. EM&V activities may include but are not limited to: process evaluations that inform program design and implementation, impact evaluations and measurement and verification activities that inform TRM revision, as well as other market research.

[9] *Evaluated Savings* refers to the measure and program Realization Rate savings, not including Free Ridership or Spillover, determined by a review of implementation contractor databases, post-installation measure counts, verification of measure installation, operating hours verification, and savings calculation verification. A *Realization Rate* shall be developed for measures, programs, and portfolios.

- Activity 1: UEEP ("Utility Energy Efficiency Programs 15-M-0252") Ongoing Non-Residential Electric and Natural Gas Program Impact Evaluations. This evaluation includes detailed measure and program impact evaluations, through desk reviews and extensive on-site measurement and verification. Any new energy-saving program measures implemented in the Companies' Energy Efficiency Program Portfolios must be evaluated within 12 months. The evaluation is designed to determine: (a) measure and program energy savings, (b) measure operating hours, (c) measure persistence, (d) measure lifetime savings, and (e) program and portfolio electric demand reductions made at the local circuit, substation, utility, and NYISO peak demands.

  Demand reduction calculations shall be based on on-site measured demand reductions for a statistically significant sample of measures and sites. Activity will center on the continuation of the existing rolling evaluation of the Companies' prescriptive and custom electric and natural gas programs. The quarterly sampling and reporting provides interim feedback, and over time, the precision desired of gross energy evaluation.[10]

- Activity 2: UEEP Small Business Direct Install Process Evaluation. The SBDI program will be enhanced to achieve more savings, especially for non-lighting measures. Enhancements may also include a financing or pay-for-performance component. A process evaluation is important during the early stages of program introduction or redesign.[11] The evaluation will be conducted through surveys, telephone interviews, implementation vendor database review, and an assessment of the measure implementation process. The research will assess whether or not the enhanced program is operating smoothly, if customers are satisfied, and if it is effectively reaching the target market. The evaluation will identify opportunities for improved program delivery, opportunities for increased savings, best practices, and customer feedback.

[10] Interim feedback and rolling samples are encouraged per *Evaluation, Measurement & Verification Guidance,* NY DPS Office Of Clean Energy, Clean Energy Guidance, November 1, 2016, pp. 3-4. Desired precision is 90% confidence/10% relative precision, p. 17.

[11] *Evaluation, Measurement & Verification Guidance,* NY DPS Office Of Clean Energy, Clean Energy Guidance, November 1, 2016, p.3.

- Activity 3: UEEP Portfolio Attribution Study. Program administrators are required to evaluate program attribution to ensure responsible spending of ratepayer dollars. While neither gross verified savings nor evaluations savings are expected to account for free-ridership,[12] program administrators are expected to identify programs with low influence and improve or replace them. This is a multi-program comparative attribution study that identifies programs with relatively high or low net-to-gross ratios. This evaluation will follow the best practices described in the EM&V Guidance Document.[13] Since the Companies' Energy Efficiency Program Portfolios are currently composed primarily of conventional resource acquisition programs, the Self-Report Approach ("SRA") will be the principal technique utilized. The goal of the study is to determine the current levels of free-ridership in the Companies' existing Energy Efficiency Program Portfolios.

- Activity 4: UEEP Residential Heat Pump Evaluation, Including On-Site Metering. This is an impact evaluation of heat pump installations. Current residential impact evaluation activity is focused on identifying the full load hours of natural gas heating and central air conditioner cooling for a typical home in NYSEG's and RG&E's service territories. New research during the next evaluation period will extend this targeted investigation to a new measure for the Companies—electric heat pumps. This evaluation is designed to find the accurate heat pump savings data to improve the quality of heat pump savings TRM calculations and subsequently, the reported savings. To accurately estimate savings from energy-efficient heat pumps, the evaluation will look at a statistically significant sample of homes and utilize detailed site surveys, on-site metering of end-use heating and cooling equipment, and statistical analysis of utility bills.

- Activity 5: UEEP Annual Residential and Non-Residential Natural Gas and Electric Outreach and Education Process Evaluation. This process evaluation includes the use of surveys, telephone interviews, and focus groups to determine the effectiveness of the Companies'

[12] *Gross Savings Verification Guidance, Development, Progress, Definitions, and Feedback, Discussion Draft,- Deliberative; Non-Final*, Energetics for the NY DPS, Nov. 30, 2018, Slide 10.
[13] *Evaluation, Measurement & Verification Guidance,* NY DPS Office Of Clean Energy, Clean Energy Guidance, November 1, 2016, Appendix F.

outreach, education, and marketing channels. The Companies' Energy Efficiency Program Portfolios are currently promoted through umbrella marketing campaigns coordinated by outside advertising agencies.

The objective of the evaluation is to determine if the marketing campaigns are effective and if they drive savings achievements. The researchable question to be answered by this process evaluation is, "How effective is this marketing and does it drive savings achievements?" This process evaluation is a continuation of work started in 2018 and will continue through 2020. Additionally, the Companies will, over the same period, commission a study to identify and target important sectors that have relatively low participation in their Non-Residential programs. While there is some anecdotal evidence of which sectors participate less, a market segmentation study has not been conducted to identify the size of different Non-Residential sectors in the Companies' service territories and their respective participation rates. A variety of methods, from desk review of marketing concepts and materials, to focus groups, and telephone or web-based surveys, may be employed in this evaluation.

- Activity 6: UEEP Residential Portfolio Process Evaluation. This is a process evaluation for the Companies' Residential Energy Efficiency Portfolio. This includes the Residential Online Marketplace, the Residential Rebate program, and the Appliance Recycling Program (being re-introduced to the market with a new implementation vendor after a substantial period without the program). The Online Marketplace (RG&E's YES Store), which originated as a REV demonstration project for RG&E expanded to NYSEG customers in Q4 2018. The Residential Rebate program is being substantially expanded to include new efficiency measures, including central air conditioning equipment and heat pumps. Additionally, the Companies may introduce a new Behavioral program. For other existing programs, marked increases in savings goals will require as-yet-unspecified changes.

With these major changes, it is valuably important to evaluate the effectiveness of new processes, customer response, and aid the programs in reaching customers to increase savings. Evaluation activities will include surveys, telephone interviews, database reviews, assessment of lost opportunities, and potentially focus groups. The evaluation's objective is to seek opportunities for improved program delivery, opportunities for increased savings, best practices to be reinforced, and customer feedback.

- Activity 7: UEEP Residential Online Marketplace Program Impact Evaluation. Through the online marketplace, the Companies' customers can purchase rebated energy-efficient equipment for their homes. The Companies claim deemed energy and demand savings per unit with each sale. This impact evaluation will verify how much of the claimed savings is realized. Evaluation activities will include algorithm and tracking system desk review, and telephone/online surveying. The evaluation is designed to determine measure program measure level energy and demand savings.

- Activity 8: UEEP Multifamily Program Impact and Integrated Process Evaluations. The Companies' Multifamily program offers the direct installation of natural gas and electric energy efficiency upgrades to multifamily property owners. Impact evaluation activities will include detailed desk reviews, phone interviews, and onsite measurement and verification for a sample of the projects completed. Process evaluation activities such as customer surveys and tracking database reviews will be interwoven with impact evaluation activities (e.g., both process and impact evaluation questions will be included in phone interviews) to achieve efficiency.

  Other process evaluation activities will include interviews of program managers and assessments of the measure implementation process. The evaluations are designed to determine the following information: verification of measure and program energy and demand savings, effectiveness of program delivery and measure implementation, review of tracking system and documentation, opportunities for increased savings, best practices, and customer satisfaction and feedback.

- Activity 9: UEEP Evaluation (TBD). As new programs are implemented or existing programs are modified over the 2019 and 2020 program years, it may be deemed necessary to commission targeted evaluation tasks that provide real-time feedback on program performance, derive factors to inform gross verified savings ("GVS") calculations, or assess the market. Activities for this evaluation could include, but are not limited to: program performance benchmarking, logic model development for market transformation type programs, pre-implementation technical reviews, baseline and potential studies. This evaluation's objective will be to verify savings and determine strategies to improve program delivery and realized savings.

3.1.2 EM&V Activity Schedules

Table 6 details the two-year plan and schedule for the Companies' EM&V activities and clearly identifies the following information: (a) purpose of, or information being sought through the EM&V activity, and (b) date by which it will be obtained to support the overall program and guidance cycle.

Table 6: Two-Year EM&V Activity Schedule

EM&V Activity (Electric or Natural Gas)	Expected Plan Submission Date	Expected Start Date[14]	Expected Completion Date	Status
Activity 1: Utility Energy Efficiency Programs ("UEEP") 15-M-0252 Ongoing Non-Residential Electric and Natural Gas Program Impact Evaluations *(continue current rolling evaluation)*	June 1, 2019 (updated plan)	September 1, 2019	September 1, 2020	Ongoing, Next Round to begin September 1, 2019
Activity 2: UEEP Small Business Direct Install Process Evaluation	June 30, 2019	August 1, 2019	June 30, 2020	Anticipated to commence on August 1, 2019
Activity 3: UEEP Portfolio Attribution Study	June 30, 2019	August 1, 2019	June 30, 2020; June 30, 2021	Anticipated to commence on August 1, 2019
Activity 4: UEEP Residential Heat Pump Impact Evaluation, including On-Site Metering	June 30, 2019	October 1, 2019	December 31, 2019; December 31, 2020	Anticipated to commence on October 1, 2019
Activity 5: UEEP Annual Residential and Non-Residential Electric and Natural Gas Outreach and Education Process Evaluation	June 30, 2019	September 1, 2019	June 30, 2019; June 30, 2020	Ongoing, Next phase to begin September 1, 2019
Activity 6: UEEP Residential Portfolio Process Evaluation	June 1, 2019	July 1, 2019	June 30, 2020	Anticipated to commence on July 1, 2019
Activity 7: Residential Online Marketplace Program Impact Evaluation	June 30, 2019	October 1, 2019	June 30, 2020	Anticipated to commence on October 1, 2019
Activity 8: UEEP Multifamily Program Impact and Integrated Process Evaluation	June 30, 2019	August 1, 2019	December 31, 2020	Anticipated to commence on August 1, 2019

[14] Start dates listed are the dates of initial kick-off meetings.

3.1.3 EM&V Activity Forecasted Expenditures

Table 7 details the forecasted expenditures allocated for the Companies' EM&V activities for the 2019 and 2020 program years. The Companies have ensured that all EM&V activities listed match those referenced in Table 6 as requested by the Commission.

Table 7: EM&V Activity Forecasted Expenditures (2019-2020)

EM&V Activity (Electric or Natural Gas)	2019	2020
Activity 1: Utility Energy Efficiency Programs ("UEEP") 15-M-0252 Ongoing Non-Residential Electric and Natural Gas Program Impact Evaluations	$500,0000	$600,000
Activity 2: UEEP Small Business Direct Install Process Evaluation	$90,000	$85,000
Activity 3: UEEP Portfolio Attribution Study	$125,000	$100,000
Activity 4: UEEP Residential Natural Gas Impact Evaluation, Including On-Site Metering	$450,000	$450,000
Activity 5: UEEP Annual Residential and Non-Residential Electric and Natural Gas Outreach and Education Process Evaluation	$75,000	$75,000
Activity 6: UEEP Residential Portfolio Process Evaluation	$150,000	$100,000
Activity 7: Residential Online Marketplace Program Impact Evaluation	$110,000	$100,000
Activity 8: UEEP Multifamily Program Impact and Integrated Process Evaluation	$400,000	$450,000
Activity 9: UEEP EM&V activity to be determined	$150,000	$200,000
Total EM&V Forecasted Expenditures	$2,050,000	$2,160,000

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CHAPTER FOUR: BENEFIT-COST ANALYSIS

4.1 TECHNICAL RESOURCE MANUAL

The New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs—Residential, Multi-Family, and Commercial/Industrial, known as the Technical Resource Manual ("TRM"), provides a standardized and transparent approach for measuring energy savings across New York State's array of utility-driven energy efficiency programs. The current TRM[15] provides standardized energy savings assumptions and calculations, at the measure level, to help utility planners estimate both demand and energy savings for 2019 programs. The TRM is revised at least once a year to reflect new technologies, modified energy-saving calculations, and evaluation findings. All of NYSEG's and RG&E's energy efficiency programs, residential, non-residential, and multifamily, utilize the TRM to inform program design, incentive levels, and energy and demand savings.

4.2 BENEFIT-COST ANALYSIS

4.2.1 2019-2020 BCA Updates

The benefit-cost calculation procedures and inputs for the 2019-2020 SEEP filing are in conformance with the Commission 2016 Order[16] and the Companies' revised Benefit Cost Analysis Handbook ("BCA Handbook").[17] The BCA results shown for Program Years 2019 and 2020 in Tables 9A-9D were calculated using the : (a) specified benefit-cost tests to be conducted, (b) the required input data to be used in the test, and (c) the sources of the required input data. Additionally, the Companies are complying with the required use of the new common template for documenting and presenting Societal Cost Test analyses.[18]

[15] 2019 TRM, Version 6, issued April 6, 2018, effective January 1, 2019. Available at: http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/72c23decff52920a85257f1100671bdd/$FILE/TRM%20Version%206%20-%20January%202019.pdf.
[16] Case 14-M-0101, *Order Establishing the Benefit Cost Analysis Framework*, Jan. 21, 2016.
[17] *Benefit Cost Analysis Handbook*, Version 2.0, Jul. 26, 2018.
[18] CE-07, *Utility-Administered Energy Efficiency Benefit-Cost Analysis Filing Requirement Guidance*, May 14, 2018.

4.2.2 Cost-Effectiveness Tests

The 2019-2020 SEEP uses the Societal Cost Test ("SCT") as the primary test for energy efficiency programs and portfolios, rather than using the Total Resource Cost Test. The SCT compares the costs incurred to design and deliver projects and customers costs with avoided electricity and other supply-side resource costs (e.g., generation, transmission, and natural gas) and also includes the cost of externalities (e.g., carbon emission and other net non-energy benefits). The BCA Order[19] positions the SCT as the primary cost-effectiveness test as it evaluates impacts on society as a whole.

The 2019-2020 SEEP also utilizes the Utility Cost Test ("UCT") and the Ratepayer Impact Measure ("RIM") test as secondary tests to inform the Companies' review of programs and portfolios. The UCT compares the costs incurred to design, deliver, and manage projects by the utility with avoided electricity supply-side resource costs. The RIM test compares utility costs and utility bill reductions with avoided electricity and other supply-wide resource costs. The role of the UCT and RIM tests is to assess the preliminary impact on utility costs and ratepayer bills from the benefits and costs that pass the SCT. The results of the UCT and RIM tests are critical in identifying energy efficiency programs that may require a more detailed analysis of their impact to the utility and ratepayers. Through these tests, projects which may not provide benefits to the utility and/or ratepayers will be determined as beneficial to society as a whole.

It is important to note, however, that if an energy efficiency measures passes the SCT, but its results do not satisfy the UCT and RIM tests, the measure would not be rejected unless a complete bill impact analysis determined that the impact was of a "magnitude that is unacceptable."[20]

[19] Case 14-M-0101, *Order Establishing the Benefit Cost Analysis Framework*, Jan. 21, 2016.
[20] Case 14-M-0101, *Order Establishing the Benefit Cost Analysis Framework*, Jan. 21, 2016, p. 13.

The portfolio level BCA must be calculated using the total benefits and total costs of the portfolio, and the SCT ratio must exceed 1.0.[21] Tables 9A-9D provide the required SCT, UCT, and RIM test results at the portfolio level.

Tables 8A-8D provide benefit-cost test results as both a ratio and in dollars. The ratio illustrates how much benefits exceed costs, regardless of program size. A SCT result of 2.0, for example, indicates that the program returns twice as much in benefits to society as the incremental cost to society of the energy-efficient equipment, its installation, and the cost of running the program. A SCT result of 1.5 indicates that benefits exceed costs by 50 percent, and a SCT of 1.0 indicates that benefits exactly equal costs.

The dollar values in Tables 8A-8D represent lifetime benefits of the program to society as a whole. These values are shown in today's dollars using an appropriate interest rate, and also show the costs of running the program. Subtracting the program costs from the program benefits results in the net value to society from implementing these programs.

The BCA test results (both the test ratios and the benefit and cost dollar values) in Tables 8A-8D utilize actual program performance from program year 2017. Since the programs, targets, and metrics remain the same in this filing, the Companies felt this back-cast of actual data provided the most reliable basis for predicting future program performance in program years 2019 and 2020.

As noted elsewhere in the 2019-2020 SEEP, the Companies are planning to deploy additional new energy efficiency efforts beyond their core programs, their BCA test results will be presented in a future filing. Corresponding program design assumptions, program participation

[21] Case 15-M-0252, *In the Matter of Utility Energy Efficiency Programs, Order Authorizing Utility-Administered Energy Efficiency Portfolio Budgets and Targets for 2016-2018* (issued January 22, 2016) (2016 ETIP Order). A demonstration that the ETIP portfolio of programs passes a SCT at a 1.0 or better, in addition to requirements to apply benefit cost screening at varying levels of granularity, is described in the Commission-ordered ETIP Guidance, CE-02: ETIP Guidance, which outlines the required elements of the ETIP filings

levels, program costs, and savings levels will be used at that time to calculate the BCA test results for those programs.

Table 8-A: Two-Year Benefit Cost Ratios (NYSEG Electric)

PORTFOLIO	2019	2020
Commercial & Industrial Sector		
C&I Rebate Program		
Benefits	$24,189,550.33	$23,775,381.57
Costs	$12,446,291.37	$11,652,739.79
Benefit Cost Ratio	1.94	2.04
Small Business Direct Install		
Benefits	$14,550,125.28	$14,330,347.99
Costs	$5,545,666.00	$5,192,085.01
Benefit Cost Ratio	2.62	2.76
Residential Sector		
Online Energy Marketplace		
Benefits	$609,433.99	$597,107.13
Costs	$176,587.96	$165,329.05
Benefit Cost Ratio	3.45	3.61
Residential Rebate Electric		
Benefits	$75,022.42	$71,988.08
Costs	$68,681.33	$64,302.34
Benefit Cost Ratio	1.09	1.12
RFRP		
Benefits	$1,118,770.12	$1,104,552.63
Costs	$820,094.67	$767,807.02
Benefit Cost Ratio	1.36	1.44
Multifamily Sector		
Multifamily Program		
Benefits	$2,238,421.03	$2,207,357.29
Costs	$433,680.17	$406,029.56
Benefit Cost Ratio	5.16	5.44
Total Benefits	$42,781,323.17	$42,086,734.69
Total Costs	$19,491,001.50	$18,248,292.77
Portfolio Benefit Cost Ratio	2.19	2.40

Table 8-B: Two-Year Benefit Cost Ratios (NYSEG Natural Gas)

PORTFOLIO	2019	2020
Commercial & Industrial Sector		
C&I Rebate Program		
Benefits	$2,811,079.66	$2,794,184.41
Costs	$1,160,771.64	$1,088,087.40
Benefit Cost Ratio	2.42	2.57
Residential Sector		
Online Energy Marketplace		
Benefits	$280,177.71	$279,608.99
Costs	$69,459.53	$65,110.17
Benefit Cost Ratio	4.03	4.29
Residential Rebate Gas		
Benefits	$3,021,736.20	$3,010,204.35
Costs	$2,904,412.37	$2,722,546.28
Benefit Cost Ratio	1.04	1.11
Multifamily Sector		
Multifamily Program		
Benefits	$1,034,845.96	$1,033,674.51
Costs	$117,596.38	$110,232.83
Benefit Cost Ratio	8.80	9.38
Total Benefits	$7,147,839.53	$7,117,672.27
Total Costs	$4,252,239.92	$3,985,976.68
Portfolio Benefit Cost Ratio	1.68	1.79

Table 8-C: Two-Year Benefit Cost Ratios (RG&E Electric)

PORTFOLIO	2019	2020
Commercial & Industrial Sector		
C&I Rebate Program		
Benefits	$11,870,505.47	$11,613,136.78
Costs	$6,304,989.37	$5,866,197.78
Benefit Cost Ratio	1.88	1.98
Small Business Direct Install		
Benefits	$5,076,260.75	$4,967,621.15
Costs	$2,116,378.24	$1,969,090.29
Benefit Cost Ratio	2.40	2.52
Residential Sector		
Online Energy Marketplace		
Benefits	$2,136,507.08	$2,073,876.59
Costs	$746,126.45	$694,200.27
Benefit Cost Ratio	2.86	2.99
Residential Rebate Electric		
Benefits	$137,352.87	$129,259.29
Costs	$101,657.56	$94,582.77
Benefit Cost Ratio	1.35	1.37
RFRP		
Benefits	$791,643.67	$777,274.41
Costs	$585,451.87	$544,707.73
Benefit Cost Ratio	1.35	1.43
Multifamily Sector		
Multifamily Program		
Benefits	$3,087,052.95	$3,019,581.66
Costs	$659,666.62	$613,757.55
Benefit Cost Ratio	4.68	4.92
Total Benefits	$23,099,322.79	$22,580,749.88
Total Costs	$10,514,270.11	$9,782,536.39
Portfolio Benefit Cost Ratio	2.20	2.31

Table 8-D: Two-Year Benefit Cost Ratios (RG&E Natural Gas)

PORTFOLIO	2019	2020
Commercial & Industrial Sector		
C&I Rebate Program		
Benefits	$2,568,583.56	$2,526,409.50
Costs	$936,109.17	$870,394.39
Benefit Cost Ratio	2.74	2.90
Residential Sector		
Marketplace		
Benefits	$1,664,335.26	$1,647,832.65
Costs	$460,263.02	$427,952.59
Benefit Cost Ratio	3.62	3.85
Residential Rebate Gas[22]		
Benefits	$5,540,659.80	$5,486,380.66
Costs	$6,490,267.44	$6,034,651.27
Benefit Cost Ratio	0.85	0.91
Multifamily Sector		
Multifamily Program		
Benefits	$1,708,374.57	$1,692,919.75
Costs	$206,279.63	$191,798.82
Benefit Cost Ratio	8.28	8.83
Total Benefits	$11,481,953.19	$11,353,542.56
Total Costs	$8,092,919.25	$7,524,797.07
Portfolio Benefit Cost Ratio	1.42	1.51

[22] The RG&E Residential Gas Rebate program is forecasted to not pass the SCT in 2019 and 2020. RG&E plans to continue this program and will make program adjustments to achieve a Benefit Cost Ratio of 1 or greater.

4.2.3 Two-Year Portfolio BCA Results

2019 and 2020 benefit cost ratios include EM&V and internal administration costs at program, sector, and portfolio levels.

Table 9-A: Two-Year Portfolio BCA Results (NYSEG Electric)

Portfolio (Electric)	Current Year 2019	Planned Year 2020
Societal Cost Test Ratio	2.19	2.40
Utility Cost Test Ratio	3.00	3.31
Ratepayer Impact Measure Test Ratio	0.42	0.46

Table 9-B: Two-Year Portfolio BCA Results (NYSEG Natural Gas)

Portfolio (Natural Gas)	Current Year 2019	Planned Year 2020
Societal Cost Test Ratio	1.68	1.79
Utility Cost Test Ratio	2.39	2.54
Ratepayer Impact Measure Test Ratio	0.48	0.50

Table 9-C: Two-Year Portfolio BCA Results (RG&E Electric)

Portfolio (Electric)	Current Year 2019	Planned Year 2020
Societal Cost Test Ratio	2.20	2.31
Utility Cost Test Ratio	3.14	3.33
Ratepayer Impact Measure Test Ratio	0.33	0.34

Table 9-D: Two-Year Portfolio BCA Results (RG&E Natural Gas)

Portfolio (Natural Gas)	Current Year 2019	Planned Year 2020
Societal Cost Test Ratio	1.42	1.51
Utility Cost Test Ratio	2.56	2.72
Ratepayer Impact Measure Test Ratio	0.57	0.60

4.2.4 Input Data Sources

1. Long Run Average Costs ("LRACs") for electric energy, capacity, natural gas, carbon dioxide emissions, and appropriate escalation factors, provided by Staff in an April 18, 2017 e-mail and through an August 15, 2017 filing by Staff with the Commission.
2. Annual Avoided Generation Capacity Costs ("AGCC") file submitted by Staff on May 2018.
3. Interest rates, loss factors, and avoided local (marginal) distribution costs from the Companies' BCA Handbook, Version 2.0, filed July 26, 2018.
4. Program implementation costs, including incentives and services, contractor and employee costs, administrative costs, and outreach and education costs from 2017 actual program costs.
5. EM&V costs based on 5 percent of projected program budgets.
6. Savings from 2017 actual program gross savings.[23]
7. Energy Efficiency Measure material and labor costs, both full and incremental, are taken from the Companies' program implementation contractor data files and from industry incremental cost studies. Available at: http://www.neep.org/initiatives/emv-forum/forum-products#Incremental Cost Studies), and from publicly available sources.
8. Program, sector, and portfolio Effective Useful Lives ("EULs") calculated from a savings weighted average of measure EULs rebated or provided through the Companies' programs.

[23] Measure-level factors addressing Free Ridership, Spillover and Realization Rates are being incorporated into the TRM (the New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs – Residential, Multi-Family, and Commercial/Industrial Measures) with each revision, making further discounting of savings at a gross program or portfolio level unnecessary. Furthermore, in the Commission's Track 2 order (*Order Adopting a Ratemaking and Utility Revenue Model Policy Framework*, CASE 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, May 19, 2016, p. 65), with regard to Free Ridership and Spillover, the Commission states: "Avoidance of counterfactuals: Incentive mechanisms are less effective and lead to significant controversy when metrics rely on complicated verification processes and debatable baseline assumptions. *"Incentives that depend on a determination of what would have taken place in the absence of the incentive — that is, the proving of a counterfactual — are challenging to administer, can lead to contentious ex post review processes, and may result in tremendous administrative expense for uncertain net benefit.*"(emphasis added).

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CHAPTER FIVE: PROGRAM DESCRIPTIONS

5.1 INTRODUCTION

In 2019 and 2020, the Companies plan to continue aligning their Energy Efficiency Program Portfolios based on market sector. The Companies' energy efficiency programs are designed with flexible structures that can be modified quickly to address changing customer and marketplace needs, as well as integrate emerging technologies and new and/or pilot initiatives. This flexibility allows the Companies to develop and modify the programs toward greater efficacy while driving energy savings, GHG emissions reductions, customer engagement and satisfaction, and increased economic benefits.

The Companies continue to work with other New York State utilities and NYSERDA to identify program and geographic gaps created by NYSERDA's move from a program implementer toward a primarily research and development agency. Additionally, the Companies are collaborating with NYSERDA regarding the addition of heat pumps to the Residential, Non-Residential, and Multifamily Sectors and the development of a statewide framework for Low-to-Moderate ("LMI") income customers which the Companies will consider as they develop LMI programs. The Companies will work closely with NYSERDA as they research, design, and deploy new energy efficiency program pilots in NYSEG's and RG&E's service territories.

5.2 PROGRAM HIGHLIGHTS

In 2019 and 2020, the Companies will continue to offer programs which have been successful, while also accelerating the deployment of programs that promote emerging energy-efficient technologies, equipment, and more comprehensive measure offerings to maximize energy savings. Throughout 2019 and 2020, the Companies will continue to look for opportunities to integrate energy efficiency with other REV-supported initiatives.

The Companies manage and implement energy efficiency programs within the following three Sectors:

- Non-Residential;
- Residential; and
- Multifamily.

5.2.1 Heat Pump Technologies

The NENY White Paper referenced in Chapter One describes how heat pumps can improve overall efficiency and reduce GHG emissions. The NENY White Paper further recommended a longer-term market strategy be developed for large-scale integration of heat pumps into efficiency and GHG emissions reduction goals. The Commission's December Order established a minimum statewide target of 5 TBtus for energy savings from heat pump technologies between 2021 and 2025. Though primarily intended for Residential Sector programs, the 5 TBtus target does not preclude the Companies targeting larger, Non-Residential customers. This energy savings target may be increased in future Commission orders and may also include a requirement for the Companies to develop programs for non-residential (commercial and industrial) customers.

Though the NENY White Paper and December Order reference the 2021-2025 program years, the Companies recognize the immediate need to ramp up their efforts to accelerate the deployment of heat pump technologies in their service territories. During the 2019 and 2020 program years, the Companies will promote heat pump technologies in residential applications and explore offering additional incentives to customers to support heat pump installations to displace electric resistance heat and other heating fuels, where high-efficiency equipment would benefit the customer and satisfy cost-benefit and other criteria. For the 2019 program year, the Companies will incentivize heat pump water heaters and air-source heat pumps within the Residential Rebate program. The heat pump offerings are expected to be available to customers during Q2 2019.

This accelerated ramp up in 2019 and 2020 will help the Companies determine the best approaches to promoting heat pump technologies and also assist the Companies in achieving

their allocated heat pump savings targets set by the Commission for the 2021-2025 period. In order to fund an expanded heat pump offering, the Companies estimate that they will need to use approximately $2 million of unspent funds to incentivize heat pump technologies in 2020. The Companies will continue to evaluate and expand the residential heat pump offering throughout 2020, including possibly including ground-source heat pump technologies.

In addition, the Companies' Energy Efficiency and Economic Development groups are currently collaborating on the development of a heat pump grant program for non-residential customers. The Economic Development program would target non-residential customers in gas-constrained areas in both NYSEG's and RG&E's service territories. The funding would be in the form of a one-time Economic Development grant using under-utilized funds to incentivize non-residential customers to install air-source or geothermal heat pump technologies. Economic development grants awarded for heat pumps would be in addition to incentives available for heat pumps from the Companies' energy efficiency programs.

5.2.2 Low-and-Moderate Income Customers

The NENY White Paper proposed that investor-owned utilities in New York should allocate at least 20 percent of their 2019-2025 energy efficiency budgets toward funding LMI programs for residential and multifamily customers. This proposal was adopted as part of the December Order and the 20 percent allocation per utility is inclusive of a 40 percent allocation mandate for 2019-2025 Multifamily Sector budgets.

The Companies already have a variety of initiatives in place that support LMI customers outside of Energy Efficiency, including: the Low-Income Rate Reduction ("LIRR") program, the Arrears Forgiveness program, and the Project SHARE Heating Fund. Additionally, the Companies have a partnership with Cornell Cooperative Extension and Get Your Green Back ("GYGB") organization, as part of the Energy Smart Community program, to focus on LMI energy conservation and sustainability issues within NYSEG's service territory in Tompkins County. Both the Cornell/GYGB and LIRR initiatives help customers learn more about the wise use of energy and how to better manage energy bills. The LIRR program refers newly-enrolled customers to NYSERDA's EmPower

NY program.

Currently, while NYSEG and RG&E energy efficiency programs are available to LMI customers, the Companies do not have programs specifically and exclusively targeted to LMI customers. In order to meet the LMI energy efficiency goals established in the December Order, the Companies are reviewing a variety of program options. Initially, the Companies will collaborate with NYSERDA to expand its current LMI offering, the EmPower NY program, in NYSEG's and RG&E's service territories. NYSERDA's EmPower NY program provides no-cost energy efficiency services to low-income homeowners and renters, including air sealing, installation of energy-efficient lighting, and upgrading refrigerators and freezers. The Companies will collaborate with NYSERDA to consider LMI options, including providing NYSEG and RG&E customers who participate in the EmPower program with additional energy efficiency measures, such as insulation, Wi-Fi enabled thermostats, and energy-efficient furnaces and water heaters.

Additionally, the Companies will look to collaborate with NYSERDA to expand its Assisted Home Performance with ENERGY STAR program in NYSEG's and RG&E's service territories. This program is a comprehensive, whole-house approach to improving energy efficiency and home comfort while saving money.

As referenced above, the December Order also requires investor-owned utilities in New York to allocate 40 percent of the LMI budget to provide energy efficiency services for their multifamily programs. Currently, the Companies' Multifamily program provides direct-install services for multifamily buildings. Starting in 2019, the Companies will explore potential Multifamily program design changes and adding energy efficiency services to better target LMI customers.

5.3 NON-RESIDENTIAL ENERGY EFFICIENCY SECTOR

Since 2009, the Companies have delivered cost-effective energy efficiency programs to non-residential electric and natural gas customers across their service territories. The Companies' 2019-2020 Non-Residential Energy Efficiency Sector consists of three existing programs for non-residential (i.e., commercial, industrial, and municipal) customers:

- Commercial and Industrial Rebate program;
- Small Business Direct Install program; and the
- Large Customer Self-Direct program.

During this period, the Companies will look to expand these existing programs by adding additional measures to drive more comprehensive energy savings. Also, during the 2019-2020 period, the Companies plan to explore, design, and deploy additional Non-Residential programs which are discussed within this section.

Through their Non-Residential programs, the Companies will provide non-residential customers with a variety of energy efficiency services, including: direct customer incentives (custom and prescriptive), direct installation of measures, self-directed, and other delivery mechanisms.

5.3.1 Commercial and Industrial Rebate Program

The Companies' Commercial and Industrial ("C&I") Rebate program is designed to incent non-residential customers for improving the efficiency of their facilities through the installation of new, high-efficiency technologies and equipment. The Companies operate the C&I Rebate program in the same manner, utilizing the same vendor for both utilities, and thus for the 2019-2020 SEEP, the programs are described in the same section. The primary objectives of the C&I Rebate program are to: a) obtain cost-effective energy savings, b) improve non-residential customers' bottom line, and (c) integrate sustainability into a customer's business and facility operations.

Customer Eligibility Rules and Anticipated Participation Levels

Commercial, industrial, and municipal customers with existing facilities are eligible for the program if they are an active NYSEG or RG&E C&I (non-residential) customer who pay the EE Tracker surcharge on their electric and/or natural gas bills. Common area portions of multifamily buildings or buildings which are not separately metered per dwelling unit are also eligible for the program. In 2019, the Companies plan to begin allowing new construction projects under the Prescriptive portion of the program.

Electric customers of NYSEG and RG&E are eligible for electric measure incentives, both custom and prescriptive. NYSEG and RG&E natural gas customers are eligible for custom and prescriptive natural gas measure incentives. If a commercial, industrial, or municipal customer is both an electric and natural gas customer of NYSEG and/or RG&E, they are eligible for both electric and natural gas measure incentives from the Company with whom they are a customer.

There is no minimum or maximum kilowatt ("kW") or dekatherm ("Dth") criteria for customers wishing to participate in the program. NYSEG and RG&E have no customer caps or limits to the number of rebates redeemed or incentive dollars offered through the C&I Rebate program. Pre-approval is required for prescriptive incentive applications totaling more than $10,000 and for all custom incentive applications.

Participation in the C&I Rebate program has remained steady over the past decade. The Companies are currently monitoring a potential market saturation impact and the impacts of other new programs over the next few years. Any noted impacts will be reflected in future SEEPs. During the 2019 through 2020 period, the Companies estimate that there will be an average of 1,162 NYSEG electric, 52 NYSEG natural gas, 673 RG&E electric, and 61 RG&E natural gas C&I Rebate program projects completed annually. These estimates are based in part on 2018 average cost per project results and have not been adjusted to reflect new measures that have been added or may be added to the program in 2019 and 2020.

Equipment Eligibility Rules

Through 2018, the C&I Rebate program has only been for equipment replacement in existing facilities, otherwise known as retrofit projects. The program required that all incentivized equipment must be new, and that used or rebuilt equipment was not eligible for program incentives. Existing equipment must be removed and not reinstalled within NYSEG's or RG&E's service areas.

As the C&I Rebate program is for retrofit equipment, new construction projects are currently not eligible to receive the program's prescriptive or custom rebates. As previously noted, the Companies plan to begin allowing new construction projects under the Prescriptive portion of the program in 2019. Additionally, in 2019 and 2020, the Companies will explore the possibility of expanding new construction program offerings to be in the form of a standalone, custom/comprehensive program for launch after 2020. New construction is defined as any new building which requires new utility electric or natural gas services for which a licensed professional architect or engineer has prepared and certified building plans.

Incentives

The C&I Rebate program offers both prescriptive and custom incentives to eligible NYSEG and RG&E non-residential customers to help them improve the efficiency of their buildings and facilities. Prescriptive incentives are fixed, pre-determined rebates offered to non-residential customers who install standard or "typical" energy-efficient equipment and technologies in their facilities. Custom incentives are calculated based on site-specific engineering and cost analysis. The Companies expanded the types and number of measures available under the program's prescriptive option in 2019. Prescriptive measures added in 2019 include commercial kitchen equipment and steam traps. The Companies will continue to consider adding additional prescriptive measures in 2019-2020 and beyond.

The Companies continuously review and update their incentive measure calculations to address new technologies, the saturation of a market with measures indicating that customers may no

longer require incentives to install the high-efficiency technology, or due to other factors which impact the need and level for incentivizing customers to achieve savings goals.

Prescriptive incentives are pre-set or fixed and are generally established to reduce the higher market price for a customer when they select an incrementally higher efficiency measure. In the case of lighting measures, the incentive is based on Appendix O of the TRM. For the 2019-2020 SEEP, the C&I Rebate program plans to provide prescriptive incentives (rebates) for HVAC and plumbing equipment lighting controls, and process systems. The program will also include two new prescriptive rebates for commercial kitchen equipment (convection ovens and ice-makers) and one new prescriptive rebate for steam traps and steam trap surveys.

- HVAC and Plumbing Equipment: HVAC equipment (boilers, furnaces, and unit heaters), steam traps and steam trap surveys, tune-ups for boilers and chillers, variable frequency drives ("VFDs") for fans and pumps, unitary equipment (e.g., heat pumps, remote terminal units, and split systems), and controls (demand control ventilation ("DCV"), thermostats and boiler resets).
- Kitchen Equipment: Convection ovens, dishwashers, electronically commutated ("EC") motors for refrigeration, fryers, griddles, ice-makers, ovens, and steamers.
- LED Lighting and Controls: Interior and exterior light-emitting diode ("LED") lamps and fixtures; and lighting controls (e.g., dimmers, occupancy sensors, and advanced lighting control ("ALC") systems.
- Process Systems: Compressed air systems, including: variable-speed drive ("VSD") compressors, air dryers, and zero-loss drains.

The C&I Rebate program provides custom incentives (rebates) for energy efficiency projects that are site-specific and include the installation of multiple energy efficiency measures, or that don't fall into the Companies' prescriptive rebate category. Custom incentive amounts are generally established to buy down up to 50 percent of the incrementally higher market price for selecting an incrementally higher efficiency measure. Custom lighting measure incentives are determined by using Appendix O of the TRM. Custom incentive levels may be adjusted based on customer

adoption levels, market conditions, and/or the technology. These incentive amounts are periodically reviewed and revised. Depending upon market demand, the Companies may cap rebates at a dollar per kilowatt-hours ("kWh") or BTUs delivered, the payback period, and/or an annual cap of total incentive per customer account.

Custom rebates are offered, but not limited to, the following types of energy-saving equipment and processes:

- Building envelope improvements (e.g., insulation, roofs, and windows);
- Energy-efficient process improvements (e.g., making industry-specific process equipment more energy efficient);
- Energy management systems ("EMS");
- Heat recovery;
- Laundry equipment;
- LED lighting and lighting controls (non-prescriptive);
- Process-related equipment; and
- Snow-making equipment.

Delivery Method

The Companies' eligible non-residential customers can select their own contractor to install energy-efficient equipment. The Companies have established a robust and growing trade ally network for the program—the NYSEG and RG&E Commercial and Industrial Rebate Program Trade Ally Network. This network is made up of contractors, distributors, and other professionals who receive training and information to help them with understanding and working within the program's parameters. The trade allies and other contractors submit their applications online or via e-mail to the Companies' implementation contractor.

The implementation contractor performs a variety of services for the C&I Rebate program, including: communications with customers and trade allies, assistance with applications and project development, application processing, providing an engineering review for applicable

custom incentive projects, developing and refining detailed program design, marketing strategies, quality assessment/quality control ("QA/QC") activities, and developing marketing strategies, technical guidelines, program forms, and detailed program procedures in consultation with the Companies.

Additionally, the Companies' program evaluation contractor performs periodic evaluations, for feasibility and energy savings potential, prior to or in conjunction with the implementation contractor. This additional review is typically conducted with new emerging technologies or highly complex projects in order for the Companies to make an initial determination regarding whether the project can be developed in a manner consistent with the C&I Rebate program's guidelines.

Anticipated 2019-2020 Changes

For the 2019 and 2020 program years, the Companies will continue to explore offering new prescriptive rebates for additional energy efficiency measures. As noted in the Design section, the 2019 program year is the first year that prescriptive incentives will be offered for steam traps and steam trap surveys, and two types of commercial kitchen equipment—convection ovens and ice-makers. Additionally, as previously mentioned, the Companies plan to begin allowing new construction projects to receive prescriptive incentives in 2019.

QA/QC Procedures

The Companies provide QA/QC through a combination of implementation contractor activities and NYSEG/RG&E employee oversight and monitoring. The QA/QC processes and controls undertaken by the implementation contractor are designed to ensure proper project energy savings calculations and incentive payments are utilized within the C&I Rebate program. Additionally, the QA/QC procedures ensure compliance with other program rules specific to the Companies' Non-Residential Energy Efficiency Program Sector. QA/QC procedures include:

- Operations and project management;
- Project documentation;

- Engineering review;
- Inspections; and
- Incentive payments.

The Companies' staff monitor QA/QC compliance as part of their normal energy efficiency program management activities, including processing invoices, tracking/reporting (the Clean Energy Dashboard), and monthly project documentation audits. QA/QC compliance also includes Company staff and the Companies' evaluation contractor randomly selecting projects for intensive review and the accompaniment of implementation contractor QA/QC inspectors during their scheduled pre- and/or post-inspections to verify the contractor's compliance with the Companies' QA/QC procedures.

Program Activity and Budgets

Historically, the C&I Rebate program's project implementation activity levels do not follow a consistent, levelized, or seasonal pattern since rebate fulfillments are based on customers' schedules and varying customer demand. Therefore, the timing of energy savings and budget expenditures are not possible to predict with accuracy. However, the Companies have projected program savings and budgets to be evenly spread during both the 2019 and 2020 program years.

5.3.2 Small Business Direct Install Program

Since 2009, the Companies have administered and managed a Small Business Direct Install ("SBDI") program. The SBDI program is designed to help non-residential electric customers identify cost-effective efficiency improvement retrofit opportunities in their facilities and incentivizes them to install high-efficiency equipment. The SBDI program provides free energy assessments of customers' facilities and direct installation of qualifying energy-efficient improvements approved by the customer. SBDI program measure incentives are designed for project costs to be cost-shared, through EE Tracker contributions, with the program paying

approximately 70 percent[24] of total equipment retrofit costs. The customer is responsible for paying the remaining 30 percent of a SBDI project's cost.

The primary objectives of the SBDI program are: a) obtain cost-effective energy savings, b) improve a small business customer's bottom line, and (c) integrate sustainability into a customer's business and facility operations.

Customer Eligibility Rules and Anticipated Participation Levels

Customers are eligible for the SBDI program if they are a NYSEG or RG&E small, non-residential electric customer with an average electric demand of less than or equal to 110 kilowatts ("kW") per month. The customer must also pay an EE Tracker surcharge on their electric bill.

The SBDI program's participation levels have remained steady over the past decade. The Companies are currently monitoring a potential market saturation impact and the impacts of other new programs over the next few years. Any noted impacts will be reflected in future SEEPs. During the 2019 through 2020 period, the Companies estimate that an average of 3,745 NYSEG and 1,741 RG&E SBDI projects will be completed annually. These estimates are based in part on 2018 average cost per project results and have not been adjusted to reflect new measures that have been added or may be added to the program in 2019 and 2020.

Design and Incentives

Currently, the SBDI program is only available for the installation of energy-efficient electric measures. However, the Companies are currently exploring adding natural gas energy efficiency measures that pass benefit-cost screenings and other criteria. The goal of seeking to incorporate natural gas measures into the SBDI program is to gain additional energy savings, drive additional cost savings for customers, and engage customers in more comprehensive efficiency projects. The electric energy-efficient measures that are eligible for SBDI incentives include:

[24] The Companies generally provide up to 70% of the installed costs for Non-Residential SBDI projects, however the Companies have offered, and may continue to offer, projects where the Company contribution is higher or lower, depending on customer needs, system needs, and program targets.

- Retrofitting of existing fluorescent fixtures with higher efficiency lamps and ballasts;
- Retrofitting exit signs to utilize light-emitting diode ("LED") lighting;
- Installation of occupancy sensors;
- Retrofitting incandescent bulbs with LEDs;
- Replacing LED high-bay and canopy fixtures; and
- Installation of refrigeration measures.

Delivery Method

The Companies utilize an implementation vendor to provide turn-key services, including conducting facility energy assessments, preparing and presenting recommended energy-saving opportunity reports to customers, and installing electric energy-efficient measures at customers' facilities. The implementation contractor performs a variety of additional services for the SBDI program, including promoting the program, qualifying customers' eligibility, obtains customer authorizations for project installation, procuring energy-efficient equipment to be installed, removing old equipment and installing energy-efficient equipment, billing customers for the cost-sharing balance, providing customer service and support, and performing QA/QC procedures.

The SBDI program offers a free energy assessment of eligible customers' facilities to determine energy efficiency opportunities. The information gathered during the assessment helps the SBDI implementation vendor develop the Customer's Energy Efficiency Proposal; a list of energy efficiency recommendations and potential energy savings. Once the customer commits to the project; the implementation vendor will install the approved energy-efficient equipment in the customer's facility and then process the SBDI project's incentive.

Anticipated 2019-2020 Changes

For 2019 and 2020, the Companies will continue to expand the SBDI program with the addition of new high-efficiency equipment and technologies to better serve the small business, non-residential market sector and have the program capture more comprehensive, qualifying cost-effective savings from each project. As noted previously in this section, the Companies may

consider expanding the SBDI program to include natural gas efficiency measures, and also possibly adding additional electric measures beyond lighting and refrigeration measures.

The performance of the program indicates that the evolution of included measures may require an increase in customer cost-sharing (would move to lower than current 70 percent rate). In 2019 and 2020, the Companies will explore possible changes to the cost-sharing rate. This would help the SBDI program maintain its cost-effectiveness and contribute to the Companies' targeted savings goals. The program may also be impacted as other potential non-residential efficiency programs are deployed over the next two years.

QA/QC Procedures

The Companies provide QA/QC through a combination of implementation contractor activities and NYSEG/RG&E employee oversight and monitoring. The implementation contractor directly supervises the installation of energy-efficient measures by its subcontractors to ensure compliance with local and national electrical codes. Additionally, the Companies' QA/QC procedures require that the implementation contractor must collect and dispose of all removed equipment (lamps and ballasts) in accordance with New York State regulations and laws.

The Companies' staff monitor QA/QC compliance as part of their normal energy efficiency program management activities, including invoice processing, tracking/reporting (the Clean Energy Dashboard), and monthly project documentation audits. QA/QC compliance also includes the Companies' staff and the Companies' evaluation contractor who randomly select SBDI projects for periodic audits of program activities, such as customer installations and implementation contractor project documentation.

Program Activity and Budgets

Historically, the SBDI program's installation activity levels do not follow a seasonal pattern since participation is based on customers' needs which are unique and subject to change. Therefore, the energy savings and budget expenditures are projected to be evenly spread during both the 2019 and 2020 program years.

5.3.3 Large Customer Self-Direct Program

The Large Customer Self-Direct ("Self-Direct") program is designed to encourage large, non-residential energy users to pursue unique energy management actions by allowing them to self-direct funds toward a suite of investments over a three-year period. This customized program allows customers to be innovative and determine the energy efficiency measures or initiatives that will best complement their existing or future strategic energy management activities.

The Commission's REV Order[25] required each investor-owned utility in New York to implement a Self-Direct program for their large energy users by January 1, 2017. In collaboration with Staff, large industrial customers and the utilities developed and issued guidelines that established rules and principles for the program. Thus, the Self-Direct program is a recent addition to the Companies' Non-Residential Energy Efficiency Sector and its energy-saving opportunities are only now beginning to be realized.

As with the utilities' other energy efficiency programs, the Self-Direct Program is included in the portfolio-level cost-effectiveness test. This program was intended to achieve savings at a lower cost than traditional energy efficiency programs due to the requirement that a run rate of at least 7.5 percent lower than the total authorized program-only dollar per MWh cost of the Company's energy efficiency portfolio is achieved.

Ordering Clause No. 6 of the March 15, 2018 Order ordered each investor-owned utility in New York to, "notify Staff by the end of 2018 as to whether it intends to offer the Self-Direct program and provide any requests for modification to Guidance CE-03" (Order No. 6). In an email dated November 30, 2018, the Companies notified Staff of their intention to conduct a survey of customers eligible to participate in the Companies' Self-Direct program. The Companies subsequently conducted the survey. Respondents who participated in the Self-Direct program were "somewhat satisfied" with the program. Respondents who had not participated were

[25] Commission, REV Order, Jun. 9, 2016. Available at: http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/255ea3546df802b585257e38005460f9/$FILE/83138547.pdf/CE-03_Self-Direct%20Program%20Guidance_6-9-16.pdf.

either not aware of Self-Direct or indicated Self-Direct requires more effort on their part, with lower rebate amounts compared to other available energy efficiency programs.

Based on survey responses, low customer participation in the Self-Direct program, and the Companies' staff experience implementing numerous Non-Residential programs, the Companies plan to close the Self-Direct program to accepting new project applications effective June 1, 2019. The Companies will incorporate a self-direct optional participation path into the custom portion of the Companies' existing C&I Rebate program. Incorporating self-direct as an optional path within the existing C&I Rebate program will help bring greater awareness of the option to customers and reduce overall administrative costs, while retaining self-direct as an optional participation path for interested customers.

Design and Incentives

Funding for the Self-Direct program is collected from participating customers through a volumetric surcharge, the EE Tracker, and is deposited in a customer-specific Energy Savings Account ("ESA"). Participants have the opportunity to self-direct a majority of their own contributions in their ESA to qualifying energy efficiency projects of their own choosing. However, a portion of a participant's contribution, no more than 15 percent, must be allocated to support program administration and EM&V.

Upon enrollment in the Self-Direct program, each customer is assigned an energy savings goal based on the stated dollar per MWh in the customer's program application. Once enrolled, participants are no longer eligible to participate in the Companies' other energy efficiency programs. If a participant wishes to withdraw from the Self-Direct program, they must provide written notice to NYSEG or RG&E in the second quarter of any year during the cycle. This withdrawal from the program is not effective until the beginning of the next year (January 1) and the participant's contributions to the ESA match the amount that the participant has self-directed (used).

Upon a customer's withdrawal, the balance of the customer's ESA will be retained by the Companies and included in the next competitive solicitation. Customers who withdraw during a three-year cycle are ineligible to participate in the next Self-Direct program cycle. Upon the effective date of the withdrawal, customers are eligible to participate in the Companies' other energy efficiency programs.

Customer Eligibility Rules and Anticipated Participation Levels

Customers are eligible for the Self-Direct program if they are a large single account electric non-residential customer with an average electric demand of 2 MW or greater, or a multiple account electric non-residential customer with an aggregated monthly demand of 4 MW or greater. Participants must have directed a portion of their EE Tracker contributions to fund cost-effective energy efficiency projects of their own choosing. Non-residential customers are notified of their eligibility directly by telephone and U.S. mail during the six-month enrollment period prior to the three-year program cycle and are encouraged to enroll in the Self-Direct program.

A Self-Direct program customer must implement the energy efficiency projects within the Company providing the funds. Participating customers are allowed to aggregate their accounts within a service territory in accordance with the customer eligibility rules. The Self-Direct program funds new projects only; a participating customer may not receive program funds for projects it has already undertaken. Eligible projects are defined as those electric efficiency projects that achieve MWh savings at the dollar per MWh committed to by the customer at the time of enrollment and pass the benefit-cost criteria.

Delivery Method

The Self-Direct program is implemented on consecutive three-year cycles with the current cycle being program years 2017-2019. Eligible customers are encouraged to apply for enrollment during quarters two and three of the year prior to the new three-year cycle (current cycle = enrollment in 2016 Q2 and Q3). Throughout this three-year cycle, participants can access their ESA to fund eligible energy efficiency projects of their choosing. As noted above, a participant

may withdrawal from the program; however, they will forfeit any ESA funds they have accumulated and will lose the opportunity to participate in the next three-year cycle.

A common customer application for enrollment has been developed and requires the customer's commitment to achieve energy savings at a specific dollar per MWh that is at least 7.5 percent less than the Companies' approved portfolio-level program only, dollar per MWh. The application must also include an estimated portfolio savings plan ("Project Plan") that contains enough details to allow the Companies to determine the reasonableness and efficacy of customer's Self-Direct proposal. A list of the customer's electric accounts with the Companies that will be included in the aggregated ESA must also be included in the customer enrollment application. Additionally, the enrollment package must include a legally-binding agreement agreeing to grant the Companies and their consultants the right to review all project data, including performing on-site inspections and metering, as necessary, to verify measure installation and performance, operating parameters, and cost documentation.

As noted above, the participants in the Self-Direct program must provide the Companies for their review and approval a detailed Project Plan prior to initiating their self-directed energy savings project. At a minimum, the Project Plan must include:

- A detailed description of the proposed project, expected costs, and savings target;
- Information and data to support the calculation of the current baseline;
- A proposed method EM&V;
- A schedule for completion and payment milestones; and
- A list of third-party contractors.

Anticipated 2019-2020 Changes

For 2019 and 2020, the Companies plan to: close the Self-Direct program to accepting new project applications effective June 1, 2019 and incorporate a self-direct optional participation path into the custom portion of the Companies' existing C&I Rebate program. Incorporating self-direct as an optional path within the existing C&I energy efficiency programs will help bring

greater awareness of the option to customers and reduce overall administrative costs, while retaining self-direct as an optional participation path for interested customers.

QA/QC Procedures

The Companies provide QA/QC for the Self-Direct program through a combination of Non-Residential Energy Efficiency Sector implementation contractor activities and oversight and monitoring by the Companies' employees. The Self-Direct program's QA/QC procedures require the Companies to review and approve all Project Plans for cost-effectiveness prior to their installation. Additionally, the Companies must verify that the completed installation aligns with the approved Project Plan before the funds requested from the customer's ESA are paid.

The Companies' staff monitor QA/QC compliance during their normal energy efficiency program management activities, including: invoice processing, tracking/reporting (the Clean Energy Dashboard), and monthly project documentation audits. The Companies' staff randomly select Self-Direct projects for periodic audits of program activities, such as customer installations and implementation contractor project documentation.

Program Activity and Budgets

During the six-month enrollment period in 2016, six customers (four NYSEG and two RG&E) applied and were accepted into the Self-Direct program. In 2019, participation will consist of the five customers currently remaining in the program. Since the program will be closed, pending Staff approval, the Companies will not be accepting new project applications effective June 1, 2019. Therefore, the Companies' projections reflect zero participation in 2020.

5.3.4 Potential New Non-Residential Energy Efficiency Programs

The Companies have identified several non-traditional programs which may be deployed in 2019 and 2020 for the Non-Residential Energy Efficiency Sector. The deployment of these innovative programs will help the Companies expand their outreach to new marketplaces and provide the most effective mix of energy savings and customer value. The Companies are working to secure program implementation services for these non-traditional programs. Once secured, the

programs' design and the timing for their implementation will impact the success of their deployments. The Companies are assessing options to launch the following programs and initiatives in 2019: a SBDI Install Pay-Through-Savings pilot, midstream rebate offerings, a Commercial New Construction program, and additional Non-Residential program activities.

Small Business Direct Install: Pay-Through-Savings Pilot

During the period 2019-2020, the Companies will consider launching a pilot to expand the SBDI program to allow customers the option to pay for measure installation costs not covered by utility incentives over time through bill savings. This new approach will address issues regarding lack of customer capital and uncertainty regarding energy savings which can be particularly problematic for small businesses. This pilot, if implemented, would determine if program participation can be increased through the use of a pay-through-savings approach versus the traditional approach currently employed in this program which requires customers to pay their share of project costs up front.

Another potential benefit of the Pay-Through-Savings pilot is that it could be designed to utilize an advanced measurement and verification ("M&V") approach to determine metered savings as opposed to the current approach using deemed savings. This pilot would provide an opportunity for the Companies to test this approach.

Midstream Rebate Offerings

For 2019-2020 program offerings, the Companies are considering adding midstream rebates to the Non-Residential Energy Efficiency Sector. Midstream rebates are typically offered through distributor-focused channels; similar to the ENERGY STAR® Retail Products Platform introduced in the Residential Energy Efficiency Sector section below. The Companies will consider including a midstream rebate offering as they develop their system energy efficiency plans for 2021-2025.

Commercial New Construction Program

For 2019-2020 program offerings, the Companies are planning to begin allowing new construction projects to receive prescriptive rebates through the C&I Rebate program. This will

allow the Companies to capture additional energy savings by encouraging the installation of above-code equipment in new construction projects. The program is currently eligible only to retrofit projects. During 2019-2020, the Companies also plan to explore adding a more custom and comprehensive new construction program offering for possible deployment after 2020.

Other New Non-Residential Program Activities

Also, during 2019-2020, the Companies will explore additional new Non-Residential programs for possible inclusion into their system energy efficiency plans to attain 2021-2025 savings targets. Additional new Non-Residential programs currently under consideration include: Comprehensive New Construction program, Industrial Process Efficiency program, Operations and Maintenance/Building Controls/Retro-commissioning program, and a Commercial Behavioral program. In addition to contributing to the achievement of higher savings goals established for 2021-2025, new programs will be aimed at filling gaps left by phased out NYSERDA programs.

5.4 RESIDENTIAL ENERGY EFFICIENCY SECTOR

Since 2009, the Companies have delivered cost-effective energy efficiency programs to residential electric and natural gas customers across their service territories. The Companies' 2019-2020 Residential Energy Efficiency Sector consists of three programs for residential customers:

- Residential Rebate program;
- Online Energy Marketplace and the
- Appliance Recycling program.

Through the 2019-2020 Residential Energy Efficiency Sector, the Companies will provide residential customers with a variety of energy efficiency services, including direct customer incentives and online energy marketplaces.

5.4.1 Residential Rebate Program

The Companies' Residential Rebate program is designed to incent residential customers to invest in high-efficiency space and water heating equipment. Initially, only natural gas customers were eligible for the program; however, beginning in the 2017 program year, the program expanded to include some electric efficiency measures. In the 2019 and 2020 program years, the Companies' Residential Rebate program will continue to offer incentives for residential natural gas customers to install high-efficiency space and domestic water heating equipment in their homes and to residential electric customers who install Wi-Fi-enabled thermostats to control central air conditioning or electric heating.

For the 2019 and 2020 program years, the Companies will also add heat pump water heaters and air-source heat pumps to the Residential Rebate program. The heat pump offerings are expected to be available to customers by April 2019. Additional natural gas efficiency measures will also be added to the program in 2019 and 2020, including: natural gas dryers and boiler tune-ups. Throughout 2019 and 2020, the Companies will continue to evaluate the inclusion of other electric and natural gas efficiency measures to the Residential Rebate program.

Customer Eligibility Rules and Anticipated Participation Levels

The target market for the Residential Rebate program is all of the Companies' active residential electric and natural gas customers who pay an EE Tracker surcharge on their monthly bill. Additional program eligibility rules are designed to ensure the installation of new, high-efficiency equipment by qualified contractors. These same rules will be applied for the heat pump installations once they are officially integrated into the Residential Rebate program. The installation of the Wi-Fi-enabled thermostats may either be contractor or self-installed.

To increase participation levels in the program, the Companies will continue to include additional cost-effective measures. The Companies' natural gas conversion rebate programs have helped to offset the increase in market saturation and are expected to do so over the next several years.

Design and Incentives

On July 1, 2009, the Companies launched a Residential Natural Gas Rebate program as an effort to encourage customers to install high-efficiency natural gas boilers, furnaces, and associated equipment. The program continues to be effective in helping reduce natural gas energy consumption and helping to reduce GHG emissions. Initially the program offered incentives only for boilers, furnaces, indirect water heaters, and thermostats; however, as prices for ENERGY STAR-certified storage and instantaneous water heaters declined, these units became more cost-effective and were added to the program. As noted in the previous section, the Residential Rebate program will expand during the 2019 and 2020 program years to include heat pumps, heat pump water heaters, natural gas dryers, and boiler tune-ups.

Delivery Method

The Companies utilize an implementation contractor to deliver services for the Residential Rebate program, including rebate application and payment processing, customer service (e.g., call center functions), reporting, and QA/QC activities including field verification inspections.

Anticipated 2019-2020 Changes

For 2019 and 2020, the Companies will continue to review and incorporate changes to the mix of natural gas and electric measures due to ongoing EM&V analysis of measure performance, the emergence of new technologies, and modifications that improve the efficiency of measures already incentivized through the program. As referenced in previous sections, the Companies are expanding the Residential Rebate program to include heat pump measures to contribute to the statewide heat pump savings target of 5 TBtus by 2025.

QA/QC Procedures

The Companies maintain QA/QC processes and procedures to ensure the high-quality of work performed and data accuracy, including:

- Rebate application processing quality checks, including customer and equipment eligibility and non-duplication of incentives;

- Sampling of installed equipment in the field to verify installation quality and savings veracity; and
- Program reporting, including regular performance reports, data needed for impact and process evaluations, and maintenance of the tracking database.

The Companies' staff monitor QA/QC compliance during their normal energy efficiency program management activities, including invoice processing, tracking/reporting (the Clean Energy Dashboard), and monthly project documentation audits. Additionally, the Companies' staff randomly select Residential Rebate program projects for periodic audits of program activities, such as customer installations and implementation contractor project documentation.

Program Activity and Budgets

The Residential Rebate program is promoted on a seasonal basis, with outreach activities beginning in the late summer and ending in March. The Companies' experience shows that customers are less likely to request space heating equipment rebates during the spring and summer due to the lack of use and concern about the seasonal equipment. As a result, program expenditures and reported energy savings are generally lower from April through August than during the other months of the year. The Companies anticipate that this program will continue to operate through 2020 and beyond, with consistent energy savings and program expenditures anticipated for future program years.

5.4.2 Online Energy Marketplace Program

The Companies' Online Energy Marketplace program was designed to incent residential customers to purchase energy-efficient products through a utility-managed online retail website. The incentivized products must meet high-efficiency criteria and the online platform allows the Companies to introduce new products to the marketplace efficiently and swiftly. The Companies' currently operate two separate Online Energy Marketplaces that share the same program implementation vendor; however, they have their own webpages and branding. Currently, from a customer-facing perspective the NYSEG and RG&E energy marketplaces are separate

programs.

NYSEG's marketplace is currently called NYSEG Smart Solutions and RG&E's is called the RG&E Your Energy Savings ("YES") Store. The Companies intend to align the naming conventions of each marketplace under one consistent Smart Solutions brand name.

Background

In September 2016, RG&E launched the RG&E Energy Marketplace REV demonstration project as an online portal that offered RG&E customers point-of-sale rebates on energy-efficient products. These products were chosen for their efficacy in reducing energy use and system demand, while increasing customer engagement. The Energy Marketplace REV demonstration project officially ended on December 31, 2017 when it transitioned to a program under the Energy Efficiency umbrella and continued to operate for all of 2018. For the 2019 and 2020 program years, the Companies have extended the contract for RG&E's Energy Marketplace which continues to be branded as the RG&E YES Store.

The NYSEG Smart Solutions portal was initially introduced as part of the utility's Energy Smart Community ("ESC") offerings targeted to only Tompkins County, NY customers. Beginning in November 2018, the RG&E YES Store expanded to all of NYSEG customers under the brand name of NYSEG Smart Solutions. When NYSEG customers access the portal, they are prompted to enter their county of residence. Customers who reside in Tomkins County are directed to the ESC Marketplace version which offers energy-efficient products in addition to the ability to connect with Distributed Energy Resources ("DER") service providers for residential and community solar, as well as sign up for a NYSERDA energy assessment. The NYSEG Smart Solutions portal will continue to operate in 2019 and 2020.

Customer Eligibility Rules and Anticipated Participation Levels

The target market for the Online Energy Marketplace program is all of the Companies' residential electric and natural gas customers who pay an EE Tracker surcharge on their utility bills. Electric customers are eligible to receive rebates on electric efficiency measures and natural gas

customers are eligible for rebates on gas-saving measures. To receive a rebate for a Wi-Fi enabled thermostat, the customer must use the thermostat to control: (a) electric central air conditioning ("CAC") equipment, (b) natural gas HVAC equipment, or (c) a combination of both electric CAC and natural gas HVAC equipment. Similar eligibility rules will be established for the domestic hot water-saving measures that are currently being added to the program.

During the 2019 and 2020 program years, the Companies estimate that approximately 15,000 NYSEG and 8,000 RG&E customers will participate in the Online Energy Marketplace program annually.

Design and Incentives

Currently, the Companies' Online Energy Marketplace program offers rebates for the following energy-efficient equipment: LED lighting, advanced power strips and Wi-Fi enabled thermostats. For the 2019 and 2020 program years, the Companies will add rebates for domestic hot water-saving measures, such as faucet aerators, low-flow showerheads, and thermostatic shower restriction valves.

In addition to incentivized measures, the Companies' Online Energy Marketplace program also offers non-incentivized products, such as electric vehicle chargers, portable power devices, and connected home technologies that allow customers to manage other home systems, such as smoke alarms, lighting, and home monitoring systems.

The Companies' Online Energy Marketplace program is also used as a cross-promotional channel to promote the Smart Savings Rewards Direct Load Control demand response program to customers. Customers can enroll directly into the Smart Savings Rewards demand response program through links on each eligible thermostat product page on the YES Store marketplaces. For the 2019 and 2020 program years, currently eligible products include Nest and Ecobee thermostats. These efforts help further integrate RG&E's energy efficiency and demand response portfolios.

Delivery Method

The Companies utilize an implementation contractor to deliver services for both NYSEG's and RG&E's Online Energy Marketplaces, including making online portal design updates, customer service (e.g., call center functions), reporting, and QA/QC activities.

Anticipated 2019-2020 Changes

In 2019, the Companies anticipate adding a new segment to their Online Energy Marketplace program, the Rebates-as-a-Service ("RaaS") platform. The RaaS offering is Simple Energy's (the program's implementation vendor) proprietary technology which enables NYSEG and RG&E energy efficiency rebates to be made available as instant discounts to customers across both e-commerce and brick-and-mortar channels. The platform verifies customers' eligibility and acceptance of program terms and conditions. This innovative solution focuses on the customer, meeting them where they are (online or at a store) and how they like to shop (e-commerce or brick-and-mortar stores) and provides customers with instant rebate validation and redemption at the point-of-sale.

5.4.3 Appliance Recycling Program

In 2018, the Companies ceased offering the Refrigerator and Freezer Recycling program. After additional review, the Companies will reinstate the program in 2019. The new program will be called the Appliance Recycling Program ("ARP") and will give rebates to customers who recycle their old refrigerators, freezers, and room air conditioners. The addition of room air conditioners to the program will enable the Companies to achieve their program savings targets and expand the marketing for the ARP.

5.4.4 Potential New Residential Energy Efficiency Programs

The Companies have identified several non-traditional programs which may be deployed in 2019 and 2020 for the Residential Energy Efficiency Sector. The deployment of these innovative programs will help the Companies expand their outreach to new marketplaces and provide the most effective mix of energy savings and customer value. The Companies are working to secure

program implementation services for these non-traditional programs. Once secured, the programs' design and the timing for their implementation will impact the success of their deployments. The Companies plan to launch the ENERGY STAR Retail Products Platform in 2019 and are assessing options to launch the following programs and initiatives in 2019: Behavioral program, and the Residential Pay-Through-Savings program.

ENERGY STAR Retail Products Platform

In 2019, the Companies will launch their ENERGY STAR Retail Products Platform ("ESRPP"), a new marketing and rebate program model managed by the U.S. Environmental Protection Agency ("EPA") and the U.S. Department of Energy ("DOE"). The ESRPP is a collaboration between the EPA, DOE, energy efficiency program sponsors (like NYSEG and RG&E), and retail partners. The ESRPP engages retailers on a national level to increase the stocking and sale of energy-efficient appliances and electronics, while giving utilities and other energy efficiency program managers accessibility to a low-cost, retail-based rebate platform.

The goal of the ESRPP is to transform markets by streamlining and coordinating energy efficiency programs with retailers, making them less complex and more cost-effective. Increasing the availability of ENERGY STAR-qualified products will generate energy savings as utility customers purchase and install more efficient models in their homes. The Companies will initially provide rebates to its participating retailers for the following high-efficiency appliances and electronics: air cleaners, clothes dryers, clothes washers, refrigerators, soundbars, and room air conditioners. Based on product sales data in 2019, the Companies may expand their ESRPP to include additional energy-efficient appliances and electronics.

All appliances and electronics marketed through the ESRPP will have to meet the requirements for an ENERGY STAR Tier 2, Advanced, or Most Efficient[26] product.

[26] ENERGY STAR utilizes the Tier 2 (also referred to as Advanced) criteria when there is not a Most Efficient designation for a product and/or where there is a desire for a higher specification than the basic ENERGY STAR criteria.

Behavioral Program

Historically, the Companies have deployed traditional resource acquisition programs that provide direct rebates and incentives to promote energy efficiency. Since 2010, other utilities and energy efficiency program managers across the nation have begun to integrate behavioral-based programs into their traditional resource acquisition program portfolios. Behavioral-based programs are designed to effectively change a customer's behaviors or habits in how they consume energy in the home or a business.

In the June 2017 ETIP filing, the Companies announced their intention to implement a Behavioral program in 2018. The Behavioral program's implementation was delayed in 2018. The Companies are anticipating launching a small-scale program in 2019 to residential customers. In 2020, the Companies may potentially expand the program to achieve additional electric and natural gas savings.

The Companies' anticipated Behavioral program will offer customized home energy reports and an associated web portal for program participants to access and track their energy usage and savings. These home energy reports and website will encourage residential customers to save energy through targeted energy-saving tips and promote the Companies' traditional energy efficiency programs.

Residential Pay-Through-Savings Pilot

For the 2019 and 2020 program years, the Companies are considering implementing a performance-based residential energy efficiency financing option—the Residential Pay-Through-Savings pilot. This potential pilot would entail the Companies in partnering with a financial services provider to enable qualified customers the opportunity to get insulation and other smart home technologies installed in their homes with no or limited upfront costs.

If implemented, the Residential Pay-Through-Savings pilot would be integrated into the Companies' Residential Rebates program. This financing would allow customers the option to pay for energy-efficient measure installation costs not covered by the Companies' rebates over

time through bill savings. Due to the installation of the energy-efficient measure, the customer would see a difference between their old and new utility bills regarding their energy consumption (energy savings). The customer's monthly energy savings would be utilized to pay back the financing for the installed measure costs over a set time period. Thus, the customer would incur no, or limited, upfront costs for installing the energy-efficient equipment.

The Companies hope that this approach, if implemented, would increase customer engagement and participation in the Residential Rebates program.

5.5 MULTIFAMILY ENERGY EFFICIENCY SECTOR

5.5.1 Multifamily Program

The Companies' Multifamily program offers energy efficiency upgrades to multifamily property owners. The program services residential buildings with four or more dwelling units. The Multifamily Sector is a hybrid of the Non-Residential and Residential Energy Efficiency Sectors; thus, the Multifamily program provides direct installation of measures in common areas (Non-Residential) and also provides direct services to dwelling units (Residential).

Customer Eligibility Rules and Anticipated Participation Levels

The Multifamily program services residential properties with four or more tenant/living units. These types of properties can include, but are not limited to: apartments and complexes, condominiums, and mixed-use residential and commercial properties. The properties must have an active electric and/or natural gas account with the Companies on which the EE Tracker surcharge is paid. There are no income-eligibility guidelines for the program and there is no cap on the number of tenant/living units in the building.

Though participation in the Multifamily program has remained steady over time, the Companies will continue to monitor the market saturation impact in 2019 and 2020. Any impact will be reflected in future filings with the Commission. In 2019 and 2020, the Companies estimate that

10,677 NYSEG electric, 10,368 NYSEG natural gas, 2,678 RG&E electric, and 1,235 RG&E natural gas multifamily customers will participate in the program annually. These estimates are based in part on 2018 average cost per project results and have not been adjusted to reflect new measures that have been added or may be added to the program in 2019 and 2020.

Design and Incentives

The Companies' implementation contractor works directly with multifamily building property owners to promote the program and determine the best energy efficiency solution for each building and their dwelling units. In 2016, the program expanded to include a number of energy-efficient measures, including interior and exterior LED lighting in common areas and hot water-saving measures installed within the tenant/living units.

For the tenant/living units, the LED lighting and hot water-saving measures (e.g., faucet aerators, low-flow showerheads, and pipe wrap) are provided at no charge to the customer. Additionally, some common area LED lighting measures are provided at no charge to the customers (e.g., installation of LED lights in a hallway). For other common area LED lighting upgrades, the Companies pay up to 60 percent of the cost and require the customer to cost-share the remaining balance of the installed costs.

Delivery Method

The Companies utilize an implementation contractor to deliver the Multifamily program's energy efficiency services. The implementation contractor is responsible for providing these services: marketing and customer recruitment, customer service provided by field and office staff, performing audits, providing project proposals, scheduling and carrying out installation activities, ensuring customer satisfaction with post-installation communications, proper disposal of removed lighting and hot water measures, reporting, QA/QC activities, and customer issue resolution.

Anticipated 2019-2020 Changes

As the energy-efficient lighting marketplace and prices evolve, the Multifamily program will adjust its program offerings, accordingly, including adding new measures and eliminating others for which program incentives are obsolete. The evolution of LED technologies is expected to continue over the next two-year period and the technology now plays a larger role in the program. The Companies will continue to collaborate with NYSERDA as their multifamily program transition plans develop.

The Companies are exploring adding additional measures to the Multifamily program in 2019-2020 and beyond in order to capture higher levels of electric and natural gas savings. This may include adding measures beyond those that are direct-install in nature, such as: equipment retrofits, equipment tune-ups, and such upgrades as programmable thermostats.

To further address the energy needs of LMI customers, the Companies will explore different cost-effective channels to serve this market sector in the 2019 and 2020 program years. These channels could include targeted marketing to customers identified as LMI or a new track within the Multifamily program that addresses LMI customers' energy needs.

QA/QC Procedures

The Companies maintain QA/QC processes and procedures to ensure the high-quality of work performed and data accuracy by the implementation vendor. These QA/QC processes include: vendor appointment scheduling and measure installation verification (i.e., management of appropriate vendor crew size, training, supervision, on-site review for conditions and customer concerns, and quality benchmarking against metrics).

The Companies' staff monitor QA/QC compliance during their normal energy efficiency program management activities, including: invoice processing, tracking/reporting (the Clean Energy Dashboard), and monthly project documentation audits. Additionally, the Companies' staff randomly select Multifamily projects for periodic audits of program activities, such as customer installations and implementation contractor project documentation.

Program Activity and Budgets

Historically, the Multifamily program's activities have not followed a seasonal pattern. Therefore, energy savings and program expenditures are predicted to spread evenly during the 2019 and 2020 program years. If new efficiency measures are introduced to the 2019-2020 program or changes are made to the TRM, this would impact future program savings and expenses. However, such impacts are not included here.

5.6 NON-SEEP ACTIVITIES

The Companies' Energy Efficiency group continues to collaborate with other company business areas that support programs for Smart Grids, REV Demonstration projects, Non-Wire Alternative ("NWA") or Non-Pipe Alternative ("NPA") projects, demand response, and rate case programs.

5.6.1 Demand Reduction Programs

The Companies existing dynamic Load Management demand response programs are primarily focused on peak demand reduction benefits. The residual energy savings are unpredictable to forecast based on the number of events, length of events, and customer enrollment levels. However, energy efficiency and demand response continually seek to find ways to cross leverage programs such as offering enrollment into the Companies' Bring Your Own Thermostat demand response program, Smart Savings Rewards, on both of the Companies' online marketplaces.

To date, the Companies separately evaluate and track energy efficiency and demand response programs. As the Companies' demand response programs evolve through other initiatives, such as Electric Vehicles, NWA, and Energy Storage, the lines between energy efficiency and demand response benefits become blurred and program evaluation and reporting at a portfolio level will need to be considered.

5.6.2 Non-Wire Alternative and Non-Pipe Alternative Efforts

The Companies' NWA/NPA projects allow NYSEG and RG&E to defer, reduce, or avoid conventional infrastructure investments while maintaining or improving system reliability while potentially lowering GHG emissions. In 2019 and 2020, the Companies are in the planning phase of offering energy efficiency programs to help reduce load on the electrical grid for a substation in RG&E's service territory in Irondequoit, NY. The load reductions realized through energy efficiency, combined with a Request for Proposals seeking NWA DER solutions, will allow the Companies to address this service area with an NWA portfolio approach. Similar NWA approaches have been widely used and accepted by other utilities in New York and by Staff. The Companies' Energy Efficiency and NWA/NPA teams communicate closely as projects arise and seek solutions that involve the Energy Efficiency team as part of both NWA/NPA portfolio approaches to address high load or capacity-constrained service areas.

5.6.3 Energy Smart Community

As referenced in Chapter One, the ESC within NYSEG's Service Territory of Tompkins County, NY continues to be a testing ground for new technologies, program designs, and products and services. Approximately 12,400 electric and 7,300 natural gas smart meters have been installed in the Ithaca area along with online tools which provide customers access to their energy consumption, usage alerts, and tools and tips for customers to better manage usage. Collaboration continues with the Companies' Energy Efficiency and ESC project teams to identify further opportunities to test energy-efficient measures that can leverage smart meters and new technologies as part of this pilot project.

5.6.4 REV Demonstration Projects

Through the ESC and other REV demonstration projects such as the RG&E YES Store and NYSEG Smart Solutions marketplaces, the Companies have made considerable progress in integrating emerging technologies, testing new business models, and enabling market opportunities that meet the energy-related needs.

Several initiatives outlined in the December Order offer additional opportunities for REV demonstration projects. In the coming months, the Companies' Energy Efficiency and REV demo project groups will be working closely to identify specific areas in which a REV demo project could be most beneficial.

5.6.5 Electric Vehicle Opportunities

As New York continues to electrify the transportation sector, the Companies recognize that electric vehicles ("EVs") have the potential to be a significant source of new load. EVs provide a unique opportunity to increase system efficiency if they are charged during off-peak times and avoid charging at times of system peak. The Companies will endeavor to design programs to help improve system efficiency as EV adoption increases. Programs may include promotion of time-of-use rates, incentives for off-peak charging, and EVs as a participating resource in demand response events.

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APPENDIX A: BENEFIT-COST ANALYSIS WORK PAPERS

A.1 NYSEG Electric

Utility	NYSEG

A.1.1 Utility Specific Assumptions (NYSEG Electric)

First Year of Portfolio	2019
Inflation Rate (GDP-PI)	2.00%
WACC (Nominal Discount Rate)	6.81%
Avg. Losses	7.28%

A.1.2 Avoided Cost Streams (NYSEG Electric)

Nominal $s

	LBMP ($/kWh)	CO2 ($/kWh)	Generation Capacity ($/kW)	Distribution Transmission Capacity ($/kW)	Primary Distribution Capacity ($/kW)	Secondary Distribution Capacity ($/kW)
2019	$ 0.0386	$ 0.0242	$ 39.7017	$ 0.0042	$ 12.4300	$ 18.4100
2020	$ 0.0422	$ 0.0242	$ 17.8600	$0.0042	$ 12.4300	$ 18.4100
2021	$ 0.0441	$ 0.0242	$ 36.7732	$ 0.0042	$ 12.4300	$ 18.4100
2022	$ 0.0469	$ 0.0242	$ 26.4491	$ 0.0042	$ 12.4300	$ 18.4100
2023	$ 0.0489	$ 0.0242	$ 25.2172	$ 0.0042	$ 12.4300	$ 18.4100
2024	$ 0.0559	$ 0.0242	$ 25.0374	$ 0.0042	$ 12.4300	$ 18.4100
2025	$ 0.0583	$ 0.0242	$ 25.5540	$ 0.0042	$ 12.4300	$ 18.4100
2026	$ 0.0605	$ 0.0242	$ 26.6280	$ 0.0042	$ 12.4300	$ 18.4100
2027	$ 0.0627	$ 0.0242	$ 29.4433	$ 0.0042	$ 12.4300	$ 18.4100
2028	$ 0.0654	$ 0.0242	$ 32.5160	$ 0.0042	$ 12.4300	$ 18.4100
2029	$ 0.0674	$ 0.0242	$ 35.7015	$ 0.0042	$ 12.4300	$ 18.4100
2030	$ 0.0699	$ 0.0242	$ 38.4493	$ 0.0042	$ 12.4300	$ 18.4100
2031	$ 0.0722	$ 0.0242	$ 40.8595	$ 0.0042	$ 12.4300	$ 18.4100
2032	$ 0.0745	$ 0.0242	$ 43.2089	$ 0.0042	$ 12.4300	$ 18.4100
2033	$ 0.0764	$ 0.0242	$ 45.3642	$ 0.0042	$ 12.4300	$ 18.4100
2034	$ 0.0787	$ 0.0242	$ 47.9959	$ 0.0042	$ 12.4300	$ 18.4100
2035	$ 0.0787	$ 0.0242	$ 50.7848	$ 0.0042	$ 12.4300	$ 18.4100
2036	$ 0.0787	$ 0.0242	$ 53.6264	$ 0.0042	$ 12.4300	$ 18.4100
2037	$ 0.0787	$ 0.0242	$ 55.3001	$ 0.0042	$ 12.4300	$ 18.4100
2038	$ 0.0787	$ 0.0242	$ 57.1127	$ 0.0042	$ 12.4300	$ 18.4100
2039	$ 0.0000	$ 0.0000	$ 0.0000	$ 0.0000	$ 0.0000	$ 0.0000
2040	$ 0.0000	$ 0.0000	$ 0.0000	$ 0.0000	$ 0.0000	$ 0.0000
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A.1.3 Societal Cost Test (NYSEG Electric)

BCA NPV Societal Cost Test

	Benefits	Costs	Benefit Cost Ratio
2019	$ 42,781,323	$ 19,491,002	2.19
2020	$ 43,787,039	$ 18,248,293	2.40

A.1.4 2019 Portfolio Characteristics (NYSEG Electric)

	Avoided Energy (kWh)	Coincident Demand Reduction (kW)	Avoided Transmission (kW)	Avoided Distribution (kW)
2019	56,719,765	11,009		
2020	56,719,765	11,009		
2021	56,719,765	11,009		
2022	56,719,765	11,009		
2023	55,927,958	10,892		
2024	53,552,538	10,542		
2025	53,552,538	10,542		
2026	53,552,538	10,542		
2027	53,552,538	10,542		
2028	44,876,158	9,104		
2029	24,869,004	5,303		
2030	3,136,720	300		
2031	3,136,720	300		
2032	926,884	201		
2033				
2034				
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A.1.5 2019 Portfolio Costs (NYSEG Electric)

Nominal $s

	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019	$ 7,652,076	$1,535,178	$ 678,622	$ 633,370	$ 8,991,756	$ 19,491,002
2020						
2021						
2022						
2023						
2024						
2025						
2026						
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						$ 19,491,001.50

A.1.6 2019 Portfolio Benefits (NYSEG Electric)

Nominal $s

	LBMP ($)	CO2 ($)	Generation Capacity ($)	Distribution Transmission ($)	Primary Distribution ($)	Secondary Distribution ($)	Total Portfolio Benefits
2019	$ 2,188,249	$ 1,374,887	$ 437,081	$ 237,089	$ 136,844	$ 202,678	$ 4,576,828
2020	$ 2,390,738	$ 1,374,887	$ 196,623	$ 237,089	$ 136,844	$ 202,678	$ 4,629,636
2021	$ 2,500,774	$ 1,374,887	$ 404,842	$ 237,089	$ 136,844	$ 202,678	$ 5,053,341
2022	$ 2,660,157	$ 1,374,887	$ 291,181	$ 237,089	$ 136,844	$ 202,678	$ 5,202,929
2023	$ 2,733,199	$ 1,355,694	$ 274,673	$ 233,779	$ 135,391	$ 200,526	$ 5,339,921
2024	$ 2,993,051	$ 1,298,114	$ 263,933	$ 223,850	$ 131,032	$ 194,070	$ 5,635,284
2025	$ 3,121,042	$ 1,298,114	$ 269,380	$ 223,850	$ 131,032	$ 194,070	$ 5,898,261
2026	$ 3,238,322	$ 1,298,114	$ 280,701	$ 223,850	$ 131,032	$ 194,070	$ 6,163,949
2027	$ 3,355,602	$ 1,298,114	$ 310,379	$ 223,850	$ 131,032	$ 194,070	$ 6,459,413
2028	$ 2,935,798	$ 1,087,798	$ 96,015	$ 187,582	$ 113,158	$ 167,598	$ 5,722,043
2029	$ 1,677,166	$ 602,825	$ 189,326	$ 103,952	$ 65,917	$ 97,629	$ 3,336,160
2030	$ 219,288	$ 76,034	$ 11,525	$ 13,111	$ 3,726	$ 5,518	$ 409,323
2031	$ 226,534	$ 76,034	$ 12,248	$ 13,111	$ 3,726	$ 5,518	$ 427,615
2032	$ 69,016	$ 22,468	$ 8,681	$ 3,874	$ 2,497	$ 3,699	$ 142,600
2033	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2035	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2036	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2037	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2038	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2039	$ -	$ -	$ -	$ -	$ -	$ -	$ -
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2049							
							$ 42,781,323.17

A.1.7 2020 Portfolio Characteristics (NYSEG Electric)

	Avoided Energy (kWh)	Coincident Demand Reduction (kW)	Avoided Transmission (kW)	Avoided Distribution (kW)
2019				
2020	56,719,765	11,009		
2021	56,719,765	11,009		
2022	56,719,765	11,009		
2023	56,719,765	11,009		
2024	55,927,958	10,892		
2025	53,552,538	10,542		
2026	53,552,538	10,542		
2027	53,552,538	10,542		
2028	53,552,538	10,542		
2029	44,876,158	9,104		
2030	24,869,004	5,303		
2031	3,136,720	300		
2032	3,136,720	300		
2033	926,884	201		
2034				
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A.1.8 2020 Portfolio Costs (NYSEG Electric)

Nominal $s						
	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019						
2020	$ 7,652,076	$ 1,535,178	$ 678,622	$ 633,370	$ 8,991,756	$ 19,491,002
2021						
2022						
2023						
2024						
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2026						
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						$ 18,248,292.77

A.1.9 2020 Portfolio Benefits (NYSEG Electric)

Nominal $s

	LBMP ($)	CO2 ($)	Generation Capacity ($)	Distribution Transmission ($)	Primary Distribution ($)	Secondary Distribution ($)	Total Portfolio Benefits
2019	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2020	$ 2,390,738	$1,374,887	$ 196,623	$ 237,089	$ 136,844	$ 202,678	$ 4,816,673
2021	$ 2,500,774	$ 1,374,887	$ 404,842	$ 237,089	$ 136,844	$ 202,678	$ 5,257,496
2022	$ 2,660,157	$ 1,374,887	$ 291,181	$ 237,089	$ 136,844	$ 202,678	$ 5,413,127
2023	$ 2,771,895	$ 1,374,887	$ 277,620	$ 237,089	$ 136,844	$ 202,678	$ 5,631,953
2024	$ 3,125,814	$ 1,355,694	$ 272,713	$ 233,779	$ 135,391	$ 200,526	$ 6,115,506
2025	$ 3,121,042	$ 1,298,114	$ 269,380	$ 223,850	$ 131,032	$ 194,070	$ 6,136,551
2026	$ 3,238,322	$ 1,298,114	$ 280,701	$ 223,850	$ 131,032	$ 194,070	$ 6,412,972
2027	$ 3,355,602	$ 1,298,114	$ 310,379	$ 223,850	$ 131,032	$ 194,070	$ 6,720,373
2028	$ 3,503,407	$ 1,298,114	$ 342,770	$ 223,850	$ 131,032	$ 194,070	$ 7,078,831
2029	$ 3,026,448	$ 1,087,798	$ 325,014	$ 187,582	$ 113,158	$ 167,598	$ 6,224,022
2030	$ 1,738,592	$ 602,825	$ 203,897	$ 103,952	$ 65,917	$ 97,629	$ 3,638,672
2031	$ 226,534	$ 76,034	$ 12,248	$ 13,111	$ 3,726	$ 5,518	$ 444,891
2032	$ 233,560	$ 76,034	$ 12,952	$ 13,111	$ 3,726	$ 5,518	$ 464,193
2033	$ 70,814	$ 22,468	$ 9,114	$ 3,874	$ 2,497	$ 3,699	$ 154,391
2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2035	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2036	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2037	$ -	$ -	$ -	$ -	$ -	$ -	$ -
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							43,787,038.77

A.2 RG&E Electric

Utility	RG&E

A.2.1 Utility Specific Assumptions (RG&E Electric)

First Year of Portfolio	2019
Inflation Rate (GDP-PI)	2.00%
WACC (Nominal Discount Rate)	7.48%
Avg. Losses	6.93%

A.2.2 Avoided Cost Streams (RG&E Electric)

Nominal $s						
	LBMP ($/kWh)	CO2 ($/kWh)	Generation Capacity ($/kW)	Distribution Transmission Capacity ($/kW)	Primary Distribution Capacity ($/kW)	Secondary Distribution Capacity ($/kW)
2019	$0.0373	$0.0242	$39.7017	$0.0033	$8.1600	$23.4100
2020	$0.0406	$0.0242	$17.8600	$0.0033	$8.1600	$23.4100
2021	$0.0425	$0.0242	$36.7732	$0.0033	$8.1600	$23.4100
2022	$0.0451	$0.0242	$26.4491	$0.0033	$8.1600	$23.4100
2023	$0.0471	$0.0242	$25.2172	$0.0033	$8.1600	$23.4100
2024	$0.0546	$0.0242	$25.0374	$0.0033	$8.1600	$23.4100
2025	$0.0570	$0.0242	$25.5540	$0.0033	$8.1600	$23.4100
2026	$0.0590	$0.0242	$26.6280	$0.0033	$8.1600	$23.4100
2027	$0.0612	$0.0242	$29.4433	$0.0033	$8.1600	$23.4100
2028	$0.0639	$0.0242	$32.5160	$0.0033	$8.1600	$23.4100
2029	$0.0659	$0.0242	$35.7015	$0.0033	$8.1600	$23.4100
2030	$0.0682	$0.0242	$38.4493	$0.0033	$8.1600	$23.4100
2031	$0.0705	$0.0242	$40.8595	$0.0033	$8.1600	$23.4100
2032	$0.0726	$0.0242	$43.2089	$0.0033	$8.1600	$23.4100
2033	$0.0746	$0.0242	$45.3642	$0.0033	$8.1600	$23.4100
2034	$0.0768	$0.0242	$47.9959	$0.0033	$8.1600	$23.4100
2035	$0.0768	$0.0242	$50.7848	$0.0033	$8.1600	$23.4100
2036	$0.0768	$0.0242	$53.6264	$0.0033	$8.1600	$23.4100
2037	$0.0768	$0.0242	$55.3001	$0.0033	$8.1600	$23.4100
2038	$0.0768	$0.0242	$57.1127	$0.0033	$8.1600	$23.4100
2039	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000
2040	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000
2041	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000
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A.2.3 Societal Cost Test (RG&E Electric)

BCA NPV Societal Cost Test

	Benefits	Costs	Benefit Cost Ratio
2019	**$ 23,099,323**	**$ 10,514,270**	**2.20**
2020	**$ 22,580,750**	**$ 9,782,536**	**2.31**

A.2.4 2019 Portfolio Characteristics (RG&E Electric)

	Avoided Energy (kWh)	Coincident Demand Reduction (kW)	Avoided Transmission (kW)	Avoided Distribution (kW)
2019	29,206,186	5,954		
2020	29,206,186	5,954		
2021	29,206,186	5,954		
2022	29,206,186	5,954		
2023	28,646,546	5,872		
2024	26,874,353	5,610		
2025	26,874,353	5,610		
2026	26,874,353	5,610		
2027	26,874,353	5,610		
2028	26,874,353	5,610		
2029	24,491,020	5,167		
2030	9,187,091	2,036		
2031	4,960,047	1,236		
2032	4,924,576	1,215		
2033	3,186,495	182		
2034	3,186,495	182		
2035	286,785	16		
2036				
2037				
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A.2.5 2019 Portfolio Costs (RG&E Electric)

Nominal $s

	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019	$ 3,468,302	$ 1,083,593	$ 354,897	$ 496,472	$ 5,111,006	$ 10,514,270
2020						
2021						
2022						
2023						
2024						
2025						
2026						
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2049						
						$ 10,514,270.11

A.2.6 2019 Portfolio Benefits (RG&E Electric)

Nominal $s

	LBMP ($)	CO2 ($)	Generation Capacity ($)	Distribution Transmission ($)	Primary Distribution ($)	Secondary Distribution ($)	Total Portfolio Benefits
2019	$1,089,683	$707,958	$236,397	$94,920	$48,587	$139,391	$2,316,936
2020	$1,186,939	$707,958	$106,344	$94,920	$48,587	$139,391	$2,329,823
2021	$1,240,095	$707,958	$218,960	$94,920	$48,587	$139,391	$2,548,887
2022	$1,317,783	$707,958	$157,486	$94,920	$48,587	$139,391	$2,617,072
2023	$1,348,106	$694,392	$148,068	$93,101	$47,913	$137,457	$2,672,567
2024	$1,467,877	$651,434	$140,462	$87,342	$45,778	$131,332	$2,786,949
2025	$1,530,763	$651,434	$143,361	$87,342	$45,778	$131,332	$2,916,772
2026	$1,586,393	$651,434	$149,385	$87,342	$45,778	$131,332	$3,045,930
2027	$1,643,635	$651,434	$165,180	$87,342	$45,778	$131,332	$3,192,423
2028	$1,717,540	$651,434	$182,418	$87,342	$45,778	$131,332	$3,365,195
2029	$1,613,713	$593,662	$184,476	$79,596	$42,164	$120,964	$3,211,533
2030	$626,927	$222,695	$78,272	$29,858	$16,611	$47,656	$1,270,753
2031	$349,535	$120,232	$50,511	$16,120	$10,088	$28,940	$729,778
2032	$357,573	$119,372	$52,504	$16,005	$9,915	$28,446	$755,228
2033	$237,649	$77,241	$8,244	$10,356	$1,483	$4,254	$447,602
2034	$244,818	$77,241	$8,722	$10,356	$1,483	$4,254	$466,847
2035	$22,034	$6,952	$831	$932	$133	$383	$42,919
2036	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0
2041							
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2046							
2047							
2048							
2049							
							$ 23,099,322.79

A.2.7 2020 Portfolio Characteristics (RG&E Electric)

	Avoided Energy (kWh)	Coincident Demand Reduction (kW)	Avoided Transmission (kW)	Avoided Distribution (kW)
2019				
2020	29,206,186	5,954		
2021	29,206,186	5,954		
2022	29,206,186	5,954		
2023	29,206,186	5,954		
2024	28,646,546	5,872		
2025	26,874,353	5,610		
2026	26,874,353	5,610		
2027	26,874,353	5,610		
2028	26,874,353	5,610		
2029	26,874,353	5,610		
2030	24,491,020	5,167		
2031	9,187,091	2,036		
2032	4,960,047	1,236		
2033	4,924,576	1,215		
2034	3,186,495	182		
2035	3,186,495	182		
2036	286,785	16		
2037				
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A.2.8 2020 Portfolio Costs (RG&E Electric)

Nominal $s						
	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019						
2020	$3,468,302	$ 1,083,593	$ 354,897	$ 496,472	$ 5,111,006	$ 10,514,270
2021						
2022						
2023						
2024						
2025						
2026						
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2050						
						$ 9,782,536.39

A.2.9 2020 Portfolio Benefits (RG&E Electric)

Nominal $s

	LBMP ($)	CO2 ($)	Generation Capacity ($)	Distribution Transmission ($)	Primary Distribution ($)	Secondary Distribution ($)	Total Portfolio Benefits
2019	$0	$0	$0	$0	$0	$0	$0
2020	$1,186,939	$707,958	$106,344	$94,920	$48,587	$139,391	$2,329,823
2021	$1,240,095	$707,958	$218,960	$94,920	$48,587	$139,391	$2,548,887
2022	$1,317,783	$707,958	$157,486	$94,920	$48,587	$139,391	$2,617,072
2023	$1,374,443	$707,958	$150,152	$94,920	$48,587	$139,391	$2,722,805
2024	$1,564,674	$694,392	$147,012	$93,101	$47,913	$137,457	$2,963,960
2025	$1,530,763	$651,434	$143,361	$87,342	$45,778	$131,332	$2,916,772
2026	$1,586,393	$651,434	$149,385	$87,342	$45,778	$131,332	$3,045,930
2027	$1,643,635	$651,434	$165,180	$87,342	$45,778	$131,332	$3,192,423
2028	$1,717,540	$651,434	$182,418	$87,342	$45,778	$131,332	$3,365,195
2029	$1,770,751	$651,434	$200,289	$87,342	$45,778	$131,332	$3,519,147
2030	$1,671,267	$593,662	$198,675	$79,596	$42,164	$120,964	$3,364,979
2031	$647,414	$222,695	$83,179	$29,858	$16,611	$47,656	$1,328,374
2032	$360,149	$120,232	$53,416	$16,120	$10,088	$28,940	$761,862
2033	$367,275	$119,372	$55,123	$16,005	$9,915	$28,446	$786,589
2034	$244,818	$77,241	$8,722	$10,356	$1,483	$4,254	$466,847
2035	$244,818	$77,241	$9,229	$10,356	$1,483	$4,254	$476,880
2036	$22,034	$6,952	$877	$932	$133	$383	$43,843
2037	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0
2041							
2042							
2043							
2044							
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2046							
2047							
2048							
2049							
2050							
							$ 22,580,749.88

A.3 NYSEG Natural Gas

Utility	NYSEG Natural Gas

A.3.1 Utility Specific Assumptions (NYSEG Natural Gas)

First Year of Portfolio	2019
Inflation Rate (GDP-PI)	2.00%
WACC (Nominal Discount Rate)	6.68%
Avg. Losses	0.030%

A.3.2 Avoided Cost Streams (NYSEG Natural Gas)

Nominal $s

	Energy Cost ($/Dth)	CO2 ($/Dth)	Distribution System Capacity ($/Dth -peak day)
2019	$3.1338	$2.9098	
2020	$3.3663	$3.0436	
2021	$3.6085	$3.1088	
2022	$3.7841	$3.2497	
2023	$3.9773	$3.3934	
2024	$4.1880	$3.5435	
2025	$4.3987	$3.6989	
2026	$4.5919	$3.8584	
2027	$4.7675	$4.0231	
2028	$4.9255	$4.1930	
2029	$5.0748	$4.2815	
2030	$5.2153	$4.4601	
2031	$5.3557	$4.6452	
2032	$5.4962	$4.8355	
2033	$5.6367	$5.0322	
2034	$5.7772	$5.7585	
2035	$5.9177	$5.7585	
2036	$5.9177	$5.7585	
2037	$5.9177	$5.7585	
2038	$5.9177	$5.7585	
2039	$5.9177	$5.7585	
2040	$5.9177	$5.7585	
2041	$5.9177	$5.7585	
2042	$5.9177	$5.7585	
2043	$5.9177	$5.7585	
2044	$5.9177	$5.7585	
2045	$5.9177	$5.7585	
2046	$5.9177	$5.7585	
2047	$5.9177	$5.7585	
2048	$5.9177	$5.7585	
2049	$5.9177	$5.7585	
2050	$5.9177	$5.7585	
2051	$ -	$ -	
2052			
2053			
2054			
2055			
2056			
2057			
2058			
2059			

A.3.3 Societal Cost Test (NYSEG Natural Gas)

BCA NPV Societal Cost Test

	Benefits	Costs	Benefit Cost Ratio
2019	$ 7,147,840	$ 4,252,240	1.68
2020	$ 7,117,672	$ 3,985,977	1.79

A.3.4 2019 Portfolio Characteristics (NYSEG Natural Gas)

	Avoided Energy (Dth)	Avoided Capacity (Dth - peak day)
2019		
2020	79,582	
2021	79,582	
2022	79,582	
2023	79,582	
2024	79,582	
2025	79,582	
2026	79,582	
2027	79,582	
2028	79,582	
2029	79,582	
2030	62,725	
2031	58,566	
2032	58,566	
2033	58,566	
2034	58,566	
2035	58,566	
2036	30,207	
2037	2,192	
2038		
2039		
2040		
2041		
2042		
2043		
2044		
2045		
2046		
2047		
2048		
2049		
2050		

A.3.5 2019 Portfolio Costs (NYSEG Natural Gas)

Nominal $s

	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019	$ 1,035,422	$ 373,967	$ 83,691	$ 101,911	$ 2,657,248	$ 4,252,240
2020						
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						
2032						
2033						
2034						
2035						
2036						
2037						
2038						
2039						
2040						
2041						
2042						
2043						
2044						
2045						
2046						
2047						
2048						
2049						
						$ 10,514,270.11

A.3.6 2019 Portfolio Benefits (NYSEG Natural Gas)

	Energy ($)	CO2 ($)	Distribution System Capacity ($/Dthm - peak day)	Total Portfolio Benefits
2019	$249,396.69	$231,568.39		$480,965.08
2020	$267,901.92	$242,220.54		$520,324.91
2021	$287,176.55	$247,407.67		$556,181.42
2022	$301,151.07	$258,615.58		$594,028.85
2023	$316,523.06	$270,055.06		$634,931.02
2024	$333,292.49	$282,003.99		$679,337.03
2025	$350,061.92	$294,369.74		$725,734.72
2026	$365,433.90	$307,059.69		$772,483.75
2027	$379,408.43	$320,166.46		$819,663.48
2028	$391,985.51	$333,690.05		$867,249.47
2029	$318,316.38	$268,555.49		$715,393.53
2030	$305,436.30	$261,211.22		$704,554.96
2031	$313,663.54	$272,049.58		$742,825.85
2032	$321,890.78	$283,194.68		$782,742.56
2033	$330,118.02	$294,714.69		$824,453.49
2034	$338,345.26	$337,250.13		$909,262.45
2035	$178,756.80	$173,948.46		$484,188.74
2036	$12,972.77	$12,623.82		$35,841.41
2037	$0.00	$0.00		$0.00
2038	$0.00	$0.00		$0.00
2039	$0.00	$0.00		$0.00
2040	$0.00	$0.00		$0.00
2041	$0.00	$0.00		$0.00
2042	$0.00	$0.00		
2043	$0.00	$0.00		
2044	$0.00	$0.00		
2045	$0.00	$0.00		
2046	$0.00	$0.00		
2047				
2048				
2049				
				$ 7,147,839.53

A.3.7 2020 Portfolio Characteristics (NYSEG Natural Gas)

	Avoided Energy (Dth)	Avoided Capacity (Dth - peak day)
2019		
2020	79,582	
2021	79,582	
2022	79,582	
2023	79,582	
2024	79,582	
2025	79,582	
2026	79,582	
2027	79,582	
2028	79,582	
2029	79,582	
2030	62,725	
2031	58,566	
2032	58,566	
2033	58,566	
2034	58,566	
2035	58,566	
2036	30,207	
2037	2,192	
2038		
2039		
2040		
2041		
2042		
2043		
2044		
2045		
2046		
2047		
2048		
2049		
2050		

A.3.8 2020 Portfolio Costs (NYSEG Natural Gas)

Nominal $s						
	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019						
2020	$ 1,035,422	$ 373,967	$ 83,691	$ 101,911	$ 2,657,248	$ 4,252,240
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						
2032						
2033						
2034						
2035						
2036						
2037						
2038						
2039						
2040						
2041						
2042						
2043						
2044						
2045						
2046						
2047						
2048						
2049						
						$ 3,985,976.68

A.3.9 2020 Portfolio Benefits (NYSEG Natural Gas)

	Energy ($)	CO2 ($)	Distribution System Capacity ($/Dthm - peak day)	Total Portfolio Benefits
2019	$0.00	$0.00		$0.00
2020	$267,901.92	$242,220.54		$520,324.91
2021	$287,176.55	$247,407.67		$556,181.42
2022	$301,151.07	$258,615.58		$594,028.85
2023	$316,523.06	$270,055.06		$634,931.02
2024	$333,292.49	$282,003.99		$679,337.03
2025	$350,061.92	$294,369.74		$725,734.72
2026	$365,433.90	$307,059.69		$772,483.75
2027	$379,408.43	$320,166.46		$819,663.48
2028	$391,985.51	$333,690.05		$867,249.47
2029	$403,863.85	$340,729.73		$907,655.43
2030	$327,127.90	$279,762.03		$754,591.35
2031	$313,663.54	$272,049.58		$742,825.85
2032	$321,890.78	$283,194.68		$782,742.56
2033	$330,118.02	$294,714.69		$824,453.49
2034	$338,345.26	$337,250.13		$909,262.45
2035	$346,572.50	$337,250.13		$938,741.93
2036	$178,756.80	$173,948.46		$493,872.51
2037	$12,972.77	$12,623.82		$36,558.24
2038	$0.00	$0.00		$0.00
2039	$0.00	$0.00		$0.00
2040	$0.00	$0.00		$0.00
2041	$0.00	$0.00		$0.00
2042	$0.00	$0.00		$0.00
2043	$0.00	$0.00		$0.00
2044	$0.00	$0.00		$0.00
2045	$0.00	$0.00		$0.00
2046	$0.00	$0.00		$0.00
2047				
2048				
2049				
				$ 7,117,672.27

A.4 RG&E Natural Gas

Utility	RG&E Natural Gas

A.4.1 Utility Specific Assumptions (RG&E Natural Gas)

First Year of Portfolio	2019
Inflation Rate (GDP-PI)	2.00%
WACC (Nominal Discount Rate)	7.55%
Avg. Losses	0.44%

A.4.2 Avoided Cost Streams (RG&E Natural Gas)

Nominal $s

	Energy Cost ($/Dth)	CO2 ($/Dth)	Distribution System Capacity ($/Dth -peak day)
2019	$3.1338	$2.9098	
2020	$3.3663	$3.0436	
2021	$3.6085	$3.1088	
2022	$3.7841	$3.2497	
2023	$3.9773	$3.3934	
2024	$4.1880	$3.5435	
2025	$4.3987	$3.6989	
2026	$4.5919	$3.8584	
2027	$4.7675	$4.0231	
2028	$4.9255	$4.1930	
2029	$5.0748	$4.2815	
2030	$5.2153	$4.4601	
2031	$5.3557	$4.6452	
2032	$5.4962	$4.8355	
2033	$5.6367	$5.0322	
2034	$5.7772	$5.7585	
2035	$5.9177	$5.7585	
2036	$5.9177	$5.7585	
2037	$5.9177	$5.7585	
2038	$5.9177	$5.7585	
2039	$5.9177	$5.7585	
2040	$5.9177	$5.7585	
2041	$5.9177	$5.7585	
2042	$5.9177	$5.7585	
2043	$5.9177	$5.7585	
2044	$5.9177	$5.7585	
2045	$5.9177	$5.7585	
2046	$5.9177	$5.7585	
2047	$5.9177	$5.7585	
2048	$5.9177	$5.7585	
2049	$5.9177	$5.7585	
2050	$5.9177	$5.7585	
2051	$0.0000	$0.0000	
2052	$0.0000	$0.0000	
2053			
2054			
2055			
2056			
2057			
2058			
2059			

A.4.3 Societal Cost Test (RG&E Natural Gas)

BCA NPV Societal Cost Test

	Benefits	Costs	Benefit Cost Ratio
2019	$ 1,481,953	$ 8,092,919	1.42
2020	$ 11,353,543	$ 7,524,797	1.51

A.4.4 2019 Portfolio Characteristics (RG&E Natural Gas)

	Avoided Energy (Dth)	Avoided Capacity (Dth - peak day)
2019	143,867	
2020	143,867	
2021	143,867	
2022	143,867	
2023	143,867	
2024	143,867	
2025	143,867	
2026	143,867	
2027	143,867	
2028	143,867	
2029	115,008	
2030	89,287	
2031	89,287	
2032	89,287	
2033	89,287	
2034	27,352	
2035	24,772	
2036	24,772	
2037	16,845	
2038		
2039		
2040		
2041		
2042		
2043		
2044		
2045		
2046		
2047		
2048		
2049		
2050		

A.4.5 2019 Portfolio Costs (RG&E Natural Gas)

Nominal $s

	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019	$1,719,680	$ 406,562	$ 141,415	$ 136,036	$ 5,689,226	$ 8,092,919
2020						
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						
2032						
2033						
2034						
2035						
2036						
2037						
2038						
2039						
2040						
2041						
2042						
2043						
2044						
2045						
2046						
2047						
2048						
2049						
						$ 8,092,919.25

A.4.6 2019 Portfolio Benefits (RG&E Natural Gas)

	Energy ($)	CO2 ($)	Distribution System Capacity ($/Dthm - peak day)	Total Portfolio Benefits
2019	$450,851.75	$418,622.29		$869,474.04
2020	$484,304.95	$437,878.92		$940,627.54
2021	$519,149.02	$447,256.06		$1,005,447.85
2022	$544,411.75	$467,517.38		$1,073,867.29
2023	$572,200.75	$488,197.32		$1,147,808.97
2024	$602,516.02	$509,798.23		$1,228,084.81
2025	$632,831.29	$532,152.66		$1,311,961.15
2026	$660,620.29	$555,093.16		$1,396,472.62
2027	$685,883.02	$578,787.19		$1,481,762.71
2028	$708,619.47	$603,234.73		$1,567,787.20
2029	$583,641.60	$492,403.68		$1,311,693.18
2030	$465,653.75	$398,230.29		$1,074,131.22
2031	$478,196.61	$414,753.93		$1,132,477.21
2032	$490,739.48	$431,745.23		$1,193,332.33
2033	$503,282.34	$449,308.10		$1,256,922.86
2034	$158,020.45	$157,508.98		$424,661.07
2035	$146,591.84	$142,648.71		$397,065.29
2036	$146,591.84	$142,648.71		$405,006.60
2037	$99,682.45	$97,001.12		$280,912.58
2038	$0.00	$0.00		$0.00
2039	$0.00	$0.00		$0.00
2040	$0.00	$0.00		$0.00
2041	$0.00	$0.00		$0.00
2042	$0.00	$0.00		$0.00
2043	$0.00	$0.00		$0.00
2044				
2045				
2046				
2047				
2048				
2049				
				$ 11,481,953.19

A.4.7 2020 Portfolio Characteristics (RG&E Natural Gas)

	Avoided Energy (Dth)	Avoided Capacity (Dth - peak day)
2019		
2020	143,867	
2021	143,867	
2022	143,867	
2023	143,867	
2024	143,867	
2025	143,867	
2026	143,867	
2027	143,867	
2028	143,867	
2029	143,867	
2030	115,008	
2031	89,287	
2032	89,287	
2033	89,287	
2034	89,287	
2035	27,352	
2036	24,772	
2037	24,772	
2038	16,845	
2039		
2040		
2041		
2042		
2043		
2044		
2045		
2046		
2047		
2048		
2049		
2050		

A.4.8 2020 Portfolio Costs (RG&E Natural Gas)

Nominal $s

	Incentives & Services	Program Implementation	Portfolio Administration	Portfolio EM&V	Participant Net Cost	Total Societal Cost
2019						
2020	$ 1,719,680	$ 406,562	$ 141,415	$ 136,036	$ 5,689,226	$ 8,092,919
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						
2032						
2033						
2034						
2035						
2036						
2037						
2038						
2039						
2040						
2041						
2042						
2043						
2044						
2045						
2046						
2047						
2048						
2049						
						$ 7,524,797.07

A.4.9 2020 Portfolio Benefits (RG&E Natural Gas)

	Energy ($)	CO2 ($)	Distribution System Capacity ($/Dthm - peak day)	Total Portfolio Benefits
2019	$0.00	$0.00		$0.00
2020	$484,304.95	$437,878.92		$940,627.54
2021	$519,149.02	$447,256.06		$1,005,447.85
2022	$544,411.75	$467,517.38		$1,073,867.29
2023	$572,200.75	$488,197.32		$1,147,808.97
2024	$602,516.02	$509,798.23		$1,228,084.81
2025	$632,831.29	$532,152.66		$1,311,961.15
2026	$660,620.29	$555,093.16		$1,396,472.62
2027	$685,883.02	$578,787.19		$1,481,762.71
2028	$708,619.47	$603,234.73		$1,567,787.20
2029	$730,092.79	$615,960.84		$1,640,831.87
2030	$599,797.77	$512,951.17		$1,383,563.44
2031	$478,196.61	$414,753.93		$1,132,477.21
2032	$490,739.48	$431,745.23		$1,193,332.33
2033	$503,282.34	$449,308.10		$1,256,922.86
2034	$515,825.20	$514,155.62		$1,386,218.58
2035	$161,862.89	$157,508.98		$438,429.15
2036	$146,591.84	$142,648.71		$405,006.60
2037	$146,591.84	$142,648.71		$413,106.73
2038	$99,682.45	$97,001.12		$286,530.83
2039	$0.00	$0.00		$0.00
2040	$0.00	$0.00		$0.00
2041	$0.00	$0.00		$0.00
2042	$0.00	$0.00		$0.00
2043	$0.00	$0.00		$0.00
2044	$0.00	$0.00		$0.00
2045	$0.00	$0.00		$0.00
2046	$0.00	$0.00		$0.00
2047				
2048				
2049				
				$ 11,353,542.56