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Regulatory Affairs



December 21, 2017

Hon. Kathleen H. Burgess
Secretary to the Commission
New York State Public Service Commission
Agency Building 3
Albany, NY 12223-1350

Re: Case 15-M-0252 – *In the Matter of Utility Energy Efficiency Programs*; Central Hudson Gas & Electric Corporation's Energy Efficiency Transition Implementation Plan (ETIP) and 2017-2020 Budget and Metric Plan

Dear Secretary Burgess:

In accordance with the New York State Public Service Commission's February 26, 2015 *Order Adopting Regulatory Policy Framework and Implementation Plan* in Case 14-M-0101, Central Hudson Gas & Electric Corporation submits both its Energy Efficiency Transition Implementation Plan (ETIP) and its 2017-2020 Budget and Metric Plan for filing in the above-referenced case.

Please contact the undersigned at (845)486-5831 or pcolbert@cenhud.com with any questions regarding this matter.

Respectfully submitted,

/s/Paul A. Colbert

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2017-2020 ENERGY EFFICIENCY TRANSITION IMPLEMENTATION PLAN

Contents

- Electric Portfolio 1
 - Electric Budget and Target Summary: 3
 - Forecasted Portfolio-Level Activity: 5
 - Evaluation Measurement and Verification (EM&V): 6
 - Benefit Cost Analysis (BCA): 8
 - Electric Program Descriptions: 9
- Gas Portfolio 24
 - Gas Budget and Target Summary: 25
 - Forecasted Portfolio-Level Activity: 27
 - Evaluation Measurement and Verification (EM&V): 28
 - Benefit Cost Analysis (BCA): 30
 - Gas Program Descriptions: 31

Central Hudson Gas & Electric Corporation

ETIP 2017-2020

ELECTRIC PORTFOLIO

Central Hudson Gas & Electric Corporation (“Central Hudson” or “the Company”) will continue to implement programs which offer customers opportunities to reduce energy usage, with a focus on maximizing the value that these programs provide. During 2014, Central Hudson commissioned Applied Energy Group, Inc. (AEG) to perform a comprehensive Potential Study to assess the future potential for savings through the Company’s Energy Efficiency portfolio. The results of this study were filed with the Commission on June 1, 2017 and indicate that annual savings potential in future years will drop significantly, even with similar program funding streams.

In 2016, Central Hudson integrated new residential lighting opportunities into the portfolio. These programs led to increased energy savings in 2017 and will continue in the next program year. The expansion of lower cost lighting initiatives continues to drive down the average cost of the electric portfolio and maximize the potential savings associated with this end-use, as shown in the Potential Study filed on June 1, 2017.

Launching new lighting initiatives such as the Residential Retail Point-of-Sale initiative, the CenHub Store, and the Community Lighting initiative, has provided residential customers with more opportunities and choices to participate. Residential customers now have the option to shop online through the CenHub Store or visit local brick and mortar retail stores to purchase LED lights at a reduced cost.

The Residential Retail Point-of-Sale initiative provides customers with an opportunity to purchase LED bulbs at a lower cost while they are shopping in brick and mortar stores that they commonly visit, such as Sam’s Club, Lowe’s, Home Depot, Walmart, Target, and Ace Hardware. The Residential Retail Point-of-Sale initiative also affords an opportunity to increase customer awareness through marketing materials provided to customers during in-store events.

The Community Lighting initiative is the first Central Hudson initiative targeted toward low-income customers. To implement the Community Lighting initiative, Central Hudson partnered with community organizations such as United Way to distribute LED bulbs to local agencies they support and fund. The Company was able to achieve cost effective savings by partnering with the manufacturer to procure lighting measures at wholesale prices.

In Q4 of 2017, Central Hudson introduced and is continuing to test a new performance based model for commercial lighting. The goals of the performance based model are 1) maximize the customer's energy savings, 2) simplify and/or minimize the need to incorporate utility incentives, and 3) utilize the customer's actual energy savings to payback the project. This test will also focus on alternative EM&V techniques. Using "behind the meter" data, a customized payment plan will be calculated using the customer's experienced monthly savings. The model is designed such that the customer can finance the project with no cost upfront, be cash flow positive from the onset, and receive the full financial benefit of the energy savings when the payment terms are complete.

During 2018, Central Hudson expects to continue to offer heating & cooling incentives to all customer segments. However, the Company will continue to evaluate and assess the cost and effectiveness of these initiatives.

Central Hudson will continue to offer a suite of energy efficient products, behavioral tips and energy usage information through the CenHub customer engagement platform. Lighting is expected to continue being the biggest driver of customer purchases on the CenHub Store. However, new opportunities will be sought to further engage and drive customers to make smart product decisions leading to lowering the energy usage in their homes.

AEG was retained by Central Hudson to conduct process evaluations of all new initiatives. These process studies were completed in 2017. The evaluations identified several recommendations to improve each of the initiatives assessed. Those recommendations and associated program adjustments are described within this document.

The majority of Central Hudson's energy savings potential in 2018 is associated with LED lighting measures, which are currently being implemented at a lower cost than the rest of the electric portfolio. As stricter efficiency standards are adopted through the proposed EISA regulations, the potential to achieve savings from lighting within DSM programs will be severely impacted. At that time, Energy Efficiency budgets will need to be expended on measures which have a higher cost efficiency (\$/kWh) than LEDs, driving up the cost efficiency of the portfolio. The results of the Potential Study have been incorporated into Central Hudson's proposed budgets and targets below. The target and budget allocation also reflect Central Hudson's plans to discontinue or significantly alter the existing behavioral initiative after 2018.

ELECTRIC BUDGET AND TARGET SUMMARY:

All figures in this ETIP, including budgets, targets, forecasted expenditures, and benefit cost analyses (“BCAs”) represent an estimate of future activity based on: 1) the potential to achieve energy savings within the Company’s service territory as reflected in the results of the Company’s comprehensive Potential Study and 2) the Company’s expected annual expenditures on ETIP programs as authorized in the ETIP Order.

TABLE 1: FOUR-YEAR BUDGETS:

ELECTRIC PORTFOLIO	2017	2018	2019	2020
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Incentives & Services	\$3,760,516	\$3,760,516	\$3,760,516	\$3,760,516
Program Implementation	\$448,071	\$448,071	\$448,071	\$448,071
Total Budget	\$4,208,587	\$4,208,587	\$4,208,587	\$4,208,587
<i>Residential Sector</i>				
Residential Program				
Incentives & Services	\$1,678,250	\$1,678,250	\$2,478,246	\$2,478,246
Program Implementation	\$2,018,508	\$2,018,508	\$1,218,512	\$1,218,512
Total Budget	\$3,696,758	\$3,696,758	\$3,696,758	\$3,696,758
<i>Total Portfolio</i>				
Total Commercial Program	\$4,208,587	\$4,208,587	\$4,208,587	\$4,208,587
Total Residential Program	\$3,696,758	\$3,696,758	\$3,696,758	\$3,696,758
<i>Portfolio Administration</i>	\$74,000	\$74,000	\$74,000	\$74,000
<i>Portfolio EM&V</i>	\$500,000	\$500,000	\$500,000	\$500,000
Total Portfolio Budget	\$8,479,345	\$8,479,345	\$8,479,345	\$8,479,345

NOTE: 2017 budgets within this table are as filed within the prior ETIP report on 6/1/2017 and do not represent a forecast of 2017 expenditures. Actual expenditures for 2017 will be reported in the 4th Quarter 2017 Scorecard on or before 3/31/18.

ELECTRIC PORTFOLIO ADMINISTRATION COSTS:

- The Program Administration budget category includes but is not limited to: costs associated with participating in industry organizations which promote sharing of best practices in Energy Efficiency, as well as training and educational expenses.

- Per the income statements included in Appendix A of the JP approved in Case 14-E-0318, internal labor for energy efficiency employees is included in base delivery rates at the following amounts:¹
 - January 1, 2016-June 30, 2016- \$244,000
 - July 1, 2016-June 30, 2017- \$504,000
 - July 1, 2017-June 30, 2018- \$521,000

EVALUATION, MEASUREMENT AND VERIFICATION:

- The Company has proposed that the budget for EM&V activities in 2018-2020 remain consistent with the historic level of expenditures. However, funding estimates may change as programs or individual initiatives are introduced or evolve. This budget category includes costs associated with projects including, but not limited to: potential studies, baseline studies, process, and impact evaluations.

TABLE 2: FOUR-YEAR PRIMARY AND SECONDARY TARGETS:

ELECTRIC PORTFOLIO	2017	2018	2019²	2020
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Net MWh (Primary)	13,225	13,225	13,225	8,777
Net MW (Secondary)	1.61	1.61	1.61	1.10
Carbon Dioxide Metric Tons (Secondary)	3,704	3,704	3,687	2,432
Participation (Secondary)	2,423	2,423	2,398	2,398
<i>Residential Sector</i>				
Residential Program				
Net MWh (Primary)	21,015	21,015	9,263	6,345
Net MW (Secondary)	1.62	1.62	0.64	0.54

¹ The amounts included are on a calendar year basis (2016- \$244,000, 2017-\$513,000, 2018-\$521,000) and are based on a blend of rate years presented in Appendix A of the JP approved in Case 14-E-0318. The amounts listed here are electric only. Fringe benefits for energy efficiency employees are included with the Company’s total fringe benefits, and costs are not broken out separately.

² Beginning in 2019, the electric portfolio is forecasted to have a lower potential than prior years. Central Hudson has designated 2019 and 2020 targets based on savings levels which can be achieved with the same budget as 2018. 2017 targets within this table are as filed within the prior ETIP report on 6/1/2017 and do not represent a forecast of 2017 actuals. Actual achievements for 2017 will be reported in the 4th Quarter 2017 Scorecard on or before 3/31/18.

ELECTRIC PORTFOLIO	2017	2018	2019²	2020
Carbon Dioxide Metric Tons (Secondary)	5,886	5,886	2,582	1,758
Participation (Secondary)	162,888	162,888	68,243	58,666
<i>Total Portfolio</i>				
Net MWh (Primary)	34,240	34,240	22,488	15,122
Net MW (Secondary)	3.2	3.2	2.2	1.6
Maximum Achievable Potential ³	N/A	60,509	51,118	33,847
Carbon Dioxide Metric Tons (Secondary)	9,590	9,590	6,269	4,190
Participation (Secondary)	165,311	165,311	70,641	61,064

FORECASTED PORTFOLIO-LEVEL ACTIVITY:

TABLE 3: FORECASTED EXPENDITURES

Budgets (Electric)	Forecasted Expenditures				
	2017	2018	2019	2020	Total
<i>2017</i>	<i>\$5,497,013</i>				<i>\$5,497,013</i>
<i>2018</i>		<i>\$8,479,345</i>			<i>\$8,479,345</i>
<i>2019</i>			<i>\$8,479,345</i>		<i>\$8,479,345</i>
<i>2020</i>				<i>\$8,479,345</i>	<i>\$8,479,345</i>
Total Program	<i>\$5,497,013</i>	<i>\$8,479,345</i>	<i>\$8,479,345</i>	<i>\$8,479,345</i>	\$30,935,048

TABLE 4: FORECASTED PROGRAM ACHIEVEMENTS (PRIMARY METRIC)

	Forecasted Achievements (Net MWh)				
	2017	2018	2019	2020	Total
<i>2017</i>	<i>51,597</i>				<i>51,597</i>
<i>2018</i>		<i>34,240</i>			<i>34,240</i>
<i>2019</i>			<i>22,488</i>		<i>22,488</i>
<i>2020</i>				<i>15,122</i>	<i>15,122</i>
Total Program	51,597	34,240	22,488	15,122	123,447

³ Maximum Achievable Potential (MAP), which assumes unlimited budgets, and idealized market conditions and acceptance rates, is shown for illustrative purposes. Targets have been based on Realistic Achievable Potential (RAP).

The table above shows a reduction in targets in 2019 and 2020. This is primarily due to the following drivers:

- Central Hudson’s behavioral initiative as it is currently designed will be discontinued at the end of 2018. The costs and lifetime savings of this program have been evaluated and new program design elements are being considered for the post 2018 program cycle.
- In 2020, the lighting baseline will change to one that is more efficient. These changes are in response to the Energy Independence and Security Act (“EISA”) that will be phasing out inefficient bulbs through federal standards. Due to this change, the potential of savings from lighting in the electric portfolio will decrease significantly. As the lighting potential decreases, other measures with a higher \$/kWh will be required to meet targets.

EVALUATION MEASUREMENT AND VERIFICATION (EM&V):

TABLE 5: FOUR-YEAR EM&V ACTIVITY SCHEDULE

EM&V Activity (Electric)	Expected Plan Submission Date	Expected Start Date	Expected Completion Date	Cycle Year Informed	Status
Residential Appliance Saturation Study	December 2018	March 2018	June 2018	2019-2021	Upcoming
Process Evaluation ⁴	TBD	TBD	TBD	TBD	TBD
Program Impact Calculations	Concurrent with ETIP filings	Annually	Annually	2018-2020	Upcoming
Statewide Commercial Baseline Studies	N/A	November 2017	June 2018	2019-2021	Upcoming
Potential Study	TBD	2019	2019	TBD	Upcoming

⁴ Process Evaluations for the electric programs will be performed as needed. No specific studies are scheduled at this time.

TABLE 6: EM&V ACTIVITY FORECASTED EXPENDITURES⁵

EM&V Activity (Electric)	2017	2018	2019	2020
Process Evaluation	\$173,368	\$205,000	\$205,000	\$205,000
Program Support & Planning	\$194,511	\$230,000	\$230,000	\$230,000
Program Impact Calculations	\$54,971	\$65,000	\$65,000	\$65,000
Total EM&V Forecasted Expenditures	\$422,850	\$500,000	\$500,000	\$500,000

Below is additional detail on the aforementioned EM&V activities.

Residential Appliance Saturation Study (RASS): Central Hudson plans to perform a comprehensive study to better understand customers' energy consumption by end use, including existing saturation of HVAC equipment and appliances, and information on customer purchase behavior for lighting. Data obtained within the RASS will be valuable in supporting future potential studies and to calculate the impacts of lighting initiatives. The last RASS was completed in 2012. The planned study will identify changes in saturation which have occurred since that time, and obtain additional data points.

Process Evaluation: Central Hudson will, as needed, perform ongoing process evaluations of select initiatives to identify effective methodologies, and understand opportunities for improvement, with consideration of industry best practices.

Program Impact Calculations: Central Hudson will, as needed, perform ongoing measurement & verification analyses to quantify program impacts and validate ex-ante assumptions included within the Technical Reference Manual.

Statewide Commercial Baseline Study: Central Hudson is currently participating in a statewide commercial baseline study in collaboration with NYSERDA and other New York utilities. The purpose of this study is to better understand the specifics of energy consumption within the commercial sector.

⁵ Central Hudson is planning to complete a potential study within 2019. Annual expenditures may be adjusted when the costs and timeline of the project are better known.

Potential Study: Potential studies are a critical tool in assessing the future ability of Central Hudson’s portfolio to achieve energy savings. Originally planned for 2018, the next potential study is now planned for 2019. The results of the study will include comprehensive analysis of potential within individual customer sector and end uses. The potential study will be instrumental in determining future targets that are achievable.

Program Support & Planning: This category includes all ongoing evaluation support apart from specific process and impact evaluations. The RASS and Potential Study would be included in this category, as well as informal analyses that are used to better understand and optimize the impacts of the portfolio.

BENEFIT COST ANALYSIS (BCA):

TABLE 7: FOUR-YEAR BENEFIT COST RATIOS

ELECTRIC PORTFOLIO	2017	2018	2019	2020
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Benefits	\$16,435,003	\$15,734,121	\$15,430,487	\$9,649,015
Costs	\$4,246,165	\$6,742,361	\$6,384,897	\$6,296,812
<i>Benefit Cost Ratio</i>	<i>3.87</i>	<i>2.33</i>	<i>2.42</i>	<i>1.53</i>
<i>Residential Sector</i>				
Residential Program				
Benefits	\$17,591,735	\$11,135,324	\$6,285,913	\$3,848,373
Costs	\$12,029,508	\$7,366,481	\$6,249,439	\$5,648,023
<i>Benefit Cost Ratio</i>	<i>1.46</i>	<i>1.51</i>	<i>1.01</i>	<i>0.68</i>
<i>Total Portfolio</i>				
Total Benefits	\$34,026,737	\$26,869,445	\$21,716,400	\$13,497,388
Total Costs	\$16,275,673	\$14,108,842	\$12,634,335	\$11,944,835
Portfolio Benefit Cost Ratio	2.09	1.90	1.72	1.13

TABLE 8: FOUR-YEAR PORTFOLIO BCA RESULTS

ELECTRIC PORTFOLIO	2017	2018	2019	2020
Societal Cost Test Ratio	2.09	1.90	1.72	1.13
Utility Cost Test Ratio	3.63	1.83	1.48	0.92
Ratepayer Impact Measure Test Ratio	0.41	0.39	0.41	0.36

ELECTRIC PROGRAM DESCRIPTIONS:

Commercial Program

COMMERCIAL ELECTRIC BUDGET & TARGETS	2017	2018	2019	2020
Net MWh (Primary)	13,225	13,225	13,225	8,777
Net MW (Secondary)	1.6	1.6	1.6	1.1
Carbon Dioxide Metric Tons (Secondary)	3,704	3,704	3,687	2,432
Participation (Secondary)	2,423	2,423	2,398	2,398
Incentives & Services	\$3,760,516	\$3,760,516	\$3,760,516	\$3,760,516
Program Implementation	\$448,071	\$448,071	\$448,071	\$448,071
Total budget	\$4,208,587	\$4,208,587	\$4,208,587	\$4,208,587

PRESCRIPTIVE

Central Hudson implemented the Prescriptive initiative for the first time in 2016. Larger customers with demand greater than 120kW, who potentially utilize more sophisticated energy management systems, are the target sector. The objective of this initiative is to offer customers a standard suite of incentives which cover common efficiency measures. The customer is able to utilize the installer of their choice to retrofit their space with lighting and or heating, cooling, and ventilation (“HVAC”) measures. The incentivized measures are readily available, proven technologies, with known performance characteristics. Prescriptive incentives allow participants to choose common products from a pre-qualified list of measures that are listed and approved in the New York Technical

Reference Manual. In order to qualify for rebates, the measures must be installed by a participating Central Hudson Trade Ally with an active participation agreement.

Within the next three portfolio planning years, Central Hudson will continue looking for ways to improve the customer experience. An online rebate application process, referred to as an online intake tool, allows the trade ally to enter in the customer information and provide the customer with their rebate, without the need to fill out a paper application. With education sessions, we have seen a large increase in Trade Allies who are using the online intake tool. This tool is one method that Central Hudson has employed to improve the customer experience and cut costs associated with processing rebates.

Central Hudson's third party implementer provides the following services:

- Oversight and quality assurance when processing customer applications (all information included within the online rebate application is validated and corrected if necessary).
- Provide customer service support.
- Performance and cost tracking.
- Progress reports towards goals and opportunities for improvement.
- Quality Assurance/Quality control measures.
- Provide marketing strategies to best reach goals.

Quality Assurance/Quality Control Procedures:

The primary purpose of quality assurance in the Prescriptive initiative is to confirm that the equipment specified on the application is installed and operational at the location as reported. Installations are randomly selected for a pre and post-inspection. 10% of all projects are inspected for accuracy of the energy audit, measures that were proposed, quality of work installed, and the customer experience. All Trade Allies must agree to a listing of prerequisite requirements in order to qualify to work within the Prescriptive initiative and provide incentives to customers. As the costs of energy efficiency measures (specifically lighting) continue to decrease, Central Hudson regularly reviews the prescriptive incentive rates to ensure they are appropriate.

Process Evaluation:

Applied Energy Group, Inc. (AEG) conducted a process evaluation of Central Hudson’s C&I Custom and Prescriptive initiatives which was completed in 2017. The evaluation identified several recommendations to improve the initiative, included in the table below.

C&I Custom and Prescriptive Process Evaluation

Recommendation	Resulting Action
<p>Collect information on the end use customer including Central Hudson account number, contact name, business name, address, telephone number and email address.</p> <p>The tracking database does not track adequate contact information for end use customers. The trade ally information is often listed in the customer fields. It is important to capture information on the end use customer for a variety of reasons including verification that they are a Central Hudson customer, analysis of participation information (e.g., characteristics of customers participating in the program) and evaluation.</p>	<p>The implementation contractor has improved their QA/QC protocol to ensure that the information collected and retained in their tracking system is as accurate as possible. A follow up with the Trade Ally is conducted if warranted after the data is reviewed.</p>
<p>Review the application, fix any web log in issues, and determine whether it can be streamlined.</p> <p>Some trade allies feel the application is long and tedious and have had difficulty with the web log in. Fixing any issues with the web log in and streamlining the application where possible will improve trade ally participation and make them more likely to promote the program to customers.</p>	<p>Central Hudson and the contractor developed enhanced training materials for Trade Allies that include short cuts to using the web portal. The portal was also updated for ease of use, including:</p> <ul style="list-style-type: none"> • A reorganized application field sequence making it easier for Trade Allies to flow from application fields directly to equipment measures entries • Additional dropdowns to simplify selections • Reorganized customer email area and to avoid confusion. • Created functionality which enables Trade Allies to return to an application if they were missing key documentation
<p>Closely monitor 2017 participation rates and budget expenditures.</p> <p>The considerable effort and outreach conducted in 2016 to build the trade ally network should be producing increased participation in 2017. If 2017</p>	<p>Year-to-date results through October indicate favorable program performance. Annual savings targets have been surpassed and additional funding has been requested to meet the demand for participation in this program. The implementation contractor, Central Hudson, and the Trade Ally network have kept the project pipeline very active</p>

participation looks like it will fall short, other outreach and marketing efforts may need to be considered.	this year and plan to continue to be productive into the 2018 calendar year.
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SMALL BUSINESS DIRECT INSTALL (“SBDI”)

Central Hudson has been offering commercial customers a “direct install” solution for retrofitting their existing lighting fixtures since 2010. The direct install model provides the customer with a turn-key solution from audit, to proposal, installation, and beyond. Since the initiative began, the incentive model has undergone several design changes in order to stimulate the market, and reach as many customers as possible. While this initiative has historically served all commercial markets, it has evolved into focusing on the small business customer with less than 120kW of electric demand.

Central Hudson plans to introduce a new “performance based” model of acquiring MWh’s in 2017. This model integrates customer education, project financing, and an ongoing assessment of energy savings. Measurement of “behind the meter” equipment usage will be utilized to forecast energy savings potential and develop the customer’s payment plan and adjust if needed. The payment plan will be designed so that the customer’s cash flows are positive from the onset, and they will receive the full financial benefit of the project when the payment terms are complete. Impacts resulting from each project will be measured using advanced EM&V techniques, and used to validate the payment plan. The customer will be guaranteed that their project payments will not exceed the value of their energy savings.

The performance based model will be tested by generating approximately 100 project proposals, and may be expanded if results warrant. The original lighting model will continue to be offered simultaneously while this new model is tested.

The SBDI implementation strategy will incorporate the following components:

- **Energy Audits:** Trained auditors complete a walk-through examination of the business and develop a project proposal using standard audit software, identifying specific lighting saving opportunities. Once the audit is validated and the project viability has been assessed, the auditor will review the proposal with the customer. The payment terms are established such that the customer shares their monthly savings to pay for the cost of the equipment and installation.

- **Meter Installation and Billing:** A technician returns to install wireless metering technology to measure the actual usage on the identified lighting circuits. The metered data is analyzed by a disaggregation system to identify runtimes and are expressed as switch-level savings. The lighting savings with new efficient lighting are presented in a shared savings bill to the customer each month for the project term.

Quality Assurance/Quality Control Procedures:

The primary purpose of performing quality assurance in the SBDI initiative is to ensure that the equipment specified on the application is installed and operational at the location as required. Installations are randomly selected for a pre and post-inspection. 10% of all projects are inspected for accuracy of the energy audit, measures that were proposed, quality of work installed, and the customer experience. For customers that participate in the new performance based model, baseline wattages are confirmed through M&V equipment in advance of the lighting installation. The M&V equipment will remain in place for the term of the offer, during which time this equipment will be used to measure actual energy saved achieved by the project.

CUSTOM

The Custom initiative, simultaneously implemented with Prescriptive, was new to the portfolio in 2016. This initiative targets larger commercial customers that may have unique energy management needs. Since customer incentives are based on kWh or Dth saved, custom options are generally technology neutral, allowing the customer the flexibility to choose the best possible solution for the project. Equipment that does not currently qualify for a prescriptive rebate may still be eligible for a custom rebate. This provides non-residential customers more flexibility to meet their unique facility needs. Applications must be pre-approved by the implementation contractor and Central Hudson before the equipment is purchased and installed. The project must result in a BCR⁶ of greater than 1.0 to be eligible for an incentive under the Custom initiative.

In addition, the implementer of this initiative provides implementation and quality control services that are identical to the Prescriptive initiative discussed above.

⁶ Benefit Cost Ratio, determined by the Societal Cost Test per Central Hudson's Benefit Cost Analysis Handbook version 1.1.

Process Evaluation:

Applied Energy Group, Inc. (AEG) was retained by Central Hudson Gas & Electric Corporation (Central Hudson) to conduct a process evaluation of its C&I Custom and Prescriptive initiatives which was completed in 2017. The evaluation identified several recommendations to improve the initiative, included in the table below.

C&I Custom and Prescriptive Process Evaluation

Recommendation	Resulting Action
<p>Collect information on the end use customer including Central Hudson account number, contact name, business name, address, telephone number and email address.</p> <p>The tracking database does not track adequate contact information for end use customers. The trade ally information is often listed in the customer fields. It is important to capture information on the end use customer for a variety of reasons including verification that they are a Central Hudson customer, analysis of participation information (e.g., characteristics of customers participating in the program) and evaluation.</p>	<p>The implementation contractor has improved their QA/QC protocol to ensure that the information collected and retained in their tracking system is as accurate as possible. A follow up with the Trade Ally is conducted if warranted after the data is reviewed.</p>
<p>Review the application, fix any web log in issues, and determine whether it can be streamlined.</p> <p>Some trade allies feel the application is long and tedious and have had difficulty with the web log in. Fixing any issues with the web log in and streamlining the application where possible will improve trade ally participation and make them more likely to promote the program to customers.</p>	<p>Central Hudson and the contractor developed enhanced training materials for Trade Allies that include short cuts to using the web portal. The portal was also updated for ease of use, including: -</p> <ul style="list-style-type: none"> • A reorganized application field sequence making it easier for Trade Allies to flow from application fields directly to equipment measures entries • Additional dropdowns to simplify selections • Reorganized customer email area and to avoid confusion. • Created functionality which enables Trade Allies to return to an application if they were missing key documentation
<p>Closely monitor 2017 participation rates and budget expenditures.</p> <p>The considerable effort and outreach conducted in 2016 to build the trade ally network should be producing increased participation in 2017. If 2017</p>	<p>Year-to-date results through October indicate favorable program performance. Annual savings targets have been surpassed and additional funding has been requested to meet the demand for participation in this program. The implementation</p>

participation looks like it will fall short, other outreach and marketing efforts may need to be considered.	contractor, Central Hudson, and the Trade Ally network have kept the project pipeline very active this year and plan to continue that into the 2018 calendar year.
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MUNICIPAL STREETLIGHT INITIATIVE

Through this initiative, municipal customers within our service territory are encouraged to replace streetlights with new LED fixtures. Central Hudson will now provide incentives based on the energy savings the new lighting fixture will save to cover a portion of the cost. Replacing the inefficient streetlight fixtures currently installed with high efficiency LED fixtures provides a great way to capture energy savings toward the portfolio goal. This initiative will be available to any municipal customer for which the Company owns and maintains their streetlights.

Beginning in the first or second quarter of 2018, funding will be made available in the portfolio budget to cover a portion of these costs to municipalities.

Residential Program

RESIDENTIAL ELECTRIC BUDGET & TARGETS	2017	2018	2019	2020
Net MWh (Primary)	21,015	21,015	9,263	6,345
Net MW (Secondary)	1.62	1.62	0.64	0.54
Carbon Dioxide Metric Tons (Secondary)	5,886	5,886	2,582	1,758
Participation (Secondary)	162,888	162,888	68,243	58,666
Incentives & Services	\$1,678,250	\$1,678,250	\$2,478,246	\$2,478,246
Program Implementation	\$2,018,508	\$2,018,508	\$1,218,512	\$1,218,512
Total budget	\$3,696,758	\$3,696,758	\$3,696,758	\$3,696,758

RESIDENTIAL ELECTRIC HVAC

The Residential Electric HVAC initiative has been part of Central Hudson’s residential energy efficiency initiative since 2009. Since that time, several design changes have taken place to reduce incentives and eliminate measures that were too costly. Incentives are currently available for heat

pump water heaters, air source heat pumps, and Wi-Fi thermostats (as included in the installation of a heat pump). All residential electric customers are eligible to take advantage of this initiative.

Central Hudson has proposed within the Company's Rate Case to provide an additional carbon reduction incentive for heat pump technologies in support of New York State's policy goals. Heat pump technology, including air source and ground source, provide the greatest carbon reduction per dollar compared to other distributed energy resources, including photovoltaic distributed generation, when directly offsetting the use of fossil fuels for heating. These additional incentives, if approved, would not be dependent on the efficiency of the unit being installed, and can be combined with incentives under the Residential HVAC initiative where eligible.

The Company also plans to re-evaluate the more expensive measures that place upward pressure on the unit kWh cost of the overall portfolio. Incentives will be monitored and changed as appropriate to ensure successful management.

Central Hudson's third party implementer provides the following services:

- Process customer applications.
- Provide customer service support.
- Track performance.
- Progress reports towards goals and opportunities for improvement.
- Quality Assurance/Quality control measures.
- Provide marketing strategies to best reach goals.

Quality Assurance/Quality Control Procedures:

A sampling of 10% of submitted applications are inspected to ensure the equipment listed is installed as reported, and to check the quality of the installation. Trade Allies that are applying for their first four rebates or where the data provided on the rebate application is questionable, will be selected first. The remainder of the inspections will be scheduled to meet the 10% target and will be selected randomly. Because there is a self-installation option for the heat pump water heater, most customers install this measure without the help from a Trade Ally. The 10% target does not apply to these self-installations; instead 100% are inspected for quality and safety.

APPLIANCE RECYCLING

Central Hudson has been offering an incentive for customers to recycle their primary and secondary refrigerators and freezers since 2010. All residential electric customers are eligible to take advantage of this initiative. This offering incentivizes residential customers to have inefficient refrigerators and freezers removed from their homes and disposed of in a safe and environmentally responsible manner.

For the next planning phase, our efforts will focus on how to use this initiative as a marketing channel promoting other engagement opportunities such as the CenHub Store. Central Hudson sees potential to utilize this initiative as a starting point to engage customers in other available offerings.

The Requirements to recycle a refrigerator or freezer:

- Unit must be between 10 and 30 cubic feet in size.
- Unit must be in working condition.
- At time of pickup the unit must be empty and plugged into an electrical outlet.
- No age restriction.
- Unit can be primary or secondary.

Customers may receive a \$50 incentive for each unit recycled, up to two units per household per year and up to four units per Central Hudson account.

Quality Assurance/Quality Control Procedures:

The implementation contractor creates an Appliance Turn-in Order (ATO) that enables the unit information for tracking and reporting purposes. At the time the customer schedules a pick-up appointment; appliance information is collected and recorded in an order entry screen identifying the size, color, and brand of the unit. When a representative arrives at the customer's home to pick up the appliance, this information is verified and other characteristics about the unit are collected. The data will be reported through the ATO systems' program manager web portal. The implementation contractor's client support coordinators will compile weekly technical reports that will reflect activity from the previous week

RETAIL POINT OF SALE LIGHTING

Central Hudson incorporated residential lighting into the portfolio in April 2016. This initiative utilizes a midstream strategy to increase the penetration of efficient lighting in customer homes by incentivizing LED lighting purchased at retail locations within Central Hudson's service territory. The incentives vary depending on the type of LED lighting (standard or specialty bulb) and the associated retail cost. A maximum purchase limit of 25 bulbs for each customer at the register has been set.

Central Hudson intends to continue driving residential lighting market transformation. The goal of this initiative is not only to buy down the cost of LEDs for residential customers, but to gain additional attribution for providing these incentives. Our goal is to increase awareness so customers associate Central Hudson with encouraging them to be more energy conscious while providing customers financial assistance to do so. This initiative will also serve as a way to market other opportunities such as promoting information available through CenHub.

The implementation process includes:

- Establishing relationships with retailers throughout Central Hudson's service territory.
- Tracking performance, including tracking sales data, reviewing sales data for accuracy, and payment to retailers.
- Weekly reporting towards portfolio goals.

Quality Assurance/Quality Control Procedures:

Central Hudson will work with the retailer and implementation contractor to continue to monitor the quantity of bulbs purchased.

Process Evaluation:

Applied Energy Group, Inc. (AEG) was retained by Central Hudson Gas & Electric Corporation (Central Hudson) to conduct a process evaluation of its Point of Sale Lighting initiative which was completed in 2017. The evaluation identified several recommendations to improve the initiative, included in the table below.

Point of Sale Process Evaluation

Recommendation	Resulting Action
<p>Obtain stronger local store commitment by conducting annual or bi-annual training events with local store personnel to discuss the program and educate sales associates about the benefits of LEDs.</p> <p>Sales staff that are invested in the program are likely to encourage more customers to buy LEDs, especially those customers who might not normally do so. Additionally, more invested sales staff could be more articulate and helpful in emphasizing Central Hudson's role in the program.</p>	<p>With the assistance of the implementation contractor, Central Hudson offers ongoing training to the sales force at each local store location. We also hold annual meetings with retail staff and work one-on-one with each lighting sales associates about the program.</p>
<p>Improve point of sale (POS) displays.</p> <p>Since Central Hudson's sponsorship is going largely unnoticed, we recommend the following: make the Central Hudson logo larger, add brochures and pamphlets, and separate the discounted lamps from other LEDs when possible. More effective in-store sales materials will likely lead more customers who do not have prior experience with LED lamps to purchase the discounted lamps.</p>	<p>Central Hudson has redesigned all point of sale promotional material. The size of the Central Hudson logo was increased to the maximum size limit agreed upon with each retailer. We added brochures and pamphlets to our in-store demonstration events. Central Hudson has no control in determining separation or location of discounted lamps, which is at the sole discretion of the retailer.</p>
<p>Hold turn-in events.</p> <p>Turn-in events (in which customers get an additional discount for turning in incandescent lamps) may be particularly useful because they are novel and might generate additional publicity for the program. Recall that forty-five percent of customers who purchased the discounted lamps said they would be using those lamps to replace other, already installed high efficiency lamps (e.g., LEDs and CFLs). A turn-in event could increase the number of incandescent lamps replaced by discounted LEDs, thereby reducing the total number of incandescent lamps in the service territory. Additionally, these types of events may provide additional encouragement to try LEDs for those people who have not installed any LEDs so far.</p>	<p>Central Hudson hasn't held a turn-in event to date. We are in discussions with the implementation contractor to design a turn-in event to promote the program in the future.</p>
<p>Hold customer education events at stores. Program staff identified an interest in, and need for, more</p>	<p>Central Hudson holds in-store events on a monthly basis to increase awareness of LEDs and our discount</p>

customer education, specifically leveraging in-store promotional events. Such events are likely to increase awareness of LEDs among those customers with little or no prior experience with LEDs, and should reinforce the Central Hudson brand. It will be important for ICF to work with retailers to hold these events on known high-volume days, such as spring home makeover sales.

program. We hold the events on high-volume days and high volume hours of operation.

CENHUB STORE- REV DEMONSTRATION PROJECT

Central Hudson implemented this initiative as a REV Demonstration Project, which launched in April 2016. Along with encouraging customer engagement, CenHub drives customers to learn more about their specific usage, how to better manage their energy, then incentivizing the purchase of products. This solution is a convenient way for customers to participate in Central Hudson’s energy efficiency offerings. This platform was created to modernize Central Hudson’s online presence and provide customers with an experience similar to other industries.

All Central Hudson residential customers are eligible to participate and purchase products from the CenHub Store. This initiative significantly reduces leakage, ensuring that the incentive dollars are utilized within the service territory. Central Hudson has controls in place to prevent non-Central Hudson account holders from participating. In order to receive a rebate on an eligible product, the customer must be signed into their CenHub My Account. This platform was created with single sign-on controls so once the customer logs in with their My Account credentials, they have been verified as a Central Hudson account holder.

Residential lighting will continue to be the primary focus of the CenHub Store. To date, lighting has been most popular product type on the store. Driving customers to the store through promotions and strategic marketing has contributed to the CenHub Store’s success.

Quality Assurance/Quality Control Procedures:

As mentioned above, the single sign-on control prevents non-Central Hudson account holders from receiving a rebate for applicable product purchased on the Store. When a customer makes a

purchase, at the time of checkout they are required to verify that they will be installing this product in their home.

Process Evaluation:

Applied Energy Group, Inc. (AEG) was retained by Central Hudson Gas & Electric Corporation (Central Hudson) to conduct a process evaluation of its CenHub Store initiative which was completed in 2017. The evaluation identified several recommendations to improve the initiative, included in the table below:

CenHub Store Process Evaluation

Recommendation	Resulting Action
<p>Focus marketing emails on products in addition to LEDs.</p> <p>Email marketing appears to be an effective tool for promoting the store. If customers become more familiar with the benefits of other energy saving products, sales of those other products will likely increase.</p>	<p>Central Hudson recognizes our email marketing is a very effective means to marketing the store. We continue to market our cost effective LEDs as well as Wi-Fi thermostats and advanced power strips. New products are added to the store or removed on a quarterly basis. Our marketing team works with Simple Energy to promote new products and educate customers on each energy savings product.</p>
<p>Work with the Implementation Contractor to create a report template with consistent data inputs and a firm report delivery deadline.</p> <p>Make the template and the delivery deadline a contractual requirement if possible. Accurate program information is imperative to program success. Central Hudson staff needs accurate, timely reports in order to make informed decisions that will improve the program. Accurate and on-time reports will also save on utility staff analysis time.</p>	<p>Central Hudson has worked with the contractor to build a reporting template. Our internal Business Intelligence team coordinates and ingests reporting data feeds. All data is reviewed for accuracy and the contractor's reporting adheres strictly to predetermined timelines.</p>
<p>Ensure all necessary data is collected and tracked by the Implementation Contractor.</p> <p>Tracking all program data, including heating fuel type for thermostat purchasers, water heating type for water-related purchases, and customer account number is crucial to evaluating program success. Accurate program data is necessary for Central Hudson staff to gauge the success of the program and ensure that only Central Hudson customers are purchasing measures through the CenHub Store. A question should be added</p>	<p>The contractor has implemented a new tracking system for the CenHub Store. They are able to track customer reported heating type for thermostat purchases. We are currently unable to track heating type for water-related purchases, but are designing a process to capture the required information to accurately determine water heater type.</p>

upon purchase of a water savings measure to accurately determine the water heating type.	
<p>Determine if there are savings from non-rebated measures.</p> <p>Some energy saving measures are currently sold through the CenHub store but are not rebated by Central Hudson. These measures may still yield energy savings compared to a less efficient standard option (e.g., Holiday LED lights versus standard holiday lights). Central Hudson should conduct research to determine if savings (deemed or calculated) could be applied to these measures, and/or if they could cost effectively add a small rebate for these measures.</p>	<p>Central Hudson is continuously evaluating measures and rebate assignments based on cost effectiveness screening.</p>

COMMUNITY LIGHTING DISTRIBUTION

Central Hudson added this initiative to the electric portfolio in 2016 by leveraging an existing relationship with Philips in order to secure the purchase of LED bulbs at wholesale costs. This is an opportunity to distribute LED bulbs and engage with low-income or hard-to-reach customers that may not have access to such energy saving measures.

This initiative targets customers utilizing services from organizations such as United Way. Additionally, Customer Service Representatives visiting Social Services offices are able to help customers with questions about their bills and service, provide information regarding energy savings, and distribute the LED bulbs.

Quality Assurance/Quality Control Procedures:

For purposes of tracking, each customer who receives LED bulbs is required to provide their name, address, and a statement that they will install these lights in their home. There is a limit of 6 bulbs per household.

BEHAVIORAL- ENERGY INSIGHT REPORTS

The Energy Insights initiative is not voluntary, and customers were chosen based on a number of requirements such as length of time account is open, usage, etc. The goal of this initiative is to reduce consumption through targeted and seasonal messaging through email and mailed paper reports. Energy reports are sent capturing seasonality trends focusing on cooling in the summer for

electric customers. Customers are provided access to an online tool to track energy consumption and offer tips to reduce usage. Social competitiveness increases behavior to reduce energy consumption.

During the next planning cycle, Central Hudson will be modifying this initiative to address key concerns that include cost, treatment size, and persistence of savings. Beginning in 2019, Central Hudson may offer this benefit to a larger group of residential customers in order to maximize savings and engagement. A key concern with this approach is the measurement and verification of savings. Measurement & verification of this initiative has traditionally been accomplished by comparing impacts within treatment and control groups. This consideration will be incorporated into the planning and design process.

Quality Assurance/Quality Control Procedures:

Once the treatment and control groups have been chosen, the design for the initiative does not change. Customers cannot opt into this initiative however, they can opt out of receiving reports and/or emails. For this initiative, the evaluation of impacts occurs after it has been implemented for a period of time is best practice to ensure savings are reported accurately.

Process Evaluation:

Applied Energy Group, Inc. (AEG) was retained by Central Hudson Gas & Electric Corporation (Central Hudson) to conduct a process evaluation of its Behavioral initiative which was completed in 2017. The evaluation identified several recommendations to improve the initiative, included in the table below.

Behavioral Process Evaluation

Recommendation	Resulting Action
<p>Work with the Implementation Contractor to continue improving program reporting.</p> <p>The implementation contractor should create one report that is delivered on a monthly basis. Hard deadlines should be established and agreed upon with consequences for delays if the deadlines are not met. Central Hudson staff need accurate, timely reports if they are to make informed decisions that will improve</p>	<p>Central Hudson has worked with the contractor to build a reporting template. Our internal Business Intelligence team coordinates and ingests reporting data feeds. All data is reviewed for accuracy and the contractor's reporting adheres strictly to predetermined timelines.</p>

<p>the program. Accurate, on-time reports will also save on utility staff analysis time.</p>	
<p>Track program status in the program tracking database.</p> <p>The program tracking database should include fields that show the status of each participant and the mode they receive the Energy Insights reports. When a participant is inactive or an email participant unsubscribes that status and the date it occurred should be recorded so Central Hudson can accurately track program participation from month to month.</p>	<p>Central Hudson has access to the program tracking database which includes customers who receive paper reports versus digital reports. There are two types of unsubscribe methods which are both tracked. One method will unsubscribe the customer from all Central Hudson engagement and the other will only unsubscribe the customer from the contractors' emails.</p>
<p>Increase the frequency of information about other Central Hudson energy efficiency programs in the reports.</p> <p>Include a link to more program information. Customers who are more aware of Central Hudson programs are, of course, more likely to participate. Customers who learn about Central Hudson offerings from the reports will likely find the reports more useful.</p>	<p>The frequency has remained the same because we do not want to exhaust the customer's interest in energy reduction education however we do cross promote our programs through the online portal and utilizing custom tips to promote other programs.</p>
<p>Conduct research with participants to gain ideas on how to make the reports more useful.</p> <p>It is unclear why participants are not viewing the energy saving ideas included in the reports as new information, or why they are not using the information in the reports more frequently. Focus groups or in-depth interviews could shed light on this finding and provide new ideas for improving the reports.</p>	<p>Central Hudson utilized focus groups at the end of 2015 to evaluate customer's wants & needs with regards to the Insights reports. We will consider utilizing this route again in the future to keep up with the changing demands of the customers.</p>

GAS PORTFOLIO

Central Hudson has been offering gas incentives for both residential and commercial customers since 2010. The residential program has stayed consistent, providing customer incentives to upgrade heating equipment. A portion of residential gas heating customers receive energy insight reports that provide tips to save energy during the heating season. The commercial portfolio was expanded to include a custom initiative, identical to the custom initiative design as part of the electric portfolio.

GAS BUDGET AND TARGET SUMMARY:

TABLE 9: FOUR-YEAR BUDGETS:

GAS PORTFOLIO	2017 ⁷	2018	2019	2020
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Incentives & Services	\$394,109	\$394,109	\$394,109	\$394,109
Program Implementation	\$244,984	\$244,984	\$244,984	\$244,984
Total Budget	\$639,093	\$639,093	\$639,093	\$639,093
<i>Residential Sector</i>				
Residential Program				
Incentives & Services	\$22,147	\$22,147	\$22,147	\$22,147
Program Implementation	\$112,432	\$112,432	\$112,432	\$112,432
Total Budget	\$134,579	\$134,579	\$134,579	\$134,579
Total Portfolio				
Total Commercial Program	\$639,093	\$639,093	\$639,093	\$639,093
Total Residential Program	\$134,579	\$134,579	\$134,579	\$134,579
<i>Portfolio Administration</i>	\$25,000	\$25,000	\$25,000	\$25,000
<i>Portfolio EM&V</i>	\$38,684	\$38,684	\$38,684	\$38,684
Total Portfolio Budget	\$837,356	\$837,356	\$837,356	\$837,356

Gas Portfolio Administration Costs:

- The costs associated with Program Administration include membership renewals to relevant industry organizations. The costs incorporated also include training opportunities that are included as being members of leading industry organizations.
- Per the income statements included in Appendix A of the JP approved in Case 14-G- 0319, internal labor for energy efficiency employees is included in base delivery rates at the following amounts:

⁷ 2017 budgets within this table are as filed within the prior ETIP report on 6/1/2017 and do not represent a forecast of 2017 expenditures. Actual expenditures for 2017 will be reported in the 4th Quarter 2017 Scorecard on or before 3/31/18.

- January 1, 2016-June 30, 2016- \$15,000
- July 1, 2016-June 30, 2017- \$31,000
- July 1, 2017-June 30, 2018- \$32,000

TABLE 10: FOUR-YEAR PRIMARY AND SECONDARY⁸ TARGETS:

GAS PORTFOLIO	2017*	2018	2019	2020
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Net Dth (Primary)	16,541	16,541	16,541	16,541
Carbon Dioxide Metric Tons (Secondary)	877	877	877	877
Participation (Secondary)	380	380	380	380
<i>Residential Sector</i>				
Residential Program				
Net Dth (Primary)	20,756	20,756	20,756	20,756
Carbon Dioxide Metric Tons (Secondary)	1,100	1,100	1,100	1,100
Participation (Secondary)	40,092	40,092	2,527	2,527
Total Portfolio				
Net Dth (Primary)	37,297	37,297	37,297	37,297
Carbon Dioxide Metric Tons (Secondary)	1,977	1,977	1,977	1,977
Participation (Secondary)	40,472	40,472	3,575	3,575

⁸ 2017 targets within this table are as filed within the prior ETIP report on 6/1/2017 and do not represent a forecast of actuals. Actual achievements for 2017 will be reported in the 4th Quarter 2017 Scorecard on or before 3/31/18. The secondary targets listed here will be for tracking and monitoring program performance only.

FORECASTED PORTFOLIO-LEVEL ACTIVITY:

TABLE 11: FORECASTED EXPENDITURES

Budgets (Gas)	Forecasted Expenditures				
	2017	2018	2019	2020	Total
<i>2017</i>	\$580,993				\$580,993
<i>2018</i>		\$837,356			\$837,356
<i>2019</i>			\$837,356		\$837,356
<i>2020</i>				\$837,356	\$837,356
Total Program	\$580,993	\$837,356	\$837,356	\$837,356	\$3,093,061

TABLE 12: FORECASTED PROGRAM ACHIEVEMENTS (PRIMARY METRIC)

	Forecasted Achievements (Net Dth)				
	2017	2018	2019	2020	Total
<i>2017</i>	41,116				37,296
<i>2018</i>		37,296			37,296
<i>2019</i>			37,296		37,296
<i>2020</i>				37,296	37,296
Total Program	41,116	37,296	37,296	37,296	153,004

EVALUATION MEASUREMENT AND VERIFICATION (EM&V):

TABLE 13: FOUR-YEAR EM&V ACTIVITY SCHEDULE

EM&V Activity (Gas)	Expected Plan Submission Date	Expected Start Date	Expected Completion Date	Cycle Year Informed	Status
Process Evaluation ⁹	TBD	TBD	TBD	TBD	TBD
Program Impact Calculations	Concurrent with ETIP filings	Annually	Annually	2018-2020	Upcoming
Residential Appliance Saturation Study	December 2018	March 2018	June 2018	2019-2021	Upcoming
Statewide Commercial Baseline Studies	N/A	November 2017	June 2018	2019-2021	Upcoming
Potential Study	TBD	2019	2019	TBD	Upcoming

TABLE 14: EM&V ACTIVITY FORECASTED EXPENDITURES¹⁰

EM&V Activity (Gas)	2017	2018	2019	2020
Process Evaluations	\$0	\$6,104	\$10,054	\$10,054
Program Support & Planning	\$0	\$3,232	\$3,232	\$3,232
Program Impact Calculations	\$0	\$8,617	\$12,567	\$12,567
Total EM&V Forecasted Expenditures	\$0	\$38,419	\$38,420	\$38,420

Below is additional detail on the aforementioned EM&V activities.

Residential Appliance Saturation Study (RASS): Central Hudson plans to perform a comprehensive study to better understand customers' energy consumption by end use, including existing saturation of HVAC equipment and appliances. Data obtained within the RASS will be valuable in supporting future potential studies. The last RASS was completed in 2012. The planned study will identify changes in saturation which have occurred since that time, and obtain additional data points.

⁹ Process Evaluations for gas programs will be performed as needed. No specific studies are scheduled at this time.

¹⁰ Central Hudson is planning to complete a potential study within 2018 or 2019. Annual expenditures may be adjusted when the timeline of the project is better known.

Process Evaluation: Central Hudson will, as needed, perform ongoing process evaluations of select initiatives to identify effective methodologies, and understand opportunities for improvement, with consideration of industry best practices.

Program Impact Calculations: Central Hudson will, as needed, perform ongoing measurement & verification analyses to quantify program impacts and validate ex-ante assumptions included within the Technical Reference Manual.

Statewide Commercial Baseline Study: Central Hudson is currently participating in a statewide commercial baseline study in collaboration with NYSERDA and other New York utilities. The purpose of this study is to better understand the specifics of energy consumption within the commercial sector.

Potential Study: Potential studies are a critical tool in assessing the future ability of Central Hudson's portfolio to achieve energy savings. Originally planned for 2018, the next potential study is now planned for 2019. The results of the study will include comprehensive analysis of potential within individual customer sector and end uses. The potential study will be instrumental in determining future energy savings targets that are achievable.

Program Support & Planning: This category includes all ongoing evaluation support apart from specific process and impact evaluations. The RASS and Potential Study would be included in this category, as well as informal analyses that are used to better understand and optimize the impacts of the portfolio including benefit cost analyses.

BENEFIT COST ANALYSIS (BCA):

TABLE 15: FOUR-YEAR BENEFIT COST RATIOS

GAS PORTFOLIO	2017	2018	2019	2020
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Benefits	\$650,626	\$2,167,267	\$2,204,053	\$2,034,326
Costs	\$41,224	\$1,234,073	\$1,208,981	\$1,184,977
<i>Benefit Cost Ratio</i>	<i>15.78</i>	<i>1.76</i>	<i>1.82</i>	<i>1.89</i>
<i>Residential Sector</i>				
Residential Program				
Benefits	\$1,328,754	\$301,812	\$2,448,120	\$2,477,479
Costs	\$1,361,039	\$269,908	\$1,635,641	\$1,572,667
<i>Benefit Cost Ratio</i>	<i>0.98</i>	<i>1.12</i>	<i>1.50</i>	<i>1.58</i>
<i>Total Portfolio</i>				
Total Benefits	\$1,979,380	\$2,469,079	\$4,652,172	\$4,711,805
Total Costs	\$1,402,263	\$1,503,981	\$2,844,622	\$2,757,644
Portfolio Benefit Cost Ratio	1.41	1.64	1.64	1.71

TABLE 16: FOUR-YEAR PORTFOLIO BCA RESULTS

PORTFOLIO (Gas)	2017	2018	2019	2020
Societal Cost Test Ratio	1.41	1.64	1.64	1.71
Utility Cost Test Ratio	2.73	2.32	4.23	4.16
Ratepayer Impact Measure Test Ratio	0.38	0.42	0.45	0.47

GAS PROGRAM DESCRIPTIONS:

Commercial Program

COMMERCIAL GAS PROGRAM BUDGETS & TARGETS	2017	2018	2019	2020
Net Dth (Primary)	16,541	16,541	16,541	16,541
Carbon Dioxide Metric Tons (Secondary)	877	877	877	877
Participation (Secondary)	380	380	380	380
Incentives & Services	\$394,109	\$394,109	\$394,109	\$394,109
Program Implementation	\$244,984	\$244,984	\$244,984	\$244,984
Total budget	\$639,093	\$639,093	\$639,093	\$639,093

PRESCRIPTIVE

Central Hudson has implemented this initiative for commercial gas customers since 2010. This initiative targets all commercial gas customers regardless of their annual usage.

For additional information about implementation refer to the Prescriptive initiative as part of the commercial program of the electric portfolio.

CUSTOM

For additional information about implementation refer to the Custom initiative as part of the commercial program of the electric portfolio.

Residential Program

RESIDENTIAL GAS PROGRAM BUDGETS & TARGETS	2017	2018	2019¹¹	2020
Net Dth (Primary)	20,756	20,756	20,756	20,756
Carbon Dioxide Metric Tons (Secondary)	1,100	1,100	1,100	1,100
Participation (Secondary)	40,092	40,092	2,527	2,527
Incentives & Services	\$22,147	\$22,147	\$22,147	\$22,147
Program Implementation	\$112,432	\$112,432	\$112,432	\$112,432
Total budget	\$134,579	\$134,579	\$134,579	\$134,579

RESIDENTIAL GAS HVAC

The Residential Gas HVAC initiative has been part of Central Hudson’s gas efficiency portfolio since 2010. Since that time, several design changes have taken place to reduce incentives and eliminate measures that caused confusion and were too costly. Incentives are currently available for furnaces and boiler replacements. All residential gas customers are eligible to take advantage of this initiative. For the next planning cycle, Central Hudson plans to monitor measures in this initiative that are driving up the cost of the total program and portfolio. Incentives will be monitored and changed as appropriate to ensure successful management of the initiative.

For additional information about implementation refer to the Residential HVAC initiative as part of the residential program of the electric portfolio.

CENHUB STORE- REV DEMONSTRATION PROJECT

The CenHub customer engagement platform was launched as a REV Demonstration project in April 2016. The gas savings from measures such as low flow showerheads and faucet aerators may be applied to the acquired portfolio savings in accordance with the Technical Reference Manual. Driving customers to the Store through promotions and strategic marketing have contributed to the CenHub Store’s success.

¹¹ The planned elimination or significant restructuring of the residential Behavioral initiative results in a significant decrease to the residential target beginning in 2019. A corresponding increase in the commercial targets will be used to achieve the portfolio level goals. Budgets are also adjusted accordingly.

Quality Assurance/Quality Control Procedures:

The single sign-on controls prevent non-Central Hudson account holders from receiving a rebate for applicable product purchased on the Store. When a customer makes a purchase, we require them to verify questions that provide us with information that the customer will be installing this product in their home.

BEHAVIORAL- ENERGY INSIGHT REPORTS

The Energy Insights initiative is not voluntary, and customers were chosen based on a number of requirements such as length of time account is open, usage, etc. The goal of this initiative is to reduce consumption through targeted and seasonal messaging through email and mailed paper reports. Energy reports are sent capturing seasonality trends focusing on heating in the winter for gas customers. Customers are provided access to an online tool to track energy consumption and offer tips to reduce usage. Social competitiveness increases behavior to reduce energy consumption.

For additional information about implementation refer to the Behavioral initiative as part of the residential program of the electric portfolio.

Appendix A: Revised ETIP 2016 Annual Report

Appendix A:

Central Hudson Revised ETIP 2016 Annual Report

Program Year: 2016

ELECTRIC PORTFOLIO FINANCIAL AND SAVINGS ACTIVITIES

ELECTRIC BUDGET AND TARGET ACTIVITY SUMMARY:

TABLE 1: TOTAL FUNDS EXPENDED AND ENCUMBERED:

ELECTRIC PORTFOLIO	Planned Annual Budget	Expended	Encumbered	Total Expended and Encumbered
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Incentives & Services	\$3,534,747	\$2,968,236	\$14,498	\$2,982,734
Program Implementation	\$479,759	\$340,318	\$0	\$340,318
Total Budget	\$4,014,506	\$3,308,554	\$14,498	\$3,323,052
<i>Residential Sector</i>				
Residential Program				
Incentives & Services	\$1,169,333	\$1,313,460	\$5,250	\$1,318,710
Program Implementation	\$2,696,506	\$1,850,366	\$10,920	\$1,861,286
Total Budget	\$3,865,839	\$3,163,826	\$16,170	\$3,179,996
Total Portfolio				
Total Commercial Program	\$4,014,506	\$3,308,554	\$14,498	\$3,323,052
Total Residential Program	\$3,865,839	\$3,163,826	\$16,170	\$3,179,996
Portfolio Administration	\$74,000	\$70,530	\$0	\$70,530
Portfolio EM&V	\$525,000	\$509,056	\$0	\$509,056
Total Portfolio Budget	\$8,479,345	\$7,051,966	\$30,668	\$7,082,634

ELECTRIC PORTFOLIO ADMINISTRATION COSTS:

- The Program Administration budget category includes but is not limited to: costs associated with participating in industry organizations which promote sharing of best practices in Energy Efficiency, as well as training and educational expenses.

- Per the income statements included in Appendix A of the JP approved in Case 14-E-0318, internal labor for energy efficiency employees is included in base delivery rates at the following amounts:¹
 - January 1, 2016-June 30, 2016- \$244,000
 - July 1, 2016-June 30, 2017- \$504,000
 - July 1, 2017-June 30, 2018- \$521,000

SIGNIFICANT DIFFERENCES BETWEEN ANNUAL BUDGET AND ACTUAL EXPENDITURES:

- The Commercial Program total budget ended the year with a 17.6% variance between budget and actual expenditures and encumbrances. There were two main drivers that led to this variance:
 - The Commercial Online Lighting Store 2016 actuals were much less than originally estimated. This estimate was based on two large sales at the end of 2015. This experience served as a learning opportunity for designing and marketing new commercial initiatives in the future.
 - Participation in the Prescriptive and Custom programs in 2016 was less than originally estimated.

¹ The amounts included are on a calendar year basis (2016-\$496,000, 2017-\$513,000, 2018-\$521,000) and are based on a blend of rate years presented in Appendix A of the JP approved in Case 14-E-0318. The amounts listed here are electric only. Fringe benefits for energy efficiency employees are included with the Company's total fringe benefits, and costs are not broken out separately.

TABLE 2: PRIMARY AND SECONDARY TARGETS ACQUIRED AND COMMITTED THIS YEAR:

ELECTRIC PORTFOLIO	Planned Annual Targets	Acquired This Year	Committed at Year End	Year Total
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Net MWh (Primary)	16,025	13,157	83	13,240
Net MW (Secondary)	1.191	1.872	0.005	1.877
Carbon Dioxide Metric Tons (Secondary)	4,521	3,712	23	3,735
Participation (Secondary)	6,671	289	7	296
<i>Residential Sector</i>				
Residential Program				
Net MWh (Primary)	18,800	34,160	65	34,225
Net MW (Secondary)	1.842	2.439	0.565	3.004
Carbon Dioxide Metric Tons (Secondary)	5,303	9,636	18	9,655
Participation (Secondary)	121,173	146,982	105	147,087
<i>Total Portfolio</i>				
Net MWh (Primary)	34,240	47,317	148	47,465
Net MW (Secondary)	3.033	4.311	0.57	4.881
Carbon Dioxide Metric Tons (Secondary)	9,824	13,348	41	13,390
Participation (Secondary)	127,844	147,271	112	147,383

EVALUATION MEASUREMENT AND VERIFICATION (EM&V):

TABLE 3: EM&V ACTIVITY EXPENDITURES

EM&V Activity (Electric)	Planned Expenditures	Expended	Encumbered	Total Expended and Encumbered
Energy Efficiency & Demand Response Potential Study	\$77,998	\$73,762	\$0	\$73,762
Program Support & Planning	\$59,645	\$54,604	\$0	\$54,604
Market Research-Customer engagement	\$45,881	\$46,168	\$0	\$46,168
Market Research-Program Design	\$45,881	\$39,854	\$0	\$39,854
SBDI Impacts	\$22,500	\$19,516	\$0	\$19,546
Process Evaluation	\$105,527	\$68,351	\$37,176	\$105,527
Miscellaneous		\$169,592		\$169,595
Total EM&V Budget	\$357,432	\$471,847	\$37,176	\$509,056

TABLE 4: WITHDRAWN OR COMPLETED EM&V ACTIVITIES

EM&V Activity (Electric)	Status	Details & Significant Dates
Energy Efficiency & Demand Response Potential Study	Complete	Completed in May 2016
Market Research – Customer Engagement	Complete	Completed in April 2016
Market Research – Program Interest	Complete	Completed in April 2016
SBDI Program Impacts	Complete	Completed in December 2016

ELECTRIC PROGRAM DESCRIPTIONS:

Residential Program

In 2016, the electric residential portfolio expanded the number of initiatives that were implemented include residential lighting, including an option for low income customers, as well as an online marketplace. Other programs have been part of the portfolio for several years including residential heating and cooling, appliance recycling, and a behavior modification program. The residential program contributed 99.8% of the total electric portfolio acquired savings, while lighting alone contributed to 47.8% of the residential target.

For the first time in 2016, Central Hudson offered incentives for residential lighting as well as a program directed toward low income customers. Based on our potential study, residential and commercial lighting applications have the highest potential of savings in our service territory. Our Point of Sale lighting initiative ended the year at 86.2% of target. This initiative did not launch until April 2016, and the high participation from customers resulted in almost meeting the annual goal in under eight months. In-Store events were held where Central Hudson employees spoke with customers and provided them with education on lighting, but also other ways to manage their energy usage such as opening an account on CenHub. Partnering with Energy Star, manufacturers, and retailers have provided customers with additional products and information so that they have the tools to make more informed energy choices.

Point of Sale lighting and the CenHub Store made energy efficiency much more accessible to more residential customers than any other initiative ever offered. Customers are able to understand what the products are, and learn how updated lighting in their home can do more than just lower their energy bills. The increased participation in the residential program is primarily through these two initiatives. Customers are voluntarily deciding to take advantage of these “two ways to shop.”

In April 2016, the CenHub Store was launched as part of Central Hudson’s REV Demonstration Project. Along with increasing engagement, this environment was created to mimic other shopping experiences customers typically have today with other industries. Most of the products sold on the Store are aimed towards energy efficiency, while some are there to appeal to the more “tech” driven customers who want a “connected home.” While the energy efficiency products that are eligible come with an instant rebate, products such as indoor cameras and smart door locks do not.

Commercial Program

Central Hudson's electric commercial program was comprised of mature programs such as Direct Install Lighting and new initiatives that included a Prescriptive and Custom model. A test program was implemented as an online platform for commercial customers to purchase bulbs directly and install on their own. As with any new initiative, ramp up and customer awareness is a challenge. While the direct install lighting program has been part of the portfolio for several years, the other programs required additional time to develop in time in 2016. Last year, the commercial program contributed 59.9% of the total electric portfolio acquired MWh achievement, with the majority of savings achieved from lighting measures.

In 2016, Central Hudson wanted to test new concepts within the commercial sector. The Commercial Online Lighting Store was created as a tool commercial customers could use to self-audit their facility to determine what lighting products would best suit their needs. Feedback from customers in the past has been that they would like the opportunity to purchase bulbs, receive an incentive, and use an internal employee to perform the installation. The Commercial Online Lighting Store launched as a test in October 2015. During the test phase in 2015, two large purchases were made that falsely represented the actual interest from customers.

The full program launched in April 2016 with a robust marketing plan through email and direct mailers as well as a "Feet on the Street" community campaign. In addition to the online model, this program provided a revenue sharing opportunity for each purchase made. Although engagement in the beginning was promising, the activity in 2016 slowed down significantly and the Company decided not offer this program anymore as an option in our portfolio. This test serves as a learning opportunity when Central Hudson looks to design new engagement initiatives for commercial customers.

GAS PORTFOLIO FINANCIAL AND SAVINGS ACTIVITIES

GAS BUDGET AND TARGET ACTIVITY SUMMARY:

TABLE 5: TOTAL FUNDS EXPENDED AND ENCUMBERED:

GAS PORTFOLIO	Planned Annual Budget	Expended	Encumbered	Total Expended and Encumbered
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Incentives & Services	\$99,875	\$55,080	\$0	\$55,080
Program Implementation	\$79,816	\$49,737	\$0	\$49,737
Total Budget	\$179,691	\$104,817	\$0	\$104,817
<i>Residential Sector</i>				
Residential Program				
Incentives & Services	\$316,381	\$314,255	\$0	\$314,255
Program Implementation	\$277,600	\$226,610	\$0	\$226,610
Total Budget	\$593,981	\$540,865	\$0	\$540,865
Total Portfolio				
Total Commercial Program	\$179,691	\$104,817	\$0	\$104,817
Total Residential Program	\$593,981	\$540,865	\$0	\$540,865
<i>Portfolio Administration</i>	\$25,000	\$191	\$0	\$191
<i>Portfolio EM&V</i>	\$38,684	\$0	\$0	\$0
Total Portfolio Budget	\$837,356	\$645,682	\$0	\$645,682

GAS PORTFOLIO ADMINISTRATION COSTS:

- The Program Administration budget category includes but is not limited to: costs associated with participating in industry organizations which promote sharing of best practices in Energy Efficiency, as well as training and educational expenses.
- Per the income statements included in Appendix A of the JP approved in Case 14-G- 0319, internal labor for energy efficiency employees is included in base delivery rates at the following amounts:²

² The amounts included are on a calendar year basis (2016-\$15,000, 2017-\$31,000, 2018-\$32,000) and are based on a blend of rate years presented in Appendix A of the JP approved in Case 14-G-0319. The amounts listed here are gas only. Fringe benefits for energy efficiency employees are included with the Company's total fringe benefits, and costs are not broken out separately.

- January 1, 2016-June 30, 2017- \$15,000
- July 1, 2016-June 30, 2017- \$31,000
- July 1, 2017-June 30, 2018- \$32,000

SIGNIFICANT DIFFERENCES BETWEEN ANNUAL BUDGET AND ACTUAL EXPENDITURES:

- The Commercial Program ended the year with the 41.7% variance between the annual budget and actual expenditures and encumbrances due to lower customer participation in the Prescriptive and Custom initiatives in 2016 than originally estimated.
- The Portfolio Administration total budget ended the year with the 99.2% variance between budget and actual expenditures and encumbrances. The main driver of this variance is Central Hudson's expenses for training and industry meetings were not focused on gas energy efficiency activities.
- The EM&V total budget ended the year with the 100% variance between budget and actual expenditures and encumbrances. The main drivers that led to this variance:
 - The evaluation activity in 2016 was heavily focused on electric energy efficiency technologies and initiatives.

TABLE 6: PRIMARY AND SECONDARY TARGETS ACQUIRED AND COMMITTED THIS YEAR:

GAS PORTFOLIO	Planned Annual Targets	Acquired This Year	Committed at Year End	Year Total
<i>Commercial & Industrial Sector</i>				
Commercial Program				
Net Dth (Primary)	6,500	2,656	0	2,656
Carbon Dioxide Metric Tons (Secondary)	345	141	0	141
Participation (Secondary)	202	41	0	41
<i>Residential Sector</i>				
Residential Program				
Net Dth (Primary)	30,796	52,501	0	52,501
Carbon Dioxide Metric Tons (Secondary)	1,633	2,783	0	2,783
Participation (Secondary)	41,207	30,689	0	30,689
Total Portfolio				
Net Dth (Primary)	37,296	55,157	0	55,157
Carbon Dioxide Metric Tons (Secondary)	1,978	2,924	0	2,924
Participation (Secondary)	41,409	30,730	0	30,730

SIGNIFICANT DIFFERENCES BETWEEN ANNUAL TARGET AND ACTUAL ACQUIRED:

- The Commercial Program ended the year with a 59.1% variance between the annual target and actual acquired due to lower than expected customer participation in the Prescriptive and Custom initiative.
- The Residential Program ended the year with a 70.5% positive variance between the annual target and actual acquired due to greater than expected customer response to the Energy Insights initiatives.

EVALUATION MEASUREMENT AND VERIFICATION (EM&V):

TABLE 7: EM&V ACTIVITY EXPENDITURES

EM&V Activity (Gas)	Planned Expenditures	Expended	Encumbered	Total Expended and Encumbered
Activity 1		\$0		\$0
Activity 2		\$0		\$0
Activity 3		\$0		\$0
Total EM&V Budget	\$38,684	\$0		\$0

TABLE 8: WITHDRAWN OR COMPLETED EM&V ACTIVITIES

EM&V Activity (Gas)	Status	Details & Significant Dates
Activity 1	N/A	N/A
Activity 2	N/A	N/A
Activity 3	N/A	N/A

- Central Hudson’s 2016 Evaluation activities were focused on the electric portfolio and new initiatives.

GAS PROGRAM DESCRIPTIONS:

Residential Program

Central Hudson's residential gas portfolio has offered a residential heating, cooling, and ventilation option for customers since September 2009. The behavioral insights program also targets a portion of the messaging towards customers that heat with gas. A clustering of messages in the heating season promote high levels of savings. Both of these programs are standard, and other opportunities to test new concepts aren't as common due to the fact that only 25% of Central Hudson's residential customers heat with gas.

Commercial Program

Central Hudson's commercial gas portfolio has offered a commercial heating, cooling, and ventilation option for customers since December 2010. In 2016, a custom program opportunity was created similar to the commercial electric portfolio. Both of these programs are standard and other opportunities to test new concepts aren't as common due to the fact that only 25% of Central Hudson's customers heat with gas.

Appendix B: Energy Efficiency 2017-2020 Budget and Metric Plan



Central Hudson Gas & Electric Corporation

Energy Efficiency 2017-2020 Budget and Metric Plan

Central Hudson Gas & Electric Corporation

ENERGY EFFICIENCY 2017-2020 BUDGET AND METRIC PLAN

Electric Portfolio	2017	2018	2019	2020
Budget	\$8,479,345	\$8,479,345	\$8,479,345	\$8,479,345
Target (MWh) ¹	34,240	34,240	22,488	15,122

Gas Portfolio	2017	2018	2019	2020
Budget	\$837,356	\$837,356	\$837,356	\$837,356
Target (Dth)	37,296	37,296	37,296	37,296