The Narragansett Electric Company
d/b/a National Grid
Docket XXXX
Annual Plan Attachment 7

2021 Bill and Rate Impacts

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1 Summary

National Grid has performed analyses of the electric and gas bill impacts resulting from the proposed 2021 Energy Efficiency Program Plan pursuant to the updated Least Cost Procurement Standards approved by the RI PUC in Docket 5015. Bill impacts are distinct from rate impacts because they model the effects of efficiency programs on annual customer bills by aggregating rate and consumption changes. In the electric bill impact analysis, rate changes are modeled by mapping EE programs to rate classes and estimating changes in both delivery service rates and supply costs due to the energy efficiency (EE) program charge proposed in the Plan. Consumption impacts are predicted from proposed participation and energy efficiency savings. In the electric model, other effects of energy efficiency beyond direct energy savings such as price suppression and avoided infrastructure investments are also included.

The gas bill and rate impact analysis use a new model that was developed by Synapse Energy Economics (Synapse) that improves upon the modeling approach for rate and bill impacts that was used in the 2020 and prior year plans. This new model uses a similar approach as the electric model to estimate the long-term impacts to rates and average bills due to the presence of energy efficiency in one year compared to a counterfactual with no efficiency programs. The new model is capable of outputting a comparable set of long term rate and bill impacts as included in the electric modeling in this year and in prior years and is described further in Section 4.

2 Key Findings

In the 2021 analysis, National Grid used the same methods for the electric bill impacts as in previous years. In the natural gas analysis, National Grid used the new modeling approach developed by Synapse Energy Economic (Synapse). The electric findings did not change dramatically from the 2020 Annual Plan analysis to the present 2021 Annual Plan analysis. Because of the change in methods for the natural gas analysis, the results are not directly comparable to prior years' analyses. Changes to the natural gas analysis are discussed in more detail in Section 4. The key findings of the bill impact analyses are:

- Most customers are participating in EE programs.
- In the electric portfolio, high participation means that over the lifetimes of the programs proposed for 2021, the average Rhode Island customer's (participants and non-participants combined) bill will be less than if there were no programs. Overall, rates may increase, but energy savings from participation in electric EE programs results in bill savings that offset the costs of the EE program charge and revenue recovery.
- In the gas portfolio, the analysis shows slight long term average rate increases of between 0.3% and 0.7% depending on sector due to the 2021 annual plan. Participants in all programs and customer segment groupings see reductions in their long term bills due to their 2021 participation.

3 Electric Bill Impacts

3.1 Methodology

The electric bill impact models used to generate the electric results were adapted from models originally built by Synapse Energy Economics on behalf of the Division of Public Utilities and Carriers in 2013. These models are distinct from the traditional electric bill impacts models the Company presents in Rates proceedings before the PUC. The models analyze two cases: the fulfillment of the 2021 Plan and the absence of an efficiency plan in 2021. This comparison isolates the effects of the proposed 2021 EE program charge and Fully Reconciling Funding Mechanism. It assumes energy efficiency plans have been implemented before 2021 but will not be offered starting in 2021. The analysis also incorporates how system-wide reduction in energy consumption affects the different elements of rates such as transmission, distribution, and commodity charges.

As in the analysis in the 2020 Plan, five separate electric models were developed, one for each of the main customer segments: Residential, Income Eligible, Small Commercial, Medium Commercial, and Large Commercial and Industrial. For all of the electric models, the key inputs are the net planned participation and savings numbers from Table E-7 in Attachment 5.[1] The models combine these data with rate class information to determine the benefits to customer bills from program participation. Table 1 below shows the mapping of efficiency programs to rate classes for the five models.[2] The diversity of the commercial customer profile means that customers from multiple rate classes can participate in any commercial program. Assumptions for these rate classes were made based on historical program participation data.[3]

Table 1. Electric Rate and Program Mapping

Electric Bill Impact Model	Rate Class(es)	Efficiency Programs
Residential Electric	A-16	Home Energy Reports
		EnergyStar HVAC
		EnergyWise Multifamily
		EnergyStar Lighting
		Residential Consumer Products
Income Eligible Electric	A-60	Income Eligible Single Family
		Income Eligible Multifamily

[1] The 2021 Annual Plan analysis maintains the approach of modeling five rate class groupings as used in the last year's annual plan to allow for a more realistic depiction of bill impacts because there is a wide array of usage among commercial customers and having more groupings helps illustrate typical impacts.

[2] Delivery service rate tariffs is R.I.P.U.C. Tariff No. 2095 for rates A-16 (basic residential rate), A-60 (low-income residential rate), C-06 (small C&I rate), G-02 (medium C&I rate), G-32 (large C&I rate). Standard Offer Service rates used in the analysis are R.I.P.U.C. No. 2096 and R.I.P.U.C. No. 4809 A-16 & A-60 total commodity charge for standard and low income residential rate group, C-06 total commodity charge for small C&I rate group, G-02 total commodity charge for medium C&I rate group and G-32 total commodity charge for large C&I rate group.

[3] Savings and participation modeled by C&I rate classes is partitioned and estimated based on historical data.

		Home Energy Reports
		EnergyStar Lighting
Small Commercial	C-06	Small Business Direct Install
		Large Commercial New Construction
		Large Commercial Retrofit
Medium Commercial	G-02	Small Business Direct Install
		Large Commercial New Construction
		Large Commercial Retrofit
Large Commercial	G-32, G-62	Small Business Direct Install
		Large Commercial New Construction
		Large Commercial Retrofit

3.2 Discussion and Interpretation of Electric Results

The results of the models are shown in Tables 2 through 6, and some highlights of the results are presented after the Tables. The columns in the Tables are as follows:

- Long-term rate impacts are defined as the average rate increase percentage from 2021 to 2040 (positive numbers indicate rate increase).
- Typical energy savings refer to the average percentage of energy savings to total annual consumption from 2021 to 2040 (negative numbers indicate electricity consumption reduction).
- Typical bill savings are defined as average percentage of bill decrease to total customer bill from 2021 to 2040 (negative numbers indicate electricity bill reduction).

The long-term rate impacts, typical energy savings, and typical bill savings are shown for average participants in energy efficiency programs, non-participants, and average customers within each of the five main customer segments. Average customers combine the bill impacts of EE participants and non EE participants to show the impacts of all customers combined. For the 2021 Bill Impact analysis the key finding is that over the lifetimes of the programs proposed for 2021 the average Rhode Island customer's (participants and non-participants combined) bill will be less than if there were no programs.

Table 2. Residential Bill Impact Analysis – A-16 (2021 EE Plan vs. No EE)

Residential	**Long-Term Rate Impacts (% of Total Rate)**	**Typical Energy Savings (% per Participant)**	**Typical Bill Savings (% of Total Bill)**
Average Participant	0.41%	-1.05%	-0.42%
Non-Participant	0.41%	0.00%	0.41%
Average Customer	0.41%	-1.05%	-0.42%

Table 3. Income-Eligible Bill Impact Analysis – A-60 (2021 EE Plan vs. No EE)4

Income-Eligible	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	1.23%	-3.72%	-2.54%
Non-Participant	1.23%	0.00%	1.23%
Average Customer	1.23%	-3.66%	-2.46%

Table 4. Small Commercial Bill Impact Analysis – C-06 (2021 EE Plan vs. No EE)5

Small Business	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	0.37%	-10.9%	-8.88%
Non-Participant	0.37%	0.00%	0.37%
Average Customer	0.37%	-1.14%	-0.81%

Table 5. Medium Commercial Bill Impact Analysis – G-02 (2021 EE Plan vs. No EE)

Medium C&I	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	0.03%	-9.05%	-9.02%
Non-Participant	0.03%	0.00%	0.03%
Average Customer	0.03%	-1.66%	-1.66%

Table 6. Large C&I Bill Impact Analysis – G-32, G-62 (2021 EE Plan vs. No EE)

Commercial & Industrial	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	-0.16%	-4.29%	-4.44%
Non-Participant	-0.16%	0.00%	-0.16%
Average Customer	-0.16%	-2.56%	-2.72%

On the residential side, rates increase for both the residential and income-eligible rate classes. For all rate classes non-participant bills increase slightly, while participant and average customer bills decrease. The

[4] Home Energy Reports and Energy Star Lighting participation and savings are split between standard residential and income-eligible customers, since these measures reach all residential customers. For analysis purposes, the participation and savings in these two programs are allocated based on the percent of residential customers in standard income and income-eligible rates. Income-eligible customers account for 7.7% of participation and 7.7% of savings in the two programs.

[5] For 2021, as in the 2020 Plan analysis, the small business (C-06 rate) customer count has been refined to better estimate customers. The number of accounts on the C-06 rate is greater than the number of customers, for example there are many accounts for cell towers, pumps, etc. that belong to one customer. This is an estimate based on the best data currently available to the Company.

reduction in average customer bills demonstrates that the scale of the energy savings due to program participation outweighs the incremental costs to implement the program.

On the commercial side, long-term rates increase slightly for small C&I and medium C&I customers, and decrease for large C&I customers. Overall, long term rate impacts are similar in terms of magnitude and direction across all rate classes from 2020 to 2021. For Small, Medium, and Large Commercial customers, bill savings occur for all customers (participants and non-participants), with the exception of slight bill increases (0.37%) for non-participant small business customers and (0.03%) for non-participant medium business customers.

- *Residential long-term rate impact*: EE programs bring system benefits in terms of avoided infrastructure investment in generation, transmission, and distribution in the long-run. These avoided investments will ultimately flow through rates and offset the short-term contribution of the EE program charge to the 2021 rate and bring the long-term rate increase down to 0.41% for standard residential customers and 1.23% for income-eligible residential customers.
- *Small, Medium, and Large C&I long-term rate impact*: Avoided infrastructure costs flow through rates and offset the EE program charge for 2021 and beyond, leading to a 0.37% increase in rates for small C&I customers, a 0.03% rate increase for medium C&I customers, and a 0.16% rate decrease for large C&I customers through 2040.
- *Average participant bill savings*: the proposed EE programs will bring bill savings to participants in all rate groups. Specifically, typical bill savings are 0.42% for standard residential participants, 2.54% for income-eligible residential participants, 8.88% for small C&I participants, 9.02% for medium C&I participants, and 4.44% for large C&I participants.
- For the 2021 Bill Impact Analysis, Commercial participation by rate class is assumed to be similar to historical participation from calendar year 2019.
- *Average customer typical bill savings*: among all participants and non-participants, typical bill savings are 0.42% for standard residential customers, 2.46% for income-eligible residential customers, 0.81% for small C&I customers, 1.66% for medium C&I customers, and 2.72% for large C&I customers, indicating that the proposed EE programs will bring net benefits to all types of electric customers in Rhode Island (Tables 2-6).

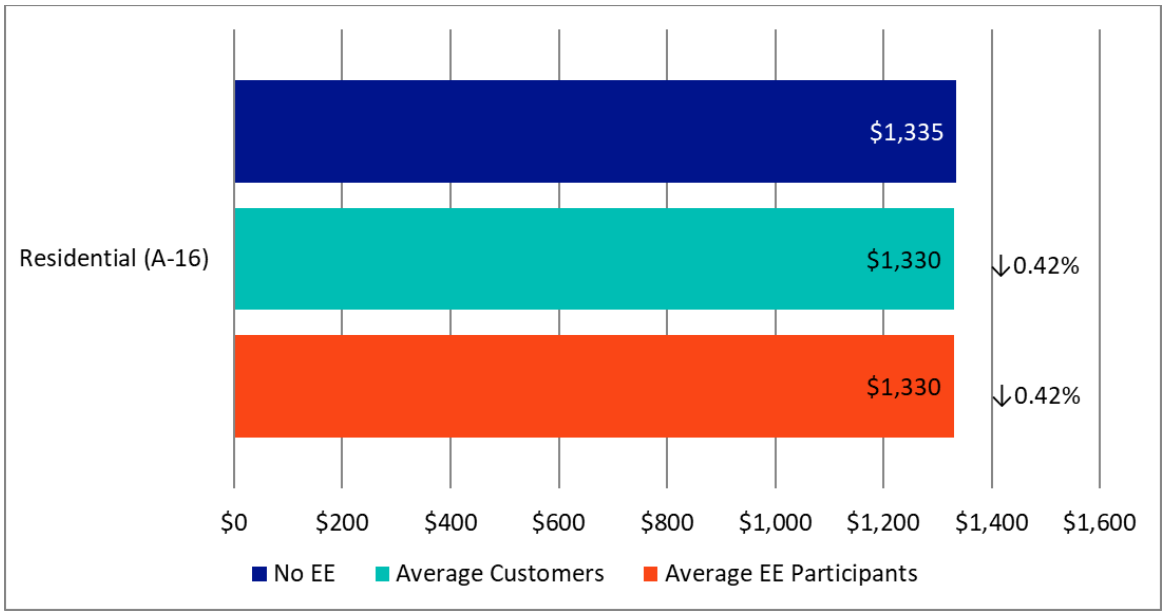
Figure 1 through Figure 5 show examples of electric bill reduction for average residential, income-eligible, small C&I, medium C&I and large C&I customers and participants. Bills are calculated based on average annual consumption of a typical customer in Rhode Island in each class, using the values in Table 7.

Table 7. Average Annual Consumption per Customer in Modeled Customer Classes[6]

Modeled Customer Class	Average Annual Per-Customer Consumption (kWh/year)
Residential (A-16)	6,764
Income-Eligible (A-60)	6,134
Small C&I (C-06)	33,885
Medium C&I (G-02)	151,049
Large C&I (G-32 and G-62)	2,143,795

In the figures below, the rates are the same as rates used in the bill impact analysis above. This illustration is different from traditional incremental bill impacts because it shows the long-term bill impact of the proposed EE programs and accounts for the measure life of the energy efficiency measures.

Figure 1. Example of Typical Residential (A-16) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)



[6] Average per-customer annual consumption is calculated based on the forecast electric consumption for each rate class for 2021 and the latest customer counts, for all classes except small business C-06. The small business (C-06 rate) average customer consumption has been refined to better estimate customers based on best data currently available to the Company for both count of customers and their annual consumption. The number of accounts on the C-06 rate is greater than the number of customers, for example there are many accounts for cell towers, pumps, etc. that belong to one customer.

Figure 2. Example of Typical Income Eligible (A-60) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)

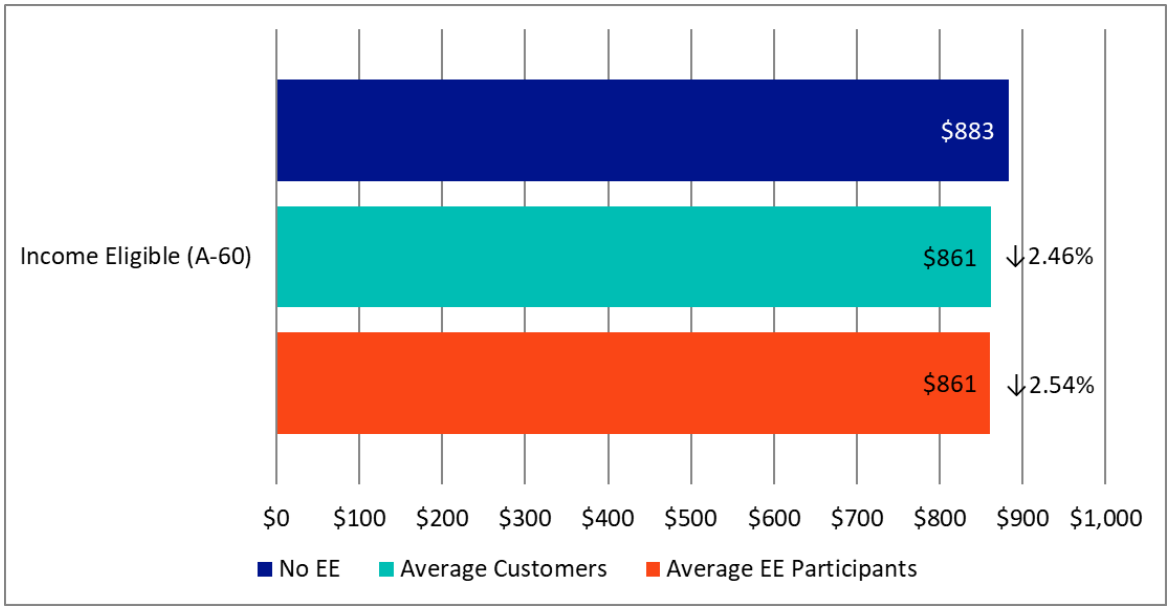


Figure 3. Example of Typical Small C&I (C-06) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)

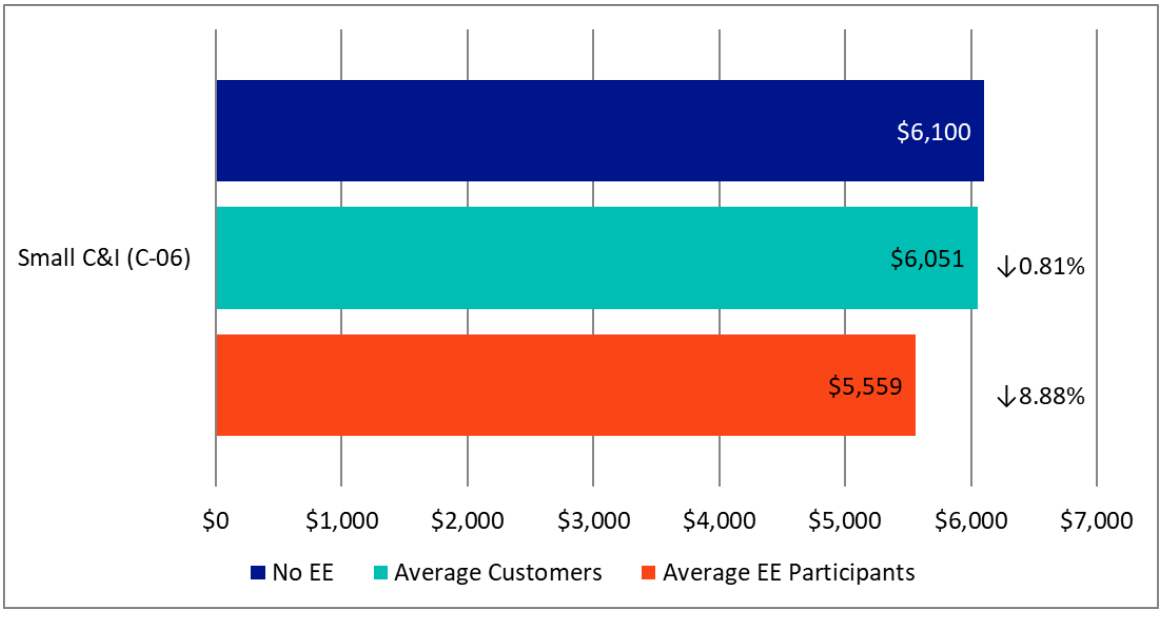


Figure 4. Example of Typical Medium C&I (G-02) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)

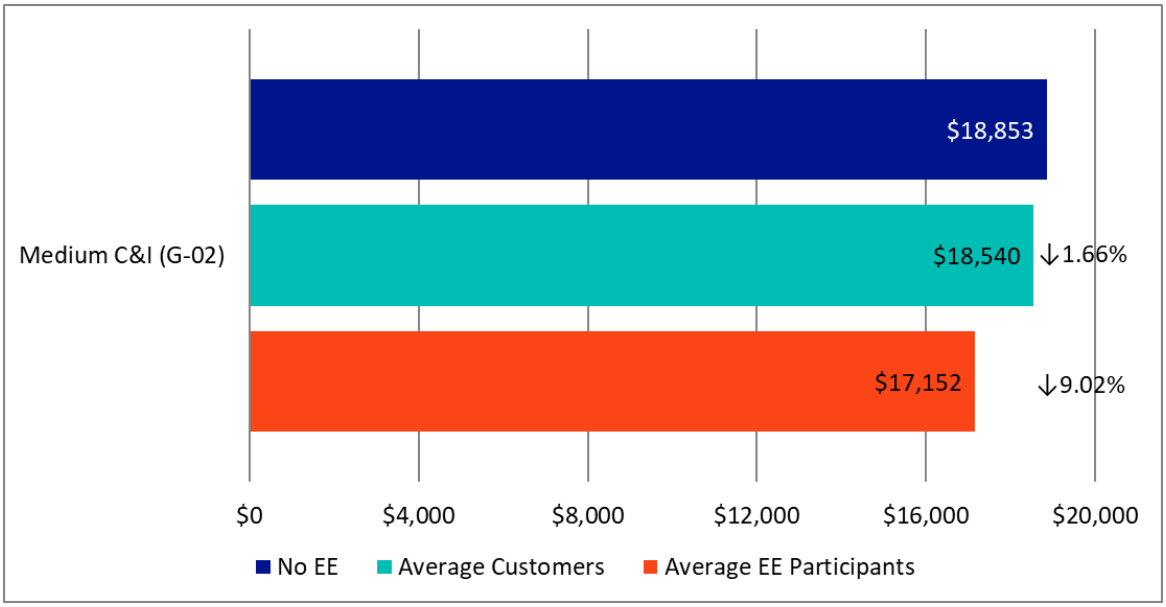
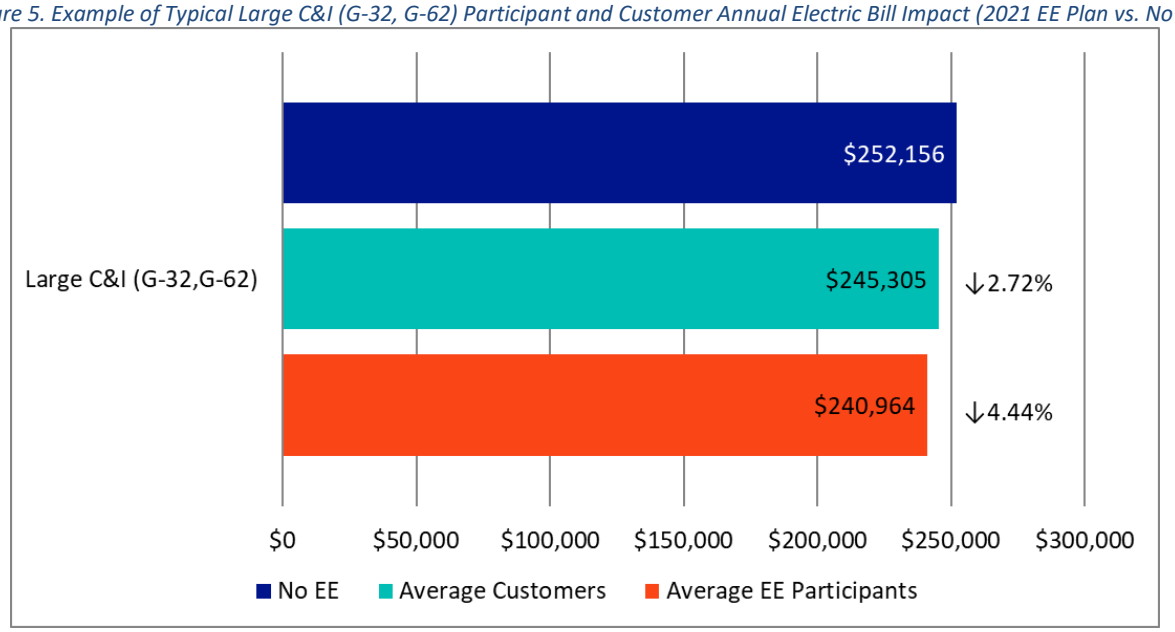


Figure 5. Example of Typical Large C&I (G-32, G-62) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)



4 Gas Bill and Rate Impacts

4.1 Model Background

During the process leading up to the 2020 Annual Energy Efficiency Plan, the Company and stakeholders determined that there was a need for an enhanced methodology to estimate the rate and bill impacts of the natural gas portfolio. In the 2020 plan and in prior years the Company utilized internally-developed methodologies to estimate rate and bill impacts for the gas portfolios. In calendar year 2020, the Company contracted with Synapse Energy Economics ("Synapse") to develop an enhanced model for use in the 2021 Annual Energy Efficiency Plan.

The modeling tool developed by Synapse is designed to analyze long-term rate and bill impacts from energy efficiency programs implemented over a course of three years, or one year. This is an enhancement over prior years' analysis which were more limited in scope. For example, the 2020 analysis included only the first year effects of the energy efficiency charge on rates, and the first year bill impacts due to energy savings generated from efficiency program participation.

The new model used in this plan provides a long term perspective on the impact of one year of gas energy efficiency programs compared to a counterfactual where there is no energy efficiency program in that year. The model considers the upward pressure on rates and bills due to the energy efficiency surcharge in the first year, the upward pressure of lost revenue collection in the first year and future years in which energy efficiency measures create savings, and the downward pressure on rates and bills due to the avoided costs generated by those savings as they persist into the future.

For the analysis presented in this plan and section, the 2021 proposed programs are analyzed. The model assesses four categories of customers. These categories include all the programs offered in the gas portfolio:

- Residential
    - EnergyWise
    - EnergyStar HVAC
    - EnergyWise Multi-family
    - Home Energy Reports
    - Residential New Construction
- Income Eligible
    - Single Family
    - Multi-family
- Small Commercial and Industrial
    - Small Business Direct Install
- Large Commercial and Industrial
    - Commercial New Construction

- Commercial Retrofit
- Commercial Multi-family

The model outputs of interest are the forecast changes in rates and the forecast changes in bills due to the proposed energy efficiency investments. The model compares two scenarios: (1) a scenario in which no efficiency resources are implemented over the next three years, and (2) a scenario that reflects the proposed investments in efficiency over the same period.

- *Rate impacts* indicate the extent to which rates change for all customers due to utility energy efficiency programs. This includes upward pressure on rates from program cost and lost revenue recovery, as well as downward pressure on rates from avoided utility system costs.
    - *Long-term rate impacts.* The model includes all avoided costs that might exert downward pressure on rates, as well as any factors that might exert upward pressure on rates. It estimates rate impacts over the long-term to capture the full period over which the efficiency savings occur. The resulting impacts are provided in terms of annual net change in rates in dollars per therm, annual percent change in rates, and long-term net change in levelized rates over a 24 year period.
- *Bill impacts* indicate the extent to which customer bills might be reduced for those customers that participate in efficiency programs and how bills will be impacted for non-participating customers.
    - *Typical bill impacts.* The model calculates average annual bill impacts for program participants, all customers, and non-participants. It considers the long-term rate impacts and energy savings for each program and the four customer types. The resulting bill impacts are shown in terms of levelized long-term average dollar change in bills, net-present value of long-term dollar change in bills, and long-term average percent change in bills.

4.2 Model Inputs

The model takes as input the following categories of information:

- Energy Efficiency program savings: the model takes as input the planned savings for each program in both annual and lifetime savings.
- Participation: National Grid projects participation for each program across each year of the plan.
- Avoided Costs: The model takes as input the avoided cost of natural gas and natural gas demand reduction induced price effect (DRIPE) due to gas energy efficiency.
    - The portion of the natural gas avoided cost that impacts rates is limited to the avoided retail margin costs, and price suppression benefits (Demand Reduction Induced Price Effects or DRIPE

    - The model has the capability to be further refined in the future if other components of avoided costs are quantified and monetized, such as gas transmission and distribution values. Those types of costs are included in the electric bill and rate impact, but are not included in the gas analysis.
- Programmatic Costs: The costs planned for each program are input to the model based on National Grid's budget and benefit cost analysis models. Sector or portfolio levels costs are also included and allocated to customer groupings proportionally to program specific costs.
- Rates: Natural Gas rates for customer classes modeled: residential, income eligible, small commercial and industrial, and large commercial and industrial. The rates are averaged from the prevailing rates on January 1, 2020, May 1, 2020, and September 1, 2020 to capture variability in rates throughout the year.
    - Residential: Rate 12
    - Income eligible: Rate 13
    - Small Commercial and Industrial: Rate 21
    - Large Commercial and Industrial
        - Large C&I: Weighted average of Rates 22,33,23,34,24. Weighted by program participation in the Large C&I programs for 2018-2019.
        - C&I Multi-family: Rate 22
- Customer Count: The latest gas customer counts as of August 31, 2020 by sector are included in the model. These customer counts are escalated out into the future based on projected growth rates.
- Sales Forecast: A sales forecast that omits future natural gas energy efficiency savings is utilized in the model to properly characterize the counterfactual state of the world with no energy efficiency programs.

4.3 Summary of Results

The following subsections summarize the results of the rate and bill impact modeling for each of the four modeled customer segments. The overall results for the 2021 plan at the sector level are presented in the table below with additional detail provided in subsections and figures below. This analysis projects that each modeled customer sector will see a levelized net change in long term rates of between 0.3% and 0.7% due to the 2021 energy efficiency programs. The first year cost of the programs combined with the recovery of lost revenue put upward pressure on rates, while avoided costs as detailed earlier generate downward pressure on rates.

The 2021 gas portfolio will result in long term average bill decreases for program participants in the income eligible, small C&I, and large C&I sectors of between 1.16% and 7.12%.

The residential sector is unique in that it includes the Home Energy Report (HER) program. This behavioral program provides recommendations for residential customers to save energy by taking actions in their home, rather than by installing more-efficient equipment. This results in the program

having a measure life of only one year, as the evaluated results show that behavioral efficiency of this type has relatively short persistence compared to other residential programs that install longer-lived measures. The HER program also reaches nearly all residential customers through either mail or email, meaning that nearly all residential customers are participants.[7]

It is therefore instructive to view the rate and bill impacts for the residential sector in three separate modeling analyses:

1) Results of the HER program in isolation
2) Results of all other residential programs together (EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Residential New Construction)
3) Results with HER and all other residential programs

It is important to note that each of these three parts of the residential sector analysis has been developed using a separate instance of the gas rate and bill impacts model. In the model, the period of time covered by the analysis is determined by the average measure life of the longest included program. Consequently, the model instance analyzing the Home Energy Report program in isolation covers a much shorter period of time than the other two model instances, which means that the three instances are not directly comparable, and the first two model instances do not additively result in the third instance.

Additionally, in the model instance that assesses all programs together, HER participants incur costs associated with the non-HER programs, such as lost revenue recovery. These costs are not captured in the model instance analyzing the Home Energy Report program in isolation.

The HER program in isolation shows essentially no change in bills for participants (-0.01%), average customers (0.00%) or non-participants (0.02%). This is to be expected because the number of participants is high enough that the per-participant savings is less than 1 net MMBtu per participant, resulting in minimal change to bills. Taken at the individual level, the savings results are modest, however in aggregate the HER program generates significant net annual savings by reaching most residential customers and doing so at relatively low cost.

When the remaining four residential programs are assessed together, the results show that participants see an average reduction of 5.29% on their bills over the long term, while average customers see a 0.15% increase, and non-participants see an increase of 0.41%. The EnergyWise, EnergyStar HVAC,

[7] Customers who are not served by the HER program are only excluded due to reasons of evaluability, that is, in order to assess the savings in a statistically valid way, a control group of sufficient size is required.

EnergyWise Multi-family, and Residential New Construction programs have fewer participants than the HERs program, have longer-lived average measure lives (between 17 and 23 years), and generate deeper savings per participant than the HER program, all resulting in deeper bill savings for participants.

Lastly, when all residential programs are modeled together (HER, EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Residential New Construction), the modeling shows a counterintuitive result of participants realizing a slight increase (0.03%) in their long-term bills. This result is a byproduct of the way that the model considers participants for the residential sector when all residential programs are considered together. To calculate impacts for total participants, the model considers the count of participants in the first year, including the large pool of HER participants, through the duration of the modeling period (24 years). The savings for all of the residential programs are therefore spread across a large group of participants and minimizing their impact.

Because of the truly unique nature of the HER program in terms of its measure life, distribution to most customers, and relatively small per-customer savings relative to other residential programs, the Company believes that in the context of this analysis it is also appropriate to consider the results of the HER program in isolation from the remaining four residential programs. Therefore, the residential programs are modeled with three separate modeling instance as shown below.

Table 8. Summary of Rate and Bill Changes due to the 2021 Proposed Natural Gas Energy Efficiency Portfolio

Sector	Levelized net change in rates due to 2021 Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.4%	0.41%	0.15%	-5.29%
Residential (Model 3: All Programs)	0.4%	0.43%	0.15%	0.03%
Income Eligible	0.7%	0.75%	-0.16%	-4.48%
Small C&I	0.3%	0.25%	0.19%	-7.12%
Large C&I	0.4%	0.41%	0.00%	-1.16%

Further detail is provided for each sector in the subsections below.

4.3.1 Residential

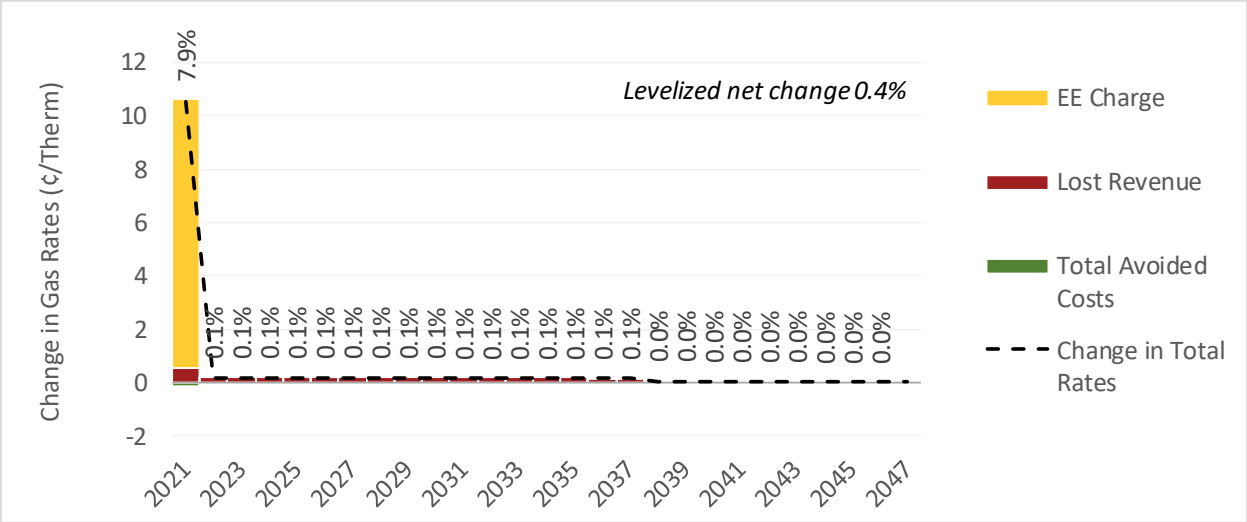
The Income Eligible sector is modeled using rates from rate class 12, Residential Heating. The rate and bill impacts for this sector are modeled for five programs, EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Home Energy Reports, and Residential New Construction. The residential sector is modeled

using an annual consumption figure of 845 therms per year, of which 699 therms are winter usage and 146 therms are summer usage determined by dividing sales for the sector by meter counts. The customer population is modeled using latest customer counts as of August 2020, 209,537 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020.

4.3.1.1 Residential Rates

For the residential sector the 2021 Plan creates a levelized net change in rates of 0.4% (Figure 6) compared to the counterfactual with no energy efficiency.

Figure 6. Change in Rates: Proposed EE vs No EE for the 2021 Plans - Residential



4.3.1.2 Residential Bills

As discussed in the Summary of Results (Section 4.3), the residential programs should be considered in three distinct modeling iterations. First the HER program is assessed in isolation, then the four remaining programs are considered together, and finally all programs are combined in a single analysis. For purposes of characterizing the bill impacts from the residential programs, the results of the first model illustrates that for the HER program in isolation, there is minimal change in long-term average bills, with only a 0.01% reduction for participants. This result is reasonable given the short duration of savings for the HERs program and the small per-participant savings generated by this program.

Figure 7. 2021 Long-Term Levelized Average Change in Annual Bills – Residential, HER Program Only

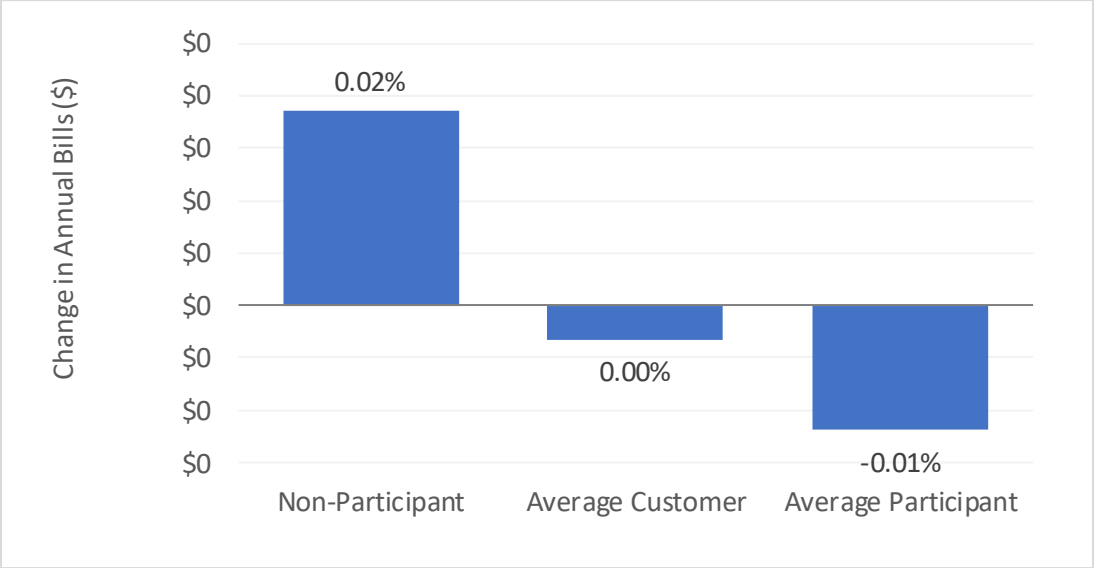
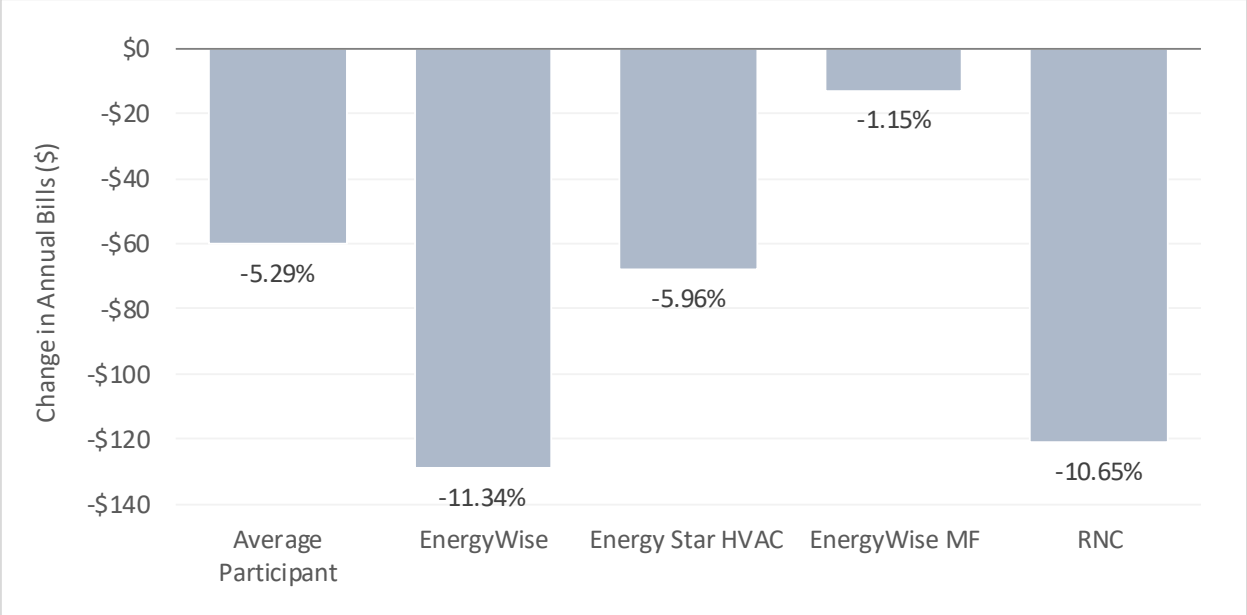


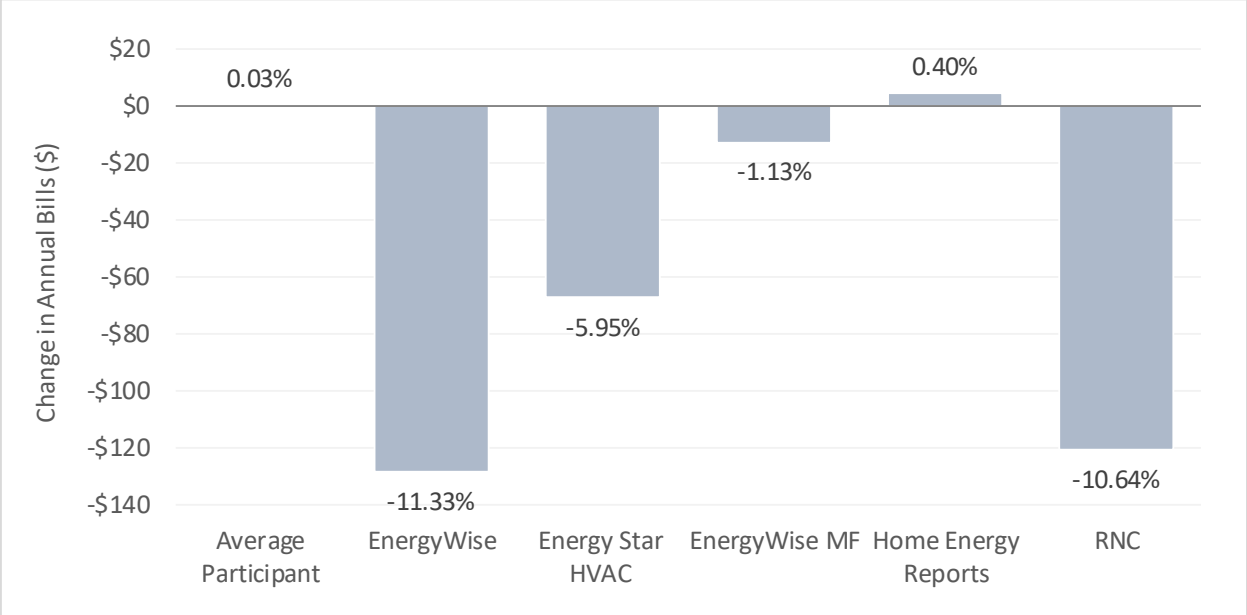
Figure 8 shows the long-term average bill change for program participants in the EnergyWise, Energy Star HVAC, EnergyWise Multi-family, and Residential New Construction programs. The average bill savings range from 1.15% to 11.34% among these programs.

Figure 8. 2021 Long-Term Levelized Average Change in Annual Bills by Program Participants –Residential, HER Excluded



Lastly, Figure 9 shows the impacts for all residential programs together. As discussed previously, these results should not be indicative of a true increase in bills among program participants, but rather result from the combination of the disparate nature of the programs included in this model scenario and how their respective inputs interact in the model.

Figure 9. 2021 Long-Term Levelized Average Change in Annual Bills by Program Participants – All Residential



4.3.2 Income Eligible

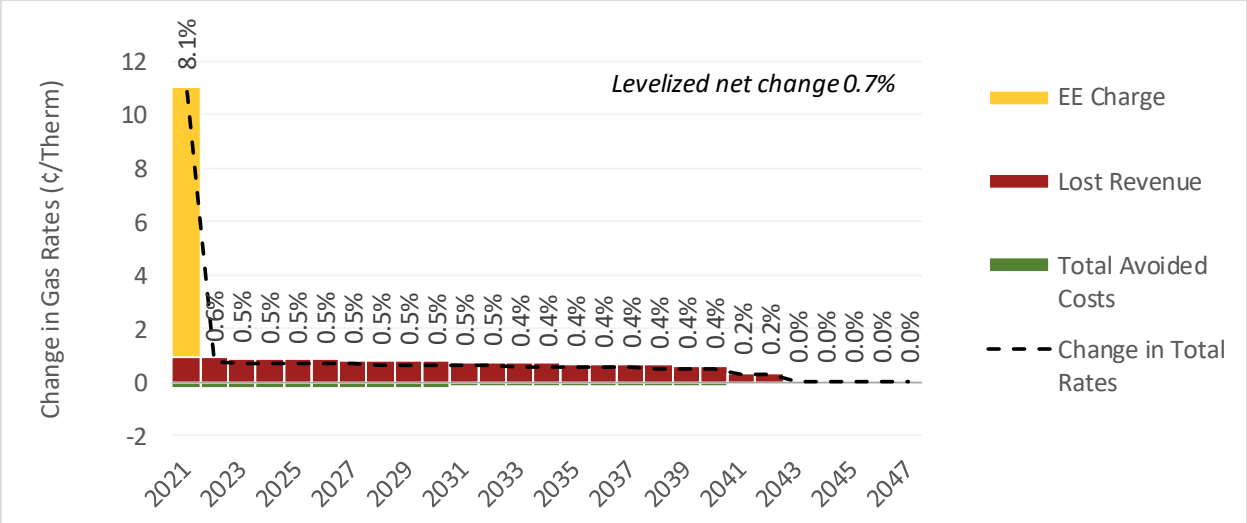
The Income Eligible sector is modeled using rates from rate class 13, low income residential heating. The rate and bill impacts for this sector are modeled for two primary programs, the income eligible single family and income eligible multifamily programs. Income eligible customers also participate in the home energy reports program that is modeled as part of the residential sector in this analysis. The income eligible sector is modeled using an annual consumption figure of 841 therms per year, of which 690 therms are winter usage and 151 therms are summer usage determined by dividing sales for the sector by meter counts. The customer population is modeled using latest customer counts as of August 2020, 20,703 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020.

4.3.2.1 Income Eligible Rates

The 2021 programs addressing the income eligible market are projected to result in a 0.7% levelized increase in rates for the income eligible sector (Figure 10). Compared to the residential sector, which has similar usage as the income eligible sector, the relative impact to rates is larger for this customer group partially because the energy efficiency charge represents a larger portion of the overall per-therm cost

because distribution adjustment charges (DAC) are lower for income eligible customers than residential customers.

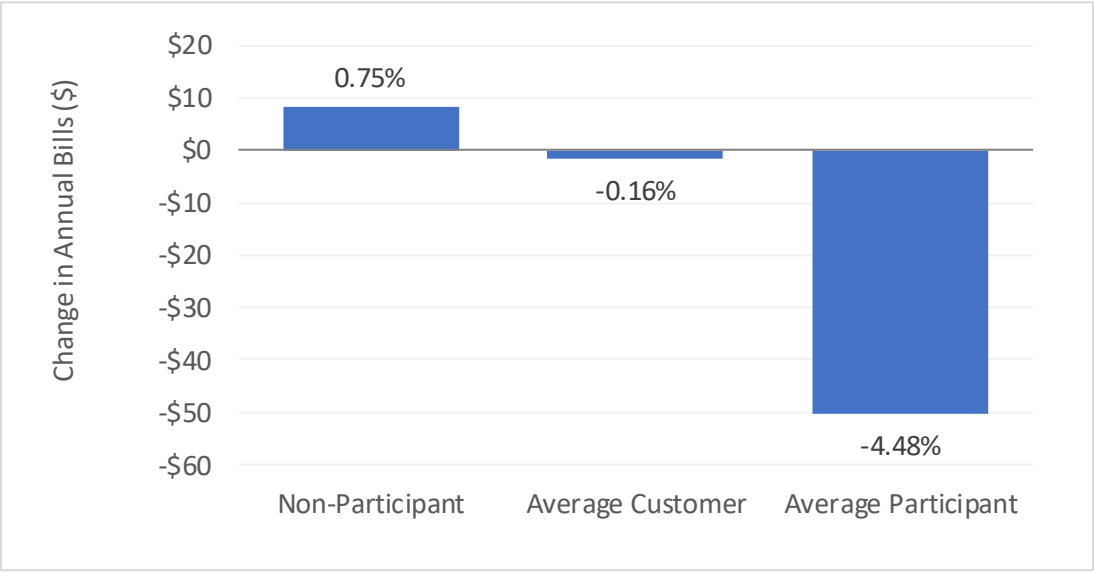
Figure 10. Change in Rates: Proposed EE vs No EE for the 2021 Plan – Income Eligible



4.3.2.2 Income eligible Bills

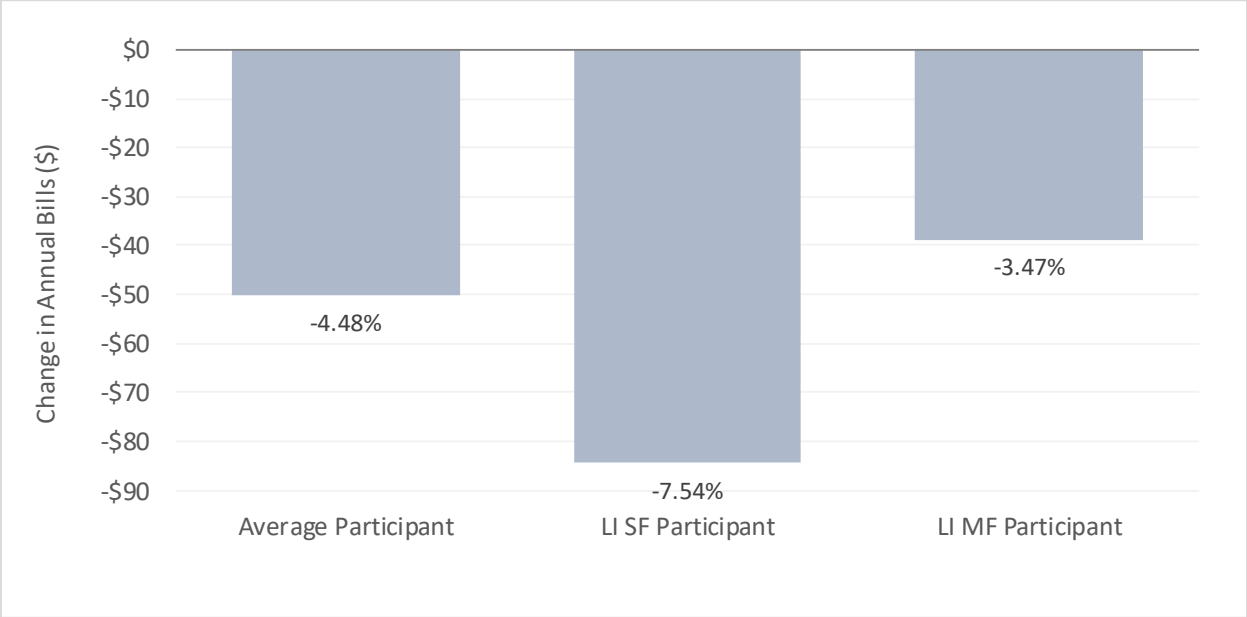
The income eligible programs planned in the 2021 plan will result in a long-term average reduction in bills for participating customers of 4.48% on average. Average customers will see a 0.16% reduction in annual bills and non-participants will see a 0.75% increase in bills.

Figure 11. Long-Term Average Change in Annual Bills for the 2021 Plan– Income eligible Customer Group



Analyzing each program individually, participants in the single family income eligible program will see an average of 7.54% reduction in annual bills due to their 2021 participation, while multi-family income eligible participants will see an average 3.47% reduction in annual bills over the long-term.

Figure 12. Long-Term Average Change in Annual Bills for the 2021 Plan– Income eligible participant impacts by program



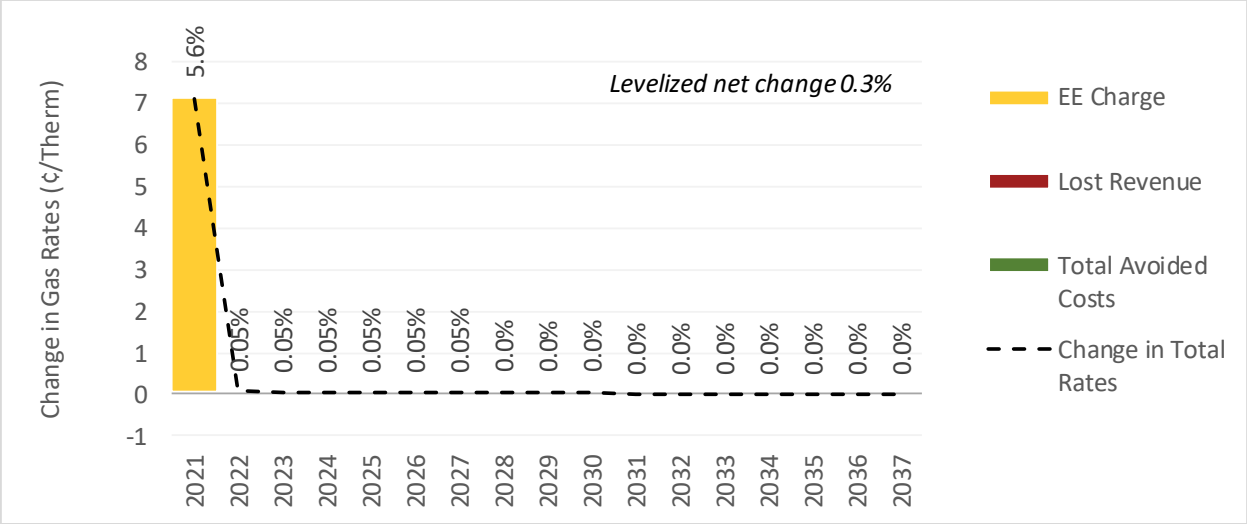
4.3.3 Small Commercial and Industrial

The Small Commercial and Industrial sector is modeled using rates from rate class 21, Small (< 5,000/yr). The rate and bill impacts for this sector are modeled for the Small Business Direct Install program. The Small Commercial and Industrial sector is modeled using an annual consumption figure of 1,270 therms per year, of which 1,062 therms are winter usage and 208 therms are summer usage determined by dividing sales for the sector by meter counts. The customer population is modeled using latest customer counts as of August 2020, 19,063 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020.

4.3.3.1 Small Commercial and Industrial Rates

The 2021 program addressing the small C&I market are projected to result in a 0.3% levelized increase in rates for the commercial and industrial sector (Figure 13).

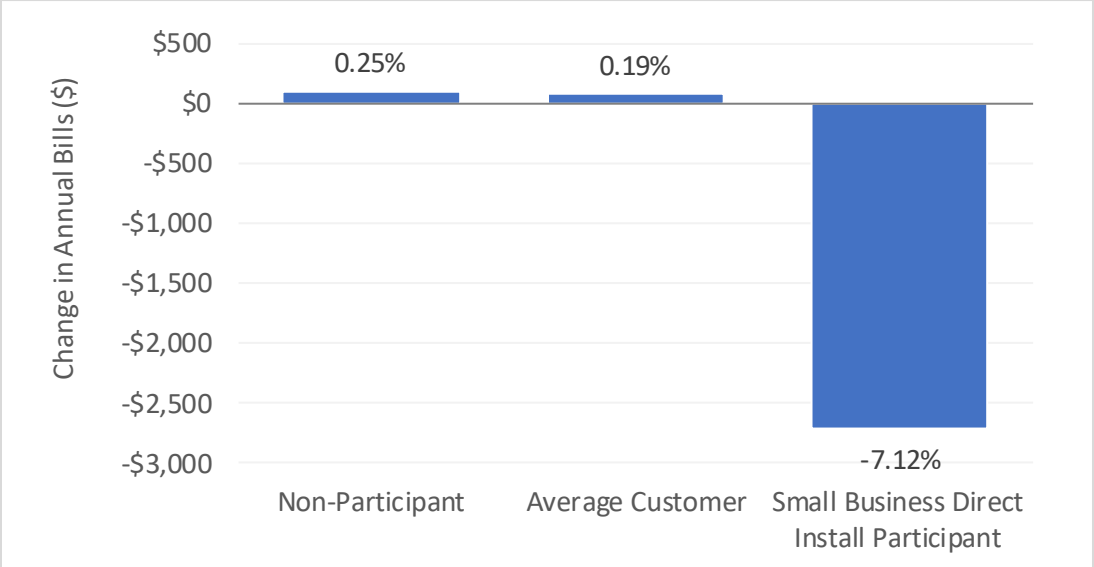
Figure 13. Change in Rates: Proposed EE vs No EE for the 2021 Plan – Small Commercial and Industrial



4.3.3.2 Small Commercial and Industrial Bills

The Small Commercial and Industrial program will result in an average annual bill reduction of 7.12% for participants in the Small Business Direct Install program (Figure 14).

Figure 14. Long-Term Average Change in Annual Bills for the 2021 Plan– Small Commercial and Industrial



4.3.4 Large Commercial and Industrial

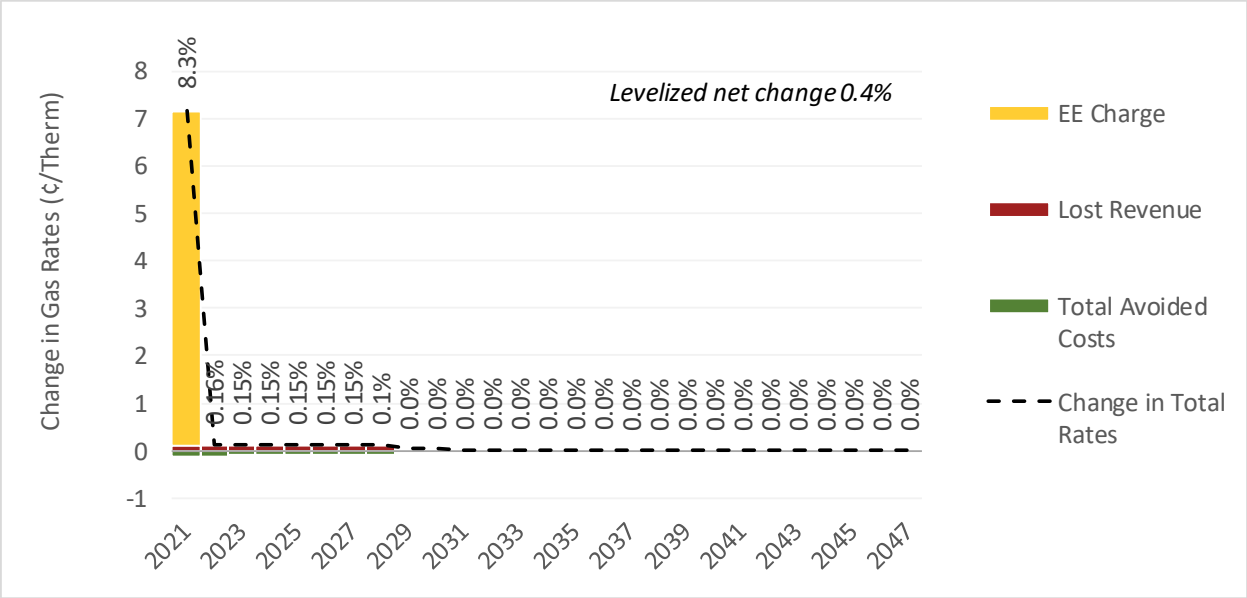
The Large Commercial and Industrial sector is modeled using rates from rate classes 22,33,23,34,24. The rate and bill impacts for this sector are modeled for the Commercial New Construction, Commercial

Retrofit, and Commercial Multi-family programs. The customer population is modeled using latest customer counts as of August 2020, 5,910 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020. Consumption among participants is modeled using usage observed among the large C&I program participants in the 2018 and 2019 programs and for the medium C&I class for C&I multifamily participants.

4.3.4.1 Large Commercial and Industrial Rates

The 2021 programs addressing the large C&I market are projected to result in a 0.4% levelized increase in rates for the commercial and industrial sector.

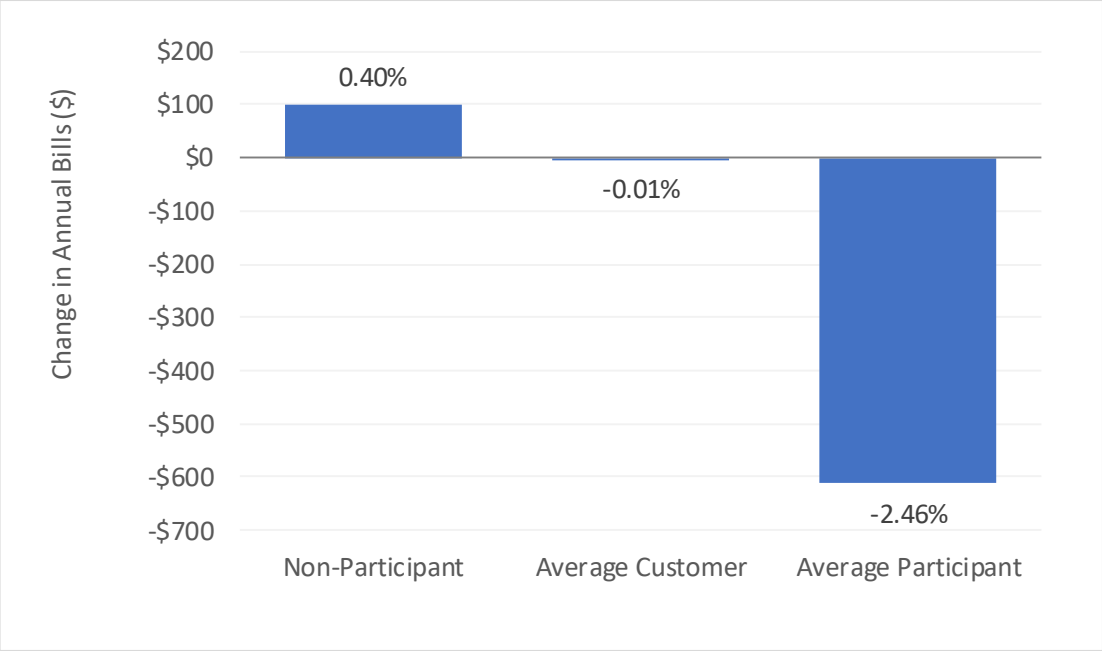
Figure 15. Change in Rates: Proposed EE vs No EE for the 2021 Plan – Large Commercial and Industrial



4.3.4.2 Large Commercial and Industrial Bills

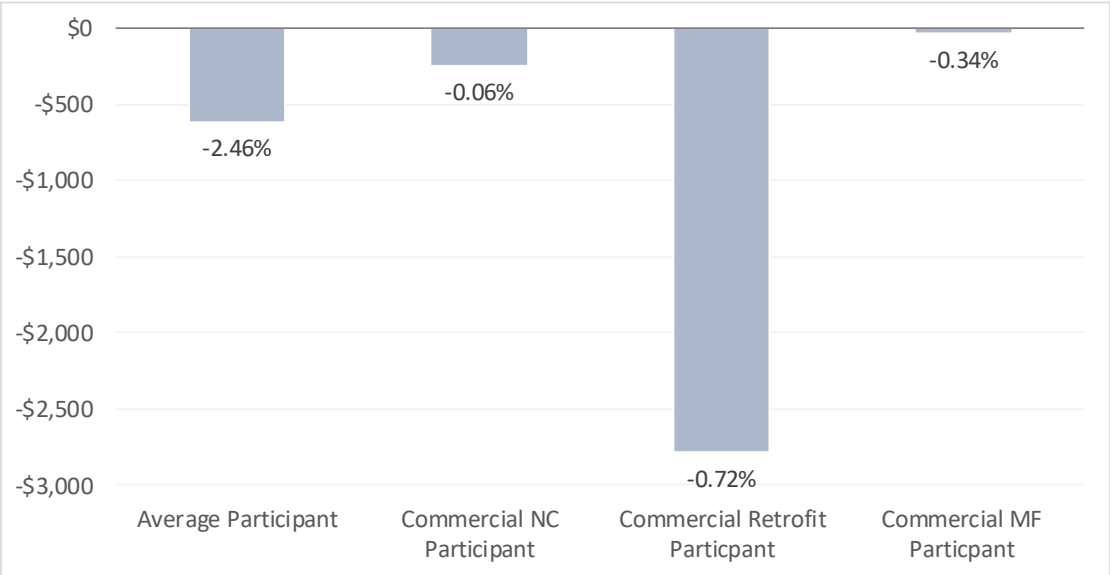
The large commercial and industrial programs will result in an average annual bill reduction of 1.16% for participants.

Figure 16. Long-Term Average Change in Annual Bills for the 2021 Plan– Large Commercial and Industrial Group



Analyzing each program individually, commercial retrofit participants will see a reduction of 0.72%, while participants in the commercial new construction program and the commercial multi-family programs will see smaller changes in their bills with changes of -0.06% and 0.34%, respectively.

Figure 17. Long-Term Average Change in Annual Bills for the 2021 Plan– Large Commercial and Industrial impacts by program



4.4 Discussion and Interpretation of Natural Gas Results

While this analysis indicates that for the proposed natural gas efficiency investments there is slight upward movement of rates, as with most customer segments in the electric portfolio, the results should not be viewed in isolation and are one component that the Company considers in its proposed energy efficiency plan. For each customer segment the modeling shows reductions in long-term bills due to customer participation in the programs. In addition to the rate and bill impacts, the Company considers both the benefit cost results and the cost of supply in developing its proposal. The portfolio of programs is highly cost effective per the RI Test analysis and less than the cost of supply. The 2021 gas portfolio overall has a BC ratio of 3.0 under the RI Test and cost of supply analysis shows that the cost of energy efficiency is $14.2 Million less than the cost of alternative gas supply.

Note that the RBI model excludes several key benefits of energy efficiency. For example, the price of carbon is not fully accounted for in National Grid's natural gas rates. Efficiency programs reduce carbon and other greenhouse gas emissions, which is not accounted in this model but is accounted for in the BCA as a non-embedded benefit. Likewise, the gas efficiency programs create non-energy benefits that are not accounted for in this model but are included in the BCA.

As noted earlier, a key distinction between the gas model and the related electric model is the limited set of gas avoided costs. The portion of the natural gas avoided cost that impacts rates is limited to the avoided retail margin costs, and price suppression benefits (Demand Reduction Induced Price Effects or "DRIPE"). In contrast, in the electric model there are embedded RGGI costs in rates and the electric model also accounts for T&D avoided costs. The gas model has the capability to incorporate a T&D avoided cost in the future should one be developed through the AESC 2021 study, but it is not currently accounted for in the calculation of long term rates in the present analysis.

The Company will reassess the inputs and assumptions in this analysis for each subsequent annual efficiency plan filing and make updates to the analysis and model as appropriate to continue to incorporate latest information and understanding of the impacts of the gas programs on long-term energy costs and customer bills.