

STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET DE 20-092

IN THE MATTER OF: Electric and Gas Utilities
 2021-2023 Triennial Energy Efficiency Plan

DIRECT TESTIMONY

OF

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October 29, 2020

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1 **Introduction**

2 **Q. Please state your full name?**

3 A. My name is Elizabeth R. Nixon.

4 **Q. By whom are you employed and what is your business address?**

5 A. I am employed by the New Hampshire Public Utilities Commission (NH PUC) as a Utility
6 Analyst in the Electric Division. My business address is 21 S. Fruit Street, Suite 10, Concord,
7 NH 03301.

8 **Q. Please summarize your education and professional work experience.**

9 A. I joined the NH PUC in August 2012 in the Sustainable Energy Division working on
10 renewable energy issues. In August 2016, I became a Utility Analyst in the NH PUC's
11 Electric Division. Prior to the NH PUC, I was employed at the NH Department of
12 Environmental Services, Air Quality Division, from 1999 until 2012, in various positions.
13 Prior to joining the State, I worked as a consultant at ICF and AER*X, Inc. Throughout my
14 career, I have focused on energy, environmental, and economic issues and analysis. I earned
15 a B.S. in Mathematics from the University of Vermont. More details on my educational and
16 professional background is provided in Attachment ERN-1.

17 **Q. What is the purpose of your testimony in this proceeding?**

18 A. My testimony provides comments and recommendations regarding various aspects of the
19 2021-2023 New Hampshire Statewide Energy Efficiency Plan ("Plan" or "plan") dated
20 September 1, 2020 filed jointly by the New Hampshire electric and gas utilities ("Utilities").
21 The Utilities are Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities
22 ("Liberty Utilities Electric"), New Hampshire Electric Cooperative, Inc. ("NHEC"), Public
23 Service Company of New Hampshire d/b/a Eversource Energy ("Eversource"), and Utility

1 Energy Systems, Inc. (“Unitil Electric”), and EnergyNorth Natural Gas, Inc. d/b/a Liberty
2 Utilities (“Liberty Utilities Gas”), and Northern Utilities, Inc. (“Unitil Gas”).

3 **Q. Please provide a summary of your testimony.**

4 A. My testimony addresses the savings targets, spending per customer and associated rates and
5 bill impacts; lost base revenues; planning structure and plan filings/modifications; the
6 technical reference manual; program incentives; the energy optimization pilot; the active
7 demand response program; cost-effectiveness analyses; EM&V working group; reporting;
8 and future planning approach. In the final section, I summarize my comments and
9 recommendations.

10

11 **Savings Targets, Spending per Customer and Associated Rates and Bill Impacts**

12 *Savings Targets*

13 **Q. What are the savings targets proposed for the three year plan?**

14 A. The electric utilities combined propose to save five percent over the three years from 2019
15 electric delivery sales levels. The gas utilities combined propose to save three percent over
16 the three years from 2019 sales levels. Note, however, that each utility and each sector is not
17 projected to save these proposed overall saving goal levels; some utilities project savings
18 above the overall goals, while some project savings below the overall goals.

19 **Q. Please explain how the savings are distributed among the electric utilities and sectors?**

20 Please see Table 1 which summarizes the total annual savings for the three year period for
21 each electric utility by sector. As the table shows, Eversource saves a little more than five
22 percent, while the other electric utilities save less than five percent. For electric utilities,
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Table 1. Total Annual Savings By Electric Utility By Sector (2021-2023)

	Eversource		NHEC		Liberty Electric		Unitil Electric		Total Electric	
	Total Savings 2021-2023 (kWh)	% of Utility Savings	Total Savings 2021-2023 (kWh)	% of Utility Savings	Total Savings 2021-2023 (kWh)	% of Utility Savings	Total Savings 2021-2023 (kWh)	% of Utility Savings	Total Savings 2021-2023 (kWh)	% of Utility Savings
Residential	46,315.8	11.5%	7,503.9	29.5%	10,051.8	22.7%	16,096.5	30.2%	79,968.0	15.2%
C&I	356,052.5	88.5%	17,896.2	70.5%	34,133.7	77.3%	37,283.1	69.8%	445,365.5	84.8%
Total	402,368.3	100.0%	25,400.1	100.0%	44,185.5	100.0%	53,379.6	100.0%	525,333.5	100.0%
% Savings from 2019	5.2%		3.3%		4.9%		4.6%		5.0%	

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Table 2. Total Annual Savings By Gas Utility By Sector (2021-2023)

	Liberty Gas		Unitil Gas		Total Gas	
	Total Savings 2021-2023 (MMBtu)	% of Utility Savings	Total Savings 2021-2023 (MMBtu)	% of Utility Savings	Total Savings 2021-2023 (MMBtu)	% of Utility Savings
Residential	231,671.7	41.0%	63,471.1	33.7%	295,142.8	39.2%
C&I	333,507.3	59.0%	124,930.8	66.3%	458,438.1	60.8%
Total	565,179.0	100.0%	188,401.9	100.0%	753,580.9	100.0%
% Savings from 2019	3.2%		2.5%		3.0%	

5

1 overall the commercial and industrial (“C&I”) sector is proposed to save about 85 percent of
2 the total electric savings from C&I versus 15 percent of the savings from the residential
3 sector. For Eversource, the savings are similarly proportional - the C&I sector provides 88.5
4 percent of the savings versus the residential sector’s contribution of 11.5 percent, while the
5 savings for the other electric utilities is closer to about 23-30 percent residential versus 70-77
6 percent C&I.

7 **Q. What are the 2019 electric sales by utility and sector?**

8 A. For Eversource, Unitil and Liberty electric, the C&I sales are about 58 percent and residential
9 are 42 percent although the split is a little different depending on the utility. NHEC ratio is
10 reversed with more residential sales (62 percent) than C&I sales (38 percent).

11 **Q. Do the percentage savings by sector and utility align with corresponding percentages of**
12 **sales?**

13 A. Overall, each electric utility proposes to achieve savings in approximately the same ratio as
14 statewide sales, but the sector savings are not aligned with sector sales. The C&I sector is
15 proposed to achieve more energy savings (85 percent) compared to the residential sector (15
16 percent) while sales from each sector are 42 percent for residential versus 58 percent for C&I
17 (except for NHEC).

18 **Q. Please explain how the savings are distributed between the gas utilities and sectors?**

19 A. Please see Table 2 which summarizes the annual energy savings by gas utility for the three
20 year period of the Plan. For the gas utilities, Liberty Gas proposes to save a little more than
21 three percent and Unitil Gas a little less. The savings are distributed between the sectors at
22 about 30-40 percent for residential and 60-70 percent for C&I.

23

1 *Spending per Customer*

2 **Q. What is the spending per customer for each of the utilities and sectors?**

3 A. Please refer to Table 3 which summarizes the total spending per total customers (or members
4 for NHEC, but hereinafter referred to as customers for simplicity) by sector for the three-year
5 period for each utility. While the customer mix varies from utility to utility, the actual
6 spending per customer presumably should not vary significantly unless the variation can be
7 explained. As shown, the spending per residential customer seems fairly consistent except
8 for low income customers where the spending per customer varies significantly. Liberty
9 Electric proposes spending about \$3,900/low income customer with Liberty Gas spending
10 about \$890 per low income customer. The other utilities propose spending \$1,300 per
11 customer to \$2,200 per customer. The utilities have committed to spending 17 percent of
12 their budgets for low income customers.¹ The contractors for the low income program all
13 agree to be paid the same rates. It is unclear why Liberty Electric has proposed to spend
14 more than double what most of the other utilities have proposed to spend per low income
15 customer. Liberty Electric does have fewer low income customers than the other electric
16 utilities, but their low income population is similar to Unitil Gas who proposes to spend
17 about \$1670 per customer.

18 For C&I customers, the gas utilities propose spending about \$780 per customer to \$890 per
19 customer, while the electric utilities propose spending about \$170 per customer at NHEC to
20 \$2000 per customer at Eversource. Unitil Electric and Liberty Electric both propose to spend
21 about the same per C&I customer at about \$1550 per customer. As noted previously,
22 Eversource has proposed spending more on C&I customers compared to the other utilities

¹ Note that the electric utilities are also required to spend at least 20 percent of the energy efficiency funds collected through system benefit charge on low income programs. See RSA 374-F:3, VI.

1 and compared to their residential sector. NHEC has more small C&I customers, therefore,
2 the amount of savings that can be achieved in their C&I sector may be more limited.

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Table 3. Spending per Customer by Utility and Sector (2021-2023)

	Eversource	NHEC	Liberty Electric	Unitil Electric	Liberty Gas	Unitil Gas
Low Income	\$ 2,211	\$ 1,701	\$ 3,896	\$ 1,303	\$ 890	\$ 1,667
Residential	\$ 120	\$ 135	\$ 156	\$ 137	\$ 134	\$ 156
C&I	\$ 2,054	\$ 173	\$ 1,570	\$ 1,547	\$ 779	\$ 888
Total	\$ 529	\$ 187	\$ 510	\$ 439	\$ 272	\$ 380

5

6 *System Benefits Charge (“SBC”)*

7 **Q. What system benefits charge rates does each electric utility propose?**

8 A. The system benefits charge rate consists of three parts: the energy efficiency programs
9 portion, the lost base revenue (“LBR”) portion, and the Employee Assistance Programs
10 (“EAP”) portion. Importantly, the SBC is a nonbypassable charge.² Please refer to Table 4
11 which summarize the total SBC rates for the three-year period for each utility by sector and
12 shows the percentage change from year to year and from the current rates in 2020. Note that
13 in this three-year plan, the electric utilities have proposed a different SBC rate for each
14 sector, whereas in the past the SBC rate (for the energy efficiency portion of the SBC) was
15 the same for all electric utilities and for all sectors. The 2020 SBC rates include LBR which
16 varies from utility to utility so the 2020 rates presented in the table vary utility by utility.
17 For the proposed three-year plan, the residential rates vary from year to year from a decrease
18 for NHEC in 2023 but with a more significant increase in the first year. The rest of the

² RSA 374-F:3, IV.

1 utilities' residential rates increase from year to year by a low of 4 percent to a maximum of
2 28 percent from year to year. The C&I rates change from year to year from about 15 percent
3 at Liberty to a high of 71 percent for Eversource. More notable is the overall increase from
4 the current rates in 2020. In 2023, the residential rates increase by 27 percent (Eversource) to
5 58 percent (Liberty) from the current rates. The C&I rates at their highest point increase by a
6 range of 75 percent by NHEC in 2022 to 227 percent by Eversource in 2023.

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Table 4. Summary of Total SBC Rates and Percentage Change³

		Total SBC rate (\$/kWh)		Year to Year Percentage Change		Percentage Change from 2020	
		Residential	C&I	Residential	C&I	Residential	C&I
Eversource	2020	0.00743	0.00743				
	2021	0.00866	0.01270	17%	71%	17%	71%
	2022	0.00898	0.01807	4%	42%	21%	143%
	2023	0.00941	0.02432	5%	35%	27%	227%
Liberty	2020	0.00678	0.00678				
	2021	0.00790	0.00783	17%	15%	17%	15%
	2022	0.01014	0.00993	28%	27%	50%	46%
	2023	0.01072	0.01211	6%	22%	58%	79%
Unitil	2020	0.00752	0.00752				
	2021	0.00885	0.01146	18%	52%	18%	52%
	2022	0.01068	0.01341	21%	17%	42%	78%
	2023	0.01165	0.01613	9%	20%	55%	114%
NHEC	2020	0.00678	0.00678				
	2021	0.00988	0.01056	46%	56%	46%	56%
	2022	0.01023	0.01186	4%	12%	51%	75%
	2023	0.01003	0.01155	-2%	-3%	48%	70%

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³ Note that Liberty confirmed in a data request that their calculation of lost base revenue for 2021 is \$0.00072/kWh although they indicate it as 0.00072 cents/kWh in Attachment F3 in the filed plan. Therefore, the total SBC is corrected in Table 4. See Attachment ERN-2 for an update to Unitil's C&I SBC rate for 2023 as noted in data response Staff 2-077.

1 The percentage change in rates is useful to see, but also the absolute change in rates should
2 be considered as well as the overall bill impact, in judging whether a rate is just and
3 reasonable. In 2020, all the SBC rates are below 1 cent per kWh. As proposed, Eversource
4 has the highest total C&I SBC rate at 2.432 cents/kWh. All of the other utilities propose total
5 SBC rates under 1.7 cents/kWh. For comparison, the current SBC rate associated with just
6 the energy efficiency programs is 0.528 cents/kWh (or 0.678 cents/kWh including EAP).
7 The total current SBC rates range from 0.678 cents/kWh to 0.752 cents/kWh. In 2023, the
8 residential total SBC rates range from 0.941 cents/kWh (Eversource) to 1.165 cents/kWh
9 (Unitil).

10 **Q. How do these rate changes in this three-year EERS plan compare to previous years of**
11 **the EERS?**

12 A. In 2017, which was the transition year to the EERS, the energy efficiency portion of the SBC
13 rates was 0.198 cents/kWh. When taking into account the lost base revenue and EAP, the
14 total SBC rate in 2017 ranged from 0.348 cents/kWh (NHEC) to 0.357 cents/kWh (Unitil).
15 The percentage change in the total SBC rate from 2017 to 2020 was between 92 percent and
16 111 percent to achieve an overall proposed electric savings of 3.1 percent of 2014 electric
17 delivery sales. The annual increase in the total SBC rate from 2017 to 2020 was about 20 to
18 30 percent per year.

19
20 *Bill Impacts*

21 **Q. What are the bill impacts associated with the proposed rates in this plan?**

22 A. Please refer to Table 5 for a summary of the bill impacts. As shown for the residential bill
23 impacts, the year over year impacts are less than one percent, and the overall bill impacts for

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Table 5. Summary of Bill Impacts⁴

		Monthly Bill Change from 2020		Percentage Change	
Year		Residential	C&I	Residential	C&I
Eversource					
Total Bill	2020	\$ 115.76	\$ 1,610.64		
Change in Bill	2021	\$ 0.77	\$ 52.71	0.66%	3.27%
	2022	\$ 0.20	\$ 53.69	0.17%	3.23%
	2023	\$ 0.27	\$ 62.49	0.23%	3.64%
Total Change from 2020		\$ 1.24	\$ 168.90	1.07%	10.49%
Liberty					
Total Bill	2020	\$ 117.47	\$ 1,094.58		
Change in Bill	2021	\$ 0.73	\$ 10.50	0.62%	0.96%
	2022	\$ 1.46	\$ 21.00	1.23%	1.90%
	2023	\$ 0.51	\$ 21.80	0.43%	1.94%
Total Change from 2020		\$ 2.70	\$ 53.30	2.30%	4.87%
Unitil					
Total Bill	2020	\$ 109.78	\$ 1,479.39		
Change in Bill	2021	\$ 0.83	\$ 39.38	0.76%	2.66%
	2022	\$ 1.14	\$ 19.56	1.03%	1.29%
	2023	\$ 0.61	\$ 27.18	0.54%	1.77%
Total Change from 2020		\$ 2.58	\$ 86.13	2.35%	5.82%
NHEC					
Total Bill	2020	\$ 117.01	\$ 1,649.14		
Change in Bill	2021	\$ 1.94	\$ 37.83	1.66%	2.29%
	2022	\$ 0.22	\$ 13.01	0.19%	0.77%
	2023	\$ (0.13)	\$ (3.18)	-0.11%	-0.19%
Total Change from 2020		\$ 2.03	\$ 47.66	1.74%	2.89%

Note that for the residential bill impact, Eversource, Unitil and NHEC assumed usage of 625 kWh/month and Liberty assumed 650 kWh/month. For the C&I bill impact, Eversource and Unitil assumed a Rate G, three phase service, using 40 kW, 10,000 kWh/month; NHEC assumed a Commercial B3, three phase service, less than 50 kW, 10,000 kWh/month; and Liberty assumed a Rate G-2 customers using 25 kW and 9000 kWh/month.

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⁴ Note that Unitil revised the C&I bill impacts in data response Staff 2-077 as shown in Attachment ERN-2.

1 the three years is between 1 percent and 2.3 percent. The C&I bill impacts for year over year
2 is less than 1 percent to 3.6 percent; however, the overall bill impact for the three years
3 ranges from 2.9 percent to over 10 percent.

4
5 *Long Term Rate and Bill Impacts*

6 **Q. The Plan in Attachment M, shows a long term rate and bill impact analysis. Please**
7 **explain how that is different than the rate and bill impacts shown in Table 5.**

8 A. The rate and bill impact analysis in Attachment M is looking at the effects of this plan in
9 isolation for the average life of the measures. It does not take into account any savings that
10 have occurred from previous plans, and it does not take into account the lost revenue that is
11 included in this plan and will continue for the life of the measures (unless the utility has
12 decoupled). Also, note that the Attachment M rate and bill impact analysis had to make
13 simplifying assumptions-one of which is worth noting. The analysis assumes that a rate case
14 is completed each year to account for the benefits (avoided distribution utility costs)
15 produced by the energy efficiency programs and the associated reduced revenue requirement.
16 Distribution rate cases do not occur every year, but energy efficiency program costs are
17 collected each year through the SBC. Thus, the cost of the programs are billed to customers
18 each year while the avoided distribution costs savings are retained by the utilities between
19 rate cases and not immediately passed on to customers in lower rates.

20 **Q. What does the rate and bill impact analysis in Attachment M show?**

21 A. For all of the customer classes at all the utilities, except for the large C&I class at two
22 utilities, the levelized rate change is estimated to go up slightly over the long term from 0.1
23 percent for Liberty Electric residential and low income customers to 1.1 percent for

1 Eversource's small C&I customers. The levelized rate is expected to go down by 0.4 percent
2 at Eversource's large C&I and 1.0 percent at Liberty Electric's large C&I. For the average
3 customer, the bill change over the life of the measures is estimated to go down for all of the
4 customer classes, except Eversource's residential class where it is estimated to increase
5 slightly (0.07 percent). The bill impacts over the long term are estimated to range from a
6 small decrease at Unitil Electric (0.07 percent) to about a 10.2 percent decrease at Liberty
7 Gas.

8
9 *Summary of Rate and Bill Impacts*

10 **Q. Please summarize your observations of the rate and bill impact of this plan.**

11 A. The review of the SBC rates and bill impacts should not occur in a vacuum. New Hampshire
12 is still in the midst of the COVID-19 pandemic that has affected both residential and C&I
13 customers in New Hampshire.⁵ Some customers are currently experiencing hardships in
14 paying their utility bills, so bill increases may be more difficult for some to endure.⁶ As
15 shown in the long term bill impacts, the energy efficiency programs may result in bill
16 decreases, but the short term impacts of the programs will result in bill increases. Staff
17 observes the following:

- 18 ♦ The shift to an SBC rate by sector and utility aligns the customer group with the costs
19 incurred in that sector, but the rates should be somewhat similar between companies so
20 that each customer within a given sector in New Hampshire is paying approximately the

⁵ As noted in Staff Witness Jay Dudley's testimony, the utilities are concerned with the impacts of the COVID-19 pandemic and have requested reductions in performance incentive thresholds; however, the proposed savings goals and related rate and bill impacts do not appear to be adjusted with the same concern for uncertainty.

⁶ See Docket IR 20-089, where, for example, Eversource has indicated that the 60 and 90 day old accounts receivable have continued to increase each month since March and are greater than last year.
https://www.puc.nh.gov/Regulatory/Docketbk/2020/20-089/LETTERS-MEMOS-TARIFFS/20-089_2020-09-30_EVERSOURCE_RESPONSES_OON_REQUESTS.PDF

1 same rate towards the energy efficiency programs. That is not the case proposed here
2 where in 2023 an Eversource C&I customer will pay an SBC of 2.432 cents per kWh
3 while a Liberty C&I electric customer will pay half that – for essentially the same energy
4 efficiency programs. Meanwhile, the residential customers for all four electric
5 companies in 2023 will pay about 1 cent per kWh.

- 6 ♦ The rate and bill impact analysis in Attachment M and the short term rate and bill impacts
7 summarized above show that in the short term, rates and bills will increase over the next
8 three years as a result of this plan, although over the life of the measures the energy
9 savings are beneficial to all customers (because essentially all the proposed programs
10 pass the benefit/cost screening test) and appear to provide overall rate and bill decreases
11 for most C&I and residential customers.
- 12 ♦ Eversource’s C&I customers will see the largest rate and bill increases, which is about
13 double the increases of the other utilities’ C&I customers, while Eversource’s residential
14 customers will experience about half of the percentage increase in rates and bills than
15 other residential customers. Eversource is proposing the highest SBC for C&I customers
16 in New England, based on current information available. The increases for Eversource’s
17 C&I customers are of substantial concern, especially given that any changes to the benefit
18 assumptions, such as might result from the upcoming avoided cost study or from other
19 changes to savings assumptions, could have significant impacts on the savings goals,
20 benefits and costs. Other than the Eversource C&I rate, the percentage increases
21 proposed are similar to what occurred in the SBC for the past 3-4 years. However
22 continual yearly increases of 20-30 percent have a cumulative effect; the percentage

1 increases in 2017-2020 were applied to lower existing rates. The impact of a 20-30
2 percent SBC increase in 2022 is much greater than the same percentage increase in 2017.

- 3 ♦ Staff recommends Eversource revise its C&I customer budgets to better balance short
4 term rate impacts with the long term goal of achieving all cost-effective energy
5 efficiency, keeping them more in line with the short term rate impacts of the other
6 utilities.
- 7 ♦ Liberty Electric is spending significantly more per low income customer (\$3,896 per
8 customer) than the other utilities. Liberty Gas is spending significantly less per low
9 income customer (\$890 per customer). NHEC is paying less for C&I, but they have more
10 small C&I customers with fewer saving opportunities.
- 11 ♦ The overall budgets and overall savings for each electric utility approximately match
12 each utility's share of the overall sales in 2019; however, the sector savings and budgets
13 do not match each utility's share of sales by sector.

14 15 **Lost Base Revenue**

16 **Q. Please comment on the current lost base revenue calculation.**

17 A. In 2019, the utilities revised the methodology for calculating actual lost base revenue. Since
18 that revised methodology, the utilities do not appear to be using a consistent approach for
19 calculating the lost base revenue. Some of the differences, along with Staff's
20 recommendation, include the following:

- 21 ♦ Treatment of the first month of kWh and kW savings. Some utilities use one-half of a
22 calculated monthly savings, while others use 100 percent of the monthly savings when
23 calculating LBR for the first month of a measure installation. Staff recommends that

1 one-half of the calculated monthly savings be used in the first month, to account for the
2 fact that not all installations are made on the first day of the month. The half month
3 method attempts to recognize that installations are made throughout each month.

- 4 ♦ Treatment of rate cases. Staff proposes that (for companies that have not decoupled) lost
5 base revenues resume with installations in the first month following a test year (most
6 often January). Any installations before and during the test year should not be factored
7 into the lost base revenue calculation because savings from those installations would have
8 been reflected in the rate case revenue requirement.
- 9 ♦ Average distribution rate. Staff recommends that for planning purposes, the utilities use
10 the distribution rate in effect at the time of the EE filing. For reconciliation purposes, the
11 utilities use the rates in effect for the installation period. In other words, if the rate
12 changes during the year, then the rate used for reconciliation changes at that time, too.
- 13 ♦ Interest rate. The utilities should all use and apply the prime interest rate to the
14 cumulative balance as posted on the PUC website.

15 **Q. Do you have any additional suggestions for the lost base revenue calculation**
16 **methodology for this plan?**

17 A. Yes. In the report issued by the lost base revenue working group, Staff suggested that instead
18 of using an average distribution rate for all sectors that a rate be calculated by class or by
19 sector. The utilities have proposed using an average distribution rate by sector. Staff
20 believes that this approach is better than one average distribution rate. Staff also suggests
21 that for measures that increase energy usage, such as with the energy optimization program,
22 the “found revenues” be subtracted from the lost base revenues. Further, Staff does not
23 believe that the active demand response program results should be considered in the

1 calculation of lost base revenue because the purpose of an active demand program is to
2 reduce ISO-NE peak load, not distribution or customer peaks, and to shift load.

3

4 **Planning Structure**

5 **Q. Please summarize the planning structure proposed in the plan.**

6 A. The utilities propose that this plan be a true, three-year plan with the opportunity for updates
7 and notifications, if necessary, instead of having fully reviewed and approved annual
8 updates, as was done for the first triennial plan (2018-2020). The utilities propose that
9 certain changes trigger notifications and other changes trigger mid-term modification, which
10 would require Commission approval.

11 **Q. Please comment on this proposed planning structure.**

12 A. Staff agrees with a true, three-year plan, but believes that certain updates must be filed,
13 regardless of any potential thresholds outlined. Given the fact that the avoided energy supply
14 components (“AESC”) study is currently being updated, and the likelihood that it may result
15 in significant change in avoided costs, Staff believes that the utilities should be required to
16 file the benefits and cost-effectiveness analyses within a few months of the completion of the
17 AESC study, which is expected to be completed during the first quarter of 2021. Also, any
18 recently completed evaluation studies or revised assumptions that would affect the benefits
19 and plan should also be included in that updated plan filing.

20 As proposed, the utilities have specified that the utilities are the only ones that could trigger a
21 mid-term modification and only under certain specified circumstances. Staff believes that
22 Staff and any party to this proceeding should have the right to propose that the utilities file a
23 mid-term modification, and the Commission should decide whether a modification is

1 warranted. In addition, Staff is concerned that the thresholds proposed for mid-term
2 modifications are too complicated and will be time consuming to monitor.
3 Staff does not agree with only a notification for transitioning a pilot program to a full
4 program, but instead such a change should require Commission approval. Pilots should be
5 limited in size, scope, and duration, and should result in an evaluation which is available for
6 Commission review. During the time the program administrators are piloting a program,
7 pilot status is taken into account when evaluating whether it must surpass a 1:1 cost-
8 effectiveness threshold.

9 In addition, Staff recommends that on or before September 1 of each year, the utilities file an
10 updated cost-effectiveness analysis incorporating any change in assumptions triggered by any
11 study, evaluation, update to the technical reference manual, or other unknowns, such as the
12 effect of the global pandemic, for review by the Commission, Staff and other parties.⁷ At the
13 time of these filings, the utilities would either propose a mid-term modification or indicate
14 why none was needed. Staff and other parties could recommend whether an update/mid-term
15 modification to the plan is needed, and the Commission could decide that question.

16 In addition, Staff believes that notification is appropriate in certain circumstances, such as
17 small transfers of funds from one program to another, within a sector. Staff recommends that
18 the circumstances requiring notification be clearly defined and be similar to the current
19 notification criteria in the 2018-2020 plan.

20 **Q. Does Staff agree with the utilities' proposal regarding rate change approvals?**

21 No. Staff does not agree with the utilities' proposal for approval of SBC rates and LDAC
22 rates only for increases or decreases of more than 10 percent. Staff supports setting the three

⁷ A memo should accompany the updated cost-effectiveness analysis describing any changes that have occurred and why they occurred.

1 years of SBCs up front, but believes that any changes to the SBC and LDAC rates should be
2 reviewed and approved by the Commission. A ten percent bandwidth could make the steep
3 SBC increases sought in this case even steeper. And, the SBC recovers performance
4 incentives and lost base revenue – both of which affect the utilities earnings – so any changes
5 to the SBC should receive specific scrutiny.

6
7 **Technical Reference Manual**

8 **Q. Please comment on the draft Technical Reference Manual included with the plan.**

9 A. The Technical Reference Manual (TRM) will be a helpful addition to this plan once it is
10 completed since it summarizes all of the savings assumptions that are used as the basis for
11 this plan and serves to ensure consistency among the utilities. The assumptions for the
12 programs are key to the credibility of the program. The TRM attached to the plan filed on
13 September 1, 2020 is a draft. Given its expansiveness, it is very important that any changes
14 over time are highlighted and summarized in a table of revisions.⁸

15 Staff is concerned with the methodology for determining the appropriate assumptions and
16 with several of the assumptions that are proposed in the draft technical reference manual,
17 including the C&I custom realization rates and the HERs savings and measure lifetime.⁹ In
18 addition, Staff makes recommendations below regarding prospective versus retrospective
19 application of study results, net-to-gross savings, and the use of industry standard practice
20 (ISP) vs code as the baseline. Finally, Staff recommends that the utilities ensure that all of

⁸ See, New York State Public Service Commission. Technical Reference Manual Record of Revision. Page 1.
Available at:
[http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/72c23defff52920a85257f1100671bdd/\\$FILE/ATTW4FPV.pdf/Q4%202019%20TRM%20Update-%20ROR-Revisions.pdf](http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/72c23defff52920a85257f1100671bdd/$FILE/ATTW4FPV.pdf/Q4%202019%20TRM%20Update-%20ROR-Revisions.pdf)

⁹ Staff witness Eckberg discusses details of the HERs program in his testimony.

1 the assumptions in their modeling are consistent because Staff notes that assumptions in
2 Liberty Electric’s benefit/cost model related to lighting are not consistent with the other
3 utilities nor with the TRM.

4 Staff supports resolving these issues in the EM&V Working Group discussion, as had been
5 done with many other TRM issues over the past six – nine months. However, because time
6 is running short and the major issues should be resolved before the 2021-2023 plan is
7 approved the Commission may need to resolve some of these issues as part of this
8 proceeding.¹⁰

9 **Q. Please expand on Staff’s concerns with the methodology proposed for determining the**
10 **appropriate assumptions.**

11 A. In the plan, the utilities proposed the following:¹¹

12 *The primary source of methodologies and inputs for the TRM is New Hampshire-*
13 *specific evaluations, where available. New Hampshire jurisdiction-specific results will*
14 *be favored over results from other jurisdictions in order to account for differences in*
15 *climate, hours of use, program design and delivery, market conditions, and evaluation*
16 *frameworks. When considering whether to apply results from a study originating in*
17 *another jurisdiction to New Hampshire programs, the EM&V Working Group will make*
18 *the determination based on (1) the similarity of evaluated program/measures to those*
19 *offered in New Hampshire; (2) the similarity of relevant markets and customers base;*
20 *(3) the recency of the study relative to the recency of any applicable New Hampshire*
21 *results; and (4) the quality of the study’s methodology and sample size. In addition to*
22 *third-party evaluations, inputs may also be based on sources including manufacturer*
23 *and industry data, data from government agencies such as the US DOE or EPA, or*
24 *credible and realistic factors developed using engineering judgment.*

25
26 In the EM&V Group, Staff understood that the following was the criteria being followed:

27 ***Other factors being equal***, *New Hampshire jurisdiction-specific results will be favored*
28 *over results from other jurisdictions in order to account for differences in climate,*
29 *hours of use, program design and delivery, market conditions, and evaluation*

¹⁰ See, 2018-20 Triennial Plan. (September 1, 2017) Page 150. (Stating: “If areas of difference among the EM&V Working Group members cannot be resolved, the Working Group parties may appeal to the Commission for resolution.”)

¹¹ Triennial plan, Bates pp. 218-219.

1 *frameworks. **However, when relevant results exist both from New Hampshire and***
2 ***from other states, it may be necessary to balance the desirable attributes of state-***
3 ***specificity and data reliability.** When considering whether to apply results from a*
4 *study originating in another jurisdiction to New Hampshire programs, the EM&V*
5 *Working Group **(with support from independent evaluation firms as needed),** will*
6 *make the determination based on (1) the similarity of evaluated program/measures*
7 *to those offered in NH; (2) the similarity of relevant markets and customers base; (3)*
8 *the recency of the study relative to the recency of any applicable NH results; and (4)*
9 *the quality of the study's methodology and sample size. [Emphasis added to highlight*
10 *key differences of the methodologies.]*
11

12 The highlighted areas are critical in determining the appropriate assumptions. Although Staff
13 usually prefers New Hampshire-specific information as was stressed in the need for review
14 of the NEIs, other factors need to be considered beyond whether the study was completed in
15 New Hampshire or elsewhere as noted above. For example, a more recent study in another
16 jurisdiction may be more reliable than an older study in New Hampshire. The methodology
17 as proposed by the utilities is, in Staff's view, not acceptable, and should not be adopted.
18 Rather, the original language from the EM&V Working group should be restored to allow
19 flexibility to use the most reliable information available when developing a credible TRM
20 and energy efficiency plan.

21 **Q. Please expand on Staff's concern about the continued use of adjusted gross savings for**
22 **certain measure types.**

23 A. For almost two decades, New Hampshire's energy efficiency programs have based their
24 claimed savings on adjusted gross savings. Gross savings is "The difference between energy
25 consumption of the affected equipment or facility with versus without the EE project or EE
26 measure in place, *without consideration of program influence or attribution.*"¹² In many

¹² US Department of Energy. State and Local Energy Efficiency Action Network. SEE Action Guide for States: Evaluation, Measurement, and Verification Frameworks—Guidance for Energy Efficiency Portfolios Funded by Utility Customers. (January 2018) Page 72. (emphasis added) Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/EMV-Framework_Jan2018.pdf

1 states, program administrators instead report net savings to indicate the percentage of
2 observed savings which are *actually attributable to a program intervention*. A primary
3 benefit of using net savings is that it can help program administrators understand when a
4 market has reached the end stages of the market transformation cycle and plan an exit
5 strategy for program incentives for that market.¹³ Commercial and industrial lighting, which
6 represents about half of the triennial plan’s planned savings,¹⁴ is a market which is moving
7 towards transformation.¹⁵ This is particularly true for non-networked TLEDs, which other
8 states are contemplating phasing out of programs in favor of TLEDs designated as networked
9 replacement lamps by the Design Lights Consortium.¹⁶ Recognizing the place of C&I
10 lighting on the market transformation curve, the utilities have for the first time in New
11 Hampshire proposed the use of net savings to determine the savings associated with
12 midstream lighting offerings.¹⁷ Staff supports the use of net savings for those measures
13 which other states have identified as nearing the point of market transformation. Staff
14 recommends however, that the net savings figures used for non-networked TLEDs offered
15 via midstream program be revised downward so that they are substantially similar to the net
16 savings percentage used for midstream LED downlights.¹⁸ Staff also recommends

¹³ US Department of Energy. State and Local Energy Efficiency Action Network. Energy Efficiency Program Impact Evaluation Guide. (December 2018) Page 59. (stating “Obtaining insight into how the market is changing and transforming over time by tracking net savings across program years and determining the extent to which free ridership and spillover rates have changed during the period—and potentially using this insight for defining when, and how, to implement a program exit strategy.”) Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf

¹⁴ Joint Utility Response Staff 3-15 Excel Attachment. See Attachment ERN-3.

¹⁵ Staff notes that the residential lighting market is likely even further along in the market transformation cycle, but focuses instead on the C&I lighting assumptions due to the relatively low amount of savings and budgets allocated to residential lighting in the triennial plan.

¹⁶ MA EEAC Consultants. The Future of C&I Lighting in Massachusetts: A Continued Major Source of Savings, or in Decline? September 25, 2019. Page 13-15. Available at: <http://ma-eeac.org/wordpress/wp-content/uploads/The-Future-of-CI-Lighting-October-2019.pdf>

¹⁷ Triennial Plan at 215.

¹⁸ Joint Utilities Response to Staff 2-059. See Attachment ERN-4.

1 incorporation of a net savings figure for C&I downstream lighting offerings. The same net
2 savings figure used for midstream lighting offerings may be appropriate for downstream
3 because both channels tap a single overall market. Staff also notes that the proposed adjusted
4 measure lives for C&I lighting is out of alignment with other states in New England, and
5 recommends that the measure lives be revised downward to be more consistent with
6 neighboring jurisdictions.

7 **Q. Do you have any further recommendations to ensure that the program incentives are**
8 **appropriately adjusted to recognize a measure or program's place in the market**
9 **transformation cycle?**

10 A. Yes. The EM&V Working group is currently soliciting a contractor to develop a study of
11 baseline practices. Ensuring accurate baselines for the programs is of the utmost importance
12 because, similar to the use of net savings, setting the appropriate baseline helps ensure that
13 programs are only claiming savings for those actions actually attributable to the program.
14 Two common approaches are the use of building energy codes and appliance standards as the
15 baseline and the use of common/industry standard practice (ISP) as a baseline. The latter
16 requires a greater degree of study in order to apply, but likely more accurately captures the
17 incremental savings attributable to the program intervention. For example, if the building
18 energy code requires a certain measure during new construction, but the building industry has
19 generally already embraced a more efficient measure because it is easier to install or less
20 costly to implement, the ISP baseline approach would use the more efficient measure as the
21 baseline. Staff recommends that the Commission consider a transition to the use of ISP
22 baselines, as informed by the results of the pending evaluation.

1 **Q. Please expand on Staff’s concern about the commercial and industrial custom program**
2 **realization rates.**

3 A. Realization rates are, among other things, used by program administrators to compare
4 claimed savings to evaluated savings that result from an impact evaluation. Realization rates
5 are particularly important for C&I custom programs because those programs do not rely
6 heavily on savings determination based on deemed savings values, but rather determine
7 savings claims based on the unique mix of technologies and measures applied to a specific
8 customer’s needs. The C&I custom programs account for a significant percent of the C&I
9 savings proposed for the triennial plan, ranging from 40 percent to 99 percent, depending on
10 the year and program administrator.¹⁹ The non-lighting C&I custom program realization
11 rates proposed in the triennial plan are between 99.9 percent and 100 percent, meaning that
12 the program administrators anticipate that the projected savings associated with a given
13 project will match the post-installation verified savings. This 99.9 percent figure is
14 supported by a New Hampshire C&I Impact evaluation of 2014 programs²⁰ and is out of
15 date and inconsistent with the realization rates produced by an extensive body of more recent
16 studies in in neighboring jurisdictions.²¹ Notably, the EM&V Working Group will be
17 overseeing a Large C&I program evaluation during the first year of the triennium which
18 should be used to verify the validity of the currently proposed C&I custom program

¹⁹ Joint Utilities Response to Staff 2-060. See Attachment ERN-5.

²⁰ DNV-GL. New Hampshire Utilities Large Commercial and Industrial (C&I) Retrofit and New Equipment Construction Program Impact Evaluation. (September 25, 2015) Page 4. Available at: <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf>

²¹ See, Connecticut 2021 Program Savings Document. (March 1, 2020) Page 291-293. Available at: <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf> ; see also, Massachusetts Technical Reference Library (eTRM) Large C&I Custom Programs. Available at: <https://etrm.anbetrack.com/#/workarea/trm/MADPU/COM-CM-CMLCI/2019-2021%20Plan%20TRM/version/1?measureName=Custom%20-%20Large%20C&I>

1 realization rates. Staff recommends, based on its review of large C&I custom program
2 realization rates from neighboring jurisdictions, that a realization rate of 85 percent for C&I
3 custom gas programs and 85 percent for C&I custom non-lighting electric programs be
4 applied for planning purposes until the completion of the large C&I impact evaluation
5 planned for 2021 can be completed.

6 **Q. Please expand on Staff's concern about the continued prospective application of impact**
7 **evaluations.**

8 A. Energy efficiency program administrators often use technical reference manuals to define the
9 deemed savings attributable to a program or measure. Impact evaluations are used to verify
10 and update the energy and demand savings attributable to a deemed savings, among other
11 things. If the savings observed by an impact evaluation of a given measure or program does
12 not match the projected energy and demand savings, the projections are often revised within
13 the technical reference manual. Some states only apply impact evaluations prospectively,
14 while others, like Massachusetts, apply them retrospectively.²² In light of the proposed
15 transition away from an annually updated plan, Staff recommends that the results of impact
16 evaluations conducted during the triennium — including, but not limited to, custom program
17 realization rates and net-to-gross evaluations — be applied retrospectively to the first year of
18 the three year plan. This approach would reduce concerns relating to the lag time before
19 savings assumptions can be brought into alignment with study results.²³

²² Northeast Energy Efficiency Partnerships (NEEP). Current and Evolving Policies, Issues, and Methods Pertaining to Gross and Net Savings. (April 2016) Page 5. Available at: <https://neep.org/sites/default/files/FINAL%20Supplemental%20Document%201%20Trends%20and%20Issues%20May%203%202016.pdf>; see also, Kushler, M. et alia. A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs. (February 2012). Page 56-57. Available at: <https://www.aceee.org/sites/default/files/publications/researchreports/u122.pdf>

²³ Occasionally, evaluation timelines run long and miss the September deadline for inclusion in the next plan update, resulting in incorporation of evaluated results up to 2-3 years after the program year in which the measure was installed. Retrospective application avoids this lag-time, and enhances program administrator accountability.

1 **Incentives**

2 **Q. Do you have any comments related to the proposed incentives for the programs**
3 **offered?**

4 A. Yes. As in previous years, Staff believes that the utilities need to ensure that the incentives
5 offered are available on the NHSaves website for both residential and C&I customers and be
6 consistent from utility to utility. Staff notes that many C&I incentives are often listed as
7 custom, which does not allow for consistency and equity among customers. Given that many
8 of the “custom” incentives can easily be translated into prescriptive offerings, Staff
9 recommends that the utilities offer more prescriptive incentives and fewer custom incentives.

10

11 **Energy Optimization Pilot**

12 **Q. Please explain the purpose of the energy optimization pilot.**

13 A. Per Staff’s recommendation in Docket DE 17-136, dated October 31, 2019,²⁴ and the
14 Commission’s Order No. 26,322,²⁵ the purpose of the energy optimization pilot is to
15 determine if energy optimization measures, such as heat pumps, could improve the load
16 factor, and also to evaluate how to account for unregulated fuels savings and increased
17 electricity consumption.

18 **Q. Does the design of proposed energy optimization pilot achieve these goals?**

19 The interest in the energy optimization pilot is to review the replacement of fossil fuel
20 technologies currently used for heating with new electric heat pump technologies.

21 Complicating this pursuit is the fact that heat pumps also supply air conditioning. For energy

²⁴ https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136_2019-10-31_STAFF_FILING_WORKING_GROUP_REC.PDF

²⁵ https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/ORDERS/17-136_2019-12-30_ORDER_26322.PDF

1 optimization to benefit the lowering of fossil fuel, the heating must be balanced against the
2 increased use of electricity for air conditioning. The proposed pilot seems to target
3 customers who have or would like to install air conditioning. In Staff's view, the target
4 population should be anyone who is looking to install heating and/or air conditioning.
5 Unless the whole potential population of customers installing heat pumps is considered, then
6 the full impact of energy optimization measures cannot be realized. A current customer
7 without air conditioning, who installs a heat pump regardless of the reason for installing it,
8 will most likely increase electric load for heating (unless the customer is currently using
9 electric for heating) and also increase electric load for cooling. Customers interested in the
10 Energy Star products rebate for heat pumps should be considered for the pilot as well as
11 those who may not participate in that program. Retailers and installers of heat pumps and
12 other heating and cooling options should be part of the pilot to ensure access to the full
13 population. The energy optimization pilot should offer the same incentive for a heat pump
14 regardless of its intended use. Therefore, the pilot should have a scope that covers all of
15 these intended uses and their effects.

16 **Q. Will the proposed evaluation analyze the key elements of the energy optimization pilot?**

17 A. No. The proposed evaluation does not gather all of the data that is necessary to evaluate the
18 pilot. Baseline energy consumption data as well as energy consumption data during the pilot
19 should be collected and evaluated. The current evaluation plan is too simplistic and will not
20 answer the critical questions needed to assess the pilot. For example, studies in other states
21 have recognized that one baseline cannot describe the numerous previous conditions and
22 intended uses that a heat pump application replaces, and what would have been done had the
23 pilot not been available. The evaluation model that was used as part of the energy

1 optimization pilot was not developed to assess real savings and impacts from New
2 Hampshire participants, but instead was used to estimate impacts for the study, for screening
3 purposes and not to replace a programmatic evaluation study. The purpose of the evaluation
4 should be to collect and analyze data specific to New Hampshire and determine if the
5 modeling assumptions are accurate for New Hampshire. The evaluation must be a process
6 and impact study, and will be very complicated because of the various elements to study,
7 including the populations, baselines, intended use, actual use, and load factor impacts. The
8 EM&V working group should be the lead on a New Hampshire specific evaluation study.

9 **Q. What will be the process for approval of a full program, if warranted, after the**
10 **evaluation and completion of the pilot?**

11 A. As with any pilot, Staff believes that the utilities must seek and obtain Commission approval
12 for a full program after the pilot and evaluation study is complete and prior to implementing
13 a full program. The utilities must propose the design of the full program making any changes
14 learned from the pilot. In contrast, the utilities have not proposed such a process for any of
15 their pilots. Instead the utilities have proposed that they move from a pilot to a full program
16 without specific Commission approval.

17
18 **Active Demand Response Program**

19 **Q. Does Staff have any recommendations regarding the active demand response program?**

20 A. Yes. Staff believes that the active demand response program could potentially save the
21 utilities and customers more money if designed differently. In addition, Staff proposes that
22 the active demand response programs for residential customers continue as pilots until the
23 results clearly show that they are cost-effective and beneficial. Staff proposes that the C&I

1 storage programs continue as pilots, also. Staff also proposed that the performance incentive
2 be designed differently as discussed by Staff Witness Jay Dudley in his testimony.

3 **Q. What is the goal of the active demand response programs as proposed?**

4 A. The utilities state that the goal of the programs are “to flatten peak loads, improve system
5 load factors, and reduce long term system costs for all grid-tied New Hampshire customers.
6 Active Demand savings (kW) are realized by dispatching resources during ISO-NE peak
7 demand periods. Reducing load during ISO-NE peak hours also has the effect of reducing
8 New Hampshire’s share of the installed capacity (“ICAP”) cost allocation.”²⁶ In addition, the
9 utilities say that “lowering daily summer peak demand may lower the distribution company’s
10 associated capacity costs,”²⁷ which they propose to achieve through dispatching of residential
11 battery storage.

12 **Q. Please explain if there are other goals that the active demand programs should seek to**
13 **achieve.**

14 A. In addition to the goals proposed by the utilities, Staff proposes that the utilities pilot an
15 active demand response program that also targets system-wide monthly peaks to lower the
16 transmission cost allocation for New Hampshire. In response to discovery, the joint utilities
17 state that “The NH Potential Study, under the guidance of the EM&V Working Group,
18 considered the question of active demand opportunity outside of the summer months and
19 found that ‘a little over half of the annual peak potential can be maintained on a monthly
20 basis over the winter and shoulder seasons.’” The Commission has repeatedly requested the
21 utilities to explore ways to reduce or control transmission costs.²⁸ Focusing on the summer

²⁶ Triennial Plan, Bates p. 148.

²⁷ Triennial Plan, Bates p. 151

²⁸ Order No. 26,232 (April 5, 2019) at 5 (citing Order No. 26,142 at 5 (July 24, 2017) (stating that transmission costs are tied to peak loads and requiring Unitil to consider what measures could be taken to mitigate increases in

1 peak does alleviate some of those costs, but transmission costs are assessed by ISO-NE on a
2 monthly basis, and the Commission has previously recognized the value of peak Regional
3 Network Service (RNS) and Local Network Service (LNS) cost reductions associated with
4 monthly peak demand reduction.²⁹ Note that a pilot could also target other peaks, such as
5 distribution peaks or customer peaks, but Staff does not propose to include these additional
6 goals at this time.

7 **Q. Did the NH pilot or pilots in other states show that these goals could be achieved?**

8 A. The pilots showed that demand was reduced during the ISO-NE annual peak. The New
9 Hampshire pilot showed that on other summer days, demand was also reduced. The
10 evaluation study did not indicate what specific cost savings accrued to ratepayers from these
11 demand reductions. The study of the New Hampshire pilot did not evaluate the other goals
12 outlined above nor did the utilities explain in this plan if pilots and evaluations in other states
13 specifically addressed these goals and the related impacts.

14 **Q. Please explain Staff's recommendation regarding the active demand response program.**

15 A. Staff believes that targeting the ISO-NE annual peak is appropriate, but also believes that
16 targeting monthly peaks is appropriate. The monthly peak targets should be part of a pilot.
17 Staff recommends targeting monthly system-wide peaks, because this will potentially reduce
18 the regional and local transmission costs for New Hampshire. The Liberty battery storage
19 pilot is targeting these monthly peaks. Staff is also concerned with the residential programs
20 especially since Unitil's residential program is not estimated to be cost-effective in the early

transmission costs); DE 18-089, Eversource Energy, 2018 Transmission Cost Adjustment Mechanism, Hearing Transcript of July 12, 2018, at 19-20; DE 18-051, Liberty Utilities (Granite State Electric) Corp., Annual Retail Rate Filing, Hearing Transcript of May 9, 2018, at 46-52.)

²⁹ Order No. 26,209 (January 17, 2019) at 19 (stating "Liberty would dispatch the battery output so as to maximize savings to Liberty and its customers by reducing ISO-NE coincident system peak load. Id. at 8. Those savings would result from lower RNS and LNS transmission charges assessed by ISO-NE, as well as lower ISO-NE Forward Capacity Market (FCM) costs.")

1 years. Since residential programs, including both load curtailment and battery storage have
2 not been fully shown to be cost-effective, Staff proposes that the residential programs
3 continue to be implemented as pilots. In addition, Staff proposes that that battery storage and
4 thermal storage for C&I customers also continue as pilots. Before adding technologies, such
5 as electric vehicles, to the active demand response programs, Staff believes that the utilities
6 should seek review and approval by the Commission.

7 Staff also recommends that the utilities provide more details on the past programs, if
8 possible, regarding the actual impact on other peak days, the system load factors, the
9 distribution capacity costs, and the long-term system costs for customers, and estimate then
10 evaluate the effect of the proposed program on these elements.

11
12 **Cost-Effectiveness Analyses**

13 **Q. Do you have any comments on the cost-effectiveness analyses?**

14 A. Yes. With this plan, the utilities have started using a new primary benefit/cost test and new
15 secondary tests. One of the key assumptions that several recent studies reviewed was for the
16 non-energy impact (“NEIs”) assumptions. Based on the study that was conducted for the
17 secondary test NEIs, the utilities calculated an NEI percentage for each program for each
18 utility based on the measures proposed. Staff does not believe that the NEI that is applied to
19 the secondary test should be based on the measures proposed in a program by utility. Instead
20 for simplicity since these are used only in the secondary test, Staff believes that the NEI
21 percentage should be consistent across the electric utilities and across the gas utilities and
22 differentiated by sector.

1 Staff recommends that the gas utilities use a 15 percent adder for residential (excluding the
2 low income program) and C&I, and the electric utilities use a 25 percent adder for residential
3 (excluding the low income program) and a 10 percent adder for C&I.³⁰ Since these
4 assumptions are used only in the secondary test, Staff does not recommend studying these
5 adders for the non-low income programs any further at this time.

6 Staff supports the NEI assumptions for the primary test as proposed for the low income
7 programs and for fossil fuel emissions. The low income NEI is based on the evaluation study
8 recently completed. The fossil fuel emissions NEI is similar to that used previously and is
9 based on the RGGI costs and the carbon content of the fossil fuels.

10 **Q. Please comment on the cost-effectiveness of the proposed programs.**

11 A. As proposed, all of the programs have a benefit/cost ratio greater than 1.00 meaning that they
12 are cost-effective, except for a few programs. Liberty Gas's Home Energy Reports program
13 in 2021 and the Aerial Infrared Mapping program in 2021 and in total for 2021-2023 are not
14 proposed to be cost-effective. Liberty Electric's Home Energy Reports program in 2021 is
15 not proposed to be cost-effective. Unitil Electric's residential Active Demand Response
16 program in 2021 is not proposed to be cost-effective. Please refer to Staff Witness Stephen
17 Eckberg's testimony regarding the Home Energy Report programs and the Aerial Infrared
18 Mapping Program. As noted above, for Unitil Electric's residential Active Demand
19 Response program, Staff proposes that this program be implemented as a pilot.

20
21 **Evaluation, Measurement, and Verification (EM&V) Working Group**

22 **Q. Does Staff agree with the dispute resolution process outlined by the utilities in the plan?**

³⁰ The utilities have indicated that the NEIs used in the secondary test had an error. Refer to Attachment ERN-6 for an update to the NEIs.

1 A. No. The utilities propose that for any issue for which the EM&V working group cannot
2 reach consensus, the issue be filed to be reviewed and approved by the Commission with a
3 position summary written by each party. As the utilities note, to date issues have been able
4 to be resolved by the EM&V working group; however, as noted above, several issues may be
5 more contentious. Staff proposes that instead of seeking resolution by the Commission
6 immediately, that the EM&V working group defer to the expertise of the EM&V consultant
7 to resolve disputes. Staff believes that in most situations, the EM&V consultant is the
8 EM&V expert of the group and can offer a decision that is best for a credible energy
9 efficiency program for New Hampshire. If the parties do not agree, then dispute is elevated
10 to the Commission for final resolution and approval with parties providing position
11 summaries.

12 **Q. Does Staff agree with the EM&V working group members proposed by the utilities?**

13 A. Staff wants to make one clarification regarding the group members. Staff wants to ensure
14 that the EM&V consultant also serves as a member of the group. The EESE Board
15 Representative may also include a consultant hired by the representative for assistance, if
16 desired.

17

18 **Reporting**

19 **Q. Please comment on the reporting proposed in the plan.**

20 A. The utilities propose to file quarterly reports, two annual reports and a term report for the full
21 three years. Staff recommends that the utilities continue to file the quarterly reports as they
22 currently do. For the annual and term reports, Staff recommends that the content of the
23 annual and term reports be expanded to discuss more details on actual implementation and

1 successes of the programs and provide more supporting documentation. Staff does not
2 believe that the content needs to be decided prior to a decision on this plan, but instead
3 recommends that the utilities propose an outline to be discussed by the parties in the first
4 quarter of 2021. In addition, in many instances within the plan, the utilities commit to
5 exploring or investigating initiatives or offerings; the utilities should file a memo
6 summarizing the status of these efforts after the first and second year of the triennial plan.

7
8 **Future Planning Approach**

9 **Q. Do you have suggestions regarding the approach for developing plans in the future?**

10 A. Staff believes that robust stakeholder engagement is very helpful in formulating the energy
11 efficiency plans, but to ensure equity among all customer segments, each customer segment
12 needs to be adequately represented and engaged throughout the process. Staff recommends
13 that any planning and stakeholder engagement structure used to develop plans and plan
14 modifications should allow full and forthright participation of all potential participants in the
15 litigated process, including the Staff of the Commission. To do otherwise risks duplicative
16 efforts in separate venues, undermining the value of the stakeholder engagement and
17 collaboration during the plan development and review process.

18 The planning process should begin more than one year, possibly two years, before the plan is
19 filed to provide adequate time to discuss relevant issues. Staff believes that the savings
20 targets and associated budgets and rates need to be determined first, then the details of the
21 plan can be further discussed. Staff believes that the working groups formed during the
22 2018-2020 plan were very productive and informative and could serve as one venue for
23 discussion. Staff recommends that the filing of the next plan occur no later than July 1, 2023

1 and an initial draft of the plan with proposed savings targets and budgets and rates be
2 distributed no later than April 1, 2022.

3
4 **Recommendations and Observations**

5 **Q. Please summarize your recommendations and observations.**

6 A. The following summarizes the key comments and recommendations as discussed in more
7 detail above:

8 **Savings Targets, Spending per Customer and Associated Rates and Bill Impacts**

- 9 ♦ Eversource's C&I customers will see the largest rate and bill increases, which is
10 about double the increases of the other C&I customers, while Eversource's residential
11 customers will experience about half of the percentage increase in rates and bills than
12 other residential customers. The increases for Eversource's C&I customers are of
13 substantial concern, especially given that any changes to the benefit assumptions,
14 such as might result from the upcoming avoided cost study or from other changes to
15 savings assumptions, could have significant impacts on the savings goals, benefits
16 and costs. Staff recommends Eversource revise its C&I customer budgets to better
17 balance short term rate impacts with the long term goal of achieving all cost-effective
18 energy efficiency, keeping them more in line with the short term rate impacts of the
19 other utilities.
- 20 ♦ Liberty Electric is spending significantly more per low income customer (\$3,896 per
21 customer) than the other utilities. Liberty Gas is spending significantly less per low
22 income customer (\$890 per customer).

- 1 ♦ The overall budgets and overall savings for each utility approximately match each
2 utility's share of the overall sales in 2019; however, the sector savings and budgets do
3 not match each utility's share of sales by sector.

4 **Lost Base Revenue**

- 5 ♦ The utilities' methodology for calculating planned and actual lost base revenue needs
6 to be consistent.
- 7 ♦ Staff recommends that "found revenues" from measures with increased energy
8 consumption be subtracted from the lost revenues.
- 9 ♦ Staff believes that the active demand response programs should not be part of the lost
10 revenue calculation, since they are not targeting distribution cost savings.

11 **Planning Structure**

- 12 ♦ Staff recommends that the utilities file any changes to the savings and cost-effective
13 analysis and other plan summaries based on recent studies or changes in assumptions.
14 Since the AESC study is expected to be completed in the first quarter of 2021, Staff
15 recommends that updates to the cost-effectiveness and benefits analyses including the
16 applicable AESC study results and other recent studies and assumption changes be
17 filed within a few months of the completion of the AESC study.
- 18 ♦ Staff recommends that utilities file prior to September 1 of each year an update to the
19 cost-effectiveness analysis and benefits and other relevant summaries when any
20 assumptions change. At the time of the filing, the utilities can indicate if they
21 propose to make a mid-term modification. After the filing or at any time, other
22 parties can also decide if they choose to propose a mid-term modification.

1 ♦ Staff proposes that the notification requirements remain the same as in the plan for
2 2018-2020.

3 ♦ Staff does not agree with the preapproval of certain rate changes. Instead Staff
4 believes that any changes in the SBC and LDAC rates must be filed for review and
5 approval by the Commission.

6 **Technical Reference Manual**

7 ♦ Staff believes that the methodology for determining which assumptions to include in
8 the TRM should be based upon the criteria agreed to in the EM&V working group,
9 not that proposed by the utilities in the plan.

10 ♦ Staff proposes that any revisions to the TRM be summarized in a table.

11 ♦ Staff recommends that the net savings figures used for non-networked TLEDs offered
12 via midstream program be revised downward so that they are substantially similar to
13 the net savings percentage used for midstream LED downlights.

14 ♦ Staff also recommends incorporation of a net savings figure for C&I downstream
15 lighting offerings that is similar to the midstream lighting offerings.

16 ♦ Staff recommends that the average measure lives of C&I lighting be revised
17 downward to be more consistent with neighboring jurisdictions.

18 ♦ Staff recommends that the Commission consider a transition to the use of ISP
19 baselines, as informed by the results of the pending evaluation.

20 ♦ Staff recommends that a realization rate of 85 percent for C&I custom gas programs
21 and 85 percent for C&I custom non-lighting electric programs be applied for planning
22 purposes until the completion of the large C&I impact evaluation planned for 2021
23 can be completed.

- 1 ♦ Staff recommends that the results of impact evaluations conducted during the
2 triennium — including, but not limited to, custom program realization rates and net-
3 to-gross evaluations — be applied retrospectively to the first year of the three year
4 plan.

5 **Incentives**

- 6 ♦ Staff proposes that the utilities offer more prescriptive C&I incentives than custom
7 C&I incentives since many of the “custom” incentives can easily be translated into
8 prescriptive offerings.

9 **Energy Optimization Pilot**

- 10 ♦ Staff recommends that customers installing heat pumps for any reason be included in
11 the study so that the reduction in fossil fuels and increase in electricity consumption
12 can be evaluated.
- 13 ♦ Staff recommends that the evaluation include robust data collection including
14 baseline data and energy consumption data to calculate savings and increases. The
15 evaluation must be a process and impact study, and will be very complicated because
16 of the various elements to study, including the populations, baselines, intended use,
17 actual use, and load factor impacts.
- 18 ♦ As with any pilot, Staff believes that the utilities must seek and obtain Commission
19 approval for a full program after the pilot and evaluation study is complete and prior
20 to implementing a full program.

1 **Active Demand Response Program**

- 2 ♦ Staff recommends that the utilities include monthly peak load reduction as part of an
3 active demand response pilot.
- 4 ♦ The utilities need to provide justification that the goals that they are trying to achieve
5 have been achieved in the New Hampshire pilot or other applicable pilots.
- 6 ♦ Staff recommends that the residential active demand response programs continue as
7 pilots especially since Unitil's residential program is not proposed to be cost-effective
8 in 2021 and barely cost-effective over the three years.
- 9 ♦ Staff proposes that the C&I battery storage and thermal storage programs continue to
10 be implemented as pilots.
- 11 ♦ Before adding technologies, such as electric vehicles, to the active demand response
12 programs, Staff believes that the utilities should seek review and approval by the
13 Commission.

14 **Cost-Effectiveness Analyses**

- 15 ♦ Staff recommends that the utilities use a consistent NEI factor for the electric utilities
16 and for the gas utilities by sector. Staff recommends that the gas utilities use a 15
17 percent adder for residential (excluding the low income program) and C&I, and the
18 electric utilities use a 25 percent adder for residential (excluding the low income
19 program) and a 10 percent adder for C&I.
- 20 ♦ Refer to Staff Witness Stephen Eckberg's testimony regarding the behavior
21 programs--Home Energy Reports and Aerial Infrared Mapping.

1 **EM&V Working Group**

- 2 ♦ Staff proposes that the EM&V consultant serve to resolve disputes, but if parties do
3 not agree then the Commission will review and resolve the dispute.

4 **Reporting**

- 5 ♦ Staff recommends that the annual reports and mid-term reports include more details
6 on the actual results of the program. Staff suggests that an outline and content be
7 agreed to by the utilities and Staff.
8 ♦ Staff recommends that the utilities file a memo summarizing their exploration and
9 investigation into various initiatives and offerings after the first and second year of
10 the triennial plan.

11 **Future Planning Approach**

- 12 ♦ Staff recommends that any planning and stakeholder engagement structure used to
13 develop plans and plan modifications should allow full and forthright participation of
14 all potential participants in the litigated process, including the Staff of the
15 Commission. The working groups led by PUC Staff served as a good venue for
16 exploring issues and reaching consensus for the previous plan.
17 ♦ Staff recommends that the planning process begin more than one year, possibly two
18 years before the plan is filed to provide adequate time to discuss relevant issues. The
19 savings targets and associated budgets and rates need to be determined first.
20 ♦ Staff recommends that the filing of the next plan occur no later than July 1, 2023 and
21 an initial draft of the plan with proposed savings targets and budgets and rates be
22 distributed no later than April 1, 2022.

1 **Q. Does this conclude your testimony?**

2 A. Yes.

1 Attachment A

2 Education and Professional Background

3 Elizabeth R. Nixon

4
5 My name is Elizabeth R. Nixon. I am employed as a Utility Analyst with the New
6 Hampshire Public Utilities Commission (PUC). My business address is 21 S. Fruit St., Suite 10,
7 Concord, NH 03301.

8 I earned a B.S. in Mathematics from the University of Vermont in 1985. I worked for
9 ICF, a consulting firm, where we estimated, modeled, and analyzed the energy, environmental
10 and economic impacts of various emission reduction strategies at electric utilities. At ICF and
11 AER*X, Inc., I assisted companies in implementing market-based emissions trading programs. I
12 provided comments on various air quality programs affecting the electric utilities and other
13 industries in the Northeast and other states. I also worked for the Center for Clean Air Policy
14 where we coordinated a dialogue of states and electric utilities to discuss energy efficiency and
15 other emission control strategies to reduce acid rain and greenhouse gases at electric utilities.

16 At the New Hampshire Department of Environmental Services, I wrote the air quality
17 permits for Eversource's electric generating facilities as well as other electric generating
18 facilities and manufacturing facilities in NH. I testified before the NH Air Resources Council
19 regarding the determination of the baseline mercury emissions for Eversource's coal-fired
20 electric generating facilities.

21 I joined the PUC's Sustainable Energy Division in August 2012 where I managed
22 renewable energy incentive programs, determined compliance with the renewable portfolio
23 standard (RPS) program, and conducted analysis of and provided testimony and presentations on

1 the RPS program and rebate programs. In August 2016, I joined the PUC's Electric Division. I
2 completed electric utility rate training at New Mexico State University's Center for Public
3 Utilities.

4 I have testified in the energy efficiency program docket (DE 17-136) and Liberty's
5 battery storage pilot docket (DE 17-189). In addition, I have provided Staff recommendations in
6 the grid modernization docket (IR 15-296) and electric vehicle rate design docket (IR 20-004).

**Unitil Energy System, Inc.
System Benefits Charge ("SBC") Calculation**

Unitil Energy Systems, Inc.
NHPUC Docket No. DE 20-092
Attachment H3 - (2021 - 2023 Plan)
Page 1 of 11

Residential Sector (includes Low-Income Residential)													(Jan 1, 21 & 22 & 23)
Year	EE Total Budget	RGGI Revenues	FCM Revenues	Other Revenues	Prior Year Deferral with Interest	Current Year Interest	SBC Requirement	Forecasted Distribution (kWh)	SBC Rate EE Portion (\$/kWh)	SBC Rate EAP Portion (\$/kWh)	SBC Rate LBR Portion (\$/kWh)	Total SBC Rate (\$/kWh)	
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	
2021	\$ 4,677,524	\$ 56,687	\$ 168,524	\$ 963,228	\$ (465,753)	\$ (14,347)	\$ 3,008,984	489,122,763	\$0.00615	\$0.00150	\$0.00120	\$0.00885	
2022	\$ 5,158,548	\$ 54,463	\$ 140,137	\$ 1,239,115	\$ 879	\$ (727)	\$ 3,724,986	482,005,817	\$0.00773	\$0.00150	\$0.00145	\$0.01068	
2023	\$ 5,638,608	\$ 52,238	\$ 133,129	\$ 1,488,459	\$ (148)	\$ (715)	\$ 3,963,919	478,409,960	\$0.00829	\$0.00150	\$0.00186	\$0.01165	

Commercial & Industrial (C&I) Sector													Total SBC Rate
Year	EE Total Budget	RGGI Revenues	FCM Revenues	Other Revenues	Prior Year Deferral with Interest	Current Year Interest	SBC Requirement	Forecasted Distribution (kWh)	SBC Rate EE Portion (\$/kWh)	SBC Rate EAP Portion (\$/kWh)	SBC Rate LBR Portion (\$/kWh)	Total SBC Rate (\$/kWh)	
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	
2021	\$ 4,891,985	\$ 228,000	\$ 393,222	\$ (963,228)	\$ 122,445	\$ (11,204)	\$ 5,345,233	616,422,193	\$0.00867	\$0.00150	\$0.00129	\$0.01146	
2022	\$ 6,187,942	\$ 228,000	\$ 326,985	\$ (1,239,115)	\$ 852	\$ 1,295	\$ 6,874,218	642,314,405	\$0.01070	\$0.00150	\$0.00121	\$0.01341	
2023	\$ 7,751,441	\$ 228,000	\$ 310,634	\$ (1,488,459)	\$ (14)	\$ 934	\$ 8,702,186	652,689,123	\$0.01333	\$0.00150	\$0.00130	\$0.01613	

- Col. A: Effective year
- Col. B: Company Forecast
- Col. C: Company Forecast
- Col. D: Company Forecast
- Col. E: Company Forecast, C&I Funding for Low-Income Program
- Col. F: Page 2, Line 15
- Col. G: Page 3, Line 14
- Col. H: Col. B - Col. C - Col. D - Col. E + Col. F + Col. G
- Col. I: Company Forecast
- Col. J: Col. H / Col. I
- Col. K: EAP Portion of SBC Rate
- Col. L: Page 4, Col. G
- Col. M: Col. J + Col. K + Col. L

Unitil Energy Systems, Inc.
NHPUC Docket No. DE 20-092
Attachment H3 - (2021 - 2023 Plan)
Page 9 of 11

Bill Impacts of Changes in System Benefits Charge - Unitil Energy Systems, Inc.
Rates Proposed for Effect January 1, 2021, January 1, 2022 & January 1, 2023

	2020	2021	2022	2023
System Benefits Charge (\$/kWh) Residential	\$ 0.00752	\$ 0.00885	\$ 0.01068	\$ 0.01165
System Benefits Charge (\$/kWh) C&I	\$ 0.00752	\$ 0.01146	\$ 0.01341	\$ 0.01613
<u>Bill per month, including UES Default Service Charge</u>				
Residential Rate R (625 kWh/month)	\$ 109.78	\$ 110.61	\$ 111.75	\$ 112.36
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)	\$ 1,479.39	\$ 1,518.77	\$ 1,538.33	\$ 1,565.52
<u>Change from previous rate level - \$ per month</u>				
Residential Rate R (625 kWh/month)		\$ 0.83	\$ 1.14	\$ 0.61
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		\$ 39.38	\$ 19.56	\$ 27.18
<u>Change from previous rate level - %</u>				
Residential Rate R (625 kWh/month)		0.8%	1.0%	0.5%
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		2.7%	1.3%	1.8%

Docket No. DE 20-092
 Direct Testimony of Elizabeth R. Nixon
 Attachment ERN-3
 Page 1 of 1

Lighting Measures	Sector	2021 Plan					2022 Plan					2023 Plan				
		Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs
Eversource	Residential	10,930,661	31,674,847	-	-	\$3,685,866	4,539,948	12,878,563	-	-	\$2,061,949	1,698,859	3,492,288	-	-	\$839,792
	C&I	53,629,429	666,043,477	-	-	\$17,034,472	62,028,328	774,789,598	-	-	\$22,032,824	69,178,454	867,824,887	-	-	\$24,870,557
Liberty	Residential	2,678,327	8,077,847	-	-	\$355,477	1,669,890	5,155,220	-	-	\$241,529	400,135	830,775	-	-	\$92,765
	C&I	8,066,999	106,380,008	-	-	\$1,125,543	9,077,820	118,669,368	-	-	\$1,272,769	10,121,147	131,312,355	-	-	\$1,423,015
NHEC	Residential	4,906,902	16,183,027	-	-	\$575,592	2,473,044	7,315,868	-	-	\$294,136	455,695	956,659	-	-	\$72,633
	C&I	3,730,951	49,160,561	-	-	\$928,351	4,067,595	53,619,651	-	-	\$1,115,164	3,943,081	51,819,890	-	-	\$1,070,787
Unitil	Residential	2,163,579	5,999,375	-	-	\$581,963	1,111,868	3,080,059	-	-	\$427,222	452,236	869,295	-	-	\$238,531
	C&I	4,845,615	55,005,648	-	-	\$1,557,835	4,387,598	46,804,957	-	-	\$1,625,832	3,599,204	38,015,224	-	-	\$1,551,145

Non-Lighting Measures	Sector	2021 Plan					2022 Plan					2023 Plan				
		Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs
Eversource	Residential	7,980,099	125,537,941	87,540	1,814,814	\$18,373,707	9,653,855	151,372,400	99,635	2,073,810	\$23,433,170	11,512,315	179,663,291	109,566	2,286,381	\$28,524,345
	C&I	38,131,941	558,148,523	3,355	70,966	\$13,840,711	54,736,514	785,970,467	3,360	71,044	\$21,884,642	78,347,816	1,107,589,873	3,365	71,122	\$34,225,602
Liberty	Residential	2,140,754	20,441,683	5,383	118,249	\$1,658,510	2,725,789	24,394,568	6,459	141,810	\$2,014,306	3,750,739	29,376,974	7,731	168,756	\$2,390,091
	C&I	1,968,468	28,972,687	56	1,104	\$362,752	2,304,326	34,071,500	56	1,104	\$421,296	2,708,837	40,227,536	56	1,104	\$479,953
NHEC	Residential	1,715,969	26,563,299	12,492	277,148	\$2,098,349	1,653,087	25,456,385	12,871	286,262	\$2,246,069	1,705,389	26,393,910	13,201	293,570	\$2,531,796
	C&I	2,001,582	26,296,700	127	3,170	\$421,342	2,037,687	26,801,835	127	3,170	\$468,882	2,115,276	27,708,459	127	3,170	\$449,311
Unitil	Residential	3,255,359	20,707,056	8,727	170,129	\$2,214,962	3,874,970	24,556,833	10,906	211,296	\$3,264,895	5,222,645	29,488,346	12,588	239,035	\$3,733,251
	C&I	7,240,032	77,536,794	398	5,605	\$1,983,473	7,775,408	108,459,780	407	7,777	\$3,139,341	11,025,471	149,496,948	165	1,653	\$4,299,862

Lighting Measures	Sector	2021 Plan					2022 Plan					2023 Plan				
		Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs
Liberty	Residential	-	-	-	-	\$75	-	-	-	-	\$80	-	-	-	-	\$89
	C&I	-	-	-	-	\$0	-	-	-	-	\$0	-	-	-	-	\$0
Unitil	Residential	-	-	-	-	\$0	4,463	8,925	-	-	\$1,161	-	-	-	-	\$0
	C&I	-	-	-	-	\$0	-	-	-	-	\$0	-	-	-	-	\$0

Non-Lighting Measures	Sector	2021 Plan					2022 Plan					2023 Plan				
		Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs	Annual kWh Savings	Lifetime kWh Savings	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Incentive Costs
Liberty	Residential	31,028	550,165	51,872	672,523	\$3,132,654	35,280	624,120	82,027	767,031	\$3,400,566	38,055	676,431	97,772	874,006	\$3,680,034
	C&I	9,506	152,173	102,013	1,366,661	\$1,892,649	9,699	155,570	109,692	1,503,913	\$2,110,787	9,917	159,339	121,802	1,658,558	\$2,338,502
Unitil	Residential	-	-	16,247	261,160	\$1,131,947	-	-	16,292	323,530	\$1,388,678	-	-	20,254	403,659	\$1,793,247
	C&I	497	7,458	27,903	403,286	\$956,606	621	9,322	41,467	587,247	\$1,423,220	-	-	55,559	787,081	\$2,163,421

**Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 20-092**

Date Request Received: 10/05/2020

Date of Response: 10/19/2020

Request No. STAFF 2-059

Page 1 of 1

Request from: New Hampshire Public Utilities Commission Staff

Witness: Katherine W. Peters, Eric Stanley, Mary Downes, Carol Woods

Request:

It appears that the NH utilities are using different net-to-gross assumptions for C&I midstream lighting. Eversource and NHEC use NTG of 70% NTG for midstream TLEDs and fixtures and 53% for lamps, while Liberty and Unitil use NTG of 84% for midstream TLEDs and fixtures and 73% for lamps. Please provide the source of the NTG assumptions that the NH utilities are using and explain why different NTG factors would be appropriate for different utilities.

Response:

The NH Utilities' BC models include consistent net-to-gross assumptions for C&I midstream lighting across the three years of the Plan. The values that are cited in the question for Eversource and NHEC are for 2023 and those that are referenced for Liberty and Unitil are for 2021. Below are the net-to-gross values used in the models for the utilities that have planned for midstream C&I lighting. It should be noted that only Unitil and Eversource are planning to offer midstream lighting for 2021-2023, but that Liberty electric and the NH Electric Cooperative may decide to offer measures through a midstream pathway in the future.

	2021	2022	2023
Midstream LED Downlight	73%	63%	53%
Midstream LED Exterior	84%	77%	70%
Midstream LED High Bay/Low Bay	84%	77%	70%
Midstream LED Linear Fixture	84%	77%	70%
Midstream LED Linear Fixture with Controls	84%	77%	70%
Midstream LED Linear Lamp	84%	77%	70%
Midstream LED Screw In	73%	63%	53%
Midstream LED Stairwell Kit	84%	77%	70%

Free-ridership and spillover are based on study results from CT—which is the nearby jurisdiction with programs and markets most similar to those in NH. Midstream lighting assumptions are described in detail in the draft NH Technical Reference Manual beginning on Bates 516.

Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 20-092

Date Request Received: 10/05/2020

Date of Response: 10/19/2020

Request No. STAFF 2-060

Page 1 of 1

Request from: New Hampshire Public Utilities Commission Staff

Witness: Katherine W. Peters, Eric Stanley, Mary Downes, Carol Woods

Request:

Please provide an estimate, for each utility and for each plan year, of the proportion of C&I savings expected to come from custom vs prescriptive measures, including whether and how much this proportion is expected to vary from the 2018-2020 cycle.

Response:

The following table displays the planned share of annual savings in the BC models that are attributable to custom versus prescriptive savings measures. The Utilities note that planned values for prescriptive versus custom measures should be viewed as directional estimates, as it is not possible to know how many projects will actually go through a custom or prescriptive path. Therefore, it is difficult to predict “whether and how much this proportion is expected to vary from the 2018-2020 cycle.” In 2018, much of the C&I savings for the electric programs was prescriptive due to the predominance of lighting in the electric portfolio (lighting is typically processed as prescriptive). However, in 2019, the portfolio was a bit more diversified in its measure mix and there were a greater number of custom projects, which led to an increase in the proportion of ‘custom.’ The utilities expect that such year-to-year variations will continue. For the natural gas programs, custom projects accounted for 60-70 percent of total C&I savings in 2018 and 2019. We expect that the inclusion of more midstream program offerings and more widespread marketing of prescriptive offerings will impact the savings mix between custom and prescriptive in the next term.

Electric	2021		2022		2023	
	Custom	Prescriptive	Custom	Prescriptive	Custom	Prescriptive
Eversource	40%	60%	45%	55%	50%	50%
Liberty Electric	79%	21%	75%	25%	72%	28%
NHEC	99%	1%	99%	1%	97%	3%
Unitil Electric	42%	58%	53%	47%	52%	48%

Gas	2021		2022		2023	
	Custom	Prescriptive	Custom	Prescriptive	Custom	Prescriptive
Liberty Gas	55%	45%	57%	43%	54%	46%
Unitil Gas	46%	54%	48%	52%	70%	30%

Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 20-092

Date Request Received: 09/17/2020

Date of Response: 10/01/2020

Request No. STAFF 1-013

Page 1 of 3

Request from: New Hampshire Public Utilities Commission Staff

Witness: Katherine W. Peters, Mary Downes, Eric Stanley, Carol Woods

Request:

Reference Bates 212 and the program cost-effectiveness and benefits for each utility in Attachments E-J. Please provide supporting documentation for the non-energy impacts (NEIs) used in the secondary Granite State Test -2 benefit/cost analyses.

- a. Please provide a summary table showing the NEI value for each measure that was used as the basis for the NEIs used for each utility's Granite State Test -2 benefit/cost analysis.
- b. Please provide the supporting documentation that shows the basis for each utility's sector level NEI percentages.

Response:

- a. As reviewed by the EM&V Working Group, the database supporting the NEIs developed by third party evaluator DNV-GL is too complex to summarize by measure. Please reference the methodology memo describing how DNV-GL did the secondary research into NEI values elsewhere and adjusted them for NH
[<https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/Final-NH-NEI-Methodology-Memo-20200409.pdf>] and the database that was developed as a deliverable in that comprehensive NEI evaluation
[<https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200722-NH-NEI-Draft-Database-NHML-core.xlsm>]. The result of the analysis undertaken by DNV-GL at the request of the EM&V Working Group for the purposes of developing sector level adders for the 2021-2023 Plan is contained in Attachment Staff 1-013 A. The original version of the sector level adder analysis contained an error that is described in detail below. Attachment A discusses this error and updates the results of the original adder analysis.
- b. The NH Utilities apply an annual per participant NEI adder of \$405.71 to each unique HEA weatherization project. The adder is based on the Home Energy Assistance Program Evaluation Report 2016-2017
[<https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200729-NHSaves-HEA-Evaluation-Report-FINAL.pdf>], published in July 2020. The NEI value in the model takes the total weatherization projects (equivalent to the number of planned Insulation projects, since most projects typically include this measure) and multiplies by the annual NEI adder at a 15-year (measure life of Insulation and Air Sealing measures) discounted rate. The NEI adder value is located in cell G69 in the Lookups tab of the EE models, and the calculation of lifetime benefits is made in the Calculations tabs, row 70, column DB (column DD for Liberty).

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For the non-low income Residential and C&I sectors, the NH Utilities included a non-energy impact (NEI) adder in their 2021-2023 BC Model that served as a proxy for participant benefits the program delivered beyond those derived from reduced energy use. The adder was in the form of a percentage applied to savings benefits. The following NEI percentages by sector were used in the secondary Granite State Test – 2 benefit/cost analyses:

	Residential Adder (Not Applied to HEA)	C&I Adder
Eversource	36.3%	17.6%
Liberty Electric	37.2%	21.3%
NHEC	10.0% (adder not updated for 9/1)	10.0% (adder not updated for 9/1)
Unitil	51.0%	17.0%
Liberty Gas	26.9%	21.9%
Unitil Gas	28.0%	25.0%

The supporting documentation that shows the basis for the sector level NEI percentages used in the secondary Granite State Test – 2 benefit / cost analysis is introduced here as Attachment Staff 1-013 A.

After submitting the 2021–2023 NH Statewide EE Plan, it was discovered that the original file utilized by the vendor for the NEI percentage calculations by sector included a pre-populated “NEI adder” column from the BC models provided. The inclusion of this column inflated NEI benefits impacting the Second Granite State Test results. Eversource, Liberty (Electric and Gas) and Unitil (Electric and Gas) were impacted by the inclusion of this column in the original submission. The low income and demand response programs were not affected. The error affected some residential programs and the C&I programs. The corrected NEI percentages by sector are below. These corrections will be made to the benefit / cost models in a compliance filing. Under the updated sector-level adders, calculated benefits under the secondary GST-2 test decrease by approximately 4%. This change does not cause any cost effective program to become not-cost effective under the GST-2.

	Residential Adder (Not Applied to HEA)	C&I Adder
Eversource	28.0%	10.8%
Liberty Electric	33.2%	14.7%
NHEC	27.4%	18.2%
Unitil	42.5%	11.5%
Liberty Gas	19.5%	14.0%
Unitil Gas	19.4%	16.7%

The supporting documentation for the corrected NEIs used in the secondary Granite State Test -2 benefit/cost analyses are introduced here as Excel Attachments Staff 1-013 B, C, D and E, and also discussed in Attachment Staff 1-013 A.

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In addition to the sector-level NEI adders, the NH Utilities claim benefits from reduced fossil emissions based on RGGI. As described in AESC 2018, some environmental costs are “embedded” in the price of the energy due to regulations that require expenditures by generators or other energy suppliers to reduce emissions (e.g., the Regional Greenhouse Gas Initiative or (“RGGI”). “Non-embedded” environmental costs are externalities associated with energy production and supply that are not directly reflected in energy prices. AESC 2018 electric energy avoided costs include embedded avoided emissions costs. However, there are not comparable embedded emissions values associated with fossil fuels. In order to treat electric and fossil fuel emissions consistently in benefit-cost screening, the EE model incorporates comparable fossil fuel avoided emissions with a conservative calculation based on the AESC 2018 forecast of RGGI values and standard emissions output factors for those fuels.

The values that we have in the Avoided Costs tab of the model for the Fossil Emissions based on RGGI come from Table 131 of AESC 2018. Table 131 provides the fuel oil emission values for SO₂, NO_X, and CO₂. The emission values are shown by year and by sector. For our model, we take the CO₂ in \$/MMBtu from the table and then convert it to a price per ton. We use the CO₂ emissions rate for Oil to make this conversion. We use these costs and apply them to each fossil fuel saving measure based on the converted tons of fossil fuel saved. For these conversion factors we use the values from Table 20 of AESC 2018. What this amounts to is an inflation-adjusted price per ton of \$12.95 in the first year for 2021, or a cumulative price per ton of \$283.74 for a measure installed in 2021 with a 15 year measure life.