

**BEFORE THE
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION**

**2021-2023 TRIENNIAL ENERGY
EFFICIENCY PLAN**

Docket DE 20-092

**Direct Testimony of
Courtney Lane and Danielle Goldberg**

**On Behalf of
The Office of the Consumer Advocate**

April 19, 2022

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Schedule CLDG-1: Resume of Courtney Lane

Schedule CLDG-2: Resume of Danielle Goldberg

Attachment CLDG-1: Response to DOE 1-002

Attachment CLDG-2: Response to DOE TS 1-002

Attachment CLDG-3: Response to OCA 3-001

Attachment CLDG-4: Response to DOE 2-002(b)

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q Please state your name, title, and employer.**

3 **A Ms. Lane:** My name is Courtney Lane. I am a Senior Associate at Synapse Energy
4 Economics (“Synapse”), located at 485 Massachusetts Avenue #3, Cambridge, MA
5 02139.

6 **A Ms. Goldberg:** My name is Danielle Goldberg. I am an Associate at Synapse Energy
7 Economics, located at 485 Massachusetts Avenue #3, Cambridge, MA 02139.

8 **Q Please describe Synapse Energy Economics.**

9 **A**Synapse is a research and consulting firm specializing in electricity and gas industry
10 regulation, planning, and analysis. Our work covers a range of issues, including economic
11 and technical assessments of demand-side and supply-side energy resources, energy
12 efficiency policies and programs, integrated resource planning, electricity market
13 modeling and assessment, renewable resource technologies and policies, and climate
14 change strategies. Synapse works for a wide range of clients, including attorneys general,
15 offices of consumer advocates, public utility commissions, environmental advocates, the
16 U.S. Environmental Protection Agency, the U.S. Department of Energy, the U.S.
17 Department of Justice, the Federal Trade Commission, and the National Association of
18 Regulatory Utility Commissioners. Synapse has over 30 professional staff with extensive
19 experience in the electricity industry.

1 **Q Please summarize your professional and educational experience.**

2 **A Ms. Lane:** I have 17 years of experience in energy policy and regulation. At Synapse, I
3 work on utility regulatory models, performance incentive mechanisms, rate and bill
4 impact analysis of utility energy efficiency programs, and the development of cost-
5 effectiveness frameworks for distributed energy resources. Prior to working at Synapse, I
6 spent six years at National Grid where I led the development of National Grid's Annual
7 and Three-Year Energy Efficiency Plans and System Reliability Procurement Plans for
8 the state of Rhode Island. This involved collaborating with internal and external
9 stakeholders, facilitating the Rhode Island Energy Efficiency Collaborative, overseeing
10 benefit-cost models, testifying before the Public Utilities Commission, and participating
11 in Rhode Island grid modernization and power sector transformation proceedings. Prior
12 to joining National Grid, I worked on regulatory and state policy issues pertaining to
13 energy conservation, retail competition, net metering, and the Alternative Energy
14 Portfolio Standard for Citizens for Pennsylvania's Future (PennFuture). Prior to that, I
15 worked for Northeast Energy Efficiency Partnerships, Inc. where I promoted energy
16 efficiency throughout the Northeast.

17 I have sponsored testimony before the New Hampshire Public Utilities Commission, the
18 Maryland Public Service Commission, the Pennsylvania Public Service Commission, the
19 Public Service Commission of the District of Columbia, and the Rhode Island Public
20 Utilities Commission.

1 I hold a Master of Arts in Environmental Policy and Planning from Tufts University and
2 a Bachelor of Arts in Environmental Geography from Colgate University. My resume is
3 attached as Schedule CLDG-1.

4 **A Ms. Goldberg:** I have 5 years of experience in research and consulting at Synapse. While
5 at Synapse, my work has focused on energy efficiency topics, including cost-
6 effectiveness analysis, best practices for energy efficiency program design, electrification
7 strategies, and equitable distribution of benefits. Most of my energy efficiency experience
8 is in Massachusetts. However, I have also reviewed energy efficiency policies across all
9 50 states; supported energy efficiency modeling in Vermont, New Hampshire, and
10 Connecticut; and critiqued energy efficiency plans or policy in Kansas, New Jersey, Nova
11 Scotia, Minnesota, Wisconsin, Missouri, Illinois, Iowa, Ohio, Indiana, and Puerto Rico. I
12 hold a Bachelor of Science in Mechanical Engineering from Northeastern University. My
13 resume, attached as Schedule CLDG-2, presents additional details of my professional and
14 educational experience.

15 **Q On whose behalf are you testifying in this case?**

16 **A** We are testifying on behalf of the Office of the Consumer Advocate (OCA).

17 **Q What is the purpose of your testimony?**

18 **A** The purpose of our testimony is to explain why the OCA generally supports the NHSaves
19 2022–2023 Plan proposal (the “Proposed Plan”) submitted jointly by Liberty Utilities
20 (Granite State Electric) Corp. d/b/a Liberty, New Hampshire Electric Cooperative
21 (NHEC), Public Service Company of New Hampshire d/b/a Eversource Energy, Unitil

1 Energy Systems, Inc. (UES), Liberty Utilities (EnergyNorth Natural Gas) Corp d/b/a
2 Liberty, and Northern Utilities, Inc. (Northern) (collectively, the “Utilities”). Specifically,
3 we address the Proposed Plan’s compliance with House Bill 549 (“HB 549”), offer some
4 recommended improvements to the Proposed Plan, explain our support for the Granite
5 State Test (“GST”) for cost-effectiveness, and we reinforce the longstanding view of the
6 OCA that rate-payer funded energy efficiency programs are critically important for the
7 state’s residential utility customers.

8 **Q What materials did you rely on to develop your testimony?**

9 **A** The sources for our testimony and exhibits are public documents, responses to discovery
10 requests, and our personal knowledge and experience.

11 **Q Was your testimony prepared by you or under your direction?**

12 **A** Yes. Our testimony was prepared by us or under our direct supervision and control.

13 **II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

14 **Q Please summarize your primary conclusions.**

15 **A** Our primary conclusions are as follows:

16 1. The Proposed Plan meets the requirements of HB 549 and previous Commission
17 Orders.

18 2. There is room for improvement in the Proposed Plan, specifically additional
19 opportunities for financing and committing to incorporating net-to-gross ratios

1 (“NTG”) in future updates to the *New Hampshire Technical Reference Manual for*
2 *Estimating Savings from Energy Efficiency Measures* (“TRM”).¹

3 3. Utility-sponsored, ratepayer-funded energy efficiency programs continue to offer
4 significant benefits to New Hampshire customers in terms of reduced electricity and
5 gas costs, reduced risks associated with volatile natural gas prices, and benefits to the
6 local economy.

7 4. In the more than two decades since the wholesale electricity markets were established
8 in New England and elsewhere, experience has clearly indicated that market-based
9 initiatives alone are unlikely to deliver the full potential for cost-effective energy
10 efficiency savings, and that utility-sponsored, ratepayer-funded energy efficiency
11 programs are still necessary to deliver these important benefits to customers.

12 5. The GST was designed by a robust stakeholder process to address the energy policy
13 goals specific to New Hampshire using principles and concepts based on current best
14 practices in the industry. Contrary to the opinion expressed by the Commission in
15 November, there is nothing subjective about the GST.

16 **Q Please summarize your primary recommendations.**

17 **A** Our primary recommendations are as follows:

¹ NTG ratios account for free-ridership and spillover. Free-ridership accounts for program participants that would have installed the measure or practice even in the absence of the efficiency program. Spillover accounts for reductions in energy that occurred because of the presence of an efficiency program, but that were not funded by the efficiency program.

- 1 1. We recommend that the Commission approve the Proposed Plan.
- 2 2. We recommend that, as part of the approval of the Proposed Plan, the Commission
- 3 direct the Utilities to adopt the further improvements to the Proposed Plan described
- 4 in our testimony.
- 5 3. We recommend that, unless and until it is demonstrated that a competitive market for
- 6 energy efficiency products and services can provide cost-effective energy efficiency
- 7 savings to all customer types, that the Commission support the utility-sponsored,
- 8 ratepayer-funded energy efficiency programs for that purpose.
- 9 4. We recommend that the Commission embrace the GST as the primary cost-
- 10 effectiveness test for evaluating NH energy efficiency programs, as required by HB
- 11 549. If the Commission still feels that there is anything subjective or arbitrary or
- 12 otherwise inappropriate about the GST, then we recommend that the Commission
- 13 conduct technical sessions with relevant stakeholders to address these concerns.

14 **III. THE 2022–2023 STATEWIDE ENERGY EFFICIENCY PLAN COMPLIES WITH**
15 **HOUSE BILL 549 AND COMMISSION ORDERS**

16 **Q Please summarize HB 549 with respect to the Proposed Plan filing.**

17 **A**HB 549, as signed into law by Governor Sununu on February 24, 2022, amended RSA
18 374-F:3, VI by requiring the Utilities to file a revised 2022–2023 Plan on March 1, 2022
19 that reflects the programmatic framework and components that were in effect January 1,
20 2021. HB 549 also requires the Commission to issue an order approving or denying the

1 Proposed Plan by May 1, 2022. The Proposed Plan is required to adhere to the following
2 key provisions included in HB 549:

- 3 • The energy efficiency portions of the electric utilities' System Benefits Charge
4 ("SBC") and the natural gas utilities' Local Distribution Adjustment Charge
5 ("LDAC") are set at 2020 levels for calendar year 2022, and then increase every
6 year using the 3-year average of the Consumer Price Index, plus 0.25 percentage
7 points. The Utilities are also required to continue to seek alternative sources of
8 funding to supplement these charges.
- 9 • The Granite State Test ("GST") is defined as the primary cost-effectiveness test
10 and the Total Resource Cost ("TRC") test is defined as the secondary test.
- 11 • For electric utilities, 65 percent of overall planned energy savings are required to
12 come from electric system savings.
- 13 • The Utilities are required to direct up to \$400,000 of annual SBC revenues to the
14 Department of Energy ("DOE") to promulgate the benefits of energy efficiency.
- 15 • A least 20 percent of the annual SBC funds must be used for funding low-income
16 energy efficiency programs.
- 17 • A maximum of 5 percent of the overall program budget may be allocated to
18 Evaluation, Measurement, and Verification ("EM&V") studies.

1 **Q Did the Commission indicate other criteria for review?**

2 **A** Yes. The Commission stated in its March 16, 2022 Supplemental Notice and Procedural
3 Order that it will also review whether the Proposed Plan targets cost-effective
4 opportunities that would be otherwise lost to market barriers and whether those market
5 barriers were identified and addressed in accordance with RSA 374-F:3. The Commission
6 advised that it will also assess whether changes to programs and rebate caps are
7 reasonable, whether rates are just and reasonable, and whether the Proposed Plan
8 addresses free-ridership.²

9 **Q Does the Proposed Plan comply with HB 549 and meet the criteria specified by the**
10 **Commission?**

11 **A** Yes. In the testimony that follows we will describe how the Proposed Plan meets the
12 requirements of HB 549 and the criteria listed by the Commission in its March 16, 2022
13 Supplemental Notice and Procedural Order.

14 **Funding Requirements**

15 **Q What are the funding requirements for HB 549?**

16 **A** HB 549 listed five primary funding requirements: (1) the energy efficiency portions of
17 the SBC and LDAC shall be set at the level approved for the 2020 plan year, (2) up to
18 \$400,000 shall be allocated for the DOE to promulgate the benefits of energy efficiency,
19 (3) no more than 5 percent of program budget shall be spent on EM&V, (4) at least 20

² Docket DE 20-092, Supplemental Notice of Adjudicative Proceeding and Procedural Order re: Procedural Schedule, March 16, 2022 (tab 171).

1 percent of the funds collected shall be spent on low-income energy efficiency, and (5) the
2 Utilities should investigate additional funding sources for energy efficiency.

3 **Q Do the energy efficiency portions of the SBC and LDAC rates in the Proposed Plan**
4 **comply with HB 549?**

5 **A** Yes. HB 549 set the energy efficiency portions of the SBC and LDAC at the same rate as
6 approved in 2020. Table 1 displays the SBC for 2020, 2022, and 2023. Consistent with
7 the directive from HB 549, the SBC rate for Program Year 2022 is set equal to the 2020
8 rate. The Utilities estimated an SBC rate for Program Year 2023 using the inflation
9 calculation in accordance with HB 549.

10 **Table 1. SBC charges for 2020, 2022, and 2023—All Utilities**

Year	SBC Rate (EE Portion) (\$/kWh)
2020	0.00528
2022	0.00528
2023	0.00543

11 *Sources: Order No. 26,323 and Utilities Response to DOE 1-002.*

12 Table 2 displays the energy efficiency portion of the LDAC for 2020, 2022, and 2023,
13 broken out by customer segment.

14 **Table 2. LDAC charges for 2020, 2022, and 2023, by utility and customer segment**

Year	LDAC (EE Portion) (\$/therm)	
	Northern	EnergyNorth
2020	Res: 0.0706 C&I: 0.0359	Res: 0.0640 C&I: 0.0478
2022	Res: 0.0499 C&I: 0.0247	Res: 0.0640 C&I: 0.0426
2023	Res: 0.0513 C&I: 0.0254	Res: 0.0658 C&I: 0.0438

15 *Sources: Order No. 26,303, Order No. 26,306, and Utilities Response to DOE 1-002.*
16 *C&I refers to Commercial & Industrial customers. Res refers to Residential customers.*

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1 Consistent with the directive from HB 549, the LDAC rate for Program Year 2022 is set
2 equal to the 2020 rate. The Utilities estimated a preliminary LDAC rate for Program Year
3 2023 based on the inflation calculation in HB 549. In September 2022, Northern and
4 EnergyNorth will file a new LDAC rate in accordance with HB 549 for Program Year
5 2023.

6 **Q Did the Utilities set aside up to \$400,000 of SBC funds for DOE?**

7 **A** Yes. As indicated in the Utilities' Response to DOE TS 1-002, the electric utilities
8 account for their share of the \$400,000 of SBC charges by reducing the amount of
9 funding available for their total program budgets.³

10 **Q Do EM&V costs comprise of 5 percent or less of the total energy efficiency budget?**

11 **A** Yes. Table 3 below displays the combined electric and gas energy efficiency budgets, by
12 sector, for Program Years 2022 and 2023. The EM&V costs as a percent of total range
13 from 3.0 to 4.4 percent of the total budget, complying with HB 549.

14 **Table 3. EM&V costs as a percent of total**

Sector by Year	Total Program Costs	EM&V Costs	EM&V Costs as a % of Total
2022	\$70,457,819	\$2,143,632	3.0%
A - Residential	\$23,524,619	\$726,168	3.1%
B - Low-Income	\$14,066,713	\$417,756	3.0%
C - Commercial & Industrial	\$32,866,486	\$999,707	3.0%
2023	\$72,192,539	\$3,149,013	4.4%
A - Residential	\$24,038,908	\$1,065,188	4.4%
B - Low-Income	\$14,396,507	\$613,811	4.3%
C - Commercial & Industrial	\$33,757,124	\$1,470,014	4.4%
Grand Total	\$142,650,358	\$5,292,645	3.7%

³ Utilities Response to DOE TS 1-002.

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1 *Source: Utilities Benefit-Cost Models. Primary Data Tab.⁴*

2 **Q Is at least 20 percent of the total energy efficiency budget allocated for low-income**
3 **programs?**

4 **A** Yes. Table 4 displays the combined electric and gas energy efficiency budget for each
5 customer sector and as a percent of the total energy efficiency budget. For both 2022 and
6 2023, the low-income budget comprises 20 percent of the total budget.

7 **Table 4. Low-income budget as a percent of total**

Sector	2022		2023	
	Total Program Budgets	Percent of Total Budget	Total Program Budgets	Percent of Total Budget
A - Residential	\$23,524,619	33%	\$24,038,908	33%
B - Low-Income	\$14,066,713	20%	\$14,396,507	20%
C - Commercial & Industrial	\$32,866,486	47%	\$33,757,124	47%
Total	\$70,457,819	100%	\$72,192,539	100%

8 *Source: Utilities Benefit-Cost Models. Primary Data Tab.⁵*

9 **Q Did the Utilities investigate alternative sources of funding and financing for energy**
10 **efficiency?**

11 **A** Yes. The Utilities commissioned a report in January 2020 to investigate external funding
12 and partnership opportunities.⁶ The report recommended the Utilities request their non-
13 profit partners prepare and submit proposals to external foundations to seek additional
14 funding. The report also indicated that available funding may only have a fractional
15 impact on total energy efficiency budgets. In Section 1.3.3 of the Proposed Plan, the
16 Utilities conclude that finding large sums of money from external sources is unrealistic,

⁴ Utilities live Excel Benefit-Cost Models as filed in conjunction with the Plan filing (Plan Narrative and Attachments) filed on March 1, 2022. Data obtained from Primary Data Tab.

⁵ *Ibid.*

⁶ NHSaves 2022-2023 Plan, March 1, 2022. Attachment O.

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1 but that their vendor, Resilient Buildings Group, successfully identified opportunities for
2 project-specific funding.

3 The Utilities continue to offer all customer segments a variety of financing options to
4 support investments in energy efficiency. These include partnering with local lenders to
5 provide low-interest loans for residential customers, buying down interest rates to zero
6 percent for moderate income customers, and connecting customers to private financing
7 options.

8 The Utilities also offer two types on on-bill financing, traditional on-bill and tariff-based
9 on-bill. Traditional zero-percent on-bill financing is offered by all the utilities, which
10 allows customers to repay energy efficiency loans through monthly natural gas or electric
11 bills.

12 Eversource and NHEC also offer a tariff-based on-bill financing program called
13 SmartSTART, where the monthly payments are designed to be less than or equal to the
14 customer's estimated monthly energy savings. Eversource and NHEC offer SmartSTART
15 tariffs to their municipal customers and NHEC also offers it to its commercial
16 customers.⁷

⁷ NHSaves 2022-2023 Plan, March 1, 2022. Page 26-27 (Bates 30-31).

Savings Requirements

Q What are the savings requirements for HB 549?

A HB 549 requires that, for electric utility energy efficiency programs, at least 65 percent of energy savings come from electric energy savings.

Q Do the electric utilities comply with these savings requirements?

A Yes. The Utilities interpreted HB 549 to refer to lifetime energy savings, ensuring that lifetime electric energy savings exceed 65 percent of total lifetime energy savings. Table 5 below summarizes electric savings and non-electric savings (converted to MWh) in the Utilities' Proposed Plan. For 2022 and 2023, lifetime electric savings as a percent of total energy savings meet or exceed 65 percent.

Table 5. Electric savings as a percent of total energy savings

Year	Electric savings (MWh)		Non-electric savings (MWh)		Electric savings as a % of total savings (%)	
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
2022	88,257	1,028,243	18,518	544,842	83%	65%
2023	82,159	956,885	17,799	502,582	82%	66%

Source: Utilities Electric Benefit-Cost Models. Primary Data Tab.⁸

Market Barriers

Q Please describe what is meant by market barriers.

A Market barriers refer to real-world obstacles that hinder electricity and natural gas customers from adopting energy efficiency measures on their own. In a perfectly functioning economy, all customers would adopt efficiency measures that resulted in

⁸ Utilities live Excel Benefit-Cost Models as filed in conjunction with the Plan filing (Plan Narrative and Attachments) submitted on March 1, 2022. Data obtained from Primary Data Tab.

1 long-term financial gains and product availability would directly follow product demand.

2 In reality, markets for energy and for energy efficiency goods and services are imperfect
3 and hence the markets fail to produce the efficient outcome.

4 **Q What are common market barriers to energy efficiency?**

5 **A** There are well known barriers to customer adoption of energy efficiency that are still in
6 place today. We summarize the most common below.

- 7 • Transaction costs and lack of capital: Customers, businesses, and industries may
8 lack the up-front capital to invest in an energy efficiency product. This is
9 particularly true for low-income customers. There is also the issue of transaction
10 costs, where an investment of time and money may be required to obtain
11 information, make an informed purchase, and install energy efficiency measures.
12 This is a particular problem when construction, renovation, and equipment failure
13 require fast decision-making and product procurement.
- 14 • Imperfect information: Energy consumers do not often consider energy efficiency
15 measures as an alternative to purchasing electricity and natural gas. Customers,
16 businesses, industries, and contractors are often not aware of the full range of
17 energy efficiency options, or they lack information on the economic, productivity,
18 and other non-energy benefits of those efficiency measures. Further, for many
19 customers, energy costs represent a small portion of the total costs of maintaining
20 a home, running a business, or operating a factory, so little or no attention is paid
21 to opportunities to reduce these costs.

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- 1 • Limited product availability: Many energy efficiency measures are produced and
2 distributed on a limited scale and are not readily available to customers, builders,
3 contractors, or industries.
- 4 • Split incentives: The financial interests of those in a position to implement energy
5 efficiency measures are often not aligned with the interests of those who would
6 benefit from such measures. For example, landlords make capital purchases and
7 maintain buildings, while tenants frequently pay the energy bills. Similarly, at the
8 time of new construction the builder has incentive to minimize short-term costs,
9 while it is the new owner who would benefit from lower electricity bills over the
10 long term.
- 11 • Purchasing procedures: Businesses may be focused on minimizing short-term
12 costs over minimizing life-cycle costs, including energy costs. In addition,
13 businesses may have competing priorities from capital and operating budgets.
- 14 • Uncertainty and risk avoidance: Customers may be skeptical of potential energy
15 efficiency savings, may have doubts about whether an unfamiliar energy
16 efficiency measure will work properly, or may find the more efficient technology
17 to be less attractive or effective than the existing less-efficient technology.

18 **Q What market barriers are identified in the Proposed Plan?**

19 **A The Utilities identify the following market barriers: first-cost obstacles, lack of**
20 **information and imperfect information, lack of product availability, and lack of trained**

1 contractors with the requisite experience to recommend and install the higher efficiency
2 equipment.⁹

3 **Q Does the Proposed Plan adequately address these barriers?**

4 **A** Yes. Here are the ways in which the Proposed Plan addresses market barriers:

5 • First-cost obstacles: The Proposed Plan addresses the higher upfront costs of
6 energy efficiency in several ways. It provides direct rebates to customers to help
7 cover the higher incremental first-cost of energy efficiency measures; provides
8 indirect incentives for equipment discounts through midstream¹⁰ incentives and
9 midstream point of sale; and provides customers with technical audits, employee
10 and contractor labor to install measures, expenses, materials, and supplies. The
11 Proposed Plan also provides low-interest or interest-free loans and on-bill
12 financing to cover the portion of the customer's share of cost of the energy
13 efficiency investment.¹¹

14 The initial cost of energy efficiency investments is one of the main barriers to
15 customer adoption. It is therefore worth highlighting that the Proposed Plan
16 allocates most funds towards addressing this barrier. For Year 2022, 85 percent of
17 electric utility funding and 81.1 percent of gas utility funding goes towards

⁹ NHSaves 2022-2023 Plan, March 1, 2022. Pages 8-9 (Bates 12-13).

¹⁰ Midstream incentives are those provided directly to distributors or contractors, who then pass cost savings to customers.

¹¹ *Id.* pages 23 and 45 (Bates 27 and 49).

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1 Rebates and Services. In Year 2023, these percentages are 83.8 and 82.2
2 respectively.¹²

- 3 • Information: The Proposed Plan addresses the lack of customer information on
4 the benefits of energy efficiency through marketing and contractor education
5 using a variety of pathways. Specifically, the Proposed Plan promotes energy
6 efficiency and provides customer education through the NHSaves website, direct
7 mail, bill inserts, emails, engagement with retailers and distributors, and
8 marketing in-stores, online, and at point of purchase. The Proposed Plan also
9 proposes to offer co-marketing with contractors and retailers and provide targeted
10 outreach using case studies, technical assistance, and building assessments.¹³
- 11 • Product availability: The Proposed Plan addresses this barrier through midstream
12 distributor incentives to encourage distributors to stock and promote higher
13 efficient equipment for the residential and the commercial and industrial sectors.¹⁴
- 14 • Contractors and workforce: The Proposed Plan provides resources for contractor
15 training and workforce development. Specifically, the Proposed Plan offers Home
16 Energy Rating System (“HERS”) Rater support and training, community action
17 agency (“CAA”) contractor training, and training and certification for HVAC
18 contractors.¹⁵

¹² *Id.* Attachment C (2022) page 4 and Attachment C (2023) page 8.

¹³ *Id.* page 23 and 45 (Bates 27 and 49).

¹⁴ *Id.* page 30 and 45 (Bates 34 and 49).

¹⁵ *Ibid.*

1 **Cost-Effectiveness**

2 **Q What does HB 549 require for Commission review of cost-effectiveness?**

3 **A**HB 549 requires the Commission to use the GST as the primary cost-effectiveness test in
4 its review of the NHSaves programs and the TRC test as a secondary test. The legislation
5 further directs the Commission to base its review upon the latest Avoided Energy Supply
6 Cost Study (“AESC”) for New England, as well as EM&V results, including for free-
7 ridership.

8 **Q What is the difference between a primary and a secondary cost-effectiveness test?**

9 **A**The purpose of a primary test is to inform whether the Utilities’ proposed investments in
10 energy efficiency create more benefits than costs and therefore merit approval by the
11 Commission. The primary test is the main determinant of whether a program should be
12 included in the Proposed Plan.

13 A secondary test is meant to support the primary test by helping to enhance the overall
14 understanding of the energy efficiency impacts. The additional information from a
15 secondary test can help to prioritize energy efficiency programs and to inform decisions
16 regarding marginally cost-effective programs and allocation of resources. The secondary
17 test is not intended to undermine the purpose of the primary test.¹⁶

¹⁶ National Energy Screening Project (NESP), *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources* (NSPM for DERs), August 2020, page. 3-16. Available at: <https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/>.

1 **Q Please describe the GST.**

2 **A The GST is a jurisdiction-specific cost-effectiveness test that compares the net present**
3 value (“NPV”) of a stream of benefits compared to the NPV of costs for energy
4 efficiency measures and programs over their useful lives. If the NPV of benefits is greater
5 than the NPV of costs to deliver those programs, than it is determined to be cost-effective
6 (i.e., a benefit-cost ratio of 1.0 or above).

7 The GST includes all utility system impacts. For electric utilities, utility system impacts
8 include those associated with the generation, transmission, and distribution of electricity
9 services. For gas utilities, these include impacts related to the transportation, storage, and
10 distribution of gas services. The GST also includes non-utility system impacts related to
11 other fuels (i.e., oil and propane), water, low-income participants, and environmental.

12 Table 6 below shows the GST impacts currently quantified within the Utilities’ benefit-
13 cost assessment (“BCA”) models and their source.

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1

Table 6. Quantified Granite State Test impacts within the Proposed Plan

Category	Impact	Source
Utility System Costs	Measure costs (utility portion)	Proposed Plan Budget
	Other financial or technical support costs	Proposed Plan Budget
	Other program and administrative costs	Proposed Plan Budget
	EM&V costs	Proposed Plan Budget
	Performance incentives	Proposed Plan Budget
Utility System Benefits	Avoided energy costs	2021 AESC ¹⁷
	Avoided generating capacity costs	2021 AESC
	Avoided reserves	2021 AESC
	Avoided transmission costs	2021 AESC
	Avoided distribution costs	Utility-specific calculations
	Avoided transmission and distribution line losses	2021 AESC
	Avoided ancillary services	2021 AESC
	Intrastate price suppression effects (DRIPE)	2021 AESC
	Avoided compliance with RPS requirements	2021 AESC
	Avoided environmental compliance costs (embedded)	2021 AESC
Reduced Risk	2021 AESC	
Non-Utility System Impacts	Other fuel	2021 AESC
	Water resource	Average of Manchester, NH and Concord, NH water and sewer costs per gallon from July 2016. ¹⁸
	Income eligible (participant)	Home Energy Assistance Program Evaluation Report ¹⁹
	Environmental, NH fossil fuel proxy	Regional Greenhouse Gas Initiative's dollar per ton carbon dioxide

2

¹⁷ Synapse Energy Economics. *Avoided Energy Supply Components in New England: 2021 Report*, amended May 14, 2021. Available at https://www.synapse-energy.com/sites/default/files/AESC%202021_20-068.pdf.

¹⁸ Utilities live Excel Benefit-Cost Models as filed in conjunction with the Plan filing (Plan Narrative and Attachments) filed on March 1, 2022.

¹⁹ Opinion Dynamics. *Home Energy Assistance Program Evaluation Report 2016-2017, Final*, July 29, 2020. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200729-NHSaves-HEA-Evaluation-Report-FINAL.pdf>.

1 There are additional benefits within the GST that are currently described in a qualitative
2 manner and not currently included in the Utilities' BCA models. These benefits include
3 avoided credit and collection costs, increased reliability, and market transformation.

4 **Q How is the GST applied?**

5 **A**The GST is applied to each program in the Proposed Plan that is designed to save energy.
6 The GST requires that each program be cost-effective. While there is no requirement for
7 individual measures and projects to be cost-effective, on average, they must be cost-
8 effective to allow for the overall program to be cost-effective. The GST is used both
9 prospectively to assess cost-effectiveness of the Proposed Plan, and retrospectively as
10 part of annual and term reporting. Certain programs and initiatives are exempt from cost-
11 effectiveness, including evaluation or other research, education, pilots, programs in early
12 stages, and investments in income-eligible programs and customers.²⁰

13 **Q Does the Proposed Plan comply with HB 549 and the GST?**

14 **A**Yes. As shown in Proposed Plan Attachments E1, F1, G1, H1, I1, and J1, each electric
15 and natural gas program for each utility is cost-effective under the GST.²¹ We also
16 reviewed the Utilities' live Excel benefit-cost models as filed in conjunction with the

²⁰ NHSaves. Cost Effectiveness Testing 2021-2023. Presented to the New Hampshire Public Utilities Commission on March 16, 2020. Available at: <https://www.puc.nh.gov/EESE%20Board/Meetings/2020/20200316Mtg/20200316-EERS-NHSaves-Cost-Effectiveness-2021-2023.pdf>.

²¹ NHSaves 2022-2023 Plan, March 1, 2022. Attachment E1, Bates 523 and 526; Attachment F1, Bates 565 and 568; Attachment G1, Bates 604 and 607; Attachment H1, Bates 621 and 624; Attachment I1, Bates 669 and 672; Attachment J1, 684-685.

1 Proposed Plan filing (Plan Narrative and Attachments) on March 1, 2022 and found that
2 the relevant impacts of the GST were applied accurately.

3 **Q Please explain how the Proposed Plan accounts for NTG and other EM&V results.**

4 **A** As documented within the TRM included in Attachment A of the Proposed Plan, the
5 Utilities incorporated recent evaluation results used to estimate the energy and demand
6 savings for energy efficiency measures included in the Proposed Plan. This includes
7 factors related to adjusting gross energy savings such as NTG ratios.

8 Gross energy savings refer to changes in a program participant's energy consumption
9 regardless of why they chose to participate. NTG ratios are applied to gross energy
10 savings to determine what portion of those savings can be directly attributable to the
11 energy efficiency program, often referred to as net savings. The ratio is developed
12 through evaluations that determine levels of free-ridership and spillover for efficiency
13 measures. Free-ridership refers to program participants that would have implemented the
14 program measure or practice even without the program. Spillover refers to additional
15 energy savings beyond those directly created by efficiency programs. This can include a
16 program participant installing measures beyond those incentivized by a program or a non-
17 participant installing measures due to the influence of programs.

1 The Utilities currently apply free-ridership to midstream and upstream offerings, but not
2 to downstream measures.^{22,23} The Utilities also indicated that in coordination with the
3 EM&V Working Group, NTG impacts including free-ridership and spillover will be
4 followed for lighting and other markets and any updates will be included in the annual
5 update to the TRM.²⁴

6 **Changes to Rebate Caps**

7 **Q Did the Utilities propose any changes to rebate caps in the Proposed Plan?**

8 **A** Yes. The Utilities propose to reduce the maximum Home Energy Assistance (“HEA”)
9 rebate cap per project from \$20,000 down to \$15,000, including heating systems.²⁵

10 **Q Do you find this change is reasonable?**

11 Yes. The Utilities have based this proposed change on the actual costs of HEA projects
12 implemented over the past two years.²⁶ The right sizing of rebate levels based on recent
13 experience is prudent program administration and will help to ensure that more customers
14 are provided energy savings opportunities.

15 We also support the proposal to continue the practice of allowing HEA projects to exceed
16 the cap on a case-by-case basis after careful review of circumstances and funding
17 availability. The Utilities indicate a utility supervisor would make a case-by-case

²² *Id.* Attachment A, pages 21-24 (Bates 129-132).

²³ Unlike downstream measures, upstream and midstream delivery channels do not provide incentives directly to customers but rather to distributors, stores, contractors, or other channels that pass along costs savings indirectly to end use customers.

²⁴ *Id.* page 80 (Bates 84).

²⁵ NHSaves 2022-2023 Plan, March 1, 2022. Page 61 (Bates 65).

²⁶ *Ibid.*

1 determination for an exemption to the rebate cap based on the Community Action
2 Agency (“CAA”) recommendation, review of any Weatherization Assistance Project
3 (“WAP”) funding, the work scope, cost, project needs, energy savings and cost-
4 effectiveness of the proposed measures.²⁷ This flexibility is important for customers that
5 may have more extensive structural damage related to wiring, damaged insulation, and
6 other health and safety barriers in their home that would make them unable to adopt
7 energy efficiency measures without access to a higher rebate amount.

8 **IV. RECOMMENDED IMPROVEMENTS TO THE PROPOSED PLAN**

9 **Q Do you have any recommended enhancements to improve the Proposed Plan?**

10 **A** Yes. While we find that the Proposed Plan meets the requirements of HB 549 and
11 Commission Orders, we recommend the following improvements:

- 12 1. Increase additional financing opportunities for customers.
- 13 2. Improve the Utilities’ commitment to assessing the application of NTG ratios in
14 downstream programs.

15 **Q What is your recommendation for ways in which the Utilities can increase financing**
16 **opportunities for customers?**

17 **A** We recommend expansion of the SmartSTART tariffs. Currently, Eversource and NHEC
18 offer SmartSTART tariffs to municipal customers and NHEC also offers them to

²⁷ Utilities Response to DOE 2-002(b).

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1 commercial customers. This offering allows customers to pay for energy efficiency
2 upgrades through the energy savings on their bills, rather than through upfront costs.

3 A key benefit of the SmartSTART tariff is that it is tied to the meter not the customer or
4 business. This provides for financing without a customer or business having to take on
5 new debt. This type of financing can therefore reach customers and business that would
6 not have otherwise been able to take on loans due to debt issues or that want to reserve
7 debt for other purposes. In addition, on-bill financing like SmartSTART is commonly
8 considered an operating not a capital expense, may be seen as more favorable by a
9 business owner with competing capital project needs.

10 For these reasons, we recommend that the Commission direct all Utilities to develop
11 SmartSTART tariffs for municipal and commercial customers. We also recommend
12 Commission direct the Utilities investigate the expansion of SmartSTART to residential
13 customers. Several other energy efficiency program administrators offer on-bill financing
14 to residential customers seeking efficiency upgrades. For example, the New York State
15 Energy Research and Development Authority (NYSERDA) offers an On-Bill Recovery
16 Loan through all of its participating utilities, applying a similar model to SmartSTART to
17 residential homeowners.²⁸ Meanwhile, Ameren and Evergy in Missouri and the Ouachita
18 Electric Cooperative in Arkansas offer Pay-as-You-Save (PAYS) models to residential

²⁸ NYSERDA. "Residential Financing Options". On-Bill Recovery Loan. Accessed April 13, 2022. Available at:
<https://www.nyserda.ny.gov/All-Programs/Residential-Financing-Options>.

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1 customers.^{29,30} Residential PAYS (or similarly modeled) programs can be especially
2 valuable for including hard-to-reach customer segments, including renters, who have
3 little incentive for upfront property investments.

4 **Q Please explain your recommended improvements to incorporating NTG in the**
5 **TRM.**

6 **A** As previously discussed in our testimony, the Utilities currently apply NTG ratios to
7 midstream and upstream offerings, but not to downstream measures. However, as stated
8 previously by the OCA, New Hampshire is an outlier in this respect with other
9 jurisdictions in the region apply NTG ratios for downstream programs in addition to
10 midstream and upstream.³¹

11 Applying NTG ratios to all applicable measures is important for several reasons.

12 Understanding NTG ratios, can assist utilities in program design by signaling whether
13 measure rebate levels should be changed, whether certain measures should be terminated
14 from program offerings, and can highlight whether program design changes are needed.

15 While the Utilities indicate in the Proposed Plan that the EM&V Working Group will
16 continue to monitor the impact of NTG,³² we find this proposal needs to be strengthened.

17 Specifically, we recommend that the Commission direct the Utilities to revise this

²⁹ Ouachita Electric Cooperative Corporation. "HELP PAYS (Pay as you Save – Energy Efficiency Program).
Accessed April 13, 2022. Available at: <https://www.oecc.com/help>.

³⁰ Ameren Missouri. Pay As You Save. Accessed April 18, 2022. Available at:
<https://www.amerenmissourisavings.com/pays>.

Every PAYS program. Available at: <https://www.evergy.com/-/media/documents/ways-to-save/programs/pays-questions-and-answers.pdf?la=en>.

³¹ Direct Testimony of Philip H. Mosenthal on Behalf of the Office of the Consumer Advocate. Docket No. DE 20-092 on Behalf of the Office of the Consumer Advocate. October 29, 2020. Page 20.

³² NHSaves 2022-2023 Plan, March 1, 2022. Page 80 (Bates 84).

1 language to indicate a specific commitment to assess the incorporation of NTG ratios in
2 its TRM for downstream measures and report on progress within quarterly and annual
3 reports. We also recommend that Utilities consider applying NTG ratios from other New
4 England states as part of this effort given the limited funding available for EM&V
5 activities and the high cost of conducting NTG studies. As previously recommended the
6 OCA, New Hampshire can achieve significant economies of scale by applying NTG
7 ratios adopted in other states.³³

8 **V. THE ROLE OF RATEPAYER-FUNDED ENERGY EFFICIENCY PROGRAMS**

9 **Q Why is it important to discuss the role of ratepayer funded energy efficiency**
10 **programs at this time?**

11 **A** The Commission's recent order on the 2021-2023 Triennial Energy Efficiency Plan³⁴
12 raised several concerns about the role that ratepayer funded energy efficiency programs
13 should play in New Hampshire. We would like to take this opportunity to reiterate the
14 importance of these programs, the multiple benefits that they offer customers, and the
15 way that they help achieve the state's energy policy goals.

16 **Benefits of Energy Efficiency**

17 **Q Please provide an overview of the benefits of energy efficiency to New Hampshire.**

18 **A** Energy efficiency can provide substantial benefits to New Hampshire electric and natural
19 gas ratepayers, the environment, and the economy.

³³ Direct Testimony of Philip H. Mosenthal on Behalf of the Office of the Consumer Advocate. Docket No. DE 20-092 on Behalf of the Office of the Consumer Advocate. October 29, 2020.

³⁴ DE 20-092, Order No. 26,553 issued November 12, 2021.

1 Cost-effective energy efficiency programs can lower system-wide electricity and natural
2 gas costs, leading to reductions in customers' energy bills. Energy efficiency creates
3 long-term savings that act as a hedge against volatile fossil fuel prices and can avoid
4 investments in transmission and distribution ("T&D") infrastructure by creating
5 reductions in peak demand. These demand savings reduce stress on local T&D systems,
6 potentially deferring expensive upgrades or mitigating local transmission congestion
7 problems. These avoided costs are then passed down to all customers, regardless of
8 whether they participate in energy efficiency programs.

9 New Hampshire's energy efficiency programs also provide significant benefits to the
10 local economy. Energy efficiency jobs are local jobs ranging from electricians, HVAC
11 technicians, and insulation contractors, to engineers and architects. Energy efficiency also
12 promotes local economic development and job creation by increasing the disposable
13 income of citizens and making businesses and industries more competitive. Energy
14 efficiency in public buildings (schools, hospitals, government buildings) can also help
15 reduce the tax burden on all customers by reducing government's annual operating costs.

1 **Policy Implications of Commission’s November Order**

2 **Q What are your concerns with the Commission’s November Order on the 2021–2023**
3 **Triennial Energy Efficiency Plan?**

4 **A**There are characterizations within the November Order³⁵ related to the GST and the role
5 of ratepayer-funded energy efficiency programs in a restructured electric market that we
6 urge the Commission to reconsider.

7 **Q Please explain the issues related to the Commission’s characterization of the GST in**
8 **its November Order.**

9 **A**The Commission stated that the GST cannot be solely relied upon for benefit-cost testing
10 because it “is overly dependent upon subjective factors such that any desired outcome
11 could potentially be obtained from its application” and is too complex to be “reasonably
12 understood by the general public.”³⁶ Even with the passage of HB 549, which affirms the
13 GST as the primary test, the statements of the Commission cast unwarranted doubt on the
14 validity and transparency of the manner in which the cost-effectiveness of the Proposed
15 Plan is determined.

16 **Q Is the GST subjective?**

17 **A**No. The development of the GST framework was based on the National Standard
18 Practice Manual (NSPM) principles and steps for developing a jurisdiction-specific
19 primary cost-effectiveness test. The NSPM provides objective, neutral, and economically

³⁵ DE 20-092, Order No. 26,553 issued November 12, 2021. This Order rejected the Utilities’ request for approval of the proposed 2021–2023 New Hampshire Statewide Energy Efficiency Plan.

³⁶ *Id.* page 39.

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1 sound guidance for developing a primary cost-effectiveness test (or modifying an existing
2 primary test) and has been vetted by an advisory group consisting of regulators, state
3 agencies, utilities, expert consultants, and representatives from the energy efficiency
4 industry across the US.³⁷ The NSPM represents industry best practice for determining
5 cost-effectiveness tests that are tailored to the specific interests of each state.

6 The choices for which energy efficiency costs and benefits to include in the GST are
7 based on the policy goals specific to New Hampshire; policy goals that are identified in
8 New Hampshire statutes, state energy plans, and Commission orders. The Working
9 Group report that documents the development of the GST includes a discussion and list
10 of these policy goals.³⁸ The previous test used in New Hampshire, the TRC test, does not
11 address these state policy goals and therefore is less suitable to meet New Hampshire's
12 needs than the GST.

13 Further, as described in Section III of this testimony and shown in Table 6, the majority
14 of the GST impacts are utility system impacts, which should be included in any energy
15 efficiency cost-effectiveness test.³⁹ These impacts are obtained from the AESC. The
16 AESC is a comprehensive and well vetted study that projects avoided costs due to energy
17 efficiency programs using an industry-accepted modeling framework. This study is
18 typically updated every three-years and is developed through a transparent process that

³⁷ National Energy Screening Project, *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*, August, 2020.

³⁸ Synapse Energy Economics, *Application of the National Standard Practice Manual to New Hampshire*, Prepared for the New Hampshire Evaluation, Measurement, and Verification Working Group, October 2019, Section 3.1 and Appendix A.

³⁹ National Energy Screening Project, *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*, August, 2020.

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1 includes representation by all the major electric and gas utilities in New England as well
2 as efficiency program administrators, energy offices, regulators, and advocates.

3 Currently, the AESC is used by every energy efficiency program administrator in New
4 England.

5 The non-utility impacts included in the GST are either from independent third-party
6 evaluations or from public reports in the case of water costs and Regional Greenhouse
7 Gas Initiative impacts. Further the GST does not include percentage adders for residential
8 and commercial and industrial non-utility impacts, which were previously applied in the
9 prior TRC test. While percentage adders can serve as useful proxies for impacts that
10 cannot be quantified or monetized, they are based on professional judgment and are
11 inherently more subjective than values based on third-party evaluations or modeling. For
12 these reasons, the GST is less subjective than the TRC test used historically.

13 **Q Does the GST reflect the positions of multiple New Hampshire stakeholders?**

14 **A** Yes. The GST was developed through the Benefit-Cost Working Group with input from a
15 variety of New Hampshire stakeholders. The Working Group participants included
16 representatives from Commission Staff (including their consultants), the OCA, the
17 Department of Environmental Services, Eversource Energy, Liberty Utilities, Unitil
18 Energy Systems, the New Hampshire Electric Cooperative, The Way Home, through its

1 counsel New Hampshire Legal Assistance (NHLA), Conservation Law Foundation
2 (CLF), and Acadia Center.⁴⁰

3 In sum, the GST was designed by a robust stakeholder process to address the energy
4 policy goals specific to New Hampshire using principles and concepts based on current
5 best practices in the industry.

6 **Q Is the GST overly complex?**

7 **A** No. The GST is no more complex than other tests used to assess the cost-effectiveness of
8 energy efficiency programs, including the TRC test. In fact, the GST is simpler than the
9 TRC test because it does not include participant costs or benefits.

10 Further, the suggestion that the test must be “reasonably understood by the general
11 public” creates a standard for simplicity that few regulatory procedures would meet. The
12 general public is not expected to understand basic ratemaking concepts such as cost
13 allocation or rate design. It is not clear why a higher standard should be applied to an
14 energy efficiency cost-effectiveness test.

15 **Q What did the November Order say regarding the use of ratepayer-funded energy**
16 **efficiency in a retail electric market?**

17 **A** In its discussion of findings, the Commission cited Order 22,875, from 1998, indicating a
18 preference for stimulating market-based energy efficiency programs rather than utility-

⁴⁰ DE 17-136, 2018-20 New Hampshire Statewide Energy Efficiency Plan B/C Working Group Recommendations Regarding New Hampshire Cost-Effectiveness Review and Energy Optimization through Fuel Switching Study, page 2.

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1 sponsored and ratepayer-funded programs.⁴¹ The Commission also stated it agrees that
2 “the benefits of a retail electric market will not be fulfilled without a competitive
3 wholesale market and a vibrant, unsubsidized energy efficiency market.”⁴²

4 **Q Do you agree with these statements?**

5 **A** No. Since 1998, decades of experience have shown that ratepayer-funded energy
6 efficiency is still critically important in restructured electric markets. The competitive
7 market alone will not drive energy efficiency at the same level as ratepayer-funded
8 energy efficiency programs delivered by a utility or other program administrator due to
9 the existence of market barriers we summarized earlier in our testimony. These barriers
10 exist in restructured and regulated markets alike and require regulatory policies to
11 overcome them.

12 A prime example can be found with New York State’s Reforming the Energy Vision
13 (REV) initiative. As part of REV, New York transitioned away from utility mandates to a
14 market-based approach. The initiative sought to enable a competitive market for energy
15 efficiency that would be driven by the value it creates with the utilities acting as
16 Distribution System Platform Providers.⁴³ Despite an aggressive promotion of the
17 efficiency market through the New York REV process, the competitive market for energy
18 efficiency products and services did not materialize. Recognizing the importance of
19 achieving robust energy efficiency savings and the limitations of the competitive energy

⁴¹ DE 20-092, Order No. 26,553, page 32, and Order 22,875, available at:
<https://www.puc.nh.gov/Regulatory/Orders/1998ords/22875e.html>.

⁴² *Id.* page 33.

⁴³ NYS Department of Public Service Staff Report and Proposal. 2014. Case 14-M-0101.

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1 efficiency markets, in 2018 the New York Public Service Commission issued an
2 Accelerated Efficiency Order directing the enhancement and acceleration of energy
3 efficiency by investor-owned utilities. The Order dramatically increased the savings
4 targets and funding for utility-run energy efficiency programs.⁴⁴

5 Additional examples can be seen with the number of restructured states in the Northeast
6 and across the country that still have ratepayer-funded energy efficiency programs either
7 delivered by utilities or third-party program administrators. Table 7 lists states with
8 restructured electricity markets and ratepayer-funded energy efficiency programs. The
9 table also indicates if the state has an Energy Efficiency Resource Standard (“EERS”).⁴⁵

10 **Table 7. Restructured electric markets with ratepayer-funded energy efficiency programs**

California	EERS and ratepayer-funded utility programs
Connecticut	EERS and ratepayer-funded utility programs
District of Columbia	EERS and ratepayer-funded utility programs
Illinois	EERS and ratepayer-funded utility programs
Maine	EERS and ratepayer-funded programs implemented by independent program administrator
Maryland	EERS and ratepayer-funded utility programs
Massachusetts	EERS and ratepayer-funded utility programs
New York	EERS and ratepayer-funded utility programs
Pennsylvania	EERS and ratepayer-funded utility programs
Rhode Island	EERS and ratepayer-funded utility programs
Texas	EERS and ratepayer-funded utility programs

11 *Source: American Council for an Energy-Efficient Economy (ACEEE). 2022. State Energy Efficiency*
12 *Scorecard 2021 Progress Report. Available at: <https://www.aceee.org/research-report/u2201>*

⁴⁴ Case 18-M-0084. Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios through 2025. January 16, 2020.

⁴⁵ American Council for an Energy-Efficient Economy (ACEEE) considers a state to have an EERS if it has a policy in place that (1) sets clear, long-term (3+ years) targets for utility-sector energy savings, (2) makes targets mandatory, and (3) includes sufficient funding for full implementation of programs necessary to meet targets.

Lost Opportunities for Energy Efficiency Benefits

Q What are the key differences between the January 2021 Settlement Plan and the Proposed Plan for Years 2022 and 2023?

A The Utilities scaled back their program offerings as a result of HB 549. The funding limitations imposed on the SBC and LDAC result in a reduction in the 2022–2023 electric energy efficiency budget by 51 percent, from \$243 million to \$120 million, and a reduction in gas energy efficiency budget by 24 percent, from \$30 million to \$23 million.

In addition to reducing the total budget, the Utilities adjusted the programs offered in the Proposed Plan. In accordance with the HB 549 requirement that planned electric savings must meet at least 65 percent of total planned energy savings, the Utilities modified the portfolio mix to meet this standard. Importantly, the Utilities excluded the Energy Optimization pilot and scaled back the newly proposed Active Demand Reduction (“ADR”) program in favor of continuing the ADR pilot because neither of these initiatives emphasize electric energy savings.

Q How did the decrease in budget between the January 2021 Settlement Plan and the Proposed Plan impact electric and natural gas savings?

A This decrease in budget correspondingly decreased lifetime and annual electric and natural gas savings. For the Utilities’ electric energy efficiency program, the decrease in budget led to a 50 percent decrease in lifetime MWh savings and a 49 percent decrease in annual MWh savings. See Table 8 for a summary of the changes.

Table 8. Comparison of 2022–2023 Electric Proposed Plan to Settlement Plan

Electric Programs	2022-2023 Proposed Plan	2022-2023 Settlement Plan	% Change
Cumulative Program Funding	\$120,004,555	\$242,695,563	-51%
Cumulative Lifetime MWh Savings	1,985,128	3,987,380	-50%

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Cumulative Annual MWh Savings	170,416	331,531	-49%
Program Cost per Lifetime kWh Savings	\$0.060	\$0.061	-2%

1 *Source: Utilities Response to OCA 3-001.*

2 Despite the requirement within HB 549 that 65 percent of the energy savings must come
3 from electric savings (increased from 55 percent), the SBC cap caused the proportion of
4 electric to non-electric savings to *decrease* between plans. See Table 9 for a comparison
5 of electric savings as a percent of total savings between the Proposed Plan and the
6 January 2021 Settlement Plan. While the percent of electric annual savings stayed
7 relatively consistent between the two plans, the percent of electric lifetime savings
8 decreased by 14 and 16 percent for the two program years, respectively.⁴⁶

9 **Table 9. Comparison of electric savings as a percent of total energy savings**

Year	2022–2023 Proposed Plan		2022–2023 Settlement Plan		Percent Change (%)	
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
2022	83%	65%	84%	76%	-2%	-14%
2023	82%	66%	86%	78%	-4%	-16%

10 *Sources: Utilities Benefit-Cost Models.⁴⁷ Settlement Attachment A - TRM, Page 328 and 331.*

11 This decrease in lifetime electric savings stemmed primarily from the reduction in custom
12 projects within the cost-effective Large Business program, due to the rate cap as defined
13 by HB 549.

14 The impacts to the Utilities' natural gas energy efficiency program were less pronounced
15 to correspond with the proportionally smaller decrease in budget. Still, the natural gas

⁴⁶ We calculated the percent of total energy savings within the electric energy efficiency plan consistently with the approach taken by the Utilities. Total MMBtu savings from non-electric fuels were converted to units of electricity (kWh) using a simple factor of 0.003412 MMBtu/kWh.

⁴⁷ Utilities live Excel Benefit-Cost Models as filed in conjunction with the Plan filing (Plan Narrative and Attachments) filed on March 1, 2022. Data obtained from the Calculations Yr 2 and Calculations Yr 3 tabs.

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1 portfolio experienced a 17 percent decrease in lifetime MMBtu savings and a 28 percent
2 decrease in annual MMBtu savings. See Table 10 for a summary of the changes.

3 **Table 10. Comparison of 2022–2023 Gas Proposed Plan to Settlement Plan**

Natural Gas Programs	2022–2023 Proposed Plan	2022–2023 Settlement Plan	% Change
Cumulative Program Funding	\$22,645,045	\$29,843,776	-24%
Cumulative Lifetime MMBtu Savings	5,405,517	6,478,337	-17%
Cumulative Annual MMBtu Savings	375,399	521,814	-28%
Program Cost per Lifetime MMBtu Savings	\$4.19	\$4.61	-9%

4 *Source: Utilities Response to OCA 3-001.*

5 **Q How does this reduction in electric and natural gas savings impact customers?**

6 **A** NH electric and natural gas customers will lose \$237 million in electric utility system
7 benefits and \$22 million in natural gas utility system benefits. Electric utility system
8 benefits include avoided energy costs, avoided capacity costs, demand reduction induced
9 price effect (“DRIPE”) benefits, and T&D infrastructure costs. Natural gas utility system
10 benefits included avoided gas costs and gas DRIPE benefits.

11 All customers pay for utility system costs through rates, which represent the portion of
12 the electricity or gas system necessary to deliver service. Energy efficiency savings help
13 avoid utility system costs, the savings of which are passed down to all ratepayers
14 regardless of whether they participate in energy efficiency programs.

15 These benefits represent real cost savings to customers which will no longer be realized
16 in the Proposed Plan.

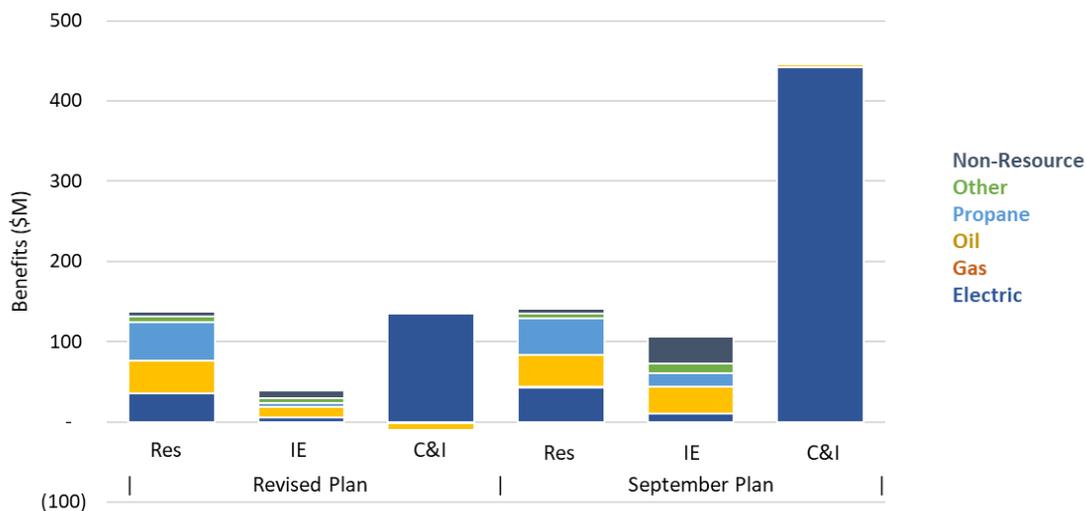
1 **Q Please describe the changes in total benefits between the 2021–2023 Plan and the**
2 **Proposed Plan.**

3 **A** Corresponding to the decrease in electric lifetime savings displayed in Table 9, the
4 changes made to the Proposed Plan by the Utilities to comply with HB 549 decreased the
5 percent of benefits coming from electric measures, in addition to decreasing total benefits
6 from other fuels. See Figure 1 for a breakdown of electric benefits within the Proposed
7 Plan and the 2022 and 2023 program years of the 2021–2023 Plan as filed on September
8 1, 2020 (“September Plan”).⁴⁸ Electric benefits were reduced in the commercial and
9 industrial sector, predominantly in the cost-effective Large Business program, which
10 decreased by 82 percent from the September Plan. Income-eligible customers also saw a
11 decrease in benefits of approximately 60 percent, particularly oil benefits, propane
12 benefits, and other non-resource benefits, which include non-energy impacts for
13 weatherization measures. Benefits for residential customers remained largely unchanged
14 between the plans.

⁴⁸ The detailed data analysis in this testimony relies on the benefit-cost models filed with the September 1, 2020 Plan rather than the models from the January 2021 Settlement Plan. The January 2021 Settlement Plan benefit-cost models are not publicly available at this time. The September Plan had higher budgets and planned savings than the final Settlement Plan, and therefore shows a more dramatic shift in programmatic changes to the current proposed Plan.

1

Figure 1. Comparison of benefits by source from Proposed Plan to September Plan



2

3 **Q How have fuel-neutral offerings changed from the 2021 Settlement Plan to the**
4 **Proposed Plan?**

5 **A** The limitations on SBC collections and the required minimum percentage of electric
6 savings have minimized funding for fuel-neutral programs such as weatherization.
7 Weatherization measures are critical to successful efficiency programs because they not
8 only contribute to direct energy savings; they also increase the efficiency of other space
9 heating, water heating, or cooling equipment. These measures are the foundation of high-
10 performing buildings and deliver long-term savings. Efficiency funds for weatherization
11 are used most effectively when measures are delivered in a fuel-blind approach, which is
12 the approach implemented by leading energy efficiency states including all of New
13 Hampshire’s neighboring New England states.⁴⁹ Energy auditors can recommend

⁴⁹ See weatherization offerings from Efficiency Maine, available at: <https://www.energymaine.com/at-home/weatherization/>, Efficiency Vermont, available at: <https://www.energymaine.com/at-home/weatherization/>, and Mass Save, available at: <https://www.masssave.com/saving/residential-rebates/home-insulation>

1 weatherization measures for all under-weatherized homes, rather than exclusively
2 electrically heated homes. This would help maximize program savings per home energy
3 audit and reduce the likelihood of lost opportunities. While it is important to protect
4 electric ratepayers from shouldering disproportionate costs of efficiency, it is more
5 important that all electric ratepayers should have access to the efficiency programs they
6 help fund—regardless of whether they reap the benefits through their electric bill savings
7 or their other fuel bill savings. Further, weatherization measures can help support carbon
8 reduction goals, which neighboring states are choosing to address through electrification.
9 Regardless of how New Hampshire proceeds with its climate goals, weatherization
10 measures are guaranteed to provide benefits to New Hampshire now and in the future.

11 **Q How has planned participation changed from the 2021 Settlement Plan to the**
12 **Proposed Plan?**

13 **A** The reduction in funding will limit the number of New Hampshire residents able to
14 participate in electric and natural gas energy efficiency programs. Customers may have to
15 face waitlists for certain programs, such as HPwES or the ADR pilot, where demand is
16 expected to outpace available funding. Waitlists can discourage customers from
17 participating in future programs and cause market disruption for the energy efficiency
18 workforce.

19 Less funding is dedicated to the income-eligible sector which will limit the number of
20 customers who can participate in the programs in the Proposed Plan.⁵⁰ Income-eligible
21 customers typically face the highest energy burden (percent of income spent on energy

⁵⁰ Utilities Response to OCA 3-001.

1 costs) and should be encouraged to participate in the energy efficiency programs they
2 help fund.

3 Limiting participation for programs all customers help fund is problematic, particularly if
4 the measures are cost-effective and provide benefits to all ratepayers. Reductions in
5 funding restrict customers' ability to equitably participate in energy efficiency.

6 **Q Does the Proposed Plan include the same commitment to the adoption of emerging**
7 **technologies?**

8 **A** No. The Utilities had to eliminate or cut back several initiatives designed to bolster
9 market adoption of emerging technologies that would bring long-term benefits to the
10 state, including an Energy Optimization Pilot and an expanded ADR program.

11 In the January 2021 Settlement Plan, the Utilities proposed an Energy Optimization Pilot
12 that would incentivize switching from non-electric fuels to electric heat pumps. The pilot
13 was discontinued after HB 549 because the program produced negative electric savings,
14 which runs counter to the requirement that 65 percent of energy savings must come from
15 electric energy. Energy optimization programs help reduce total customer energy usage
16 and are widely recognized as a long-term strategy to curb GHG emissions. Ratepayer-
17 funded programs can help shift customer economics of adopting new technology and
18 ultimately transform the market such that these products can be available for all.

19 The Utilities also scaled back their proposed ADR program, instead reinstating the
20 successful residential ADR pilot that Eversource and Unitil started implementing in 2020.

21 In the January 2021 Settlement Plan, the Utilities proposed developing an ADR program
22 that would expand the existing residential pilot and include new commercial and

Docket DE 20-092
Testimony of Courtney Lane and Danielle Goldberg

1 industrial measures, but ultimately scaled it back to comply with HB 549. The Utilities’
2 expanded ADR program was predominantly structured as a Bring Your Own Device
3 (BYOD) program, making it a flexible, low-risk investment for ratepayers to enjoy
4 additional avoided capacity benefits. Instead, the pilot focuses on continuity for the
5 existing participants, rather than reaching additional participants.

6 **Q Please describe your conclusions related to these lost opportunities.**

7 **A** The OCA believes that ratepayers were not well-served by the process of scaling back the
8 programs and goals presented to the Commission as part of the Settlement Plan.
9 However, we believe that HB 549 represents a commendable commitment to energy
10 efficiency that should guide the Commission in supporting the current Proposed Plan as
11 an effective pathway to the development of future NHSaves programs, which the
12 Commission should treat as an essential component of the service that electric and natural
13 gas utilities provide to customers.

14 **Q Does this conclude your testimony?**

15 **A** Yes, it does.

Schedules and Attachments



Courtney Lane, Senior Associate

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 3 | Cambridge, MA 02139 | 617- 453-7028
clane@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Associate*, November 2019 – Present.

Provides consulting and researching services on a wide range of issues related to the electric industry including performance-based regulation, benefit-cost assessment, rate and bill impacts, and assessment of distributed energy resource policies and programs. Develops expert witness testimony in public utility commission proceedings.

National Grid, Waltham, MA. *Growth Management Lead, New England*, May 2019 – November 2019, *Lead Analyst for Rhode Island Policy and Evaluation*, June 2013 – April 2019.

- Portfolio management of product verticals including energy efficiency, demand response, solar, storage, distributed gas resources, and electric transportation, to optimize growth and customer offerings.
- Strategy lead for the Performance Incentive Mechanisms (PIMs) working group.
- Worked with internal and external stakeholders and led the development of National Grid's Annual and Three-Year Energy Efficiency Plans and System Reliability Procurement Plans for the state of Rhode Island.
- Represented energy efficiency and demand response within the company at various Rhode Island grid modernization proceedings.
- Led the Rhode Island Energy Efficiency Collaborative; a group focused on reaching consensus regarding energy efficiency plans and policy issues for demand-side resources in Rhode Island.
- Managed evaluations of National Grid's residential energy efficiency programs in Rhode Island, and benefit-cost models to screen energy efficiency measures.

Citizens for Pennsylvania's Future, Philadelphia, PA. *Senior Energy Policy Analyst*, 2005–2013.

- Played a vital role in several legislative victories in Pennsylvania, including passage of energy conservation legislation that requires utilities to reduce overall and peak demand for electricity (2009); passage of the \$650 million Alternative Energy Investment Act (2008); and important amendments to the Alternative Energy Portfolio Standards law vital to the development of solar energy in Pennsylvania (2007).
- Performed market research and industry investigation on emerging energy resources including wind, solar, energy efficiency and demand response.
- Planned, facilitated and participated in wind energy advocates training meetings, annual partners retreat with members of wind and solar companies, and the PennFuture annual clean energy conference.

Northeast Energy Efficiency Partnerships, Inc., Lexington, MA. *Research and Policy Analyst*, 2004–2005.

- Drafted comments and testimony on various state regulatory and legislative actions pertaining to energy efficiency.
- Tracked energy efficiency initiatives set forth in various state climate change action plans, and federal and state energy regulatory developments and requirements.
- Participated in Regional Greenhouse Gas Initiative (RGGI) stakeholder meetings.
- Analyzed cost-effectiveness of various initiatives within the organization.

Massachusetts Executive Office of Environmental Affairs, Boston, MA. *Field Projects Extern*, 2003.

- Worked for the Director of Water and Watersheds at the EOEA, examining the risks and benefits of different groundwater recharge techniques and policies throughout the U.S.
- Presented a final report to both Sea Change and the EOEA with findings and policy recommendations for the state.

EnviroBusiness, Inc., Cambridge, MA. *Environmental Scientist*, July 2000 – May 2001

- Conducted pre-acquisition assessments/due diligence assignments for properties throughout New England. Environmental assessments included an analysis of historic properties, wetlands, endangered species habitat, floodplains, and other areas of environmental concern and the possible impacts of cellular installations on these sensitive areas.
- Prepared and managed NEPA reviews and Environmental Assessments for telecommunications sites.

SKILLS

Software: SPSS, Arcview GIS, IMPLAN, Access, Microsoft Excel, Word, Power Point

EDUCATION

Tufts University, Medford, MA

Master of Arts; Environmental Policy and Planning, 2004.

Colgate University, Hamilton, NY

Bachelor of Arts; Environmental Geography, 2000, *cum laude*.

PUBLICATIONS

Woolf, T., D Bhandari, C. Lane, J. Frost, B. Havumaki, S. Letendre, C. Odom. 2021. *Benefit-Cost Analysis of the Rhode Island Community Remote Net Metering Program*. Synapse Energy Economics for the Rhode Island Division of Public Utilities and Carriers.

Lane, C., S. Kwok, J. Hall, I. Addleton. 2021. *Macroeconomic Analysis of Clean Vehicle Policy Scenarios for Illinois*. Synapse Energy for the Natural Resources Defense Council.

Lane, C., K. Takahashi. 2020. *Rate and Bill Impact Analysis of Rhode Island Natural Gas Energy Efficiency Programs*. Synapse Energy Economics for National Grid.

Chang, M., J. Frost, C. Lane, S. Letendre, PhD. 2020. *The Fixed Resource Requirement Alternative to PJM's Capacity Market: A Guide for State Decision-Making*. Synapse Energy Economics for the State Energy & Environmental Impact Center at the NYU School of Law.

National Energy Screening Project. 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*. E4TheFuture, Synapse Energy Economics, Energy Futures Group, ICF, Pace Energy and Climate Center, Schiller Consulting, Smart Electric Power Alliance.

TESTIMONY

Maryland Public Service Commission (Docket No. 9655): Direct and Surrebuttal Testimony of Courtney Lane regarding the application of Potomac Electric Company for a Multi-Year Plan and Performance Incentive Mechanisms. On behalf of the Maryland Office of People's Counsel. March 3, 2021 and April 20, 2021.

Pennsylvania Public Utility Commission (Docket No. M-2020-3020830): Direct testimony of Alice Napoleon and Courtney Lane regarding PECO Energy Company's proposed Act 129 Phase IV Energy Efficiency and Conservation Plan. On behalf of the Natural Resources Defense Council. January 14, 2021.

Maryland Public Service Commission (Case No. 9645): Direct and Surrebuttal Testimony of Courtney Lane regarding the Application of Baltimore Gas and Electric Company for an Electric and Gas Multi-Year Plan. On behalf of the Maryland Office of People's Counsel. August 14, 2020 and October 7, 2020.

Maryland Public Service Commission (Case No. 9619): Comments of Maryland Office of People's Counsel Regarding Energy Storage Pilot Program Applications, attached Synapse Energy Economics Report. June 23, 2020.

Public Service Commission of the District of Columbia (Formal Case No. 1156): Direct, Rebuttal, Surrebuttal, and Supplemental Testimony of Courtney Lane regarding the Application of Potomac Electric Power Company for Authority to Implement a Multiyear Rate Plan for Electric Distribution Service in the District of Columbia. On behalf of the District of Columbia Government. March 6, 2020, April 8, 2020, June 1, 2020, and July 27, 2020.

Rhode Island Public Utilities Commission (Docket No. 4888): Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2019 Energy Efficiency Program (EEP). On behalf of National Grid. December 11, 2018.

Rhode Island Public Utilities Commission (Docket No. 4889): Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2019 System Reliability Procurement Report (SRP). On behalf of National Grid. December 10, 2018.

Rhode Island Public Utilities Commission (Docket No. 4755): Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2018 Energy Efficiency Program (EEP). On behalf of National Grid. December 13, 2017.

Rhode Island Public Utilities Commission (Docket No. 4684): Oral testimony of Courtney Lane regarding the RI Energy Efficiency and Resource Management Council (EERMC) Proposed Energy Efficiency Savings Targets for National Grid's Energy Efficiency and System Reliability Procurement for the Period 2018-2020 Pursuant to §39-1-27.7. On behalf of National Grid. March 7, 2017.

Rhode Island Public Utilities Commission (Docket No. 4684): Oral testimony of Courtney Lane regarding National Grid's 2018-2020 Energy Efficiency and System Reliability Procurement Plan. On behalf of National Grid. October 25, 2017.

Rhode Island Public Utilities Commission (Docket No. 4654): Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2017 Energy Efficiency Program Plan (EPPP) for Electric & Gas. On behalf of National Grid. December 8, 2016.

Rhode Island Public Utilities Commission (Docket No. 4580): Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2016 Energy Efficiency Program Plan (EPPP) for Electric & Gas. On behalf of National Grid. December 2, 2015.

Pennsylvania Public Utility Commission (Docket No. P-2012-2320369): Direct testimony of Courtney Lane regarding the Petition of PPL Electric Utilities Corporation for an Evidentiary Hearing on the Energy Efficiency Benchmarks Established for the Period June 1, 2013 through May 31, 2016. On behalf of PennFuture. October 19, 2012.

Pennsylvania Public Utility Commission (Docket No. P-2012-2320334): Direct testimony of Courtney Lane regarding the Petition of PECO Energy for an Evidentiary Hearing on the Energy Efficiency Benchmarks Established for the Period June 1, 2013 through May 31, 2016. On behalf of PennFuture. September 20, 2012.

Pennsylvania Public Utility Commission (Docket No. I-2011-2237952): Oral testimony of Courtney Lane regarding the Commission's Investigation of Pennsylvania's Retail Electricity Markets. On behalf of PennFuture. March 21, 2012.

Committee on the Environment Council of the City of Philadelphia (Bill No. 110829): Oral testimony of Courtney Lane regarding building permitting fees for solar energy projects. On behalf of PennFuture. December 5, 2011.

Pennsylvania Public Utility Commission (Docket No. M-00061984): Oral testimony of Courtney Lane regarding the En Banc Hearing on Alternative Energy, Energy Conservation, and Demand Side Response. On behalf of PennFuture. November 19, 2008.

PRESENTATIONS

Lane, C. 2021. "Accounting for Interactive Effects: Assessing the Cost-Effectiveness of Integrated Distributed Energy Resources." Presentation at the 2021 American Council for an Energy-Efficient Economy (ACEEE) National Conference on Energy Efficiency as a Resource, October 27, 2021.

Lane, C. 2019. "The RI Test." Presentation for AESP Webinar: Emerging Valuation Approaches in Cost-Effectiveness and IRPs, October 31, 2019.

Lane, C., A. Flanders. 2017. "National Grid Rhode Island: Piloting Wireless Alternatives: Forging a Successful Program in Difficult Circumstances." Presentation at the 35th Annual Peak Load Management Association (PLMA) Conference, Nashville, TN, April 4, 2017.

Lane, C. 2013. "Regional Renewable Energy Policy Update." Presentation at the Globalcon Conference, Philadelphia, PA, March 6, 2013.

Lane, C. 2012. "Act 129 and Beyond." Presentation at the ACI Mid-Atlantic Home Performance Conference, October 1, 2012.

Lane, C. 2012. "Act 129: Taking Energy Efficiency to the Next Level." Presentation at the Energypath Conference, June 28, 2012.

Lane, C. 2011. "Pennsylvania's Model Wind Ordinance." Presentation at Harvesting Wind Energy on the Delmarva Peninsula, September 14, 2011.

Lane, C. 2011. "Electric Retail Competition and the AEPS." Presentation at the Villanova Law Forum, November 4, 2011.

Lane, C. 2009. "Act 129: Growing the Energy Conservation Market." Presentation at the Western Chester County Chamber of Commerce, March 25, 2009.

Resume updated March 2022



Danielle Goldberg, Associate

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 3 | Cambridge, MA 02139 | 617-453-7063
dgoldberg@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Associate*, April 2019 – Present, *Research Associate*, February 2017 – March 2019

- Conducts research and provides consulting on energy sector issues, with a focus on data, programs, policies, and technologies related to energy efficiency, electrification, and electricity generation.
- Analyzes ratepayer-funded energy efficiency and other distribute energy resource programs across North America for best practices in cost-effectiveness testing and program design.
- Develops and evaluates cost-benefit analyses and other Excel-based models for energy efficiency programs and technologies.
- Assists with the preparation of expert testimony related to various energy-sector topics

Helping Overcome Obstacles Peru, Arequipa, Peru. *School Coordinator, English Teacher*, May 2016 – July 2016

- Managed daily operation of the school and organized school functions, including assemblies and field trips.
- Acted as liaison between office staff, volunteers, and parents, communicating in both Spanish and English.
- Developed and led custom lesson plans to teach English to children ages 3-6.

Allen Medical Systems, Acton, MA. *New Product Development Co-op*, January – June 2015

- Designed lifecycle tests for arm traction device adhering to medical standards.
- Worked with pneumatic and electromechanical equipment.
- Developed extensive test documentation detailing calculations and procedures for load profiles and estimated lifetime usage.
- Created parts, drawings, and assemblies for design prototypes.

Bose Corporation, Framingham, MA. *Design Compliance Engineering Mechanical Test Co-op*, January – June 2014

- Performed design validation testing on audio and visual products.
- Conducted environmental and dynamic testing, such as thermal testing, transportation testing, drop testing, and surface damage testing.

Amphenol Alden Products, Brockton, MA, *Mechanical Engineering Co-op*, January – June 2013

- Completed extensive formal training in the fundamentals of SolidWorks for 2D and 3D modeling followed by application of software.
- Performed tolerance analyses and proposed changes based on the results.
- Assessed severity of micro-cracks in electrical connectors using advanced lab equipment.

EDUCATION**Northeastern University**, Boston, MABachelor of Science in Mechanical Engineering, 2016. *Cum Laude*.**PUBLICATIONS**

Takahashi, K., T. Woolf, B. Havumaki, D. White, D. Goldberg, S. Kwok, A. Takasugi. 2021. *Missed Opportunities: The Impacts of Recent Policies on Energy Efficiency Programs in Midwestern States*. Synapse Energy Economics for the Midwest Energy Efficiency Alliance.

Takahashi, K., E. Sinclair, A. Napoleon, A.S. Hopkins, D. Goldberg. 2021. *Evaluation of EnergyWise Low-Income Energy Efficiency Program in Mississippi – Program Performance, Design, and Implications for Low-Income Efficiency Programs*. Synapse Energy Economics for Sierra Club and Gulf Coast Community Foundation.

Eash-Gates, P., K. Takahashi, D. Goldberg, A.S. Hopkins, S. Kwok. 2021. *Boston Building Emissions Performance Standard: Technical Methods Overview*. Synapse Energy Economics for the City of Boston.

Goldberg, D., J. Frost, D. Hurley, K. Takahashi. 2020. *New England Electrification Load Forecast*. Synapse Energy Economics for E4TheFuture.

Takahashi, K., J. Frost, D. Goldberg, A. S. Hopkins, K. Nishio, K. Nakano. 2020. *Survey of U.S. State and Local Building Decarbonization Policies and Programs*. Presented at the 2020 ACEEE Summer Study of Energy Efficiency in Buildings.

Malone, E., T. Woolf, D. Goldberg. 2019. "Assessing Resource Cost Effectiveness." *A.E.S.P. Magazine*, 2019 Edition, 8-10.

Napoleon, A., D. Goldberg, K. Takahashi, T. Woolf. 2019. *An Assessment of Prince Edward Island Energy Corporations' 2018 - 2021 Energy Efficiency and Conservation Plan*. Synapse Energy Economics for Carr, Stevenson and MacKay as Counsel to the Island Regulatory and Appeals Commission.

Malone, E., D. Goldberg, J. Frost. 2018. *Database of State Efficiency Screening Practices (DSESP): A Resource of the NESP*. Synapse Energy Economics for E4TheFuture.

Knight, P., D. Goldberg, E. Malone, A. S. Hopkins, D. Hurley. 2018. *Getting SMART: Making sense of the Solar Massachusetts Renewable Target (SMART) program*. Prepared for Cape Light Compact.

Malone, E., T. Woolf, D. Goldberg. 2018. *Updating the Energy Efficiency Cost-Effectiveness Framework in Minnesota: Application of the National Standard Practice Manual to Minnesota*. Conservation Applied Research and Development (CARD) Report. Synapse Energy Economics for Minnesota Department of Commerce, Division of Energy Resources.

Fisher, J., M. Whited, T. Woolf, D. Goldberg. 2018. *Utility Investments for Market Transformation: How Utilities Can Help Achieve Energy Policy Goals*. Synapse Energy Economics for Energy Foundation.

A. Hopkins, PhD, K. Takahashi, D. Goldberg. 2018. *Strategic Electrification Webinar*. Synapse Energy Economics.

D. Goldberg, E. Malone, J. Kallay, K. Takahashi. 2018. *Blog post: Switch on the Savings: A Heat Pump Cost-Effectiveness Study*. Synapse Energy Economics.

D. Goldberg, J. Kallay. 2017. *Blog post: Energy Efficiency Programs Plan for Post LED Success*. Synapse Energy Economics.

TESTIMONY ASSISTANCE

Illinois Commerce Commission (Docket No. 18-0211): Direct Testimony of Max Chang regarding Ameren Illinois Company's voltage optimization plan and the importance of prioritizing low-income communities. On behalf of the People of the State of Illinois, represented by the Office of the Illinois Attorney General. March 7, 2018.

Commonwealth of Massachusetts Appellate Tax Board (Docket No. C331142): Expert report by Max Chang on the process of steam generation and distribution under the Commonwealth of Massachusetts' definition for manufacturing. On behalf of the City of Boston. January 11, 2018.

Resume updated April 2022

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

**Date Request Received: March 11, 2022
Data Request No. DOE 1-002**

**Date of Response: March 25, 2022
Page 1 of 1**

Request from: Department of Energy

Request:

Please provide a chart or table showing EE rates in effect for each month for each utility for the full plan period 2022 – 2023. If the shown rate was not effective for a full month, please provide the dates the rate was effective.

Response:

Please refer to Attachment DOE 1-002.

Unitil Energy Services	Jan 2022⁽¹⁾	Feb 2022⁽²⁾	Mar 2022	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
SBC (EE Portion) \$/kWh	0.00373	0.00373 & 0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528

(1) Per Order No. 26,553 issued November 12, 2021

(2) Rate change effective February 14, 2022 per Order No. 26,579 issued February 10, 2022 & Passage of HB 549

Unitil Energy Services	Jan 2023⁽³⁾	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	July 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
SBC (EE Portion) \$/kWh	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543

(3) Estimated to incorporate the inflation calculation in accordance with HB 549 (does not reflect adjustment for carry-over/carry-under)

Northern Utilities	Jan 2022⁽¹⁾	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Residential EEC \$/therm	0.0476	0.0476	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499
Commercial & Industrial EEC \$/therm	0.0326	0.0326	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247

(1) Per Order No. 26,553 issued November 12, 2021

(2) Per Order No. 26,303 issued October 29, 2019 & Passage of HB 549

Northern Utilities	Jan 2023⁽³⁾	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	July 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
Residential EEC \$/therm	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513	0.0513
Commercial & Industrial EEC \$/therm	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254	0.0254

(3) Estimated to incorporate the inflation calculation in accordance with HB 549 (does not reflect adjustment for carry-over/carry-under)

Eversource Energy	Jan 2022⁽¹⁾	Feb 2022	Mar 2022⁽²⁾	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
SBC (EE Portion) \$/kWh	0.00373	0.00373	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528

(1) Per Order No. 26,553 issued November 12, 2021

(2) Rate change effective March 1, 2022 per Order No. 26,579 issued February 10, 2022 & Passage of HB 549

Eversource Energy	Jan 2023⁽³⁾	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	July 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
SBC (EE Portion) \$/kWh	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543

(3) Estimated to incorporate the inflation calculation in accordance with HB 549 (does not reflect adjustment for carry-over/carry-under)

Granite State Electric	Jan 2022⁽¹⁾	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
SBC (EE Portion) \$/kWh	0.00373	0.00373	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528

(1) Per Order No. 26,553 issued November 12, 2021

Granite State Electric	Jan 2023⁽³⁾	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	July 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
SBC (EE Portion) \$/kWh	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543

(3) Estimated to incorporate the inflation calculation in accordance with HB 549 (does not reflect adjustment for carry-over/carry-under)

EnergyNorth Natural Gas	Jan 2022⁽¹⁾	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Residential EEC \$/therm	0.00475	0.00475	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Commercial & Industrial EEC \$/therm	0.0258	0.0258	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426

(1) Per Order No. 26,553 issued November 12, 2021

(2) Per Order No. 26,303 issued October 29, 2019 & Passage of HB 549

EnergyNorth Natural Gas	Jan 2023⁽³⁾	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	July 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
Residential EEC \$/therm	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658	0.0658
Commercial & Industrial EEC \$/therm	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438

(3) Estimated to incorporate the inflation calculation in accordance with HB 549 (does not reflect adjustment for carry-over/carry-under)

New Hampshire Electric Cooperative, Inc.	Jan 2022⁽¹⁾	Feb 2022	Mar 2022⁽²⁾	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
SBC (EE Portion) \$/kWh	0.00373	0.00373	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528	0.00528

(1) Per Order No. 26,553 issued November 12, 2021

(2) Rate change effective March 1, 2022 per Order No. 26,579 issued February 10, 2022 & Passage of HB 549

New Hampshire Electric Cooperative, Inc.	Jan 2023⁽³⁾	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	July 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
SBC (EE Portion) \$/kWh	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543	0.00543

(3) Estimated to incorporate the inflation calculation in accordance with HB 549 (does not reflect adjustment for carry-over/carry-under)

Public Service Company of New Hampshire d/b/a Eversource Energy
Docket No. DE 20-092**Date Request Received: April 07, 2022**
Data Request No. TS 1-002**Date of Response: April 12, 2022**
Page 1 of 1**Request from: Department of Energy**

Request:

Please refer to data response to DOE 1-016. Please explain how each electric utility accounted for its share of the \$400,000, of systems benefit charges identified in HB-549 to “promulgate the benefits of energy efficiency” including an explanation of whether the funding was included in the total program budgets, whether the funding was included in the performance incentive calculation, and how it is accounted for in the SBC calculations. If helpful, please provide updated tables or spreadsheets that explicitly show how each utility’s share of the \$400,000 was accounted for.

Response:

The Electric Utilities accounted for their share of the \$400,000 of systems benefit charges identified in HB-549 to “promulgate the benefits of energy efficiency” by reducing the amount of funding available for their total program budgets. Since this share of the \$400,000 is excluded from the total program budgets, it is not included in the performance incentive calculation.

For a demonstration of how this accounted for in the SBC calculations, please refer to the following for each Electric Utility.

- Eversource: Please refer to Attachment E3 in the March 1, 2022 Plan Filing. In the Energy Efficiency Expense & SBC Revenue Reconciliation attachments, the company’s share of the \$400,000 (\$290,311.93 for 2022 and \$290,745.70 for 2023) is delineated in line 6 as RSA 125-O:5-a Funding. The amount for Program Expenses in line 7 is the remainder of what is used in the planned program budgets.
- Liberty: Please refer to Page 3 in Attachment DOE 1-007.
- NHEC: Please refer to Line 7 on Pages 2 and 3 in NHEC Attachment TS 1-002. The amounts shown on Line 7 represent the amounts NHEC set aside from the 2022 and 2023 funding for the Company’s allocation of the \$400,000. The actual amounts NHEC anticipates allocating are \$29,995.79 in 2022 and \$29,522.22 in 2023, as depicted in Attachment DOE 1-016.
- Unitil: Please refer to DOE 1-012 Attachment 1-UES. In UES’ Energy Efficiency Expense & SBC Revenue Reconciliation attachments, its share of the \$400,000 is delineated in line 2 as RSA 125-O:5-a Funding. The amount for Program Expenses in line 3 is the remainder of what is used in the planned program budgets. Line 3 includes program costs as well as projected performance incentives.

New Hampshire Electric Cooperative, Inc.
NH Saves Energy Efficiency Programs
NHPUC Docket No. DE - 20-092
Attachment G3 (2022-2023)
Page 1 of 4
TS1-002

New Hampshire Electric Cooperative, Inc.
2022-2023 System Benefits Charge ("SBC") Calculation
(\$ in 000's)

Year	EE Total Budget	RGGI Revenues	FCM Revenues	Carryforward with Interest	SBC Requirement	Forecasted Distribution (MWh)	2022		2023		SBC Rate EAP Portion (cents/kWh)	SBC Rate EAP Portion (cents/kWh)	Total SBC Rate (cents/kWh)	Total SBC Rate (cents/kWh)	Total SBC Rate (cents/kWh)
							Jan-Feb SBC Rate EE Portion (cents/kWh)	Mar-Dec SBC Rate EE Portion (cents/kWh)	Jan-Dec SBC Rate EE Portion (cents/kWh)	Mar-Dec SBC Rate EE Portion (cents/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	Col. N	Col. O	
2022	\$ 5,713	\$ 207	\$ 100	\$ 1,532	\$ 3,873	786,599	\$ 0.373	\$ 0.528	\$ 0.543	\$ 0.150	\$ 0.523	\$ 0.678	\$	0.693	
2023	\$ 4,507	\$ 207	\$ 100	\$ -	\$ 4,199	777,382				\$ 0.150			\$		

Col. A: Effective year
Col. B: Budget Projections
Col. C: Budget Projections
Col. D: Budget Projections
Col. E: Budget Projections
Col. F: Col. B - Col. C - Col. D - Col. E
Col. G: Company Forecast
Col. H: (Col. H / Col. I) x 100
Col. I: EAP Portion of SBC Rate
Col. J: Col. J + Col. K

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New Hampshire Electric Cooperative, Inc.
Energy Efficiency Expense & SBC Revenue Reconciliation
January 1, 2022 to December 31, 2022
(\$ in 000's)

Line	Description	Carryover 12/31/21	Forecast Jan 2022	Forecast Feb 2022	Forecast Mar 2022	Forecast Apr 2022	Forecast May 2022	Forecast June 2022	Forecast Jul 2022	Forecast Aug 2022	Forecast Sep 2022	Forecast Oct 2022	Forecast Nov 2022	Forecast Dec 2022	2022 Total
		Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	kWh Sales	1,532	324	295	357	345	272	282	388	352	363	287	285	378	3,896
2	RGGI Revenues		17	17	17	17	17	17	17	17	17	17	17	17	207
3	FCM Revenues		8	8	8	8	8	8	8	8	8	8	8	8	100
4	Total Revenues		349	320	383	370	297	308	383	377	388	312	311	403	4,203
5	Program Expenses		476	476	476	476	476	476	476	476	476	476	476	476	5,713
6	Total Program Expenses		476	476	476	476	476	476	476	476	476	476	476	476	5,713
7	HB 549 EE Education Allocation		2	2	2	2	2	2	2	2	2	2	2	2	23
8	Current Month Over/(Under) Recovery		(128)	(157)	(95)	(108)	(181)	(170)	(94)	(101)	(90)	(166)	(167)	(75)	
9	Cummulative Over/(Under) Recovery	1,532	1,404	1,246	1,151	1,043	863	692	588	497	407	242	75	(0)	
12	Interest @ Prime Rate		0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	
13	Interest		4	4	3	3	3	2	2	1	1	1	0	0	24
14	Monthly Sales (MWh)		86,829	79,055	67,616	65,290	51,453	53,394	67,784	66,601	68,721	54,318	54,018	71,520	786,599
15	EE SBC Rate		0.373	0.373	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528

Line 1: (Line 14 x Line 15) / 100
 Line 2: Page 1, Col. C
 Line 3: Page 1, Col. D
 Line 4: Sum of Lines 1 through Lines 3
 Line 5: Page 1, Col. B
 Line 6: Sum of Line 5
 Line 7: HB 549 EE Education Allocation
 Line 8: Line 4 - Line 6 - Line 7
 Line 9: Prior month Line 8 + Current month Line 9
 Line 12: Prime Rate / 12
 Line 13: (Prior Month Line 8 + Current Month Line 8) / 2 x Line 11
 Line 14: Company Forecast
 Line 15: Page 1, Col. J/K

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Energy Efficiency Expense & SBC Revenue Reconciliation
January 1, 2023 to December 31, 2023
(\$ in 000's)

Line	Description	Carryover 12/31/22	Forecast Jan 2023	Forecast Feb 2023	Forecast Mar 2023	Forecast Apr 2023	Forecast May 2023	Forecast June 2023	Forecast Jul 2023	Forecast Aug 2023	Forecast Sep 2023	Forecast Oct 2023	Forecast Nov 2023	Forecast Dec 2023	2023 Total
		Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	kWh Sales	-	466	424	363	350	276	287	364	357	376	291	290	384	4,221
2	RGGI Revenues	-	17	17	17	17	17	17	17	17	17	17	17	17	207
3	FCM Revenues	-	8	8	8	8	8	8	8	8	8	8	8	8	100
4	Total Revenues	-	492	450	388	376	302	312	389	383	394	317	316	409	4,529
5	Program Expenses	-	376	376	376	376	376	376	376	376	376	376	376	376	4,507
6	Total Program Expenses	-	376	376	376	376	376	376	376	376	376	376	376	376	4,507
7	HB 549 EE Education Allocation	-	2	2	2	2	2	2	2	2	2	2	2	2	22
8	Current Month Over/(Under) Recovery	-	114	72	11	(1)	(76)	(65)	12	6	17	(60)	(62)	32	
9	Cummulative Over/(Under) Recovery	-	114	187	198	196	121	55	67	73	90	30	(32)	(0)	
12	Interest @ Prime Rate	-	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
13	Interest	-	0	0	1	1	0	0	0	0	0	0	0	(0)	3
14	Monthly Sales (MWh)	-	85,812	78,129	66,824	64,525	50,851	52,768	66,990	65,820	67,916	53,682	53,385	70,682	777,382
15	EE SBC Rate	-	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543

Line 1: (Line 14 x Line 15) / 100
 Line 2: Page 1, Col. C
 Line 3: Page 1, Col. D
 Line 4: Sum of Lines 1 through Lines 3
 Line 5: Page 1, Col. B
 Line 6: Sum of Line 6
 Line 7: HB 549 EE Education Allocation
 Line 8: Line 4 - Line 6 - Line 7
 Line 11: Line 9 - Line 10
 Line 12: Prime Rate / 12
 Line 13: (Prior Month Line 8 + Current Month Line 8) / 2 x Line 11
 Line 14: Company Forecast
 Line 15: Page 1, Col. J/K

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Bill Impacts of Changes in System Benefits Charge - New Hampshire Electric Cooperative, Inc.

	2021	Jan-Feb 2022	Mar-Dec 2022	2023
System Benefits Charge (\$/kWh)	\$ 0.00678	\$ 0.00523	0.00678	0.00693
<u>Bill per month, including NHEC default energy service</u>				
Residential Rate B (625 kWh/month)	\$ 124.33	\$ 123.36	\$ 124.33	\$ 124.42
Commercial B3, three-phase service (<50 kW, 10,000 kWh/month)	\$ 1,766.24	\$ 1,750.74	\$ 1,766.24	\$ 1,767.74
<u>Change from previous rate level - \$ per month</u>				
Residential Rate B (625 kWh/month)		\$ (0.97)	\$ 0.97	\$ 0.09
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		\$ (15.50)	\$ 15.50	\$ 1.50
<u>Change from previous rate level - %</u>				
Residential Rate B (625 kWh/month)		-0.8%	0.8%	0.1%
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		-0.9%	0.9%	0.1%

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Request from: Office of Consumer Advocate

Request:

1. Please refer to the 2021-2023 New Hampshire Statewide Energy Efficiency Plan, Revised by Settlement and Submitted January 19, 2021 (“Settlement Plan”) and the 2022-2023 New Hampshire Statewide Energy Efficiency Plan, submitted March 1, 2022 (“Revised Plan”).

- a. Please explain the process by which the NH Electric and Natural Gas Utilities revised the Settlement Plan for years 2022 and 2023 to comply with House Bill 549.
- b. What are the key differences between the Settlement Plan and the Revised Plan for years 2022 and 2023?
- c. The passage of House Bill 549 reduced the total funding levels available for the 2022 and 2023 energy efficiency programs. Please explain how the NH Electric and Natural Gas Utilities allocated budget reductions across each program. Please include in your response any criteria relied upon such as cost-of-saved energy, historic participation, customer equity, and evaluation results.
- d. Did the NH Electric and Natural Gas Utilities consider reducing each program’s budget by the same percentage to comply with House Bill 549? Please explain why or why not.
- e. For each Residential Energy Efficiency Program please explain any programmatic differences between the Settlement Plan and the Revised Plan for years 2022 and 2023. Please include in your response if these differences impact participation, savings, target populations, delivery channels, or measure mix.
- f. For each Commercial and Industrial (“C&I”) Efficiency Program please explain any programmatic differences between the Settlement Plan and the Revised Plan for years 2022 and 2023. Please include in your response if these differences impact participation, savings, target populations, delivery channels, or measure mix.
- g. For each Active Demand Reduction (“ADR”) pilot, please explain any differences between the Settlement Plan and the Revised Plan for years 2022 and 2023. Please include in

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your response if these differences impact participation, savings, target populations, or delivery channels.

h. Were there any programs and/or measures that were offered in the Settlement Plan that are not offered in the Revised Plan for years 2022 and 2023? If yes, please identify and explain.

i. How is the Revised Plan different for low-income ratepayers compared to the Settlement Plan in years 2022 and 2023?

j. Did the NH Electric and Natural Gas Utilities make modifications to planned evaluation, measurement and evaluation (“EM&V”) activities in the Revised Plan as compared to the Settlement Plan? If yes, please explain.

k. Please provide an amended version of Tables 1-1. 2022-2023 Plan Goals (Electric) and Table 1-2: 2023-2023 Plan Goals (Natural Gas) as included on pages 7 and 8 of the Revised Plan so that it also includes the same information from the Settlement Plan. For each row, if there are differences between the Revised Plan and the Settlement Plan, please explain what contributed to the difference.

l. Please explain why the Revised Plan 2022 program budget for the Municipal Program remains the same as year 2022 in the Settlement Plan but the annual savings, lifetime savings, and participants increases?

m. Please explain why the Revised Plan 2022 program budget and participants for the Home Performance with Energy Star program decreases compared to year 2022 in the Settlement Plan, but the annual savings and lifetime savings increase?

n. Please explain why the Revised Plan 2022 program budget, annual savings, and lifetime savings for the Energy Star Homes program decreases compared to year 2022 in the Settlement Plan, but the kW reduction and participation increases?

o. Please explain why the Revised Plan no longer includes an Energy Optimization Pilot.

p. Please confirm that the number of Participants included in Table 2-2: Small Business Energy Solutions Program - Energy Savings and Budgets on page 31 of the Revised Plan are correct for both Electric and Gas. If confirmed, did the NH Electric and Natural Gas Utilities

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change the definition of participants in the Small Business Energy Solutions Program compared to the Settlement Plan?

q. Please explain whether the electric energy efficiency programs provide incentives for customers to switch from natural gas space heating to electric heat pumps. If not, why not?

r. Please explain whether the electric energy efficiency programs provide incentives for customers to switch from space heat fueled by oil, propane, or other delivered fuels to electric heat pumps. If not, why not?

s. Please explain whether and how energy equity was addressed in developing the Revised Plan. The term “energy equity” refers to the fair distribution of costs and benefits of energy investments, particularly the distribution of costs and benefits to marginalized, disadvantaged, or vulnerable customers.

Response:

- a. Given the direction provided by HB 549 and recent PUC Orders, the NH Utilities updated the NHSaves Plan from program year 2020 based on funding available, current savings assumptions, and current market conditions.

Following the guidance of the PUC and HB 549, the NH Utilities focused resources on those programs that were in place in program years 2020 and 2021 and on overcoming current market barriers. Activities not directly resulting in energy savings were carefully considered and, in some cases, scaled back or eliminated, including Liberty Utilities’ originally proposed aerial mapping program and the statewide Energy Optimization pilot. Given the rates set by HB 549, the scale of ramping up of programs and increase in participation included in the 2021-2023 Settlement Plan is no longer feasible. As a result, some outreach efforts described in the Settlement Plan are unlikely to be pursued in order to avoid generating customer demand for energy efficiency services that cannot be met.

The NH Utilities worked together to draft the revised 2022-2023 narrative, to coordinate our approach to program design, and to budget for statewide expenses such as evaluation. Prior to developing the budgets for the programs, \$400,000 was set aside from the SBC revenue forecast to provide funding to the NH Department of Energy to promulgate the benefits of energy efficiency. The EM&V Working Group worked collaboratively on the strategic

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evaluation plan chapter, which reflects the consensus of that group, including consultants to the DOE. Measure savings assumptions are based on a revised TRM specific to Plan Year 2022, which was also reviewed and approved by the EM&V Working Group. The OCA, SNHS, and Listen were consulted regarding the setting of rebate levels to be offered in the Home Energy Assistance program targeting income-eligible customers. The NH Department of Energy was consulted regarding the calculation of the 2023 inflation adjustment and estimate of RGGI revenues.

- b. The key differences include a scaling back of program offerings, lower funding levels, revised savings assumptions, and a change to the planned proportion of electric savings relative to overall energy savings. The Settlement had full programs for ADR, the creation of a statewide pilot for Energy Optimization (EO) and the creation of an Aerial Infrared Mapping (AIM) program for Liberty. This plan contains the continuation of pilots for ADR, no EO pilot, and no AIM program. The Settlement was developed utilizing 2019 data and savings assumptions ramped up to achieve an EERS goal developed by the stakeholder process, while this plan was developed utilizing 2021 supporting data and the funding available given rates established by statute. The Settlement planned for at least 55% of all energy savings in the NH Electric utilities' programs be electric savings, while the current plan is responsive to the mandate included in HB 549 that the NH Electric Utilities plan for at least 65% of all energy savings to come from electricity.

- c. The Utilities undertook the following process for allocating funding:
 1. The SBC funding that HB 549 mandated be directed to the Department of Energy and EESE Board were removed.
 2. The forecasted RGGI dollars were allocated, per statute, to the Municipal and Income-Eligible programs.
 3. Each utility's forecasted sales and the rates included in the legislation were used to determine the sector funding for Residential and C&I as well as the income-eligible programs.
 4. Each utility allocated the mandated portion of funding to be dedicated to the income-eligible programs.
 5. Remaining dollars were allocated within each sector across the suite of programs in place in 2020 and 2021 such that:

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- Cost-effective programs will enable participating customers to overcome existing market barriers;
 - Portfolio-wide planned electric savings in the electric programs met the mandate in HB 549 that at least 65 percent of energy savings planned for in the electric portfolio be electric savings;
 - Measure mixes within programs reflected both a prospective look at market trends as well as a retrospective look at historic participation
 - Savings assumptions reflected the 2022 TRM (for prescriptive measures) and estimates of future performance (for custom measures or those based on algorithms)
- d. No. Please refer to the response provided to OCA 3-001 Part C for an explanation as to why that approach was not taken.
- e. As noted above, the scale of residential programs proposed in the March 1, 2022 filing remains at roughly current levels, resulting in program participation and savings that are lower than were proposed in the settlement plan. In addition, there are some programmatic changes compared to the settlement.
- Home Energy Assistance – Please refer to the response provided to Part I of this question for changes related to this program.
 - HPwES – The NH Utilities will carefully monitor incentive levels for this program. The demand for services in this program is expected to outpace the available funding, which has resulted in a reduction in the outreach, marketing and community engagement that was planned for in settlement. It is also likely that certain utilities will have to institute a waiting list for HPwES services before the end of each year, given current budget levels. The NH Utilities will continue to actively manage the demand for services in this program in order to minimize the stop-start issues that were identified by stakeholders and vendors during the development of the Plan. The settlement Plan also included several new elements that are no longer anticipated in the 2022-2023 Plan; a potential pathway for self-

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installed insulation, expansion of financing to cover health and safety barriers, and virtual assessments.

- Homes – Demand for this new construction program is also anticipated to outpace the available funding, leading to active management of fees to HERs raters and rebates to customers. The pursuit of a Codes and Standards initiative, which was proposed in the settlement plan, will no longer be investigated given limited funding and the absence of near-term energy savings. Several other pathways for new construction included in the Settlement are no longer included; a renovations and major additions offering, an offering focused on the US DOE Zero Energy Ready Home Program, and new incentive structures for passive solar, solar PV ready, EV ready and all electric homes have all been removed from the 2022-2023 Plan.
 - Retail (appliances and lighting) - Retail lighting rebates will be focused on those retailers that are last to adopt high quality, high efficiency lighting options. The Settlement Plan anticipated additional eligible equipment products including freezers and appliance recycling for air conditioners and dehumidifiers. These items are not included in the 2022-2023 Plan. The NH Natural Gas Utilities will carefully monitor natural gas water heating equipment and may lower or stop offering rebates on this equipment in order to focus on other equipment. The originally proposed EO program, which would have focused on encouraging customers to choose electric heat pumps instead of fossil fuel heating equipment, has been dropped from this proposal, as described in the response to Part O of this question.
 - Home Energy Reports / Behavior - The AIM program that Liberty proposed is no longer contained in the plan.
- f. While the scale of the programs has been altered, the actual programmatic offerings for the Municipal Program, as well as the Small and Large Business Energy Solutions Programs, are similar to those contemplated in the settlement. Primarily due to the reduction in scale of the programs, participation and savings are expected to be lower than contemplated in the settlement. However, there are a number of customer-focused recruitment strategies that were proposed in the settlement that are no longer being pursued, including:
- expansion of general outreach and education
 - the elimination of a multi-year Codes and Standards initiative

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- the buildout of a community network of energy champions that was to include municipal representatives, sustainability groups, energy committees, and economic development commissions
 - expansion of Main Streets efforts and community blitzes
- g. Rather than developing ADR into a full program with expanded access for customers and increased savings, as proposed in the Settlement Plan, the continuation of the pilots will be consistent with the scope of the 2020 pilot. These differences impact participation and savings as they are currently operating with a waitlist and are unable to accept more customers unless and until a change in funding occurs for ADR.
- h. Please refer to the response to Part B of this question.
- i. There is less funding dedicated to income-eligible customers in this revised plan compared to the Settlement Plan. As a result, the NH Utilities and the Community Action Agencies with whom we partner will be able to serve fewer participants and achieve lower overall program savings through the Home Energy Assistance program. In order to reflect actual data on average project size from 2020 and 2021 and the desire to provide comprehensive services during a single project, the maximum rebate for participating customers was planned at \$15,000, subject to waiver in certain circumstances. Otherwise, the operation of programs is anticipated to be similar in the future as it was in the 2018-2020 term.
- j. Yes. The Settlement Plan anticipated that a number of additional studies would be undertaken, notably of the EO pilot, which is no longer being proposed. The 2022-2023 Plan was developed based on the current suite of program offerings and revised funding for both energy efficiency programs and evaluation. As described in the response to Part A of this question, the EM&V activities contained in this updated Plan were reviewed and approved by the EM&V Working Group.

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- k. The below tables are amended versions of Tables 1-1 and 1-2 from the 2022-2023 New Hampshire Statewide Energy Efficiency Plan, which include an additional column displaying the same metrics for 2022-2023 from the Settlement Plan. The differences in savings can be attributed to the revised budget that was filed in accordance with HB549. The most directly comparable metrics in the tables are the costs per lifetime kWh and MMBtu. The revised 2022-23 Plan for electric programs has a cost per lifetime kWh of \$0.060, which is nearly the same as the \$0.061 filed in the Settlement Plan for 2022-2023, and a cost per lifetime MMBtu of \$4.19, which is slightly lower than the \$4.61 filed in the Settlement Plan for 2022-2023.

Electric Programs	2022	2023	2022-2023 Plan	2022-2023 Settlement Plan
Cumulative Lifetime MWh Savings	1,028,080	957,048	1,985,128	3,987,380
Cumulative Annual MWh Savings	88,246	82,170	170,416	331,531
Cumulative Annual Savings as a % of 2019 Delivery Sales	0.84%	0.78%	1.62%	3.15%
Cumulative Program Funding	\$59,179,376	\$60,825,179	\$120,004,555	\$242,695,563
Program Cost per Lifetime kWh Savings	\$0.058	\$0.064	\$0.060	\$0.061

Note: Numbers may not add up due to rounding

Natural Gas Programs	2022	2023	2022-2023 Plan	2022-2023 Settlement Plan
Cumulative Lifetime MMBtu Savings	2,766,322	2,639,195	5,405,517	6,478,337
Cumulative Annual MMBtu Savings	187,974	187,425	375,399	521,814
Cumulative Annual Savings as a % of 2019 Delivery Sales	0.75%	0.75%	1.49%	2.08%
Cumulative Program Funding	\$11,278,443	\$11,367,360	\$22,645,045	\$29,843,776
Program Cost per Lifetime MMBtu Savings	\$4.08	\$4.31	\$4.19	\$4.61

Note: Numbers may not add up due to rounding.

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- l. The difference in planned savings between the revised 2022 Plan and the Settlement Plan can be attributed to an adjustment in the measure mix and average project savings that more closely aligns with actual projects that were incentivized in 2021, versus the 2019 and partial year 2020 program data that were used to develop the Settlement Plan. It also reflects less emphasis on non-energy savings outreach and support activities than were proposed in the original 2021-2023 Plan.

- m. The difference in planned savings between the revised 2022 Plan and the Settlement Plan can be attributed to an adjustment in the measure mix and average savings that more closely aligns with actual projects that were incentivized in 2021, versus the 2019 and partial year 2020 program data that were used to develop the Settlement Plan. It also reflects less emphasis on non-energy savings outreach, marketing, vendor training and support activities than were proposed in the original 2021-2023 Plan, which were intended to increase the capacity of the program to reach customers.

- n. The difference in the kW reduction between the revised 2022 Plan and the Settlement Plan is due to a modeling update made for cooling and hot water measures. In the Settlement Plan, kW savings were only claimed based on a load shape associated with heating measures. In the revised 2022 Plan, the measures were disaggregated and included lines specific to cooling savings, which have a higher maximum demand factor – which resulted in higher overall planned kW for the program.

The number of planned participants in the revised 2022 Plan is 769 versus 764 in the Settlement Plan, reflecting an immaterial change. Participation is achieved with lower budgets and lower per-participant rebates. The difference can be attributed to a planned average project savings that more closely aligns with actual projects that were incentivized in 2021, versus the 2019 and partial year 2020 program data that were used to develop the Settlement Plan.

- o. The NH Utilities developed the original 2021-2023 Plan over the course of many months in collaboration with a diversity of stakeholders. Given the increasing emphasis in other jurisdictions, including Maine, Vermont, and Massachusetts, and interest on the part of both

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stakeholders and the NH Electric Utilities in realizing energy efficiency potential through heat pump technologies that displace fossil fuels, the NH Utilities proposed to launch an EO pilot. The intent of this pilot was to incentivize the adoption of heat pumps by residential customers and measure the impact on those customers' electric use in both the summer cooling season as well as in the shoulder and heating months and the impact on those customers' fossil fuel use during the shoulder and heating months.

Because "energy optimization" results in increases in electricity use while driving fossil fuel use down, the pilot would be in direct conflict with the mandate in HB 549 to prioritize kWh savings in portfolio planning. Additionally, the funding required to undertake an EO pilot would necessarily reduce funding and/or support for other programs and measures. This budgetary pressure would only increase should the pilot be transitioned to a full program.

- p. For the NH Electric Utilities, the number of planned Small Business participants in the revised 2022 Plan is lower than the Settlement Plan in a way that is proportional to the decrease in budgets. The revised 2022 Plan budget for Small Business is 45% lower than the Settlement Plan, and the number of participants is 27% lower. The reason they are not directly proportional is due to the larger share of the incentive budget that is planned for midstream offerings, which have a relatively higher number of participants per dollar spent.

For the NH Gas Utilities, there is no change to the definition of participants in the revised 2022 Plan as compared to the Settlement plan. A notable difference for Liberty Gas is the quantity of projected Faucet Aerators, Low Flow Showerheads and Pre-Rinse Spray Valves in the revised 2022 Plan (i.e., 1,507 in 2022) as compared to the Settlement Plan (i.e., 180 in 2022).

- q. The Electric NH Utilities provide incentives to customers to adopt high-efficiency heating appliances. The incentive is designed to overcome the market barrier posed by a higher up-front cost of this equipment compared to standard-efficiency equipment, not to incentivize the customer to switch from fossil fuel heating to electric heat pump equipment. Similarly, the NH Gas Utilities use incentives to help customers overcome the higher cost of a high efficiency gas heating appliance, but do not incentivize customers to switch their heating fuel.

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- r. Please refer to the response provided to Part Q of this question.
- s. The NH Utilities are dedicated to providing excellent service to all of our residential and Commercial and Industrial customers. The Utilities pay particular attention to our most vulnerable customers, who are income-eligible for weatherization services at no cost to them. The NH Utilities work with the network of Community Action Agencies throughout the state to identify and serve income-eligible customers in both single family and multi-family housing. Each utility dedicates at least 17 percent of all portfolio energy efficiency funding to income-eligible programming, and spends a portion of this funding on overcoming barriers to weatherization in our customers' homes, such as electrical wiring, minor repairs, mold and other issues. The NH Utilities also work closely with non-profit organizations, offering enhanced incentives to overcome financial barriers to energy efficiency adoption.

Recognizing the importance of developing a more comprehensive understanding of and approach to equity, the EM&V Working Group has proposed a study to "identify if there are systematic patterns or gaps in how well these populations are served." The NH Utilities anticipate being able to leverage the recent surge in attention and research related to improving equity in energy efficiency program design and delivery so that NHSaves programs will engage those customers who have been least able to access our programs and the benefits they deliver.

Public Service Company of New Hampshire d/b/a Eversource Energy
Docket No. DE 20-092**Date Request Received: March 25, 2022**
Data Request No. DOE 2-002**Date of Response: April 04, 2022**
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Request:

Reference EE Plan at Bates 65 where, in Section 3.4.2 it states that NH Utilities plan to utilize a maximum HEA Program rebate per project of \$15,000. Please respond to the following:

- a) What is the current maximum project rebate level and that for each of the prior 3 program years 2019, 2020, 2021?
- b) What specific decision criteria will be used by an “implementation supervisor” to make a determination about exceeding the \$15,000 project limit?
- c) Is the “implementation supervisor” an employee of one of the NHSaves sponsoring utilities? An employee of a program implementation contractor? Please clarify.

Response:

- a. In November 2021, in response to PUC Order 26,553, the project cap was adjusted to \$8,000, which remains in effect today. The cost of replacing heating systems is included within the cap.

In program year 2019, the maximum project rebate level was \$8,000. If additional cost-effective weatherization work was identified for the residence, it would often need to be deferred to the next program year if the limited amount of available federal Weatherization Assistance Program (“WAP”) funding could not cover it. At that time, heating systems were excluded from the project cap calculation. If a heating system replacement was recommended as part of the project, the cost of the replacement was considered separately from the weatherization project cost. Each utility allowed for up to 25% of the HEA budget to be used for heating systems. Heating system spending could be approved above the project cap after reviewing the work scope, cost, project needs, energy savings, and taking into account portfolio cost-effectiveness.

Program year 2020 began under the same framework as 2019, but in May of 2020 the project cap was adjusted to \$20,000. With the adjustment to the higher rebate limit, the cost of heating system replacements moved to be included within the project cap rather than being assessed separately. This approach was less administratively burdensome and allowed for the interactive effects of the weatherization and heating system to be included, providing more

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accurate energy savings. It also provided a more consistent and clear policy for both Community Action Agencies (“CAAs”) and utility staff.

The \$20,000 cap helped to account for, and was responsive to, increases in material and labor costs and was consistent with a program approach that focuses on serving an income-eligible customer fully with a comprehensive set of measures during a single project. It also minimized the need to break projects up and go back for additional cost-effective work in a subsequent program year, or the potential to leave some measures undone altogether. The increased \$20,000 cap also ensured that the opportunity to provide cost-effective insulation or a heating system was not lost due to a conservative spending cap.

In addition, a utility supervisor could, on a case-by-case basis, approve work above the \$20,000 project cap after reviewing the work scope, cost, project needs, energy savings, and taking into account portfolio cost-effectiveness.

For program year 2021, the cap remained at \$20,000 until November 2021, when the project cap was adjusted to \$8,000 in response to PUC Order 26,553. Heating systems continue to be included within the cap, which creates a limiting effect on the amount of weatherization available to income-eligible customers that are in need of a heating system.

- b. If additional cost-effective work can be performed within a given residence that would exceed the \$15,000 limit, based on the CAA recommendation including review of any Weatherization Assistance Project (“WAP”) funding, then the project will be escalated to a utility supervisor on a case-by-case basis to review the work scope, cost, project needs, energy savings and cost-effectiveness of the proposed measures to determine if the exception is justifiable in the event that there is available budget.
- c. The implementation supervisor is always an employee of one of the NHSaves Utilities.