1	Attachment A
2	Education and Professional Background
3	Elizabeth R. Nixon
4	
5	My name is Elizabeth R. Nixon. I am employed as a Utility Analyst with the New
6	Hampshire Public Utilities Commission (PUC). My business address is 21 S. Fruit St., Suite 10,
7	Concord, NH 03301.
8	I earned a B.S. in Mathematics from the University of Vermont in 1985. I worked for
9	ICF, a consulting firm, where we estimated, modeled, and analyzed the energy, environmental
10	and economic impacts of various emission reduction strategies at electric utilities. At ICF and
11	AER*X, Inc., I assisted companies in implementing market-based emissions trading programs. I
12	provided comments on various air quality programs affecting the electric utilities and other
13	industries in the Northeast and other states. I also worked for the Center for Clean Air Policy
14	where we coordinated a dialogue of states and electric utilities to discuss energy efficiency and
15	other emission control strategies to reduce acid rain and greenhouse gases at electric utilities.
16	At the New Hampshire Department of Environmental Services, I wrote the air quality
17	permits for Eversource's electric generating facilities as well as other electric generating
18	facilities and manufacturing facilities in NH. I testified before the NH Air Resources Council
19	regarding the determination of the baseline mercury emissions for Eversource's coal-fired
20	electric generating facilities.
21	I joined the PUC's Sustainable Energy Division in August 2012 where I managed
22	renewable energy incentive programs, determined compliance with the renewable portfolio
23	standard (RPS) program, and conducted analysis of and provided testimony and presentations on

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

Public Service of New Hampshire d/b/a Eversource Energy Docket No. DE 17-136

Date Request Received: 10/09/2017Date of Response: 10/23/2017Request No. STAFF 1-044Page 1 of 1Request from:New Hampshire Public Utilities Commission Staff

Witness: Michael R. Goldman

Request:

Reference Bates page 445, Table 1, regarding the NEIs for electric and gas utility programs combined in other states.

- a. Please provide this table for electric only.
- b. Please provide this table for gas only.
- Please explain why VT's adder is listed as a 15% adder, yet this table shows a much greater NEI percentage (60.88% for non-income eligible residential). If this table includes other adders (e.g., carbon adder, etc.) for VT, please itemize the NEIs totaling \$30 million and 60.88% by category (in \$ and %) to show the 15% adder and a breakout of the other adders.

Response:

Please see the attached spreadsheet for the referenced NEI table, with electric- and gas-specific numbers broken out. Please note that the numbers for Vermont's programs are based on the best information available from VEIC. The information VEIC provided does not include gas program NEIs since VEIC does not deliver gas efficiency programs. The information also does not allow for calculations of the values of each of the three categories of Vermont's NEIs: (1) the 15 percent adder accounting for hard-to-quantify participant benefits, (2) the additional 15 percent low-income NEI adder, and (3) the environmental externalities benefit based on the \$100/short ton of CO2 emissions value from the 2015 report, *Avoided Energy Supply Costs in New England* (March 31, 2015). However, VEIC staff have indicated that environmental externalities is the largest of the three NEI categories.

Joint Utility Response

Non-income eligible residentialS02S014.30%MA Electric (con actual)Income eligible residentialS71S4460.46%Income eligible residentialS12S20016.36%MA Gas (sofo actual)Total Res and C&IS129S33447.35%MA Gas (sofo actual)Income eligible residentialS199S4410.35%MA Gas (sofo actual)Total Res and C&IS199S1539.96%MA Gas (sofo actual)Non-income eligible residentialS199S1939.96%Income eligible residentialS199S1939.96%Total Res and C&IS199S1939.96%Non-income eligible residentialS107S4138.64%Commereligible residentialS192S1939.96%Non-income eligible residentialS192S1936.96%Cr Gas (cor) planned) (note 2)Non-income eligible residentialS19S610.00%Cr Gas (cor) planned) (note 2)Non-income eligible residentialS19S610.00%RI Electric (cord planned)Non-income eligible residentialS10S183.00%RI Gas (soro plane)Non-income eligible residentialS10S183.00%RI Gas (soro plane)Non-income eligible residentialS10S183.00%RI Gas (soro plane)Non-income eligible residentialS10S183.00%RI Gas (soro plane)Non-income eligible residentialS16 <td< th=""><th></th><th>Program area</th><th>Total Resource Benefits (\$ millions) (note 1)</th><th>NEIs (\$ millions) (note 2)</th><th>NEIs as percent of Total Resource Benefits</th></td<>		Program area	Total Resource Benefits (\$ millions) (note 1)	NEIs (\$ millions) (note 2)	NEIs as percent of Total Resource Benefits
MA Electric (200) actual) residential (Commercial and industrial) residential (Supported)			\$627		14.36%
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preliminary estimates) (note 4)residential\$3\$2\$7,85%commercial and industrial\$66\$35\$2,93%				\$30	
industrial \$66 \$35 52.93%			\$3	\$2	67.85%
Total Res and C&I \$119 \$67 56.60%	estimates) (note 4)		\$66	\$35	52.93%
		Total Res and C&I	\$119	\$67	56.60%

1. Total resource benefits include electric capacity, electric energy, natural gas, oil, propane, and water savings.

2. NEI values for all states reflect participant NEIs, such as O&M, labor, health, safety, and property values. Massachusetts' and Rhode Island's NEI values also include utility NEIs such as reduced arrearages associated with low-income customers. Vermont's participant NEIs are applied as a 15% adder to total energy benefits, with an additional 15% adder for low-income programs. In addition, Vermont NEIs include externalities based on values from the Avoided Energy Supply Component Study Group, "Avoided Energy Supply Costs in New England: 2015 Report," which are in turn based on \$100/short ton of CO2 emission.

3. Connecticut numbers are Eversource-only. They do not include the states' other regulated utilities (UI, CNG, and SCG), as these utilities do not publish sufficiently granular data for calculating NEI values comparably with Eversource's NEI values. Eversource serves the majority of CT's electric and natural gas customers.

4. Vermont numbers are based on the best information available from Vermont Energy Investment Corporation (VEIC). The information VEIC provided does not include information from non-electric programs, which are funded through different sources than the electric programs.

Public Service of New Hampshire d/b/a Eversource Energy Docket No. DE 17-136

Date Request Received: 10/06/2017 Request No. TWH 1-001 Request from: The Way Home Date of Response: 10/23/2017 Page 1 of 1

Witness: Michael R. Goldman

Request:

Reference Testimony of Michael R. Goldman at p. 10, lines 10-12; a) Can you elucidate what standards are used to determine the independence and methodological rigor of NEI evaluations? b) What standards are used to determine whether a study is sufficiently independent and methodologically sound?

Response:

NEI evaluations, as with other energy efficiency evaluations, are conducted by independent third-party contractors, and are typically solicited, planned, conducted, and reported under an established process that includes review and input from a range of stakeholders, including public utility commissions and other regulatory bodies. The evaluations provide the basis for program plans and claimed savings, which are litigated before these same bodies. Furthermore, evaluators must typically demonstrate their expertise and past performance when bidding on evaluation contracts, and a thorough proposal review process ensures that evaluations are conducted by well-qualified, independent evaluators.

Methodological standards for energy efficiency evaluations have been established and refined by numerous bodies over several decades, including the International Efficiency Valuation Organization, the U.S. Department of Energy, and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. Regarding NEIs specifically, a variety of evaluation methodologies are used, which have been developed and refined over time to ensure that they yield reliable and valid results. [See, for example, Stevens N., Clendenning, G., Caron, N., NMR/DNV-GL, NEI Abbreviated Literature Review (TXC41), April 2017; Abdou M. et al, EM&V Roadmap to Quantifying Challenging Non-Energy Impacts, paper and presentation before the 2016 International Energy Program Evaluation Conference; Skumatz L., Non-Energy Benefits / NEBs – Winning at Cost-Effectiveness Dominos: State Progress and TRMs, 2016 ACEEE Summer Study; Clendenning, G. et al, Measuring Participant Perspective Non-Energy Impacts (NEIs), 2012 ACEEE Summer Study.] There is a large body of research on engineering models, survey valuation methods, and the use of different cost and benefit data to measure health, economic, and other impacts. This research has led to the emergence of best practices, such as using engineering studies to supplement self-reported surveys, avoiding double counting of overlapping NEIs, and ensuring evaluations include non-energy costs as well as benefits. Methodologies used in NEI research have also been successfully utilized across the social sciences, including in healthcare, real estate appraisal, and economic development.

Joint Utility Response

Notes		
Green = Electric Energy	Yellow = Electric Capacity	Blue = Non-Electric (NEB)
Electric and TR Benefit	Electric and TR Benefit	TR Benefit only

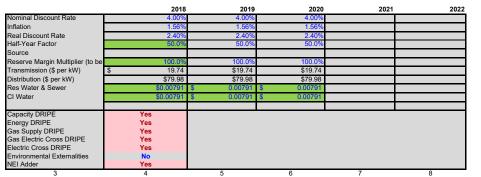
Avoided Costs do NOT include line losses. Those are added in during the calculation of the benefit

Avoided Cost Data - Forecasts can be entered in either "NOMINAL" or "REAL" dollars

- If "NOMINAL", enter values directly in the appropriate section below

- If "Real", enter specific values in the "REAL" dollars sections further down this page and the Model will convert them to NOMINAL below AESC Tables are located at the bottom of this worksheet beginning in row 221

AESC Tables are located at the bottom of this worksheet beginning in row 221



Energy												
Winter Peak	Wint	er Off-Peak	Summer Peak	Summer Off-Peak	Summer Gener.							
	6.112%	5.330%	6.112%	5.330%								
TD_Year		2017	l									
Wt_Year		2016										
Real year		2017	l .									

Year 1 Avoided Cost Data - In 2018\$

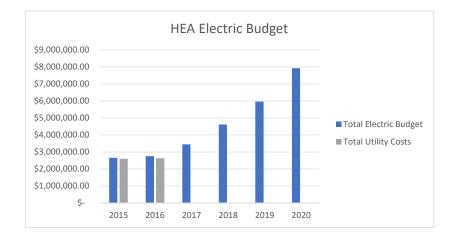
Annual Cumulative		Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	
Winter Peak Energy		Winter Off-Peak Energ	y (\$ per kWh)	Summer Peak Energy	(\$ per kWh)	Summer Off-Peak E	nergy (\$ per kWh)	Summer Genera	ation (\$ per kW)	Winter Generation (\$ per kW)		
\$0.056	\$0.055	\$0.049	\$0.048	\$0.040	\$0.039	\$0.032	\$0.032	\$77.13	\$76.22	\$0.00	\$0.	
\$0.060	\$0.113	\$0.053	\$0.100	\$0.046	\$0.084	\$0.038	\$0.068	\$51.73	\$126.15	\$0.00	\$0.	
\$0.065	\$0.174	\$0.056	\$0.153	\$0.055	\$0.135	\$0.042	\$0.108	\$52.92	\$176.02	\$0.00	\$0.	
\$0.071	\$0.239	\$0.063	\$0.211	\$0.060	\$0.190	\$0.048	\$0.152	\$130.61	\$296.22	\$0.00	\$0.	
\$0.073	\$0.305	\$0.064	\$0.268	\$0.062	\$0.246	\$0.050	\$0.197	\$123.07	\$406.82	\$0.00	\$0.	
\$0.077	\$0.373	\$0.068	\$0.328	\$0.066	\$0.304	\$0.054	\$0.244	\$115.64	\$508.32	\$0.00	\$0.	
\$0.080	\$0.442	\$0.070	\$0.388	\$0.069	\$0.363	\$0.058	\$0.294	\$120.43	\$611.53	\$0.00	\$0.	
\$0.083	\$0.511	\$0.073	\$0.449	\$0.074	\$0.425	\$0.060	\$0.344	\$132.74	\$722.63	\$0.00	\$0.	
\$0.082	\$0.578	\$0.072	\$0.509	\$0.075	\$0.486	\$0.060	\$0.394	\$145.31	\$841.40	\$0.00	\$0	
\$0.083	\$0.644	\$0.073	\$0.567	\$0.075	\$0.546	\$0.061	\$0.442	\$157.41	\$967.04	\$0.00	\$0	
\$0.084	\$0.709	\$0.074	\$0.624	\$0.079	\$0.607	\$0.063	\$0.491	\$169.81	\$1,099.40	\$0.00	\$0	
\$0.086	\$0.775	\$0.076	\$0.682	\$0.082	\$0.670	\$0.065	\$0.540	\$183.13	\$1,238.79	\$0.00	\$0	
\$0.087	\$0.839	\$0.078	\$0.740	\$0.084	\$0.732	\$0.066	\$0.590	\$201.12	\$1,388.28	\$0.00	\$0	
\$0.088	\$0.903	\$0.079	\$0.798	\$0.090	\$0.798	\$0.068	\$0.639	\$209.13	\$1,540.09	\$0.00	\$0	
\$0.089	\$0.966	\$0.081	\$0.855	\$0.094	\$0.864	\$0.070	\$0.688	\$209.13	\$1,688.33	\$0.00	\$0	
\$0.090	\$1.029	\$0.082	\$0.912	\$0.097	\$0.932	\$0.071	\$0.738	\$209.13	\$1,833.10	\$0.00	\$0	
\$0.092	\$1.091	\$0.084	\$0.969	\$0.101	\$1.000	\$0.073	\$0.787	\$209.13	\$1,974.47	\$0.00	\$0	
\$0.093	\$1.152	\$0.086	\$1.026	\$0.106	\$1.070	\$0.075	\$0.837	\$209.13	\$2,112.53	\$0.00	\$0	
\$0.095	\$1.213	\$0.088	\$1.082	\$0.110	\$1.141	\$0.077	\$0.887	\$209.13	\$2,247.35	\$0.00	\$0	
\$0.096	\$1.274	\$0.090	\$1.139	\$0.114	\$1.213	\$0.079	\$0.937	\$209.13	\$2,379.01	\$0.00	\$0	
\$0.098	\$1.334	\$0.091	\$1.195	\$0.119	\$1.286	\$0.082	\$0.987	\$209.13	\$2,507.58	\$0.00	\$0	
\$0.099	\$1.393	\$0.093	\$1.251	\$0.124	\$1.361	\$0.084	\$1.037	\$209.13	\$2,633.13	\$0.00	\$0	
\$0.101	\$1.452	\$0.095	\$1.307	\$0.129	\$1.436	\$0.086	\$1.087	\$209.13	\$2,755.74	\$0.00	\$0	
\$0.102	\$1.511	\$0.097	\$1.362	\$0.135	\$1.513	\$0.088	\$1.138	\$209.13	\$2,875.48	\$0.00	\$0.	
\$0.104	\$1.569	\$0.099	\$1.418	\$0.140	\$1.592	\$0.091	\$1.189	\$209.13	\$2,992.41	\$0.00	\$0	

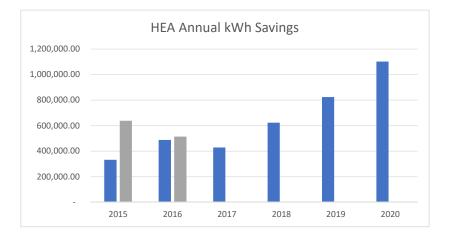
Administrator: Eversource Energy Program Year: 2018

·															
Sector (Dropdown)	Program (Dropdown)	Subprogram (Dropdown)	Measure	End Use (Dropdown)	Quantity Year 1	Quantity Year 2	Quantity Year 3	Measure Life	Total Resource Cost	Incentive	Processing Costs	Customer Cost	Free- Ridership Rate	[Participant] Rate	Participant]
Low-Income	Home Energy Assista	HEA (Weatherization)	Oil-Wxn: Air Sealing, Insulation, Water mea	Envelope	181	243	330	21	\$ 6,067.33	\$ 6,067.33		\$ -	0%	0%	0%
Low-Income	Home Energy Assista	HEA (Weatherization)	Propane-Wxn: Air Sealing, Insulation, Wate	Envelope	65	87	118	21	\$ 6,240.57	\$ 6,240.57		\$-	0%	0%	0%
		HEA (Weatherization)	Gas-Wxn: Air Sealing, Insulation, Water me		71	96	130	22	\$ 3,515.42	\$ 3,515.42		\$-	0%	0%	0%
Low-Income	Home Energy Assista	HEA (Weatherization)	Kerosene-Wxn: Air Sealing, Insulation, Wa	Envelope	129	173	235	20	\$ 6,060.59			\$-	0%	0%	0%
		HEA (Weatherization)	Electric-Wxn: Air Sealing, Insulation, Water		15	20	27	21	\$ 5,743.49	\$ 5,743.49		\$-	0%	0%	0%
		HEA (Weatherization)	Cord Wood-Wxn: Air Sealing, Insulation, W		15	21	28	20	\$ 5,600.59	\$ 5,600.59		\$ -	0%	0%	0%
		HEA (Weatherization) HEA (Weatherization)	Wood Pellets-Wxn: Air Sealing, Insulation, Baseload SF homes	Envelope Envelope	10 110	14 147	19 200	20 20	\$ 5,600.65	\$ 5,600.65		\$ - \$ -	0%	0%	0%
Low-Income	Home Energy Assista	HEA (HVAC Systems)	Oil- Thermostat	Envelope				25				\$- \$-	0%	0%	0%
		HEA (HVAC Systems)	Propane- Thermostat	Envelope				25				\$-	0%	0%	0%
		HEA (HVAC Systems)	Gas- Thermostat	Envelope				25				\$ -	0%	0%	0%
		HEA (HVAC Systems) HEA (HVAC Systems)	Kerosene- Thermostat Electric- Thermostat	Envelope Envelope				25 25				\$ - ¢	0% 0%	0% 0%	0% 0%
		HEA (HVAC Systems)		Envelope				25				φ - \$ -	0%	0%	0%
		HEA (HVAC Systems)		Envelope				25				\$ -	0%	0%	0%
		HEA (Weatherization)	LED Lighting Products	Lighting	3,217	4,321	5,876	5	\$ 12.78	\$ 12.78		\$- \$-	0%	0%	0%
		HEA (Weatherization)	Refrigerator	Refrigeration	191	256	348	12	\$ 775.00	\$ 775.00		\$ -	0%	0%	0%
		HEA (Weatherization) HEA (Weatherization)	Direct Install Water Measures (if broken ou User Defined	Hot Water								\$ - ¢			
		HEA (Weatherization)	User Defined									φ - \$ -			
		HEA (Weatherization)	User Defined									\$ -			
			Oil Boiler Replacement, >=87% AFUE	HVAC	35	47	64	25				ъ - \$ -	0%	0%	0%
			Propane Boiler Replacement, >=95% AFU		6	8	11	25	\$ 5,128.86	\$ 5,128.86		\$ -	0%	0%	0%
Low-Income	Home Energy Assista		Gas Boiler Replacement, >=95% AFUE Kerosene Boiler Replacement, >=87% AFU	HVAC	2	2	3 2	25 25	\$ 7,550.00 \$ 6,900.00	\$ 7,550.00 \$ 6,900.00		\$ -	0% 0%	0% 0%	0% 0%
			Boiler Replacement, User Defined	HVAC	1		2	25	\$ 0,900.00	\$ 0,900.00		\$ - \$ -	0.78	0 %	0 %
			Oil Furnace Replacment, >=87% ECM	HVAC	37	50	67	20	\$ 5,124.25			\$- \$-	0%	0%	0%
			Propane Furnace Replacment, >=95% EC		22	29	40	20	\$ 4,663.19	\$ 4,663.19		\$ -	0%	0%	0%
			Natural Gas Furnace Replacment, >=95%		6 34	8 45	11 61	20 20	\$ 5,546.82 \$ 3,334.74	\$ 5,546.82		\$ -	0% 0%	0% 0%	0% 0%
			Kerosene Furnace Replacment, >=87% EC Furnace Replacement, User Defined	HVAC	34	45	01	20	\$ 3,334.74	\$ 3,334.74		\$ - \$ -	0%	0%	0%
Low-Income	Home Energy Assista	HEA (Weatherization)	DHW: Heat Pump Water Heater	Hot Water				13	\$ 1,400.00	\$ 1,400.00		\$- \$- \$-	0%	0%	0%
			WXn Admin Fee (if not captured above) WXn Quality Assurance		1	1	1	1	\$ 60,000.00	\$ 60,000.00		\$- \$- \$-			
Low-Income	Home Energy Assista	HEA (Weatherization)	Base load SF Lighting	Lighting	658	883	1,201	5	\$ 12.78	\$ 12.78		э - \$ -			
Low-Income	Home Energy Assista	HEA (Weatherization)	Base load SF Fridge	Refrigeration	55	74	100	12	\$ 775.00	\$ 775.00		\$-			
		HEA (Weatherization)	User Defined	-								\$-			
		HEA (HVAC Systems)	User Defined									\$ -			
		HEA (HVAC Systems) HEA (HVAC Systems)	User Defined User Defined									\$- \$-			
												\$- \$-			
	Home Performance w	HPwES (Weatherizatio	Oil-Wxn: Air Sealing, Insulation, Water mea	Envelope	290	520	819	20	\$ 7,094.96	\$ 3,547.48		\$- \$3,547.48	0%	0%	0%
Residential			Propane-Wxn: Air Sealing, Insulation, Wate		117	210	331	20	\$ 6,558.53	\$ 3,279.27		\$ 3,279.27	0%	0%	0%
Residential Residential			Gas-Wxn: Air Sealing, Insulation, Water me Kerosene-Wxn: Air Sealing, Insulation, Wa		5	9	14	20 20	\$ 5,725.05 \$ 7,146.40	\$ 2,862.53 \$ 3,573.20		\$ 2,862.53 \$ 3,573.20	0% 0%	0% 0%	0% 0%
Residential			Electric-Wxn: Air Sealing, Insulation, Water		5 15	9 27	42	20	\$ 7,146.40 \$ 4,644.62	\$ 3,573.20 \$ 2,322.31		\$ 3,573.20 \$ 2,322.31	0%	0%	0%
Residential			Cord Wood-Wxn: Air Sealing, Insulation, Wale		24	44	69	20	\$ 7,151.41	\$ 3,575.71		\$ 3,575.71	0%	0%	0%
			Wood Pellets-Wxn: Air Sealing, Insulation,		19	35	55	20	\$ 7,151.41	\$ 3,575.71	1	\$ 3,575.71	0%	0%	0%
Residential	Home Performance w	HPwES (Weatherizatio	Baseload SF	Envelope	101	181	286	20				\$ - \$ -			
		HPwES (HVAC System		Envelope	1							\$ -	0%	0%	0%
		HPwES (HVAC System		Envelope								\$ -	0%	0%	0%
		HPwES (HVAC System HPwES (HVAC System		Envelope Envelope	1							\$ - \$ -	0% 0%	0% 0%	0% 0%
		HPWES (HVAC System		Envelope	1							\$ -	0%	0%	0%
. tooracriual		I. WEO (LIVAO Oystell	Lissaio- monitostat		1	1	1	1	I	1	I	÷	0 /0	570	0 /0

	Δ	в	C	D	F	F	G	н	1		к	1	м	N	0	Р	0	R	s
1 Yea	20	018	0	b	L		0			5	R.		- Wi	N IN	0		ŭ	IX.	0
2							1												
3				Inputs					Costs						ectric Savings: En	ergy			
Se	ctor	Program	Subprogram	Measure	End Use	Quantity	Measure	TRC (Total)	Incentive (Total)		Gross Annual MWh			Net Annual MWh	Net Lifetime	Winter Peak	Winter Off-Peak	Summer Peak	Summer Off-Peak Energy
							Life			(Total)	Savings	Annual MWh Savings	MWh Savings	Savings	MWh Savings	Energy MWh Net Lifetime	Energy MWh Net	Energy MWh Net Lifetime	MWh Net Lifetime
4												Savings				Litetime	Liteume	Lifetime	
5 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	Oil-Wxn: Air Sealing, Insulation, W	Envelope	181	21		\$ 1,096,670	\$-	69.047			60.001			495.708	161.105	247.854
6 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	Propane-Wxn: Air Sealing, Insulation	Envelope	65	21	\$ 404,594		<u>s</u> -	24.766			21.522		121.453	179.931	58.477	89.965
7 LOW-	ncome Ho	ome Energy Assista	HEA (Weatherization) HEA (Weatherization)	Gas-Wxn: Air Sealing, Insulation, V Kerosene-Wxn: Air Sealing, Insulat	Envelope Envelope	71 129	22 20	\$ 250,701 \$ 779,170		<u>\$</u> - \$-	27.242			23.673	518.662 856.157	140.039 231.162	207.465 342.463	67.426	103.732 171.231
9 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	Electric-Wxn: Air Sealing, Insulatio	Envelope	15	21	\$ 86,337	\$ 86,337	\$ -	84.352	73.302	1,551.580	73.302	1,551.580	418.927	620.632	201.705	310.316
			HEA (Weatherization)	Cord Wood-Wxn: Air Sealing, Insu	Envelope	15	20	\$ 86,222		ş -	5.881			5.111			41.902	13.618	20.951
11 Low-	ncome He	ome Energy Assista	HEA (Weatherization) HEA (Weatherization)	Wood Pellets-Wxn: Air Sealing, Ins Baseload SF homes	Envelope Envelope	10	20 20	\$ 57,482 \$ -		<u>\$</u>	3.921	1 3.407 0 0.000		3.407		18.856	27.935	9.079	13.967 0.000
12 LOW-	icome ni	une Energy Assista	HEA (Weatherization)	Baseload SF homes	Envelope	110	20	÷ -	-	· ·	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			HEA (HVAC Systems)	Oil- Thermostat	Envelope														
15 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Propane- Thermostat Gas- Thermostat	Envelope														
17 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems) HEA (HVAC Systems)	Kerosene- Thermostat	Envelope														
18 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Electric- Thermostat	Envelope														
19 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Wood Pellets- Thermostat	Envelope														
20 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	All Fuels- Thermostat	Envelope														
22 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	LED Lighting Products	Lighting	3,217	5	\$ 41,113	\$ 41,113	ş -	195.594	4 169.972		169.972	849.858	365.439	203.966	178.470	101.983
23 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	Refrigerator	Refrigeration	191	12	\$ 147,744		\$ -	160.517			139.489			577.151	269.996	318.203
24 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	Direct Install Water Measures (if bi User Defined	Hot Water	····													
25 LOW-	ncome He	ome Energy Assista	HEA (Weatherization) HEA (Weatherization)	User Defined User Defined	0	+					+	+	+						
27 Low-	ncome He	ome Energy Assista	HEA (Weatherization)	User Defined	Ö		1		· · · · · · · · · · · · · · · · · · ·			1							
28								-		-									
			HEA (HVAC Systems) HEA (HVAC Systems)	Oil Boiler Replacement, >=87% AF Propane Boiler Replacement, >=95	HVAC HVAC	35 6	25 25	\$ 236,672 \$ 30,097	\$ 236,672 \$ 30,097	<u>\$</u> - \$-	2.696			2.343 2.035	58.563 50.868	28.725 24.951	28.661 24.895	0.433 0.376	0.744 0.646
			HEA (HVAC Systems)	Gas Boiler Replacement, >=95% A	HVAC	2	25	\$ 12,659	\$ 12,659	s -	0.000			0.000		0.000	0.000	0.000	0.040
32 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Kerosene Boiler Replacement, >=8	HVAC	1	25	\$ 5,784		\$ -	0.000			0.000			0.000	0.000	0.000
33 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Boiler Replacement, User Defined	HVAC														
34 35 Low-	ncome H	me Energy Accieta	HEA (HVAC Systems)	Oil Furnace Replacment, >=87% E	HVAC	37	20	\$ 189,014	\$ 189,014	¢	0.247	0.215	4.295	0.215	4.295	2.107	2.102	0.032	0.055
36 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Propane Furnace Replacment, >=9	HVAC	22	20	\$ 101,641		s -	2.847	2.474		2.474		24.271	24.216	0.366	0.628
37 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	Natural Gas Furnace Replacment,	HVAC	6	20	\$ 32,550		\$ -	0.000			0.000			0.000	0.000	0.000
38 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems) HEA (HVAC Systems)	Kerosene Furnace Replacment, >= Furnace Replacement, User Define	HVAC HVAC	34	20	\$ 111,824	\$ 111,824	\$ -	2.937	2.553	51.054	2.553	51.054	25.042	24.986	0.378	0.648
40	icome ni	une Energy Assista	HEA (HVAC Systems)	Furnace Replacement, Oser Denne	HVAC														
41 Low-I	ncome He	ome Energy Assista	HEA (Weatherization)	DHW: Heat Pump Water Heater	Hot Water														
42																			
43 44 I ow-	ncome H	me Energy Accieta	HEA (Weatherization)	WXn Admin Fee (if not captured al	0														
	ncome He	ome Energy Assista	HEA (Weatherization)	WXn Quality Assurance		1	1	\$ 60,000	\$ 60,000	s -	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46																			
			HEA (Weatherization)	Base load SF Lighting Base load SF Fridge	Lighting	658 55	5	\$ 8,403 \$ 42,467	\$ 8,403 \$ 42,467	<u>s</u> -	39.979			34.742		74.695	41.690 165.893	36.479 77.606	20.845 91.462
	ncome He	ome Energy Assista	HEA (Weatherization) HEA (Weatherization)	User Defined	Refrigeration 0	55	12	\$ 42,407	\$ 42,407	· ·	40.130	40.094	401.127	40.094	401.127	140.100	105.693	//.000	91.402
50 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	User Defined	0														
51 Low-	ncome He	ome Energy Assista	HEA (HVAC Systems)	User Defined	0														
52 Low-1	ncome He	ome Energy Assista	HEA (HVAC Systems)	User Defined	0														
54				····		L	1				· · · · · · · · · · · · · · · · · · ·	1							
55							1												
			HPwES (Weatherization) HPwES (Weatherization)	Oil-Wxn: Air Sealing, Insulation, W Propane-Wxn: Air Sealing, Insulation	Envelope Envelope	290 117	20 20	\$ 2,057,595 \$ 768,386	\$ 1,028,798 \$ 384,193	\$ 1,028,798 \$ 384,193			2 1,305.036 1 527.212	65.252 26.361	1,305.036 527.212	352.360 142.347	522.014 210.885	169.655 68.538	261.007 105.442
07 110010	ential He	ome Performance w	HPWES (Weatherization) HPWES (Weatherization)	Gas-Wxn: Air Sealing, Insulation, V	Envelope	11/	20	φ /00,380	φ 304,193	ψ 304,193	20.301	20.301	527.212	20.361	521.212	142.347	210.885	00.038	105.442
	ential He	ome Performance w	HPwES (Weatherization)	Kerosene-Wxn: Air Sealing, Insulat	Envelope	5	20	\$ 34,733	\$ 17,366	\$ 17,366				1.094		5.905	8.748	2.843	4.374
			HPwES (Weatherization)	Electric-Wxn: Air Sealing, Insulatio	Envelope	15	20	\$ 69,049	\$ 34,524	\$ 34,524				85.178		459.959	681.420	221.462	340.710
61 Resid	ential He ential He	ome Performance w	HPwES (Weatherization) HPwES (Weatherization)	Cord Wood-Wxn: Air Sealing, Insu Wood Pellets-Wxn: Air Sealing, Ins	Envelope Envelope	24	20	\$ 174,603 \$ 139,437	\$ 87,301 \$ 69,718	\$ 87,301 \$ 69,718			3 109.868 7 87.740	5.493			43.947 35.096	14.283	21.974
			HPwES (Weatherization)		Envelope	101	20		\$ -	\$ -	0.000			0.000			0.000		0.000
64				01 T															
	ential He ential He	ome Performance w	HPwES (HVAC Systems) HPwES (HVAC Systems)	Oil- Thermostat Propane- Thermostat	Envelope Envelope						+	1							
	ential He	ome Performance w	HPwES (HVAC Systems)	Gas- Thermostat	Envelope							1							
68 Resid	ential He	ome Performance w	HPwES (HVAC Systems)	Kerosene- Thermostat	Envelope		1					1.							
	ential He	ome Performance w	HPwES (HVAC Systems)	Electric- Thermostat	Envelope	·····						l							
	ential He ential He	ome Performance w	HPwES (HVAC Systems) HPwES (HVAC Systems)	Wood Pellets- Thermostat	Envelope Envelope	+					+		····						
72					LINGIOPO	L	1				· · · · · · · · · · · · · · · · · · ·	1							
				LED Lighting Products	Lighting	3,088	5	\$ 33,902		s -	93.889			93.889			112.667	98.583	56.333
			HPwES (Weatherization)	Refrigerator Direct Install Water Measures (if bi	Refrigeration 0	29	12	\$ 5,603	\$ 5,603	\$ -	22.986	6 22.986	6 275.828	22.986	275.828	83.796	95.105	44.491	52.435
			HPWES (Weatherization) HPWES (Weatherization)	Other (user defined)	0	+ • • • • • •	1					· · · · · ·				· · · · · · · · · · · · · · · · · · ·			
77 Resid	ential He	ome Performance w	HPwES (Weatherization)	Other (user defined)	Ö	· · · · ·	1		· · · · · · · · · · · · · · · · · · ·			1	1						
78 Resid	ential He	ome Performance w	HPwES (Weatherization)	Other (user defined)	0							1							

	Home Energy Assistance						
<u>Planned</u>		2015	2016	2017	2018	2019	2020
1)	Total Electric Budget	\$ 2,661,464.00	\$ 2,751,286.00	\$ 3,450,394.00	\$ 4,611,266.00	\$ 5,960,136.00	\$ 7,927,639.00
	Total Annual Electric Savings (kWh)	332,704.68	487,614.55	429,219.81	623,609.04	823,838.00	1,102,644.60
	\$/Annual kWh Saved	\$ 8.00	\$ 5.64	\$ 8.04	\$ 7.39	\$ 7.23	\$ 7.19
2)	Total Electric Budget	\$ 2,661,464.00	\$ 2,751,286.00	\$ 3,450,394.00	\$ 4,611,266.00	\$ 5,960,136.00	\$ 7,927,639.00
	Total kW saved	31.70	46.33	40.26	83.25	111.46	151.12
	\$/kW saved	\$ 83,961.98	\$ 59,383.90	\$ 85,705.87	\$ 55,388.90	\$ 53,473.18	\$ 52,458.82
3)	Total Electric Budget	\$ 2,661,464.00	\$ 2,751,286.00	\$ 3,450,394.00	\$ 4,611,266.00	\$ 5,960,136.00	\$ 7,927,639.00
	Total Fuel Neutral MMBtu Saved	7,527.20	8,371.96	11,489.26	14,683.27	19,721.49	26,820.91
	\$/Total Fuel Neutral MMBtu Saved	\$ 353.58	\$ 328.63	\$ 300.31	\$ 314.05	\$ 302.22	\$ 295.58
	Home Energy Assistance						
Actuals		2015	2016				
1)	Total Utility Costs	\$ 2,602,622.35	\$ 2,630,799.37				
	Total Annual Electric Savings (kWh)	638,554.22	514,041.71				
	\$/Annual kWh Saved	\$ 4.08	\$ 5.12				
2)	Total Utility Costs	\$ 2,602,622.35	\$ 2,630,799.37				
	Total kW saved	64.34	16.12				
	\$/kW saved	\$ 40,451.13	\$ 163,221.09				
3)	Total Utility Costs	\$ 2,602,622.35	\$ 2,630,799.37				
	Total Fuel Neutral MMBtu Saved	7,839.29	9,126.57				
	\$/Total Fuel Neutral MMBtu Saved	\$ 332.00	\$ 288.26				





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