Attachment 1

Educational and Professional Background

James J. Cunningham, Jr.

I am employed by the New Hampshire Public Utilities Commission (Commission) as a Utility Analyst. My business address is 21 S. Fruit Street, Suite 10, Concord New Hampshire, 03301.

I am a graduate of Bentley University, Waltham, Massachusetts, and I hold a Bachelor of Science-Accounting Degree. Prior to joining the Commission I was employed by the General Electric Company (GE). While at GE, I graduated from the Corporate Financial Management Training Program and held assignments in General Accounting, Government Accounting & Contracts and Financial Analysis.

In 1988, I joined the staff of the NHPUC. I have provided expert testimony pertaining to depreciation studies, actuarial studies for pension and retirement benefits, energy efficiency programs and other topics pertaining to NH electric, natural gas, water, and steam utilities. In 1995, I completed the NARUC Annual Regulatory Studies Program at Michigan State University, sponsored by the National Association of Regulatory Utility Commissioners. In 1998, I completed the Depreciation Studies Program, sponsored by the Society of Depreciation Professionals, Washington, D.C. I am a member of the Society of Depreciation Professionals (SDP). In 2008, I was promoted to my current position of Utility Analyst.

Educational and Professional Background

Jay E. Dudley

I started at the Commission in June of 2015 as a Utility Analyst in the Electric Division. Before joining the Commission, I was employed at the Vermont Public Service Board ("PSB") for seven years as a Utility Analyst and Hearing Officer. In that position I was primarily responsible for the analysis of financing and accounting order requests filed by all Vermont utilities, including review of auditor's reports, financial projections, and securities analysis. As Hearing Officer, I managed and adjudicated cases involving a broad range of utility-related issues including rate investigations, energy efficiency, consumer complaints, utility finance, construction projects, condemnations, and telecommunications. Prior to working for the PSB, I worked in the commercial banking sector in Vermont for twenty years where I held various management and administrative positions. My most recent role was as Vice President and Chief Credit Officer for Lyndon Bank in Lyndonville, Vermont. In that position I was responsible for directing and administering the analysis and credit risk management of the bank's loan portfolio, including internal loan review, regulatory compliance, and audit.

In performing those responsibilities, I also provided oversight for the commercial and retail lending functions with detailed financial analysis of large corporate relationships, critique of loan proposals and loan structuring, consultation on business development efforts, and advised the Board of Directors on loan approvals and loan portfolio quality. Prior to my role as Chief Credit Officer, I held the position of Vice President of Loan Administration. In this position, I was responsible for directing and administering the

underwriting, processing, and funding of all commercial, consumer, and residential mortgage loans. My responsibilities also included the management of loan processing and loan origination staff and partnering with the Compliance Officer to monitor and ensure compliance with all banking laws, regulations, and the bank's lending policy. Previous to my position as Loan Administration Vice President, I held the position of Assistant Vice President of Commercial Loan Administration with Passumpsic Savings Bank in St. Johnsbury, Vermont. In that role, I was responsible for supervising loan administration and loan operations within the commercial lending division of the bank.

I received my Bachelor of Arts degree in Political Science from St. Michael's College. Throughout my career in banking, I took advantage of numerous continuing education opportunities involving college level coursework in the areas of accounting, financial analysis, law, economics, and regulatory compliance. Also, during my career with the PSB I took advantage of various continuing education opportunities including the Regulatory Studies Program at Michigan State University and Utility Finance & Accounting for Financial Professionals at the Financial Accounting Institute.

Educational and Professional Background

Leszek Stachow

I am employed by the New Hampshire Public Utilities Commission (Commission) as Assistant Director of the Electric Division. My business address is 21 S. Fruit Street, Suite 10, Concord, New Hampshire, 03301.

I am a graduate of the following institutions of higher learning: University of Keele, Keele, Staffordshire, United Kingdom, from which I received a BA Triple Honors in Economics, Politics and History, and subsequently from the University of Sussex, Brighton, United Kingdom, from which I received a Masters in Political Economy.

While pursuing a PhD at the Massachusetts Institute of Technology in Cambridge, Mass, I concurrently served as a faculty member at St. Anselm College, NH and adjunct faculty at the Whittemore School of Business and Economics of the University of New Hampshire, where I taught regulatory economics. In 1987 I joined the Economics department of the New Hampshire Public Utilities Commission where I primarily supported rate cases in the telecommunications and energy sectors.

In 1988, I completed the NARUC Annual Regulatory Studies Program at Michigan State University, sponsored by the National Association of Regulatory Utility Commissioners as well as sundry other targeted regulatory courses.

In 1992, I was appointed regional manager for Central Europe on behalf of management consulting firm, Booz Allen & Hamilton. In that capacity I advised numerous government agencies in Central and Eastern Europe, the Middle East, Africa, and Latin

America on optimizing the functioning of energy, telecommunications, water/waste water, and gas sector regulatory bodies and markets.

In 2004, I was employed by Camp Dresser McKee to develop their Central European engineering consulting business. Beyond a primary focus on mergers and acquisitions, I was appointed President and manager of CDM Poland, as well as director of CDM AG in Germany.

After retiring from my business activities, I returned to the Commission in 2010, where I initially supported the telecommunications division and latterly the gas and electric divisions.

DE 15-137
EERS

Attachment 2

Annual State EERS Targets

Electric Utilities:	**Plan A**
	Plan B
Gas Utilities:	**Plan A**
	Plan B

DE 15-137
EERS

Attachment 2

Annual State EERS Targets

Electric Utilities: Plan A

DE 15-137
EERS
Electric - Savings Targets

Plan A

Schedule JJC-1

Electric kWh Savings Summary						
		Percent	Annual Savings		Cumulative Savings	
Year	Description	Year-To-Year kWh Saving Increase	kWh	Percent to 2014 kWh Sales	kWh	Percent to 2014 kWh Sales
				(1) (2)		
2014	Actual kWh Savings		67,728,171	0.63%		
2015	Approved Core		56,979,474	0.53%		
2016	Proposed Core Upd		53,087,627	0.49%		
2017	Short-Term	10.00%	58,396,390	0.54%	58,396,390	0.54%
2018	Short-Term	11.00%	64,819,993	0.60%	123,216,382	1.14%
2019	Short-Term	12.00%	72,598,392	0.67%	195,814,774	1.82%
2020	Long-Term	13.00%	82,036,183	0.76%	277,850,957	2.58%
2021	Long-Term	13.00%	92,700,886	0.86%	370,551,843	3.44%
2022	Long-Term	13.00%	104,752,002	0.97%	475,303,844	4.41%
2023	Long-Term	13.00%	118,369,762	1.10%	593,673,606	5.51%
2024	Long-Term	13.00%	133,757,831	1.24%	727,431,437	6.75%
2025	Long-Term	13.00%	151,146,349	1.40%	878,577,786	8.16%
2026	Long-Term	13.00%	170,795,374	1.59%	1,049,373,160	9.74%

(1) Actual kWh sales for year 2014 are used for measurement purposes — 10,770,750,548

(2) See Schedule 8 for percenge of kWh sales for other New England States

R127

EERS

kWh Savings Details - Electric Utilities

Plan A

Schedule JJC-1A

Description	Year	2014 Starting Points	% Annual Savings to 2014 Usage	Cumulative Savings Targets By End of Each Forecast Year 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual Savings	2014 Actual	67,728,171	0.63%										
	2015 Core	56,979,474	0.53%										
	2016 Core	53,087,627	0.49%										
EERS	2017	58,396,390	0.54%	58,396,390	58,396,390	58,396,390	58,396,390	58,396,390	58,396,390	58,396,390	58,396,390	58,396,390	58,396,390
EERS	2018	64,819,993	0.60%		64,819,993	64,819,993	64,819,993	64,819,993	64,819,993	64,819,993	64,819,993	64,819,993	64,819,993
EERS	2019	72,598,392	0.67%			72,598,392	72,598,392	72,598,392	72,598,392	72,598,392	72,598,392	72,598,392	72,598,392
EERS	2020	82,036,183	0.76%				82,036,183	82,036,183	82,036,183	82,036,183	82,036,183	82,036,183	82,036,183
EERS	2021	92,700,886	0.86%					92,700,886	92,700,886	92,700,886	92,700,886	92,700,886	92,700,886
EERS	2022	104,752,002	0.97%						104,752,002	104,752,002	104,752,002	104,752,002	104,752,002
EERS	2023	118,369,762	1.10%							118,369,762	118,369,762	118,369,762	118,369,762
EERS	2024	133,757,831	1.24%								133,757,831	133,757,831	133,757,831
EERS	2025	151,146,349	1.40%									151,146,349	151,146,349
EERS	2026	170,795,374	1.59%										170,795,374
Cumulative Savings			*ACEEE-EERS ramps up to new sav of 1.5% of prior yr sales*	58,396,390	123,216,382	195,814,774	277,850,957	370,551,843	475,303,844	593,673,606	727,431,437	878,577,786	1,049,373,160
% Cumulative Savings to 2014 Actual Usage				0.54%	1.14%	1.82%	2.58%	3.44%	4.41%	5.51%	6.75%	8.16%	9.74%
								VEIC=1.75					*GDS=10.8%*
								(Equiv in 5 years					*(Pot Obtain in 10 yrs)*

Comments:

1. Annual savings in 2026 achieve 1.6% of 2014 actual usage, in line with ACEEE -EERS expectation.
2. Cumulative savings by 2021 achieve 3.44% of 2014 actual usage, twice as much as VEIC's November 2013 Report of 1.7% by end of year five.
3. Cumulative savings by 2026 achieve 9.75% of 2014 actual usage, one percentage point lower than GDS' January 2009 Report of 10.8%.
4. 2014 Actual kWh Elec Usage for the four NH utilities. 10,770,750,548

DE 15-137
EERS
Electric - Spending and Funding

Plan A

Schedule JJC-2

Year	Description	Spending: Annual Saving kWh	Unit Cost To Achieve Savings	Utility Spend Excl. PI & LR	Plus: ESSE Consult.	Plus: Est. Perm. EESE Brd.	Plus: Est. TRM Costs	Plus: PI 10% Cap	Plus: LR	Less: RGGI/ISO	Total	SBC: Calculated Rate	SBC: Excess/(Shortfall) From Existing $0.0018 SBC	Incremental Monthly Residential Bill Impact	Incremental Monthly Gen'l Serv. Bill Impact
		(1)	(2)		(3)	(4)	(5)	(6)	(7)			(8)		(9)	(9)
2014	Actual	67,728,171													
2015	Core Filing	56,979,474													
2016	Core Filing	53,087,627													
2017	Short-Term	58,396,390	$ 0.427	$ 24,911,761	$ 100,000			$ 2,491,176	$ -	$ (5,000,000)	22,502,937	$ 0.0020	$ (2,723,892.77)	$ 0.174	$ 1.735
2018	Short-Term	64,819,993	$ 0.437	$ 28,343,356	$ 102,500			$ 2,834,336	$ -	$ (5,000,000)	26,280,191	$ 0.0024	$ (6,501,147.31)	$ 0.414	$ 4.141
2019	Short-Term	72,598,392	$ 0.448	$ 32,538,172	$ 105,063			$ 3,253,817	$ 920,465	$ (5,000,000)	31,817,517	$ 0.0029	$ (12,038,472.94)	$ 0.767	$ 7.669
2020	Long-Term	82,036,183	$ 0.459	$ 37,687,338	$ 107,689	$ 1,000,000	$ 500,000	$ 3,768,734	$ 3,159,382	$ (5,000,000)	41,223,143	$ 0.0038	$ (21,444,098.74)	$ 1.366	$ 13.661
2021	Long-Term	92,700,886	$ 0.471	$ 43,651,359	$ 110,381	$ 1,025,000	$ 250,000	$ 4,365,136	$ 3,962,266	$ (5,000,000)	48,364,142	$ 0.0044	$ (28,585,098.45)	$ 1.821	$ 18.210
2022	Long-Term	104,752,002	$ 0.483	$ 50,559,187	$ 113,141	$ 1,050,625	$ 256,250	$ 5,055,919	$ 4,061,322	$ (5,000,000)	56,096,444	$ 0.0051	$ (36,317,400.02)	$ 2.314	$ 23.136
2023	Long-Term	118,369,762	$ 0.495	$ 58,560,178	$ 115,969	$ 1,076,891	$ 262,656	$ 5,856,018	$ 4,162,855	$ (5,000,000)	65,034,568	$ 0.0059	$ (45,255,523.97)	$ 2.883	$ 28.829
2024	Long-Term	133,757,831	$ 0.507	$ 67,827,327	$ 118,869	$ 1,103,813	$ 269,223	$ 6,782,733	$ 4,266,927	$ (5,000,000)	75,368,890	$ 0.0069	$ (55,589,846.32)	$ 3.541	$ 35.413
2025	Long-Term	151,146,349	$ 0.520	$ 78,561,001	$ 121,840	$ 1,131,408	$ 275,953	$ 7,856,100	$ 4,373,600	$ (5,000,000)	87,319,903	$ 0.0079	$ (67,540,858.98)	$ 4.303	$ 43.026
2026	Long-Term	170,795,374	$ 0.533	$ 90,993,280	$ 124,886	$ 1,159,693	$ 282,852	$ 9,099,328	$ 4,482,940	$ (5,000,000)	101,142,979	$ 0.0092	$ (81,363,935.29)	$ 5.183	$ 51.832

(1) Annual savings: targets for annual savings are shown on Schedule 1.
(2) Unit cost: Utility spending, excl PI, divided by annual kWh savings. Eversouce avg. of 2014-2016 in then year dollars, with 2.5% ann. Escalation, excluding PI. See Schedule 5.
(3) Estimated amount to provide a placeholder for an administrative resource to assist permanent EESE Board.
(4) Estimated amount to provide a placeholder for estimated cost of Permanent EESE Board.
(5) Estimated amount to provide a placeholder for estimated cost of TRM.
(6) PI and LR: Retain PI at 10% Cap when LR is introduced.
(7) Lost Revenue (LR): Lost revenues is adjusted to reflect "incremental" and "retirement" adjustments. See Schedule 3.
(8) SBC Rates: 2017-2026 rates are calculated using 2016 kWh sales per Core filing for all years (excluding $5,000,000 in RGGI/ISO revenue).
Year 2016 kWh sales are taken from the 2016 Update Core filing at p. 2 ($19,779,044 / $0.0018 per kWh): 10,988,357,778
(9) Based on illustrated monthly usage of 700 kWh and 7,000 kWh for Res and Gen'l Service respectively (9/16 Slides, p. 4 and 5)

DE 15-137
EERS
Electric - Lost Revenue

Plan A

Schedule JJC-3

Year	Description	Annual kWh Savings for Lost Rev.				Cumulative kWh Savings for LR	Lost Revenue Amount			
		Annual Saving Estimate	Adjust For Increment	Adjust For Retirement	Adjusted Annual Savings		Estimated LR $ Per kWh	LR Amount (Not < $0)	Cap $	LR - Lower of Calc. or Cap $
			(1)	(2)			(3)		(4)	
2014	*Actual*	*67,728,171*						$ -		
2015	*Approved Core*	*56,979,474*						$ -		
2016	*2016 Core Update*	*53,087,627*						$ -		
2017	Short-Term	58,396,390	(59,265,091)	(47,845,506)	(48,714,207)	(48,714,207)	$ 0.043	$ -	$ 3,589,617	$ -
2018	Short-Term	64,819,993	-	(32,522,220)	32,297,773	(16,416,434)	$ 0.044	$ -	$ 3,679,358	$ -
2019	Short-Term	72,598,392	-	(35,738,327)	36,860,065	20,443,631	$ 0.045	$ 920,465	$ 3,771,342	$ 920,465
2020	Long-Term	82,036,183	-	(34,021,047)	48,015,135	68,458,766	$ 0.046	$ 3,159,382	$ 3,865,625	$ 3,159,382
2021	Long-Term	92,700,886	-	(34,613,137)	58,087,749	126,546,515	$ 0.047	$ 5,986,143	$ 3,962,266	$ 3,962,266
2022	Long-Term	104,752,002	-	(28,500,340)	76,251,662	202,798,177	$ 0.048	$ 9,832,972	$ 4,061,322	$ 4,061,322
2023	Long-Term	118,369,762	-	(28,202,280)	90,167,482	292,965,659	$ 0.050	$ 14,559,999	$ 4,162,855	$ 4,162,855
2024	Long-Term	133,757,831	-	(27,751,924)	106,005,907	398,971,565	$ 0.051	$ 20,324,059	$ 4,266,927	$ 4,266,927
2025	Long-Term	151,146,349	-	(26,402,521)	124,743,828	523,715,393	$ 0.052	$ 27,345,615	$ 4,373,600	$ 4,373,600
2026	Long-Term	170,795,374	-	(25,002,972)	145,792,402	669,507,795	$ 0.054	$ 35,832,067	$ 4,482,940	$ 4,482,940

Footnotes:
(1) Projected LR is reduced to reflect "incremental" savings levels in order to remove average 2014-2016 savings levels which were achieved without LR.
(2) Projected LR is reduced to reflect prior installed savings that are "retired" during 2017-2026. See Schedule 6.
(3) Projected lost revenue per kWh is illustrated using Eversource's 2015 Res. Rate of $0.04079/kWh ($28.55/700 kWh) (9/16 Utilities' slides) as follows:

	Estimate Year 2015	Estimate Year 2016	Estimate Year 2017
Illustrated using Eversource Distribution Res Rate	$ 0.041	$ 0.042	$ 0.043

(4) Calculation of amount of lost revenue cap (assuming 0.25%):

	Actual Year 2014	Estimate Year 2015 (Escal. At 2.5%)	Estimate Year 2016 (Escal. At 2.5%)	Estimate Year 2017 (Escal. At 2.5%)
Estimated Distribution Revenue	$ 1,333,326,584	$ 1,366,659,749	$ 1,400,826,242	$ 1,435,846,898

	Year 2017	Year 2018	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026
Rev.	$ 1,435,846,898	$ 1,471,743,071	$ 1,508,536,648	$ 1,546,250,064	$ 1,584,906,315	$ 1,624,528,973	$ 1,665,142,198	$ 1,706,770,753	$ 1,749,440,021	$ 1,793,176,022
Cap%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Cap	$ 3,589,617	$ 3,679,358	$ 3,771,342	$ 3,865,625	$ 3,962,266	$ 4,061,322	$ 4,162,855	$ 4,266,927	$ 4,373,600	$ 4,482,940

Note: LR is difficult to calculate and it's important to avoid windfall profits - i.e., lost fixed cost recoveries that are over and above utilities' opearting costs.

Plan A

Schedule JJC-4

EERS

Electric - Details of Benefit Cost

	Benefits					Costs			
Year	Annual Pure kWh Savings	Annual Equivalent kWh Savings	Lifetime Equiv. kWh Savings	Benefits = Life kWh Sav x Rate/kWh	NPV Benefits 1.36% Disc. Rate	Utility Cost (Incl. PI & LR)	Util+Cust Installed Cost	NPV Costs 2.5% Disc. Rate	B/C
		(1)	(2)	(3)	(3)		(4)		
2017	58,396,390	75,547,041	1,080,021,518	$ 90,555,125	$ 90,555,125	$ 22,502,937	$ 38,052,456	$ 38,052,456	2.38
2018	64,819,993	83,857,216	1,198,823,885	$ 101,883,209	$ 100,516,189	$ 26,280,191	$ 44,439,792	$ 43,355,895	2.32
2019	72,598,392	93,920,082	1,342,682,751	$ 115,661,079	$ 112,578,132	$ 31,817,517	$ 53,803,407	$ 51,210,858	2.20
2020	82,036,183	106,129,692	1,517,231,509	$ 132,474,499	$ 127,213,289	$ 41,223,143	$ 69,708,316	$ 64,731,102	1.97
2021	92,700,886	119,926,552	1,714,471,605	$ 151,732,052	$ 143,751,016	$ 48,364,142	$ 81,783,744	$ 74,092,036	1.94
2022	104,752,002	135,517,004	1,937,352,914	$ 173,789,037	$ 180,976,499	$ 56,096,444	$ 94,859,063	$ 83,841,589	2.16
2023	118,369,762	153,134,215	2,189,208,793	$ 199,052,401	$ 183,555,673	$ 65,034,568	$ 109,973,426	$ 94,829,741	1.94
2024	133,757,831	173,041,663	2,473,805,936	$ 227,988,251	$ 207,397,448	$ 75,368,890	$ 127,448,761	$ 107,218,212	1.93
2025	151,146,349	195,537,079	2,795,400,708	$ 261,130,447	$ 234,382,238	$ 87,319,903	$ 147,657,918	$ 121,189,730	1.93
2026	170,795,374	220,956,899	3,158,802,800	$ 299,090,458	$ 264,851,929	$ 101,142,979	$ 171,032,734	$ 136,950,761	1.93

footnotes:

(1)	Factor for equivalent kWh saved, based on 3-year average (2014-2016)	1.29	See Sch. 7
(2)	Est. average lifetime for equivalent savings, based on 3-year average (2014-2016)	14.3	See Sch. 7
(3)	Est. value of benefits/lifetime kWh, based on 3-year average (2014-2016)	$ 0.084	See Sch. 7
(4)	Estimated installed cost factor (Total/Utility Cost)based on 3-year average (2014-2016).	1.69	See Sch. 7

DE 15-137
EERS

Plan A

Schedule JJC-5

Derivation of Utility Unit Cost to achieve KWh Saving (Eversource as proxy, excl PI):
Annual Basis

	Amount	
Forecast for 2015-2026:		
2015 Escalation at 2.5%	$ 0.378	
2016 Escalation at 2.5%	$ 0.416	(1)
2017 Escalation at 2.5%	$ 0.427	
2018 Escalation at 2.5%	$ 0.437	
2019 Escalation at 2.5%	$ 0.448	
2020 Escalation at 2.5%	$ 0.459	
2021 Escalation at 2.5%	$ 0.471	
2022 Escalation at 2.5%	$ 0.483	
2023 Escalation at 2.5%	$ 0.495	
2024 Escalation at 2.5%	$ 0.507	
2025 Escalation at 2.5%	$ 0.520	
2026 Escalation at 2.5%	$ 0.533	

Footnotes:

(1) Calculation of 2016 Utility Unit Cost (Eversource):

	Average in 2016 Price Levels			
	2014 Actual	2015 Core	2016 Core	Average
Utility Cost (excl PI)	$ 19,113,200	$ 18,424,500	$ 17,486,600	
Annual kWh Saving	51,888,800	43,528,700	40,882,600	
Unit Cost per kWh	$ 0.368	$ 0.42	$ 0.428	
2015 - Escal at 1.025	$ 0.378			
2016 - Escal at 1.025	$ 0.387	$ 0.434	$ 0.428	$ 0.416

Comparison to Cost to Achieve kWh Savings in New England States:
Lifetime Basis:

	Year 2013
ME	$ 0.0200
NH	$ 0.0310
VT	$ 0.0320
MA	$ 0.0350
RI	$ 0.0370
CT	$ 0.0400

Source: DE 15-248, PSNH Least Cost Integrated Resource Plan, June 19, 2015, p. 22.

DE 15-137

Plan A

Schedule JJC-6

EERS

Derivation of Estimated Retirement of Prior EE Installations

Lifetime Sav		Annual Retirements					Retirement kWh Discounted By 50 percent
		Core	Co. Specific	Lifetime Savings Life Savings	Life (Years)	Annual Savings	
					(1)		(2)
Year Installed	Year Retired						
2003	2017			1,368,000,000	14.30	95,691,012	47,845,506
2004	2018	851,633,400	78,242,775	929,876,175	14.30	65,044,439	32,522,220
2005	2019	972,035,330	49,795,874	1,021,831,204	14.30	71,476,654	35,738,327
2006	2020	934,721,338	38,009,365	972,730,703	14.30	68,042,095	34,021,047
2007	2021	925,977,328	63,682,413	989,659,741	14.30	69,226,274	34,613,137
2008	2022	749,773,432	65,109,047	814,882,479	14.30	57,000,679	28,500,340
2009	2023	739,944,852	66,415,502	806,360,354	14.30	56,404,560	28,202,280
2010	2024	728,397,258	65,086,500	793,483,758	14.30	55,503,848	27,751,924
2011	2025	684,593,766	70,307,829	754,901,595	14.30	52,805,042	26,402,521
2012	2026	668,386,293	46,499,357	714,885,650	14.30	50,005,944	25,002,972

footnotes:

(1) Based on 3-year average (Sch. 7): 14.30

(2) It is difficult to project future customer purchase of standard vs. high efficiency equipment; therefore, a discount factor of 50% is applied.

DE 15-137 | Plan A | Schedule JJC-7

EERS

Data for Calculation of Benefit Cost (BC) Ratios

	2014 Actual (final)		2015 Core		2016 Core		Average	
Ratio of Equiv to Pure kWh (Eversource):								
Electric annual kWh Savings		51,888,800		43,528,700		40,882,600		45,433,367
Annual MMBtu Savings	69,186		28,337		39,100		45,541	
kWh factor	293	20,271,498	293	8,302,741	293	11,456,241	293	13,343,493
Equiv kWh Savings		72,160,298		51,831,441		52,338,841		58,776,860
Factor for Equiv. kWh		1.39		1.19		1.28		1.29
Measure Life (Eversource):								
Electric lifetime kWh Savings		694,571,000		565,700,800		553,930,600		604,734,133
Lifetime MMBtu Savings	1,132,264		575,524		703,891		803,893	
kWh Factor	293	331,753,352	293	168,628,473	293	206,240,122	293	235,540,649
Equiv kWh Savings		1,026,324,352		734,329,273		760,170,722		840,274,782
Annual Equivalent kWh Savings		72,160,298		51,831,441		52,338,841		58,776,860
Measure Life		14.2		14.2		14.5		14.30
Benefits per equivalent lifetime kWh saved (Eversource):								
Benefit Dollars		$ 86,016,400		$ 62,033,700		$ 63,310,100		$ 70,453,400
Lifetime Equivalent kWh savings		1,026,324,352		734,329,273		760,170,722		840,274,782
Rate per kWh		$ 0.084		$ 0.084		$ 0.083		$ 0.084
Customer Cost Factor (Eversource):								
"Customer" Cost		$ 16,649,700		$ 13,285,100		$ 10,938,600		$ 13,624,467
"Utility" Cost Incl. PI at 7.5%	$ 19,113,200	$ 20,546,690	$ 18,424,500	$ 19,806,338	$ 17,486,600	$ 18,798,095	18,341,433	19,717,041
"Installed" Cost		$ 37,196,390		$ 33,091,438		$ 29,736,695		$ 33,341,508
Installed Cost Factor		$ 1.81		$ 1.67		$ 1.58		$ 1.69

EERS
EERS Savings Targets

Plan A

Schedule JJC-8

EERS Comparisons kWh Savings as % of Load (1)							EERS Planned Savings or New Hampshire	
							Short-Term	Long-Term
Industry	Year	ME	VT (2)	RI	CT	MA	Year 2019	Year 2026
Electricity	2014 2015	1.6% 1.6%	2.0%	2.5%	1.4% 1.4%	2.5% 2.6%	0.7%	1.6%

Footnotes:

(1) Source: ACEEE, *Energy Efficiency Resource Standards* , April, 2014.
(2) Includes demand response targets.

DE 15-137 | Plan A | Schedule JJC-9

EERS

Summary of PI and Lost Revenue Impacts for certain years

			Utility Spending	PI	Pecent of Util Spending	Percent of Utility Sales $
Year 2014 Actual:			*Final PI Report*			$ 1,333,326,584
	PI	Eversource	$ 19,113,200	$ 1,755,017	9.2%	
		Liberty	$ 2,168,000	$ 196,915	9.1%	
		Unitil	$ 2,760,000	$ 261,415	9.5%	
		NHEC	$ 1,839,500	$ 159,125	8.7%	
		Total	$ 25,880,700	$ 2,372,472	9.2%	0.2%
Year 2017 Est:			*Schedule 2*			$ 1,435,846,898
	PI			$ 2,491,176	10.0%	
	Lost Rev			$ -		
	Total		$ 24,911,761	$ 2,491,176	10.0%	0.2%
Year 2018 Est:			*Schedule 2*			$ 1,471,743,071
	PI			$ 2,834,336		
	Lost Rev			$ -		
	Total		$ 28,343,356	$ 2,834,336	10.0%	0.2%
Year 2019 Est:			*Schedule 2*			$ 1,508,536,648
	PI			$ 3,253,817		
	Lost Rev			$ 920,465		
	Total		$ 32,538,172	$ 4,174,282	12.8%	0.3%
Year 2020			*Schedule 2*			
	PI			$ 3,768,734		$ 1,546,250,064
	Lost Rev			$ 3,159,382		
	Total		$ 37,687,338	$ 6,928,116	18.4%	0.4%
Year 2021			*Schedule 2*			
	PI			$ 4,365,136		$ 1,584,906,315
	Lost Rev			$ 3,962,266		
	Total		$ 43,651,359	$ 8,327,402	19.1%	0.5%
Year 2022			*Schedule 2*			
	PI			$ 5,055,919		$ 1,624,528,973
	Lost Rev			$ 4,061,322		
	Total		$ 50,559,187	$ 9,117,241	18.0%	0.6%
Year 2023			*Schedule 2*			$ 1,665,142,198
	PI			$ 5,856,018		
	Lost Rev			$ 4,162,855		
	Total		$ 58,560,178	$ 10,018,873	17.1%	0.6%
Year 2024			*Schedule 2*			$ 1,706,770,753
	PI			$ 6,782,733		
	Lost Rev			$ 4,266,927		
	Total		$ 67,827,327	$ 11,049,660	16.3%	0.6%
Year 2025			*Schedule 2*			$ 1,749,440,021
	PI			$ 7,856,100		
	Lost Rev			$ 4,373,600		
	Total		$ 78,561,001	$ 12,229,700	15.6%	0.7%
Year 2026			*Schedule 2*			$ 1,793,176,022
	PI			$ 9,099,328		
	Lost Rev			$ 4,482,940		
	Total		$ 90,993,280	$ 13,582,268	14.9%	0.8%
Note #1:	LR Only (2019-2026)			$ 29,389,757		
	Util. Spending (2019-2026)			$ 460,377,843		
	Percentage			6%		
Note #2:	PI + LR (2019-2026)			$ 75,427,541		
	Util. Spending (2019-2026)			$ 460,377,843		
	Percentage			16%		

DE 15-137
EERS

Attachment 2

Annual State EERS Targets

Electric Utilities: Plan B

DE 15-137
EERS
Electric - Savings Targets

Plan B

Schedule JJC-1

Electric kWh Savings Summary						
		Percent	Annual Savings		Cumulative Savings	
Year	Description	Year-To-Year kWh Saving Increase	kWh	Percent to 2014 kWh Sales (1)	kWh	Percent to 2014 kWh Sales
2014	Actual kWh Savings		67,728,171	0.63%		
2015	Approved Core		56,979,474	0.53%		
2016	Proposed Core Upd		53,087,627	0.49%		
2017	Short-Term	15.00%	61,050,771	0.57%	61,050,771	0.57%
2018	Short-Term	18.00%	72,039,910	0.67%	133,090,681	1.24%
2019	Short-Term	20.00%	86,447,892	0.80%	219,538,573	2.04%
2020	Long-Term	20.00%	103,737,470	0.96%	323,276,043	3.00%
2021	Long-Term	20.00%	124,484,964	1.16%	447,761,007	4.16%
2022	Long-Term	20.00%	149,381,957	1.39%	597,142,964	5.54%
2023	Long-Term	20.00%	179,258,348	1.66%	776,401,313	7.21%
2024	Long-Term	20.00%	215,110,018	2.00%	991,511,331	9.21%
2025	Long-Term	20.00%	258,132,022	2.40%	1,249,643,352	11.60%
2026	Long-Term	20.00%	309,758,426	2.88%	1,559,401,779	14.48%
(1) Actual kWh sales for year 2014 are used for measurement purposes					10,770,750,548	

R138

DE 15-137
EERS
Electric - Spending and Funding

Plan B

Schedule JJC-2

Year	Description	Annual Saving kWh	Unit Cost To Achieve Savings	Utility Spending Excl. PI &LR	Plus: EESE Consult.	Plus: Est. Permanent EESE Board	Plus: Est. TRM Costs	Plus: PI 10% Cap	Plus: LR	Less: RGGI/ISO	Total	SBC Calculated Rate	SBC Excess/(Shortfall) From Existing $0.0018 SBC	Est. Monthly Residential Bill Impact	Est. Monthly Gen'l Service Bill Impact
		Spending													
		(1)	(2)		(3)	(4)	(5)	(6)	(7)			(8)		(9)	(9)
2014	Actual	67,728,171													
2015	Core Filing	56,979,474													
2016	Core Filing	53,087,627													
2017	Short-Term	61,050,771	$ 0.427	$ 26,044,113	$ 100,000			$ 2,604,411	$ -	$ (5,000,000)	23,748,525	$ 0.0022	$ (3,969,480.81)	$ 0.253	$ 2.529
2018	Short-Term	72,039,910	$ 0.437	$ 31,500,355	$ 102,500			$ 3,150,036	$ -	$ (5,000,000)	29,752,891	$ 0.0027	$ (9,973,846.75)	$ 0.635	$ 6.354
2019	Short-Term	86,447,892	$ 0.448	$ 38,745,437	$ 105,063			$ 3,874,544	$ 1,988,618	$ (5,000,000)	39,713,661	$ 0.0036	$ (19,934,616.78)	$ 1.270	$ 12.699
2020	Long-Term	103,737,470	$ 0.459	$ 47,656,887	$ 107,689	$ 1,000,000	$ 500,000	$ 4,765,689	$ 5,255,756	$ (5,000,000)	54,286,021	$ 0.0049	$ (34,506,977.06)	$ 2.198	$ 21.982
2021	Long-Term	124,484,964	$ 0.471	$ 58,617,972	$ 110,381	$ 1,025,000	$ 250,000	$ 5,861,797	$ 7,924,532	$ (5,000,000)	68,789,682	$ 0.0063	$ (49,010,637.55)	$ 3.122	$ 31.222
2022	Long-Term	149,381,957	$ 0.483	$ 72,100,105	$ 113,141	$ 1,050,625	$ 256,250	$ 7,210,010	$ 8,122,645	$ (5,000,000)	83,852,776	$ 0.0076	$ (64,073,732.17)	$ 4.082	$ 40.817
2023	Long-Term	179,258,348	$ 0.495	$ 88,683,129	$ 115,969	$ 1,076,891	$ 262,656	$ 8,868,313	$ 8,325,711	$ (5,000,000)	102,332,669	$ 0.0093	$ (82,553,625.25)	$ 5.259	$ 52.590
2024	Long-Term	215,110,018	$ 0.507	$ 109,080,249	$ 118,869	$ 1,103,813	$ 269,223	$ 10,908,025	$ 8,533,854	$ (5,000,000)	125,014,032	$ 0.0114	$ (105,234,987.60)	$ 6.704	$ 67.039
2025	Long-Term	258,132,022	$ 0.520	$ 134,168,706	$ 121,840	$ 1,131,408	$ 275,953	$ 13,416,871	$ 8,747,200	$ (5,000,000)	152,861,979	$ 0.0139	$ (133,082,934.51)	$ 8.478	$ 84.779
2026	Long-Term	309,758,426	$ 0.533	$ 165,027,508	$ 124,886	$ 1,159,693	$ 282,852	$ 16,502,751	$ 8,965,880	$ (5,000,000)	187,063,571	$ 0.0170	$ (167,284,527.19)	$ 10.657	$ 106.567
					$ 1,120,338	$ 7,547,430	$ 2,096,934	$ 77,162,446	$ 57,864,195	$ (50,000,000)	$ 95,791,344				

(1) Annual savings: targets for annual savings are shown on Schedule 1.
(2) Unit cost: Utility spending, excl. PI, divided by annual kWh savings. Eversource avg. of 2014-2016 in then-year dollars, with 2.5% ann. Escalation, excluding PI. See Schedule 5.
(3) Estimated amount to provide a placeholder for an administrative resource to assist the Permanent EESE Board.
(4) Estimated amount to provide a placeholder for estimated cost of Permanent EESE Board
(5) Estimated amount to provide a placeholder for estimated cost of TRM.
(6) PI and LR: Retain PI at 10% Cap and when LR is introduced.
(7) Lost Revenue (LR): Lost revenues is adjusted to reflect "incremental" and "retirement" adjustments. See Schedule 3.
(8) SBC Rates: 2017-2026 rates are calculated using 2016 kWh sales per Core Update filing for all years (excluding $5,000,000 in RGGI/ISO revenue).
Year 2016 kWh sales are taken from the 2016 Update Core filing at p. 2 ($19,779,044 / $0.0018 per kWh): 10,988,357,778
(9) Based on illustrated monthly usage of 700 kWh and 7,000 kWh for Res and Gen'l Service respectively (9/16 Slides, p. 4 and 5)

DE 15-137
EERS
Electric - Lost Revenue

Plan B

Schedule JJC-3

Year	Description	Annual kWh Savings for Lost Rev.				Cumulative kWh Savings for LR	Lost Revenue Amount			
		Annual Saving Estimate	Adjust For Increment	Adjust For Retirement	Adjusted Annual Savings		Estimated LR $ Per kWh	LR Amount (Not < $0)	Cap $	LR - Lower of Calc. or Cap $
			(1)	(2)			(3)		(4)	
2014	*Actual*	*67,728,171*						$ -		
2015	*Approved Core*	*56,979,474*						$ -		
2016	*2016 Core Update*	*53,087,627*						$ -		
2017	Short-Term	61,050,771	(59,265,091)	(47,845,506)	(46,059,826)	(46,059,826)	$ 0.043	$ -	$ 7,179,234	$ -
2018	Short-Term	72,039,910	-	(32,522,220)	39,517,690	(6,542,136)	$ 0.044	$ -	$ 7,358,715	$ -
2019	Short-Term	86,447,892	-	(35,738,327)	50,709,565	44,167,429	$ 0.045	$ 1,988,618	$ 7,542,683	$ 1,988,618
2020	Long-Term	103,737,470	-	(34,021,047)	69,716,423	113,883,852	$ 0.046	$ 5,255,756	$ 7,731,250	$ 5,255,756
2021	Long-Term	124,484,964	-	(34,613,137)	89,871,827	203,755,679	$ 0.047	$ 9,638,437	$ 7,924,532	$ 7,924,532
2022	Long-Term	149,381,957	-	(28,500,340)	120,881,617	324,637,297	$ 0.048	$ 15,740,524	$ 8,122,645	$ 8,122,645
2023	Long-Term	179,258,348	-	(28,202,280)	151,056,068	475,693,365	$ 0.050	$ 23,641,320	$ 8,325,711	$ 8,325,711
2024	Long-Term	215,110,018	-	(27,751,924)	187,358,094	663,051,459	$ 0.051	$ 33,776,584	$ 8,533,854	$ 8,533,854
2025	Long-Term	258,132,022	-	(26,402,521)	231,729,501	894,780,960	$ 0.052	$ 46,720,673	$ 8,747,200	$ 8,747,200
2026	Long-Term	309,758,426	-	(25,002,972)	284,755,454	1,179,536,414	$ 0.054	$ 63,128,806	$ 8,965,880	$ 8,965,880

Footnotes:
(1) Projected LR is reduced to reflect "incremental" savings levels in order to remove average 2014-2016 savings levels which were achieved without LR.
(2) Projected LR is reduced to reflect prior installed savings that are "retired" during 2017-2026. See Schedule 6.
(3) Projected lost revenue per kWh is illustrated using Eversource's 2015 Res. Rate of $0.04079/kWh ($28.55/700 kWh) (9/16 Utilities' Slides) as follows:

	Estimate Year 2015	Estimate Year 2016	Estimate Year 2017
Illustrated using Eversource Distribution Res Rate	0.041	0.042	0.043

(4) Calculation of amount of lost revenue cap):

	Actual Year 2014	Estimate Year 2015 (Escal. At 2.5%)	Estimate Year 2016 (Escal. At 2.5%)	Estimate Year 2017 (Escal. At 2.5%)
Estimated Distribution Revenue	$ 1,333,326,584	$ 1,366,659,749	$ 1,400,826,242	$ 1,435,846,898

	Year 2017	Year 2018	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026
Rev.	$ 1,435,846,898	$ 1,471,743,071	$ 1,508,536,648	$ 1,546,250,064	$ 1,584,906,315	$ 1,624,528,973	$ 1,665,142,198	$ 1,706,770,753	$ 1,749,440,021	$ 1,793,176,022
Cap%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Cap	$ 7,179,234	$ 7,358,715	$ 7,542,683	$ 7,731,250	$ 7,924,532	$ 8,122,645	$ 8,325,711	$ 8,533,854	$ 8,747,200	$ 8,965,880

DE 15-137
EERS
Electric - Details of Benefit Cost

Plan B

Schedule JJC-4

	Benefits					Costs			
Year	Annual Pure kWh Savings	Annual Equivalent kWh Savings	Lifetime Equiv. kWh Savings	Benefits = Life kWh Sav x Rate/kWh	NPV Benefits 1.36% Disc. Rate	Utility Cost (Incl. PI & LR)	Util+Cust Installed Cost	NPV Costs 2.5% Disc. Rate	B/C
		(1)	(2)	(3)	(3)		(4)		
2017	61,050,771	78,980,998	1,129,113,405	$ 94,671,267	$ 94,671,267	$ 23,748,525	$ 40,158,745	$ 40,158,745	2.36
2018	72,039,910	93,197,577	1,332,353,818	$ 113,231,380	$ 111,712,095	$ 29,752,891	$ 50,312,125	$ 49,085,000	2.28
2019	86,447,892	111,837,093	1,598,824,582	$ 137,725,592	$ 134,054,514	$ 39,713,661	$ 67,155,783	$ 63,919,841	2.10
2020	103,737,470	134,204,511	1,918,589,498	$ 167,518,392	$ 160,865,417	$ 54,286,021	$ 91,797,638	$ 85,243,233	1.89
2021	124,484,964	161,045,414	2,302,307,398	$ 203,755,970	$ 193,038,501	$ 68,789,682	$ 116,323,322	$ 105,383,188	1.83
2022	149,381,957	193,254,496	2,762,768,878	$ 247,832,462	$ 258,082,167	$ 83,852,776	$ 141,795,008	$ 125,326,126	2.06
2023	179,258,348	231,905,396	3,315,322,653	$ 301,443,580	$ 277,975,441	$ 102,332,669	$ 173,044,499	$ 149,215,729	1.86
2024	215,110,018	278,286,475	3,978,387,184	$ 366,651,855	$ 333,537,623	$ 125,014,032	$ 211,398,673	$ 177,842,355	1.88
2025	258,132,022	333,943,770	4,774,064,621	$ 445,965,984	$ 400,284,635	$ 152,861,979	$ 258,489,539	$ 212,154,403	1.89
2026	309,758,426	400,732,524	5,728,877,545	$ 542,437,346	$ 480,341,562	$ 187,063,571	$ 316,324,418	$ 253,289,933	1.90

footnotes:

(1) Factor for equivalent kWh saved, based on 3-year average (2014-2016)		1.29	See Sch. 7
(2) Est. average lifetime for equivalent savings, based on 3-year average (2014-2016)		14.3	See Sch. 7
(3) Est. value of benefits/lifetime kWh, based on 3-year average (2014-2016)	$	0.084	See Sch. 7
(4) Estimated installed cost factor (Total/Utility Cost)based on 3-year average (2014-2016).		1.69	See Sch. 7

DE 15-137
EERS

Plan B

Schedule JJC-5

Derivation of Utility Unit Cost to achieve Annual KWh Saveing (Eversource as proxy, excl PI):

	Amount	
Forecast for 2015-2026:		
2015 Escalation at 2.5%	$ 0.378	
2016 Escalation at 2.5%	$ 0.416	(1)
2017 Escalation at 2.5%	$ 0.427	
2018 Escalation at 2.5%	$ 0.437	
2019 Escalation at 2.5%	$ 0.448	
2020 Escalation at 2.5%	$ 0.459	
2021 Escalation at 2.5%	$ 0.471	
2022 Escalation at 2.5%	$ 0.483	
2023 Escalation at 2.5%	$ 0.495	
2024 Escalation at 2.5%	$ 0.507	
2025 Escalation at 2.5%	$ 0.520	
2026 Escalation at 2.5%	$ 0.533	

Footnotes:

(1) Calculation of 2016 Utility Unit Cost (Eversource):

	Average in 2016 Price Levels			
	2014 Actual	2015 Core	2016 Core	Average
Utility Cost (excl PI)	$ 19,113,200	$ 18,424,500	$ 17,486,600	
Annual kWh Saving	51,888,800	43,528,700	40,882,600	
Unit Cost per kWh	$ 0.368	$ 0.42	$ 0.428	
2015 - Escal at 1.025	$ 0.378			
2016 - Escal at 1.025	$ 0.387	$ 0.434	$ 0.428	$ 0.416

Comparison to Cost to Achieve kWh Savings in New England States:
Lifetime Basis:

	Year 2013
ME	$ 0.0200
NH	$ 0.0310
VT	$ 0.0320
MA	$ 0.0350
RI	$ 0.0370
CT	$ 0.0400

Source: DE 15-248, PSNH Least Cost Integrated Resource Plan, June 19, 2015, p. 22.

DE 15-137

Plan B

Schedule JJC-6

EERS

Derivation of Estimated Retirement of Prior EE Installations

Lifetime Sav		Annual Retirements					Retirement kWh Assume 50% Replace with Std. EE
		Core	Co. Specific	Lifetime Savings Life Savings	Life (Years) (1)	Annual Savings	(2)
Year Installed	Year Retired						
2003	2017			1,368,000,000	14.30	95,691,012	47,845,506
2004	2018	851,633,400	78,242,775	929,876,175	14.30	65,044,439	32,522,220
2005	2019	972,035,330	49,795,874	1,021,831,204	14.30	71,476,654	35,738,327
2006	2020	934,721,338	38,009,365	972,730,703	14.30	68,042,095	34,021,047
2007	2021	925,977,328	63,682,413	989,659,741	14.30	69,226,274	34,613,137
2008	2022	749,773,432	65,109,047	814,882,479	14.30	57,000,679	28,500,340
2009	2023	739,944,852	66,415,502	806,360,354	14.30	56,404,560	28,202,280
2010	2024	728,397,258	65,086,500	793,483,758	14.30	55,503,848	27,751,924
2011	2025	684,593,766	70,307,829	754,901,595	14.30	52,805,042	26,402,521
2012	2026	668,386,293	46,499,357	714,885,650	14.30	50,005,944	25,002,972

footnotes:

(1) Based on 3-year average (Sch. 7): 14.30

(2) It is difficult to project future customer purchase of standard vs. high efficiency equipment; therefore, a discount factor of 50% is applied.

DE 15-137 | Plan B | Schedule JJC-7

EERS

Data for Calculation of Benefit Cost (BC) Ratios

	2014 Actual (final)		2015 Core		2016 Core		Average	
Ratio of Equiv to Pure kWh (Eversource):								
Electric annual kWh Savings		51,888,800		43,528,700		40,882,600		45,433,367
Annual MMBtu Savings	69,186		28,337		39,100		45,541	
kWh factor	293	20,271,498	293	8,302,741	293	11,456,241	293	13,343,493
Equiv kWh Savings		72,160,298		51,831,441		52,338,841		58,776,860
Factor for Equiv. kWh		1.39		1.19		1.28		1.29
Measure Life (Eversource):								
Electric lifetime kWh Savings		694,571,000		565,700,800		553,930,600		604,734,133
Lifetime MMBtu Savings	1,132,264		575,524		703,891		803,893	
kWh Factor	293	331,753,352	293	168,628,473	293	206,240,122	293	235,540,649
Equiv kWh Savings		1,026,324,352		734,329,273		760,170,722		840,274,782
Annual Equivalent kWh Savings		72,160,298		51,831,441		52,338,841		58,776,860
Measure Life		14.2		14.2		14.5		14.30
Benefits per equivalent lifetime kWh saved (Eversource):								
Benefit Dollars		$ 86,016,400		$ 62,033,700		$ 63,310,100		$ 70,453,400
Lifetime Equivalent kWh savings		1,026,324,352		734,329,273		760,170,722		840,274,782
Rate per kWh		$ 0.084		$ 0.084		$ 0.083		$ 0.084
Customer Cost Factor (Eversource):								
"Customer" Cost		$ 16,649,700		$ 13,285,100		$ 10,938,600		$ 13,624,467
"Utility" Cost Incl. PI at 7.5%	$ 19,113,200	$ 20,546,690	$ 18,424,500	$ 19,806,338	$ 17,486,600	$ 18,798,095	18,341,433	19,717,041
"Installed" Cost		$ 37,196,390		$ 33,091,438		$ 29,736,695		$ 33,341,508
Installed Cost Factor		$ 1.81		$ 1.67		$ 1.58		$ 1.69

EERS

EERS Savings Targets

Plan B

Schedule JJC-8

EERS Comparisons Annual kWh Savings as % of Load (1)							EERS Planned Savings or New Hampshire Short-Term	Long-Term
Industry	Year	ME	VT (2)	RI	CT	MA	Year 2019	Year 2026
Electricity	2014 2015	1.6% 1.6%	2.0% 2.0%	2.5%	1.4% 1.4%	2.5% 2.6%	0.8%	2.9%

Footnotes:

(1) Source: ACEEE, *Energy Efficiency Resource Standards* , April, 2014.
(2) Includes demand response targets.

DE 15-137 **Plan B** Schedule JJC-9

EERS

Summary of PI and Lost Revenue Impacts for certain years

		Utility Spending	PI	Pecent of Util Spending	Percent of Utility Sales $
Year 2014 Actual:		*Final PI Report*			$ 1,333,326,584
PI	Eversource	$ 19,113,200	$ 1,755,017	9.2%	
	Liberty	$ 2,168,000	$ 196,915	9.1%	
	Unitil	$ 2,760,000	$ 261,415	9.5%	
	NHEC	$ 1,839,500	$ 159,125	8.7%	
	Total	$ 25,880,700	$ 2,372,472	9.2%	0.2%
Year 2017 Est:		*Schedule 2*			$ 1,435,846,898
PI			$ 2,604,411	10.0%	
Lost Rev			$ -		
Total		$ 26,044,113	$ 2,604,411	10.0%	0.2%
Year 2018 Est:		*Schedule 2*			$ 1,471,743,071
PI			$ 3,150,036		
Lost Rev			$ -		
Total		$ 31,500,355	$ 3,150,036	10.0%	0.2%
Year 2019 Est:		*Schedule 2*			$ 1,508,536,648
PI			$ 3,874,544		
Lost Rev			$ 1,988,618		
Total		$ 38,745,437	$ 5,863,161	15.1%	0.4%
Year 2020		*Schedule 2*			
PI			$ 4,765,689		$ 1,546,250,064
Lost Rev			$ 5,255,756		
Total		$ 47,656,887	$ 10,021,445	21.0%	0.6%
Year 2021		*Schedule 2*			
PI			$ 5,861,797		$ 1,584,906,315
Lost Rev			$ 7,924,532		
Total		$ 58,617,972	$ 13,786,329	23.5%	0.9%
Year 2022		*Schedule 2*			
PI			$ 7,210,010		$ 1,624,528,973
Lost Rev			$ 8,122,645		
Total		$ 72,100,105	$ 15,332,655	21.3%	0.9%
Year 2023		*Schedule 2*			$ 1,665,142,198
PI			$ 8,868,313		
Lost Rev			$ 8,325,711		
Total		$ 88,683,129	$ 17,194,024	19.4%	1.0%
Year 2024		*Schedule 2*			$ 1,706,770,753
PI			$ 10,908,025		
Lost Rev			$ 8,533,854		
Total		$ 109,080,249	$ 19,441,879	17.8%	1.1%
Year 2025		*Schedule 2*			$ 1,749,440,021
PI			$ 13,416,871		
Lost Rev			$ 8,747,200		
Total		$ 134,168,706	$ 22,164,071	16.5%	1.3%
Year 2026		*Schedule 2*			$ 1,793,176,022
PI			$ 16,502,751		
Lost Rev			$ 8,965,880		
Total		$ 165,027,508	$ 25,468,631	15.4%	1.4%
Note #1:	LR (2019-2026)		$ 57,864,195		
	Util. Spending (2019-2026)		$ 714,079,993		
	Percentage		8%		
Note #2:	PI + LR (2019-2026)		$ 129,272,194		
	Util. Spending 2019-2026)		$ 714,079,993		
	Percentage		18%		

DE 15-137
EERS

Attachment 2

Annual State EERS Targets

Gas Utilities: Plan A

DE 15-137
EERS
Gas - MMBtu Savings Targets

Plan A

Schedule JJC-1

Gas MMBtu Savings Summary						
		Percent	Annual Savings		Cumulative Savings	
Year	Description	Year-To-Year kWh Saving Increase	MMBtu	Percent to 2014 MMBtu Sales (1)	MMBtu	Percent to 2014 MMBtu Sales
2014	Act. MMBtu Saving		150,197	0.60%		
2015	Approved Core		140,963	0.57%		
2016	Proposed Core Upd.		152,492	0.61%		
2017	Short-Term	7.00%	163,166	0.66%	163,166	0.66%
2018	Short-Term	8.00%	176,220	0.71%	339,386	1.37%
2019	Short-Term	9.00%	192,080	0.77%	531,466	2.14%
2020	Long-Term	10.00%	211,287	0.85%	742,753	2.99%
2021	Long-Term	10.00%	232,416	0.93%	975,169	3.92%
2022	Long-Term	10.00%	255,658	1.03%	1,230,827	4.95%
2023	Long-Term	10.00%	281,224	1.13%	1,512,051	6.08%
2024	Long-Term	10.00%	309,346	1.24%	1,821,397	7.33%
2025	Long-Term	10.00%	340,281	1.37%	2,161,678	8.69%
2026	Long-Term	10.00%	374,309	1.51%	2,535,986	10.20%
	(1) Actual MMBtu sales for year 2014 are used for measurement purposes				24,862,611	

R148

EERS

MMBtu Savings Details - Gas Utilities

Plan A

Schedule JJC-1A

Description	Year	2014 Starting Points	% Annual Savings to 2014 Usage	Cumulative Savings Targets By End of Each Forecast Year 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual Savings	2014 Actual	150,197	0.60%										
	2015 Core	140,963	0.57%										
	2016 Core	152,492	0.61%										
EERS	2017	163,166	0.66%	163,166	163,166	163,166	163,166	163,166	163,166	163,166	163,166	163,166	163,166
EERS	2018	176,220	0.71%		176,220	176,220	176,220	176,220	176,220	176,220	176,220	176,220	176,220
EERS	2019	192,080	0.77%			192,080	192,080	192,080	192,080	192,080	192,080	192,080	192,080
EERS	2020	211,287	0.85%				211,287	211,287	211,287	211,287	211,287	211,287	211,287
EERS	2021	232,416	0.93%					232,416	232,416	232,416	232,416	232,416	232,416
EERS	2022	255,658	1.03%						255,658	255,658	255,658	255,658	255,658
EERS	2023	281,224	1.13%							281,224	281,224	281,224	281,224
EERS	2024	309,346	1.24%								309,346	309,346	309,346
EERS	2025	340,281	1.37%									340,281	340,281
EERS	2026	374,309	1.51%										374,309
Cumulative Savings			*ACEEE-EERS ramps up to new sav of 1.5% of prior yr sales*	163,166	339,386	531,466	742,753	975,169	1,230,827	1,512,051	1,821,397	2,161,678	2,535,986
% Cumulative Savings to 2014 Actual Usage				0.66%	1.37%	2.14%	2.99%	3.92%	4.95%	6.08%	7.33%	8.69%	10.20%
								VEIC=1.75					*GDS=10.8%*
								(Equiv in 5 years					*(Pot Obtain in 10 yrs)*

Comments:

1. Annual savings in 2019 achieves 0.8% of 2014 actual usage, in line with other New England states.
2. Cumulative savings by 2021 achieves 3.92% of 2014 actual usage, versus VEIC's November 2013 Report of 1.7%.
3. Cumulative savings by 2026 achieve 10.2% of 2014 actual usage, versus GDS' January 2009 Report of 10.8%.
4. 2014 Actual MMBtu Usage for the two NH utilities. 24,862,611

DE 15-137
EERS
Gas - Spending Targets

Plan A

Schedule JJC-2

Year	Description	Spending Summary: Annual Saving MMBtu	Unit Cost To Achieve MMBtu Sav.	Utility Cost Excluding PI Excl. Lost Rev.	Plus: EESE Consult.	Plus: Est. Perm. EESE Brd.	Plus: Est. TRM Costs	Plus: PI	Plus: Lost Rev	Total	LDAC: Calc. Rate	LDAC: Excess/Short. From Existing $0.0291/Therm
		(1)	(2)		(3)	(4)	(5)	(6)	(7)		(8)	
2014	Actual	150,197		$ 6,480,979				$ 575,924	$ -	$ 7,056,903	$ 0.0284	
2015	Core Filing	140,963		$ 6,728,741				$ 605,587	$ -	$ 7,334,328	$ 0.0288	
2016	Core Filing	152,492	$ 45.70	$ 6,969,462				$ 627,252	$ -	$ 7,596,714	$ 0.0291	$ -
2017	Short-Term	163,166	$ 47.82	$ 7,802,874	$ 100,000			$ 780,287	$ -	$ 8,683,162	$ 0.0324	$ (1,086,448)
2018	Short-Term	176,220	$ 49.02	$ 8,637,782	$ 102,500			$ 863,778	$ -	$ 9,604,060	$ 0.0350	$ (2,007,346)
2019	Short-Term	192,080	$ 50.24	$ 9,650,562	$ 105,063			$ 965,056	$ -	$ 10,720,680	$ 0.0381	$ (3,123,967)
2020	Long-Term	211,287	$ 51.50	$ 10,881,008	$ 107,689	$ 1,000,000	$ 500,000	$ 1,088,101	$ -	$ 13,576,798	$ 0.0471	$ (5,980,085)
2021	Long-Term	232,416	$ 52.79	$ 12,268,337	$ 110,381	$ 1,025,000	$ 250,000	$ 1,226,834	$ 33,015	$ 14,913,567	$ 0.0505	$ (7,316,853)
2022	Long-Term	255,658	$ 54.11	$ 13,832,550	$ 113,141	$ 1,050,625	$ 256,250	$ 1,383,255	$ 265,307	$ 16,901,128	$ 0.0558	$ (9,304,414)
2023	Long-Term	281,224	$ 55.46	$ 15,596,200	$ 115,969	$ 1,076,891	$ 262,656	$ 1,559,620	$ 271,940	$ 18,883,276	$ 0.0608	$ (11,286,563)
2024	Long-Term	309,346	$ 56.84	$ 17,584,715	$ 118,869	$ 1,103,813	$ 269,223	$ 1,758,472	$ 278,738	$ 21,113,830	$ 0.0663	$ (13,517,116)
2025	Long-Term	340,281	$ 58.27	$ 19,826,767	$ 121,840	$ 1,131,408	$ 275,953	$ 1,982,677	$ 285,707	$ 23,624,352	$ 0.0724	$ (16,027,638)
2026	Long-Term	374,309	$ 59.72	$ 22,354,679	$ 124,886	$ 1,159,693	$ 282,852	$ 2,235,468	$ 292,850	$ 26,450,429	$ 0.0791	$ (18,853,715)

(1) Annual Savings: targets for annual savings are shown on Schedule 1. $ 29,007,902
(2) Unit Cost: Gas Industry average of 2014-2016 in then year dollars, with 2.5% annual escalation See Appendix A.
(3) Estimated amount to provide a placeholder for an administrative resource to assist permanent EESE Board.
(4) Estimated amount to provide a placeholder for estimated cost of permanent EESE Board.
(5) Estimated amount to provide a placeholder for estimated cost of TRM.
(6) PI and LR: Adjust PI cap to 10%, same as electric PI and retain as LR is introduced.
(7) Lost Revenue (LR): Lost revenues reflect "incremental" and "retirement" and "fuel-switching" adjustment (Sch 3).
(8) LDAC Rates: Calculated with actual 2014 Therm sales per 2014 Annual Report plus 2.5% growth per year:

2014 Therms	2015 Therms	2016 Therms	2017 Therms	2018 Therms	2019 Therms	2020 Therms	2021 Therms	2022 Therms	2023 Therms	2024 Therms	2025 Therms	2026 Therms
248,625,510	254,841,148	261,212,176	267,742,481	274,436,043	281,296,944	288,329,368	295,537,602	302,926,042	310,499,193	318,261,673	326,218,214	334,373,670

DE 15-137
EERS
Gas - Lost Revenue

Plan A

Schedule JJC-3

Year	Description	Annual MMBtu Savings for Lost Rev.					Cumulative MMBtu Savings for LR	Lost Revenue Amount			
		Annual MMBtu Saving Est.	Adjustment For Increment (1)	Adjust For Retirement (2)	Fuel Switching (3)	Adjusted Annual Savings		Estimated LR $/MMBtu (4)	Amount (Not < $0)	Cap (4)	Total LR Lower of Calc or Cap (Not > Cap)
2014	Actual	150,197									
2015	Approved Core	140,963							$ -		
2016	Approved Core	152,492							$ -		
									$ -		
2017	Short-Term	163,166	(147,884)	(16,978)	(138,486)	(140,182)	(140,182)	$ 3.503	$ -	$ 234,493	$ -
2018	Short-Term	176,220	-	(16,978)	(141,949)	17,293	(122,889)	$ 3.591	$ -	$ 240,355	$ -
2019	Short-Term	192,080	-	(16,978)	(145,497)	29,604	(93,285)	$ 3.681	$ -	$ 246,364	$ -
2020	Long-Term	211,287	-	(16,978)	(149,135)	45,175	(48,110)	$ 3.773	$ -	$ 252,523	$ -
2021	Long-Term	232,416	-	(22,906)	(152,863)	56,647	8,538	$ 3.867	$ 33,015	$ 258,836	$ 33,015
2022	Long-Term	255,658	-	(34,574)	(156,685)	64,399	72,937	$ 3.964	$ 289,095	$ 265,307	$ 265,307
2023	Long-Term	281,224	-	(38,165)	(160,602)	82,457	155,394	$ 4.063	$ 631,322	$ 271,940	$ 271,940
2024	Long-Term	309,346	-	(72,611)	(164,617)	72,118	227,512	$ 4.164	$ 947,425	$ 278,738	$ 278,738
2025	Long-Term	340,281	-	(37,115)	(168,732)	134,434	361,946	$ 4.268	$ 1,544,926	$ 285,707	$ 285,707
2026	Long-Term	374,309	-	(55,479)	(172,951)	145,879	507,825	$ 4.375	$ 2,221,783	$ 292,850	$ 292,850

Footnotes:
(1) Projected LR is reduced to reflect "incremental" savings levels in order to remove average 2014-2016 savings levels which were achieved without LR.
(2) Projected LR is based on reduced MMBtu savings to reflect prior installed savings that are "retired" during 2017-2026. See Schedule 6.
(3) Source: Schedule JJC-6A, DR Staff 3-7, Staff 3-8, Staff 3-9, Staff 3-10, Docket DE 14-216.
(4) Illustration of LR $/MMBtu is estimated using base rates from the 2014 annual reports from Energy North and Northern as follows:

	Actual Year 2014	Estimate Year 2015	Estimate Year 2016	Estimate Year 2017
2014 Act. Base Dist Rev. ($55.9m+$31.2m=$87.1m) + 2.5% Escal.	$ 87,100,000	$ 89,277,500	$ 91,509,438	$ 93,797,173
2014 Actual MMBtu Sales, with est. 2.5% Growth	24,862,511	25,484,074	26,121,176	26,774,205
Est. Base Rate Revenue per MMBtu	$ 3.503	$ 3.503	$ 3.503	$ 3.503

(5) Derivation of Net Lost Revenue Cap:

	Year 2017	Year 2018	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026
Rev.	$ 93,797,173	$ 96,142,103	$ 98,545,655	$ 101,009,297	$ 103,534,529	$ 106,122,892	$ 108,775,965	$ 111,495,364	$ 114,282,748	$ 117,139,817
Cap%	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025	$ 0.0025
Cap	$ 234,493	$ 240,355	$ 246,364	$ 252,523	$ 258,836	$ 265,307	$ 271,940	$ 278,738	$ 285,707	$ 292,850

DE 15-137
EERS
Gas - Details of Benefit & Costs

Plan A

Schedule JJC-4

	Benefits					Costs			
Year	Annual Pure MMBtu Savings	Annual Equivalent MMBtu Savings (1)	Lifetime Equiv. MMBtu Savings (2)	Benefits Per MMBtu	NPV Benefits 1.36% Disc. Rate (3)	Utility Cost (Incl. PI & LR)	Util+Cust "Installed" Cost (4)	NPV Costs 2.5% Disc. Rate	B/C
2017	163,166	163,650	2,348,611	$ 18,961,456	$ 18,961,456	$ 8,683,162	$ 12,962,020	$ 12,962,020	1.46
2018	176,220	176,742	2,536,500	$ 20,756,878	$ 20,478,372	$ 9,604,060	$ 14,336,716	$ 13,987,040	1.46
2019	192,080	192,649	2,764,785	$ 22,932,697	$ 22,321,426	$ 10,720,680	$ 16,003,581	$ 15,232,439	1.47
2020	211,287	211,914	3,041,264	$ 25,569,040	$ 24,553,568	$ 13,576,798	$ 20,267,127	$ 16,403,670	1.50
2021	232,416	233,105	3,345,390	$ 28,508,457	$ 27,008,925	$ 14,913,567	$ 22,262,623	$ 18,106,583	1.49
2022	255,658	256,415	3,679,929	$ 31,785,789	$ 33,100,366	$ 16,901,128	$ 25,229,608	$ 20,485,936	1.62
2023	281,224	282,057	4,047,922	$ 35,439,883	$ 32,680,799	$ 18,883,276	$ 28,188,512	$ 23,757,406	1.38
2024	309,346	310,263	4,452,715	$ 39,514,052	$ 35,945,333	$ 21,113,830	$ 31,518,230	$ 28,240,090	1.27
2025	340,281	341,289	4,897,986	$ 44,056,588	$ 39,543,767	$ 23,624,352	$ 35,265,880	$ 34,407,807	1.15
2026	374,309	375,418	5,387,785	$ 49,121,333	$ 43,498,144	$ 26,450,429	$ 39,484,581	$ 42,970,636	1.01

footnotes:

(1)	Factor for equivalent MMBtu saved, based on 3-year average (2014-2016)	1.00	See Sch. 7
(2)	Est. average lifetime for equivalent savings, based on 3-year average (2014-2016)	14.4	See Sch. 7
(3)	Est. value of benefits/lifetime MMBtu, based on 3-year average (2014-2016)	$ 8.073	See Sch. 7
(4)	Estimated installed cost based on 3-year average (2014-2016).	1.49	See Sch 7

DE 15-137
EERS

Plan A

Schedule JJC-5

Gas - Derivation of Utility Unit Cost per Annual MMBtu Saved:

	Unit Cost to Achieve Ann. MMBtu Savings	LDAC Rate Calculation
Forecast for 2016-2026:		
2016 Escalation at 2.5%	$ 46.66 (1)	$ 0.026 (2)
2017 Escalation at 2.5%	$ 47.82	$ 0.026
2018 Escalation at 2.5%	$ 49.02	$ 0.026
2019 Escalation at 2.5%	$ 50.24	$ 0.026
2020 Escalation at 2.5%	$ 51.50	$ 0.026
2021 Escalation at 2.5%	$ 52.79	$ 0.026
2022 Escalation at 2.5%	$ 54.11	$ 0.026
2023 Escalation at 2.5%	$ 55.46	$ 0.026
2024 Escalation at 2.5%	$ 56.84	$ 0.026
2025 Escalation at 2.5%	$ 58.27	$ 0.026
2026 Escalation at 2.5%	$ 59.72	$ 0.026

Footnotes:

(1) Calculation of Cost to achieve Annual Savings - Average cost per MMBtu to achieve Savings:

	2014 Actual	2015 Core	2016 Core	Average
Utility Cost (Excl PI)	$ 6,480,979	$ 6,728,741	$ 6,969,462	$ 6,726,394
Annual MMBtu Savings	150,197	140,963	152,492	147,884
Unit Cost per Annual MMBtu	$ 43.15	$ 47.73	$ 45.70	$ 45.48
2015 - Escal at 1.025	$ 44.23			
2016 - Escal at 1.025	$ 45.33	$ 48.93	$ 45.70	$ 46.66

		Final PI Filing
Spending	Northern	$ 1,167,000.0
	Energy North	$ 5,313,979.0
		$ 6,480,979.0

(2) Calculation of LDAC Rate per Therm (assumes Cost and therm sales increase at 2.5% per year):

	2014 Actual	2015 Estimate	2016 Estimate
Utility Cost	$ 6,480,979	$ 6,728,741	$ 6,896,960
Annual Therm Sales	248,625,110	254,840,738	261,211,756
LDAC Rate Per Therm	$ 0.026	$ 0.026	$ 0.026
Percent EE Spending to Sales Rev Dollars			
EE Spending	$ 6,480,979	$ 6,728,741	$ 6,969,462
Distribution Sales Revenue Dollars	$ 218,048,410	$ 223,499,620	$ 229,087,111
Percent Utility Cost to Sales Rev. Dollars	3%	3%	3%
Percent MMBtu Savings to MMBtu Usage:			
MMBtu Savings	150,197	140,963	152,492
MMBtu Usage	24,862,511	25,484,074	26,121,176
% Savings	0.6%	0.6%	0.6%

DE 15-137
EERS
Gas - Derivation of Estimated Retirement of Prior EE Installations

Plan A

Schedule JJC-6

Lifetime Sav			Reported Core Savings / Retirements			Retirement MMBtu Discounted by 50 Percent
			Lifetime MMBtu Savings	Est. Life (Years)	Est. Annual Savings	
			(1)	(2)		(2)
Year Installed	Year Retired					
2001 (1)	2017	Liberty	349,226			
		Unitil	138,092			
		Total	487,318	14.4	33,956	16,978
2002 (1)	2018	Liberty	349,226			
		Unitil	138,092			
		Total	487,318	14.4	33,956	16,978
2003 (1)	2019	Liberty	349,226	14.4	24,334	
		Unitil	138,092	14.4	9,622	
		Total	487,318		33,956	16,978
2004	2020	Liberty	349,226	14.4	24,334	
		Unitil	138,092	14.4	9,622	
		Total	487,318		33,956	16,978
2005	2021	Liberty	507,395	14.4	35,355	
		Unitil	150,066	14.4	10,457	
		Total	657,461		45,812	22,906
2006	2022	Liberty	678,085	14.4	47,249	
		Unitil	314,287	14.4	21,899	
		Total	992,372		69,148	34,574
2007	2023	Liberty	840,437	14.4	58,561	
		Unitil	254,997	14.4	17,768	
		Total	1,095,434		76,329	38,165
2008	2024	Liberty	1,862,102	14.4	129,750	
		Unitil	222,052	14.4	15,472	
		Total	2,084,154		145,223	72,611
2009	2025	Liberty	858,374	14.4	59,811	
		Unitil	206,927	14.4	14,419	
		Total	1,065,301		74,230	37,115
2010	2026	Liberty	1,226,114	14.4	85,435	
		Unitil	366,302	14.4	25,524	
		Total	1,592,416		110,959	55,479

footnotes:
(1) Reflects 2004 data as a proxy.

(2) Based on 3-year average 2014-2016 14.4

(3) It is difficult to project future customer purchase of standard vs. high efficiency equipment, therefore a discount of 50 percent is applied.

DE 15-137
EERS-Gas-Lost Revenues
Fuel Switching - Estimate for 2017

Schedule JJC 6A

Description:		Liberty-Gas - 2017 Residential	Liberty-Gas - 2017 C&I	Liberty-Gas - 2017 Total	Unitil-Gas - 2017 Residential	Unitil-Gas - 2017 C&I	Unitil-Gas - 2017 Total	Annual Therms Fuel Switch
New Customers:								
No. of new customers (3)		311	70		980	406		
Less: new Res. Cust. (above) constructing new homes (?)		-	-		-	-		
Sub-Total		311	70		980	406		
Annual Equivalent Conversion % (12/10 for Liberty; 12/21 for Unitil)		120%	120%		57%	57%		
Estimated Annual Equivalent No. of new customers		373	84		559	231		
Estimated % conversions from oil or other fossil fuel heat		100%	100%		51%	51%		
No. new customers - oil/other fossil to natural gas		311	84		285	118		
Existing Customers:								
Existing customers switching to natural gas					54	24		
Annual Equivalent Conversion % (12/21)					57%	57%		
Estimated Annual Equivalent No. of existing customers		incl. above	incl. above		31	14		
Total New and Existing		311	84		316	132		
Average annual therm usage (2)		776	4,176		769	4,176		
Extended Therms	(1)	241,336	350,784		242,747	549,997		
Conversion to MMBtu (Therms divided by 10)	(2)	24,134	35,078	59,212	24,275	55,000	79,274	138,486

footnotes:
(1) Liberty-Gas EE participants that switched from oil/other fossil to gas; Unitil-Gas does not track fuel conversions; but indicates majority of new customers converted.
(2) Used Liberty-Gas' estimate of average annual non-residential usage for both Liberty and Unitl for this calculation.
(3) Source: Data Responses in Core 2016 Update Docket DE 14-216: Staff 3-7 and Staff 3-8 (Unitil-Gas); and, Staff 3-9 and Staff 3-10 (Liberty-Gas).

DE 15-137
EERS
Gas - Average 2014-2016 Data

Plan A

Schedule JJC-7

Description	2014 Actual (final)		2015 Core		2016 Core Update		Average 2014-2016	
Ratio of Equiv to Pure kWh (Liberty/Unitil Gas):								
Gas annual MMBtu Savings		150,197		140,963		152,492		147,884
kWh Savings	101,614		283,486		46		128,382	
Conversion Factor - kWh to MMBtu	293	347	293	968	293	0	293	438.16
MMBtu Savings		150,544		141,931		152,492		148,322
Factor for Equiv. kWh		1.002		1.007		1.000		1.003
Measure Life:								
Lifetime MMBtu Savings		1,757,567		2,236,530		2,372,948		2,122,348
Annual MMBtu Savings		150,197		140,963		152,492		147,884
Est. Measure Life		11.7		15.9		15.6		14.4
Benefits per lifetime MMBtu saved:								
Benefit Dollars		$ 17,698,178		$ 16,065,000		$ 17,641,000		17,134,726
Lifetime MMBtu Savings		1,757,567		2,236,530		2,372,948		2,122,348
Rate per Equiv. MMBtu		10.07		7.18		7.43		$ 8.07
Customer Cost Factor								
"Customer Cost"		$ 2,646,515		$ 3,695,000		$ 4,348,000		3,563,172
"Utility" Cost Incl. PI and LR at est. 7.5%	$ 6,480,789	$ 6,966,848	$ 6,728,741	$ 7,233,397	$ 6,969,462	$ 7,492,172	$ 6,726,331	7,230,805
"Installed" Cost		$ 9,613,363		$ 10,928,397		$ 11,840,172		10,793,977
Installed Cost Factor / Utility Cost		1.38		1.51		1.58		1.49

EERS

EERS Savings Targets

Gas Industries

Plan A

Schedule JJC-8

EERS Targets
MMBtu Savings as % of Load (1)

Industry	Year	ME	VT	RI	CT (2)	MA	NH
Gas	2014	0.30%		1.00%	0.30%	1.10%	0.60%
	2015	0.30%			0.30%	1.15%	0.57%
	2016	0.30%					0.61%
	2017						0.66%
	2018						0.71%
	2019						0.77%

Footnotes:

(1) Source: ACEEE, *Energy Efficiency Resource Standards* , April, 2014 for all states.
(2) CT Draft Decision, August 23, 2013, page 20 (gas).

DE 15-137 | Plan A | Schedule JJC-9

EERS

Gas - Summary of PI and Lost Revenue Impacts for certain years

		Spending	PI	% of Spending	% of Base Dist. Sales Rev
Year 2014 Actual:					$ 87,100,000
PI	Liberty Gas				
	Unitil Gas				
	Total	$ 6,966,848	$ 575,924	8.3%	0.7%
Year 2017 Est:					$ 93,797,173
PI			$ 780,287	10.0%	
Lost Rev			$ -		
Total		$ 7,802,874	$ 780,287	10.0%	0.8%
Year 2018 Est:					$ 96,142,103
PI			$ 863,778		
Lost Rev			$ -		
Total		$ 8,637,782	$ 863,778	10.0%	0.9%
Year 2019 Est:					$ 98,545,655
PI			$ 965,056		
Lost Rev			$ -		
Total		$ 9,650,562	$ 965,056	10.0%	1.0%
Year 2020					
PI			$ 1,088,101		$ 101,009,297
Lost Rev			$ -		
Total		$ 10,881,008	$ 1,088,101	10.0%	1.1%
Year 2021					
PI			$ 1,226,834		$ 103,534,529
Lost Rev			$ 33,015		
Total		$ 12,268,337	$ 1,259,848	10.3%	1.2%
Year 2022					
PI			$ 1,383,255		$ 106,122,892
Lost Rev			$ 265,307		
Total		$ 13,832,550	$ 1,648,562	11.9%	1.6%
Year 2023					$ 108,775,965
PI			$ 1,559,620		
Lost Rev			$ 271,940		
Total		$ 15,596,200	$ 1,831,560	11.7%	1.7%
Year 2024					$ 111,495,364
PI			$ 1,758,472		
Lost Rev			$ 278,738		
Total		$ 17,584,715	$ 2,037,210	11.6%	1.8%
Year 2025					$ 114,282,748
PI			$ 1,982,677		
Lost Rev			$ 285,707		
Total		$ 19,826,767	$ 2,268,384	11.4%	2.0%
Year 2026					$ 117,139,817
PI			$ 2,235,468		
Lost Rev			$ 292,850		
Total		$ 22,354,679	$ 2,528,317	11.3%	2.2%

PI (2018-2026)	$ 13,063,260
LR (2018-2026)	$ 1,427,557
Total	$ 130,632,600
Percent	11.1%

DE 15-137
EERS

Attachment 2

Annual State EERS Targets

Gas Utilities: Plan B

DE 15-137
EERS
Gas - MMBtu Savings Targets

Plan B

Schedule JJC-1

Gas MMBtu Savings Summary						
		Percent	Annual Savings		Cumulative Savings	
Year	Description	Year-To-Year kWh Saving Increase	MMBtu	Percent to 2014 MMBtu Sales (1)	MMBtu	Percent to 2014 MMBtu Sales
2014	Act. MMBtu Saving		150,197	0.60%		
2015	Approved Core		140,963	0.57%		
2016	Proposed Core Upd.		152,492	0.61%		
2017	Short-Term	13.00%	172,316	0.69%	172,316	0.69%
2018	Short-Term	14.00%	196,440	0.79%	368,756	1.48%
2019	Short-Term	15.00%	225,906	0.91%	594,662	2.39%
2020	Long-Term	15.00%	259,792	1.04%	854,455	3.44%
2021	Long-Term	15.00%	298,761	1.20%	1,153,216	4.64%
2022	Long-Term	15.00%	343,575	1.38%	1,496,791	6.02%
2023	Long-Term	15.00%	395,111	1.59%	1,891,902	7.61%
2024	Long-Term	15.00%	454,378	1.83%	2,346,280	9.44%
2025	Long-Term	15.00%	522,535	2.10%	2,868,815	11.54%
2026	Long-Term	15.00%	600,915	2.42%	3,469,730	13.96%

(1) Actual MMBtu sales for year 2014 are used for measurement purposes 24,862,611

R160

EERS

MMBtu Savings Details - Gas Utilities

Plan B

Schedule JJC-1A

Description	Year	2014 Starting Points	% Annual Savings to 2014 Usage	Cumulative Savings Targets By End of Each Forecast Year 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual Savings	2014 Actual	150,197	0.60%										
	2015 Core	140,963	0.57%										
	2016 Core	152,492	0.61%										
EERS	2017	172,316	0.69%	172,316	172,316	172,316	172,316	172,316	172,316	172,316	172,316	172,316	172,316
EERS	2018	196,440	0.79%		196,440	196,440	196,440	196,440	196,440	196,440	196,440	196,440	196,440
EERS	2019	225,906	0.91%			225,906	225,906	225,906	225,906	225,906	225,906	225,906	225,906
EERS	2020	259,792	1.04%				259,792	259,792	259,792	259,792	259,792	259,792	259,792
EERS	2021	298,761	1.20%					298,761	298,761	298,761	298,761	298,761	298,761
EERS	2022	343,575	1.38%						343,575	343,575	343,575	343,575	343,575
EERS	2023	395,111	1.59%							395,111	395,111	395,111	395,111
EERS	2024	454,378	1.83%								454,378	454,378	454,378
EERS	2025	522,535	2.10%									522,535	522,535
EERS	2026	600,915	2.42%										600,915
Cumulative Savings			*ACEEE-EERS ramps up to new sav of 1.5% of prior yr sales*	172,316	368,756	594,662	854,455	1,153,216	1,496,791	1,891,902	2,346,280	2,868,815	3,469,730
% Cumulative Savings to 2014 Actual Usage				0.69%	1.48%	2.39%	3.44%	4.64%	6.02%	7.61%	9.44%	11.54%	13.96%
								VEIC=1.75					*GDS=20.5%*
								(Equiv in 5 years					*(MACE in 10 yrs)*

Comments:

1. Annual savings in 2019 achieves 0.91% of 2014 actual usage, in line with other New England states.
2. Cumulative savings by 2021 achieve 4.64% of 2014 actual usage, versus VEIC's November 2013 Report of 1.75%.
3. Cumulative savings by 2026 achieve 13.96% of 2014 actual usage, versus GDS' January 2009 Report of 10.8% for potentially obtainable.
4. 2014 Actual MMBtu Usage for the two NH utilities. 24,862,611

DE 15-137
EERS
Gas - Spending Targets

Plan B

Schedule JJC-2

Year	Description	Spending Summary: Annual Saving MMBtu	Unit Cost To Achieve MMBtu Sav.	Utility Cost Excluding PI Excl. Lost Rev.	Plus: EESE Consult.	Plus: Est. Perm. EESE Board	Plus: Est. TRM Costs	Plus: PI	Plus: Lost Rev	Total	Calculated LDAC Rate Per Therm	LDAC Excess/(Short) From Existing $0.0291/Therm
		(1)	(2)		(3)	(4)	(5)	(6)	(7)		(8)	
2014	Actual	150,197		$ 6,480,979				$ 575,924	$ -	$ 7,056,903	$ 0.0284	
2015	Core Filing	140,963		$ 6,728,741				$ 605,587		$ 7,334,328	$ 0.0288	
2016	Core Filing	152,492	$ 45.70	$ 6,969,462				$ 627,251.58		$ 7,596,714	$ 0.0291	
2017	Short-Term	172,316	$ 47.82	$ 8,240,419	$ 100,000			$ 824,042	$ -	$ 9,164,460	$ 0.034	$ (1,567,747)
2018	Short-Term	196,440	$ 49.02	$ 9,628,929	$ 102,500			$ 962,893	$ -	$ 10,694,322	$ 0.039	$ (3,097,608)
2019	Short-Term	225,906	$ 50.24	$ 11,350,100	$ 105,063			$ 1,135,010	$ -	$ 12,590,173	$ 0.045	$ (4,993,459)
2020	Long-Term	259,792	$ 51.50	$ 13,378,931	$ 107,689	$ 1,000,000	$ 500,000	$ 1,337,893	$ 387,917	$ 16,712,430	$ 0.058	$ (9,115,717)
2021	Long-Term	298,761	$ 52.79	$ 15,770,414	$ 110,381	$ 1,025,000	$ 250,000	$ 1,577,041	$ 397,615	$ 19,130,453	$ 0.065	$ (11,533,739)
2022	Long-Term	343,575	$ 54.11	$ 18,589,376	$ 113,141	$ 1,050,625	$ 256,250	$ 1,858,938	$ 407,556	$ 22,275,885	$ 0.074	$ (14,679,172)
2023	Long-Term	395,111	$ 55.46	$ 21,912,227	$ 115,969	$ 1,076,891	$ 262,656	$ 2,191,223	$ 417,745	$ 25,976,711	$ 0.084	$ (18,379,997)
2024	Long-Term	454,378	$ 56.84	$ 25,829,038	$ 118,869	$ 1,103,813	$ 269,223	$ 2,582,904	$ 428,188	$ 30,332,034	$ 0.095	$ (22,735,320)
2025	Long-Term	522,535	$ 58.27	$ 30,445,978	$ 121,840	$ 1,131,408	$ 275,953	$ 3,044,598	$ 438,893	$ 35,458,671	$ 0.109	$ (27,861,957)
2026	Long-Term	600,915	$ 59.72	$ 35,888,197	$ 124,886	$ 1,159,693	$ 282,852	$ 3,588,820	$ 449,865	$ 41,494,313	$ 0.124	$ (33,897,600)

(1) Annual Savings: targets for annual savings are shown on Schedule 1. $ 32,448,955
(2) Unit Cost: Gas Industry average of 2014-2016 in then year dollars, with 2.5% annual escalation See Appendix A.
(3) Estimated amount to provide a placeholder for an administrative resource to assist the permanent EESE Board.
(4) Estimated amount to provide a placeholder for estimated cost of permanent EESE Board.
(5) Estimated amount to provide a placeholder for estimated cost of TRM.
(6) PI and LR: Adjust PI cap to 10%, same as electric PI and retain as LR is introduced.
(7) Lost Revenue (LR): Lost revenues reflect "incremental" and "retirement" and "fuel-switching" adjustments. See Schedule 3.
(8) LDAC Rates: Calculated with actual 2014 Therm sales per 2014 Annual Report plus 2.5% growth per Year:

	Therms
Year 2014 Actual (24,862,551 MMBtu x 10 = Therms)	248,625,510

2014 Therms	2015 Therms	2016 Therms	2017 Therms	2018 Therms	2019 Therms	2020 Therms	2021 Therms	2022 Therms	2023 Therms	2024 Therms	2025 Therms	2026 Therms
248,625,510	254,841,148	261,212,176	267,742,481	274,436,043	281,296,944	288,329,368	295,537,602	302,926,042	310,499,193	318,261,673	326,218,214	334,373,670

DE 15-137
EERS
Gas - Lost Revenue

Plan B

Schedule JJC-3

Year	Description	Annual MMBtu Savings for Lost Rev.					Cumulative MMBtu Savings for LR	Lost Revenue Amount			
		Annual MMBtu Saving Est.	Adjustment For Increment (1)	Adjust For Retirement (2)	Fuel Switching (3)	Adjusted Annual Savings		Estimated LR $/MMBtu (4)	Amount (Not < $0)	Cap (5)	Total LR Lower of Calc or Cap (Not > Cap)
2014	Actual	150,197									
2015	Approved Core	140,963							$ -		
2016	Approved Core	152,492							$ -		
									$ -		
2017	Short-Term	172,316	(147,884)	(16,978)	(138,486)	(131,032)	(131,032)	$ 2.691	$ -	$ 360,220	$ -
2018	Short-Term	196,440	-	(16,978)	(141,949)	37,514	(93,519)	$ 2.758	$ -	$ 369,225	$ -
2019	Short-Term	225,906	-	(16,978)	(145,497)	63,431	(30,088)	$ 2.827	$ -	$ 378,456	$ -
2020	Long-Term	259,792	-	(16,978)	(149,135)	93,679	63,592	$ 2.898	$ 184,269	$ 387,917	$ 387,917
2021	Long-Term	298,761	-	(22,906)	(152,863)	122,992	186,584	$ 2.970	$ 554,179	$ 397,615	$ 397,615
2022	Long-Term	343,575	-	(34,574)	(156,685)	152,317	338,900	$ 3.044	$ 1,031,745	$ 407,556	$ 407,556
2023	Long-Term	395,111	-	(38,165)	(160,602)	196,345	535,245	$ 3.121	$ 1,670,234	$ 417,745	$ 417,745
2024	Long-Term	454,378	-	(72,611)	(164,617)	217,150	752,395	$ 3.199	$ 2,406,547	$ 428,188	$ 428,188
2025	Long-Term	522,535	-	(37,115)	(168,732)	316,688	1,069,083	$ 3.278	$ 3,504,964	$ 438,893	$ 438,893
2026	Long-Term	600,915	-	(55,479)	(172,951)	372,485	1,441,568	$ 3.360	$ 4,844,301	$ 449,865	$ 449,865

Footnotes:

(1) Projected LR is reduced to reflect "incremental" savings levels in order to remove average 2014-2016 savings levels which were achieved without LR.

(2) Projected LR is based on reduced MMBtu savings to reflect prior installed savings that are "retired" during 2017-2026. See Schedule 6.

(3) Source: Schedule JJC-6A.

(4) Calculation of retail rate for LR is based on LR $/MMBtu using base rates from the 2014 annual reports from Energy North and Northern as follows:

	Actual Year 2014	Estimate Year 2015	Estimate Year 2016	Estimate Year 2017
2014 Act. Base Dist Rev. ($55.9m+$31.2m=$87.1m) + 2.5% escal	$ 66,900,000	$ 68,572,500	$ 70,286,813	$ 72,043,983
2014 Actual MMBtu Sales, with est. 2.5% Growth	24,862,511	25,484,074	26,121,176	26,774,205
Est. Retail Rate per MMBtu	$ 2.69	2.69	2.69	2.69

(5) Derivation of Net Lost Revenue Cap:

	Year 2017	Year 2018	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026
Rev.	$ 72,043,983	$ 73,845,082	$ 75,691,209	$ 77,583,490	$ 79,523,077	$ 81,511,154	$ 83,548,933	$ 85,637,656	$ 87,778,597	$ 89,973,062
Cap%	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050	$ 0.0050
Cap	$ 360,220	$ 369,225	$ 378,456	$ 387,917	$ 397,615	$ 407,556	$ 417,745	$ 428,188	$ 438,893	$ 449,865

DE 15-137
EERS
Gas - Details of Benefit & Costs

Plan B

Schedule JJC-4

	Benefits					Costs			
Year	Annual Pure MMBtu Savings	Annual Equivalent MMBtu Savings	Lifetime Equiv. MMBtu Savings	Benefits Per MMBtu	NPV Benefits 1.36% Disc. Rate	Utility Cost (Incl. PI & LR)	Util+Cust "Installed" Cost	NPV Costs 2.5% Disc. Rate	B/C
		(1)	(2)		(3)		(4)		
2017	172,316	172,827	2,480,309	$ 20,024,715	$ 20,024,715	$ 9,164,460	$ 13,680,492	$ 13,680,492	1.46
2018	196,440	197,022	2,827,553	$ 23,138,638	$ 22,828,175	$ 10,694,322	$ 15,964,234	$ 15,574,862	1.47
2019	225,906	226,576	3,251,686	$ 26,971,322	$ 26,252,401	$ 12,590,173	$ 18,794,315	$ 17,888,700	1.47
2020	259,792	260,562	3,739,438	$ 31,438,852	$ 30,190,261	$ 16,712,430	$ 24,947,925	$ 19,264,173	1.57
2021	298,761	299,646	4,300,354	$ 36,646,384	$ 34,718,801	$ 19,130,453	$ 28,557,492	$ 21,264,043	1.63
2022	343,575	344,593	4,945,407	$ 42,716,491	$ 44,483,133	$ 22,275,885	$ 33,252,920	$ 24,058,312	1.85
2023	395,111	396,282	5,687,218	$ 49,792,050	$ 45,915,614	$ 25,976,711	$ 38,777,426	$ 27,900,266	1.65
2024	454,378	455,724	6,540,301	$ 58,039,605	$ 52,797,747	$ 30,332,034	$ 45,278,950	$ 33,164,649	1.59
2025	522,535	524,083	7,521,346	$ 67,653,285	$ 60,723,399	$ 35,458,671	$ 52,931,873	$ 40,407,905	1.50
2026	600,915	602,695	8,649,548	$ 78,859,376	$ 69,831,909	$ 41,494,313	$ 61,941,740	$ 50,463,936	1.38

footnotes:

(1) Factor for equivalent MMBtu saved, based on 3-year average (2014-2016)		1.00	See Sch. 7
(2) Est. average lifetime for equivalent savings, based on 3-year average (2014-2016)		14.4	See Sch. 7
(3) Est. value of benefits/lifetime MMBtu, based on 3-year average (2014-2016)	$	8.073	See Sch. 7
(4) Estimated installed cost based on 3-year average (2014-2016).		1.49	See Sch 7

DE 15-137
EERS

Plan B

Schedule JJC-5

Gas - Derivation of Utility Unit Cost per Annual MMBtu Saved:

Forecast for 2016-2026:	Unit Cost to Achieve Ann. MMBtu Savings	LDAC Rate Calculation
2016 Escalation at 2.5%	$ 46.66 (1)	$ 0.026 (2)
2017 Escalation at 2.5%	$ 47.82	$ 0.026
2018 Escalation at 2.5%	$ 49.02	$ 0.026
2019 Escalation at 2.5%	$ 50.24	$ 0.026
2020 Escalation at 2.5%	$ 51.50	$ 0.026
2021 Escalation at 2.5%	$ 52.79	$ 0.026
2022 Escalation at 2.5%	$ 54.11	$ 0.026
2023 Escalation at 2.5%	$ 55.46	$ 0.026
2024 Escalation at 2.5%	$ 56.84	$ 0.026
2025 Escalation at 2.5%	$ 58.27	$ 0.026
2026 Escalation at 2.5%	$ 59.72	$ 0.026

Footnotes:

(1) Calculation of Cost to achieve Annual Savings - Average cost per MMBtu to achieve Savings:

	2014 Actual	2015 Core	2016 Core	Average
Utility Cost (Excl PI)	$ 6,480,979	$ 6,728,741	$ 6,969,462	$ 6,726,394
Annual MMBtu Savings	150,197	140,963	152,492	147,884
Unit Cost per Annual MMBtu	$ 43.15	$ 47.73	$ 45.70	$ 45.48
2015 - Escal at 1.025	$ 44.23			
2016 - Escal at 1.025	$ 45.33	$ 48.93	$ 45.70	$ 46.66

		Final PI Filing
Spending	Northern	$ 1,167,000.0
	Energy North	$ 5,313,979.0
		$ 6,480,979.0

(2) Calculation of LDAC Rate per Therm (assumes Cost and therm sales increase at 2.5% per year):

	2014 Actual	2015 Estimate	2016 Estimate
Utility Cost	$ 6,480,979	$ 6,728,741	$ 6,896,960
Annual Therm Sales	248,625,110	254,840,738	261,211,756
LDAC Rate Per Therm	$ 0.026	$ 0.026	$ 0.026
Percent EE Spending to Sales Rev Dollars			
EE Spending	$ 6,480,979	$ 6,728,741	$ 6,969,462
Distribution Sales Revenue Dollars	$ 218,048,410	$ 223,499,620	$ 229,087,111
Percent Utility Cost to Sales Rev. Dollars	3%	3%	3%
Percent MMBtu Savings to MMBtu Usage:			
MMBtu Savings	150,197	140,963	152,492
MMBtu Usage	24,862,511	25,484,074	26,121,176
% Savings	0.6%	0.6%	0.6%

DE 15-137
EERS
Gas - Derivation of Estimated Retirement of Prior EE Installations

Plan B

Schedule JJC-6

Lifetime Sav			Reported Core Savings / Retirements			Retirement MMBtu Discounted by 50 Percent
			Lifetime MMBtu Savings	Est. Life (Years)	Est. Annual Savings	
Year Installed	Year Retired		(1)	(2)		(2)
2001 (1)	2017	Liberty	349,226			
		Unitil	138,092			
		Total	487,318	14.4	33,956	16,978
2002 (1)	2018	Liberty	349,226			
		Unitil	138,092			
		Total	487,318	14.4	33,956	16,978
2003 (1)	2019	Liberty	349,226	14.4	24,334	
		Unitil	138,092	14.4	9,622	
		Total	487,318		33,956	16,978
2004	2020	Liberty	349,226	14.4	24,334	
		Unitil	138,092	14.4	9,622	
		Total	487,318		33,956	16,978
2005	2021	Liberty	507,395	14.4	35,355	
		Unitil	150,066	14.4	10,457	
		Total	657,461		45,812	22,906
2006	2022	Liberty	678,085	14.4	47,249	
		Unitil	314,287	14.4	21,899	
		Total	992,372		69,148	34,574
2007	2023	Liberty	840,437	14.4	58,561	
		Unitil	254,997	14.4	17,768	
		Total	1,095,434		76,329	38,165
2008	2024	Liberty	1,862,102	14.4	129,750	
		Unitil	222,052	14.4	15,472	
		Total	2,084,154		145,223	72,611
2009	2025	Liberty	858,374	14.4	59,811	
		Unitil	206,927	14.4	14,419	
		Total	1,065,301		74,230	37,115
2010	2026	Liberty	1,226,114	14.4	85,435	
		Unitil	366,302	14.4	25,524	
		Total	1,592,416		110,959	55,479

footnotes:
(1) Reflects 2004 data as a proxy.

(2) Based on 3-year average 2014-2016 14.4

(3) It is difficult to project future customer purchase of standard vs. high efficiency equipment, therefore a discount of 50 percent is applied.

DE 15-137
EERS-Gas-Lost Revenues
Fuel Switching - Estimate for 2017

Schedule JJC 6A

Description:		Liberty-Gas - 2017 Residential	C&I	Total	Unitil-Gas - 2017 Residential	C&I	Total	Annual Therms Fuel Switch'g
New Customers:								
No. of new customers January 2014-September 2015		311	70		980	406		
Less: new Res. Cust. (above) constructing new homes (?)		-	-		-	-		
Sub-Total		311	70		980	406		
Annual Equivalent Conversion % (12/10 for Liberty; 12/21 for Unitil)		120%	120%		57%	57%		
Estimated Annual Equivalent No. of new customers		373	84		559	231		
Estimated % conversions from oil or other fossil fuel heat		100%	100%		51%	51%		
No. new customers - oil/other fossil to natural gas		311	84		285	118		
Existing Customers:								
Existing customers switching to natural gas					54	24		
Annual Equivalent Conversion % (12/21)					57%	57%		
Estimated Annual Equivalent No. of existing customers		incl. above	incl. above		31	14		
Total New and Existing		311	84		316	132		
Average annual therm usage (2)		776	4,176		769	4,176		
Extended Therms	(1)	241,336	350,784		242,747	549,997		
Conversion to MMBtu (Therms divided by 10)	(2)	24,134	35,078	59,212	24,275	55,000	79,274	138,486

footnotes:
(1) Liberty-Gas EE participants that switched from oil/other fossil to gas; Unitil-Gas does not track fuel conversions; but indicates majority of new customers converted.
(2) Used Liberty-Gas estimate of average annual non-residential for consistency for Unitil-Gas.
(3) Source: Data Responses in Core 2016 Update Docket DE 14-216: Staff 3-7 and Staff 3-8 (Unitil-Gas); and, Staff 3-9 and Staff 3-10 (Liberty-Gas).

DE 15-137
EERS
Gas - Average 2014-2016 Data

Plan B

Schedule JJC-7

Description	2014 Actual (final)		2015 Core		2016 Core Update		Average 2014-2016	
Ratio of Equiv to Pure kWh (Liberty/Unitil Gas):								
Gas annual MMBtu Savings		150,197		140,963		152,492		147,884
kWh Savings	101,614		283,486		46		128,382	
Conversion Factor - kWh to MMBtu	293	347	293	968	293	0	293	438.16
MMBtu Savings		150,544		141,931		152,492		148,322
Factor for Equiv. kWh		1.002		1.007		1.000		1.003
Measure Life:								
Lifetime MMBtu Savings		1,757,567		2,236,530		2,372,948		2,122,348
Annual MMBtu Savings		150,197		140,963		152,492		147,884
Est. Measure Life		11.7		15.9		15.6		14.4
Benefits per lifetime MMBtu saved:								
Benefit Dollars		$ 17,698,178		$ 16,065,000		$ 17,641,000		17,134,726
Lifetime MMBtu Savings		1,757,567		2,236,530		2,372,948		2,122,348
Rate per Equiv. kWh		10.07		7.18		7.43		$ 8.07
Customer Cost Factor								
"Customer Cost"		$ 2,646,515		$ 3,695,000		$ 4,348,000		3,563,172
"Utility" Cost Incl. PI and LR at est. 7.5%	$ 6,480,789	$ 6,966,848	$ 6,728,741	$ 7,233,397	$ 6,969,462	$ 7,492,172	$ 6,726,331	7,230,805
"Installed" Cost		$ 9,613,363		$ 10,928,397		$ 11,840,172		10,793,977
Installed Cost Factor / Utility Cost		1.38		1.51		1.58		1.49

EERS

EERS Savings Targets

Gas Industries

Plan B

Schedule JJC-8

EERS Targets
MMBtu Savings as % of Load (1)

Industry	Year	ME	VT	RI	CT (2)	MA	NH
Gas	2014	0.30%		1.00%	0.30%	1.10%	0.60%
	2015	0.30%			0.30%	1.15%	0.57%
	2016	0.30%					0.61%
	2017						0.69%
	2018						0.79%
	2019						0.91%

Footnotes:

(1) Source: ACEEE, Energy Efficiency Resource Standards, April, 2014 for all states.
(2) CT Draft Decision, August 23, 2013, page 20 (gas).

DE 15-137
EERS
Plan B
Schedule JJC-9

Gas - Summary of PI and Lost Revenue Impacts for certain years

		Spending	PI	% of Spending	% of Sales Rev
Year 2014 Actual:					$ 66,900,000
PI	Liberty Gas				
	Unitil Gas				
	Total	$ 6,966,848	$ 575,924	8.3%	0.9%
Year 2017 Est:					$ 72,043,983
PI			$ 824,042	10.0%	
Lost Rev			$ -		
Total		$ 8,240,419	$ 824,042	10.0%	1.1%
Year 2018 Est:					$ 73,845,082
PI			$ 962,893		
Lost Rev			$ -		
Total		$ 9,628,929	$ 962,893	10.0%	1.3%
Year 2019 Est:					$ 75,691,209
PI			$ 1,135,010		
Lost Rev			$ -		
Total		$ 11,350,100	$ 1,135,010	10.0%	1.5%
Year 2020					$ 77,583,490
PI			$ 1,337,893		
Lost Rev			$ 387,917		
Total		$ 13,378,931	$ 1,725,811	12.9%	2.2%
Year 2021					$ 79,523,077
PI			$ 1,577,041		
Lost Rev			$ 397,615		
Total		$ 15,770,414	$ 1,974,657	12.5%	2.5%
Year 2022					$ 81,511,154
PI			$ 1,858,938		
Lost Rev			$ 407,556		
Total		$ 18,589,376	$ 2,266,493	12.2%	2.8%
Year 2023					$ 83,548,933
PI			$ 2,191,223		
Lost Rev			$ 417,745		
Total		$ 21,912,227	$ 2,608,967	11.9%	3.1%
Year 2024					$ 85,637,656
PI			$ 2,582,904		
Lost Rev			$ 428,188		
Total		$ 25,829,038	$ 3,011,092	11.7%	3.5%
Year 2025					$ 87,778,597
PI			$ 3,044,598		
Lost Rev			$ 438,893		
Total		$ 30,445,978	$ 3,483,491	11.4%	4.0%
Year 2026					$ 89,973,062
PI			$ 3,588,820		
Lost Rev			$ 449,865		
Total		$ 35,888,197	$ 4,038,685	11.3%	4.5%

PI (2020-2026)	$	16,181,416
LR (2020-2026)	$	2,927,780
Total	$	161,814,161
Percent		11.8%

DE 15-137
EERS

Attachment 2A

Overview of Staff Model – Savings, Cost, SBC/LDAC

DE 15-137
EERS - Electric Utilities

PLAN A									
			Spending to Achieve Savings						
Year	Pure kWh Savings (1)	Percent to 2014 Usage (1)(3)	Utility (2)	Less: ISO/RGGI (2)	Plus EESE (2)	SBC Total	SBC kWh (4)	SBC Rate	
	(a)		(b)	(c)	(d)	(e=b+c+d)	(f)	(g=e/f)	
2014	67,728,171	0.6%						$	0.0018
2015	56,979,474	0.5%						$	0.0018
2016	53,087,627	0.5%						$	0.0018
2017	58,396,390	0.5%	$ 27,402,937	$ 5,000,000	$ 100,000	$ 22,502,937	10,988,357,778	$	0.0020
2018	64,819,993	0.6%	$ 31,177,691	$ 5,000,000	$ 102,500	$ 26,280,191	10,988,357,778	$	0.0024
2019	72,598,392	0.7%	$ 36,712,454	$ 5,000,000	$ 105,063	$ 31,817,517	10,988,357,778	$	0.0029
2020	82,036,183	0.8%	$ 44,615,454	$ 5,000,000	$ 1,607,689	$ 41,223,143	10,988,357,778	$	0.0038
2021	92,700,886	0.9%	$ 51,978,761	$ 5,000,000	$ 1,385,381	$ 48,364,142	10,988,357,778	$	0.0044
2022	104,752,002	1.0%	$ 59,676,428	$ 5,000,000	$ 1,420,016	$ 56,096,444	10,988,357,778	$	0.0051
2023	118,369,762	1.1%	$ 68,579,052	$ 5,000,000	$ 1,455,516	$ 65,034,568	10,988,357,778	$	0.0059
2024	133,757,831	1.2%	$ 78,876,986	$ 5,000,000	$ 1,491,904	$ 75,368,890	10,988,357,778	$	0.0069
2025	151,146,349	1.4%	$ 90,790,702	$ 5,000,000	$ 1,529,201	$ 87,319,903	10,988,357,778	$	0.0079
2026	170,795,374	1.6%	$ 104,575,548	$ 5,000,000	$ 1,567,431	$ 101,142,979	10,988,357,778	$	0.0092
10-Yr. Total	1,049,373,162	9.74%	$ 594,386,013	$ 50,000,000	$ 10,764,701	$ 555,150,714			

footnotes:
(1) Att. 2A, Schedule JJC-1
(2) Att. 2A, Schedule JJC-2
(3) 2014 actual kWh usage 10,770,750,548
(4) From 2016 Core Update, p. 2. 10,988,357,778

DE 15-137
EERS - Electric Utilities

PLAN B								
			Spending to Achieve Savings				SBC	
Year	Pure kWh Savings (1)	Percent to 2014 Usage (1)(3)	Utility (2)	Less: ISO/RGGI (2)	Plus EESE (2)	Total	kWh (4)	SBC Rate
	(a)		(b)	(c)	(d)	(e=b+c+d)	(f)	(g=e/f)
2014	67,728,171	0.6%						$ 0.0018
2015	56,979,474	0.5%						$ 0.0018
2016	53,087,627	0.5%						$ 0.0018
2017	61,050,771	0.6%	$ 28,648,525	$ 5,000,000	$ 100,000	$ 23,748,525	10,988,357,778	$ 0.0020
2018	72,039,910	0.7%	$ 34,650,391	$ 5,000,000	$ 102,500	$ 29,752,891	10,988,357,778	$ 0.0027
2019	86,447,892	0.8%	$ 44,608,598	$ 5,000,000	$ 105,063	$ 39,713,661	10,988,357,778	$ 0.0036
2020	103,737,470	1.0%	$ 57,678,332	$ 5,000,000	$ 1,607,689	$ 54,286,021	10,988,357,778	$ 0.0049
2021	124,484,964	1.2%	$ 72,404,301	$ 5,000,000	$ 1,385,381	$ 68,789,682	10,988,357,778	$ 0.0063
2022	149,381,957	1.4%	$ 87,432,760	$ 5,000,000	$ 1,420,016	$ 83,852,776	10,988,357,778	$ 0.0076
2023	179,258,348	1.7%	$ 105,877,153	$ 5,000,000	$ 1,455,516	$ 102,332,669	10,988,357,778	$ 0.0093
2024	215,110,018	2.0%	$ 128,522,128	$ 5,000,000	$ 1,491,904	$ 125,014,032	10,988,357,778	$ 0.0114
2025	258,132,022	2.4%	$ 156,332,778	$ 5,000,000	$ 1,529,201	$ 152,861,979	10,988,357,778	$ 0.0139
2026	309,758,426	2.9%	$ 190,496,140	$ 5,000,000	$ 1,567,431	$ 187,063,571	10,988,357,778	$ 0.0170
10-Yr. Total	1,559,401,778	14.48%	$ 906,651,106	$ 50,000,000	$ 10,764,701	$ 867,415,807		

footnotes:
(1) Att. 2A, Schedule JJC-1
(2) Att. 2A, Schedule JJC-2
(3) 2014 actual kWh usage 10,770,750,548
(4) From 2016 Core Update, p. 2. 10,988,357,778

DE 15-137
EERS - Gas Utilities

PLAN A								
			Spending to Achieve Savings				LDAC	
Year	MMBtu Savings (1)	Percent to 2014 Usage (1)(3)	Utility (2)	Less: ISO/RGGI (2)	Plus EESE (2)	Total	Therms (4)	Rate Per Therm
	(a)		(b)	(c)	(d)	(e=b+c+d)	(f)	(g=e/f)
2014	150,197	0.6%						
2015	140,963	0.6%						
2016	152,492	0.6%						$ 0.0291
2017	163,166	0.7%	$ 8,583,162	$ -	$ 100,000	$ 8,683,162	267,742,481	$ 0.0324
2018	176,220	0.7%	$ 9,501,560	$ -	$ 102,500	$ 9,604,060	274,436,043	$ 0.0350
2019	192,080	0.8%	$ 10,615,617	$ -	$ 105,063	$ 10,720,680	281,296,944	$ 0.0381
2020	211,287	0.8%	$ 11,969,109	$ -	$ 1,607,689	$ 13,576,798	288,329,368	$ 0.0471
2021	232,416	0.9%	$ 13,528,186	$ -	$ 1,385,381	$ 14,913,567	295,537,602	$ 0.0505
2022	255,658	1.0%	$ 15,481,112	$ -	$ 1,420,016	$ 16,901,128	302,926,042	$ 0.0558
2023	281,224	1.1%	$ 17,427,760	$ -	$ 1,455,516	$ 18,883,276	310,499,193	$ 0.0608
2024	309,346	1.2%	$ 19,621,926	$ -	$ 1,491,904	$ 21,113,830	318,261,673	$ 0.0663
2025	340,281	1.4%	$ 22,095,151	$ -	$ 1,529,201	$ 23,624,352	326,218,215	$ 0.0724
2026	374,309	1.5%	$ 24,882,998	$ -	$ 1,567,431	$ 26,450,429	334,373,670	$ 0.0791
10-Yr. Tota	2,535,987	10.20%	$ 153,706,581	$ -	$ 10,764,701	$ 164,471,282		

footnotes:
(1) Att. 2A, Schedule JJC-1
(2) Att. 2A, Schedule JJC-2
(3) 2014 actual MMBtu usage 24,862,611
(4) Att. 2A, Schedule JJC-2, footnote 8.

DE 15-137
EERS - Gas Utilities

PLAN B								
			Spending to Achieve Savings				LDAC	
Year	MMBtu Savings (1)	Percent to 2014 Usage (1)(3)	Utility (3)	Less: ISO/RGGI (3)	Plus EESE (3)	Total	Therm (4)	Rate per Therm
	(a)		(b)	(c)	(d)	(e=b+c+d)	(f)	(g=e/f)
2014	150,197	0.6%						
2015	140,963	0.6%						
2016	152,492	0.6%						$ 0.0291
2017	172,316	0.7%	$ 9,064,460	$ -	$ 100,000	$ 9,164,460	267,742,481	$ 0.0342
2018	196,440	0.8%	$ 10,591,822	$ -	$ 102,500	$ 10,694,322	274,436,043	$ 0.0390
2019	225,906	0.9%	$ 12,485,110	$ -	$ 105,063	$ 12,590,173	281,296,944	$ 0.0448
2020	259,792	1.0%	$ 15,104,741	$ -	$ 1,607,689	$ 16,712,430	288,329,368	$ 0.0580
2021	298,761	1.2%	$ 17,745,072	$ -	$ 1,385,381	$ 19,130,453	295,537,602	$ 0.0647
2022	343,575	1.4%	$ 20,855,869	$ -	$ 1,420,016	$ 22,275,885	302,926,042	$ 0.0735
2023	395,111	1.6%	$ 24,521,195	$ -	$ 1,455,516	$ 25,976,711	310,499,193	$ 0.0837
2024	454,378	1.8%	$ 28,840,130	$ -	$ 1,491,904	$ 30,332,034	318,261,673	$ 0.0953
2025	522,535	2.1%	$ 33,956,470	$ -	$ 1,529,201	$ 35,485,671	326,218,215	$ 0.1088
2026	600,915	2.4%	$ 39,925,882	$ -	$ 1,567,431	$ 41,493,313	334,373,670	$ 0.1241
10-Yr. Tota	3,469,729	13.96%	$ 213,090,751	$ -	$ 10,764,701	$ 223,855,452		

footnotes:
(1) Att. 2A, Schedule JJC-1
(2) Att. 2A, Schedule JJC-2
(3) 2014 actual MMBtu usage 24,862,611
(4) Att. 2A, Schedule, JJC-2, footnote 8

Attachment 3

Annual State EERS Targets for reduction in kWh sales each year

Source: American Council for an Energy-Efficient Economy 2011

State	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Cumulative 2020	Type
Arizona	N/A	N/A	1.25%	3.00%	5.00%	7.25%	9.50%	12.00%	14.50%	17.00%	19.50%	22.00%	**22.00%**	Mandatory Standard
Arkansas	N/A	N/A	0.25%	0.75%	1.50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**1.50%**	Mandatory Standard
California	1.31%	2.56%	3.83%	5.11%	6.17%	7.13%	8.05%	9.00%	9.97%	10.96%	11.95%	12.94%	**12.94%**	Mandatory Standard
Colorado	0.53%	1.29%	2.09%	3.23%	4.44%	5.72%	7.07%	8.49%	10.00%	11.59%	13.25%	14.93%	**14.93%**	Mandatory Standard
Delaware	0.50%	1.25%	2.50%	5.00%	8.00%	11.00%	15.00%	N/A	N/A	N/A	N/A	N/A	**15.00%**	Pending
Hawaii	1.50%	3.00%	4.50%	6.00%	7.50%	9.00%	10.50%	12.00%	13.50%	15.00%	16.50%	18.00%	**18.00%**	Mandatory Standard
Illinois	0.40%	1.00%	1.80%	2.80%	4.20%	6.00%	8.00%	10.00%	12.00%	14.00%	16.00%	18.00%	**18.00%**	Cost Cap
Indiana	N/A	0.30%	0.80%	1.49%	2.39%	3.48%	4.77%	6.26%	7.95%	9.84%	11.83%	13.81%	**13.81%**	Mandatory Standard
Iowa	1.00%	2.20%	3.50%	4.90%	6.30%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**6.30%**	Mandatory Standard
Maine	N/A	N/A	1.00%	2.20%	3.60%	5.00%	N/A	N/A	N/A	N/A	N/A	N/A	**5.00%**	Mandatory Standard
Maryland	0.99%	2.23%	4.70%	7.70%	10.70%	13.70%	16.70%	N/A	N/A	N/A	N/A	N/A	**16.70%**	Mandatory Standard
Massachusetts	1.00%	2.50%	4.50%	6.90%	9.30%	11.70%	14.10%	16.50%	18.90%	21.30%	23.70%	26.10%	**26.10%**	Mandatory Standard
Michigan	0.30%	0.80%	1.55%	2.55%	3.55%	4.55%	5.55%	6.55%	7.55%	8.55%	9.55%	10.55%	**10.55%**	Cost Cap
Minnesota	N/A	1.50%	3.00%	4.50%	6.00%	7.50%	9.00%	10.50%	12.00%	13.50%	15.00%	16.50%	**16.50%**	Mandatory Standard
Nevada	0.77%	0.80%	1.58%	1.62%	2.41%	2.46%	3.00%	3.05%	3.11%	3.16%	3.21%	3.76%	**3.76%**	Combined RES-EERS
New Mexico	N/A	0.86%	1.72%	2.56%	3.38%	4.20%	4.80%	5.40%	5.98%	6.56%	7.32%	8.06%	**8.06%**	Exit Ramp
New York	2.10%	4.22%	6.38%	8.56%	10.76%	12.99%	15.25%	N/A	N/A	N/A	N/A	N/A	**15.25%**	Mandatory Standard

Attachment 4:

MI Western Energy Efficiency Targets and Funding Levels

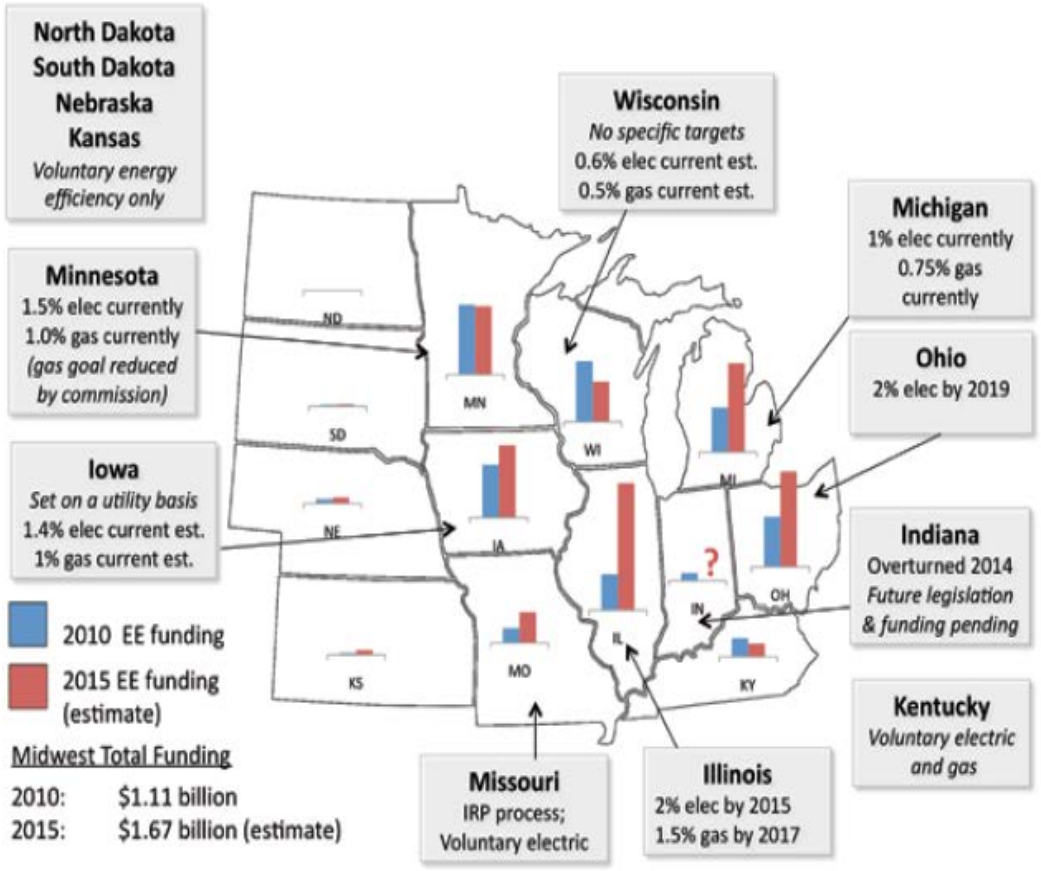

Figure 1: Midwest Efficiency Targets and Funding Levels
Midwest Energy Efficiency Alliance, April 2014

Attachment 5

State	Citation	Utility Incentives
Indiana	170 IAC 4-8-7	When appropriate, the Commission may provide the utility with a shareholder incentive to encourage participation in and promotion of a demand-side management (DSM) program. A utility may propose a shareholder incentive based on particular attributes of a DSM program and the program's desired results. A shareholder incentive may include, but is not limited to, the following: (a) a percentage share of the net benefit attributable to a (DSM) program; (b) authorization for the utility to a greater-than-normal return on equity for a rate-based (DSM) expenditure; and/or (c) an adjustment to a utility's overall return on equity in response to quantitative or qualitative evaluation of demand-side management program performance.
Kansas	Final Order in 08-GMX-441-GIV	The Commission's policy shall be to consider proposals for shared savings performance incentive plans where they are tied to specific energy efficiency programs the Commission considers most desirable. Approved Westar's Shared Savings mechanism in docket 10-WSEE-775-TAR.
Kentucky	278.285	Allows utilities to include in customer bill surcharge an incentive bonus associated with approved cost-effective energy efficiency programs.
Michigan	PA 295 Section 75	An energy optimization plan of a provider whose rates are regulated by the Commission may authorize a commensurate financial incentive for the provider for exceeding the energy optimization performance standard. The total amount of a financial incentive shall not exceed the lesser of the following amounts: (a) 25% of the net cost reductions experienced by the provider's customers as a result of implementation of the energy optimization plan. (b) 15% of the provider's actual energy efficiency program expenditures for the year.
Minnesota	Minn. Stat. 216B.16 Subd. 6c	The Commission may order public utilities to develop and submit for Commission approval incentive plans that describe the method of recovery and accounting for utility conservation expenditures and savings. In developing the incentive plans, the Commission shall ensure the effective involvement of interested parties. In approving incentive plans, the Commission shall consider: (1) whether the plan is likely to increase utility investment in cost-effective energy conservation; (2) whether the plan is compatible with the interest of utility ratepayers and other interested parties; (3) whether the plan links the incentive to the utility's performance in achieving cost-effective conservation; and (4) whether the plan is in conflict with other provisions of this chapter. The Commission may set rates to encourage the vigorous and effective implementation of utility conservation programs. The Commission may: (1) increase or decrease any otherwise allowed rate of return on net investment based upon the utility's skill, efforts, and success in conserving energy; (2) share between ratepayers and utilities the net savings resulting from energy conservation programs to the extent justified by the utility's skill, efforts, and success in conserving energy; and (3) adopt any mechanism that satisfies the criteria of this subdivision, such that implementation of cost-effective conservation is a preferred resource choice for the public utility considering the impact of conservation on earnings of the public utility.
Missouri	393.1075 RSMo. Cum. Supp. 2010	Ensures that utility financial incentives are aligned with helping customers use energy more efficiently and in a manner that sustains or enhances these incentives.
Nebraska		All electric utilities in Nebraska are either public power districts or cooperatives. As such, they do not have stockholders, and there is no need for an incentive mechanism. As an example, Omaha Public Power District identified this in its 2009 report under the Public Utility Regulatory Policies Act (PURPA)[152].
Ohio	OAC 4901:1-39-07	Utilities can recover "shared savings."
South Dakota	SDCL 49-34A-8.2.	Provides incentive rates for improved performance and efficiency. In addition to any other rate authorized, the Commission may approve incentive rates to encourage improved performance and efficiency of public utilities. The rates are in the form of preapproved rate models made applicable as levels of performance are attained by the utility.
Wisconsin	Docket 6680-UR-114	Utilities can propose incentives as part of their rate cases for the voluntary utility-administered energy efficiency programs that are outside of the Focus on Energy program. The incentive is in the form of shared savings. Alliant (WP&L) has received Commission approval to utilize the shared savings mechanism for one of the programs it offers outside of the Focus on Energy program.

* Illinois, Iowa, and North Dakota do not have utility incentive mechanisms.

Attachment 6.

Summary of selected Energy Efficiency Secondary Market Transactions

	Craft 3 Self-Help	Keystone HELP	NYSERDA	Toledo PACE	Connecticut C-PACE	Delaware SEU	HERO PACE I	HERO PACE II	WHEEL (forthcoming)	Kilowatt (forthcoming)
Date	December 2013	January 2013	NYSERDA	Toledo PACE	Connecticut C-PACE	Delaware SEU	February 2014	October 2014	TBD	TBD
Size	$15.7M	$24M	August 2013	2012-2013	May 2014	July 2011	$104M	$129M	TBD	TBD
Transaction Type	Portfolio Sale	Portfolio Sale	Revenue Bond (as QECB)	Revenue Bond	Revenue Bond	Revenue Bond	ABS	ABS	ABS	ABS
Seller (Type)	Craft3 (Private)	PA Treasury (Public)	NYSERDA (Public)	Toledo Lucas-County Port Authority (Public)	Public Finance Authority - conduit (Public)	Delaware SEU (Quasi-public)	WRCOG (Quasi-public)	WRCOG and SANBAG (Quasi-public)	WHEEL SPV (Private)	Kilowatt (Private)
Primary Capital Source	Craft 3 funds	Treasury funds	RGGI funds	Municipal revenue bonds	Municipal revenue bonds	ESCO contracts	Limited Obligation Improvement Bonds	Limited Obligation Improvement Bonds	Citibank/ Pennsylvania Treasury line of credit	Citibank line of credit
Market Sector of Underlying Loans	Residential	Residential	Residential	Commercial	Commercial	Public/ Institutional	Residential	Residential	Residential	Residential
Investor Type	Single purchaser	Consortium	Public Offer	Private Placement	Private Placement	Public Offer	Private Placement	Private Placement	Public Offer	TBD
Investor(s) if Known	Self-Help	Fox Chase, WSFS Bank, National Penn	Many, including Impact Investors	Not reported	Clean Fund, CGB	Many	Not reported	Not reported	TBD	TBD
Rating	n/a	n/a	AAA/Aaa	Unrated	Unrated	AA+	AA	AA	TBD	TBD
Yield*	5.99%	6%	3.2%	Not reported	Not reported	3.7%	4.75%	3.99%	TBD	TBD
Average Maturity	20 years	4 years	7 years	Not reported	Not reported	Not reported	11 years	11 years	TBD	TBD
Credit Enhancement (see Chapter 4 for definitions)	Reserve Account, Partial Guarantee	Sub ordination	Loan Guarantee	Reserve Account	Sale at discount	Appropriations backing (guarantee)	Over collateralization (3%), Liquidity Reserve (3% growing to 7%), Excess Spread (4%)	Over collateralization, Liquidity Reserve (3% growing to 7%), Excess Spread (4%)	Sub ordination (~20%)	TBD

** Yield to investors. Note that effective cost of capital to issuers may be lower than yield in the case of QECBs, which receive an interest rate subsidy.*

Attachment 7

Detailed taxonomy of energy efficiency programs as prepared by LBNL.

Residential Programs

Detailed category	Detailed program definition	Simplified category	Present or Absent in NH Core
Behavioral/On line Audit/Feedback	Residential programs designed around directly influencing household habits and decision-making on energy consumption through quantitative or graphical feedback on consumption, sometimes accompanied by tips on savings energy. These programs include behavioral feedback programs (in which energy usage reports compare a consumer's household energy usage with those of similar consumers); online audits that are completed by the consumer; and in-home displays that help consumers assess their usage in near real time. This program category does not include on-site energy assessments or audits.	Behavior/ Education	Yes
Consumer Product Rebate/ Appliances	Programs that incentivize the sale, purchase and installation of appliances (e.g., refrigerators, dishwashers, clothes washers and dryers) that are more efficient than current standards. Appliance recycling and the sale/purchase/installation of HVAC equipment, water heaters and consumer electronics are accounted for separately.	Consumer Product rebate	Yes
Consumer Product Rebate/ Electronics	Programs that encourage the availability and purchase/lease of more efficient personal and household electronic devices, including but not limited to televisions, set-top boxes, game consoles, advanced power strips, cordless telephones, PCs and peripherals specifically for home use, chargers for phones/smart phones/tablets. A comprehensive efficiency program to decrease the electricity use of consumer electronics products includes two focuses: product purchase and product use. Yet not every consumer electronics program will seek to be comprehensive. Some programs will embark on ambitious promotions of multiple electronics products, employing upstream, midstream, and downstream strategies with an aggressive marketing and education component. At the other end of the continuum, a program administrator may choose to focus exclusively	Consumer Product rebate	No incentives or markdowns for these products

	on consumer education.		
Consumer Product Rebate/Lighting	Programs aimed specifically at encouraging the sale/purchase and installation of more efficient lighting in the home. These programs range widely from point-of-sale rebates to CFL mailings or giveaways. Measures tend to be CFLs, fluorescent fixtures, LED lamps, LED fixtures, LED holiday lights and lighting controls, including occupancy monitors/switches.	Consumer Product Rebate	Yes
Appliance Recycling	Programs designed to remove less efficient appliances (typically refrigerators and freezers) from households.	Consumer Product Rebate	Yes
Multi-Family	Multi-family programs are designed to encourage the installation of energy efficient measures in common areas, units or both for residential structures of more than four units. These programs may be aimed at building owners/managers, tenants or both.	**Multi-Family**	Yes
New Construction	Programs that provide incentives and possibly technical services to ensure new homes are built or manufactured to energy performance standards higher than applicable code (e.g., ENERGY STAR Homes). These programs include new multi-family and new/replacement mobile homes.	**New Construction**	Yes
HVAC	Programs designed to encourage the distribution, sale/purchase, proper sizing and installation of HVAC systems that are more efficient than current standards. Programs tend to support activities that focus on central air conditioners, air source heat pumps, ground source heat pumps, and ductless systems that are more efficient than current energy performance standards, as well as climate controls and the promotion of quality installation and quality maintenance.	Prescriptive	Yes
Insulation	Programs designed to encourage the sale/purchase and installation of insulation in residential structures, often through per-square-foot incentives for insulation of specific R-values versus an existing baseline. Programs may be point-of-sale rebates or rebates to insulation installation contractors.	Prescriptive	No: No separate prescriptive incentives (incentives in HEA+HPwES when installed by BPI certified contractor)
Pool Pump	Programs that incentivize the installation of higher efficiency or variable speed pumps and controls, such as timers, for swimming pools.	Prescriptive	No

Prescriptive	Residential programs that provide or incentivize a set of pre-approved measures not included in, or distinguishable from, the other residential program categories (e.g., direct install, HVAC, lighting). For example, if a residential program features rebates for a large set of mixed, pre-approved offerings (e.g., insulation, HVAC, appliances, lighting), yet the relative contribution of each measure to program savings is unclear or no single measure accounts for a large majority of the savings, then the program should be classified as a residential prescriptive program.		No…all prescriptive (or custom) via BPI auditor recommendation in HEA and HPwES
Water Heater	Programs designed to encourage the distribution, sale/purchase and installation of electric and/or gas water-heating systems that are more efficient than current standards, including high efficiency water storage tank and tankless systems.		Yes
Windows	Programs designed to encourage the sale/purchase and installation of efficient windows in residential structures.		No specific windows program: However efficient windows are an element of ES Home program. There are no stand-alone rebates for windows. They are sometimes installed, when cost effectiveness, in HPWES/HEA.
Whole Home/ Direct Install	Direct-install programs provide a set of pre-approved measures that may be installed at the time of a visit to the customer premises or provided as a kit to the consumer, usually at modest or no cost to the consumer and sometimes accompanied by a rebate. Typical measures include CFLs, lowflow showerheads, faucet aerators, water-heater wrap and weather stripping. Such programs may also include a basic, walk-through energy assessment or audit, but the savings are principally derived from the installation of the provided measures. Education programs that supply kits by sending them home with school children are not included in this		Yes:

	program category; they are classified as education programs.		
Whole Home/ Audits	Residential audit programs provide a comprehensive, standalone assessment of a home's energy consumption and identification of opportunities to save energy. The scope of the audit includes the whole home although the thoroughness and completeness of the audit may vary widely from a modest examination and simple engineering-based modeling of the physical structure to a highly detailed inspection of all spaces, testing for air leakage/exchange rates, testing for HVAC duct leakage and highly resolved modeling of the physical structure with benchmarking to customer utility bills.		Yes
Whole Home/ Retrofit	Whole-home energy upgrade or retrofit programs combine a comprehensive energy assessment or audit that identifies energy savings opportunities with house-wide improvements in air sealing, insulation and, often, HVAC systems and other end uses. The HVAC improvements may range from duct sealing to a tune up to full replacement of the HVAC systems. Whole-home programs are designed to address a wide variety of individual measures and building systems, including but not limited to: HVAC equipment, thermostats, furnaces, boilers, heat pumps, water heaters, fans, air sealing, insulation (attic, wall, and basement), windows, doors, skylights, lighting, and appliances. As a result, whole-home programs generally involve one or more rebates for multiple measures. Whole-home programs generally come in two types: comprehensive programs that are broad in scope and less comprehensive, prescriptive programs sometimes referred to as "bundled efficiency" programs. This category addresses all of the former and most of the latter, but it excludes direct-install programs that are accounted for separately.		Yes:
Financing	Programs designed to provide or facilitate loans, credit enhancements or interest rate reductions/buy downs. As with other programs, included costs are utility costs, including the costs of any inducements for lenders, e.g., loan loss reserves, interest rate buy-downs, etc. Where participant costs are available for collection, these ideally will include the total customer share, i.e., both principal (the participant payment to purchase and install		Yes

	measures) and interest on that debt. Most of these programs will be directed toward enhancing credit or financing for residential structures.		
Other	Programs designed to encourage investment in energy efficiency activities in residences but are so highly aggregated (e.g., Existing Homes programs that include retrofits, appliances, equipment, etc.) and undifferentiated that they cannot be sorted into the residential program categories that are detailed in this document.		Yes: (Ex. Early Boiler Replacements)

2384

2385 Commercial Programs

2386

Detailed category	Detailed program definition	Simplified category	Present or absent in NH Core
Audit	Programs in which an energy assessment is performed on one or more participant commercial facilities to identify sources of potential energy waste and measures to reduce that waste.	Custom	Yes
Custom	Programs designed around the delivery of site-specific projects typically characterized by an extensive onsite energy assessment and identification and installation of multiple measures unique to that facility. These measures may vary significantly from site to site. This category is intended to capture "whole-building" approaches to commercial sector efficiency opportunities for a wide range of building types and markets (e.g., office, retail) and wide range of measures.		Yes:
Commissioning/Retro-Commissioning	Programs aimed at diagnosing energy consumption in a commercial facility and optimizing its operations to minimize energy waste. Such programs may include installation of certain measures (e.g., occupancy monitors and switches), but program activities tend to be characterized more by tuning or retuning, coordinating and testing the operation of existing end uses, systems and equipment for energy efficient operation. The construction of new commercial/industrial facilities that includes energy performance commissioning should be categorized as "Com: New Construction". The de novo installation of		Yes

	energy management systems with accompanying sensors, monitors and switches is regarded as a major capital investment and should be categorized under "Com: Custom".		
Govt./Nonprofit/ MUSH	MUSH (Municipal, University, School & Hospital) and government and nonprofit programs cover a broad swath of program types generally aimed at public and institutional facilities and which include a wide range of measures. Programs which focus on specific technologies (e.g., HVAC and lighting) have their own commercial program categories Examples include incentives and/or technical assistance to promote energy efficiency upgrades for elementary schools, recreation halls and homeless shelters. Street lighting is accounted for as a separate program category.		Yes
Street Lighting	Street lighting programs include incentives and/or technical support for the installation of higher efficiency street lighting and traffic lights than the current baseline.		Yes
New Construction	Programs that incentivize owners or builders of new commercial facilities to design and build beyond current code or to a certain certification level (e.g., ENERGY STAR or LEED).		Yes: Although there is no ENERGY STAR Standard for new C&I buildings, Utilities do provide incentives for equipment above code / standard practice and will work with customer/architect on new building designs.

HVAC	C&I HVAC programs encourage the sale/purchase and installation of heating, cooling and/or ventilation systems at higher efficiency than current energy performance standards, across a broad range of unit sizes and configurations. Most of these programs will be directed toward commercial structures.		Yes
Lighting	C&I lighting programs incentivize the installation of efficient lighting and lighting controls. Typical measures might include T-8/T-5 fluorescent lamps and fixtures; CFLs and fixtures; LEDs for lighting, displays, signs and refrigerated lighting; metal halide and ceramic lamps and fixtures; occupancy controls; daylight dimming; and timers.		Yes
Performance Contracting/ DSM Bidding	Programs that incentivize or otherwise encourage energy services companies (ESCOs) and participants to perform energy efficiency projects, usually under an energy performance contract (EPC), a standard offer or other arrangement that involves ESCOs or customers offering a quantity of energy savings in response to a competitive solicitation/bidding process with compensation linked to achieved savings.		Yes: Directly thru EE incentives. (Some customers choose performance contracting, some ESCOs sell performance contracting.)
Prescriptive/IT & Office Equipment	Programs aimed at improving the efficiency of office equipment, chiefly commercially available PCs, printers, monitors, networking devices and mainframes not rising to the scale of a server farm or floor.		No: could be done via a Custom Measure.
Prescriptive/ Grocery	Grocery programs are prescriptive programs aimed at supermarkets and are usually designed around indoor and outdoor lighting and refrigerated display cases.		Yes
Other	Prescriptive programs that encourage the purchase and installation of some or all of a specified set of pre-approved measures besides those covered in other measure-specific prescriptive programs (e.g., HVAC and Lighting).		Yes:

Custom	Custom programs applied to small commercial facilities. (See definition of custom programs for additional detail.)		Yes
Prescriptive	Prescriptive programs applied to small commercial facilities. (See definition of prescriptive programs for additional detail.) Such programs may range from a walk-through audit and direct installation of a few pre-approved measures to a fuller audit and a fuller package of measures. Audit only programs have their own category.		Yes
Financing	Programs designed to provide or facilitate loans, credit enhancements or interest rate reductions/buy downs. As with other programs, included costs are utility costs, including the costs of any inducements for lenders, e.g., loan loss reserves, interest rate buy-downs, etc. Where participant costs are available for collection, these ideally will include the total customer share, i.e., both principal (the participant payment to purchase and install measures) and interest on that debt. Most of these programs will be directed toward enhancing credit or financing for commercial structures.		Yes:
Other	Programs not captured by any of the specific commercial program categories but are sufficiently distinct to the commercial sector to not be treated as a "Commercial/Industrial Other" program. Example: An EE program aimed specifically at the commercial subsector but is not clearly prescriptive or custom in nature.		Yes

2387

2388 Industrial /Agricultural Programs

2389

Detailed category	Detailed program definition	Simplified category	Present or absent in NH Core
Audit	Programs in which an energy assessment is performed on one or more participant industrial or agricultural facilities to identify sources of potential energy waste and measures to reduce that waste.	Custom	Yes
Custom	Programs designed around the delivery of site-specific projects typically characterized by an extensive onsite energy assessment and identification and installation of multiple measures unique to that facility. These measures may vary significantly from site to site. This category is intended to capture "whole-facility" approaches to industrial or agricultural sector efficiency opportunities for		Yes

	a wide range of building types and markets		
Custom/ Data Centers	Data center programs are custom-designed around large-scale server floors or data centers that often serve high-tech, banking or academia. Projects tend to be site-specific and involve some combination of lighting, servers, networking devices, cooling/chillers, and energy management systems/software. Several of these may be of experimental or proprietary design.		Yes: via Custom Incentives. No specific program for Data Centers.
Custom/Ind. & Ag. Process	Industrial programs deliver custom-designed projects that are characterized by an onsite energy and process efficiency assessment and a site-specific measure set focused on process related improvements that may include, for example, substantial changes in a manufacturing line. This category includes all EE program work at industrial or agricultural sites that is process focused and not generic (and thus would be in the custom category) and not otherwise covered by the single-measure prescriptive programs below (e.g., lighting, HVAC, water heaters).		Yes: as part of a retro-commissioning project or a specific audit.
Custom/ Refrigerated Warehouses	Warehouse programs are typically aimed at large-scale refrigerated storage facilities and often target end uses such as lighting, climate controls and refrigeration systems.		Yes: via Custom incentives.
New Construction	Programs that incentivize owners or builders of new industrial or agricultural facilities to design and build beyond current code or to a certain certification level, e.g., ENERGY STAR or LEED.	New Construction	Yes: Although there is no ENERGY STAR Standard for new C&I buildings, Utilities do provide incentives for equipment above code / standard practice and will work with customer/architect on new building designs.
Prescriptive Industrial	Prescriptive programs that encourage the purchase and installation of some or all of a specified set of pre-approved industrial measures besides those covered in other measure-specific prescriptive programs on this list, e.g., industrial compressor programs.	Prescriptive	Yes: via Custom incentives.

Prescriptive/ Agriculture	Farm- and orchard-based agricultural programs that primarily involve irrigation pumping and do not include agricultural refrigeration or processing at scale.		Yes: via Custom incentives.
Prescriptive/ Motors	Motors programs usually offer a prescribed set of approved higher efficiency motors, with industrial motors programs typically getting the largest savings from larger, high powered motors (>200 hp).		Yes
Financing	Programs designed to provide or facilitate loans, credit enhancements or interest rate reductions/buy downs. As with other programs, included costs are utility costs, including the costs of any inducements for lenders, e.g., loan loss reserves, interest rate buy-downs, etc. Where participant costs are available for collection, these ideally will include the total customer share, i.e., both principal (the participant payment to purchase and install measures) and interest on that debt. Most of these programs will be directed toward enhancing credit or financing for industrial and/or agricultural facilities	All other IA	Yes (LU and UES)

2390

Self Direct	Industrial programs that are designed and delivered by the participant, using funds that otherwise would have been paid as ratepayer support for all DSM programs. These programs may be referred to as "opt out" programs, among other names		No

2391 Commercial/Industrial Programs

Detailed category	Detailed program definition	Simplified category	Present or absent in NH Core
Custom	Programs designed around the delivery of site-specific industrial and commercial projects typically characterized by an extensive onsite energy assessment and identification and installation of multiple measures unique to that facility. This category is for programs that address **both** the commercial and industrial sectors and cannot be relegated to one sector or another for lack of information on participation or savings.	Custom	Yes
New Construction	Programs that incentivize owners or builders of new commercial and industrial facilities to design and build beyond current code or to a certain certification level, e.g., ENERGY STAR or LEED. This category	New Construction	Yes: Although there is no ENERGY STAR Standard for new C&I buildings,

	should be used sparingly for those programs that cannot be identified with either the commercial or industrial sector on the basis of information available about participation or the source(s) of savings.		Utilities do provide incentives for equipment above code / standard practice and will work with customer/architect on new building designs.
Prescriptive	Prescriptive programs that encourage the purchase and installation of some or all of a specified set of pre-approved industrial and/or commercial measures but which cannot be differentiated by sector based upon the description of the participants or nature or source of the savings.	Prescriptive	Yes
Self Direct	Generally large commercial and industrial programs that are designed and delivered by the participant, using funds that otherwise would have been paid as ratepayer support for all DSM programs. This category is to be used for self-direct or opt-out programs that address both large commercial and industrial entities but which cannot be differentiated between these sectors because the nature and source of the savings is not available or is also too highly aggregated.	All other C&I	No
Mixed Offerings	Programs that cannot be classified under any of the specific commercial or industrial program categories and span a large variety of offerings aimed at both the commercial and industrial sectors.		Yes: via Custom incentives.
Other	Programs not captured by any of the specific commercial/industrial categories but are sufficiently distinct to the industrial and/or agricultural sectors to not be treated as a "Commercial/Industrial Other" program		Yes: via Custom incentives.

2392 Cross Cutting and Other Programs

Detailed category	Detailed program definition	Simplified category	Present or absent in NH Core
Codes & Standards (C&S)	In C&S programs, the PA may engage in a variety of activities designed to advance the adoption, application or compliance level of building codes and end-use energy performance standards. Examples	**Codes & Standards (C&S)**	Yes, part of Educati

	might include advocacy at the state or federal level for higher standards for HVAC equipment; training of architects, engineers and builder/developers on code compliance; and training of building inspectors in ensuring the codes are met.		on Programs. Utilities work with NHPUC Code person and provide Energy Code training to building code officials, builders, architects, etc. on both Code and "beyond code" construction techniques. Utilities are part of the NH Code Collaborative (nhenergycode.com)
Market Transformation (MT)	Programs that encourage a reduction in market barriers resulting from a market intervention, as evidenced by a set of market effects that is likely to last after the intervention has been withdrawn, reduced, or changed. MT programs are gauged by their market effects (e.g., increased awareness of energy efficient technologies	**Market Transformation (MT)**	Yes:

	among customers and suppliers); reduced prices for more efficient models; increased availability of more efficient models; and ultimately, increased market share for energy efficient goods, services and design practices. Example programs might include upstream incentives to manufacturers to make more efficient goods more commercially available; and point-of-sale or installation incentives for emerging technologies that are not yet cost effective. Workforce training and development programs are covered by a separate category. Upstream incentives for commercially available goods are sorted into the program categories for those goods (e.g., consumer electronics or HVAC).		
Workforce Development	Workforce training and development programs are a distinct category of market transformation program designed to provide the underlying skills and labor base for deployment of energy-efficiency measures.		Yes
Marketing, Education, Outreach (ME&O)	ME&O programs include most standalone marketing, education and outreach programs (e.g., statewide marketing, outreach and brand development). In-school energy and water efficiency programs are also included in this category, including those that supply school children with kits of prescriptive measures such as CFLs and low-flow showerheads for installation at home.	**Marketing, Education, Outreach (ME&O)**	Yes
Other	This category is intended to capture all programs that cannot be allocated to a specific sector (or are multi-sectoral) and cannot be allocated to a specific program type.		Yes
Planning/ Evaluation/ Other Programmatic Support	Non-ME&O support programs include the range of activities not otherwise accounted for in program-specific costs but needed for planning & designing a portfolio of programs and otherwise complying with regulatory requirements for DSM activities outside of program implementation. These activities generally are focused on the front and back end of program cycles, in assessing prospective programs; designing programs and portfolios; assessing the cost effectiveness of measures, programs and portfolios; and arranging for, directing or delivering reports and evaluations of the process and impacts of those programs - where those costs are not captured in program costs.		No Yes
Voltage Reduction/ Transformers	Programs that support investments in distribution system efficiency or enhance distribution system operations by reducing losses. The most common form of these programs involve the installation and use of conservation voltage regulation/reduction (CVR) systems and practices that control distribution feeder		No: Voltage Reduction and Power Factor

	voltage so that utilization devices operate at their peak efficiency, which is usually at a level near the lower bounds of their utilization or nameplate voltages. Other measures may include installation of higher efficiency transformers. These programs generally are not targeted to specific end users but typically involve changes made by the electricity distribution utility.		Correction are done via Engineering or Customers themselves (not EE) initiatives.
Shading/ Cool Roofs	Shading/reflective programs include programs designed to lessen heating and cooling loads through changes to the exterior of a structure (e.g., tree plantings to shade walls and windows, window screens and cool/reflective roofs). These programs are not necessarily specific to a sector.		Yes, via custom incentive
Multi-Sector Rebates	Multi-sector rebate programs include providing incentives for commercially available end-use goods for multiple sectors (e.g., PCs, HVAC).		Yes: HVAC No: PCs Yes via custom incentives.
Research	These programs are aimed generally at helping the PA identify new opportunities for energy savings (e.g., research on emerging technologies or conservation strategies). Research conducted on new program types or the inclusion of new, commercially available measures in an existing program are accounted for separately under cross-cutting program support.		Yes: via EEI, CEE, NEEP, ESource, Technical Assistance, and program administrators and installation contrac

			tors. One utility may pilot a new program or initiative (eg. CHP, Home Energy Reports, Wifi Tstats) prior to implementation as statewide.

Low income programs

Detailed category	.	Simplified category	Present or absent in NH Core
Low Income	Low-income programs are efficiency programs aimed at lower income households, based upon some type of income/means testing or eligibility. These programs most often take the form of single-family weatherization, but a variety of other program types also are included in this program category (e.g., multi-family/affordable housing weatherization, low-income direct-install programs).	**Low Income**	Yes

Demand Response Programs

Detailed category	Detailed program definition	Simplified category	Present or absent in NH Core
Time-of-Use Pricing	Demand-side management that uses a retail rate or Tariff in which customers are charged different prices for using electricity at different times during the day. Examples are time-of-use rates,	Pricing	No

	real time pricing, hourly pricing, and critical peak pricing. Time-based rates do not include seasonal rates, inverted block, or declining block rates.		
Critical Peak Pricing	Demand-side management that combines direct load control with a pre-specified high price for use during designated critical peak periods, triggered by system contingencies or high wholesale market prices.		No
Critical Peak Pricing with Load Control	Demand-side management that combines direct load control with a pre-specified high price for use during designated critical peak periods, triggered by system contingencies or high wholesale market prices.		No
Real-Time Pricing	Demand-side management that uses rate and price structure in which the retail price for electricity typically fluctuates hourly or more often, to reflect changes in the wholesale price of electricity on either a day-ahead or hour-ahead basis.		No
Peak Time Rebate	Peak time rebates allow customers to earn a rebate by reducing energy use from a baseline during a specified number of hours on critical peak days. Like Critical Peak Pricing, the number of critical peak days is usually capped for a calendar year and is linked to conditions such as system reliability concerns or very high supply prices.	Rebate	No
Other	Load management programs that are not captured by the specific DR categories named on this list.	Other	No

2398