



**Recommended Electric Energy Efficiency Scenario
for Vermont's 20-Year Demand Resources Plan
Comparative Analysis and Findings**

**Submitted by
Vermont Energy Investment Corporation
to the
Vermont Public Service Board**

**Proceeding EEU-2013-01
2015-2034 EEU Demand Resources Plan**

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Vermont Public Service Board Proceeding EEU-2013-01 2015-2034 EEU Demand Resources Plan

Recommended Electric Energy Efficiency Scenario for Vermont's 20-Year Demand Resources Plan Comparative Analysis and Findings

I. Executive Summary

Vermont Energy Investment Corporation (VEIC) submits this analysis and findings document in accordance with the demand-side planning responsibilities specified in the Vermont Public Service Board's December 2010 Order of Appointment for an Energy Efficiency Utility (EEU).¹

This is the Board's second triennial assessment of alternative long-range energy efficiency investment scenarios and selection of the next 20-year Demand Resources Plan (DRP) for 2015-2034. Pursuant to the Board's Order of September 30, 2013 (Order Determining Electric Resource Acquisition Scenarios to Be Analyzed and Electric and Thermal Energy and Process Fuel Quantitative Performance Indicator Framework), VEIC presents this comparative analysis and results in support of its recommended electric energy efficiency investment scenario for Years 2015 – 2034.²

This document builds on information VEIC provided in January 2014, analyzing the three alternative budget and savings scenarios approved by the Board for analysis and consideration.³ These three scenarios represent the range of potential paths for the State of Vermont to follow in integrating the DRP with future transmission, distribution, and generation

¹ The Order, "Process and Administration for an Energy Efficiency Utility Order of Appointment" (December 20, 2010), issued pursuant to Docket 7466, provides that "The Department of Public Service will propose demand-side electricity resource acquisition budgets and savings goals for 3- and 20-year periods to the Board, as well as a set of year-by-year savings goals for heating-and-process fuels by calendar year for a ten-year period. An EEU and other interested parties may also propose budgets and goals." (pg. 9)

² The September 30 Order specifies the scenarios for analysis of year-by-year costs and benefits for electric efficiency—the subject of this filing, as well as costs and benefits for thermal energy and process fuels, which is the subject of a separate section of the Demand Resources Plan Proceeding (DRPP).

³ "Analysis of Three Electric Energy Efficiency Scenarios for The 2015 – 2034 Demand Resources Plan," December 6, 2013, and slides presented at the January 16, 2014 workshop convened to discuss that analysis.

planning. Scenario 1 (“Level Budgets”), represents the lowest budget in the range. By holding annual spending constant in real terms, it yields slowly but steadily declining savings. In this scenario, future efficiency acquisition costs are expected to increase from ongoing tightening of efficiency equipment standards, stronger building codes, successful market transformations, and diminishing marginal returns per dollar of efficiency investment.

Scenario 3 (“3 Percent Savings”) is the upper end of the range. At this funding level, annual energy savings would be raised to 3 percent from current levels of roughly 2 percent of electricity sales. This increase will require higher budgets because of rising unit costs of savings.

In between is Scenario 2 (“Sustained Growth”), which would maintain savings at current levels relative to annual sales, requiring smaller increases in annual portfolio budgets than those in Scenario 3.

Starting from VEIC’s previous savings and cost-effectiveness analysis of each scenario, this filing compares all three in terms of the amount of supply resources avoided, and the magnitude of net benefits produced. It also calculates and compares the differing impacts among the three scenarios in terms of their relative contributions toward meeting Vermont’s long-range goals for carbon emission reductions.

From this analysis, VEIC concludes that pursuing reductions of up to 3 percent in annual electric energy sales offers the greatest amount of achievable capacity to Vermont’s electric system, the greatest societal net benefits to Vermont’s economy, and the lowest electricity bills to Vermont’s utility customers, and the largest reductions in pollution emissions to Vermont’s environment.

Adoption of this recommendation would achieve the statutory requirement to capture all reasonably available cost-effective energy efficiency.⁴ This recommendation would also advance the realization of the 2011 Comprehensive Energy Plan to “achieve savings of up to 3% of the electric demand annually.”⁵ Realizing these positive outcomes would exert only modest upward pressure on electric rates.

Consequently, VEIC recommends that the Board adopt Scenario 3 as the preferred statewide DRP for 2015-2034, and set 2015-2017 spending and performance goals accordingly.

These conclusions and recommendations are supported by findings from VEIC’s examination of the differences in the following defined outcomes among the three scenarios:

- **Spending:** constant 2015 dollars

⁴ 30 V.S.A. § 209.

⁵ Vermont Comprehensive Energy Plan, December 2011, page 5.

- **Electricity savings:** incremental and cumulative annual energy and peak demand reductions at generation
- **Cost-effectiveness:** present value of life-cycle benefits and costs, under the societal and electric system tests
- **Carbon emission reductions:** short tons of CO₂ emission reductions over the lifetime of each portfolio's energy savings

Spending and savings

Scenario 1 is the Level Budget scenario; it is referred to as the *Low budget scenario* in Synapse Energy Economics' rate and bill analysis.

Scenario 2 is the Sustained Growth scenario; it is referred to as the *Base budget scenario* in Synapse's rate and bill analysis.

Scenario 3 is the 3% Savings scenario; it is referred to as the *High budget scenario* in Synapse's rate and bill analysis.

Table 1 compares the (1) annual spending, (2) incremental annual savings, (3) average incremental coincident summer peak savings, and (4) yield rates (\$ / MWh) associated with the three scenarios. The table presents outcomes for 3, 10, and 20 years.

Scenario 3 requires total portfolio spending of \$1.627 billion between 2015 and 2034 in constant 2015 dollars. This amount is \$678 million more than in Scenario 2, and almost \$840 million more than in Scenario 1. The expenditures under Scenario 3 would generate 2,589 GWh in incremental annual energy savings, and 412 MW incremental annual summer peak load reductions after 20 years. These Scenario 3 amounts would result in savings that are approximately 758 GWh and 125 MW more than those forecast under Scenario 2; and 905 GWh and 147 MW more than those forecast under Scenario 1.

The higher unit costs of acquiring annual savings (\$ / MWh / year) reported in **Table 1** clearly indicate the effect on program spending in Scenarios 2 and 3 from increasing financial incentives to achieve higher participation rates.

Table 1. Spending and electricity savings under three DRP scenarios

		Scenario 1: Level Budgets			Scenario 2: Sustained Growth			Scenario 3: 3% Savings		
Years	Average Annual Budgets (2015\$)	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio
0-3	2015-2017	\$14,042,000	\$25,328,667	\$39,370,667	\$14,862,333	\$26,745,667	\$41,608,000	\$22,673,983	\$35,655,702	\$58,329,685
4-13	2018-2027	\$16,338,500	\$23,031,500	\$39,370,000	\$19,419,500	\$27,326,700	\$46,746,200	\$35,366,620	\$52,369,853	\$87,736,474
14-20	2028-2034	\$18,335,857	\$21,035,143	\$39,371,000	\$23,770,000	\$27,252,000	\$51,022,000	\$29,875,190	\$52,315,342	\$82,190,531
		Scenario 1: Level Budgets			Scenario 2: Sustained Growth			Scenario 3: 3% Savings		
Years	Average Incremental Annual MWh Savings	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio
0-3	2015-2017	41,008	57,721	98,729	42,592	60,376	102,968	57,363	74,949	132,312
4-13	2018-2027	35,349	49,030	84,380	39,142	52,228	91,370	57,295	80,339	137,634
14-20	2028-2034	36,037	41,800	77,836	41,728	45,153	86,881	47,323	69,253	116,576
		Scenario 1: Level Budgets			Scenario 2: Sustained Growth			Scenario 3: 3% Savings		
Years	Average Incremental Annual Summer MW Savings	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio
0-3	2015-2017	4.13	11.11	15.25	4.29	11.63	15.92	5.76	14.29	20.05
4-13	2018-2027	4.15	9.31	13.46	4.59	9.92	14.51	6.97	15.09	15.09
14-20	2028-2034	4.42	7.81	12.24	5.12	8.45	13.57	6.16	12.67	18.82
		Scenario 1: Level Budgets			Scenario 2: Sustained Growth			Scenario 3: 3% Savings		
Years	Spending per Incremental MWh Saved	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio	Residential	Commercial/Industrial	Portfolio
0-3	2015-2017	\$342	\$439	\$399	\$349	\$443	\$404	\$395	\$476	\$441
4-13	2018-2027	\$462	\$470	\$467	\$496	\$523	\$512	\$617	\$652	\$637
14-20	2028-2034	\$509	\$503	\$506	\$570	\$604	\$587	\$631	\$755	\$705

Table 1 uses values from revised April 8, 2014, budgets for Scenario 1 and Scenario 2.⁶

Table 2 presents the differences in (a) average incremental annual MWh savings and (b) average incremental annual summer MW savings between Scenarios 2 and 1, between Scenarios 3 and 2, and between Scenarios 3 and 1. That is, the comparisons show increases from the Sustained Growth scenario over the Level Budget scenario; and increases from the 3 Percent Savings scenario over the Level Budget, and over the Sustained Growth scenarios.

The analysis reveals that Scenario 3 produces significantly more annualized energy and summer capacity savings than either Scenario 2 or Scenario 1.

⁶ On April 8, 2014, VEIC submitted revised 2015-2034 budgets for Scenarios 1 and 2 to remove an inflation factor incorrectly applied to the EEU-2010-06 DRP "Appendix A" electric budgets. These calculations were used to establish 2015-2034 EEU-2013-01 Scenario 1 and Scenario 2 budgets. Removing inflation lowered the budgets relative to the budgets filed on December 6, 2013. MWh savings estimates for Scenarios 1 and 2 were accordingly re-calculated for informational purposes. There are no changes to Scenario 3 budgets or savings.

Table 2. MWh and Summer MW savings comparison, under three DRP scenarios

		Scenario 2 vs Scenario 1			Scenario 3 vs Scenario 2			Scenario 3 vs Scenario 1		
Years	Average Incremental Annual MWh Savings	Residential	Commercial/ Industrial	Portfolio	Residential	Commercial/ Industrial	Portfolio	Residential	Commercial/ Industrial	Portfolio
0-3	2015-2017	1,585	2,655	4,240	14,770	14,573	29,343	16,355	17,228	33,583
4-13	2018-2027	3,793	3,198	6,991	18,153	28,110	46,263	21,946	31,308	53,254
14-20	2028-2034	5,691	3,353	9,045	5,594	24,100	29,695	11,286	27,454	38,739
		Scenario 2 vs Scenario 1			Scenario 3 vs Scenario 2			Scenario 3 vs Scenario 1		
Years	Average Incremental Annual Summer MW Savings	Residential	Commercial/ Industrial	Portfolio	Residential	Commercial/ Industrial	Portfolio	Residential	Commercial/ Industrial	Portfolio
0-3	2015-2017	0.16	0.52	0.68	1.47	2.66	4.13	1.63	3.18	4.81
4-13	2018-2027	0.44	0.60	1.05	2.37	5.18	7.55	2.82	5.78	8.60
14-20	2028-2034	0.70	0.63	1.33	1.03	4.22	5.26	1.73	4.85	6.59

Table 2 uses values from revised April 8, 2014, budgets for Scenario 1 and Scenario 2.

Cost-effectiveness

Table 3 presents and compares costs and benefits of the three scenarios under the Societal Test and the Electric System Test. All three scenarios are cost effective for Vermont's economy and its electricity consumers under both tests. Scenario 3 provides the greatest net benefits, despite the higher expenditures per unit saved. Although the benefit-cost ratios for Scenario 3 under both cost-effectiveness tests are the lowest among the three scenarios, its net benefits are the highest.⁷ Under the Societal Test, the net benefit is \$1.966 billion in 2015 dollars, and under the Electric System Test, the net benefit is \$942 million. These Scenario 3 benefits produce \$347 million more than those produced under Scenario 2, with the Societal Test; and \$57 million more, with the Electric System Test. The Scenario 3 net benefits produce \$450 million more than those produced under Scenario 1, with the Societal Test; and \$64 million more, with the Electric System Test.

⁷ It is the magnitude of net benefits, not the ratio of benefits to costs, that is decisive in determining the relative value of competing investment alternatives.

Table 3. Cost-effectiveness of competing DRP scenarios

	Societal Net Benefits in 2015 \$		
	Scenario 1	Scenario 2	Scenario 3
Costs	\$893,367,889	\$994,897,423	\$1,461,509,963
Benefits	\$2,408,845,731	\$2,613,606,108	\$3,427,088,646
Net Benefits	\$1,515,477,842	\$1,618,708,685	\$1,965,578,683
Benefit / Cost Ratio	2.70	2.63	2.34

	Electric Net Benefits in 2015 \$		
	Scenario 1	Scenario 2	Scenario 3
Costs	\$640,419,878	\$762,554,598	\$1,232,582,723
Benefits	\$1,518,490,264	\$1,646,981,457	\$2,174,169,528
Net Benefits	\$878,070,385	\$884,426,859	\$941,586,805
Benefit / Cost Ratio	2.37	2.16	1.76

Table 3 uses values from VEIC's December 6, 2013, filing.

II. Comparative Analysis of the DRP Scenarios

This section presents further details of VEIC's comparative analysis and resulting findings regarding the three efficiency resource acquisition scenarios. VEIC compared projected outcomes of the three competing scenarios from five broad perspectives:

- Spending and electricity savings
- Electricity sales and peak demand forecast
- Cost-effectiveness analysis
- Carbon emissions reductions
- Rate and bill analysis

In each set of comparisons, results are shown for the residential sector, the business (commercial and industrial) sector, and for the entire portfolio. The spending and savings results for the three scenarios are shown first in tabular form and then as a graphic. Scenario cost-effectiveness analyses are tabulated next, followed by an analysis of carbon emissions reductions. Next is a section on the status of VEIC's review of bill and rate impacts. Conclusions and recommendations are stated in the third and final section of this report.

A. Spending and Electricity Savings

Table 4. Scenario spending and annual incremental MWh savings, 2015 – 2034

Resource Acquisition Budgets (Real 2015 \$), excluding Operations Fee										
Scenario 1	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
C&I	\$25,985,000	\$25,197,000	\$24,804,000	\$23,622,000	\$23,622,000	\$23,622,000	\$23,622,000	\$23,622,000	\$22,441,000	\$22,441,000
RES	\$13,386,000	\$14,173,000	\$14,567,000	\$15,748,000	\$15,748,000	\$15,748,000	\$15,748,000	\$15,748,000	\$16,929,000	\$16,929,000
Total	\$39,371,000	\$39,370,000	\$39,371,000	\$39,370,000	\$39,370,000	\$39,370,000	\$39,370,000	\$39,370,000	\$39,370,000	\$39,370,000
Scenario 2	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
C&I	\$25,985,000	\$26,654,000	\$27,598,000	\$26,576,000	\$26,937,000	\$27,285,000	\$27,564,000	\$27,911,000	\$26,815,000	\$27,144,000
RES	\$13,386,000	\$14,993,000	\$16,208,000	\$17,717,000	\$17,958,000	\$18,190,000	\$18,376,000	\$18,608,000	\$20,229,000	\$20,477,000
Total	\$39,371,000	\$41,647,000	\$43,806,000	\$44,293,000	\$44,895,000	\$45,475,000	\$45,940,000	\$46,519,000	\$47,044,000	\$47,621,000
Scenario 3	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
C&I	\$31,598,271	\$35,330,124	\$40,038,711	\$43,976,125	\$49,417,376	\$50,484,962	\$54,327,801	\$54,447,514	\$54,503,140	\$54,366,857
RES	\$20,890,610	\$22,622,035	\$24,509,305	\$28,981,856	\$28,805,938	\$36,500,355	\$41,900,576	\$42,118,900	\$37,590,499	\$36,385,392
Total	\$52,488,881	\$57,952,159	\$64,548,015	\$72,957,981	\$78,223,315	\$86,985,317	\$96,228,377	\$96,566,414	\$92,093,640	\$90,752,250
Incremental Annual MWh Savings, Net at Generation										
Scenario 1	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
C&I	61,906	56,960	54,297	51,443	51,046	50,352	52,061	50,780	47,348	47,817
RES	38,962	41,124	42,937	42,076	44,478	35,296	32,342	31,479	32,736	33,207
TOTAL	100,869	98,083	97,235	93,518	95,524	85,648	84,404	82,259	80,084	81,025
Scenario 2	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
C&I	61,890	60,445	58,794	55,257	55,525	55,155	53,447	52,887	49,761	50,890
RES	39,024	42,913	45,839	45,235	48,066	38,388	35,808	35,010	36,514	37,206
TOTAL	100,914	103,358	104,634	100,492	103,592	93,544	89,255	87,897	86,276	88,096
Scenario 3	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
C&I	70,827	75,090	78,931	82,592	85,925	84,656	83,039	81,500	79,947	78,428
RES	54,428	57,472	60,188	62,306	64,262	60,549	60,063	58,732	55,063	54,423
TOTAL	125,255	132,562	139,119	144,898	150,187	145,206	143,101	140,232	135,009	132,850

Resource Acquisition Budgets (Real 2015 \$), excluding Operations Fee										
Scenario 1	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
C&I	\$22,441,000	\$22,441,000	\$22,441,000	\$21,260,000	\$21,260,000	\$21,260,000	\$21,260,000	\$21,260,000	\$20,473,000	\$20,473,000
RES	\$16,929,000	\$16,929,000	\$16,929,000	\$18,111,000	\$18,111,000	\$18,111,000	\$18,111,000	\$18,111,000	\$18,898,000	\$18,898,000
Total	\$39,370,000	\$39,370,000	\$39,370,000	\$39,371,000	\$39,371,000	\$39,371,000	\$39,371,000	\$39,371,000	\$39,371,000	\$39,371,000
Scenario 2	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
C&I	\$27,466,000	\$27,736,000	\$27,833,000	\$26,646,000	\$26,889,000	\$27,185,000	\$27,570,000	\$27,878,000	\$27,146,000	\$27,450,000
RES	\$20,720,000	\$20,923,000	\$20,997,000	\$22,698,000	\$22,905,000	\$23,157,000	\$23,485,000	\$23,748,000	\$25,058,000	\$25,339,000
Total	\$48,186,000	\$48,659,000	\$48,830,000	\$49,344,000	\$49,794,000	\$50,342,000	\$51,055,000	\$51,626,000	\$52,204,000	\$52,789,000
Scenario 3	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
C&I	\$54,225,306	\$54,125,495	\$53,823,957	\$53,667,559	\$53,382,377	\$52,916,943	\$52,375,754	\$51,862,812	\$51,295,221	\$50,706,727
RES	\$34,813,897	\$33,700,478	\$32,868,308	\$32,453,390	\$30,938,057	\$30,912,805	\$29,905,809	\$29,089,531	\$28,334,918	\$27,491,817
Total	\$89,039,203	\$87,825,974	\$86,692,265	\$86,120,949	\$84,320,434	\$83,829,748	\$82,281,564	\$80,952,342	\$79,630,139	\$78,198,544
Incremental Annual MWh Savings, Net at Generation										
Scenario 1	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
C&I	47,136	46,476	45,844	42,926	43,410	42,825	42,249	41,690	39,676	39,821
RES	33,662	34,035	34,181	35,581	35,528	35,635	35,834	36,058	36,717	36,905
TOTAL	80,798	80,511	80,025	78,507	78,938	78,460	78,083	77,748	76,393	76,727
Scenario 2	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
C&I	50,328	50,018	49,013	45,767	46,672	46,228	45,911	45,318	42,943	43,232
RES	37,904	38,536	38,754	40,527	40,619	41,031	41,553	41,921	43,037	43,410
TOTAL	88,232	88,554	87,768	86,293	87,291	87,259	87,464	87,239	85,979	86,642
Scenario 3	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
C&I	77,039	75,757	74,503	73,309	72,051	70,623	69,230	67,857	66,501	65,202
RES	53,468	52,513	51,576	50,615	48,731	48,674	47,498	46,418	45,185	44,138
TOTAL	130,507	128,270	126,079	123,924	120,782	119,297	116,727	114,276	111,685	109,339

Table 4 uses values from revised April 8, 2014, budgets for Scenario 1 and Scenario 2.

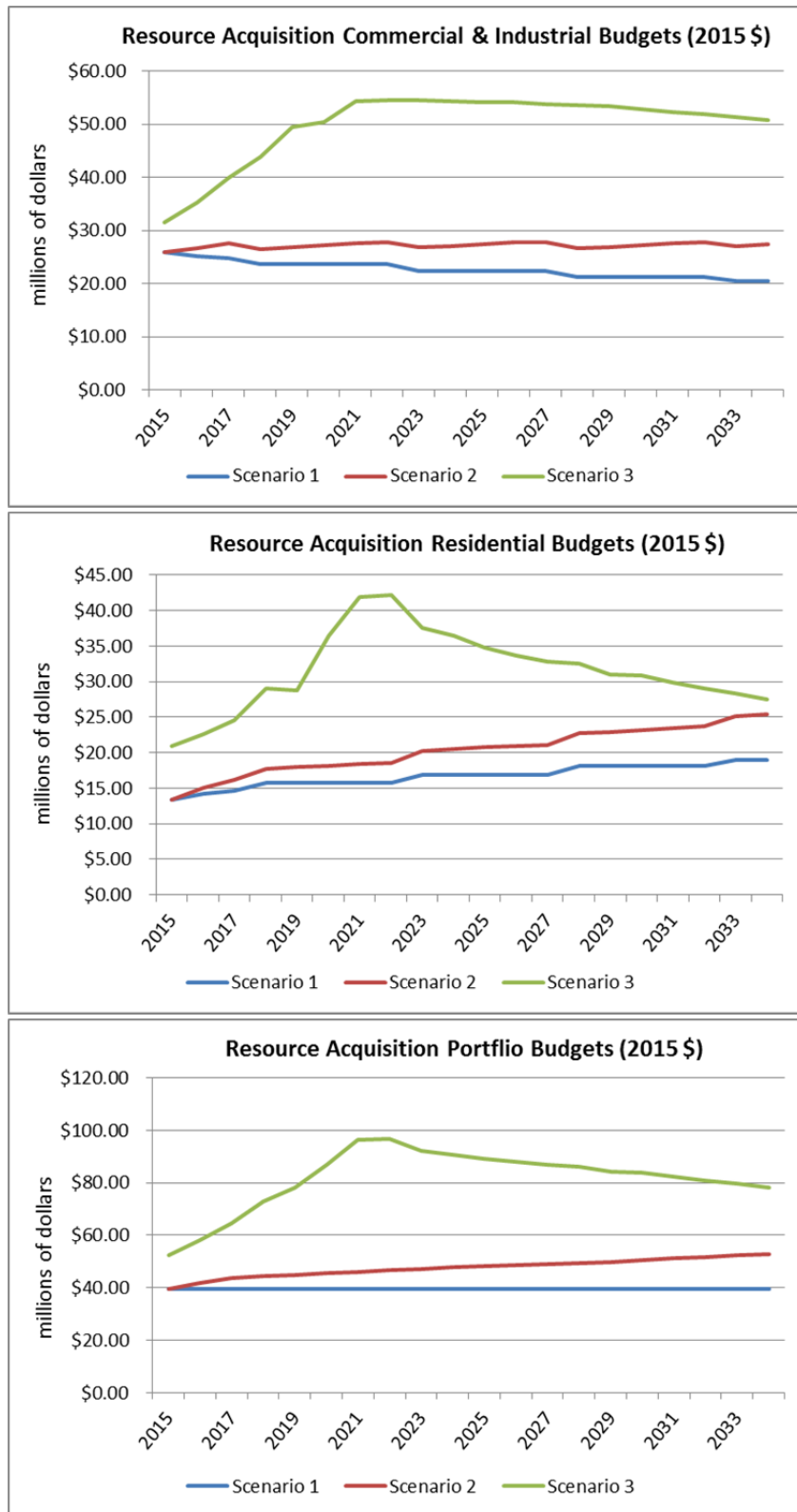


Figure 1 uses values from revised April 8, 2014 budgets for Scenario 1 and Scenario 2.

Figure 1. Scenario spending, by sector and portfolio.

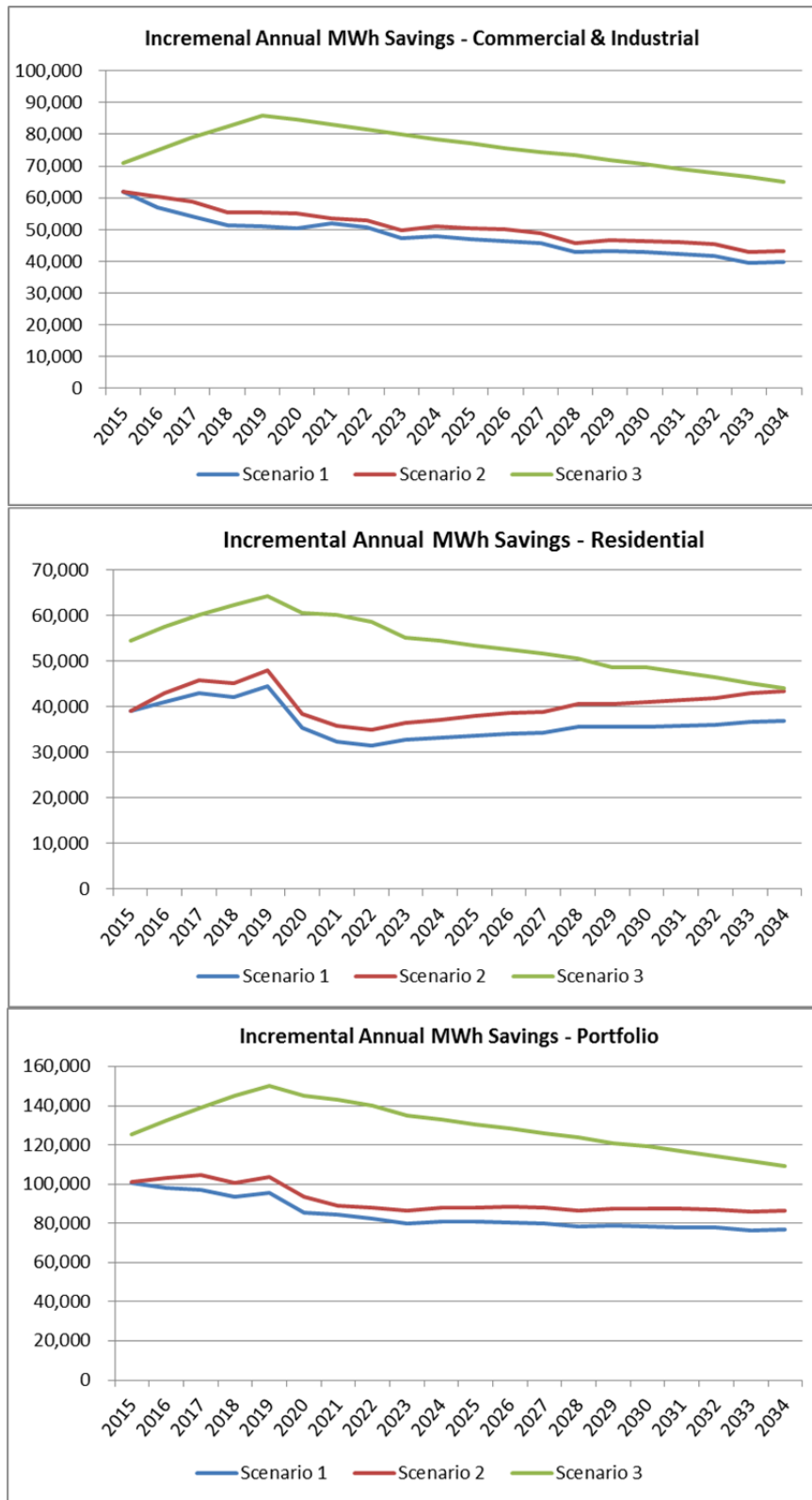


Figure 2 uses values from revised April 8, 2014 budgets for Scenario 1 and Scenario 2.

Figure 2. Scenario incremental annual MWh savings, by sector and portfolio.

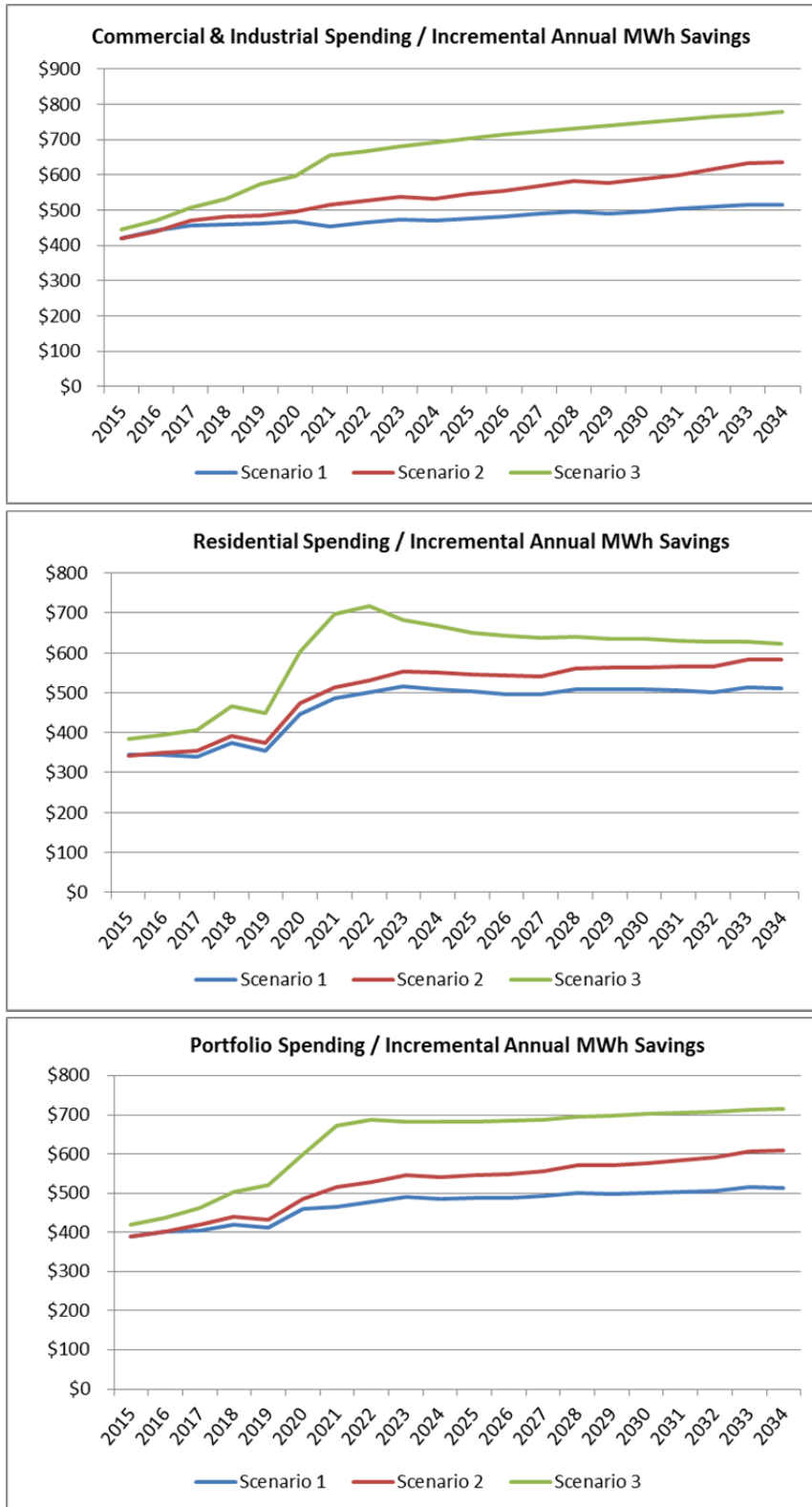


Figure 3 uses values from revised April 8, 2014 budgets for Scenario 1 and Scenario 2.

Figure 3. Spending per incremental annual MWh saved, by sector and portfolio

B. Scenario Impacts on Electricity Sales and Peak Demand Forecast

Table 5. Cumulative impact of Scenario 1 (Level Budget) on energy forecast

Scenario 1 - Level Budgets												
Year	Energy Forecast MWh at Generation			Cumulative Annual MWh Savings at Generation			Adjusted Energy Forecast Net Cumulative Annual MWh Savings			Cumulative Annual MWh Savings Share of Energy Forecast		
	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio
2015	2,947,580	2,267,055	5,214,635	65,778	41,410	107,188	2,881,802	2,225,645	5,107,447	2.23%	1.83%	2.06%
2016	3,015,457	2,313,563	5,329,020	124,133	72,962	197,094	2,891,325	2,240,601	5,131,926	4.12%	3.15%	3.70%
2017	3,069,537	2,350,386	5,419,923	178,052	106,285	284,337	2,891,485	2,244,101	5,135,586	5.80%	4.52%	5.25%
2018	3,126,417	2,386,190	5,512,607	227,513	137,537	365,051	2,898,903	2,248,653	5,147,556	7.28%	5.76%	6.62%
2019	3,178,560	2,413,884	5,592,444	275,047	170,212	445,258	2,903,513	2,243,673	5,147,186	8.65%	7.05%	7.96%
2020	3,226,365	2,316,328	5,542,693	320,977	141,473	462,450	2,905,388	2,174,856	5,080,244	9.95%	6.11%	8.34%
2021	3,274,750	2,369,326	5,644,076	366,261	161,243	527,504	2,908,489	2,208,084	5,116,572	11.18%	6.81%	9.35%
2022	3,313,565	2,389,918	5,703,483	407,103	177,595	584,698	2,906,462	2,212,323	5,118,785	12.29%	7.43%	10.25%
2023	3,351,050	2,312,899	5,663,950	444,216	193,996	638,211	2,906,835	2,118,904	5,025,738	13.26%	8.39%	11.27%
2024	3,389,159	2,356,480	5,745,639	480,575	210,444	691,019	2,908,584	2,146,036	5,054,620	14.18%	8.93%	12.03%
2025	3,431,985	2,392,105	5,824,090	506,878	227,278	734,156	2,925,106	2,164,827	5,089,934	14.77%	9.50%	12.61%
2026	3,478,939	2,426,978	5,905,917	531,227	243,982	775,209	2,947,712	2,182,996	5,130,708	15.27%	10.05%	13.13%
2027	3,526,952	2,461,132	5,988,085	553,927	260,659	814,585	2,973,026	2,200,473	5,173,499	15.71%	10.59%	13.60%
2028	3,577,886	2,491,033	6,068,919	571,395	276,344	847,739	3,006,491	2,214,689	5,221,180	15.97%	11.09%	13.97%
2029	3,625,489	2,472,521	6,098,010	580,020	291,070	871,091	3,045,469	2,181,450	5,226,919	16.00%	11.77%	14.28%
2030	3,662,964	2,548,690	6,211,654	565,506	304,088	869,594	3,097,458	2,244,603	5,342,060	15.44%	11.93%	14.00%
2031	3,700,509	2,562,421	6,262,929	556,903	314,820	871,723	3,143,605	2,247,601	5,391,206	15.05%	12.29%	13.92%
2032	3,738,815	2,584,462	6,323,276	546,448	324,076	870,525	3,192,366	2,260,385	5,452,752	14.62%	12.54%	13.77%
2033	3,777,677	2,594,967	6,372,644	533,466	332,366	865,831	3,244,212	2,262,601	5,506,813	14.12%	12.81%	13.59%
2034	3,816,470	2,615,263	6,431,733	517,294	342,458	859,751	3,299,177	2,272,805	5,571,982	13.55%	13.09%	13.37%

Table 5 uses values from VEIC's December 6, 2013, filing.

Table 6. Cumulative impact of Scenario 2 (Sustained Growth) on energy forecast

Scenario 2 - Sustained Growth												
Year	Energy Forecast MWh at Generation			Cumulative Annual MWh Savings at Generation			Adjusted Energy Forecast Net Cumulative Annual MWh Savings			Cumulative Annual MWh Savings Share of Energy Forecast		
	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio
2015	2,947,580	2,267,055	5,214,635	65,760	41,479	107,239	2,881,820	2,225,577	5,107,397	2.23%	1.83%	2.06%
2016	3,015,457	2,313,563	5,329,020	127,808	74,887	202,695	2,887,650	2,238,676	5,126,325	4.24%	3.24%	3.80%
2017	3,069,537	2,350,386	5,419,923	186,439	110,723	297,162	2,883,098	2,239,663	5,122,761	6.07%	4.71%	5.48%
2018	3,126,417	2,386,190	5,512,607	239,754	144,332	384,086	2,886,663	2,241,858	5,128,521	7.67%	6.05%	6.97%
2019	3,178,560	2,413,884	5,592,444	291,737	179,649	471,386	2,886,823	2,234,235	5,121,058	9.18%	7.44%	8.43%
2020	3,226,365	2,316,328	5,542,693	342,380	150,309	492,689	2,883,985	2,166,019	5,050,004	10.61%	6.49%	8.89%
2021	3,274,750	2,369,326	5,644,076	388,694	172,418	561,112	2,886,056	2,196,908	5,082,964	11.87%	7.28%	9.94%
2022	3,313,565	2,389,918	5,703,483	431,267	190,976	622,243	2,882,298	2,198,942	5,081,241	13.02%	7.99%	10.91%
2023	3,351,050	2,312,899	5,663,950	470,559	209,612	680,171	2,880,492	2,103,287	4,983,779	14.04%	9.06%	12.01%
2024	3,389,159	2,356,480	5,745,639	509,598	228,347	737,945	2,879,561	2,128,133	5,007,694	15.04%	9.69%	12.84%
2025	3,431,985	2,392,105	5,824,090	538,698	247,529	786,228	2,893,286	2,144,576	5,037,862	15.70%	10.35%	13.50%
2026	3,478,939	2,426,978	5,905,917	565,745	266,660	832,405	2,913,194	2,160,318	5,073,512	16.26%	10.99%	14.09%
2027	3,526,952	2,461,132	5,988,085	590,502	285,691	876,193	2,936,450	2,175,441	5,111,891	16.74%	11.61%	14.63%
2028	3,577,886	2,491,033	6,068,919	609,830	303,987	913,817	2,968,056	2,187,046	5,155,102	17.04%	12.20%	15.06%
2029	3,625,489	2,472,521	6,098,010	620,498	321,234	941,732	3,004,991	2,151,286	5,156,277	17.11%	12.99%	15.44%
2030	3,662,964	2,548,690	6,211,654	607,535	336,886	944,420	3,055,429	2,211,805	5,267,234	16.59%	13.22%	15.20%
2031	3,700,509	2,562,421	6,262,929	599,665	350,270	949,935	3,100,844	2,212,151	5,312,994	16.20%	13.67%	15.17%
2032	3,738,815	2,584,462	6,323,276	589,400	361,960	951,359	3,149,415	2,222,502	5,371,917	15.76%	14.01%	15.05%
2033	3,777,677	2,594,967	6,372,644	575,977	372,905	948,881	3,201,701	2,222,062	5,423,763	15.25%	14.37%	14.89%
2034	3,816,470	2,615,263	6,431,733	559,449	385,642	945,091	3,257,021	2,229,622	5,486,643	14.66%	14.75%	14.69%

Table 6 uses values from VEIC's December 6, 2013, filing.

**Table 7. Cumulative impacts of Demand Resources Plan scenarios on energy forecast:
Scenario 2 versus Scenario 1**

Year	Scenario 1 - Level Budgets			Scenario 2 - Sustained Growth			Impact of Energy Decrease: Scenario 2 vs Scenario 1		
	Adjusted Energy Forecast Net Cumulative Annual MWh Savings			Adjusted Energy Forecast Net Cumulative Annual MWh Savings					
	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio
2015	2,881,802	2,225,645	5,107,447	2,881,820	2,225,577	5,107,397	100.00%	100.00%	100.00%
2016	2,891,325	2,240,601	5,131,926	2,887,650	2,238,676	5,126,325	99.87%	99.91%	99.89%
2017	2,891,485	2,244,101	5,135,586	2,883,098	2,239,663	5,122,761	99.71%	99.80%	99.75%
2018	2,898,903	2,248,653	5,147,556	2,886,663	2,241,858	5,128,521	99.58%	99.70%	99.63%
2019	2,903,513	2,243,673	5,147,186	2,886,823	2,234,235	5,121,058	99.43%	99.58%	99.49%
2020	2,905,388	2,174,856	5,080,244	2,883,985	2,166,019	5,050,004	99.26%	99.59%	99.40%
2021	2,908,489	2,208,084	5,116,572	2,886,056	2,196,908	5,082,964	99.23%	99.49%	99.34%
2022	2,906,462	2,212,323	5,118,785	2,882,298	2,198,942	5,081,241	99.17%	99.40%	99.27%
2023	2,906,835	2,118,904	5,025,738	2,880,492	2,103,287	4,983,779	99.09%	99.26%	99.17%
2024	2,908,584	2,146,036	5,054,620	2,879,561	2,128,133	5,007,694	99.00%	99.17%	99.07%
2025	2,925,106	2,164,827	5,089,934	2,893,286	2,144,576	5,037,862	98.91%	99.06%	98.98%
2026	2,947,712	2,182,996	5,130,708	2,913,194	2,160,318	5,073,512	98.83%	98.96%	98.89%
2027	2,973,026	2,200,473	5,173,499	2,936,450	2,175,441	5,111,891	98.77%	98.86%	98.81%
2028	3,006,491	2,214,689	5,221,180	2,968,056	2,187,046	5,155,102	98.72%	98.75%	98.73%
2029	3,045,469	2,181,450	5,226,919	3,004,991	2,151,286	5,156,277	98.67%	98.62%	98.65%
2030	3,097,458	2,244,603	5,342,060	3,055,429	2,211,805	5,267,234	98.64%	98.54%	98.60%
2031	3,143,605	2,247,601	5,391,206	3,100,844	2,212,151	5,312,994	98.64%	98.42%	98.55%
2032	3,192,366	2,260,385	5,452,752	3,149,415	2,222,502	5,371,917	98.65%	98.32%	98.52%
2033	3,244,212	2,262,601	5,506,813	3,201,701	2,222,062	5,423,763	98.69%	98.21%	98.49%
2034	3,299,177	2,272,805	5,571,982	3,257,021	2,229,622	5,486,643	98.72%	98.10%	98.47%

Table 7 uses values from VEIC's December 6, 2013, filing.

Table 8. Cumulative impact of Scenario 3 (3 Percent Savings Target) on energy forecast

Year	Scenario 3 - 3% Savings Target											
	Energy Forecast MWh at Generation			Cumulative Annual MWh Savings at Generation			Adjusted Energy Forecast Net Cumulative Annual MWh Savings			Cumulative Annual MWh Savings Share of Energy Forecast		
	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio
2015	2,947,580	2,267,055	5,214,635	70,827	54,428	125,255	2,876,753	2,212,628	5,089,381	2.40%	2.40%	2.40%
2016	3,015,457	2,313,563	5,329,020	143,832	95,869	239,701	2,871,625	2,217,694	5,089,320	4.77%	4.14%	4.50%
2017	3,069,537	2,350,386	5,419,923	218,575	139,792	358,367	2,850,962	2,210,594	5,061,556	7.12%	5.95%	6.61%
2018	3,126,417	2,386,190	5,512,607	294,771	184,112	478,883	2,831,646	2,202,078	5,033,724	9.43%	7.72%	8.69%
2019	3,178,560	2,413,884	5,592,444	371,044	227,799	598,843	2,807,516	2,186,085	4,993,601	11.67%	9.44%	10.71%
2020	3,226,365	2,316,328	5,542,693	443,788	199,796	643,584	2,782,577	2,116,532	4,899,109	13.76%	8.63%	11.61%
2021	3,274,750	2,369,326	5,644,076	511,183	237,955	749,139	2,763,566	2,131,371	4,894,937	15.61%	10.04%	13.27%
2022	3,313,565	2,389,918	5,703,483	572,770	271,288	844,058	2,740,796	2,118,630	4,859,425	17.29%	11.35%	14.80%
2023	3,351,050	2,312,899	5,663,950	631,729	299,017	930,745	2,719,322	2,013,883	4,733,204	18.85%	12.93%	16.43%
2024	3,389,159	2,356,480	5,745,639	686,827	325,127	1,011,954	2,702,332	2,031,353	4,733,685	20.27%	13.80%	17.61%
2025	3,431,985	2,392,105	5,824,090	729,183	350,049	1,079,232	2,702,802	2,042,056	4,744,858	21.25%	14.63%	18.53%
2026	3,478,939	2,426,978	5,905,917	767,025	373,407	1,140,432	2,711,914	2,053,570	4,765,485	22.05%	15.39%	19.31%
2027	3,526,952	2,461,132	5,988,085	800,802	395,472	1,196,275	2,726,150	2,065,660	4,791,810	22.71%	16.07%	19.98%
2028	3,577,886	2,491,033	6,068,919	830,182	413,633	1,243,815	2,747,704	2,077,400	4,825,104	23.20%	16.60%	20.49%
2029	3,625,489	2,472,521	6,098,010	846,192	430,187	1,276,378	2,779,297	2,042,334	4,821,631	23.34%	17.40%	20.93%
2030	3,662,964	2,548,690	6,211,654	833,984	445,194	1,279,178	2,828,980	2,103,496	4,932,476	22.77%	17.47%	20.59%
2031	3,700,509	2,562,421	6,262,929	824,530	455,810	1,280,340	2,875,979	2,106,611	4,982,590	22.28%	17.79%	20.44%
2032	3,738,815	2,584,462	6,323,276	807,508	463,923	1,271,431	2,931,307	2,120,539	5,051,846	21.60%	17.95%	20.11%
2033	3,777,677	2,594,967	6,372,644	785,978	466,596	1,252,574	2,991,699	2,128,371	5,120,070	20.81%	17.98%	19.66%
2034	3,816,470	2,615,263	6,431,733	756,518	471,252	1,227,771	3,059,952	2,144,011	5,203,963	19.82%	18.02%	19.09%

Table 8 uses values from VEIC's December 6, 2013, filing.

**Table 9. Cumulative impacts of Demand Resources Plan scenarios on energy forecast:
Scenario 3 versus Scenario 2**

	Scenario 2 - Sustained Growth			Scenario 3 - 3% Savings Target					
	Adjusted Energy Forecast Net Cumulative Annual MWh Savings			Adjusted Energy Forecast Net Cumulative Annual MWh Savings			Impact of Energy Decrease: Scenario 3 vs Scenario 2		
Year	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio	Com/Ind	Residential	Portfolio
2015	2,881,820	2,225,577	5,107,397	2,876,753	2,212,628	5,089,381	99.82%	99.42%	99.65%
2016	2,887,650	2,238,676	5,126,325	2,871,625	2,217,694	5,089,320	99.45%	99.06%	99.28%
2017	2,883,098	2,239,663	5,122,761	2,850,962	2,210,594	5,061,556	98.89%	98.70%	98.81%
2018	2,886,663	2,241,858	5,128,521	2,831,646	2,202,078	5,033,724	98.09%	98.23%	98.15%
2019	2,886,823	2,234,235	5,121,058	2,807,516	2,186,085	4,993,601	97.25%	97.84%	97.51%
2020	2,883,985	2,166,019	5,050,004	2,782,577	2,116,532	4,899,109	96.48%	97.72%	97.01%
2021	2,886,056	2,196,908	5,082,964	2,763,566	2,131,371	4,894,937	95.76%	97.02%	96.30%
2022	2,882,298	2,198,942	5,081,241	2,740,796	2,118,630	4,859,425	95.09%	96.35%	95.63%
2023	2,880,492	2,103,287	4,983,779	2,719,322	2,013,883	4,733,204	94.40%	95.75%	94.97%
2024	2,879,561	2,128,133	5,007,694	2,702,332	2,031,353	4,733,685	93.85%	95.45%	94.53%
2025	2,893,286	2,144,576	5,037,862	2,702,802	2,042,056	4,744,858	93.42%	95.22%	94.18%
2026	2,913,194	2,160,318	5,073,512	2,711,914	2,053,570	4,765,485	93.09%	95.06%	93.93%
2027	2,936,450	2,175,441	5,111,891	2,726,150	2,065,660	4,791,810	92.84%	94.95%	93.74%
2028	2,968,056	2,187,046	5,155,102	2,747,704	2,077,400	4,825,104	92.58%	94.99%	93.60%
2029	3,004,991	2,151,286	5,156,277	2,779,297	2,042,334	4,821,631	92.49%	94.94%	93.51%
2030	3,055,429	2,211,805	5,267,234	2,828,980	2,103,496	4,932,476	92.59%	95.10%	93.64%
2031	3,100,844	2,212,151	5,312,994	2,875,979	2,106,611	4,982,590	92.75%	95.23%	93.78%
2032	3,149,415	2,222,502	5,371,917	2,931,307	2,120,539	5,051,846	93.07%	95.41%	94.04%
2033	3,201,701	2,222,062	5,423,763	2,991,699	2,128,371	5,120,070	93.44%	95.78%	94.40%
2034	3,257,021	2,229,622	5,486,643	3,059,952	2,144,011	5,203,963	93.95%	96.16%	94.85%

Table 9 uses values from VEIC's December 6, 2013, filing.

Table 10. Energy forecast, incremental annual savings, savings as a percent of energy forecast

Scenario 1, Level Budget			Scenario 2, Sustained Growth			Scenario 3, 3% Target		
Energy Forecast, GWh at Generation	Incremental Annual GWh Savings, at Generation	kWh Savings/ Energy Forecast	Energy Forecast, GWh at Generation	Incremental Annual GWh Savings, at Generation	kWh Savings/ Energy Forecast	Energy Forecast, GWh at Generation	Incremental Annual GWh Savings, at Generation	kWh Savings/ Energy Forecast
5,215	100.87	1.9%	5,215	100.91	1.9%	5,215	125.15	2.4%
5,226	98.08	1.9%	5,226	103.36	2.0%	5,201	132.63	2.6%
5,215	97.23	1.9%	5,210	104.63	2.0%	5,155	139.18	2.7%
5,206	93.52	1.8%	5,193	100.49	1.9%	5,102	145.39	2.9%
5,186	95.52	1.8%	5,166	103.59	2.0%	5,028	150.84	3.0%
5,045	85.65	1.7%	5,017	93.54	1.9%	4,834	145.01	3.0%
5,050	84.40	1.7%	5,014	89.25	1.8%	4,774	143.23	3.0%
5,018	82.26	1.6%	4,976	87.90	1.8%	4,680	140.40	3.0%
4,902	80.08	1.6%	4,855	86.28	1.8%	4,508	135.24	3.0%
4,891	81.02	1.7%	4,837	88.10	1.8%	4,436	133.08	3.0%
4,876	80.80	1.7%	4,814	88.23	1.8%	4,362	130.85	3.0%
4,862	80.51	1.7%	4,792	88.55	1.8%	4,290	128.71	3.0%
4,848	80.02	1.7%	4,769	87.77	1.8%	4,219	126.58	3.0%
4,833	78.51	1.6%	4,744	86.29	1.8%	4,148	124.44	3.0%
4,777	78.94	1.7%	4,680	87.29	1.9%	4,043	121.29	3.0%
4,786	78.46	1.6%	4,679	87.26	1.9%	3,995	119.84	3.0%
4,746	78.08	1.6%	4,629	87.46	1.9%	3,907	117.21	3.0%
4,713	77.75	1.6%	4,586	87.24	1.9%	3,826	114.78	3.0%
4,671	76.39	1.6%	4,533	85.98	1.9%	3,740	112.21	3.0%
4,638	76.73	1.7%	4,489	86.64	1.9%	3,662	109.85	3.0%

Table 10 uses values from revised April 8, 2014 budgets for Scenario 1 and Scenario 2.

C. Cost-Effectiveness Analysis

Table 11. Comparison of scenario net benefits, by sector and portfolio, and by societal and energy system cost-effectiveness tests

	Societal Net Benefits in 2015\$								
	Scenario 1			Scenario 2			Scenario 3		
	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio
Costs	\$648,822,397	\$244,545,492	\$893,367,889	\$705,410,982	\$289,486,441	\$994,897,423	\$1,094,998,861	\$366,511,102	\$1,461,509,963
Benefits	\$1,361,720,209	\$1,047,125,522	\$2,408,845,731	\$1,458,874,052	\$1,154,732,057	\$2,613,606,108	\$1,943,324,997	\$1,483,763,649	\$3,427,088,646
Net Benefits	\$712,897,812	\$802,580,030	\$1,515,477,842	\$753,463,070	\$865,245,616	\$1,618,708,685	\$848,326,136	\$1,117,252,548	\$1,965,578,683
Benefit / Cost Ratio	2.10	4.28	2.70	2.07	3.99	2.63	1.77	4.05	2.34

	Electric Net Benefits in 2015\$								
	Scenario 1			Scenario 2			Scenario 3		
	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio
Costs	\$372,667,465	\$267,752,413	\$640,419,878	\$441,533,281	\$321,021,317	\$762,554,598	\$751,870,127	\$480,712,596	\$1,232,582,723
Benefits	\$991,844,061	\$526,646,203	\$1,518,490,264	\$1,063,047,314	\$583,934,142	\$1,646,981,457	\$1,414,999,890	\$759,169,638	\$2,174,169,528
Net Benefits	\$619,176,596	\$258,893,789	\$878,070,385	\$621,514,033	\$262,912,826	\$884,426,859	\$663,129,763	\$278,457,041	\$941,586,805
Benefit / Cost Ratio	2.66	1.97	2.37	2.41	1.82	2.16	1.88	1.58	1.76

Table 11 uses values from VEIC's December 6, 2013, filing.

Table 12. Changes in net benefits among scenarios, by sector and portfolio, and by societal and energy system cost-effectiveness tests

	Societal Net Benefits in 2015\$								
	Scenario 2 vs Scenario 1			Scenario 3 vs Scenario 2			Scenario 3 vs Scenario 1		
	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio
Costs	\$56,588,585	\$44,940,949	\$101,529,534	\$389,587,879	\$77,024,661	\$466,612,540	\$446,176,464	\$121,965,609	\$568,142,074
Benefits	\$97,153,843	\$107,606,535	\$204,760,377	\$484,450,945	\$329,031,593	\$813,482,538	\$581,604,788	\$436,638,127	\$1,018,242,915
Net Benefits	\$40,565,257	\$62,665,586	\$103,230,843	\$94,863,066	\$252,006,932	\$346,869,998	\$135,428,323	\$314,672,518	\$450,100,841
Benefit / Cost Ratio	1.72	2.39	2.02	1.24	4.27	1.74	1.30	3.58	1.79

	Electric Net Benefits in 2015\$								
	Scenario 2 vs Scenario 1			Scenario 3 vs Scenario 2			Scenario 3 vs Scenario 1		
	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio	Com/ Industrial	Residential	Portfolio
Costs	\$68,865,816	\$53,268,903	\$122,134,719	\$310,336,846	\$159,691,280	\$470,028,126	\$379,202,662	\$212,960,183	\$592,162,845
Benefits	\$71,203,254	\$57,287,939	\$128,491,193	\$351,952,576	\$175,235,496	\$527,188,071	\$423,155,829	\$232,523,435	\$655,679,264
Net Benefits	\$2,337,438	\$4,019,036	\$6,356,474	\$41,615,730	\$15,544,216	\$57,159,946	\$43,953,167	\$19,563,252	\$63,516,419
Benefit / Cost Ratio	1.03	1.08	1.05	1.13	1.10	1.12	1.12	1.09	1.11

Table 12 uses values from VEIC's December 6, 2013, filing.

D. Carbon Emissions Reductions

Using marginal emission rates presented in the 2013 Synapse report on avoided supply costs,⁸ VEIC estimated the amount of carbon emissions associated with the energy savings projected from the three scenarios. **Table 13** shows the amount of carbon emission reductions estimated to result over the lifetime of savings from each of the scenarios. Scenario 3's higher levels of energy savings over the 20-year planning period contribute the highest amount of emissions reductions—11.8 million metric tons—across the lifetime of program savings. This amount is 2.8 million metric tons more than what can be achieved in Scenario 2, and 3.5 million more than what can be achieved in Scenario 1. These additional reductions would bring Vermont 1.9 percent closer to achieving its 2028 greenhouse gas emission reduction goals, compared to Scenario 2's reductions, and 2.2 percent closer to achieving those goals under Scenario 1.⁹

Because these additional emission reductions are the by-product of cost-effective electricity savings, the incremental costs to society and Vermont ratepayers are negative. Based on the cost-effectiveness of Scenario 3, the cost to Vermont of achieving the additional emission reductions is -\$166 per metric ton. The incremental costs of acquiring the additional CO₂ reductions from Scenario 3 relative to Scenario 2 and Scenario 1 are -\$162 per metric ton and -\$99 per metric ton, respectively.

Table 13. Carbon emissions reductions, by scenario

Carbon Dioxide Equivalent in Metric Tons			
	Scenario 1	Scenario 2	Scenario 3
RES	3,201,484	3,550,602	4,537,382
C&I	5,122,655	5,498,121	7,298,303
Total	8,324,139	9,048,723	11,835,685

Table 13 uses values from VEIC's December 6, 2013, filing.

⁸ Hornby, Rick, Paul Chernick, David White, et al., 2013. *Avoided Energy Supply Costs in New England: 2013 Report*. Cambridge, MA: Synapse Energy Economics, Inc.

⁹ Title 10 V.S.A. § 578.Greenhouse gas reduction goals.

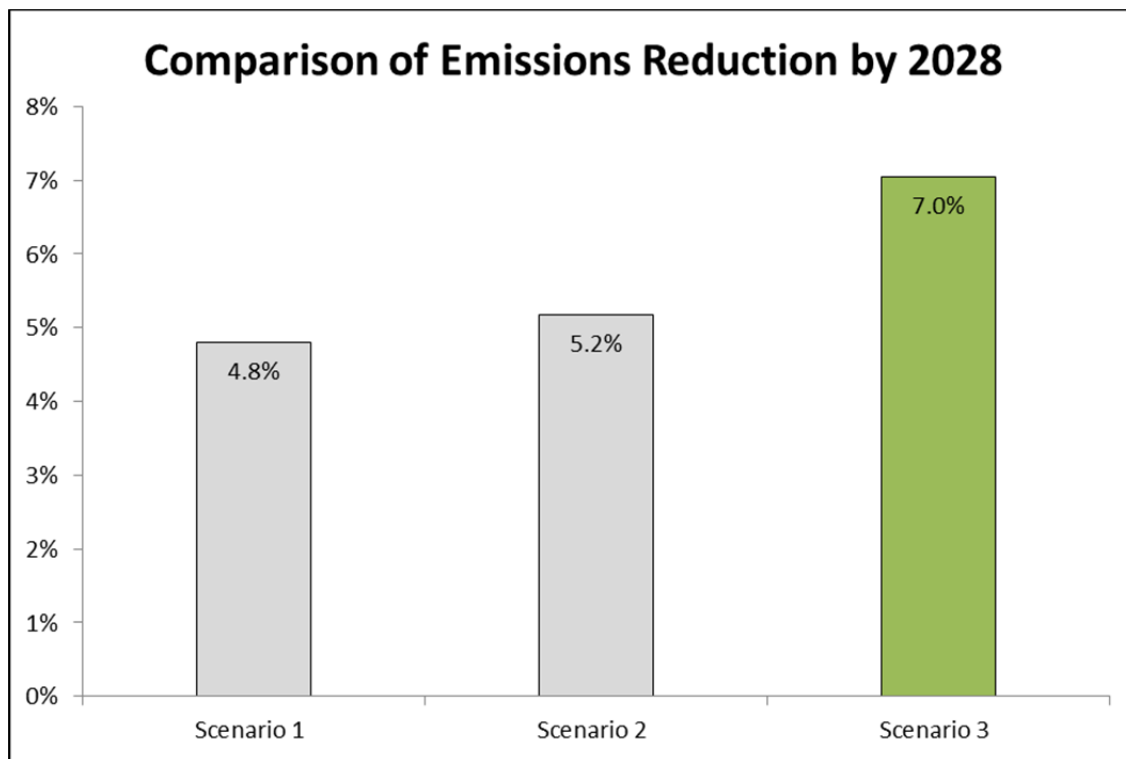


Figure 4. Achievable emissions reductions by 2028, by scenario.

Figure 4 uses values from VEIC's December 6, 2013, filing.

E. Bill and Rate Analysis

Bill and rate impacts

VEIC's bill and rate comments are based on a preliminary review of the bill and rate analysis undertaken by Synapse Energy Economics on behalf of the Public Service Department. The impact analysis involved many workbooks delivered to VEIC on April 9, 2014. Given the delay in presenting this information, VEIC has not yet completed its review of the full data set and accompanying tables. Since April 1, VEIC has been working with Synapse and the Department to address inconsistencies in the data, and related concerns, and to verify and correct inputs and assumptions. VEIC is continuing to review the Synapse analysis and confirming the latest modifications to the analysis. If needed, VEIC will file comments on Synapse's results by May 7, 2014, the deadline for initial comments on DRP budgets and savings recommendations.

III. Conclusions and Recommendations

Using the best available current information, *VEIC recommends that the Board adopt VEIC's proposed set of budgets that support the goals of Scenario 3, the 3 Percent Savings scenario.*

VEIC concludes that this scenario offers the highest value to Vermont's electric system, and delivers the highest amount of net benefit to Vermont's ratepayers. Further, Scenario 3 requires minimal increases in average electricity rates. Vermont's efficiency savings remain, by a wide margin, the state's best, least-cost electric energy supply option.¹⁰

The economic benefits of energy efficiency investments are spread broadly among all Vermont ratepayers. A recent study found that for every \$1 million of public electric efficiency investment by the EEU's, \$4.6 million of present value benefit is returned to the state.¹¹ In addition, compared to the other scenarios, this level of efficiency investment will maximize VEIC's ability to monetize capacity savings in the ISO New England Forward Capacity Market and help minimize future increases in Vermont's Regional Network Service (RNS) charges.

At a time when other dynamics in energy markets are driving up retail electricity prices in New England, VEIC can see no reasonable argument for limiting the acquisition of energy efficiency at the cost of approximately 4 cents per kWh, when any incremental energy purchased will cost between 8 and 12 cents per kWh. The only difference is that customers see the Energy Efficiency Charge on their bills, whereas they do NOT see a line item on their bills for the increased cost of supply, which they do pay for, each month. It is important to note that the Energy Efficiency Charge is essentially purchased as a long-term, fixed-price contract.

Vermont's New England neighbors are also aggressively investing in energy efficiency. Massachusetts, Rhode Island, and New York all plan to invest in efficiency at levels that will reduce their retail energy sales by more than 2 percent. Scenario 3 is the only one of the three options that consistently estimates Vermont energy savings over 2 percent of sales.

These budget levels will also achieve all reasonably available cost-effective efficiency savings and significantly reduce greenhouse gas emissions. Thus, adopting this scenario recommendation also brings the State a significant step closer to achieving its goals for reducing greenhouse gas emissions through significant reductions in annual energy demand.

¹⁰ Vermont Public Service Board's April 15, 2014 Report: *2012 Annual Report to the Legislature on Energy Efficiency Utility Program Revenues and Expenditures*, cites the kilowatt-hours saved by Efficiency Vermont have cost Vermont electric consumers approximately 3.5 cents per kilowatt-hour or approximately 41 percent of the cost that utilities would have paid for a comparable electric supply in 2012.

¹¹ 2011 Comprehensive Energy Plan, Vol.2, Section 4.