Biennial Report to the Vermont General Assembly
Pursuant to
30 V.S.A. § 8005b

by the
Vermont Public Service Board

April, 2015

The Sustainably Priced Energy Enterprise Development ("SPEED") program is designed to promote the development of renewable energy generation in Vermont.[1] The SPEED provisions require that the Public Service Board ("Board"), in consultation with the Department of Public Service ("Department"), provide to the general assembly a biennial report on various issues related to the SPEED program, renewable energy markets, and Vermont's power supply.[2] In Section 8005b(b) of Title 30, the Legislature identified eight topics for the Board to address in the biennial report. The following is a summary of the SPEED program and the Board's analysis of these eight topics.

Background

The SPEED provisions, as codified in 30 V.S.A. §§ 8005 and 8005a, were intended to establish incentives for the construction of in-state renewable energy generation projects and promote contracts between the Vermont electric distribution utilities and renewable energy generators. The SPEED provisions achieve this goal in two ways: broadly through the requirement that utilities acquire a certain amount of power from renewable energy sources and more narrowly through the creation of the standard-offer program.

The SPEED provisions establish, pursuant to 30 V.S.A. § 8005(d)(2), a goal that 20 percent of total statewide electric retail sales, by 2017, shall be generated by new renewable resources.[3] The SPEED provisions require that the Board, on or before January 31, 2018, open a proceeding to determine, for the calendar year 2017, the total amount of SPEED resources that were supplied to Vermont retail electricity providers and the total amount of statewide retail electric sales.

In addition, the SPEED provisions establish, pursuant to Section 8005(d)(4)(A), a goal that 55 percent of each retail electricity provider's annual electric sales, by 2017, be generated by renewable resources, increasing by an additional 4 percent each third year thereafter, until reaching 75 percent on and after January 1, 2032.

The SPEED program required the Board to establish "the regulations and procedures that are necessary to allow the public service board and the department of public service to implement, and to supervise further the implementation and maintenance of the SPEED program."[4] In 2006, the Board promulgated Rule 4.300 to implement this statutory mandate.

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1. Those portions of Title 30 concerning renewable energy in general, and the SPEED program in particular, are incorporated into 30 V.S.A. Chapter 89.

2. 30 V.S.A. § 8005b.

3. 30 V.S.A. § 8005(d)(2). For the purposes of the statute, new renewable projects must have come into service after December 31, 2004. *See* 30 V.S.A. § 8002(13).

4. 30 V.S.A. § 8005(e).

To provide an additional incentive for utilities to contract directly with generators, Rule 4.300 established a SPEED Facilitator to assist in identifying and procuring SPEED resources and to encourage the formation of contracts between Vermont utilities and the owners of SPEED projects.[5] The activities of the SPEED Facilitator initially focused on meeting and explaining the SPEED program to potential renewable energy developers and to the power planners of the Vermont utilities responsible for meeting SPEED goals. To assist with that function, the SPEED Facilitator developed a SPEED website (www.vermontspeed.com). In addition to its work directly involving the SPEED program, the SPEED Facilitator also participates as a non-voting member of the Vermont System Planning Committee.[6]

In 2009, the SPEED program was modified to include a state-wide standard-offer program. The SPEED standard-offer program required the Board to establish prices for long-term power purchase contracts for SPEED projects. The statute required that the prices established by the Board be sufficient to allow developers of SPEED projects to recover their costs plus a return on their investment. The standard-offer program is open to SPEED projects with a nameplate capacity of 2.2 MW (AC) or less. The enactment of the standard-offer program has expanded the role of the SPEED Facilitator, so that the SPEED Facilitator has become the contracting entity for the program.

In 2012, the legislature made a number of significant changes to the standard-offer program, including: (1) setting standard-offer prices for each renewable energy category at avoided cost, with the requirement that the Board employ a market-based mechanism if certain enumerated conditions are met; (2) annually increasing the cumulative plant capacity of the standard-offer program until the 127.5 MW capacity of the program is reached, pursuant to a predetermined schedule; and (3) excluding from the cumulative plant capacity new standard-offer plants that the Board determines will provide sufficient benefits to the operation and management of the electric grid. In a March 1, 2013, Order, the Board established a request for proposal ("RFP") mechanism for new standard-offer projects, for effect on April 1, 2013, and established avoided costs to serve as caps on the standard-offer prices solicited through the RFP mechanism. In 2013 and 2014, the Board solicited 5.0 MW of renewable capacity through the RFP mechanism for each year. Additional information regarding the results of the 2013 and 2014 RFP processes is included in Section 4, below.

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5. 30 V.S.A. § 8005(b)(1) was modified in 2009 to require the Board to "name one or more entities" as SPEED facilitator. VEPP Inc. is the designated SPEED Facilitator and operates under a contract with the Board.

6. The Vermont System Planning Committee ("VSPC") was established pursuant to a Memorandum of Understanding among many parties and approved by the Board in Docket 7081. The VSPC is designed to facilitate and support consideration of non-transmission alternatives to reliability problems in the state and to encourage public participation in the selection of solutions to reliability problems.

Statutory Considerations Pursuant to Section 8005(b)

(1) The retail sales, in kWh, of electricity in Vermont during the preceding calendar year. The report shall include the statewide total and the total sold by each retail electricity provider.

Retail sales of electricity in Vermont totaled 5,635 GWh in 2013, the most recent year for which data is available. This constitutes an increase of 1.46% since the last report submitted pursuant to 30 V.S.A. § 8005b in 2013, and represents an annual growth rate of approximately 0.73%. This rate contrasts with the annual decline of approximately 0.55% observed in the prior report, but still constitutes an overall decline of approximately 0.2% since 2004, prior to the establishment of the SPEED program.

Across the broader New England region, annual load growth is predicted to be in the 0.9-1.1% range,[7] slightly higher than the annual rate of growth observed in Vermont over the past two years. Much of the increase in retail sales over the past two years is probably a result of the nation-wide economic recovery, which led to a more normal level of electric consumption.

Total retail sales of electricity by individual providers are provided in the table in Section 2 of this report.

(2) The amount of SPEED resources owned by the Vermont retail electricity providers, expressed as a percentage of retail kWh sales. The report shall include the statewide total and the total owned by each retail electricity provider and shall discuss the progress of each provider toward achieving the goals and targets of subsection 8005(d)(SPEED) of this title.

Section 8005(d)(2) requires that 20 percent of total statewide electric retail sales be generated by new SPEED resources by 2017. Based on the retail electric sales numbers described above and assuming continued low load growth, meeting this goal will require total generation of approximately 1,110 GWh from new SPEED resources, including standard-offer resources, in 2017.

In 2014, new SPEED resources generated a total of 856,076 MWh, or approximately 15.2% of total retail sales. In addition, between 2012 and 2014 new SPEED resource generation increased by 61,576 MWh. Based on this, it appears that most of the state's retail electric providers should be able to meet the Section 8005(d)(2) requirement in 2017 with modest acquisitions of renewable generation resources.

Overall, Vermont's electric distribution utilities appear to be making substantial progress towards the requirement to purchase power from new SPEED resources. Based on data submitted by the utilities, the City of Burlington Electric Department ("BED") and Washington Electric

7. ISO-NE, *Preliminary ISO-NE Annual Energy and Seasonal Peak Forecast 2014-2023.*

Cooperative, Inc. ("WEC") appear likely to significantly exceed the 20% SPEED requirement when it comes into effect in 2017. Stowe remains the utility the farthest from the 20% target, but has moved from 1% of retail sales to 5% since the last report. The remaining utilities, including Green Mountain Power Corporation ("GMP"), Vermont Electric Cooperative, Inc. ("VEC"), and the members of the Vermont Public Power Supply Authority ("VPPSA"), have largely remained stable since 2012 but are close to the goal.

Pursuant to Section 8005(d)(4)(A), 55 percent of each retail electricity provider's annual electric sales, by 2017, must be generated by renewable generation resources, increasing by an additional 4 percent each third year thereafter, until reaching 75 percent on and after January 1, 2032. The total amount of in-state and out-of-state renewable generation under contract with Vermont utilities represents approximately 53.9 percent of 2013 retail electric sales. In 2014, only GMP and the Village of Stowe Electric Department had less than 55% of their retail sales generated by renewable resources, at 45% and 15%, respectively.

In addition, a number of utilities have projects under active development that are expected to come online in the near term. For example, GMP has approximately 10.8 MW of contracted new solar generation expected to come online this year and is also anticipating capacity increases at several hydroelectric generation facilities, which are expected to qualify as new SPEED resources. The addition of these resources should move Vermont's utilities closer to the Section 8005 goals.

RETAIL SALES AND SPEED RESOURCE OWNERSHIP

Utility	*2013 Retail Sales (kWh)*	*New SPEED Resource Ownership (% kWh sales)*[Note 1]	*SPEED Resource Renewable Ownership (% kWh sales)*[Note 2]
Barton[Note 3]	14,125,611	14%	73%
Burlington	342,361,521	35%	91%
Enosburg Falls[Note 3]	27,788,900	14%	73%
GMP	4,348,322,000	11%	45%
Hardwick[Note 3]	32,437,313	14%	73%
Hyde Park[Note 3]	11,090,459	14%	73%
Jacksonville[Note 3]	4,867,849	14%	73%
Johnson[Note 3]	13,362,512	14%	73%
Ludlow[Note 3]	49,664,223	14%	73%
Lyndonville[Note 3]	64,875,174	14%	73%

Morrisville(Note 3)	44,664,329	14%	73%
Northfield(Note 3)	29,333,588	14%	73%
Orleans(Note 3)	13,187,965	14%	73%
Stowe	73,853,546	5%	15%
Swanton(Note 3)	53,441,458	14%	73%
Vermont Electric Cooperative	443,132,041	14%	81%
Washington Electric Cooperative	69,483,392	81%	100%
TOTAL	**5,635,421,881**	15.2%	53.9%

Note 1: Includes new SPEED resources that were operational in 2012, listed in the tables in Section 3 and 4 of this report, and includes contracts that Vermont utilities have entered into with out-of-state new SPEED resources.
Note 2: Includes contracts that Vermont utilities have entered into with out-of-state SPEED resources.
Note 3: 30 V.S.A. § 8004(a) provides that the members of VPPSA may meet the requirements of Chapter 89, including the new SPEED and Total Renewables targets, in the aggregate. Accordingly, while the retail sales numbers reflect the actual sales of the individual utility, the percent of kWh sales figures reflect the overall VPPSA percentages.

(3) A summary of the activities of the SPEED program under section 8005 of this title, including the name, location, plant capacity, and average annual energy generation, of each SPEED resource within the program.

The following table provides specific information regarding existing new SPEED resources. (Information on standard-offer projects is provided in Section 4 of this report.)

NEW SPEED RESOURCES OPERATING IN 2014				
Project Name	Resource	Project Location	Project Capacity (MW)	Estimated Annual Output (MWh)
Coventry Landfill	Landfill Methane	Coventry	8	49,276
Fitchburg Landfill	Landfill Methane	Massachusetts	3	26,280
Moretown Landfill	Landfill Methane	Moretown	3.2	24,996
McNeil Emissions Upgrade	Biomass	Burlington	11	122,189
Sheffield Wind	Wind	Sheffield	40	83,736
Georgia Mountain	Wind	Georgia	10	26,922

Wind				
Kingdom Community Wind	Wind	Lowell	63	185,432
Granite Reliable Wind	Wind	New Hampshire	82	215,496
WCMASS Solar	Solar	Massachusetts	4.8	3,100
GMP Solar	Solar	Various in-state	1	1,141
BED Solar	Solar	Various in-state	Varies	1,126
GMP Hydro Upgrades	Hydro	Various in-state	4	12,620
Swanton #5	Hydro	Swanton	0.5	1,814
Total				**754,048**

(4) A summary of the activities of the standard offer program under section 8005a of this title, including the number of plants participating in the program, the prices paid by the program, and the plant capacity and average annual energy generation of the participating plants. The report shall present this information as totals for all participating plants and by category of renewable energy technology. The report shall also identify the number of applications received, the number of participating plants under contract, and the number of participating plants actually in service.

As of the beginning of 2015, 62 projects have been awarded standard-offer contracts, totaling 64.44 MW of capacity. The following table summarizes the number of awarded contracts by technology type.

AWARDED STANDARD OFFER CONTRACTS BY TECHNOLOGY		
Technology	Capacity (kW)	Number of Projects
Solar	55,147	35
Wind	0	0
Farm Methane	2,529	18
Hydroelectric	4,939	6
Biomass	1,265	2
Landfill Methane	560	1

Total:	**64,440**	**62**

As of the close of 2014, a total of 47.635 MW of standard-offer projects had been commissioned, with an estimated annual output of 101,978 MWh. This total includes twelve new standard-offer projects commissioned in 2014, which added 19 MW of capacity. The following chart provides specific information regarding SPEED standard-offer projects currently in operation.

OPERATING STANDARD OFFER PROJECTS IN 2014				
Project	Resource	Project Location	Capacity (MW)	Estimated Annual Output (MWH)
100 Bobbin Mill	Solar	Newport	0.05	64
468 Pleasant St	Solar	Newport	0.037	47
Advance Transit Building	Solar	White River Junction	0.032	41
Barton Solar Farm	Solar	Barton	1.8	2,286
Butternut Mtn. Farm	Solar	Morrisville	0.1	127
Charlotte/Hinesburg Rd.	Solar	Charlotte	2.2	2,794
Chester Solar Farm	Solar	Chester	2.2	2,794
Claire Solar Farm	Solar	South Burlington	2.2	2,794
Clarendon Solar Farm	Solar	Clarendon	2.2	2,794
Coventry Solar Project	Solar	Coventry	2.2	2,794
Cross Pollination One	Solar	New Haven	2.2	2,794
Ferrisburg Solar Farm	Solar	Ferrisburg	1	1,270
Kingsbury Solar	Solar	East Montpelier	0.05	64
Leunig's Building	Solar	Burlington	0.026	33
Limerick Road Solar Farm	Solar	Shelburne	2.2	2,794
Northshire	Solar	Manchester	0.016	20
Sheldon Springs Solar	Solar	Sheldon Springs	2.2	2,794
So. Burlington Solar Farm	Solar	South Burlington	2.2	2,794
S. Vermont Energy Park	Solar	Pownal	2.2	2,794
Springfield Solar Alliance	Solar	Springfield	1	1,270
St. Albans Solar Farm	Solar	Saint Albans	2.2	2,794

SunGen1	Solar	Sharon	2.2	2,794
Technology Drive Solar	Solar	Brattleboro	2.2	2,794
TriLand Williamstown	Solar	Williamstown	2	2,540
Whitcomb Farm Solar	Solar	Essex Junction	2.2	2,794
White River Junction Solar	Solar	White River Junction	2.2	2,794
Total Solar			**39.111**	**49,672**
Cersosimo	Biomass	Brattleboro	0.8	5,957
Total Biomass			**0.8**	**5,957**
Audets Cow Power	Farm Methane	Bridport	0.68	3,284
Berkshire Cow Power	Farm Methane	Richmond	0.6	4,021
Central Vermont Recovered Biomass	Farm Methane	Randolph	0.375	2,463
Chaput Family Farms	Farm Methane	North Troy	0.3	2,010
Dubois Energy	Farm Methane	Addison	0.45	3,016
Four Hills Digester	Farm Methane	Bristol	0.45	3,016
Gervais Family Farm	Farm Methane	Enosburg	0.2	1,340
Gervais Family Farm 2	Farm Methane	Enosburg	0.2	1,508
Green Mtn. Dairy Farm	Farm Methane	Sheldon	0.6	4,020
Kane's Kilowatts	Farm Methane	Enosburg	0.225	1,508
Maplehurst Farm Methane	Farm Methane	Greensboro	0.15	1,005
Neighborhood Energy	Farm Methane	Newport	0.225	1,508
Riverview Digester	Farm Methane	Franklin	0.18	1,206

Westminster Energy Group	Farm Methane	Westminster	0.45	3,016
Total Farm Methane			**5.385**	**34,931**
BCH Landfill Gas to Energy	Landfill Methane	Brattleboro	0.56	4,415
Total Landfill Methane			**0.56**	**4,415**
Factory Falls	Hydro	Springfield	0.15	590
North Hartland Low Flow	Hydro	North Hartland	0.138	543
Troy Hydro Project	Hydro	Troy	0.816	3,210
West Charleston Hydro	Hydro	West Charleston	0.675	2,655
Total Hydro			**1.779**	**6,998**
		Total	**47.635**	**101,978**

In 2013, the Board conducted the first RFP process to allocate SPEED standard-offer projects. Thirty-four proposals, all solar projects, totaling 60.39 MW in plant capacity, were received in the RFP process. The Bennington Solar Project, Apple Hill Solar Project, Sudbury Solar Project, and Champlain Valley Solar Farm proposals were awarded contracts, with prices of 0.1340, 0.1390, 0.1440, and 0.1441 $/kWh, respectively.

A second SPEED standard-offer RFP was conducted in 2014. Fifteen proposed solar projects and one proposed small wind project, totaling approximately 28.5 MW in plant capacity, were received in the RFP process. The Whiting Solar Center, Mountain View Solar Center, and Next Generation Solar Farm proposals were awarded contracts, with prices of 0.1187, 0.1198, and 0.1287 $/kWh, respectively.

Annual capacity allotments for the standard-offer program will be 5 MW for 2015, 7.5 MW for 2016-2018, and 10 MW beginning in 2019, until the 127.5 MW cumulative plant capacity cap is met.

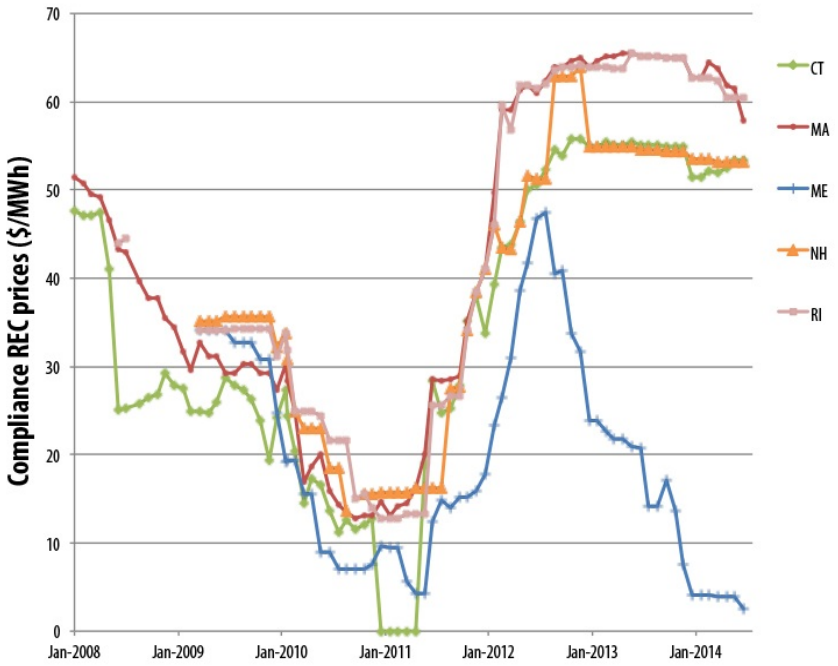
(5) An assessment of the energy efficiency and renewable energy markets and recommendations to the General Assembly regarding strategies that may be necessary to encourage the use of these resources to help meet upcoming supply requirements.

A significant factor in the limited increase in total electricity usage has been efficiency projects completed with the assistance of the Energy Efficiency Utilities ("EEUs"). The Board has approved total electric EEU budgets of $52.2 million for 2015, $56.2 million for 2016, and

$58.7 million for 2017.[8] In 2013, Efficiency Vermont achieved over 85,582 MWh in annual incremental savings.[9] The efficiency measures implemented by the EEUs will help reduce load in the state, thereby increasing the ability to meet the SPEED requirements. In addition, Efficiency Vermont's expected demand savings are bid into the regional grid's Forward Capacity Market ("FCM"). For the 12-month period from June 2013 to May 2014, demand savings bid into the FCM resulted in approximately $3,402,000 in revenue that was re-invested in thermal-energy and process-fuels efficiency programs pursuant to 30 V.S.A. § 209(e)(1)(A).

In planning the region's capacity requirements, the Independent System Operator New England ("ISO-NE") forecasts annual and peak energy consumption ten years into the future. Since 2012, ISO-NE has worked to incorporate energy efficiency into the energy forecast to enable regional transmission planning to better reflect the region's collective investment in energy efficiency resources and the resulting reduction in load.

Several of Vermont's distribution utilities are active in the renewable energy market and conduct transactions in the markets for renewable energy credits, or RECs. The Class I REC markets in Massachusetts and Connecticut have been trading between $15 and $70 per MWh and, over the past two years, have remained relatively high between $50 and $70 per MWh.



New England REC Prices through July 2014 (Source: Energy Information Agency)

8. *2013-2014 Demand Resources Plan Proceeding,* EEU-2013-01, Order of 7/9/14 at 76-77.

9. *In re: Efficiency Vermont 2013 Savings Verification*, EEU-2014-05, Order of 11/24/14 at 3. BED's 2013 efficiency savings have not yet been verified at the time of this report.

The current experience suggests there is active renewable energy development in the state. As described above, three wind generation projects, totaling 113 MW in capacity, have come online since 2011. In addition, in just the past year twelve new standard-offer projects, totaling more than 19 MW in capacity, have come online. The Board has also reviewed and granted certificates of public good to several other standard-offer projects, along with a number of other renewable projects that have secured power purchase agreements with Vermont utilities. A number of other projects are under review.

Given the success of renewable energy development in the state and the reductions in electricity usage from energy efficiency projects, the existing mechanisms appear to be effectively encouraging the use of these resources to help meet upcoming supply requirements. Thus, this report makes no recommendations regarding strategies that may be necessary to encourage the further use of these resources.

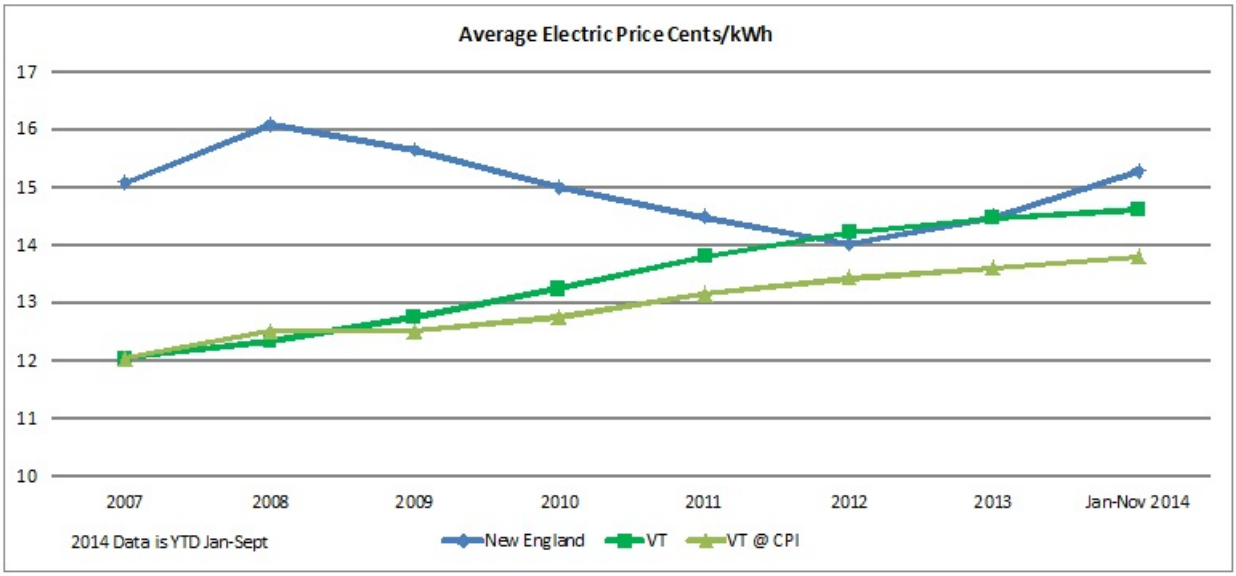
(6) An assessment of whether Vermont retail electric rates are rising faster than inflation as measured by the CPI, and a comparison of Vermont's electric rates with electric rates in other New England states. If statewide average rates have risen more than 0.2 percentage points per year faster than inflation over the preceding two or more years, the report shall include an assessment of the contributions to rate increases from various sources, such as the costs of energy and capacity, costs due to construction of transmission and distribution infrastructure, and costs due to compliance with the requirements of section 8005a (SPEED program; standard offer) of this title. Specific consideration shall be given to the price of renewable energy and the diversity, reliability, availability, dispatch flexibility, and full life cycle cost, including environmental benefits and greenhouse gas reductions, on a net present value basis of renewable energy resources available from suppliers. The report shall include any recommendations for statutory change that arise from this assessment. If electric rates have increased primarily due to cost increases attributable to nonrenewable sources of electric or to the electric transmission or distribution systems, the report shall include a recommendation regarding whether to increase the size of the annual increase described in subdivision 8005a(c)(1)(standard offer; cumulative capacity; pace) of this title.

The Department examined Vermont retail electric rates as they compare to other New England states and examined whether rates are rising faster than inflation. Based on the Department's analysis, retail electric rates over the past two years have remained largely stable relative to inflation, growing approximately 0.03% less than the consumer price index over the past two years.[10]

Based on data prepared by the Department, Vermont retail electric rates have also risen less than the average in other New England states. From January of 2013 through November of 2014, average New England electric rates have increased by 6.8%, while Vermont average rates

10. The relative rates of growth in years prior to 2013 were discussed in the Board's previous Section 8005b report submitted in April, 2013.

have increased by 0.04% over the same period. The following chart summarizes the relative growth rates of Vermont and New England electric rates and the rate of growth in the consumer price index in recent years.



(7)(A) An assessment of whether strict compliance with the requirements of section 8005a (SPEED program; standard offer) of this title:

(i) has caused one or more providers to raise its retail rates faster over the preceding two or more years than statewide average retail rates have risen over the same period;

(ii) will cause retail rate increases particular to one or more providers; or

(iii) will impair the ability of one or more providers to meet the public's need for energy services in the manner set forth under subdivision 218c(a)(1) of this title (least-cost integrated planning).

(B) Based on this assessment, consideration of whether statutory changes should be made to grant providers additional flexibility in meeting requirements of section 8005a of this title.

In assisting in the development of the 2013 report, the Department conducted an analysis of the impacts of the standard-offer program on retail electric rates. At that time, the Department concluded that the standard-offer program had caused Vermont electric rates to rise less than 0.4 percent. Since the submission of the 2013 report, total annual energy production from standard-offer projects has increased by approximately 90%. Provided that overall costs have not substantially altered over the intervening years,[11] it is likely that the standard-offer program's contribution to Vermont electric rates remains well under 1%. Given this relatively small rate impact, it is reasonable to conclude that the SPEED standard-offer program has not caused any Vermont retail provider to raise its rates faster than statewide average rates over the time since the

11. While the majority of new standard-offer projects commissioned since the last report have been solar projects, and have accordingly had somewhat higher costs, wholesale energy prices in New England have risen over the same period and thus the differential is unlikely to have substantially altered.

last report, or caused retail rate increases particular to one or more providers, or impaired the ability of one or more providers to meet the public's need for energy services in a manner consistent with the principles of least-cost integrated planning. Accordingly, this report makes no recommendations for further statutory changes to Section 8005a.

(8) Any recommendations for statutory change related to sections 8005 and 8005a of this title.

At present, a proposal is before the Vermont legislature to repeal the SPEED program and replace it with a modified requirement for Vermont utilities to purchase renewable energy. The Board has, separately, provided its comments on this proposal. In light of these proposed changes, the Board has no recommendations for statutory changes to Sections 8005 or 8005a at this time.