The 2013 Vermont Home Energy Challenge: Results & Analysis



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Vermont's Energy Goals, and the Framework for the Home Energy Challenge

In 2008, the Vermont legislature set a goal to improve the energy efficiency of 25% of the state's homes by the year 2020. In 2013 a "Thermal Efficiency Task Force," convened by the Vermont Department of Public Service, reported that the state was on track to meet only half of that goal. At the same time, Vermont has seen a surge of community-based organizing and activity on sustainable energy over the last decade. As of 2013, the Vermont

Key Findings & Insights

- There was a slight increase in the proportion of Home Performance with ENERGY STAR® projects completed in VHEC towns in 2013, as compared to 2010, 2011, and 2012
- The impact of VHEC was greatest in towns with already-active local energy groups
- VHEC appears to have provided an effective mechanism for increasing public awareness of home energy efficiency

Energy and Climate Action Network (VECAN), which serves as an umbrella network for the state's town energy committees, counted more than 150 towns with a local energy committee or local energy coordinator. Such groups have organized effectively to promote a range of activities including retrofitting schools and municipal buildings, siting small-scale renewable energy projects, and engaging their neighbors and town leaders in energy planning efforts.

The Vermont Home Energy Challenge (VHEC) was a yearlong engagement effort to test the potential of local community organizations to help raise awareness of energy efficiency and increase completion of projects under Efficiency Vermont's Home Performance with ENERGY STAR ® program. VHEC was designed and launched through a partnership of Efficiency Vermont and VECAN, and it encompassed a range of activities over the

course of 2013, with a special focus on: Turnkey outreach efforts; the distribution of pledge cards committing signers to take action on home energy efficiency; mini grants for local energy groups; training and support of local volunteers; and marketing materials designed to raise the visibility of local energy efforts.

VHEC was organized around a statewide and regional support network, along with a system of awards, prizes, and recognition for local groups. By the end of the first quarter, 79 town energy committees and local partners had signed on to participate with a target of weatherizing 3% of homes in their communities. Efficiency Vermont tracked each town's pledge card submissions and completed projects on a webpage over the course of the year, and committed to offering monetary prizes to towns with the highest percentage of completed projects and

pledge cards in each of six regions, along with the top performing towns on a statewide basis. Prizes were to be used to support weatherization of municipal buildings and other energy efficiency projects of broad community value.¹

The Long term Benefits - and Lead time - of Home Energy Efficiency

It is important to note that completion of a comprehensive home energy efficiency project requires the commitment of time, energy, and financial resources from a homeowner. There are immediate benefits in terms of dramatically improved comfort, as well as significant benefits that accrue over time in the form of reduced energy costs. This creates a complex interplay of costs and benefits for each project, and the picture looks different for every home and homeowner. It is not surprising, then, that Efficiency Vermont's research has shown there is often a long "incubation period" from the time a homeowner first considers pursuing a project, to arranging

for an energy audit, and finally completing efficiency work. According to Efficiency Vermont's data, the time elapsed between an audit and a completed project is around six months. There is no reliable way of tracking when a homeowner first considers pursuing a project, but it is easy to envision a long lead time – perhaps even several years – passing before they move to complete a project.

The existence of an extended incubation period raises a challenge for any assessment of the immediate impact of VHEC, particularly in terms of completed Home In order to accurately evaluate the impact of VHEC, it was necessary to remove the geo-location changes that had been made in 2013 for the purposes of tracking completions on the VHEC webpage.

Performance with ENERGY STAR projects. The results of a similar (though smaller-scale) Efficiency Vermont effort which ran in 2009-2010, called the "Vermont Community Energy Mobilization" (VCEM) project, help illustrate the need to conduct impact assessments at regular intervals over several years following completion of a community engagement effort. In that case, there has been a striking change in the impact data over time: In 2010, immediately following the end of VCEM, less than 1% of homes reached through the effort had completed weatherization projects; by 2012, 8.4% had completed projects.

In order to understand the full impact of VHEC, Efficiency Vermont will plan to conduct regular reassessments in future years of progress made by homes that participated, whether through submitting pledge cards or conducting energy audits.

¹ See Appendix C for an overview of VHEC and an implementation timeline.

Year	Jobs in VHEC Towns	Jobs in non-VHEC Towns	% of Jobs in VHEC Towns
2010	432	212	67%
2011	639	313	67%
2012	792	420	65%
2013	860	381	69%

Table 1: Overall percentage of VHEC and non VHEC jobs

VHEC towns have historically accounted for about two thirds of Home Performance with ENERGY STAR project completions. In 2013 there was a slight increase in this percentage.

A Note on the Data

In order to test the potential of a statewide community engagement effort to drive completion of comprehensive home efficiency projects, it was necessary to implement both data and process changes in Efficiency Vermont's programs over the course of 2013. This included the collection and integration of project completion data for towns serviced by Vermont Gas Systems' energy efficiency program, which is not tracked as part of

Although VHEC towns represent just one half of Vermont's overall population, between 2010-2012 they accounted for roughly two thirds of all Home Performance with ENERGY STAR projects.

Efficiency Vermont's Home Performance with ENERGY STAR program database. It also necessitated the creation of systems to track submitted pledge cards, home energy visit forms, and project completions on a town by town basis. In order to present this new data in a manner that conformed to the expectations of participating local groups, Vermont's rural geography, and the prevalence of small towns (many served by multiple overlapping utilities and ZIP codes) a manual process was used to geo-locate each completed project. Since this tracking process differed from the process employed in 2010, 2011, and 2012, it was necessary to remove the geo-location changes that had been applied in 2013, in order to accurately evaluate the impact of VHEC using a consistently-applied metric.² To compile a full table of historical data from 2010-2013, Efficiency Vermont was able to obtain town by town project completions from Vermont Gas and integrate those results with Home Performance with ENERGY STAR project data.

² See Appendix A for the final table of VHEC results, including 2013 geo-located projects. See Appendix B for a table of historical project completions for VHEC towns, with 2013 geo-locations removed in order to conform with Home Performance with ENERGY STAR program data from 2010-2012.

The town of Weybridge, which completed the highest percentage of jobs of any participating town, presents a compelling example of the potential impact of VHEC.

Methodology and Results

In considering the impact of VHEC, it is important to note that, in general, the 79 participating towns share some interesting characteristics. On the whole, they were more likely to have an active town energy committee, and an increased level of engagement around energy efficiency and sustainability, than other Vermont towns. Although VHEC towns

represent just one half of Vermont's overall population, between 2010-2012 they accounted for roughly two thirds of all Home Performance with ENERGY STAR projects. It is not surprising that these towns would show more interest and enthusiasm for an effort such as VHEC, but it does set a fairly high bar for evaluating overall impact.

To determine where project completion numbers in 2013 were significantly different from what would otherwise have been expected, Efficiency Vermont analyzed town level data from 2010-2012. In towns where there were clear trends, a regression was generated and projected forward to 2013; where there was no significant trend at the town level, we set our expectation for 2013 as the 2010-2012 average. For towns that participated in VHEC, and showed a deviation between these expected Home Performance with ENERGY STAR project completions and actual project completion numbers, the impact was attributed to VHEC, whether it was positive or negative.



FIGURE 1: Completions by Selected Towns by Year

Town by town results show a great deal of variation, but explanations for some 2013 town level results can be discerned based on historical local energy activity, and level of engagement with the yearlong challenge framework. There is significant variation in town level data and projections, but the data show interesting trends when considered in the context of existing local engagement structures and approaches taken toward the 3% goal. In general, it appears that VHEC had the greatest impact on project completions in towns that had a history of

community energy engagement efforts - and those that employed the yearlong challenge concept to drive a burst of retrofit activity. In the town of Alburgh, for example, where the energy committee has been less active, the years 2010-2012 showed a relatively low number of completed projects, and that trend held true for 2013. In the town of Plainfield the energy committee has been active on a range of efforts over the last several years, but project completions had declined by more than 50% from 2010-2012. In 2013, completion numbers for Plainfield increased for the first time in three years.

VHEC was designed to test the premise that a large scale community engagement effort can drive completion of retrofit jobs, and raise the level of awareness of energy efficiency.

The town of Weybridge, which completed the highest percentage of jobs of any participating town, presents a compelling example of the potential impact of VHEC. Between 2010 and 2012, there was not a single Home Performance with ENERGY STAR project completed in Weybridge; in 2013, there were 10. It is worth noting that for the purposes of consistency with historical data, the updated geo-locations of several of those projects were not included in the impact analysis: Actual project completed jobs? The Weybridge Energy Committee was formed quite recently – in October of 2011 – and they were able to use the framework of VHEC to create a burst of effort, focused on generating results in the one year time frame. Weybridge is a small, tight-knit community, with an energy committee that is now deeply embedded in the town social structure, and with proven success under VHEC that brought a significant financial reward to the town. It will be very interesting to examine the Weybridge project completion rates in future years to see if these attributes continue to generate completed jobs.

VHEC was designed to test the premise that a large scale community engagement effort can drive completion of retrofit jobs, and raise the level of awareness of energy efficiency. Although it is inherently difficult to measure "general awareness," there was a mechanism built into the challenge framework that provides immediate data, and the ability to track its impact on future completion rates: Pledge cards.

VHEC pledge cards were collected by a majority of towns and submitted to Efficiency Vermont over the course of the year. In filling out a card, a resident was asked to commit to taking one or more actions on energy efficiency - from using efficient lighting and installing a programmable thermostat, to completing a comprehensive home energy efficiency upgrade. Pledge cards were designed to be an easy point of entry to participating in VHEC, and to give local energy groups an opportunity to identify residents who would be more receptive to their messages around energy efficiency. Efficiency Vermont received 1,512 VHEC pledge cards in 2013, and one quarter of pledge signers committed to completing a comprehensive project. As VHEC impact is revisited and analyzed in future years, data from these pledge cards will be mapped to completed projects to see if they follow the same "incubation period" trend of increasing completion rates evidenced in other energy efficiency efforts.

As another indicator of general awareness, Efficiency Vermont tracked media outlets throughout the state for mentions of the "Vermont Home Energy Challenge." From the initial announcement of the challenge, and the solicitation for towns to sign on in October of 2012, through the end of 2013 there were more than 200 stories in print, radio, and television outlets. As an indicator of the strength of local outreach efforts, it is worth noting that the vast majority of these stories were generated by community groups engaging media and town leadership to communicate VHEC activities and results.

Conclusions

In testing the premise that a statewide engagement effort could drive general awareness of energy efficiency, and completion of comprehensive home efficiency projects, VHEC did show some promising results. In towns where residents were already primed to be receptive to energy and sustainability messages, or where there had been a history of local energy action, it appears that VHEC did make a difference. The action being requested of homeowners requires a significant commitment of time and financial resources, and in consequence the full results of VHEC may not be fully apparent until additional time has passed. Efficiency Vermont will continue to track completion data and report these results, while applying lessons learned from VHEC outreach to future program design.

Appendices

- A Final Tabulation of VHEC Results
- B Historical data and VHEC results used in analyzing program impact
- C VHEC Program Overview
- D VHEC Coordinator Survey: Overview of Responses

APPENDIX A - Final Tabulation of VHEC Results

March 26, 2014

Destas	Country	T	Home Performance Jobs		P	Pledge Cards		
Region	County	IOWN	Target	%	Total Complete	Target	%	Total Complete
1	Chittenden	Underhill	33	27%	9	109	23%	25
1	Chittenden	Jericho	55	27%	15	184	7%	12
1	Chittenden	Westford	23	21%	5	77	0%	-
1	Chittenden	Burlington	506	21%	104	1685	4%	74
1	Crandisla	Richmond	50	20%	10	167	704	<u>25</u>
1	Chittenden	Shelburne	88	17%	15	293	1%	
1	Chittenden	South Burlington	229	15%	34	763	2%	12
1	Chittenden	Hinesburg	52	14%	7	175	2%	4
1	Chittenden	Essex	224	10%	22	746	1%	10
1	Franklin	Saint Albans City	91	7%	6	304	0%	-
1	Franklin	Franklin	18	6%	1	59	80%	47
1	Grand Isle	Alburgh	23	4%	1	78	0%	-
1	Grand Isle	Grand Isle	28	0%	-	<u> </u>	2%	<u> </u>
1	Grand Isle	North Horo	14	0%	-	10	20%	1
2	Addison	Weybridge	14	150%	15	32	18/1%	59
2	Addison	New Haven	19	69%	13	64	19%	12
2	Addison	Salisbury	13	54%	7	43	51%	22
2	Addison	Middlebury	91	40%	37	304	32%	97
2	Addison	Cornwall	13	39%	5	44	36%	16
2	Addison	Bristol	46	24%	11	154	9%	14
2	Addison	Starksboro	23	4%	1	76	5%	4
2	Addison	Ferrisburgh	32	3%	1	108	2%	2
2	Addison	Gosnen	10	0%	-	8	0%	-
2	Audison	Mount Holly	15	14006	- 21	/4 E1	01%0	<u>60</u>
<u> </u>	Rennington	Dorset	27	66%	18	91	2%	2
3	Rutland	West Rutland	32	66%	21	108	2%	2
3	Rutland	Wallingford	29	45%	13	96	1%	1
3	Rutland	Rutland City	226	31%	70	753	0%	3
3	Bennington	Manchester	61	28%	17	203	1%	2
3	Rutland	Benson	13	23%	3	43	2%	1
3	Bennington	Peru	10	20%	2	14	21%	3
3	Rutland	Pawlet	20	20%	4	65	0%	-
3	Rutland	linmouth Middletown Springs	10	20%	2	25	0%	-
3	Rutland	Killington	<u> </u>	19%	4	29	1206	20
<u> </u>	Bennington	Bennington	188	12%	22	626	0%	-
3	Bennington	Winhall	10	10%	1	25	0%	-
3	Rutland	Rutland	53	10%	5	177	0%	-
4	Windham	Putney	27	26%	7	92	3%	3
4	Windham	Dummerston	24	25%	6	79	57%	45
4	Windham	Brattleboro	178	23%	41	592	7%	41
4	Windham	Windham	10	20%	2	24	0%	-
4	Windham	Guilford	26	16%	4	87	14%	12
4	Windham	Rockingham	66	14%	9	218	3%	1
4	Windham	Marlboro	10	8%	-	39	0%	-
4	Windham	Townshond	12	0%	-	33	0%	
<u>4</u> 5	Orange	Strafford	15	69%	11	54	65%	35
5	Orange	Thetford	32	66%	21	107	177%	189
5	Windsor	Norwich	44	39%	17	147	21%	31
5	Orange	Randolph	50	34%	17	167	3%	5
5	Windsor	Woodstock	39	21%	8	131	34%	44
5	Windsor	Sharon	20	15%	3	67	22%	15
5	Orange	Bradford	38	13%	5	126	69%	87
5	Windsor	Weatherstield	35	9%	3	118	9%	
5	Windsor	Hartland	13	8%		44	120/	10
5	Orange	Tunbridge	42	7%	<u> </u>	<u>141</u> 51	6%	10 2
5	Orange	Braintree	18	0%	-	60	2%	1
5	Orange	Fairlee	13	0%	-	44	25%	11
6	Washington	Plainfield	15	134%	20	49	76%	37
6	Washington	Montpelier	116	69%	80	386	33%	126
6	Washington	Waitsfield	24	54%	13	80	20%	16
6	Orleans	Craftsbury	14	50%	7	47	60%	28
6	Washington	Moretown	20	50%	10	68	0%	4
6	Orleans	Greensboro	10	40%	4	33	3%	1
6	Washington	Warren	18	28%	5	61	5%	3
6	Caledonia Washington	Hardwick	35 45	20%	12	11/ 210	44%	52
6	Washington	Northfield	52 52	100%	10	172	2 %0 50/2	<u>4</u> Ω
6	Washington	East Montpelier	22	15%	5	109	16%	17
6	Lamoille	Hvde Park	36	14%	5	121	4%	5
6	Washington	Marshfield	21	10%	2	70	24%	17
6	Washington	Barre City	122	10%	12	405	3%	12
6	Lamoille	Morristown	73	9%	7	243	0%	1
6	Washington	Duxbury	18	0%	-	60	5%	3
6	Washington	Favston	16	0%	-	52	0%	-

The tables below contains historical project completion data that was used to analyze the impact of VHEC. **It does not conform to the VHEC completion numbers in Appendix A because the geo-location filter that was applied in order to site 2013 projects under VHEC has been removed**. The filter was removed in order to facilitate accurate comparison with historical data (from 2010-2012), when no geo-location filter was applied. Although Efficiency Vermont does not normally track completion rates under the Vermont Gas Systems energy efficiency program, that data (for the years 2010-2012) was obtained for the analysis - and it is included here, along with the 2013 Vermont Gas Systems project data that was tracked and reported as part of VHEC.

Town	2010	2011	2012	2013
Alburgh	1	2	0	1
Ascutney	1	0	0	0
Barre City	24	12	22	20
Barre Town	4	1	7	3
Bellows Falls	0	3	0	6
Bennington	9	14	15	21
Benson	0	0	1	1
Bondville	1	1	0	83
Bradford	0	1	3	6
Brattleboro	22	52	38	35
Bristol	10	5	10	9
Burlington	23	63	28	31
Cornwall	0	2	0	4
Craftsbury	0	1	0	6
Dorset	6	11	9	20
Dummerston	2	5	8	6
Duxbury	2	2	1	0
East Montpelier	10	9	4	7
East Wallingford	0	3	0	1
Essex	4	7	12	1
Essex Junction	9	8	13	8
Fairlee	1	1	2	0
Fayston	4	0	1	3
Ferrisburgh	2	3	5	4
Franklin	0	0	0	2
Grand Isle	3	3	2	0
Greensboro	1	2	0	4
Guilford	2	2	5	3
Halifax	0	2	1	5
Hardwick	1	1	0	6
Hartland	3	3	3	5
Hinesburg	9	2	9	6
Hyde Park	4	6	13	6
Jericho	5	8	9	13
Killington	2	0	10	4
Manchester	7	4	10	3
Manchester Center	9	25	11	14
Marlboro	2	4	1	1
Marshfield	7	4	4	1
Middlebury	15	17	21	40
Middletown Springs	1	10	15	3
Monkton	3	2	4	1
Montpelier	53	54	104	68
Moretown	2	12	2	9

Томп	2010	2011	2012	2012
Morristown	2010	2011	2012	2015
Mount Holly	1	11	14	0 10
	4		14	19
		2	2	9
North Hartland	0	0	0	0
Northfield	1	5	8	8
Norwich	8	2	15	15
Pawlet	4	5	15	(
Peru	1	2	2	3
Plainfield	11	8	5	8
Post Mills	1	0	0	0
Putney	9	17	30	4
Randolph	8	11	7	16
Richmond	5	9	12	8
Rutland City	18	66	101	84
Rutland Town	2	0	2	0
Salisbury	2	2	3	7
Saxtons River	0	1	3	2
Sharon	0	0	0	3
Shelburne	12	14	13	11
Shrewsbury	6	13	9	17
South Burlington	19	12	12	17
South Hero	2	2	5	3
St. Albans	7	1	2	4
Strafford	1	1	2	11
Thetford	4	9	19	14
Thetford Center	0	1	0	2
Tinmouth	0	1	3	2
Townshend	2	0	0	2
Tunbridge	0	0	0	1
Underhill	4	6	8	6
Waitsfield	6	3	16	9
Wallingford	1	10	17	13
Warren	4	4	6	5
Waterbury	13	24	28	13
Weathersfield	0	1	1	8
West Rutland	2	5	10	18
West Topsham	0	1	0	0
West Townshend	0	0	2	1
Westford	3	3	2	4
Weybridge	0	0	0	10
Windham	1	1	1	1
Winhall	2	4	1	6
Woodstock	3	4	7	11

APPENDIX C - VHEC Program Overview

The **Vermont Home Energy Challenge (VHEC)** was a statewide effort to test the premise that community engagement efforts could encourage more Vermonters to complete comprehensive home energy efficiency improvements, and raise the level of general awareness about home energy efficiency. "Community-based social marketing" (CBSM) techniques were embedded in the overall approach for the challenge; CBSM is a methodology that uses community networks and "word-of-mouth" marketing to encourage participation in programs of social value.

Town energy committees and other local groups formed the core of the challenge. Towns were divided into six regions throughout the state wherein participating towns competed against other towns in their region to encourage residents to commit to improving efficiency and to getting their homes weatherized. Participating towns were asked to weatherize 3% of the year-round residences in their towns for the calendar year 2013. This 3% number was directly linked to the percentage of homes that need to be weatherized on an annual basis in order for Vermont to meet its statewide energy goals. The 3% number was intended as a target for towns to aim toward, but it was not necessary to achieve this number in order to win. All towns were encouraged to "challenge" themselves to meet this target.

Towns could be winners on a number of levels. Towns that achieved the highest percentage of year-round homes weatherized within their region received a financial reward. In addition, towns that achieved the highest percentage of residents committing to improving efficiency in their homes were also awarded. This was measured though the submission of VHEC pledge cards, which committed signers to take one or more actions on energy efficiency – from using efficient lighting and getting an energy audit, to completing a comprehensive home energy efficiency upgrade. Pledge cards were designed to be an easy point of entry to participating in VHEC, and to give local energy groups an opportunity to identify residents who would be more receptive to their messages around energy efficiency. All completed jobs and submitted pledge cards were posted on a monthly basis on the Efficiency Vermont website.

Efficiency Vermont, in partnership with the Vermont Energy and Climate Action Network (VECAN), managed the challenge, including: Providing mini grants to help promote local efforts; conducting trainings and providing guidance documents; developing and disseminating marketing and educational materials. Efficiency Vermont and VECAN also spearheaded a statewide "Button Up Day of Action" in October, designed to help promote home energy efficiency and the challenge. Regional partners (primarily regional planning commissions) coordinated activities and workshops for local partners at the regional level. Local partners, such as town energy committees, had direct responsibility for coordinating the implementation of the challenge in their communities. Efficiency Vermont and VECAN supported a number of turnkey programs that local partners could implement to encourage homeowners to complete comprehensive home energy efficiency improvements, including: Home energy visits, door-to-door outreach, home energy saving workshops, home energy parties, phone-a-thons, energy saving kits, and contractor partnerships, among others.

Vermont Home Energy Challenge Timeline

Milestone	Date		
Challenge announced, and town sign ups begin	October - November 2012		
Kick-off conference held and challenge launched	January 2013		
Workshops and trainings conducted	February, May/June, September 2013		
First Annual "Button Up Day of Action"	October 5, 2013		
Challenge concludes	December 31, 2013		
Results and winners announced	March 1, 2014		

In March 2014, Efficiency Vermont conducted a survey of VHEC local coordinators and received a 54% response rate (out of 87 surveys sent). The survey revealed the following results:

- 47% said they were either satisfied or very satisfied with their participation as a VHEC coordinator, with 30% neutral and 17% dissatisfied/very dissatisfied;
- Approximately 60% said they would participate in a similar program in the future, while 37% said they were "unsure;"
- Regarding support provided by Efficiency Vermont, 86% were satisfied or very satisfied with the regional workshops, 62% with the marketing materials, 70% with the guidance documents, and 77% with ongoing support;
- 76% rated support provided by the regional coordinator as excellent or good;
- 61% rated their effectiveness in getting people to participate in the challenge as either fair or better with 39% rating their effectiveness as poor; and
- 83% rated their effectiveness in recruiting volunteers as either excellent or good.

Overall Level of Satisfaction as a VHEC Coordinator			
Satisfaction Level	Percentage		
Satisfied	47%		
Neutral	30%		
Dissatisfied	17%		

Regarding what Efficiency Vermont could have done to improve the program, coordinators said:

- They wanted greater feedback from Efficiency Vermont on which homeowners in their communities had completed an energy audit or project, so they could more effectively track progress and target their outreach efforts;
- Simplify the program: a number of coordinators felt that the program was too complex and difficult for volunteer groups to take on;
- Increase financial incentives for homeowners: Some coordinators felt that the financial incentive levels for energy audits and installed measures (under the existing Efficiency Vermont Home Performance with ENERGY STAR ® program) were insufficient; and
- Start earlier: Several coordinators said that more effort should have been made prior to the January 2013 launch to raise awareness and engage communities about VHEC.

Regarding what was most personally rewarding about being a local coordinator for the Challenge, respondents said:

"Helping neighbors and friends understand how they can personally benefit from home efficiency improvements"

"Doing my part to counteract climate change and reduce adverse environmental impacts"

"Working as part of a team with other motivated and energetic community members"

"Helping people fix neighbors' homes and improve people's lives in the community"