



Vermont Clean Energy Finance Report

Prepared for the Vermont Clean Energy Development Fund

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Prepared by:



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Vermont Clean Energy Finance Report

1. Executive Summary

Vermont's extensive clean energy and greenhouse gas goals point to the need for more energy efficiency and renewable energy projects than are currently underway. As a result, many Vermont energy stakeholders question how best to unlock private capital, wonder what role financing is currently playing in facilitating clean energy projects, question whether financing could do more, and debate how best to integrate incentives with financing to significantly increase project uptake and completion as cost-effectively as possible.

The 2018 Vermont Clean Energy Finance Report is the first of three annual reports focused on the clean energy finance market. As the first, this report sets the stage regarding the various types of financing products available and the role that financing can play in supporting clean energy projects. The report summarizes the findings of a homeowner survey, a business survey, a contractor and installer survey, and phone interviews with lenders. The report also provides overviews of available clean energy finance products for residential, commercial and institutional clean energy projects. Finally, the report compares the findings from the surveys and interviews to the available products, identifies gaps in offerings and presents examples of potential product and service solutions.

Assessing the clean energy finance market poses a variety of challenges. There is a lack of consistent tracking of information, clean energy projects are frequently incorporated into larger projects and therefore may not be identified as a "clean energy" investment, and financing products are used in a variety of overlapping ways that make determining the exact size and activity of the clean energy finance market in Vermont quite difficult. Nevertheless, the report findings provide directional cues regarding financing's role in supporting clean energy projects as well as customer interest in clean energy program design modifications.

The survey results and market research suggest that there are, indeed, a variety of clean energy financing products available in Vermont and that customers who responded to the survey requests are generally aware of ways to finance clean energy projects. However, homeowners and business owners are uncertain about the value of investing in clean energy projects and they find the cost for these projects to be too high. Both customer types were strongly interested in a cash-flow-positive financing product that would guarantee the energy savings.

Developing financing products that contractors and installers are willing to promote is critical to product usage. If a product is simple, fast, financially compelling and easy to explain, contractors will utilize it in their sales process. Meanwhile, lenders state that they strive to provide their customers and members with the services they need. Some lenders have found it worthwhile to develop and offer specialized clean energy finance products while others provide financing for this work through a case-by-case approach. Effectively engaging with contractors, installers and lenders will assist in increasing the number of completed clean energy projects.

This report lays the foundation for understanding the role, challenges and possibilities of the financing realm in facilitating clean energy projects. Financing alone will not drive customers to invest in clean energy projects. But without effective financing products and programs, Vermonters will struggle to transition to a clean energy future.

2. Report Context, Purpose, Organization and Disclaimer

2.1 Report Context

The discussion of how best to harness the capabilities of private and public capital to support Vermont's clean energy transition is not a new one. State entities, non-profit organizations, credit unions, banks and businesses have piloted and offered a variety of clean energy financing products in Vermont for decades. More recently, the 2011 Comprehensive Energy Plan established the "90% by 2050" goal and articulated a variety of finance-related recommendations. Since then there have been two governor-sponsored Clean Energy Finance Summits, the 2012 Thermal Efficiency Task Force, which featured a set of finance-related recommendations, Energy Action Network's multi-year "Capital Mobilization" initiative and, currently, the Vermont Clean Energy Finance Collaborative overseen by the Public Service Department.

This ongoing discussion is spurred by the recognition that current investment in renewable energy and energy efficiency is substantially less than what is needed to achieve Vermont's goals and statutory requirements. As shown in Figure 1, one analysis of funding and financing support for efficiency and renewables conducted during the 2010 – 2014 timeframe identified \$303 million in support. The same analysis estimated that achievement of the 90% by 2050 goal would require an investment of about \$33 billion (Figure 2). While there may be differing opinions regarding the variance between what is currently spent and needed to achieve the 2050 goal as depicted in Figures 1 and 2, the analysis does highlight the disparity between current and potential future expenditures needed to meet energy goals.¹ Other reports have detailed that public funding levels are insufficient to pay for a substantial portion of energy upgrades required to achieve public policy objectives.²

What is meant by "**Clean Energy Project**"?

Because this report focuses on learning more about the role financial products play in assisting Vermonters with clean energy projects, only projects that may require financing were covered in the surveys.

For example:

- The purchase of a renewable generating system (e.g. solar array)
- A building retrofit that includes air sealing, insulation and/or duct sealing
- An upgrade to a more efficient heating system, a purchase of a renewable heating system such as a pellet boiler, or the installation of a heat pump
- The installation of more efficient windows (lower U value) and doors (with a weather strip)
- The installation or replacement of a water heater
- The installation or replacement of more efficient commercial kitchen equipment
- The installation or replacement of an efficient washing machine, dryer or dishwasher
- Upgrades to motors, manufacturing equipment and system designs, and more efficient heavy machinery
- The purchase of an electric vehicle

¹ For example, Figure 1 does not include private investments by individuals, businesses, and lending institutions.

²Goldman C., M. Fuller, E. Stuart, J. Peters, M. McRae, N. Albers, S. Lutzenhiser and M. Spahic. 2010. "Energy Efficiency Services Sector: Workforce Size and Expectations for Growth." Berkeley, Calif.: Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division. LBNL-3987E; McKinsey & Company. 2009. "Unlocking Energy Efficiency in the US Economy." New York and London.

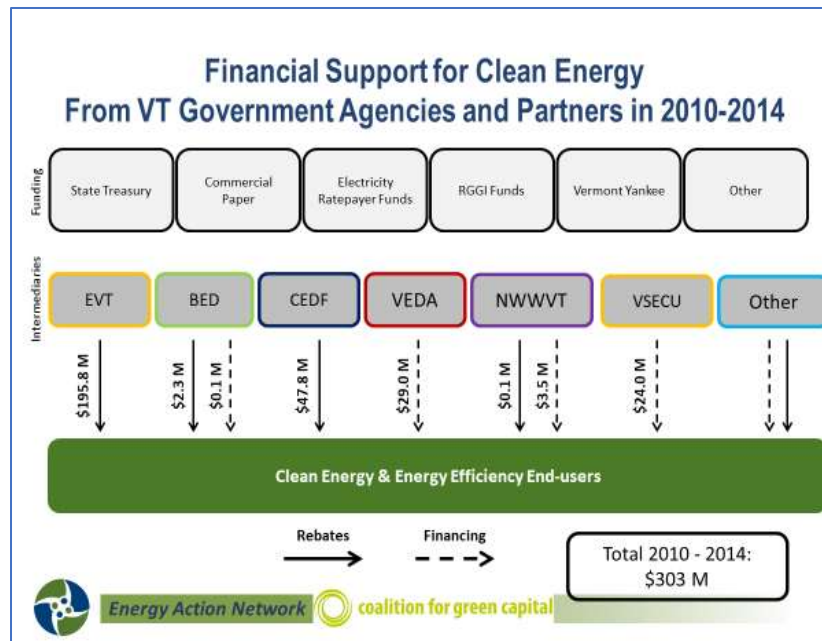


Figure 1. Financial Support for Clean Energy Projects in Vermont. 2010-2014. Energy Action Network.

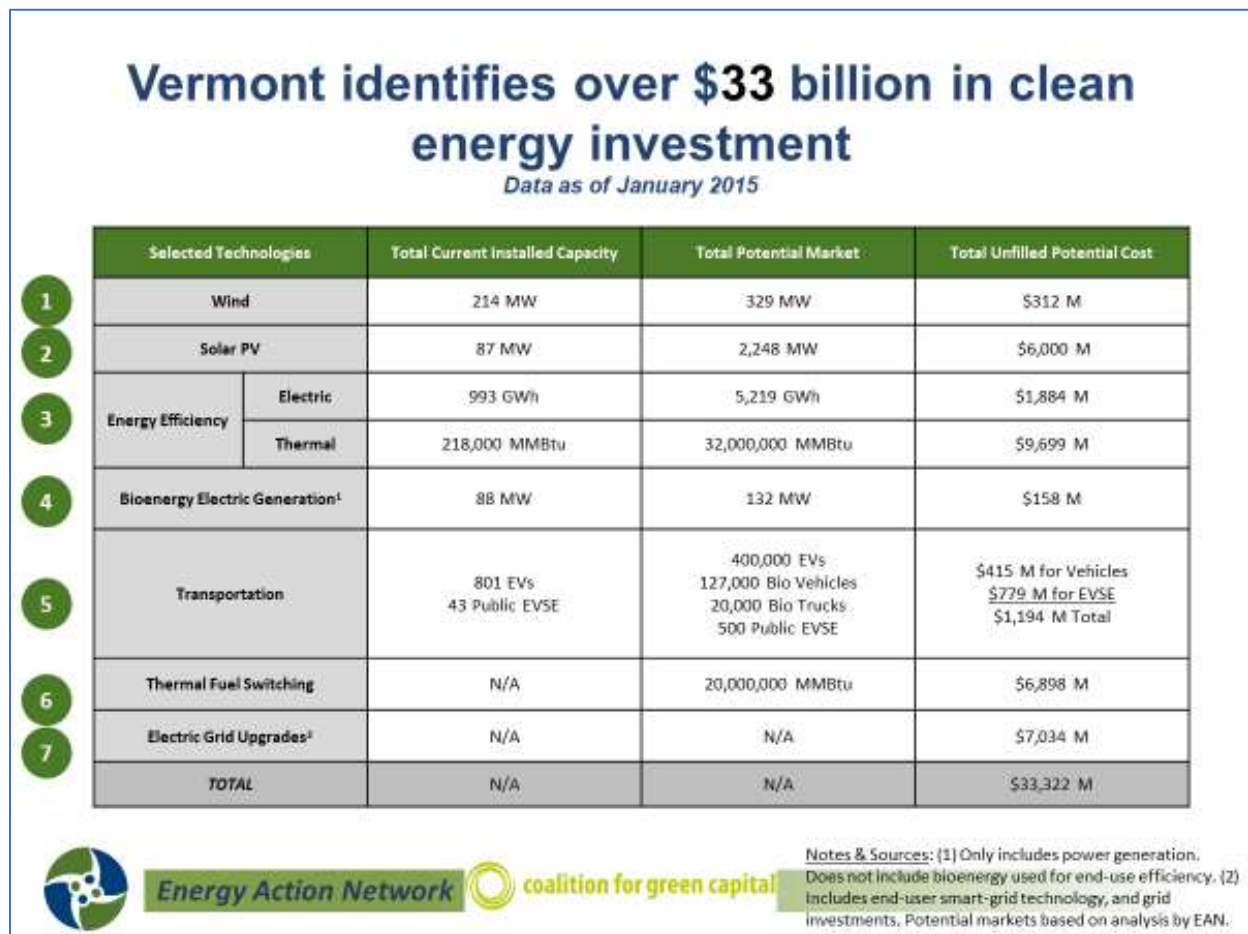


Figure 2. Investment Needed to Achieve "90% by 2050". Energy Action Network.

According to the 2016 Vermont Comprehensive Energy Plan, as of 2015 Vermont was 16% renewable across the thermal, electrical and transportation sectors. Achieving 90% renewable by 2050 will clearly require significant investment. Given the limited availability of state and federal funding support for this transition, most of the investment will come from individual Vermonters and Vermont businesses in the private sector. While efficiency projects ultimately save money (and energy) and while renewable projects have no fuel costs (except for bioenergy), both project types usually require significant upfront capital. Hence, there is ongoing interest in whether and how financing may help drive clean energy investment in Vermont. The next section describes the way this report seeks to inform the clean energy finance discussion.

2.2 Report Purpose

Vermont has many significant energy-related goals and statutory requirements, encompassed within the overarching goal of renewable energy providing 90% of all Vermont energy needs by 2050 (“90% by 2050”).^{3 4} In light of the limited resources for direct funding for this clean energy transition, several stakeholders and analyses have questioned the role that financing plays in this transition:

- What is the role of financing in supporting clean energy projects?
- What is the current status of clean energy financing in Vermont?
- Can financing do *more* to assist in the transition to clean energy?
- If yes, what?

The 2018 Vermont Clean Energy Finance Report is the first of three annual reports funded through the Vermont Clean Energy Development Fund (CEDF). The purpose of this first report is to:

1. Articulate financing’s role in the clean energy transition;
2. Establish a market snapshot of homeowner and business owner views and interactions with clean energy projects and associated financing;
3. Lay the groundwork for a general understanding of clean energy financing products currently available in Vermont; and,
4. Assess where gaps and barriers may exist by comparing survey results to available products;
5. Present examples of programs and offerings that may assist in addressing gaps and barriers in the Vermont clean energy finance market
6. Identify additional areas for further research

The 2019 and 2020 reports will build from this year’s report, perhaps repeating surveys to assess trends or perhaps delving into greater depth in specific market segments and product offerings. The specific focus for future reports will depend on the interest of the Vermont Clean Energy Development Fund, Department of Public Service and other interested stakeholders.

³ 10 VSA §581 (to substantially improve 25% of the Vermont housing stock by 2020; to reduce total fossil fuel consumption from buildings by 10% by 2020, and other goals); 10 VSA §578 (reduce greenhouse gas emissions 75% from 1990 baseline, by 2028); 30 VSA §8002-8005 (75% of retail electric sales from renewables by 2032; 10% of annual retail sales from new renewables under 5MW by 2032; 12% of retail sales of 2032 retail sales must be from new distributed renewables or from fossil-fuel savings).

⁴ “All” means energy needs resulting from the thermal, transportation and power sectors. Vermont Comprehensive Energy Plan 2016.

2.3 Report Organization

The remainder of this report is organized as follows. In Chapter Three we clarify the limits of financing as well as the possibilities from a theoretical perspective. Chapter Four presents the results from e-mail surveys of Homeowners and Business Owners who might undertake a clean energy project and Contractors and Installers who provide clean energy services. Chapter Four also presents the results of the phone interviews of lenders. An overview of the various financing products available in Vermont is presented in Chapter Five followed by a comparison of the available products in Vermont to the barriers and gaps highlighted by survey respondents in Chapter Six. Chapter Seven presents a variety of ongoing initiatives and potential ideas for addressing the Vermont-specific clean energy financing gaps and barriers identified by the comparison of survey results and available products. The report concludes with Chapter Eight followed by references and appendices (survey methodology and surveys).

2.4 Report Disclaimer

This report does not duplicate the previous work of many reports and decision guides focused on clean energy finance. Rather, a high-level overview of financing products is presented in the beginning of Chapter Three with citations for detailed, in-depth reviews of financing products and other salient information provided in the References section.

Further, while the report title and intent is to research the finance market for all clean energy categories (energy efficiency, renewables and electrified transportation), the survey and interview responses tended to focus on energy efficiency more so than renewables and electrified transportation. Therefore, while Chapter Five (“Financial Products for Clean Energy Projects in Vermont”) does represent available financing products for all clean energy sectors, Chapters Four (“Survey and Interview Results”), Six (“Comparison of Vermont Products to Survey-Identified Gaps and Barriers”), and Seven (“Ongoing Initiatives and Potential Ideas”) provide more exposure on financing energy efficiency rather than the renewables and electrified transportation. When results and findings are available regarding renewables and electrified transportation, these are included.

Finally, the survey results should be considered as “market snapshots”; they are not scientifically rigorous. The limitations in survey design, delivery and findings are described in further detail in Chapter Four and in Appendix One.

3. The Types of, Limits of and Possible Solutions in Clean Energy Finance

3.1 Types of Financing Products

There are many types of financing products available to serve the needs of different customers. Figure 3 below shows the wide array of financing products available in the marketplace for energy efficiency alone. Similar tools and products can help finance renewables and clean transportation products as well.

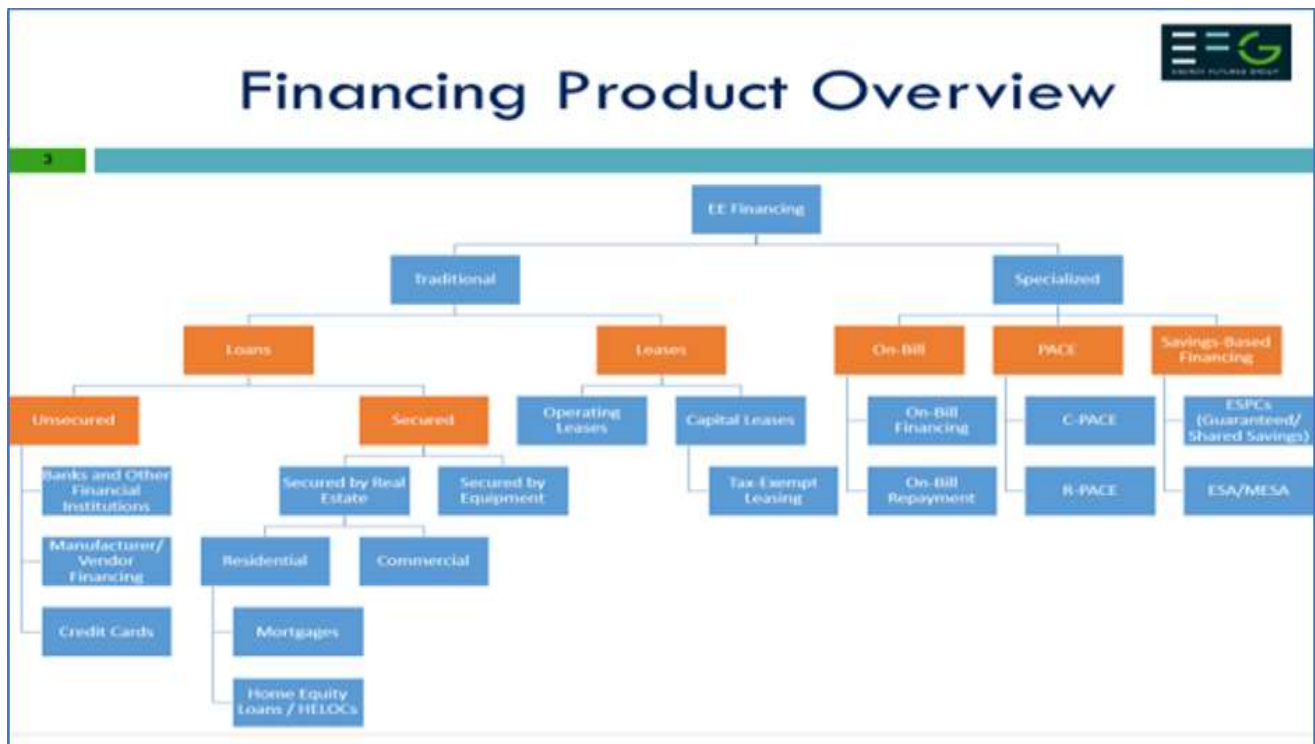


Figure 3. Financing Product Overview. Energy Futures Group. 2017⁵

What is meant by a “Clean Energy Finance Product”?

- A lease (e.g. through a utility or contractor or installer)
- A loan (e.g. from a friend or family member, a bank or credit union, or a governmental or non-profit entity)
- A credit card purchase (e.g. through a traditional credit provider through a retailer)
- A payment plan (e.g. through a contractor or a retailer)
- Refinancing one’s home or taking a home equity line of credit.

Direct incentives, subsidies or rebates are not a form of financing; they are a form of funding.

There are a range of complementary tools frequently associated with finance products. These include credit enhancements such as loss reserves, interest rate buy downs, guarantees, debt service reserves and others.

3.2 Limits of Financing

There are multiple barriers to completing efficiency and renewable energy projects, including: the cost; customer confusion as to how best to proceed with a project; complexity; workforce challenges; customer uncertainty that the savings will materialize; inability to access financing; debt

⁵ Explanation of acronyms: “HELOC” means Home Equity Line of Credit; “PACE” means Property Assessed Clean Energy (“R” refers to residential; “C” refers to commercial); “ESPC” means Energy Savings Performance Contract; “MESA” and “ESA” mean (Managed) Energy Savings Agreement.

aversion; and customer preference to invest in other priorities.⁶ Many of these barriers can be addressed through a range of complementary program strategies. As shown in Figure 4, financing is one of several linked strategies to drive and enable customer demand for energy efficiency as well as renewables and electrified transportation.

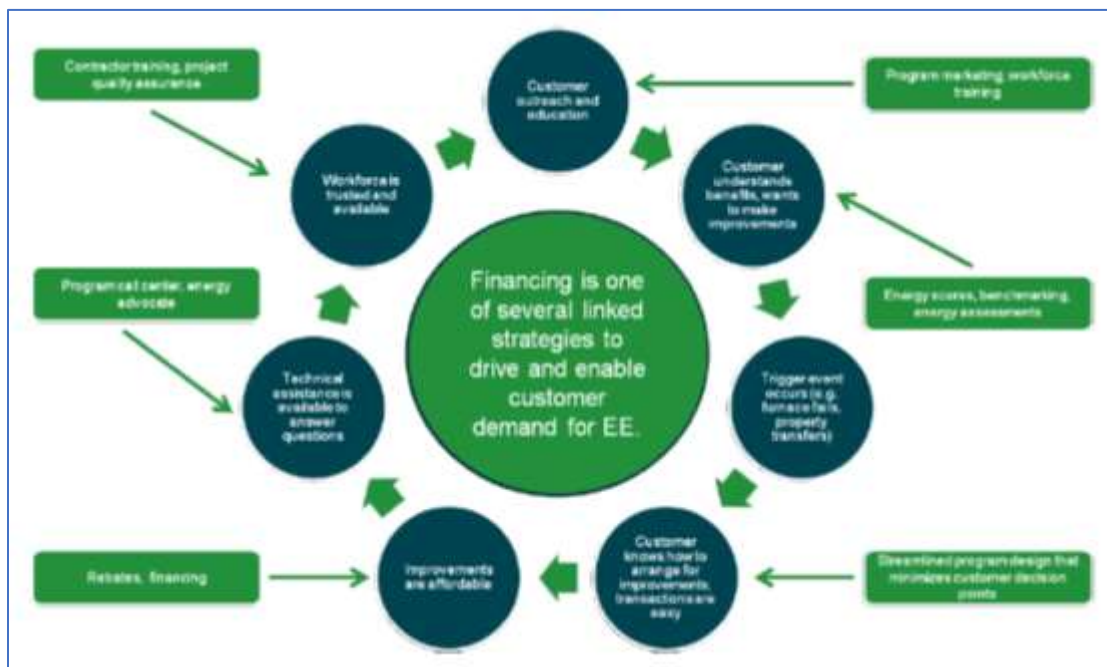


Figure 4. Strategies to drive and enable consumer demand. SEE Action 2013

Financing can help some customers move forward with some projects, but usually only if the customer has already committed to completing the project, if the customer is able to qualify for a loan (if they are “financeable”), and if the customer is willing to go into debt.⁷ Customers may be categorized as falling into four categories, shown as quadrants in Figure 5.⁸

⁶ Golove, W., Eto, J. “Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency.” 1996. Berkeley, Calif: Lawrence Berkeley National Laboratory, Energy and Environment Division. LBL-38059.

⁷ There are some financing products that are structured to not be considered debt. For example, PAYS® structures their product to be cash-flow-positive and associates the loan with the meter, and therefore if the individual moves he/she is no longer responsible for payment.

⁸ The authors thank Peter Adamczyk for providing the report with the customer segmentation theory presented in Figure 5.

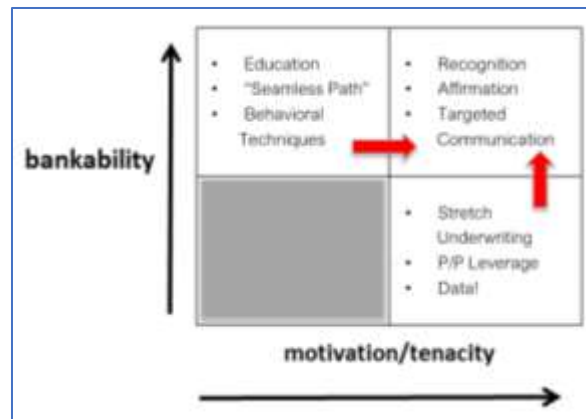


Figure 5. Customer Categories: Bankability and Motivation. P. Adamczyk. Vermont Energy Investment Corporation. 2018.

This graphical representation presents customers according to two axes: the X axis shows the customer's motivation to complete clean energy projects while the Y axis shows the customer's ability to qualify for a loan.

Customers in the upper right are those who are investing in clean energy projects; they are bankable and motivated. These may be considered "early adopters." They are "bankable" (or "financeable") and they are motivated to undertake clean energy projects. For these customers, additional financing products are likely not needed; rather, targeted communications that affirm and recognize their efforts (and support them in completing projects) is what is needed.

Customers in the lower left are those who simply do not have the ability to pay for clean energy projects on their own; for these customers, only subsidies will be of assistance. These customers are served by weatherization programs. Developing new financing products will not enable them to pursue clean energy projects because they do not have the means to pay off any loan whatsoever.

Customers in the upper left quadrant are those who *are* bankable and *could* access financing but are not interested in pursuing clean energy projects. For these customers, more financing products are unlikely to motivate them.⁹ Rather, education about the increased comfort, health and financial savings as well as making the project simple and a "seamless path" may be more fruitful.

Developing additional financing products may be most helpful for customers in the lower right quadrant. These customers are motivated to act but lenders do not serve them. For a variety of reasons (for example, insufficient collateral or credit, debt-to-income ratio), lenders find these customers to be too risky even though they may or may not be. For these customers, financing products that include "stretch underwriting" (where the economic value of the energy savings is included within the return-on-investment) and leveraging public/private partnerships to provide credit enhancements such as loan loss reserves may mean that lenders are able to offer a loan. Finally, more data is needed for these customers; tracking default rates to determine just how risky (or not) these customers are, is a key mechanism to building lender confidence.

⁹ However, there may be occasional financing offers that attract attention and are considered "too good to pass up". For example, 0% interest rates may motivate an uncommitted customer to complete a project. But thus far, supporting 0% interest rates for most clean energy projects has not been the norm and is likely to remain rare.

Financing can certainly assist those who are already interested in undertaking a clean energy project. As will be seen in the survey results below, for many customers who used financing, it plays a critical role in completing (and expanding) the clean energy project. But financing in and of itself is rarely the motivating factor in a customer choosing to move forward with a clean energy project. As such, financing must be recognized as one part of a coordinated approach to achieving clean energy goals in Vermont.¹⁰

3.3 Possible Solutions in Clean Energy Finance

In the summer of 2017, the Vermont Public Service Department (PSD) announced the formation of the Clean Energy Finance Collaborative. The collaborative is a voluntary group comprised of clean energy finance stakeholders and experts formed to improve the effectiveness of and significantly increase the state's capacity for clean energy finance necessary to advance Vermont's clean energy goals. The collaborative is made of working groups: Residential, Commercial, and Institutional.

As of January 2018, the Collaborative had identified a variety of gaps, barriers and challenges for residential, commercial and institutional customers seeking to complete clean energy projects.¹¹ These "theoretical" findings, presented in Table 1 below, reflect financing issues as well as broader market or programmatic obstacles. Detailed descriptions of these obstacles and definitions of these terms are not presented in this section. Instead, they are described throughout Chapters Four and Five. Chapter Six compares this list to the results presented in Chapters Four and Five and presents a variety of products and services for future consideration.

¹⁰ Borgeson, M., Zimring, M., Goldman, C. *The Limits of Financing for Energy Efficiency*. 2012. Lawrence Berkeley National Laboratory. American Council for an Energy Efficient Economy Summer Study.

¹¹ The Collaborative has defined these terms accordingly: a gap is an absence from the market of a viable finance product or tool for some particular audience; a barrier is something that limits or inhibits participation or access to an existing or known clean energy product or service, or financial product needed to obtain the product or service; a challenge is a difficulty in proceeding with a project, or running a program, experienced by the prospective borrower, technology vendor/service provider, or financial institution anywhere along the timeline.

Customer Type	Gap/Barrier/Challenge	Potential Solutions
Residential	Lack of coordinated, clear information	<ul style="list-style-type: none"> •Active marketing and outreach, especially to contractors •Accessible and regularly updated information resources
	Contractor and funding availability	<ul style="list-style-type: none"> •Increase the number of contractors and financial institutions offering products •Ensure ongoing availability/funding for existing products
	Project complexity	<ul style="list-style-type: none"> •Make programs and associated financing solutions easier to understand with a simpler process •Provide ongoing contractor education with program support
	Affordability	<ul style="list-style-type: none"> •Reduce interest rates •Provide longer financing terms •"Lock in" payments
	Credit challenges (FICO, Debt-to-Income, etc.)	<ul style="list-style-type: none"> •Recruit flexible, mission-driven lenders •Provide flexible capital/credit enhancements
	Health and Safety/Other non-energy related considerations	<ul style="list-style-type: none"> •Make health and safety measures eligible under clean energy financing products •Pair clean energy financing products with other products that cover health and safety measures
Commercial Also referred to as "Business" (in this report)	Lack of coordinated, clear information	<ul style="list-style-type: none"> •Active marketing and outreach, especially to contractors
	Lack of expertise	<ul style="list-style-type: none"> •Provide contractor education and program support
	Project complexity	<ul style="list-style-type: none"> •Provide 0% financing •Provide bill pay underwriting •Provide on-bill repayment
	Uncertain Savings	<ul style="list-style-type: none"> •Provide energy savings guarantees •Provide quality guarantees •Provide more information on performance of other projects
	Payback Period	<ul style="list-style-type: none"> •Provide longer financing terms •Allow for loans to be transferred to new owners
	Debt Limits	Provide off-balance-sheet financing arrangements such as: <ul style="list-style-type: none"> •Contingent payments (e.g. shared savings) •Transferable obligations (e.g. on-bill tariffs, commercial PACE)
	Split Incentives	Provide "pass-through" repayment mechanisms
Institutional Also referred to as "MUSH": Municipalities, Universities, Schools, Hospitals	Projects are too complex/Staffing Challenges	<ul style="list-style-type: none"> •State-level staffing and technical assistance
	Financing is too complex	<ul style="list-style-type: none"> •Streamlined state-administered financing center; some form of technical assistance
	Payback period is too long	<ul style="list-style-type: none"> •Financing terms matched to savings realization schedule
	Town Referendum Requirement (does not apply to state buildings)	<ul style="list-style-type: none"> •Non-Appropriation Clause (a.k.a. "Fiscal Funding" Clause) •Financing arrangements booked as current expenses
	Municipal Debt Caps (Limits on "current expenses" less restrictive than caps on long-term debt)	<ul style="list-style-type: none"> •Financing arrangements booked as current expenses

Table 1. Obstacles to completing clean energy projects. Vermont Clean Energy Finance Collaborative. January 2018.

4. Survey and Interview Results

4.1 Results from Homeowner Surveys

During the month of April 2018, Efficiency Vermont surveyed approximately 12,000 Vermont homeowners on behalf of the Clean Energy Development Fund via email. Survey questions focused on the following areas: customer awareness level of clean energy financing products; whether the customer completed any projects and if so what type, whether they used financing and how difficult it was to obtain; and if the customer considered completing a project but did not, what the obstacles were to their completing the project, whether a financing product (or other programmatic tool) could have motivated them to complete the project and if yes, which one(s). The desired outcome from these specific questions was to ascertain which financing products were being used (if any) and for what type of work, whether financing was difficult to obtain, what the obstacles were to completing projects, and which financing or programmatic tools might help overcome these barriers. “Snapshot findings” are provided below.

SNAPSHOT FINDINGS: Based on survey results, homeowners reported the following:

- They know they can take out traditional financing to complete energy related work (>70%)
- They do not want to go into debt to complete clean energy projects (>70%)
- 74% of homeowners who completed a clean energy project did not use financing
- For the 26% who used financing, credit cards were the first go-to product, followed by bank loans and lines of credit
- For those who use financing, it’s a deal breaker; without financing, they could not have done the work (only 17% said they could have definitely done the work otherwise)
- Obtaining financing was not a major barrier for the majority of survey respondents (69%); however, there were some motivated respondents who were denied a loan when they applied
- They feel this work costs too much (>70%)
- Nearly half of those who said they didn’t do a project said “affordable” financing *might* have helped them move forward...or maybe not
- An “affordable” rate is 2-3% (>30%)
- They would really like 0% financing (>70%)...but after that, they’ll take a guarantee on the savings (>70%)

Of those surveyed, 910 individuals or 7.5% of the sample pool responded.¹² Of the 910 respondents, more than 40% had a household income between \$50,000 to \$100,000, followed by 25% with a household income between \$10,000 to \$50,000 and 15% with a household income between \$100,000 to \$140,000 (Figure 6).¹³

¹² The survey respondents were drawn from those who opted into an Efficiency Vermont e-newsletter, and therefore may be more interested in energy issues than the average Vermont homeowner. Survey methodology and homeowner survey is provided in Appendix 1 and 2, respectively.

¹³ For comparison, the Census ACS one-year survey found the 2016 Vermont median household income to be \$57,677.

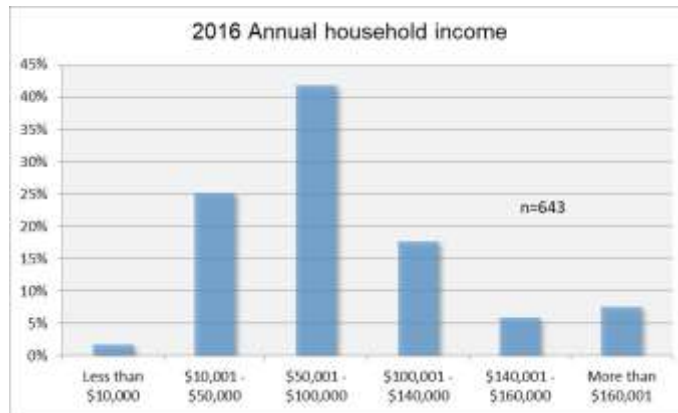


Figure 6. 2016 Annual Household Income

Regarding the types of energy investments made, 34% stated they had not done any work in the previous year, but several qualified this by adding they had completed various clean energy projects in the previous years in the comments (Figure 7). For this question, respondents could select as many clean energy projects as they had completed. More than 25% stated they had purchased a high efficiency large appliance closely followed by weatherizing their home. The fewest responses pertained to investing in renewable energy systems, which saw just over a 10% response rate.

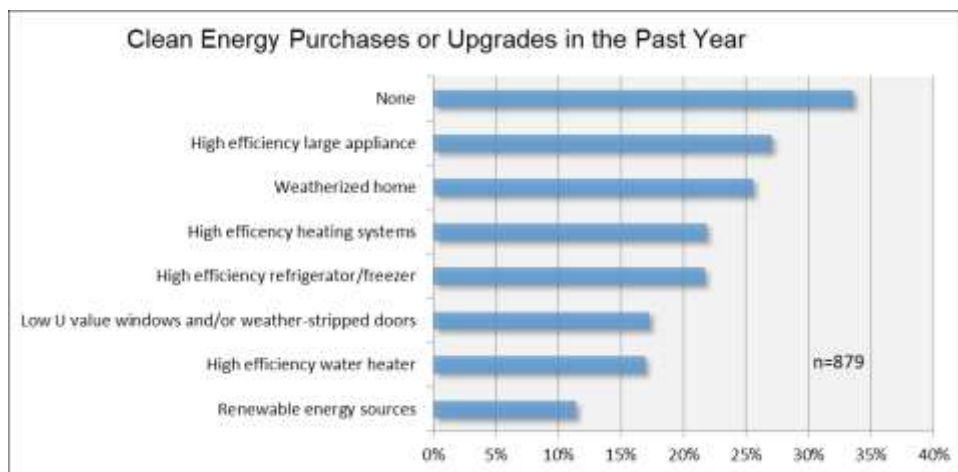


Figure 7. Clean Energy Purchases or Upgrades in the Past Year

Figure 8 below presents the type of purchases made according to income levels. Key observations include: homeowners with incomes less than \$10,000 per year were the least likely to have made any investment; the percentage of homeowners investing in clean energy upgrades increases as incomes increased (with some variation of this theme for those with incomes greater than \$160,001); homeowners with incomes ranging from \$140,001 to \$160,000 were the most likely to invest in a renewable energy system (more than 50% of respondents in this category invested in renewables).¹⁴

¹⁴ Respondents were able to comment regarding the type of renewables they installed. While not statistical, the majority of renewable energy installations were solar.

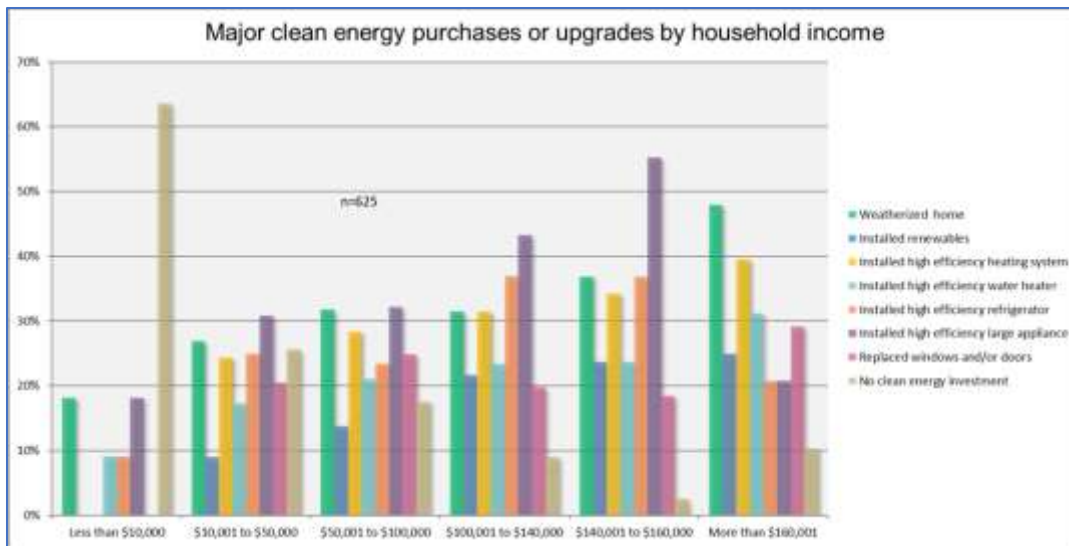


Figure 8. Clean energy purchases presented by income levels

It has been noted that for residential projects, the project cost influences whether a customer utilizes financing. Figure 9 below shows that for those who installed renewables, more than 40% used financing, followed by high efficiency heating systems, then window and door replacements, and finally, high efficiency water heaters. The survey *did* request respondents to not consider “small ticket” investments when completing the survey questions. However, if respondents did include these in their consideration then that may play some role as to why 74% of survey respondents did not use financing. Further exploration into this area would be needed to reach stronger conclusions.

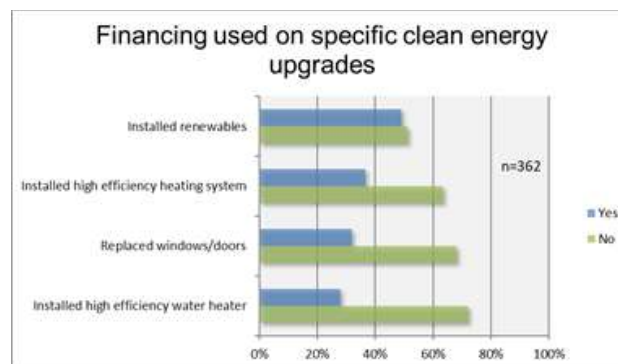


Figure 9. Financing used on specific clean energy upgrades

When asked which types of finance products homeowners were aware of, traditional loan products such as a home equity loan (75%), a personal loan (59%) and a secured mortgage loan (52%) scored the highest for awareness levels (Figure 10). Energy-specific products such as the Heat Saver Loan and financing provided by NeighborWorks® of Western Vermont received 15% and 10% response levels.¹⁵

¹⁵ As will be presented later, contractor awareness of the Heat Saver Loan is much higher than homeowner awareness. As a result, clean energy finance stakeholders are discussing the most effective strategy to increasing awareness. Specifically, is it important to increase customer awareness of specific financing products? Or, can

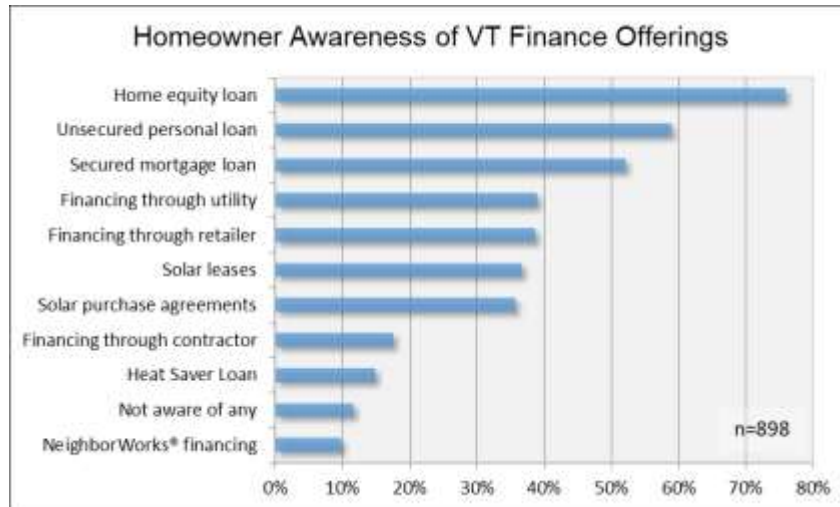


Figure 10. Homeowner Awareness of Vermont Finance Offerings

“High Cost” versus “Upfront Cost”

The terms “high cost” and “upfront cost” are frequently considered as one-and-the-same. For clarification in this report, financing can assist with the initial cost to purchase a product or service (i.e., “upfront cost”) by allowing periodic installments. However, if customers determine the product or service has a higher price than they are willing or able to pay (regardless of how long they have to pay for it), then deferring payments with financing will not address the core “high cost” issue.

Indeed, the homeowner surveys confirm both of the following: the greatest obstacle to moving forward with projects is the high cost, and homeowners do not want debt.

While financing generally may not assist with the “high cost” barrier, combining a cash-flow-positive financing product with a guarantee might provide a solution. In this case, the energy savings cover the cost (even a high cost), and the customer’s concern about the cost is addressed through the guarantee.

For those who considered undertaking a clean energy project but did not, the survey asked (1) which obstacles posed the greatest hurdle, (2) whether affordable financing could have helped, (3) what the respondents considered “affordable” and (4) which offerings were considered to be motivating to complete a clean energy project (Figure 11).

Regarding which obstacles posed a “great challenge” and “somewhat of a challenge” to completing an energy project, more than 70% responded “high cost” followed closely by 60% of respondents unwilling to take on new debt. Of note, a small but not insignificant number of respondents felt that access to financing was a barrier. However, the majority do not want new debt, and 69% do not see obtaining financing as a significant barrier.

customer-facing marketing efforts focus on increasing awareness of clean energy *generally* as long as contractors are aware of and promote the specific clean energy financing products to close more deals at the point of sale?

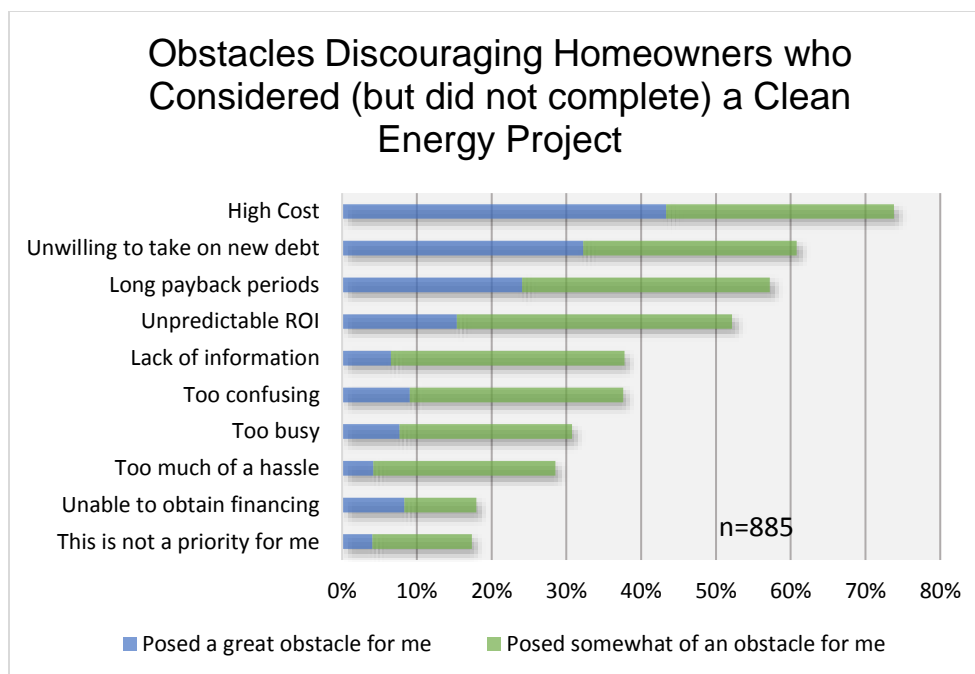


Figure 11. Obstacles to Investing in Clean Energy Projects

Those who did not complete an energy project due to the high cost were asked whether “affordable” financing would have helped them to complete the work. As shown in Figure 12, 45% stated it might have helped, but they still might not have done the project. 26% stated it would have helped considerably, that they would have done the project. 14% did not know and 13% stated they would never take out a loan to complete an energy project.

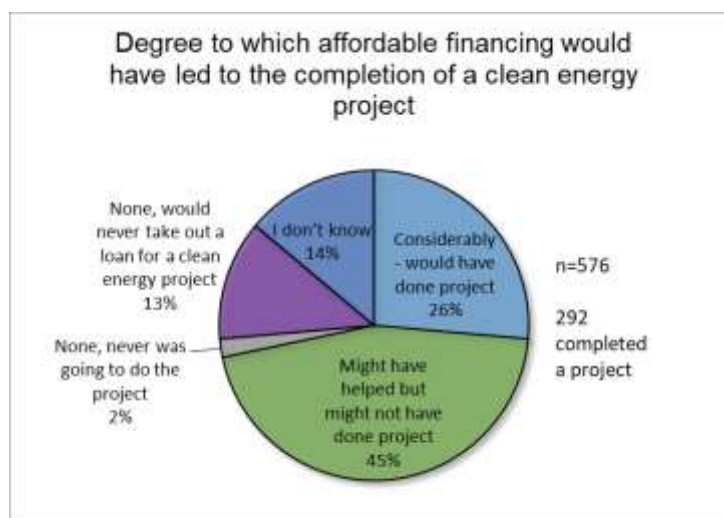


Figure 12. Degree to which affordable financing would have helped complete the project

When asked what was considered “affordable” financing, 34% believed interest rates between 2%-3% were affordable, followed by 18% believing that 1-2% were affordable, then by 14% believing 3-4% were affordable (Figure 13). Only 3% of respondents thought that interest rates at 5-6% were affordable. In contrast, many of the lenders interviewed for the Financial Institution survey viewed

interest rates of 5-6% as “competitive”. Fortunately, Vermonters can currently participate in the Heat Saver Loan program, where borrowers can find interest rates significantly below what lenders consider “competitive” via an interest rate buy-down (IRB).¹⁶ It should be noted, though, that the IRB is a significant cost to the program and, due to limited funding, this constrains overall program scope and scalability.

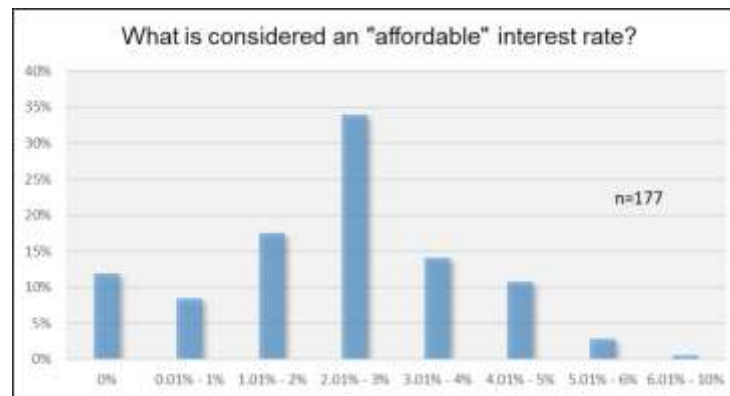


Figure 13. What is considered an “affordable” interest rate?

The last question asked respondents who considered but did not complete a clean energy project which offerings would have been motivating, and how motivating they would have been. While a 2-3% financing rate was considered affordable by the most respondents (at >30%), 0% financing (at >70%) was identified by respondents as the strongest motivator (Figure 14).¹⁷ The second strongest motivator for more than two thirds of the respondents is a guarantee of financial savings. Guarantees of savings, which can be complementary to financing arrangements, may address the high-cost concern previously identified, as they help customers have confidence that a high-cost investment will produce actual returns. A guarantee may also help to address the third highest barriers identified, namely a “long payback period” and certainly addresses uncertainty about the return on investment (fourth highest barrier).

¹⁶ The Heat Saver Loan is income-qualified with rates as low as 0.99%.

<https://www.efficiencyvermont.com/services/financing/homes/heat-saver-loan>

¹⁷ Interest rates may be somewhat related to perception. For example, in this survey homeowners stated they were strongly averse to debt, but then ranked 0% financing as the strongest motivator. 0% financing is still debt, but clearly is perceived slightly differently than debt that includes a fee for paying off the loan over time.



Figure 14. Offerings that might have motivated a clean energy project

This finding on energy savings guarantees is not new. A 2013 market research study that focused on the experiences of participants in the Vermont single-family energy efficiency retrofit market found that 76% of respondents felt the most valuable program service feature would be confidence that energy savings would be achieved (Figure 15).¹⁸

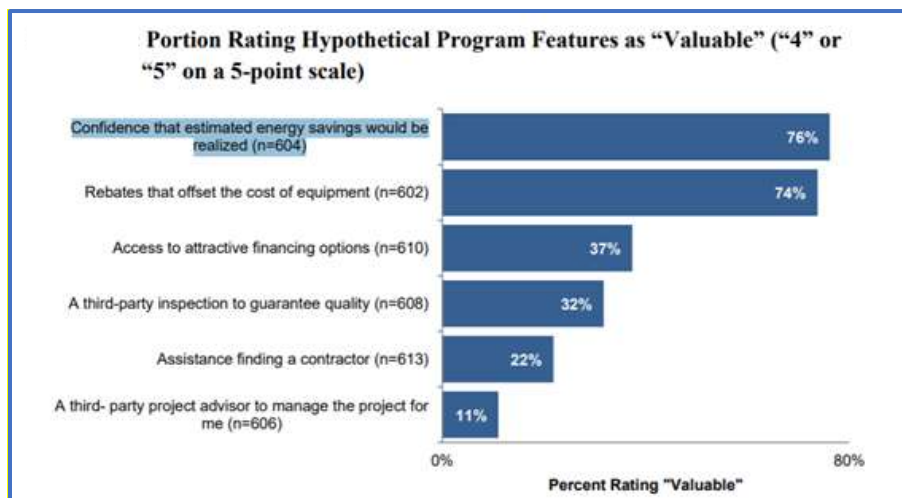


Figure 15. Confidence in Energy Savings is a “Valuable” Program Feature. GDS Associates 2013.

For those who did complete an energy project in the previous year, respondents were asked how many used financing, how difficult they found obtaining financing to be, the type of financing they used, and whether they would have been able to complete the project if they had not been able to obtain financing. As shown in Figure 16, three quarters did not use financing (74%) and for those who

¹⁸ GDS Associates, Inc. 2013. *Market Research – Vermont Single Family Energy Efficiency Retrofit Market*. High Meadows Fund in association with Vermont Public Service Department.

did utilize financing, over two thirds (69%) did not find obtaining financing to be difficult at all (Figure 17).¹⁹

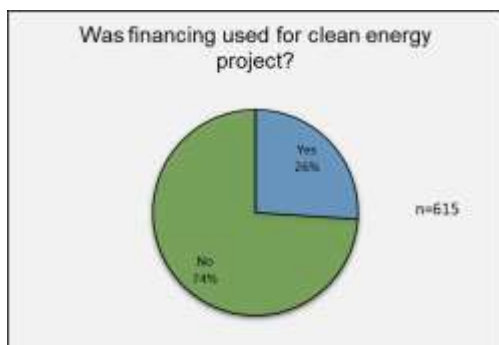


Figure 16. Financing used for clean energy investments

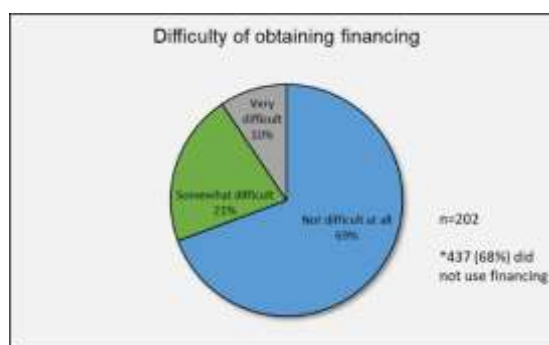


Figure 17. Difficulty of obtaining financing

Clearly, most respondents in this survey prefer not to go into debt: 60% of those who did *not* complete a project stated that going into debt posed a “great challenge” or posed “somewhat of a challenge” for them while 74% of those who *did* complete a project chose not to use financing at all. However, for the 26% who did use financing, financing can be a “deal breaker” with 52% stating that without financing they would not have been able to complete the work (Figure 18).

This finding is not unique to Vermont. For example, only 9% of program participants in the Massachusetts residential retrofit program took the HEAT loan, but of that 9%, 81% said it enabled them to make improvements they might not otherwise have made, and 85% stated that it enabled them to do more of the recommended measures.²⁰

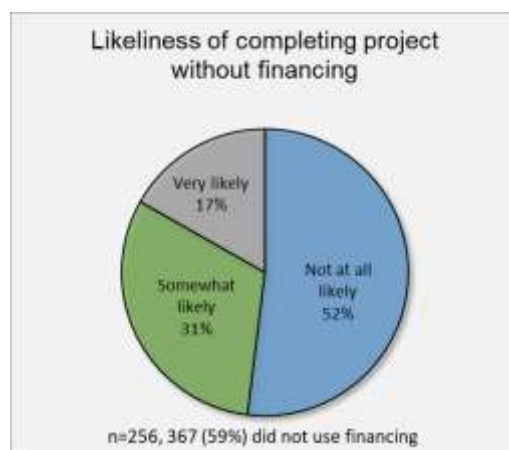


Figure 18. Likelihood of completing project without financing

¹⁹ Note: The percentage of respondents who did not use financing dropped from Q7 to Q8 to Q9 to Q10 (74% to 68% to 67% to 59%). This is a result of respondents dropping out of the survey with each additional question.

²⁰ *Home Energy Services Initiative and HEAT Loan Delivery Assessment*. 2015. Prepared for the Electric and Gas Program Administrations of Massachusetts. Ps. 62 and 70, respectively.

For those respondents who did use financing, credit cards served as the leading product (just over 29%).²¹ After that, there is a significant drop to 13% of respondents stating they used an unsecured loan or secured line of credit from a local lending provider. Between 5 to 10% of respondents stated they used financing through a retailer, utility, contractor, or the Heat Saver Loan (Figure 19). At face value, it appears that borrowers value the convenience of easy to access but more expensive credit cards over more time-intensive loans at lower interest rates and better terms. Future research can help explore this relationship.

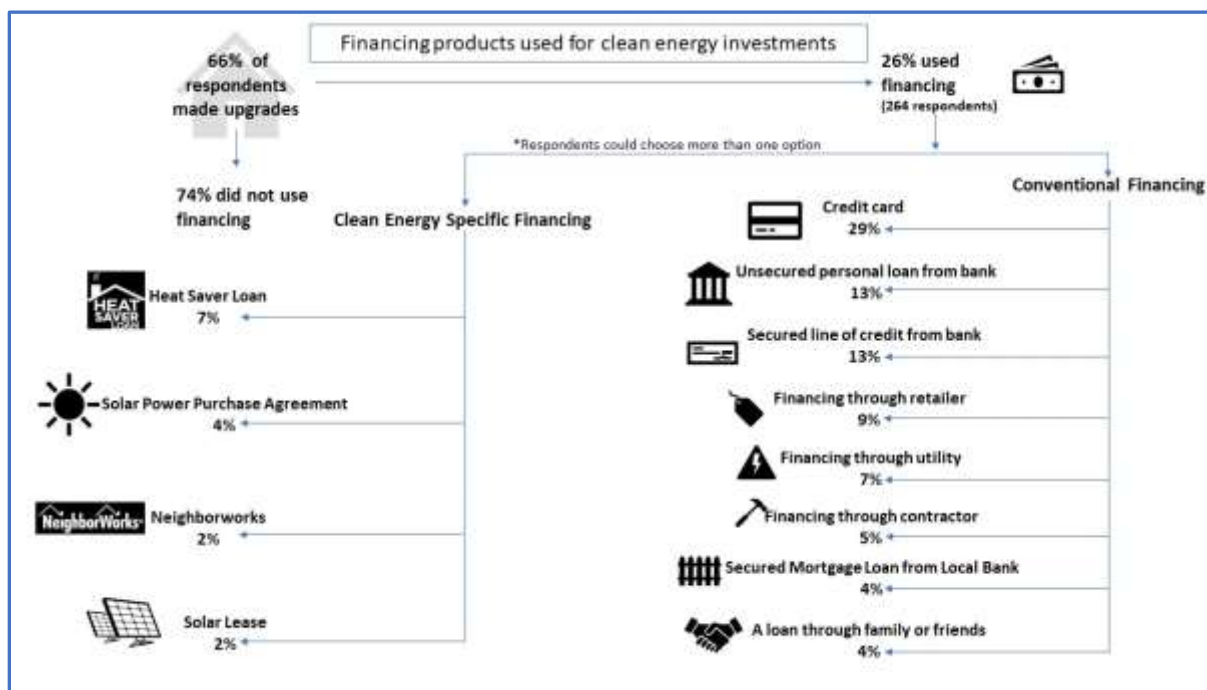


Figure 19. Financing products used for clean energy investments by homeowners

In sum, most home owners do not wish to use debt, even if it means they do not complete a clean energy project. However, 52% of respondents who *did* use financing stated they would not have been able to complete the project without some form of loan or credit. Generally, financing is not thought to be that difficult to obtain; “affordable” financing is considered to be in the range of 2-3%. The high cost of energy projects was cited as the largest barrier to completing these projects. Finally, the two most motivating products are 0% financing followed closely by an energy savings guarantee.

²¹ Credit card users can be divided into “transactors” (those who pay off the credit card in full every month) and “revolvers” (those who carry a balance from month to month). For transactors, credit cards may serve more as a convenient means of payment rather than a form of financing. Generally, only credit cards that are not paid off are considered financing (www.creditcards.com/credit-card-news/credit-card-debt-statistics-1276.php). Effectively, this means that if 26% said they used financing, this number is actually lower when factoring out the credit card users who settle their accounts monthly.

4.2 Results from Business Owner Surveys

During April 2018, Vermont Businesses for Social Responsibility surveyed its membership on behalf of the CEDF for this report.²² Only 17 of a total 620 members responded to the survey. Also, given the type of the membership organization that sent the survey, responding businesses are already likely to have a tendency towards environmental considerations such as energy efficiency and renewables. Therefore, the findings should be viewed in consideration of these factors. However, data from other reports support these initial findings and are presented here to help establish some understanding of the business customers. Question areas were similar to those in the homeowner survey (awareness levels; whether projects were completed and if so, what type; whether financing was used and if so, what type; difficulty of obtaining financing; most motivating product). The desired outcome from these specific questions was also similar to the homeowner survey; essentially, to begin to understand how financing is being used to advance clean energy projects in businesses and whether improvements can be made. “Snapshot” findings are presented below.

SNAPSHOT FINDINGS: Based on survey findings, business owners report the following:

- They know there are financing options available for clean energy projects
- They feel this work costs too much
- They do not want more debt
- They do not think obtaining financing is hard, but they’d appreciate a quicker, easier process
- A guarantee of the energy savings would help motivate them to move forward with projects, along with financing payments that are less than the energy savings

Regarding awareness, the business owners who completed this survey are generally well informed. More than 70% are aware of solar leases, solar power purchase agreements and the Efficiency Vermont/VSECU Loan with more than 30% aware of USDA and VEDA products (Figure 20).



Figure 20. Awareness of financing offerings

²² Vermont Businesses for Social Responsibility (VBSR) is a statewide, nonprofit business association with a mission to foster a business ethic in Vermont that recognizes the opportunity and responsibility of the business community to set a high standard for protecting the natural, human, and economic environments of our citizens. VBSR fosters this mission through economic development, education, public influence and networking.

Regarding work completed in the past year, more than 50% improved lighting efficiency followed by more than 30% improving the efficiency of their heating, ventilation and air conditioning (HVAC) system. Between 20% - 30% “went solar”, improved their vehicle fleet, improved their refrigeration systems or installed more efficient windows and doors. Sixty-nine percent of the respondents did not use financing while 31% did. Of those who responded to how difficult it was to obtain financing, 79% said it was not difficult at all while 21% said it was somewhat difficult. No one said it was extremely difficult. As one respondent stated: “Time consuming and intricate, but readily do-able, if one puts their mind to it.”

Communications with Efficiency Vermont shows similar results. Data on business activities with Efficiency Vermont between 2012 and 2017 showed a lack of funding was the reason for only 9.2% of terminated projects. Out of all projects initiated over that five year interval, 1.5% or 69 businesses stated that a “lack of funding” was the reason the project did not move forward.²³

The top two greatest obstacles for completing clean energy projects are the same as for homeowners: a reluctance to take on new debt and high cost. The next most challenging issues are the long payback periods, and the work being too confusing or having too little information associated with it (Figure 21).

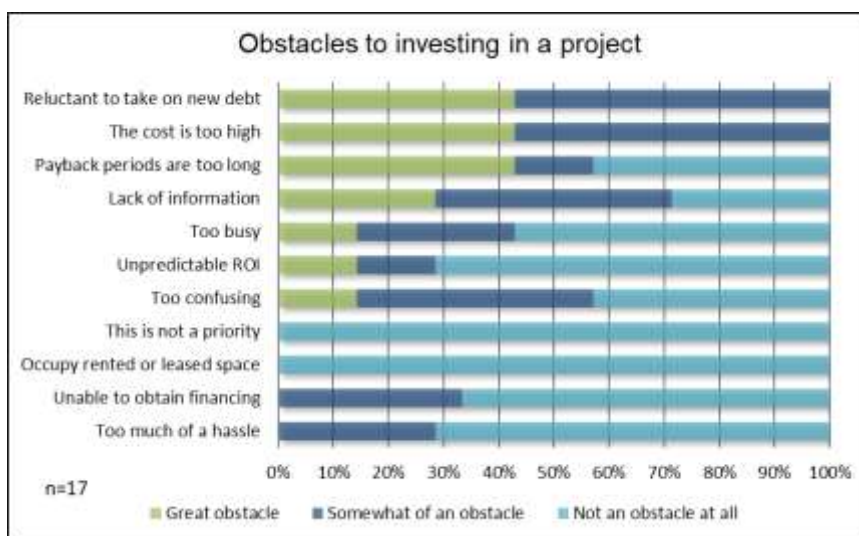


Figure 21. Obstacles to investing in a project

As shown below in Figure 22, regarding what would be the most motivating modifications for people, a guarantee of energy savings ranked first, followed by financing payments lower than the energy savings, and then 0% financing.

²³ E-mail communication between Efficiency Vermont staff and Vermont Public Service Department staff. January 7, 2018. Subject heading: Lack of capital - reason for terminated project

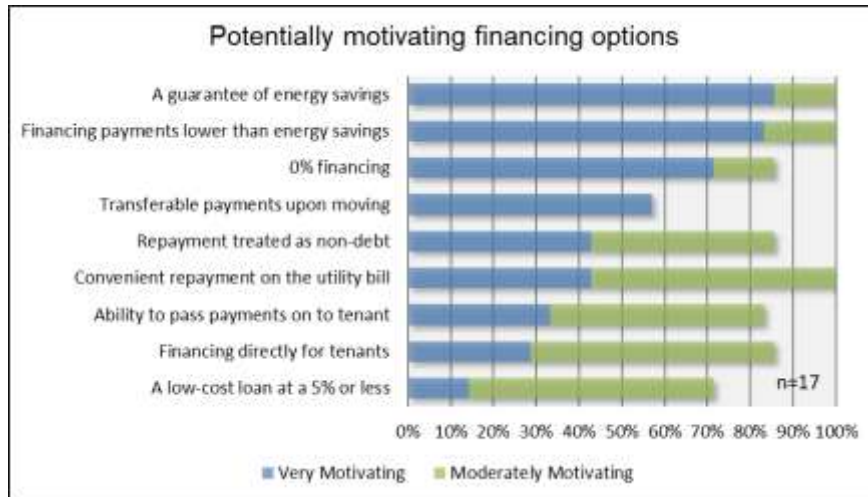


Figure 22. Potentially motivating financing options

Supporting the above findings is a 2012 Vermont Energy Investment Corporation qualitative study which states: “When considering ways to stimulate the demand for commercial retrofits, the notion of offering loans that allow businesses to be cash flow positive from the start is very compelling. It clearly helps move the assessment of such projects up in priority. Such a loan program must address business decision makers’ underlying questions and information needs: How risky would moving ahead be? How real are the numbers?”²⁴ Indeed, if a cash-flow-positive loan were to be combined with a guarantee of the savings, then perhaps there would be less skepticism regarding savings claims and therefore more motivation to move forward with a clean energy project.

The summary findings presented above should only be viewed in light of the limited response rate. It is helpful that two other Vermont analyses appear to corroborate that a lack of funding or financing is not a primary obstacle in completing clean energy projects (for those that qualify). However, if there is an interest in pursuing a greater understanding of business owners’ perceptions and use of financing for clean energy projects, further research would need to be undertaken.

²⁴ Fifth Element Associates. 2012. *Sustainable Vermont: Putting Private Capital Markets to Work in a Model Retrofit Policy for Businesses*. Vermont Energy Investment Corporation. Note: The other primary take-away from the 2012 VEIC report was that businesses desired an efficient and simple application process (“something that could take two-to-three hours and be done”).

4.3 Results from Contractor and Installer Surveys

During the month of April 2018, the Efficiency Excellence Network (EEN) overseen by Efficiency Vermont and Renewable Energy Vermont (REV) surveyed contractors on behalf of the CEDF.²⁵ Consistent with the statements above, the survey findings should inform the initial development of a “snapshot” of the clean energy finance market, providing a directional influence for future program designs; the survey results are not scientifically rigorous. Questions focused on the following areas: what type of work they do, whether they offer or promote financing to customers; awareness levels of clean energy financing products, and; which product features would help them complete more sales. Further detail about the survey methodology is provided in Appendix 1. “Snapshot” findings are provided below.

SNAPSHOT FINDINGS: Based on survey findings, contractors and installers report the following:

- More than one third of respondents say their company does not offer or promote financing
- Less than one third of respondents mention financing as an opportunity during the sales process
- They are very aware of the Heat Saver loan (>80%)
- More attractive financing terms and a simple application helps them sell financing projects to customers
- They think more training for them will be unhelpful

The survey was sent to roughly 365 discrete businesses with 55 responses, resulting in a 15% response rate.²⁶ Generally, most of the respondents were smaller businesses: 38% complete fewer than 10 projects a year, 36% complete between 10 and 50 projects a year and the remaining 25% complete more than 50 per year. Viewed another way, 75% of the respondents complete less than 50 projects a year. The majority of respondents (67%) complete heating, ventilation and air conditioning work (HVAC), followed by weatherization such as air sealing and insulation (49%) then by water heater installations (47%). Thirty-five percent complete renovations and 25% or less provide lighting, solar or motor and equipment services (Figure 23).

²⁵ EEN is a network of contractors overseen by Efficiency Vermont. REV is Vermont’s state trade association representing renewable businesses.

²⁶ There are certainly businesses that provide efficiency and renewable services and are not members of EEN or REV. Also, some REV members provide supporting services (e.g. legal, design, scientific research) or are not based in Vermont. Therefore, it should not be assumed that the 365 “total businesses” that were sent the survey is an accurate reflection of the entire clean energy contractor and installer business community in Vermont.

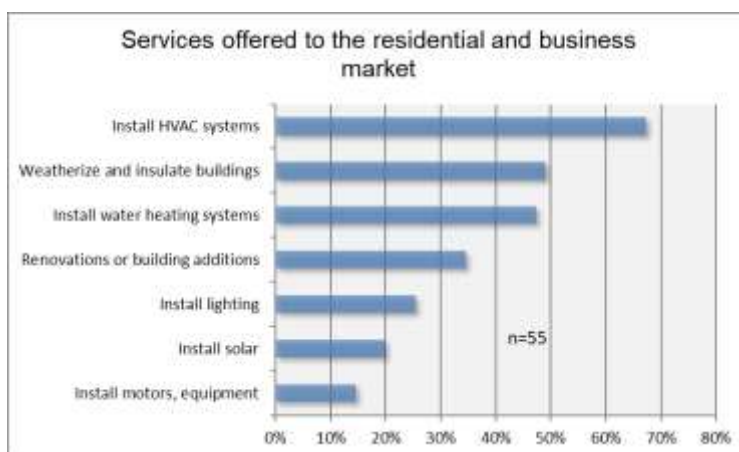


Figure 23. Services offered to the residential and business market

When asked about the role financing plays in their business model and sales processes, 62% said their company offers or promotes financing options to customers, while 38% said they did not. It may be worth exploring in the future why contractors are not offering or promoting financing and whether that might help deliver more completed projects. However, as shown in Figure 24 below, while the majority of *companies* may offer or promote financing options, not as many *individuals* include financing in their discussions with customers. Only 29% mention it always, followed by 29% mentioning it frequently and 26% mentioning it only occasionally.²⁷ This finding suggests that finance options are available but perhaps not being brought to the attention of the consumer and consistently incorporated into the sales process.

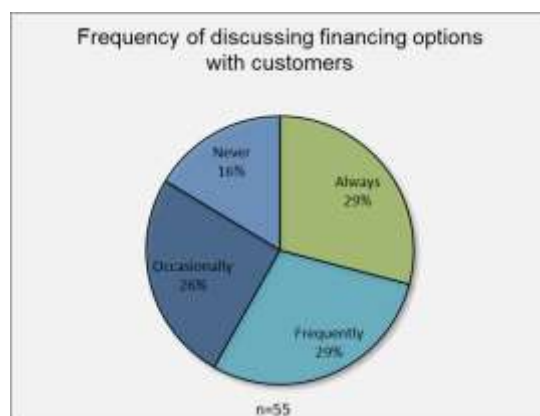


Figure 24. Frequency of discussing financing options with customers

Contractors were queried regarding the variety of financing products available to customers. The Heat Saver Loan was the most widely recognized finance product among contractors (>85%) even while homeowners were less aware of the product (Figure 25). This is a significant level of awareness for contractors and reflects the fact that EEN contractors received repeated trainings and notifications about this product. The Heat Saver Loan also offers a simple application process that can take less than

²⁷ Anecdotally, authors of this report have heard that contractors sometimes do not mention financing for fear of insulting the customer, as it may be interpreted to mean the contractor has assumed the customer does not have the money needed to pay for the project up front.

two days, thereby not significantly interfering with the contractors' sales process. Further, it features discounted interest rates based on customer income levels. A simple application process and lower interest rates are the top attractive financing features cited by contractors (Figure 27 on the next page).²⁸ It appears that if contractors are trained about a financing product, and if the product is simple to explain, easy to process with a quick turn-around time, then contractors are willing to offer and promote the financing product.

Contractor awareness levels drop off after the Heat Saver Loan, with 40% of respondents saying they were aware of a variety of offerings including equipment leases, the NeighborWorks® Energy Loan, solar leases, power purchase agreements and utility offerings. Loans typically available for businesses (the Efficiency Vermont Business Energy Loan and VEDA products) saw fewer than 40% respondents saying they had heard of these products. It may be difficult to draw a conclusion regarding this, however, as it may be that the majority of respondents focus on residential, not business, projects and therefore would not need to know of products available to businesses.²⁹

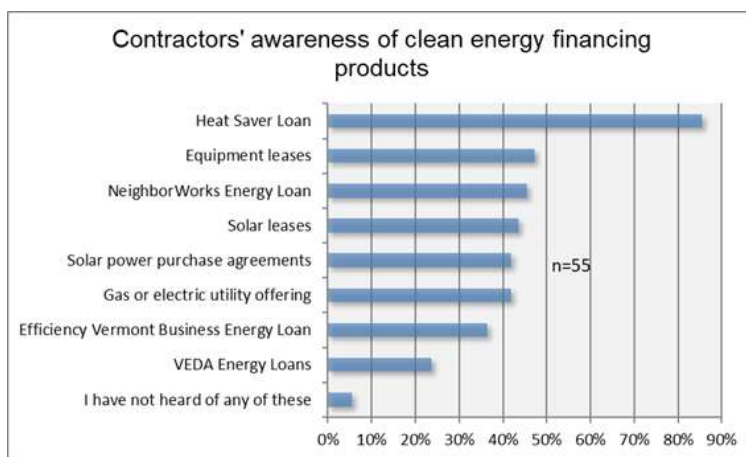


Figure 25. Contractor awareness of clean energy financing products

Respondents were asked to identify how helpful it would be to offer various improvements. Contractors responded similarly to customers: more attractive financing terms received the highest response at 40% (Figure 26). Next was better outreach to customers (30%). Contractors felt that the least helpful improvement would be better training for *themselves* (40% respondents).

²⁸ Again, however, the lower rates provided by the Heat Saver Loan are income-based and add considerable expense to the program overall, raising uncertainty about the scalability of this loan.

²⁹ Unfortunately, the survey did not ask the type of customer served (residential or business) in an effort to limit the overall number of questions in favor of receiving a higher response rate.

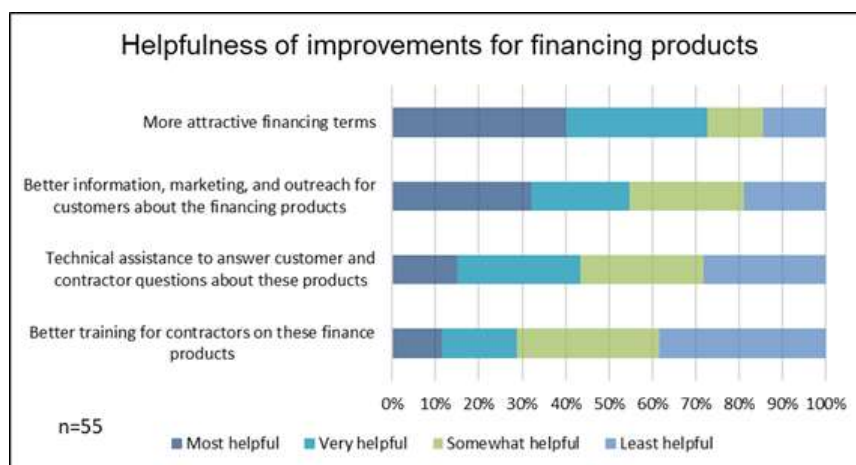


Figure 26. Helpfulness of improvements for financing products

Regarding improvements that would help contractors with selling a financial product, topping the chart at over 75% is a simple application process and low interest rates, followed by payments lower than projected energy savings (Figure 27). Of note was the contractor response regarding the value of a guarantee: while businesses and customers appreciate an energy savings guarantee, contractors subordinate this feature (receiving a 20% response rate).³⁰

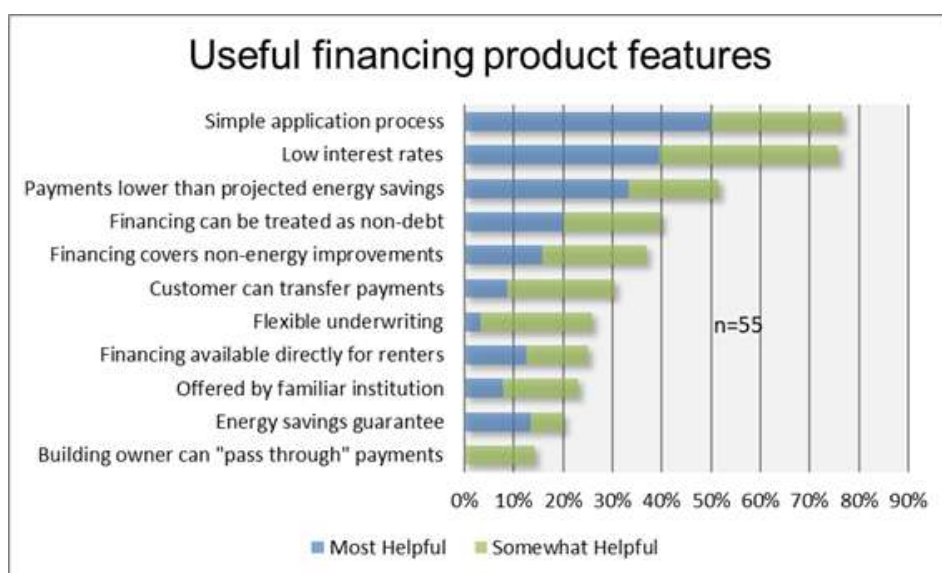


Figure 27. Useful financing features according to contractors

In sum, it appears that *companies* have a variety of financing products that they offer, but the individual *contractors* do not necessarily use these during their sales pitch. Further, it appears that if they receive training and notifications about a financing product that offers a compelling interest rate via a simple process that does not significantly interfere with their business model, then they are willing to promote the product to customers. As footnoted earlier in the homeowner survey section above, an

³⁰ It may be that contractors would feel comfortable with offering a guarantee to their customers if a third party rather than themselves were providing it. The survey did not articulate the responsible party for the guarantee.

area for further discussion is whether customer-facing marketing should focus on the broad benefits of clean energy improvements rather than clean energy financing products. If financing products meet contractors' *and* customers' needs, it appears as though contractors are quite willing to promote the product. Further, they may be in the best position to provide the most direct and effective marketing regarding financing to customers.

4.4 Results from Lender Interviews

To obtain a sense of how lenders view the clean energy finance market in Vermont, 14 brief phone interviews were held during spring of 2018, representing 34% of the 44 lending institutions providing services in Vermont. Lenders were approached via informal interviews rather than a survey due to feedback from the lender community that an on-line survey would be unlikely to yield an informative set of results. This interview methodology results in a higher level of diversity in responses, and showcases more contrasting feedback than the on-line surveys conducted with homeowners, business owners, contractors and installers. More information regarding methodologies is available in the Appendices. All phone interviews began with an overview of the report goals and research

SNAPSHOT FINDINGS: Based on survey results, lenders report the following:

- Generally, they feel they are meeting their customers' needs, be it through a specialized clean energy product or through a traditional loan that is modified to meet the specific needs of the customer
- 53% offer a specialized product; 47% do not
- Of the 47% that do not offer a specialized product, 43% had at one time done so but felt there was not enough demand
- Lenders feel that they cannot convince a customer to finance a clean energy project – the customer must already want to complete the project and more education is needed in this area
- They feel there are other issues that make clean energy projects challenging for customers to complete (such as the complexity in technology and in project scope, the high project cost)
- Setting up energy-specific products take time and resources; there must be a compelling reason to develop the niche product
- Many lenders commented on the fact that financing for solar has shifted to lenders outside of Vermont
- Lenders are aware of the financial institutions in Vermont who have chosen to actively engage in the energy finance market, but are otherwise not aware of what each other is providing; some lenders do not list their specialized energy loans on their website

approach, followed by a request for the lenders' (1) general perspective of the market and (2) detailed information about products they offer that are geared towards clean energy projects. "Snapshot findings" are presented below.

Eight of the fifteen institutions, or 53%, offer some type of specialized financing product for clean energy projects. Of these eight, three offer a product that can be applied to a broad range of technologies (renewables and efficiency); one offers a "Green High End" mortgage; one offers specialized products for solar and VerMOD homes; and the last two offer a number of products that

support a range of targeted investments such as electric vehicles, business and agricultural energy improvements, renewable energy systems and general efficiency improvements.³¹

Of the seven institutions (47%) that do not currently offer a specialized product, three had at one time offered a specialized product but found that there was so little uptake that it made more sense to broaden the product to cover more types of projects (for example, a “green” loan became a “home improvement” loan). All of the lenders who do not currently offer a specialized clean energy product report that their lending institution is still financing efficiency projects and renewable installations like solar, but that these are done through traditional products like home equity lines of credit or, with their business customers, through a customized loan product to meet the specific needs and portfolio of the customer. However, this data is not tracked or recorded and is therefore based off anecdotal recollections.

Lenders feel that, regardless of whether they provided specialized energy products, they are meeting their customers’ (and members’) needs: “We are in the business of making loans. If customers want something, we try to work with them to make it happen”. Most interviewees (those who offer specialized products as well as those who do not) commented that there is a cost to developing, implementing and offering specialized products, and that if there is limited volume, the cost may not be warranted in the long run unless it aligns with the mission of the lending institution.

Lenders feel that there are a variety of challenges that impede customers from completing clean energy projects:

“I think we are being told by consumer demand that folks aren’t too worried about this right now. I think excitement levels for energy projects lies somewhere between replacing a septic system (low) and getting new carpeting (high).”

“It’s a slow return on investment. \$20,000 for \$20 savings a month.”

“Unless there is something that hits the customer’s pocket, they will not prioritize upgrades. It is a capital market, they can choose how to spend their money.”

Lenders have noticed certain trends. Regarding solar, while many of them have provided project finance for developers of larger solar systems (and one hydro facility), they are witnessing more of these products being financed by institutions located outside of Vermont. This is also true for residential solar systems. Multiple lenders also noticed that their business customers did not seem as interested in financing clean energy improvements as homeowners.

Generally, all of the interviewees felt that they strive, and are generally able to meet, their customers’ and members’ needs with the products that they currently offer.³²

When asked what might help “move the market,” lenders tended to think that more customer education about the benefits of these projects would help, but greater education may still not be enough to overcome the high-cost barrier. Lenders also thought making the entire process more understandable could be of use—that customers don’t understand the different technologies and how

³¹ VerMOD homes are affordable, zero-energy, modular homes. <http://vermodhomes.com/>

³² However, it has been noted that Vermont banks do not serve some of the finance needs of renewable energy developers (such as non-recourse debt), and that few banks provide “stretch underwriting” where the energy savings are included in the underwriting. Stretch underwriting, as described in Chapter 3, could assist more low- to moderate-income homeowners.

they work and how to determine the various pro's and con's (e.g. when weighing potential investments in weatherization, solar and/or a heat pump). There was also a focus on the need to make the financing application as easy and simple as possible: "This energy work can be like a root canal. So when you go to your financial institutions for a root canal, it has to be easy so these people don't suffer any more!"³³ In keeping with this theme of simplification within the financing process, one lender stated: "We are very interested in helping our community, the impact on the environment, from fossil fuels and other things, it just seems we are at this moment in time where it's difficult to find the appropriate approach. If we were all working together in a unified process where the series of steps were highly consistent I do believe we'd have more money to do these projects and it'd be easier on the consumer. When there are so many different routes and avenues, there has got to be a lot of inefficiencies in the process".

Lenders referenced other ideas for improving financial offerings. One suggested that a guarantee for the banks, like what the Small Business Administration provides to banks for small business loans, could be of use to increase lender confidence and make these products more "mainstream." Another felt that there are insufficient examples and case studies of people who have undertaken clean energy projects, with their resulting savings. As suggested by the quotes provided above, many of the lenders do not feel that this area is of interest to customers right now.

Also, while lenders are familiar with the specific institutions that focus significantly on clean energy finance products, they are otherwise not that aware of what one another is providing in the marketplace. An area of future focus could be to work with lenders (and have them learn from one another) to increase their understanding of the clean energy industry as a whole, and to learn from one another regarding specific products, credit enhancements and experiences.

Some lenders highlighted that financing perhaps should not be offered to everyone. "There are certainly segments of our population that aren't served because they have credit challenges—and I don't even think we should say they are low income, because they aren't necessarily. I don't know what to do about those people."

Finally, lenders were universal in their opinion that, unless the finance offering was 0%, the customer needed to want to do the work first, and then the financing would assist them.

"I don't see a lot of members going to our website and seeing they get a discount—people have to want the product before they start looking for the product. As a financial institution, we will never be able to drive the customer to do a certain project—we can help them finance it, but they have to want it."

"We can't say 'they have never heard about this work and we are going to make them do it by giving them financing.' It's up to us to help people who want to do the work who have issues paying for it. This is a choice they make...We will finance as many projects as possible...Outside of there being a big gift of money to subsidize 0% financing...and outside of the economic situation changing (a rising interest rate) and outside of the issue of fuel prices – then we will have a very hard time engaging customers."

In sum, lenders feel that they are meeting their customers' and members' needs for clean energy financing products and that financing alone will not be able to drive more demand. Further, they mention a variety of barriers to customers' completing clean energy projects. These are generally in

³³ All quotes are from confidential interviews held with credit unions and banks during the months of April and May 2018.

keeping with the survey findings such as the high cost of projects and the lack of a simplified and coordinated approach. Finally, lenders provide a number of ideas as to how to improve the clean energy finance market in Vermont including greater education and cooperation throughout the clean energy finance market.

5. Financial Products for Clean Energy Projects in Vermont

There are multiple financing products available for homeowners, businesses and institutions. Some of these products are specifically designated for clean energy projects while many others, such as a Home Equity Line of Credit, allow for a broader use of the funds but may frequently be used to complete some clean energy work. Throughout the next six pages, Tables 2, 3 and 4 show financing products provided to homeowners, businesses and institutions and provided by government, non-profit entities and regulated energy utilities specifically for clean energy projects. Generally, financial products offered in the private sector, such as solar leases provided directly from a solar business, or home equity lines of credit provided by banks or credit unions, are not presented in these tables. Rather, these offerings are discussed in more detail in the narrative. Incentives, rebates and subsidies available through weatherization agencies and efficiency utilities are not included in the tables as these are sources of funding, not financing.

Loan volume numbers are not provided in these tables, largely because numbers provided cannot accurately depict all of the clean energy financing occurring, given that such a large portion of clean energy financing activity is supported with private, non-clean-energy-specific products. Therefore, this report followed the approach utilized in California, where surveys for homeowners and businesses asked respondents whether they completed clean energy projects, if they used financing, and if so, the type of financing used.³⁴ This provides a more complete picture of how financing is being used in the market including the use of specific clean energy products versus traditional financing products than simply reporting loan volume numbers for clean energy financing products.

These tables attempt to organize a wide range of information by grouping the financing products by the provider of the product. However, the various offerings are challenging to portray in a simple manner and even more challenging to track in terms of overall statewide impact. Indeed, one area for future research and effort could be to define a standard measure of progress in the Vermont clean energy finance market.³⁵ Finally, it should be noted that many of the products listed in the three tables involve the support of multiple parties and that some of the funding sources may have originated from programs that were not energy-focused.³⁶

³⁴ Opinion Dynamics Corporation and Dunskey Energy Consulting. 2016. *PY 2014 Finance Residential Market Baseline Study Report*. Vol 1. California Public Utilities Commission.

³⁵ Suggestions for defining a standard measure of progress are available on page 53 of “Making it Count: Understanding the Value of Energy Efficiency Financing Programs Funded by Utility Customers”. 2015.

³⁶ For example, Champlain Housing Trust programs have received funding through community development block grants (CDBG) through the Vermont Community Development Program housed at the Agency of Commerce and Community Development. CDBG grants are focused on benefiting persons of low and moderate income.

5.1 Financial Products Available for Homeowners

Table 2 below shows a variety of financing options available to homeowners in Vermont.³⁷ At the time of writing, a number of new initiatives were under development and improvements were planned for existing products while other products were currently unavailable due to a funding gap.³⁸ Not shown are the products available through banks, credit unions, and vendors or contractors that offer clean energy products or services.

Vermont Clean Energy Financing Products: Residential		
Provider of Product	Examples of Specific Products	Detailed Description
Collaborations and Partnerships	Efficiency Vermont: Heat Saver Loan (Statewide via VSECU and Opportunities Credit Union)	Secured and unsecured low interest loans for a range of efficiency improvements. Low-income rate of 0.99% for terms up to 5 years, and 2.99% for terms >5 years up to 15 years. Statewide.
	Vermont Gas: Residential Heating Loan	For high efficient heating systems (for heating and hot water) via Green Mountain Credit Union. 0% to 4% loans for terms of 3, 5 & 10 yrs, on-bill.
	Burlington Electric Department: Electric Vehicle Financing	Utility partnership with VSECU, Vermont Federal Credit Union and Opportunities Credit Union to offer low and no-interest loans.
	Vermont Electric Co-op: Community Solar	10- and 20-year plans with fixed solar energy monthly credit and financing via NeighborWorks of Western VT.
Community Development Financial Institutions (CDFIs)* and Community Loan Funds	Champlain Housing Trust Housing Loan Fund: Home Repair Loans	Income- and location- qualified for energy upgrades identified in an audit. Security: 2nd mortgage. Max amount \$25k (\$10k for manufactured homes). Interest rates: 1.5% - 4.5% APR. Northwestern VT. Loans may be deferred, due on sale or assumable by next owner if income-eligible.
	Champlain Housing Trust Housing Loan Fund: Manufactured Housing Down Payment Loan Program	Income- and location- qualified for downpayment loans to replace old manufactured home with a new Energy Star Rated model. Security: 2nd mortgage. Max amount \$27.5 k. No interest and no monthly payments; loan balance paid off when home is sold or transferred to income-eligible household. Northwestern VT. Out of funds (March 2018).
	Champlain Housing Trust Housing Loan Fund: Manufactured Housing Down Payment Loan Program	Income- and location- qualified for downpayment loans to purchase a VERMOD High Performance Home. Security: 2nd mortgage. Max amount \$35 k. No interest and no monthly payments. Principal due upon sale, transfer to income-eligible household or refinance. Northwestern VT. Out of funds (March 2018)
	Downstreet Housing and Community Development: Home Repair Loan	Income qualified loans for weatherization, health and safety and solar hot water. Central VT.
	Windham and Windsor Housing Trust: Home Repair	Income qualified loans for weatherization, health and safety improvements. Discounts for wood or pellet stoves. Southeastern VT.
	RuralEdge Community Development Corporation: Home Repair Loans	Income- and location- qualified loans for weatherization, health and safety improvements. Northeastern VT.
	NeighborWorks of Western Vermont: Home Repair Loans	Income- and location- qualified loans for weatherization, health and safety improvements. Southwestern VT.
	NeighborWorks of Western Vermont: Energy Loan	Energy Loan offering on-bill repayment option for Green Mountain Power customers. Range of eligible activities, 4.99% unsecured, up to 10 years, up to \$40,000. Statewide.
Utilities	Green Mountain Power: Tesla Powerwall	\$15/month lease for 10 years or \$1,500 upfront payment for Powerwall and install on bill.
	Green Mountain Power: Ductless Heat Pump	\$49-\$81/month lease (180 months, 10.74% APR) with VSECU. Program update coming soon.
	Green Mountain Power: Heat Pump Water Heater	\$25-\$44/month lease (180 months, 10.74% APR) with VSECU. Program update coming soon.
	Green Mountain Power: Products related to electric vehicles	\$9.99/month lease for a charger offering a \$29.99/month off-peak unlimited charge plan or \$0.60/kWh during peak hours.
Federal Government Products	US Dept. of Housing and Urban Development: Federal Housing Administration Energy Efficient Mortgage	FHA insures a borrower's mortgage for a home purchase or refinance and covers the cost of energy improvements on top of mortgage. Maximum amount varies. Not readily available throughout Vermont (may be available for Upper Valley through New Hampshire lenders). Launched March 2018.
	US Dept. of Veterans Affairs guaranteed: Energy Efficient Mortgage	Allows qualified buyers to add up to \$6,000 to a mortgage for approved energy improvements into a loan at time of home purchase or refinancing. Offered via private mortgage lenders.
	US Dept. of Agriculture Rural Development: Single Family Housing Repair Loans	Also known as Section 504 Home Repair program. Up to \$20,000 at 1% fixed, up to a 20-year term for very-low-income homeowners to repair, improve or modernize their homes.
	Fannie Mae HomeStyle Energy Mortgage Loan	Energy efficiency mortgage product that provides loan dollars for energy efficiency improvements when purchasing or refinancing a home. Can borrow up to \$10,000 above home value if supported by "as-improved" appraised value; can borrow up to \$3,500 above home value without an "as-improved" value supporting this additional amount. Requires energy report and scope of work, among other requirements.

*Note: CDFIs are also known as Nonprofit Community Development Organizations (NCDO)

Table 2. Vermont Clean Energy Financing Products: Residential

³⁷ This report focuses on the single-family, owner-occupied market. There are multiple residential markets such as renters and those living in multi-family units that face unique challenges—for example, the “split incentive” between renter and landlord (Split incentives occur when those responsible for paying energy bills (the tenant) are not the same entity as those making the capital investment decisions (the property owner). While this report does not attempt to address these issues, some resources are provided in the References section.

³⁸ Regarding the development of new initiatives, Burlington Electric Department is designing a financing product available for low and moderate-income customers and Washington Electric Department is partnering with a local credit union to buy down a loan product for electric vehicles. Meanwhile, Green Mountain Power is modifying their heat pump products to lower the interest rate. Regarding funding gaps, various Champlain Housing Trust loan programs are still considered available but are currently out of funds.

Banks offer various secured and unsecured home and personal loans, home equity lines of credit, and some energy-specific products. Credit unions provide similar offerings, with some such as VSECU, Opportunities Credit Union and Green Mountain Credit Union focusing on clean energy products as a niche market.³⁹ For these credit unions, the focus on supporting clean energy products is derived in part from the institution's mission and in some cases, is a marketing strategy to bring in new members.⁴⁰ The products provided by banks and credit unions vary, with interest rates typically in the range of 2 – 6%, terms of 5 - 20 years and a variety of credit enhancements.

Private companies also provide financing products directly to customers. This is particularly true for the solar industry, where leases, loans, and power purchase agreements are common. Local solar companies may partner with a local credit union or bank or may partner with a financial services entity, while national companies frequently use their own resources or partner with national financing entities. Some retail stores, such as Lowe's and Home Depot, also provide homeowners with credit cards and payment plans, allowing for a variety of clean energy purchases that can defer and extend payment at a specific interest rate.

Significant energy and effort has gone into the development of Property Assessed Clean Energy (PACE) financing in Vermont, and while the structure exists for PACE, the mechanics do not. More than 40 Vermont towns and cities are legally able to offer Property Assessed Clean Energy (PACE) financing, which technically lets property owners borrow up to \$30,000 (or 15% of the assessed property value, whichever is less) to pay for energy improvements.⁴¹ Repayment is made via a special assessment on the property over a period of up to 20 years and requires voter approval to establish a PACE district and eligible projects include renewables and approved efficiency measures. The Vermont legislature has made multiple changes to statute to make PACE more effective in Vermont, including addressing Federal Housing Financing Authority concerns regarding the order of lien holdings and establishing a state PACE reserve fund overseen by the Vermont Treasury. However, there has been limited uptake of the product and Efficiency Vermont is not currently accepting PACE applications (although existing loans are still managed by Opportunities Credit Union).⁴² A variety of reasons have been cited for the limited PACE uptake, with complexity as a significant, primary concern.⁴³

5.2 Financial Products Available for Businesses

A variety of financial products are also available for businesses, which in this report includes commercial and industrial companies. Table 3 below provides an overview of products available through the state, a community loan fund, efficiency utilities and the federal government. As with financing

³⁹ During the phone interviews with lenders, VSECU was recognized by peer lending institutions for leadership in clean energy financing via its VGreen program and support for multiple programs sponsored by the Vermont Department of Public Service, utilities and energy efficiency utilities.

⁴⁰ This aspect of a lender utilizing specific programs to attract new customers was referenced by some lenders during the interviews for this report and reflects findings from other locations:

<http://eetd.lbl.gov/sites/all/files/publications/policy-brief-austin-energy-star.pdf> (page 3)

⁴¹ While these towns are *legally* able to offer PACE, other than Burlington (which has its own source of capital), there is no capital provider for PACE financing in the state anymore. Therefore effectively, this means PACE is unavailable.

⁴² Towns can still decide to self-manage their own PACE initiatives, and Efficiency Vermont continues to assist in areas authorized by statute.

⁴³ PACE is seeing considerable success in some states such as California; Vermont's experience with PACE should not necessarily be viewed as a reflection on the broader PACE model.

offerings for homeowners, business owners are also able to access financing through banks, credit unions and private companies such as solar businesses and energy service companies.

The business sector differs from the residential (or “homeowner” category) sector in that most businesses have an ongoing, trusted relationship with a specific lender and therefore often seek financing through this known provider, rather than through one of the distinct energy-specific financing products listed in Table 3. Certainly, most homeowners also have bank accounts, mortgages and credit cards. However, the business survey and lender interviews stressed the point that business owners interacted more regularly and actively with their lender.

Further findings will be discussed in Chapter 6. However, it should be noted that due to the limited response in the business survey and the lender interviews, one area for future research could be a more in-depth analysis of the clean energy finance market for businesses.

Vermont Clean Energy Financing Products: Businesses		
Provider of Product	Examples of Specific Products	Detailed Description
State	Vermont Economic Development Authority (VEDA): Commercial Energy Loan Program	Up to \$2 million (usually 60% of project cost) to finance qualifying efficiency and renewables projects. Rates and terms case by case.
	VEDA: Agricultural Energy Loan Program	For agriculture- and forest product-based businesses. Up to \$2 million. Terms, rates, % of project cost determined case by case.
	VEDA: Electric Vehicle Charging Station Loan Program	Funded through the State Infrastructure Bank with Vermont Agency of Transportation and the Federal Highway Administration. Up to \$100,000 for purchase/installation of electric vehicle charging stations that are available for public use. 1% fixed rate, term dependent on useful life of asset; 2% commitment fee.
	VEDA: Vermont 504 Corporation	VEDA's affiliate Vermont 504 Corporation helps borrowers access the federal Small Business Administration program to finance fixed asset projects including renewable energy and energy efficiency projects with loans of up to 40% of a project (max loan \$5.5 million). Loans are 10 year terms on equipment, or 20 or 25 year terms on real estate projects.
	VEDA: Tax Exempt Revenue Bond Program for Non-Profits	Renewable and efficiency projects undertaken by 501(c)(3) non-profits. Low interest rate due to the tax exemption on the interest income to the bondholder. Frequently bought by banks or other investors and sometimes publicly issued.
	VEDA: Montpelier Heating District Loan Program	Up to \$60,000 to assist in connecting and converting to district heating system. 4% fixed rate, 5-7 year term. City of Montpelier contributes 10% of the project cost. \$100 application fee and 1.25% commitment fee at closing.
CDFIs & Community Loan Funds	Vermont Community Loan Fund: Business Loans	Up to \$350K with an average rate is 7.25% with terms ranging from months to 20 years. \$50 application fee; \$125 closing cost and 1% origination fee. Collateral required. Loan can be used for a variety of uses - not energy specific (but has been used multiple times for energy work).
Utilities	Burlington Electric Department: On-Bill Financing Service	Loans from \$2,500 - \$50,000 maximum per building. No money down. 12-72 month fixed-rate, maximum 4%. Requires no out of pocket expense for electric efficiency projects. Loans can be structured as cash flow positive. Repaid into revolving loan fund dedicated to electric efficiency improvements for Burlington businesses. Standard loan underwriting.
	Vermont Gas: Commercial Customer Financing Program	Vermont Gas offers 0% interest loans for 3 years, 2% for 5 years and 4% for 10 year loans through the Green Mountain Credit Union for upgrading to a new high efficient heating system. The maximum loan per individual applicant is \$15,000. Also available are loans for small retrofit and equipment replacement projects.
Collaborations and Partnerships	Efficiency Vermont: Business Energy Loan Program (with various credit unions)	No closing costs, \$0 down. Low interest loans via VSECU. \$50,000 cap, flexible terms up to 10 years. 100% financing available. No business financials required. Available to non-profits and multi-family rental housing.
	Efficiency Vermont: Financing for Agricultural Operations (with various credit unions)	Below-market interest rates, flexible terms up to 5 years, 100% financing available for cost-effective energy improvements to agricultural operations.
Federal Government	US Dept. of Agriculture Rural Development: Rural Energy for America Program Renewable Energy Systems and Energy Efficiency Improvement Loans	Guaranteed loans ranging from \$5K to \$25 million for renewable system installation and efficiency improvements. Rates and terms (7-30 years) negotiable. This loan requires a 25% match, which can be obtained through the USDA grant program.

Table 3. Vermont Clean Energy Financing Products: Businesses

5.3 Financial Products Available for Institutions

Like the homeowner and business market sectors presented previously, Table 4 below shows financial products available to the institutional market.⁴⁴ Similar to the previous tables, incentive and rebate programs available for the institutional market are also not presented in this table, as these are not considered financing. However, unlike Tables 2 and 3, Table 4 does show a variety of private sector offerings such as Energy Savings Performance Contracts provided by Energy Services Companies (ESCOs), tax exempt leasing/lease purchasing, and revolving loan funds, due to the critical role these products play in the institutional sector.^{45 46}

The institutional market often has larger organizations with strong credit and building facility managers. However, access to capital may typically rely on the use of bonds, and therefore may require greater planning, community outreach to develop support for the bond, and prioritization of one bond request over another. While *institutional facilities* may be amenable to energy improvements offered through ESCOs, those that indicate lower energy savings (such as a range of less than \$1,000,000 or \$500,000) may have no appeal to ESCOs.

Vermonters have responded to this challenge via local modifications of the Energy Savings Performance Contracting approach through groups such as Commons Energy L3C (for public purpose buildings) and the Vermont Department of Buildings and General Services (BGS). Commons Energy L3C, a subsidiary of Vermont Energy Investment Corporation, provides technical assistance, installation services, performance guarantees and financing to complete the project for public-purpose buildings.

BGS staff oversee implementation of the State Energy Management Program (SEMP), through which the state conducts energy audits and implements energy savings programs in state-owned buildings as specified in Act 178 of 2014. SEMP projects are eligible to access revolving loan funds overseen by BGS in conjunction with the Office of the Treasurer including the State Energy Revolving Fund (SERF) and the State Resource Management Revolving Fund (SRMRF). Annual SEMP program results for the state fiscal years 2017 and 2018 are provided in Figure 28. The average payback for projects is about nine years, with average building savings ranging from 25-30%.

⁴⁴ The term “institutional” is at times used loosely. For this report, the institutional market tends to refer to government-owned institutions and non-profit entities which typically have access to tax-exempt bonds and leasing, and are generally served by ESCOs. This includes government-owned (**M**unicipal) buildings, **U**niversities, K-12 **S**chools, and **H**ospitals (or, MUSH). For-profit, private hospitals and educational facilities are part of the “business” sector.

⁴⁵ Energy Savings Performance Contracts are offered by an ESCO, which is a business that provides a broad range of energy solutions including designs and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management.

⁴⁶ A peculiarity in this sector is the “annual appropriation” clause which: (1) requires the lessee to appropriate lease payments into their budget each year to renew or continue the financing; (2) enables the lessee to recognize the lease obligation as a current expense rather than debt; and (3) enables the lessee to terminate the lease agreement at the end of the current appropriation period without further obligation or penalty if the lessee is unable to obtain funding.

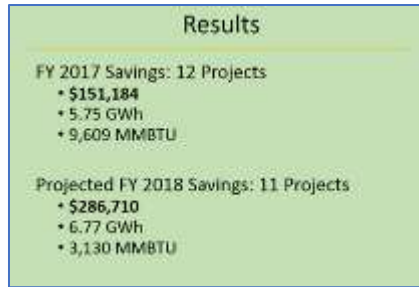


Figure 28. SERF Program 2017 and 2018 Results⁴⁷

Results from activities funded via the SERF and the SRMRF are provided in Figures 29 and 30.

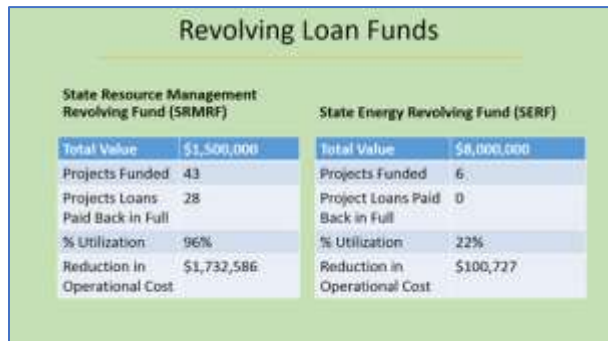


Figure 29. SEMP Improvements funded via SRMRF and SERF

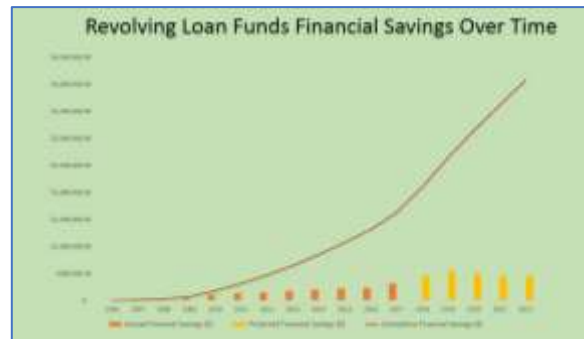


Figure 30. Financial Savings Over Time

As shown in Table 4 below, support for developing self-managed revolving loan funds is available for many organizations within the institutional sector by the Sustainable Endowments Institute. This national non-profit provides assistance to hospitals, non-profits and government entities, with the City of Montpelier being the first municipality in Vermont to utilize this service. Meanwhile, the non-profit Second Nature provides the same support role for higher education institutions.

⁴⁷ Data provided by the Vermont Department of Building and General Services, April 2018.

Vermont Clean Energy Financing Products: Institutions (Municipal, University, School and Hospitals)		
Provider of Product	Examples of Products	Detailed Description
Private Finance Tools	Self-Managed Revolving Loan Fund	Governments/hospitals/non-profits and higher education institutions can set up a self-managed green revolving loan fund with terms and parameters set by host; savings are used to pay for future projects; projects vary by need and interest of host.
	<u>Endowment Institute: Building Energy Savings Together</u>	The "BEST" Fund is a pooled revolving loan fund for under-resourced insitutions that need capital for energy efficiency projects.
	Energy Performance Contracting via Energy Service Companies (ESCOs)*	ESCOs are a type of company that typically combines an energy savings guarantee with a lease or bond to provide an Energy Performance Contract to suit the needs of the institution (government, schools, larger facilities). Usually there is a price floor for entry.
	Municipal Leasing and Lease Purchase Financing	Allows units of government to obtain energy upgrades with less cost than other financing options; terms vary 2-20 years; build equity and own at the end of term. The most common mechanism is a municipal tax exempt lease purchase agreement.
Utilities	Vermont Gas: Commercial Customer Financing Program	Vermont Gas offers 0% interest loans for 3 years, 2% for 5 years and 4% for 10 year loans through the Green Mountain Credit Union for upgrading to a new high efficient heating system. The maximum loan per individual applicant is \$15,000. Also available are loans for small retrofit and equipment replacement projects.
Municipal	<u>Vermont Municipal Bond Bank (VMBB)</u>	Provides support for municipalities to issue tax-exempt bonds including those that support renewable energy and energy efficiency projects.
	Municipal Revolving Loan Funds	Some towns operate or contract to others for operations of revolving funds that can be used for infrastructure including energy upgrades. The City of Montpelier is the first to undertake this initiative in Vermont specifically for clean energy.
Federal Government	<u>United States Department of Agriculture Rural Development: Community Facilities Direct Loan Program</u>	Low interest direct loans (below 4% for Q2 2018) for up to 100% of the project cost for facilities that provide "an essential community service" such as health care services, local government services (libraries, cultural facilities) and educational services. Term is "up to the useful life of the asset" (up to 30 years).
	<u>United States Department of Agriculture Rural Development: Rural Economic Development Loan Program (REDLG)</u>	0%, 10-year loan for nonprofit utilities for projects that will create or retain rural jobs.
State	<u>Vermont Department of Buildings and General Services (BGS) "State Energy Management Program": State Resource Management Revolving Loan Fund (SRMRLF) and State Energy Revolving Fund (SERF)</u>	SRMRLF: \$1.5 million fund available for resource conservation measures. SERF: Up to \$8 million (at the discretion of the State Treasurer) for energy efficiency and renewable projects at state properties. State funds are managed by the Treasurer's Office with BGS technical staff overseeing individual projects.
	<u>VEDA: Electric Vehicle Charging Station Loan Program</u>	Funded through the State Infrastructure Bank with Vermont Agency of Transportation and the Federal Highway Administration. Up to \$100,000 for purchase/installation of electric vehicle charging stations that are available for public use. 1% fixed rate, term dependent on useful life of asset; 2% commitment fee.
	<u>VEDA: Vermont 504 Corporation</u>	VEDA's affiliate Vermont 504 Corporation helps borrowers access the federal Small Business Administration program to finance fixed asset projects including renewable energy and energy efficiency projects with loans of up to 40% if a project (max loan \$5.5 million). Loans are 10 year terms on equipment, or 20 or 25 year terms on real estate projects.
	<u>VEDA: Tax Exempt Revenue Bond Program for Non-Profits</u>	Renewable and efficiency projects undertaken by 501(c)(3) non-profits. Low interestrates due to the tax exemption on the interest income to the bondholder. Frequently bought by banks or other investors and sometimes publicly issued.
*Note: Although not a specific product, this type of product is used frequently and hence is provided in the table.		

Table 4. Vermont Clean Energy Financing Products: Institutions (or, Municipalities, Universities, Schools, and Hospitals) (MUSH)

Municipalities may also take advantage of bonds through the Vermont Municipal Bond Bank (the "Bond Bank"). The Bond Bank is an instrumentality of the state administered by a board of directors including the State Treasurer and appointees of the Governor. Established in 1970, the Bond Bank has a mandate to provide municipalities with access to municipal bond proceeds at the lowest possible cost. Like many lenders, historically the Bond Bank did not specifically track whether a large project included clean energy components. However, in 2017, the Bond Bank issued its first Green Bond, which expanded the traditional investor base to double and triple bottom line investors interested in environmental and social returns as well as financial returns; the Bond Bank's 2017 Annual Report highlights efficiency and renewable energy projects. In 2017, approximately 13% (\$9.3 million) of the \$69 million that the Bond Bank provided in loans to school districts, municipalities, and special districts, was for clean energy

projects. Further, the Bond Bank estimates that in 2018, roughly 29% (\$11.8 million) of the total \$40 million loaned out, will be dedicated to clean energy projects.⁴⁸ The Bond Bank does currently have the potential to provide more support for municipal clean energy projects.⁴⁹

Municipalities are also able to take advantage of lease financing for energy efficiency and renewable energy (subject to annual appropriations), as well as ESCOs, and many towns and cities have signed agreements with third parties to install solar on their land or buildings. While generally little of this is tracked and recorded in a comprehensive manner, discrete data sets are available from some entities. For example, during the period of 2006-2018, the Grand Isle-based Municipal Leasing Consultants (MLC) provided a total of \$14,520,531 to twenty-two Vermont local government entities for clean energy projects specifically. Project types run the gamut from lighting upgrades to heating and ventilation improvements to solar and wood pellet boiler installations.⁵⁰ While data such as this does not allow for a complete picture of clean energy financing in Vermont, it does indicate that financing is occurring and provides a glimpse into the size and type of projects that are being completed.

6. Connecting-the-Dots to Inform Program and Product Design

A comparison of the survey and interview results from Chapter Four, to the available Vermont products presented in Chapter Five, followed by further comparison to the “theoretical” obstacles presented in Chapter Three, results in the following high-level list of financing-related issues facing residential, business and institutional customers seeking to complete clean energy projects.

Residential:

- Limited funds to support credit enhancements (such as a loan loss reserve or performance guarantee)
- Underwriting processes that rarely account for energy savings
- Limited energy savings guarantees

Commercial (or, business):

- Underwriting processes that rarely account for energy savings
- Few off-balances sheet finance options

Institutional (or, MUSH):

- Limited capital
- Short loan terms that limit the depth of energy savings achieved in a project

Broadly:

- No coordinated and consistent tracking system to establish a baseline of existing financing products and to determine progress in using financing in facilitating clean energy projects

⁴⁸ Data provided by VMBB, May 2018.

⁴⁹ VT towns must take a town-wide vote to approve a bond, which can pose a barrier. Other financing structures, such as leases in which repayments are only made each year if annual appropriations are approved, do not require a town-wide vote of approval up-front and therefore may be easier to move forward on.

⁵⁰ Data provided by MLC, June 2018.

There are, indeed, examples of products and services that provide solutions to these financing-related obstacles. These are described below. The following sections describe potential opportunities in the residential, commercial (or, business) and institutional (MUSH) sectors.

6.1 Residential

It is not currently foreseeable that funding will materialize to support 0% interest loans, and there are questions as to whether there will continue to be sufficient funding to support the interest rate buy down that is an essential aspect of the Heat Saver Loan. Therefore, a focus on what homeowners stated would be the second most motivating product feature for them to complete clean energy projects appears to have the greatest possibility of realization: a “guarantee” of the energy savings. While clearly appealing to the customer, the use of an energy savings guarantee outside of the ESCO industry has thus far been fairly limited. There is often a perception that savings guarantees are 1) too risky (in terms of predicting performance in smaller buildings), 2) potentially too costly (in terms of exposure to guarantee payouts), and 3) too complex to set up and administer. However, market players have now developed methods of managing risk, limiting exposure, and streamlining administration in ways that may make it easier to pilot savings guarantee programs in smaller buildings in the future. Below are several examples of residential savings guarantee programs.

6.1.1 Sealed

Sealed is a company based in New York that guarantees that energy savings will pay for the work done on the homes they retrofit. Sealed takes over a customer’s utility bills and pays them on the customer’s behalf, while customers make a combined utility payment directly to Sealed.⁵¹ Sealed gets paid from the difference between customers’ pre- and post-installation bills, meaning that if customers are not saving, Sealed does not make money.

Sealed has been a proponent for many years of the “portfolio diversification” approach to energy savings guarantees and began offering its business model on its own simply by betting that it could make money more often than it would lose money on residential projects. More recently, Sealed has partnered with national equipment insurance company Hartford Steam Boiler (HSB) to layer in energy performance insurance to support its savings guarantee offering.

A key feature of the Sealed model is that the company works with local contractors who perform the actual retrofit work. Contractors are paid for the cost of the project, while Sealed is paid from the savings the project produces. This means that contractors must understand the Sealed model and embrace it as part of their business model and sales pitch in order for Sealed to be successful. Sealed’s pitch to contractors is that its messaging to customers, with a guarantee that the savings will pay for the work, will help contractors close more deals. Sealed’s annual growth rate has increased steadily in recent years, and it has recently received backing from the New York Green Bank to help further expand its operations.

6.1.2 Posigen

Posigen is a company targeting the low-to-moderate income single-family residential sector. Founded in Louisiana, Posigen has expanded its presence to the Northeast, with operations in both

⁵¹ Some have commented that they think asking customers to stop paying their utility company and instead pay a company they may not have heard of previously poses challenges. The author of the report is unaware of the availability of data that would assist in assessing the size of this hurdle (for example, customer survey results).

Connecticut and New York. The company focuses on promoting solar PV installations, but also offers energy efficiency services as an optional package along with solar panels. The energy efficiency work comes with a one-year savings guarantee. In Connecticut, a successful partnership with the Connecticut Green Bank has led to over 200 installations. Due to the efficiency requirements that customers must meet in order to receive a solar incentive, the vast majority of Posigen customers in Connecticut also obtain an audit through the state's energy efficiency programs, which includes the installation of certain direct-install measures at the time of the audit. In addition, approximately two thirds of these customers also choose to layer on additional energy efficiency measures on top of those already installed during the required audit, even at an additional cost to them. By contrast, less than a quarter of all non-Posigen customers participating in the same energy efficiency programs sign on to install additional measures beyond those installed during the audit.⁵²

Unlike Sealed, Posigen does not specifically guarantee that a customer's energy savings will fully pay for the energy efficiency installations, and its savings guarantee lasts for only one year. Nonetheless, the guarantee may at least play a positive role in helping increase customer confidence in energy savings projections and convincing a relatively high percentage of customers to layer on additional efficiency measures.

6.1.3 Zero Energy Now (ZEN)

The Zero Energy Now (ZEN) program in Vermont is an example of a savings guarantee that was established by program administrators rather than a private market vendor. The program, which ran as a pilot in 2016, was primarily focused on deep, comprehensive retrofits that also included solar and heat pump installations. As part of its overall budget, the program set aside \$50,000 to serve as a "savings guarantee pool." This guarantee pool backed up a one-year savings guarantee for program participants, with a maximum claim of \$1,000 per participant (with a goal of attracting 50 participants in the first year).

As described above, the claims process was intentionally streamlined and reduced down to a two-page form, with only basic information on projected and actual fuel usage required from customers to make a claim, along with willingness to provide copies of fuel bills and receive an on-site inspection. This basic structure and streamlined approach made the process of setting up and administering the guarantee aspect of the program highly manageable. Results from the program showed that customers saved an average of \$3,700 per year on these very comprehensive projects, and zero customers submitted a claim against the guarantee, leaving the entire \$50,000 pool intact for potential reuse.⁵³

6.1.4. Energy Savings Mortgage Program

In the late 1990's the Vermont Energy Investment Corporation (VEIC) ran an Energy Improvement Mortgage (EIM) pilot program that worked with lenders, real estate professionals, appraisers and contractors to roll energy improvements into the mortgage at the time of purchase in

⁵² Under the Posigen program, the typical cost of additional energy efficiency installations is approximately \$10 per month and may be limited to measures such as smart thermostats; however, Posigen does offer deeper measures such as attic insulation and advanced air sealing.

⁵³https://greenmountainpower.com/wp-content/uploads/2013/01/GMP_CEED_Program_Participation_Package-from-BPPA-revised-8-30-16.pdf
<https://vermontbiz.com/news/zero-energy-now-streamlines-energy-savings>

order to finance needed energy upgrades in existing homes. As part of this initiative, they offered a one-year savings guarantee that covered the difference between a participant's projected energy costs after doing the work and their actual costs as a way of instilling confidence in home buyers to participate in the EIM program. VEIC served approximately 75 customers through this pilot, with average financed investments of about \$7,000. In the end, one claim was filed and VEIC paid out \$60 towards the savings guarantee.

The Homeowner Survey conducted for this report clearly indicates a need for ongoing improvements in making clean energy projects easier to understand and complete, as well as generally increasing awareness and education of the various programs and their benefits. While this is outside of the realm of financing, when needed and desired by the customer, financing products should be a coordinated part of any overarching clean energy program.

6.2 Commercial

The business survey data should be considered in light of the small sample size. However, two other Vermont-based reports support the following findings: (1) that a lack of funding does not appear to be a significant obstacle for the businesses surveyed and (2) that businesses, too, want a guarantee on their investment.

ESCOs do serve the commercial sector; however, revenues from commercial and industrial projects make up less than 10 percent of ESCOs revenues. Moreover, ESCO projects in this sector typically take place in some of the largest buildings. Therefore, there may be an opportunity to expand performance-backed business models to the small and midsize commercial sector using some of the same concepts described above for the single and multifamily sectors.

6.2.1. Joule Assets

One vendor pursuing this opportunity is Joule Assets, a company with locations on both the east and west coasts of the United States, as well as multiple locations in Europe. Its subsidiary, JouleSmart, offers energy efficiency upgrades to the small and midsize commercial sector, with a guarantee that the resulting energy savings will fully pay for project costs at no out-of-pocket expense to the customer. The JouleSmart commercial sector model shares several parallels with the Sealed model in the residential sector. As with Sealed, Joule works with local contractors to perform the actual retrofit work. Both Joule and Sealed also take over the customer's utility bills, and the customer makes payments to both based on historical utility payments. Furthermore, both Sealed and Joule are backed by the equipment performance insurance provider Hartford Steam Boiler (HSB).⁵⁴

Unlike Sealed, however, Joule provides 70% of the savings benefit over and above financing costs to the customer, even during the payment period. Customer payments are also pegged to a fixed amount, whereas Sealed customer payments may vary depending on the amount of fuel used, weather conditions, and changes in energy prices. Joule also maintains an ongoing relationship with the customer over multiple years, overseeing ongoing maintenance and energy monitoring, which accounts for a significant portion of the savings that customers enjoy. Joule also has the capacity to monetize the

⁵⁴ Joule notes that whereas traditional ESCO guarantees are backed by the ESCO balance sheet or customized project-specific insurance, its projects (like those of Sealed) are backed by "portfolio insurance." Under this model, the savings guarantee relies less on accurately predicting performance in any one particular building, and more on accurately predicting average performance over a portfolio of buildings

grid-related benefits of the energy savings over time and to share these benefits with the customer, creating an opportunity for an even longer-term relationship. Yet even with these sophisticated capacities, Joule is able to work with small buildings such as banks and fast-food restaurants, where the pitch to the customer is grounded in the guarantee that the energy savings will fully pay for the work.

6.2.2. Efficiency Capital

Efficiency Capital, based in Toronto, provides businesses with a “four-step” process: (1) business screening and on-site audit, (2) financial modeling to assess most viable shared savings agreement, (3) installation, (4) on-going measurement and verification of savings. This model covers up to 100% of the energy costs so the business is able to preserve capital, there is no debt listed on the balance sheet, energy savings are guaranteed and Efficiency Capital assumes the project risk. Efficiency Capital is a recent addition to the commercial energy services market; monitoring the results and impact may provide meaningful lessons for future product and service design.

6.3 Institutions

Institutions are large entities with multiple stakeholders involved in the many steps to any planned venture; the gears of change move deliberately. Undertaking clean energy investments within these structures requires not only a champion with the vision and time to bring the project to fruition – it also requires significant coordination across facility management teams and a prioritization of funding towards a specific clean energy decision.

Financing resources are available for municipalities through the Vermont Municipal Bond Bank and others, and there are also opportunities to establish an internal revolving loan fund, with assistance available from national non-profits for all categories within the institutional sector (municipalities, universities, schools and hospitals). However, undertaking these initiatives is no small matter: not only is technical expertise needed, so too are expert project management skills in tandem with coalition building and a multi-year vision with persevering drive to complete a significant clean energy investment.

It is unclear, given the limited survey data available, which is the greatest need for the institutional sector. It may be that having a dedicated staff person to focus on a specific project is the missing link in some cases. Or, the missing link may be a lack of ongoing support from upper level management to ensure the completion of clean energy projects, which would reduce energy costs and mitigate fuel price uncertainty. Or, it may simply be that the cost is too high.

Certainly, BGS’s State Energy Management Program is yielding results, but the limited financing is only available for short-term projects (5-7 years). It may make sense for BGS to explore alternative financing options pursued in other states that could supplement those currently under management by the State. Further, there is likely value in continuing the “State Lead by Example” theme as presented in the Vermont Comprehensive Energy Plan: BGS now has data to show the costs and savings resulting from their investments as well as experienced staff who could potentially provide technical assistance to other public entities. Meanwhile, the Vermont Municipal Bond Bank is reassessing the promise clean energy projects may offer for municipalities as a long-term financial benefit. Without a more in-depth review and analysis of this market, it remains challenging to determine what financing, or program design, offerings would be of most help to increase the uptake of clean energy projects in this sector.

Energy Saving Performance Contracting combined with a tax-exempt lease has been used widely and effectively by institutions (or, MUSH sector) for over 25 years. This strategy has enabled countless entities to achieve substantial energy savings while receiving an energy saving guarantee from the installing Energy Services Company (ESCO) and/or third-party insurance company. The strategy overcomes key barriers such as lack of time and expertise to make major energy improvements for institutions that have a small facilities staff. To execute this strategy many entities will need the trusted technical assistance of a qualified third-party to write, issue and oversee a Request for Proposals and to manage the ESCO relationship and contract details. Other states like Washington, Colorado, and Massachusetts have established very successful technical assistance programs for this sector and as a result have cumulatively made over a billion dollars in energy improvements. Whether Efficiency Vermont, the Department of Public Service or another qualified third party like BGS could or would provide such services should be investigated. Other states that have successfully used this strategy may be willing to share knowledge and best practices with Vermont; further detailed conversations with these states may be useful in assessing this option.

6.4 Ideas for Further Research

This 2018 Clean Energy Finance Report conducted a survey approach to characterize how homeowners, commercial businesses, lenders, contractors and installers provide or use clean energy finance products and services. Given the results of the 2018 report, future research areas that may be of interest are:

- Regarding the residential sector:
 - An investigation into the potential applicability in Vermont of energy service models provided by companies like SEALED and Posigen
- Regarding the commercial sector:
 - An additional business survey (due to the limited response rate in this survey) via a phone interview process or by partnering with Efficiency Vermont in one of their upcoming commercial customer surveys
 - An investigation into the potential applicability in Vermont of energy service models provided by companies like Joule Assets and Efficiency Capital
 - An investigation of other successful commercial PACE programs to assess whether commercial PACE would move the commercial market in Vermont (if yes, research into whether Vermont could attract lenders/capital given our small size)
 - An investigation into the potential value of “non-debt” financing arrangements, including accounting requirements, customer perception, and alternative ways to overcome the debt aversion barrier (such as guarantees and other assurances of return on investment)
 - A review of the Burlington Electric Department Commercial On-Bill Financing Offer
- Regarding the institutional sector:
 - Further research as to the potential to expand the BGS State Energy Management Program to provide technical support to new institutional customers
 - A survey of a subgroup within this sector; e.g. town managers, school superintendents, hospitals or higher education facility managers (perhaps focusing on those not currently eligible for BGS services and financing)

- Further discussions with states energy offices that have successfully provided technical assistance to MUSH entities in their states regarding Energy Savings Performance Contract
- Regarding contractors and installers:
 - A “deeper dive” into methods to motivate installers and contractors to utilize financing products in their sales process to increase the number of completed projects (for example, a review of the Michigan Saves program)
- Regarding lenders:
 - Greater research into what would help them understand and gain confidence in the income/savings realized by the clean energy industry (either through generation or efficiency)
- Regarding renewables and electric transportation:
 - Due to the focus of survey and interview responses on energy efficiency, this report did not delve as deeply into the needs and issues impacting financing for renewable and electric transportation projects; further research into these areas could provide helpful information to support these technologies more effectively
- Regarding data tracking:
 - Research into the extent of usage of federally supported financing products in Vermont
 - Research into the establishment of metrics to track clean energy finance programs, products and progress in facilitating the completion of clean energy projects

7. Conclusions

Financing products for clean energy projects are available. However, ensuring the stability of successful products (such as the Heat Saver Loan), increasing the understanding of the effectiveness of existing products (such as the BED, VGS and GMP on-bill financing offers), and broadly increasing the effectiveness and utilization of existing products and services, would likely leverage and build upon existing strategies as efficiently as possible. Further, both homeowners and businesses are skeptical of project results and concerned about high project costs; identifying and offering targeted solutions such as cash-flow-positive energy savings guarantees appears to have significant merit.

While financing alone cannot drive demand for clean energy projects, higher cost clean energy projects will certainly require financing. The challenge is to identify how best to combine financing products with other program and market services to ensure the specific obstacles for different customer types are met. Also, financing products need to be “user friendly” for contractors and installers; these market actors are an effective sales force when the product is simple, fast, compelling and easy-to-describe.

Given some of the realities expressed in this report, an accurate assessment of the size and scope of the clean energy finance market in Vermont is not feasible at this time. Nevertheless, it is clear that clean energy investments are occurring and that financing is facilitating some of these projects. If there is a desire to more accurately chart Vermont’s progress in clean energy financing, then a concerted effort would be needed to develop and implement a more comprehensive, coordinated tracking system.

Vermont's clean energy goals and statutory requirements are significant. To achieve these will require ongoing funding and significantly more financing. Clearly, there are opportunities to augment and improve upon existing financing products and services. However, broader market changes are likely needed to *dramatically* drive this market, such as an increase in fuel costs or regulations to cap greenhouse gas emissions. Until then, customers can choose how to use their personal resources, and these choices may or may not align with state policy interest.

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Appendices

Appendix 1. Survey Methodology

To assess the role financing plays in advancing clean energy investments, four surveys were completed. Three surveys were completed utilizing distinct surveys through SurveyMonkey® and shared via e-mail through partnering organizations. Efficiency Vermont assisted in sharing the Homeowner Survey via their opt-in electronic energy newsletter. Efficiency Vermont and Renewable Energy Vermont assisted in sharing the Contractor and Installer Survey with businesses who install and provide clean energy projects and services. Vermont Businesses for Social Responsibility assisted in sharing the Business Survey through their electronic membership newsletter. Each of these three surveys offered respondents the opportunity to enter a raffle for a \$100 gift receipt at a local retailer.

The lending community suggested to the researchers that requesting lenders to fill out on-line surveys would yield minimal responses, and further that the surveys returned would not provide the same level of insight as brief phone interviews. Therefore, rather than obtaining responses that provided percentage results, the responses from the lending community are qualitative in nature and may not provide as much of a "market snapshot" as did the online survey responses from homeowners, businesses and contractors/installers. Overall, 14 lenders at 5 banks and 9 credit unions were interviewed via phone.

Two additional items are of note. First, individuals did not have to answer every question, and the response rate decreased somewhat as respondents continued through the questions. Second, none of the surveys are a random sample: the homeowners surveyed were individuals who have chosen to receive an e-newsletter from the state efficiency utility; the businesses are members of the Vermont Businesses for Social Responsibility - an association that engages actively with the clean energy market; and all of the installers or contractors have voluntarily joined the Efficiency Vermont "Efficiency Excellence Network" or Renewable Energy Vermont. Therefore, it is likely that they all already have some degree of interest in energy-related issues. As a result, the survey results should be viewed as directional; they are not scientifically rigorous.

Appendix 2. Homeowner Survey

Thank you for taking the time to complete the Vermont Clean Energy Financing Survey. The purpose of this survey is to assist the State of Vermont in **assessing the role of financing in clean energy projects in residential homes** in Vermont.

There are ten questions.

All individual responses will be kept confidential with survey data reported in the aggregate.

If you would like to be entered into a raffle for a \$100 gift certificate from Lowe's, please provide your e-mail.

This survey will provide information on the financing options that you may or may not have used to undertake a "clean energy project" in your home.

Examples of a clean energy project could include:

- The purchase of a renewable generating system (e.g. solar array)
- A building retrofit that includes air sealing, insulation, lighting and/or duct sealing
- An upgrade to a more efficient fossil-fueled heating system, a purchase of a renewable heating system such as a pellet boiler, or the installation of a heat pump
- A purchase of an electric vehicle
- The installation of more efficient windows (lower U value) and doors (with a weather strip)
- The installation or replacement of a water heater with a higher efficiency model
- The installation or replacement of an efficient washing machine, dryer, dishwasher or other large appliance

When responding to the survey questions, please only consider items that are costly and lend themselves to seeking financing. Do not consider "small ticket" items (such as lightbulbs) as those are unlikely for you to require financing.

When we refer to financing options, these could include: leasing your water heater from your utility, credit cards, getting a loan or payment plan through a contractor or retailer, paying for upgrades through refinancing your home, getting a personal or home equity loan from a bank or credit union, or borrowing money a family member or friend.

1. If you would like to be entered into a \$100 raffle for a Lowe's gift certificate, please provide your e-mail here:

2. Before this survey, were you aware of any of the following financing offerings available for making clean energy upgrades at your home? Please check those that you were familiar with.

- ☐ Financing or payment plan through your contractor
- ☐ Financing or payment plan through a retailer (e.g. through a big box home products store)
- ☐ Financing or payment plan through your utility (electric and gas)
- ☐ A home equity loan or line of credit from a local bank or credit union – secured (e.g., a loan using your home as collateral)
- ☐ A mortgage loan from a local bank or credit union - secured (e.g. a loan using your home as collateral)
- ☐ A personal loan from a local bank or credit union - unsecured (e.g., a loan without providing anything as collateral)
- ☐ Heat Saver Loan
- ☐ NeighborWorks® Homeownership Center Energy or Rehab Loan
- ☐ Solar leases
- ☐ Solar power purchase agreements
- ☐ No, I was not aware of any financing offerings

Other (please specify) or additional comments:

3. Regardless of whether you used financing, have you made any major clean energy purchases or upgrades in your home in the past year? Please check all that apply:

- ☐ Weatherized your home - this could include envelope sealing, air sealing, insulation in any part of the home, and duct sealing
- ☐ Installed or replaced renewable energy sources such as solar, wind, or geo thermal
- ☐ Installed or replaced heating systems with a high efficiency system (such as furnace, radiator, wood heating system, heat pump)
- ☐ Installed or replaced a water heater with a high efficiency system
- ☐ Installed or replaced a refrigerator/freezer with a high efficiency system
- ☐ Installed or replaced a washing machine, dryer, dishwasher or other large appliance with a high efficiency system
- ☐ Replaced windows and/or doors with low U value windows and/or weather-stripped doors
- ☐ No, I did not make an investment in a clean energy project in the past year

Other energy improvements made / Additional comments:

4. If you DID NOT make any investments, but you considered making a major clean energy investment, then please rate the following statements on a scale of 1 - 3, with (1) posing a great obstacle to your investing in a clean energy project to (2) posing somewhat of an obstacle and (3) not posing an obstacle at all. Please select the last option (N/A) if you DID make a clean energy investment.

- ☐ There is a lack of information on products/services and how to proceed effectively
- ☐ It's too confusing to determine what to do in my home
- ☐ Efficiency upgrades or renewable energy is too much of a hassle
- ☐ The savings and/or return on investment are uncertain/unpredictable
- ☐ The payback periods for desired systems or improvements are too long
- ☐ The cost for these projects is too high
- ☐ I was unable to obtain financing to reduce upfront cost
- ☐ I am reluctant or unwilling to take on new debt
- ☐ I am too busy
- ☐ This is not a priority for me
- ☐ N/A. I did make a clean energy investment.

Other reason or additional comments:

5. If you DID NOT invest in a clean energy project due to the cost, to what degree would affordable financing have helped you to complete the project? Please select the last option (N/A) if you DID make a clean energy investment.

- ☐ It would have helped me considerably – I would have done the project.
- ☐ It might have helped, but I still may not have done the project.
- ☐ It would not have helped at all. I was not going to do the project, period.
- ☐ It would not have helped at all. I would never take a loan out to fund a clean energy project.
- ☐ I don't know. I am not familiar with the financing products available.
- ☐ N/A. I did make a clean energy investment.

What do you consider an "affordable" interest rate?

6. If you DID NOT invest in a clean energy project due to the cost, and a financing option could potentially have convinced you to complete the project, which of the following offerings might have motivated you to go forward with a clean energy project? Please state for each financial offering listed

below the degree to which the offering would motivate you to move forward with a clean energy project. Please use these rankings: (1) Very Motivating (2) Moderately Motivating, (3) Not Motivating. Please select the last option (N/A) if you DID make a clean energy investment. Please check as many as apply.

- ☐ A low-cost loan at a 5% interest rate or less
- ☐ 0% financing
- ☐ On-bill Repayment (the loan payment is added to the utility bill)
- ☐ Financing payments that are lower than projected energy savings
- ☐ A guarantee that I will see financial savings from the energy savings
- ☐ The payments made on my tax or utility bill automatically transfer to the next occupant if I leave the property and the next occupant then benefits from the energy savings
- ☐ Financing that does not require a credit check
- ☐ Financing that supports health and safety improvements or other non-energy work, along with clean energy upgrades
- ☐ Financing that includes all types of energy efficiency and/or renewable energy products or services needed for my home in one loan
- ☐ N/A. I DID make a clean energy investment

Additional comments:

If you DID NOT make any investments over the last year, thank you for completing this survey – you are all done! You may exit Survey Monkey by clicking on the Done button.

7. If you DID make a clean energy investment in your home over the last year, did you use financing?

- ☐ Yes
- ☐ No
- ☐ Other (please explain)

8. Please select the level of difficulty you found obtaining financing to be:

- ☐ Obtaining financing was not difficult at all
- ☐ Obtaining financing was somewhat difficult
- ☐ Obtaining financing was very difficult

Additional comments:

9. If you used financing for your clean energy investment, did you use.... (Select all that apply. Select the last option if you did not use financing.):

- ☐ A credit card
- ☐ Financing or payment plan through your contractor
- ☐ Financing or payment plan through a retailer (e.g. through a big box home products store)
- ☐ Financing or payment plan through your utility (electric, gas)
- ☐ A home equity loan or line of credit from a local bank or credit union – secured (e.g., a loan using your home as collateral)
- ☐ A mortgage loan from a local bank or credit union - secured (e.g. a loan using your home as collateral)
- ☐ A personal loan from a local bank or credit union - unsecured (e.g., a loan without providing anything as collateral)
- ☐ Heat Saver Loan
- ☐ A NeighborWorks® Homeownership Center Energy or Rehab Loan

- ☐ A solar lease
- ☐ A solar power purchase agreement
- ☐ A loan through family member/friend
- ☐ Don't Know
- ☐ N/A – I did not use financing

If you used any other type of financing or have additional comments, please provide that information here:

10. If you had not been able to obtain any financing, how likely would you have been to complete the project?

- ☐ Not at all likely
- ☐ Somewhat likely
- ☐ Very likely
- ☐ N/A – I did not use financing

Additional comments:

11. Which of the following best represents your annual household income from all sources in 2016, before taxes?

- ☐ Less than \$10,000
- ☐ Between \$10,001 and \$50,000
- ☐ Between \$50,001 and \$100,000
- ☐ Between \$100,001 and \$140,000
- ☐ Between \$140,001 and \$160,000
- ☐ More than \$160,001

This completes the survey. Thank you for your time.

Appendix 3. Business Owner Survey

Thank you for taking the time to complete the Vermont Clean Energy Financing Survey. The purpose of this survey is to assist the State of Vermont in **assessing the role of financing in clean energy projects** in Vermont.

There are twelve questions.

All individual responses will be kept confidential with survey data reported in the aggregate.

Please provide your company's name to ensure that we do not count more than one response for each entity. If you would like to be entered into a raffle for a \$100 gift certificate from Amazon, please provide your e-mail also.

Throughout this survey we are interested in financing that your company seeks to undertake "clean energy projects" in **your own** facilities—not on financing that you may provide to any of your customers or for you personally.

Examples of a clean energy project could include:

- The purchase of a renewable generating system (e.g. solar array)
- A building retrofit that includes air sealing, insulation and/or duct sealing

- An upgrade to a more efficient heating system, a purchase of a renewable heating system such as a pellet boiler, or the installation of a heat pump
- The installation of more efficient windows and doors
- The installation or replacement of a water heater
- The installation or replacement of more efficient commercial kitchen equipment
- The installation or replacement of an efficient washing machine, dryer or dishwasher
- Upgrades to motors, manufacturing equipment and system designs, and more efficient heavy machinery
- The purchase of an electric vehicle

When we refer to financing options throughout this survey **we are referring to loans, leases, and similar products** that businesses can get to pay for a clean energy project.

1. What is the name of your company? If you would like to be included in a raffle for a \$100 Small Dog Electronics gift certificate, please also include your e-mail. (Note: This will be kept confidential. This will be used to remove duplicate surveys from the same organization.)

2. Please provide an approximate annual operating revenue (in Vermont) for your company.

- ☐ 0 - \$100,000
☐ \$100,000 - \$250,000
☐ \$250,001 - \$500,000
☐ \$500,001 - \$750,000
☐ \$750,001 - \$1,000,000
☐ \$1,000,001 - \$5,000,000
☐ \$5,000,001 - \$10,000,000
☐ More than \$10,000,000

3. Which of the following best describes you?

- ☐ Building owner with no tenants
☐ Building owner with tenants; tenants pay utility costs
☐ Building owner with tenants; owner pays utility costs
☐ Tenant, responsible for utility costs
☐ Tenant, not responsible for utility costs

Additional comments:

4. **Before this survey**, were you aware of any of the following financing offerings available for making clean energy upgrades at your business? Please check those that you were familiar with.

- ☐ Efficiency Vermont/VSECU Business Energy Loan
☐ VEDA Energy Loans
☐ USDA Loan (or other Federal Government loan product)
☐ Vermont Community Loan Fund
☐ Gas or Electric Utility-Sponsored Financing Product
☐ Financing provided by an Energy Services Company (ESCO)
☐ Solar leases
☐ Solar power purchase agreements
☐ No, I was not aware of any financing offerings

Additional comments:

9. If you DID make a clean energy investment in your business over the last year, did you use financing?

- ☐ Yes
☐ No
☐ Other (please explain)

10. Please select the level of difficulty you found obtaining financing to be:

- ☐ Obtaining financing was not difficult at all
☐ Obtaining financing was somewhat difficult
☐ Obtaining financing was very difficult

Additional comments:

11. If you used financing for your clean energy investment, did you use.... (select all that apply):

- ☐ An unsecured loan from a bank, credit union or other financial institution (unsecured, meaning a loan without providing anything as collateral)
☐ A secured loan from a bank, credit union or other financial institution (secured, meaning a loan with collateral)
☐ A lease from a leasing company
☐ A Vermont Economic Development Authority (VEDA) loan
☐ Efficiency Vermont Business Energy Loan
☐ Financing through a contractor
☐ Financing through a retailer or wholesaler (e.g. through Lowe's)
☐ A secured equity line of credit secured (e.g. a loan using your business as collateral)
☐ A special energy efficiency or renewable energy financing program
☐ A government loan program from USDA Rural Development, HUD, SBA or other
☐ A credit card
☐ A loan through family member/friend
☐ Other
☐ Don't Know
☐ N/A – I did not use financing

Additional comments:

12. If you had not been able to obtain any financing, how likely would you have been to complete the project?

- ☐ Not at all likely
☐ Somewhat likely
☐ Very likely
☐ N/A – I did not use financing

Additional comments:

This completes the survey. Thank you for your time.

Appendix 4. Contractor and Installer Survey

Thank you for taking the time to complete the Vermont Clean Energy Financing Survey.

The purpose of this survey is to assist the State of Vermont in **assessing the role of financing in clean energy projects** in Vermont.

There are twelve questions.

All individual responses will be kept confidential with survey data reported in the aggregate.

Please provide your company's name to ensure that we do not count more than one response for each entity.

Throughout this survey we are interested in your experience selling "clean energy projects" to residential and business customers. We want to understand the role financing options play in your sales to these customers.

Examples of a clean energy project could include:

- The purchase of a renewable generating system (e.g. solar array)
- A building retrofit that includes air sealing, insulation and/or duct sealing
- An upgrade to a more efficient heating system, a purchase of a renewable heating system such as a pellet boiler, or the installation of a heat pump
- The installation of more efficient windows and doors
- The installation or replacement of a water heater
- The installation or replacement of an efficient washing machine, dryer or dishwasher
- Upgrades to motors, manufacturing equipment and system designs, and more efficient heavy machinery
- The purchase of an electric vehicle

When we refer to financing options throughout this survey **we are referring to loans, leases, and similar products** that customers can get to pay for the products and services you provide (for example, the Heat Saver Loan, a credit card, or a loan from a friend or family member).

1. What is the name of your organization?

(This will be kept confidential. This will be used to remove duplicate surveys from the same organization.)

2. Approximately how many energy efficiency and/or renewable energy projects or contracts did your company complete in Vermont in the last year?

___ 1 to 10

___ 11 to 25

___ 25 to 50

___ More than 50

Additional comments:

3. Which of the following services does your company offer the residential and business market? Please select all that apply.

___ Renovations or building additions

___ Weatherize and insulate buildings

___ Install water heating systems

___ Install HVAC systems (heating, ventilation and air conditioning systems)

- ☐ Install lighting
- ☐ Install solar
- ☐ Install motors, equipment
- ☐ Other (please specify)

4. Does your company currently offer or promote any kind of financing options to help customers purchase your products and services?

- ☐ Yes
- ☐ No

If yes, please describe.

5. How often do you mention financing options with your customers when selling a clean energy project?

- ☐ Always
- ☐ Frequently - More than half the time
- ☐ Occasionally - Less than half the time
- ☐ Never

Additional comments:

6. Thinking about the projects you sold last year, what percentage of those projects, do you estimate, used some form of financing including everything from loans to credit cards?

- ☐ 0 to 25%
- ☐ 26% to 50%
- ☐ 51% to 75%
- ☐ 76% to 100%
- ☐ I don't know

Additional comments:

7. To the best of your knowledge, how often do your customers use the following financing options to fund a clean energy project? For each option, please indicate (1) always, (2) frequently, (3) occasionally, (4) never, or (5) N/A (if you do not know).

- ☐ Home equity loan/home equity line of credit
- ☐ Secured business loan
- ☐ Unsecured loan from a bank, credit union, or other financial institution
- ☐ "Clean energy" loans from a local bank or credit union
- ☐ Other bank/credit union loans
- ☐ Financing that you offer directly through your business
- ☐ Financing from a retailer, wholesaler, manufacturer, or distributor
- ☐ Credit card
- ☐ Equipment leases for energy saving equipment
- ☐ Gas or electric utility on-bill repayment financing

Additional comments:

8. If you have lost projects because a potential customer could not obtain financing, how often does this occur?

- ☐ Always
- ☐ Frequently - More than half the time
- ☐ Occasionally - Less than half the time

- ☐ I have never lost a potential customer due to their inability to obtain financing
☐ Don't know

Additional comments:

9. Which of the following clean energy financing products have you heard of? Select all that apply.

- ☐ Heat Saver Loan
☐ NeighborWorks® Energy Loan
☐ Efficiency Vermont Business Energy Loan
☐ VEDA Energy Loans
☐ Gas or electric utility offering (on-bill repayment or financing)
☐ Equipment leases for energy saving equipment
☐ Solar leases
☐ Solar power purchase agreements
☐ I have not heard of any of these

Additional comments:

10. To the best of your knowledge, how often do your customers use the following financing options to fund a clean energy project? For each option, please indicate (1) always, (2) frequently, (3) occasionally, (4) never, or (5) N/A (if you do not know).

- ☐ Heat Saver Loan
☐ NeighborWorks® Energy Loan
☐ Efficiency Vermont Business Energy Loan
☐ VEDA Energy Loans
☐ USDA or other federal loan program
☐ Gas or electric utility offering (on-bill repayment or financing)
☐ Equipment leases for energy saving equipment
☐ Solar leases
☐ Solar power purchase agreements

Additional comments:

11. Listed below are a series of improvements that could be made for energy-specific financing products. Please rank on a scale of 1 - 4, with (1) being the least helpful and (4) being the most helpful.

- ☐ Better information, marketing, and outreach for customers about the financing products
☐ Better training for contractors on these finance products
☐ Technical assistance to answer customer and contractor questions about these products
☐ More attractive financing terms

12. Which of the following financing product features would be most helpful in terms of making energy-specific financing more attractive and useful to you in your sales process? Please rate each of the following features on a scale of 1 – 5, with (1) being the least helpful and (5) being the most helpful.

- ☐ Simple application process
☐ Flexible underwriting/no credit check (e.g., underwriting based on utility payment history)
☐ Offered by familiar institution (e.g., customer's current bank/credit union)
☐ Low interest rates
☐ Payments are lower than the projected energy savings

- ☐ Energy savings guarantee
- ☐ Landlord/building owner can “pass through” payments to tenants
- ☐ Financing available directly for renters/tenants to borrow
- ☐ Customer can transfer payments to someone else if they move and are no longer getting energy savings
- ☐ Financing covers health and safety/other non-energy improvements
- ☐ Financing can be treated as non-debt/off-balance-sheet (*Note: Please only rate this feature if you serve businesses. If you service only residential customers, please leave this blank.*)

Additional comments:

This completes the survey. Thank you for your time.

Appendix 5. Lender Phone-Interview Introduction

Thank you for taking the time to speak with me today.

As mentioned earlier via e-mail, I am calling on behalf of the Vermont Clean Energy Development Fund, housed at the Vermont Department of Public Service.

The purpose of this interview is to assist in the development of the Vermont Clean Energy Finance Report, which will be conducted in 2018, 2019 and 2020. The goals of the report are to provide a market snapshot as to what is available and what is being used in Vermont with regards to clean energy finance, as well as to assess what gaps there may or may not be and where improvements may or may not be made.

The purpose of this call, specifically, is to hear from you regarding your experience and perspective about the financing market in Vermont specifically for clean energy projects.

To clarify: by “clean energy project”, I am referring to energy efficiency and renewable energy projects. An efficiency project may be a comprehensive air sealing and insulation project in someone’s home, or it could be replacing processing equipment with highly efficient processing equipment at a manufacturing facility. It could also be an electric vehicle loan, but it would not be a loan for a traditional internal combustion engine vehicle that has a good miles-per-gallon ratio. For renewable energy, it could be the installation of solar electricity panels, solar hot water systems, a pellet heating system, a wind turbine, etc.

Also, we are interested in financing available for clean energy projects at residences, in places of business and in institutions such as municipalities, hospitals, schools, universities and governmental facilities.

We are also surveying homeowners and businesses who may pay for these projects, as well as contractors and installers who provide clean energy services and products.

However, it was suggested to us that the best way to obtain information from financial institutions was to hold brief phone calls that asked for your perspective, followed by requesting detailed information about products you may offer that are geared towards or provide significant investment in clean energy projects, specifically.