

Property  
Assessed  
Clean  
Energy  
in the  
Mad  
River  
Valley:

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Examining  
barriers and  
opportunities



# Table of Contents

**Letter of Introduction ..... 3**

**Report on Housing in the Mad River Valley ..... 4**

**PACE Survey ..... 11**

**The 5 “C”s ..... 15**

**Case Studies from the Mad River Valley ..... 16**

December 9, 2011

In the Fall of 2011, we joined forces with Chris Badger and Efficiency Vermont to help bring Property Assessed Clean Energy (PACE) to Vermont's Mad River Valley.

We are excited to present our findings in this report.

Our work covers the barriers and knowledge gaps related to the PACE program, and includes recommendations for local energy coordinators on how to overcome these barriers. We looked at the housing stock and fuel usage in the Mad River Valley (MRV) and compiled our results in a report. We also created a survey to examine why some homeowners decide to move forward with energy improvements following an audit, and why others don't. After this, we compiled a list of recommendations for communities working on implementing an energy program. Finally, we put together case studies that look at households in the MRV and show why PACE can be an appropriate solution for people given their situation.

We hope that our results contribute to Efficiency Vermont's efforts to make PACE a successful program in the MRV and throughout Vermont!

We are grateful to Chris Badger, Peter Adamczyk, Joshua Schwartz, Brad Cook and Efficiency Vermont for guiding us through the research process and providing constructive criticism along the way. Thank you also to our instructor, Erin Buckwalter, for keeping us on track and making sure we were able to learn the most possible about community initiatives through this assignment.

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# Report on Housing in the Mad River Valley

This report contains general demographic and housing information for Mad River Valley (MRV)'s four towns, including Fayston, Moretown, Waitsfield and Warren. The purpose of this report is to provide local communities and VEIC with background information which would help them shape their promotion strategy for PACE. Data used in this report are from authoritative sources including U.S. Census, Center for Rural in UVM, Vermont Housing Finance Agency and different levels of governments. The data presented are from year 2010 unless otherwise specified.

## 1. Overview of demographics in the Mad River Valley

There are 2837 households living in the Mad River Valley's four towns, and 78.5% of these households own their home. This ownership rate is significantly higher than the county and state average rates, which are 70.0% and 70.1, respectively. The median move-in year varied from 1992 to 1994 in the fours towns. According to the 2010 Census, only 10.9% of residents moved to the MRV between 2005 and 2010, which is significantly less than the 17.5% level in the 2000-2005 period. High ownership and longer residence history means that MRV residents are likely to have good control over they properties and significant equity in homes for supporting PACE assessments.

Residents of the MRV's four towns are older than the average age in Washington County and Vermont. The median age ranges from 44.3 in Moretown to 45.2 in Warren, all older than the state's median age of 41.5 and the county's median age of 42.3. The proportion of population older than 34 in the four towns is between 64%~65% while the state average and country

average is only 58% and 60%, respectively. The older age of MRV residents may explain the hesitancy to invest in energy efficiency improvements, since many of them are planning their retirement and are risk adverse with decisions. PACE program could reduce the perceived risk for these people and lower the barrier for them to make energy investment

The median household income in the four towns is higher than the statewide median income of \$51,284 (\$57,314 in Warren, \$57,422 in Waitsfield, \$63,194 in Fayston and \$54,028 in Moretown). However, the annual personal income average in the MRV is \$36,863, which is over \$3,000 lower than the county and state average (\$39,430). The fact that the median household income is above the state average, and the individual wage levels are below may result from extra income residents are earning from business investments or rental income, however other factors like age and family size may also have effect in this income-wage discrepancy. PACE do not target any particular income groups. It's hoped that PACE would help people with different levels of income and would serve as an equalizing force in terms of energy efficiency.

It is interesting to note the prevalence of small businesses in the Valley: 65.2% of business establishments in the MRV are small businesses with less than 4 employees, which is much higher than the county level of 57.9% and the state level of 57.4% (2006 County Business Pattern data, Census). Besides income, the relatively lower unemployment rates also indicate healthier economic conditions in the valley compared to the rest of the state and the country. Three towns out of four have unemployment rates lower than the state and national average (with the exception of Waitsfield). The unemployment rate in Fayston is only 1.8%, the lowest of the four towns.

## 2. Overview of housing in the MRV

As shown in Fig. 2, the four towns in the Valley have dramatically different ownership types. The rate of owner-occupied homes varies from 16% in Warren to 63% in Moretown. Although the total number of housing units is as high as 3577 in Warren and as low as 863 in Moretown, the number of owner-occupied units are all within the 500~600 range. In Warren and Fayston, where the percentage of owner-occupied units is low, the vacancy rates are high (40.8% for Warren and 34.4% for Fayston). Most of the vacant housing units in Warren and Fayston are for seasonal, recreational and occasional use (37.6% for Warren and 32.0% for Fayston). Different ownership types in the four towns require local communities and VEIC to take different promotion strategies for PACE. For Warren and Fayston, it's crucial to understand the attitude of second home owners toward energy efficiency improvements.

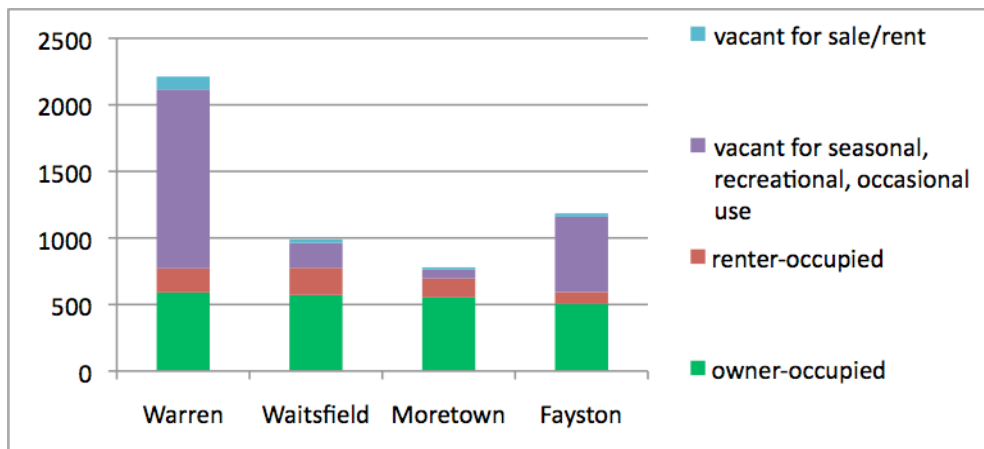


Fig. 1 Housing units by ownership types in the MRV's four towns

The 2000 census data shows that the median building year of owner-occupied housing units in the four towns ranges from 1975 to 1977 (the homes were aged between 34 and 36 years old in 2011). From Fig. 3 below, we can see that the downward trend of building new housing units started in the 70s, slowed and even reversed slightly during the housing boom of the 90s,

then resumed its decline until 2000. Although more recent data is not available for the town and county levels, the state level data shows that the number of housing units built in Vermont between 2000 and 2010 was 20,510, 17.5% down from the 1990~1999 level of 24,096 units. Given the recent financial crisis, it's likely that the MRV shared this downward trend with the state of Vermont.

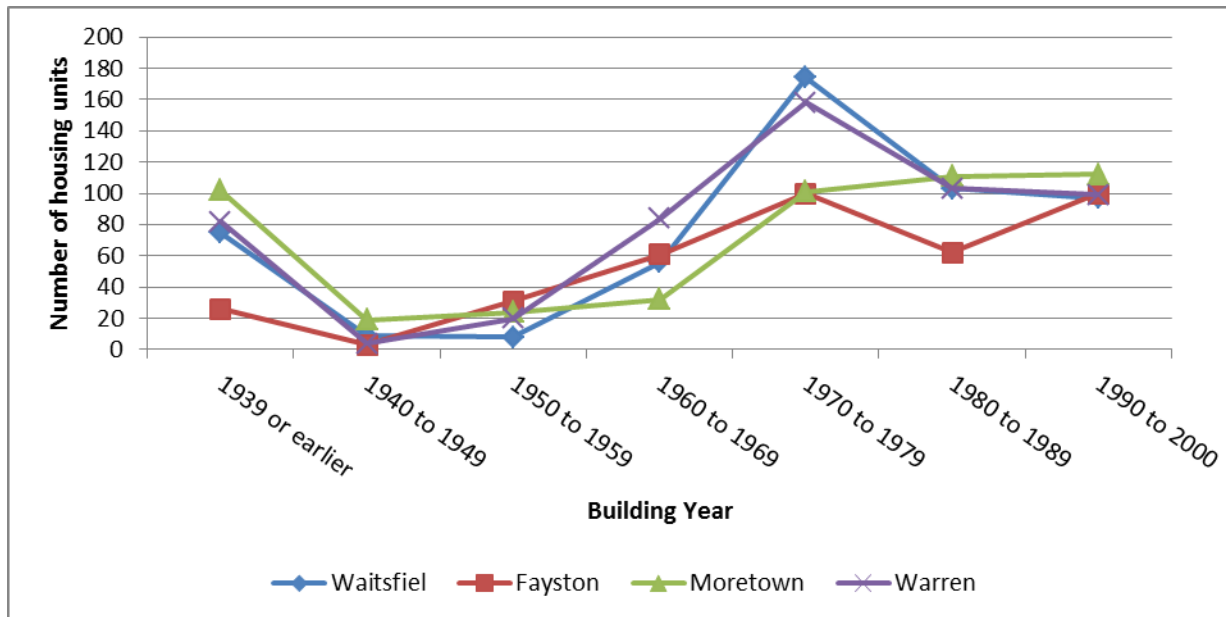


Fig. 2 The building year of owner-occupied houses (2000 data).

The mean value of specified owner-occupied housing units<sup>1</sup> is \$137,000 for Fayston, \$113,900 for Moretown, 156,100 for Waittsfield and 140,600 for Warren (Fig.3). A typical house would worth 50~100K in Moretown and worth 100~150K in the other three towns. The PACE

<sup>1</sup> Specified owner-occupied housing units are defined by the following criteria:

- Only owner-occupied.
- One family houses on less than 10 acres without a business or medical office on the property.
- Thus the data for "specified units" exclude mobile homes, houses with a business or medical office, houses on 10 or more acres, and housing units in multi-unit buildings.

program would have to adjust its strategy in different towns to appeal to owners of different types of houses.

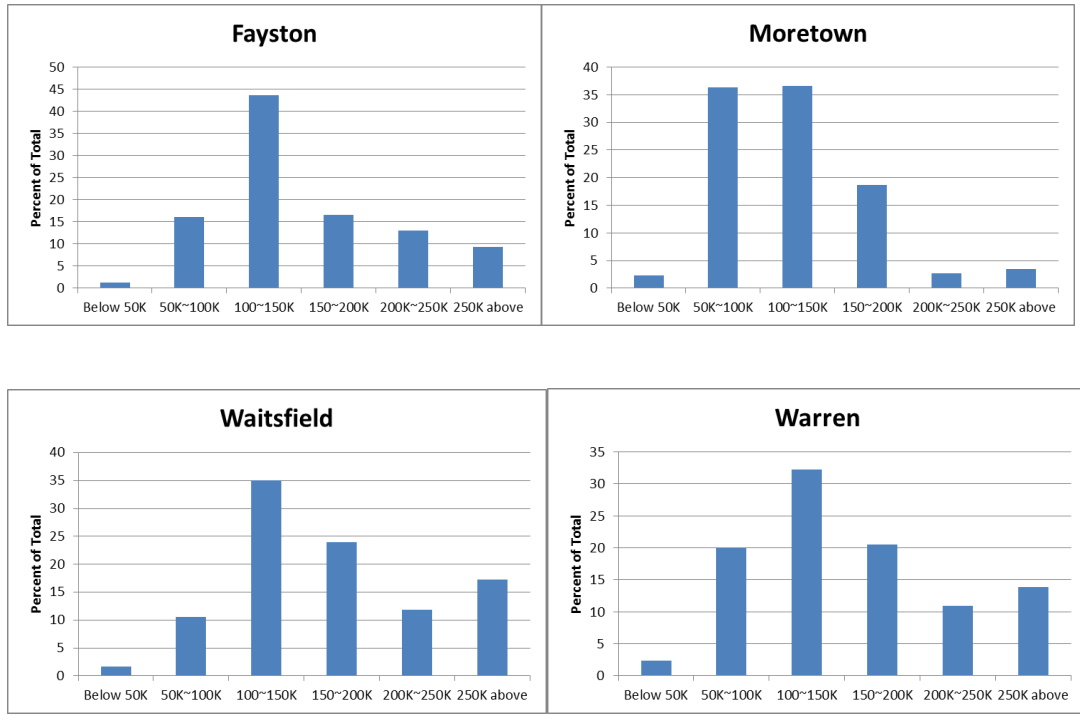


Fig. 3 Housing value distribution of specified owner-occupied housing units in MRV

The heating fuels in the MRV are dominantly propane, fuel oil, kerosene and wood. (Fig . 4) According to the Vermont Department of Public Service, in the last five year, after adjusting for inflation, the cost of propane increased by 13.9%, cost of fuel oil increased by 22.1% and cost of kerosene increases by 23.8% ,only the cost of wood decrease by 5% (September price is used for their fuels). Given the rising fuel prices, energy investments would yield high rate of returns in terms of energy savings.



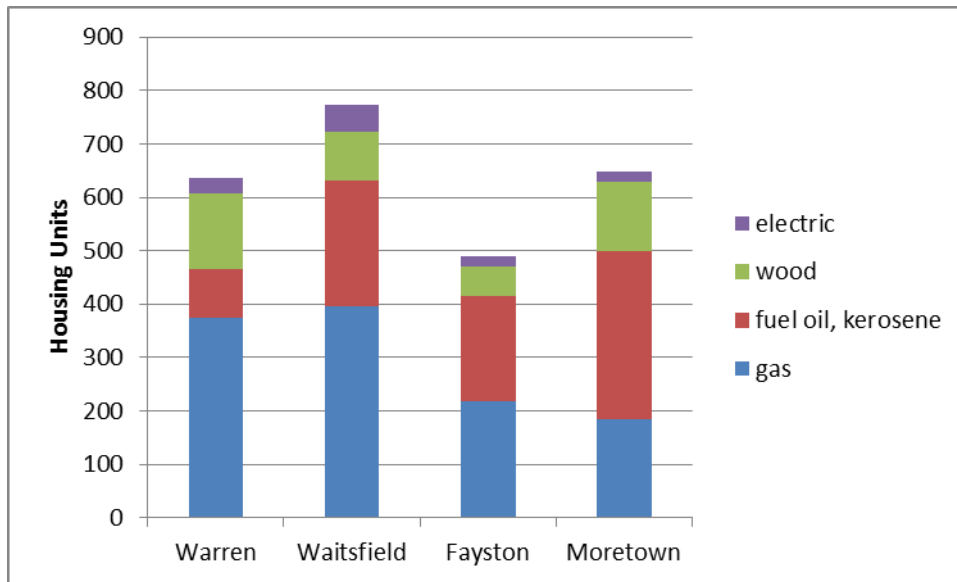


Fig. 4 Occupied house units by heating fuel types in the four towns of MRV

### 3. Implications for PACE

This brief summary shows that there are plenty of opportunities for the PACE program in the MRV region. The large proportion of older houses (median property age around 35 year) means that there is a substantial potential for home energy efficiency retrofits. As energy prices continuously raise and taking up larger shares of household spending, PACE would provide a good chance to MRV residents to invest in energy efficiency and mitigate energy costs.

PACE program may be attractive to MRV residents who are planning their retirement and are risk adverse with investments. The zero down payment and positive cash flow nature of PACE minimizes the risk associated with uncertain investment returns. If properly promoted and operated, PACE would present an opportunity for them to save money and improve life quality. PACE program may also be attractive for second home owners and renters in the MRV. If they

plan to sell their house in the near future, they may benefit from the flexibility of PACE, i.e. the remaining assessment would be paid by the next owner.

Furthermore, three of the major fuels used in the MRV—wood, fuel oil and kerosene—have relatively high carbon emission rates per unit of energy generated (wood 195 [1bsCO<sub>2</sub>/10<sup>6</sup> BTU], fuel oil 161 [1bsCO<sub>2</sub>/10<sup>6</sup> BTU], kerosene 159 [1bsCO<sub>2</sub>/10<sup>6</sup> BTU]) compared with natural gas (117 [1bsCO<sub>2</sub>/10<sup>6</sup> BTU]) and other fuel types. Therefore, if PACE could increase energy efficiency in the valley and decrease fuel consumption, it could potentially have large impacts on reducing carbon emission in the region.

## PACE SURVEY:

**PACE is a Property Assessed Clean Energy initiative that allows property owners to make energy efficiency improvements to their homes and/or businesses by attaching the cost of improvements to their property taxes. This financing is secured through a lien on the property. If the property is sold before the total cost of repairs has been paid, the new owner will inherit the remaining costs along with the financed energy improvements.**

**Directions: This survey will allow you to provide information on your experiences with the PACE program that will help your community to make improvements for future participants. Please complete the following questions to the best of your ability.**

- 1) How did you hear about the PACE program?
  - a) Town hall meetings or other city organization
  - b) Friend or neighbor in the MRV
  - c) Radio ad
  - d) Promotional material
  - e) Contractor
  - f) Other: Work \_\_\_\_\_
  
- 2) What is the main reason you are getting the audit?
  - a) Comfort
  - b) High energy bills
  - c) Environmental concerns
  - d) Needed repairs and/or upgrades
  - e) Other: \_\_\_\_\_
  
- 3) I am confident that the improvements will result in the savings described by the contractor.
  - a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
  
- 4) I consider myself informed on energy efficiency issues.
  - a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
  
- 5) Signing up for an energy audit was an easy process.
  - a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree

- 6) The information I received prior to the audit was useful.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 7) I understand how PACE works.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 8) I am satisfied with the contractor's performance during the audit.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 9) If I were to pay for the audit myself, the audit would be of higher quality.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 10) If this audit were not free, what is the maximum amount you would pay?
- a) \$0
  - b) \$50
  - c) \$100
  - d) \$200
  - e) \$300
  - f) \$400
  - g) \$500
  - h) Higher amount: \_\_\_\_\_
- 11) I am satisfied with the length of the audit.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 12) Scheduling the audit was an easy process.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree

- 13) The estimated cost of energy improvements is too high.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 14) Overall, I am satisfied with the audit process.
- a) Strongly agree
  - b) Agree
  - c) Neither agree nor disagree
  - d) Disagree
  - e) Strongly disagree
- 15) Did you learn anything new about your house during the audit? If yes, please explain.
- a) No
  - b) Yes: \_\_\_\_\_
- 16) Did you learn anything new about energy efficiency issues during the audit? This could be on new technologies, ways to save on energy use, or anything else relevant to energy. If yes, please explain.
- a) No
  - b) Yes: \_\_\_\_\_
- 17) Have you ever considered other energy improvement financing options, such as savings or a private loan? If yes, please explain.
- a) No
  - b) Yes: \_\_\_\_\_
- 18) Assuming PACE financing is available, do you plan on moving forward with the proposed energy improvements?
- a) Yes
  - b) No
  - c) I don't know
- 19) If you answered "No" or "I don't know," please check all that may apply.
- I'm uncertain about how much I would save with PACE
  - PACE seems too complex
  - I don't trust the process
  - The improvements too expensive
  - It's not the right time/inconvenient
  - Other: \_\_\_\_\_
- 20) If you were to move forward with the proposed improvements without PACE, how else would you finance the improvements?
- a) Savings
  - b) Take out a home loan
  - c) Take out a private loan
  - d) Other: \_\_\_\_\_

Please provide any additional comments or suggestions on your experiences with PACE:

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*Thank you for your participation!*

## The 5 Cs: Recommendations for a successful PACE program

### COMMUNITY AMBASSADORS:

Community ambassadors are essential to spreading the word about the program. They can be the trusted spokespeople you need to convey program information and they can help spread awareness through **word-of-mouth**. Among those leaders, special consideration must be given to churches, community centers, school representatives, politicians and local businesspeople. To find them, plan kickoff parties for community residents or make presentations to civic groups. It is best to target neighborhoods individually with customized outreach methods.

### CLEAR AND SIMPLE PROCESS:

Participants should be offered a simple, seamlessly-integrated program. Many different services (solar assessment, refrigerator checks, HVAC) should be offered during the home visit (**one-stop shop**). The more steps required, the more likely that a participant won't follow through. Homeowners should be invited to a free workshop in which special care is given to *motivate* them, not just *educate* them. The interaction with the homeowner shouldn't get bogged down in technical language.

### CLEVER MARKETING:

Successful energy improvement programs have visible logos (signs, town vehicles, in newsletters) and put on marketing events, such as light-bulb giveaways. You can build community awareness of the program by staffing a booth at local events like energy fairs. You set up your energy program for success when you encourage personal contact among peer participants.



People enjoy seeing their **friends and neighbors** featured in the media. Videos showing real residents may even attract the news media. Awareness of energy audits can be spread with direct mail and door hangers. Residents are very receptive to “Pass it on” cards to give to others after their assessment, or “I did my part” labels to put on their homes and businesses.

### CONTRACTORS:



Homeowners see contractors as ambassadors of the program. Poor work on their part reflects negatively on the program itself. Assessors need to receive training to become engaging and convincing speakers.

Contractors can be selected through a bidding program with each working in a designated area. This speeds up transit time and helps create a buzz within that area. The contractors' interest and the program's interest must be aligned.

### COMPETITION:

The healthy competition model has proven successful in several towns. Having municipalities compete with one another to lower their energy use or increase their efficiency is a great way to encourage participation. Some towns have launched competitions with parties and light bulb giveaways. Others have created websites where residents can track their progress. Prizes can be given to the winning towns, but the model also works without rewards, simply because people get excited when they compete together to win.

## PACE:

*A new way to finance energy improvements in the Mad River Valley*



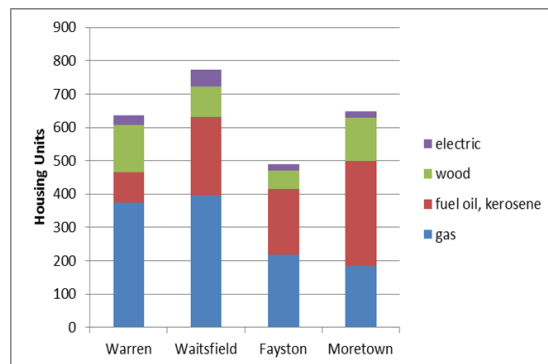
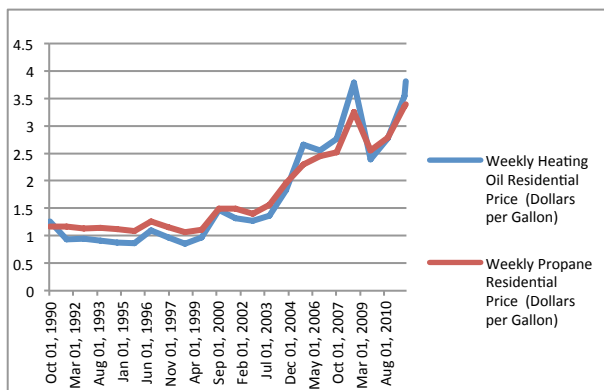
### *What is PACE?*

Property Assessed Clean Energy, or PACE, allows residential property owners to benefit from energy savings immediately while spreading the cost of improvements over a number of years. PACE is a voluntary program. Costs are a lien on property tax bills, which is tied to the property itself, not the property owner.



### *Energy usage in the Mad River Valley and future forecasts:*

The main fuels used in the Mad River Valley are oil and propane. Electricity and wood are also used, but to a lesser extent. The figures below show the Valley's fuel consumption by fuel type and over time.



This graph shows how energy prices have been rising for the past decade, and projections show that they will continue to rise. It is becoming crucial for Vermonters to adopt energy efficiency measure in their homes for their own financial security, as well as for the environmental concerns surrounding energy production.



### *Barriers to making energy improvements?*

According to a report by the Vermont Law School, the main reasons why people resist making energy efficiency improvements are:

- Concerned about taking on more debt
- Don't believe they will end up saving more over time
- Payback periods that are longer than the time they believe they will be living in the home
- Worried that they will be unable to cover the costs of an efficiency upgrade



### *Is PACE a solution?*

Yes! PACE financing can make it easier and more appealing for homeowners to invest in energy improvements. They can finance the upgrades today and pay for them over time. Since the assessment stays with the house, PACE can appeal to homeowners who don't expect to remain in the property for the duration of repayment.



## PACE:

*A new way to pay for energy improvements in the Mad River Valley*

### Scenario I

One typical home in the MRV was built in the 1970s, is worth around \$250,000, and uses mostly heating oil for its energy needs. It has three bedrooms and two bathrooms. The owners of this property have a lower credit score, but have always made all of their mortgage payments. They have been waiting to make energy improvements on their home for years, but they have not been able to obtain a loan to pay for them.

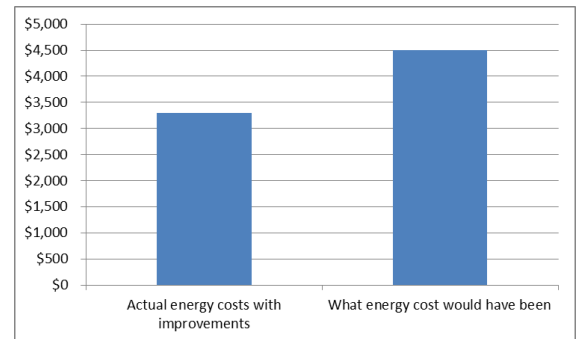


💡 *Can PACE finance energy improvements for this home?*

Yes! As long as they are current on mortgage and property tax payments, and have sufficient equity in your home, they can qualify to opt into PACE financing and make the improvements they need.

*Likely energy improvements to be made on the home:*

Whole house insulation, blower-door directed air sealing.



### Scenario II



Another typical home in the MRV is worth \$350,000, was built in the 1980s, and consumes mostly propane for its heating needs. It is used as a second home for the property owners with four bedrooms and two bathrooms. The homeowners have been thinking about making energy improvements, but they haven't done so because they plan on purchasing a different house in a few years.

💡 *Can PACE finance energy improvements in this home?*

Yes! Since these homeowners want to sell their property before the end repayments, PACE will allow them to pass on the payments to the next homeowners.

*Likely energy improvements to be made on the home:*

Air sealing throughout home, blown-in insulation, boiler replacement.

