



**VERMONT ENERGY**  
INVESTMENT CORPORATION

# Financing Alternatives for Energy-Efficient Buildings

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# Better Buildings By Design 2010



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# Learning objectives



## Financing Alternatives for Energy-Efficient Buildings

- At the end of this program, participants will be able to:
  - Examine the pros and cons of various financing options.
  - Determine the applicability to residential and commercial markets.
  - Review tax credits and incentives for efficiency investments.
  - Listen to an update on energy mortgage programs.
  - Understand the concept of property-assessed clean-energy programs.

## Common financing myths

- **Information is sufficient – if building owners have enough information on costs and benefits, they will make rational investment decisions that benefit them**
  - **An adequately attractive financing program is sufficient**
  - **This can all pay for itself out of savings – we just need to get it started and/or remove a few market barriers with bright new ideas and access to capital**
-

## Definitions

Money used for energy efficiency (or renewables) is an investment, not an expense

- **Spend** *to use up or pay out*
- **Invest** *to commit money in order to gain a financial return; to devote for future advantage or benefit*

## Amortized loan example – 4 year term

|                   |          |                 |          |
|-------------------|----------|-----------------|----------|
| Principal Amount  | \$20,000 | Monthly Payment | \$462.85 |
| Interest Rate     | 5.25%    | Annual Cost     | \$5,554  |
| Term in Years     | 4        | Total Interest  | \$2,217  |
| Payments per year | 12       | Total Cost      | \$22,217 |

## Amortized loan – just add one year

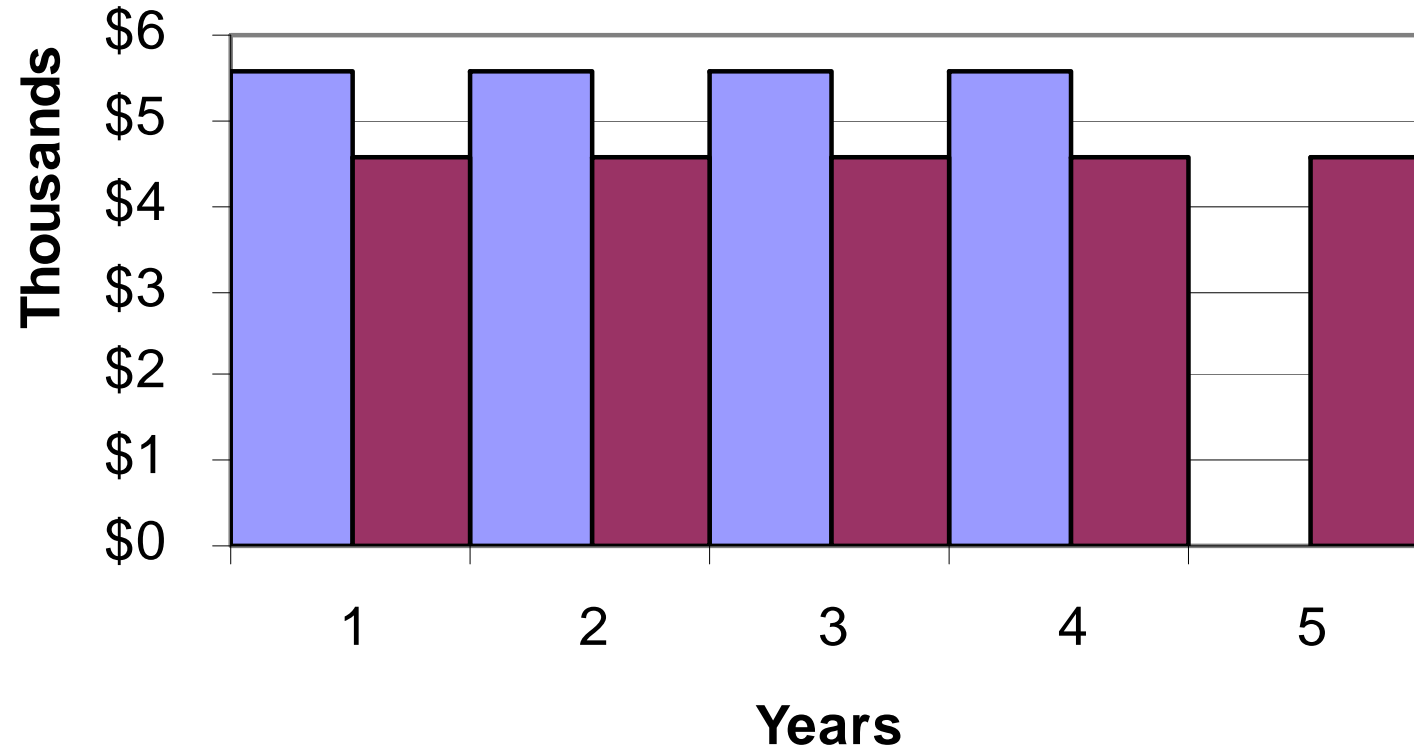
|                   |          |                 |          |
|-------------------|----------|-----------------|----------|
| Principal Amount  | \$20,000 | Monthly Payment | \$379.72 |
| Interest Rate     | 5.25%    | Annual Cost     | \$4,557  |
| Term in Years     | 5        | Total Interest  | \$2,783  |
| Payments per year | 12       | Total Cost      | \$22,783 |

## Summary of changes

|                     |          |             |           |
|---------------------|----------|-------------|-----------|
| Monthly Payment     | -\$83.13 | Annual Cost | -\$997.56 |
| Additional Payments | 12       | Total Cost  | \$566     |



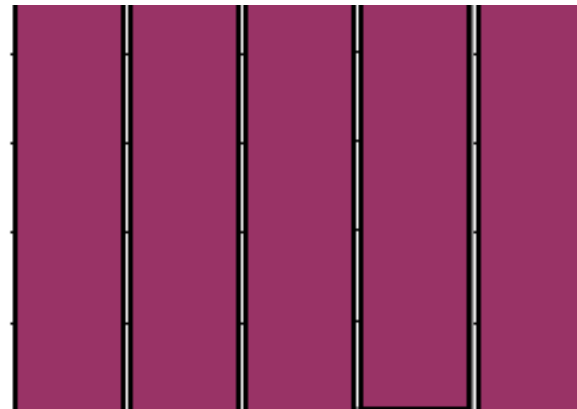
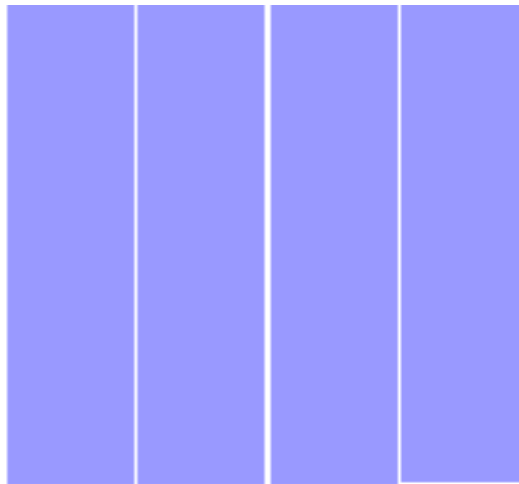
## 4 years vs. 5 years







## 4 years vs. 5 years



**Area of 4-year**  
**= 22,217**  
**(5,554 x 4)**

**Area of 5-year**  
**= 22,783**  
**(4,557 x 5)**

$$(22,783/22,217) - 1 = 2.5\%$$

# Example: Effect of term for Vermont home with 50% savings



| Existing Energy Use and Cost |                        |         | 50% Savings |
|------------------------------|------------------------|---------|-------------|
| Oil                          | 900 gallons @ \$2.66 = | \$2,394 | \$1,197     |
| Electricity                  | 9,000 kWh @\$ .14 =    | \$1,260 | \$630       |
|                              | <b>Total</b>           | \$3,654 | \$1,827     |

| Term (Years) | Annual Savings | Annual Payments * | Net Annual Cash Flow |
|--------------|----------------|-------------------|----------------------|
| 5            | \$1,827        | (\$4,557)         | (\$2,730)            |
| 10           | \$1,827        | (\$2,575)         | (\$748)              |
| 15           | \$1,827        | (\$1,929)         | (\$102)              |
| 20           | \$1,827        | (\$1,617)         | \$210                |

\* Assumes \$20,000 loan at 5.25% interest

# Example: Commercial project cashflow with financing



| Project Cashflow                    |                     |                                   |           |
|-------------------------------------|---------------------|-----------------------------------|-----------|
| <u>Project Costs</u>                |                     | <u>Investment Performance</u>     |           |
| Project Cost:                       | \$ 365,355          | <u>Internal Rate of Return:</u>   | 42.6%     |
| <u>Amount Financed:</u>             | <u>\$ (224,355)</u> | <u>Payback Period (Years):</u>    | 3.4       |
| <b>Initial Customer Investment:</b> | <b>\$ 56,000</b>    |                                   |           |
| <u>Financing Terms</u>              |                     | <u>Annual Electricity Savings</u> |           |
| Loan Rate:                          | 5.25%               | Energy (kWh):                     | 1,068,002 |
| Loan Term (Months):                 | 60                  |                                   |           |

# Example: Commercial project cashflow with financing



| Year | Net Operation & Maintenance Savings (Costs) | Annual Electric Savings (Costs) | Annual Fuel Savings (Costs) | Annual Payments (Principal & Interest) | Net Annual Cashflow | Net Cumulative Cashflow |
|------|---|---------------------------------|-----------------------------|--|---------------------|-------------------------|
| 0    |   |                                 |                             | \$ (56,000)                            | \$ (56,000)         | \$ (56,000)             |
| 1    | \$ -  | \$ 88,310                       | \$ (20,703)                 | \$ (51,115)                            | \$ 16,492           | \$ (39,508)             |
| 2    | \$ 195                                      | \$ 88,310                       | \$ (20,703)                 | \$ (51,115)                            | \$ 16,687           | \$ (22,822)             |
| 3    | \$ (180)                                    | \$ 88,310                       | \$ (20,703)                 | \$ (51,115)                            | \$ 16,312           | \$ (6,510)              |
| 4    | \$ 490                                      | \$ 88,310                       | \$ (20,703)                 | \$ (51,115)                            | \$ 16,982           | \$ 10,472               |
| 5    | \$ 2,596                                    | \$ 88,310                       | \$ (20,703)                 | \$ (51,115)                            | \$ 19,088           | \$ 29,561               |
| 6    | \$ (7,278)                                  | \$ 88,310                       | \$ (20,703)                 | \$ -                                   | \$ 60,329           | \$ 89,889               |
| 7    | \$ (358)                                    | \$ 88,310                       | \$ (20,703)                 | \$ -                                   | \$ 67,249           | \$ 157,138              |
| 8    | \$ 6,413                                    | \$ 88,310                       | \$ (20,703)                 | \$ -                                   | \$ 74,020           | \$ 231,158              |
| 9    | \$ (4,852)                                  | \$ 88,310                       | \$ (20,703)                 | \$ -                                   | \$ 62,755           | \$ 293,913              |
| 10   | \$ 20,181                                   | \$ 88,310                       | \$ (20,703)                 | \$ -                                   | \$ 87,788           | \$ 381,702              |

# Commercial project financing



## Vermont Economic Development Authority (VEDA)

- Vermont Business Energy Conservation Loan Program
  - for projects that improve energy efficiency and conserve energy
  - a joint program with Efficiency Vermont
  - loans from \$5,000 to \$150,000
  - maximum loan term of five years
  - loan may fund up to 75% of the cost of a project
  - variable rate as low as WSJ Prime minus 3%, with a floor of 2%. Rate will apply for the first three years of the loan.

# Commercial project financing



## Vermont Economic Development Authority (VEDA)

- The Direct Loan Program
  - for financing fixed assets in cooperation with commercial banks
  - loans up to \$250,000, possibility of higher amounts
  - loan terms - real estate 10 years, machinery and equipment generally 5-7 years
  - loan may fund up to 40% of the cost of a project
  - variable rate as low as WSJ Prime minus 3%, with a floor of 2%. Rate will apply for the first three years of the loan.



## Key issues:

# Energy efficiency financing

- financing is the *last* piece of the puzzle
- total cost is frequently less important than positive cash flow
- longer-term financing
  - better aligns the period of payment with the period of the savings (life of measures)
  - could allow most or all of the required investment to be paid for out of savings



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## Additional resources – Financing

- Financing Energy Efficiency in Buildings – Rebuild America Guide

<http://eber.ed.ornl.gov/commercialproducts/finance.pdf>

- Enabling Investments in Energy Efficiency

[www.veic.org/Libraries/Resource\\_Library\\_Documents/  
Energy\\_Efficiency\\_Financing\\_Report-  
Merrian\\_Fuller\\_2008.sflb.ashx](http://www.veic.org/Libraries/Resource_Library_Documents/Energy_Efficiency_Financing_Report-Merrian_Fuller_2008.sflb.ashx)



# Tax credits and deductions



## Disclaimer

**While every effort has been made to describe tax credits, deductions and incentives accurately, we cannot provide tax advice and suggest you contact a tax professional with any questions specific to your situation.**

# Federal tax credits

## Energy efficiency - Residential



- personal tax credit worth 30% of system cost, including most labor costs
- maximum of \$1,500 combined for 2009 and 2010
- applies to energy efficiency improvements in the building envelope of existing homes and for the purchase of high-efficiency heating, cooling and water-heating equipment for new and existing
- performance and quality standards for tax credit eligibility vary by technology
- efficiency improvements or equipment must be on taxpayer's primary residence

# Federal tax credits

## Renewable energy - Residential



- personal tax credit worth 30% of system cost, including most labor costs
- no maximum, excess credit can be carried forward until 2016
- eligible technologies include solar water heat, photovoltaics, wind, fuel cells, geothermal heat pumps, other solar electric technologies
- performance and quality standards for tax credit eligibility vary by technology
- does not need to be taxpayer's primary residence

# Federal tax deduction Energy-efficient commercial buildings



- \$1.80/ft<sup>2</sup> to owners of new or existing buildings who install
  - interior lighting;
  - building envelope, or
  - heating, cooling, ventilation, or hot water systemsthat reduce the building's total energy cost by 50% or more compared to minimum ASHRAE requirements
- \$0.60/ft<sup>2</sup> to owners of buildings in which individual categories above meet target levels that would “reasonably contribute to an overall building savings of 50% if additional systems were installed.”

# State tax credits

## Business tax credit - Solar



- eligible technologies include solar thermal, photovoltaics, solar fiber-optic lighting
- 30% credit for corporations that file a Vermont corporate return – **expires December 31, 2010**
- no maximum, 5-year carryover
- a taxpayer who receives CEDF funding is not eligible.



## Property tax exemption – “Local option”

- towns may exempt renewable energy systems from municipal property taxes. State property taxes still apply
- any facility for production of energy used on the premises for private, domestic, or agricultural purposes, no part of which may be for sale to the public, is eligible
- applies to the total value of the renewable energy system and land upon which the facility is located, up to  $\frac{1}{2}$  acre
- can be applied to residential, commercial, and industrial real and personal property

# Efficiency Vermont incentives – Residential



## Incentives for Home Performance with ENERGY STAR®

- new incentives are available in 2010
- up to \$2,500 in incentives per household
- energy efficiency home improvements must be completed by a certified Home Performance with ENERGY STAR contractor
- contractor will assist with understanding the incentives that may be available for a project, and will provide the paperwork needed to receive incentives



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## Additional resources – Credits and incentives

- Database of State Incentives for Renewables & Efficiency  
[www.dsireusa.org/](http://www.dsireusa.org/)
- VT Small Scale Renewable Energy Incentive Program  
[www.nerc-vt.org/incentives/newincentivestructure.htm](http://www.nerc-vt.org/incentives/newincentivestructure.htm)
- ENERGY STAR Guide to Federal Tax Credits  
[www.energystar.gov/index.cfm?c=tax\\_credits.tx\\_index](http://www.energystar.gov/index.cfm?c=tax_credits.tx_index)
- SEIA's Guide to Federal Incentives for Solar Energy  
[http://seia.org/galleries/pdf/SEIATaxManual\\_v3-0\\_FAQ.pdf](http://seia.org/galleries/pdf/SEIATaxManual_v3-0_FAQ.pdf)





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# Additional resources – Credits and incentives, continued

Efficiency Vermont

- Residential:

<http://efficiencyvermont.com/HomePerformance>

- Commercial:

[www.efficiencyvermont.com/pages/Business/RebateCenter/](http://www.efficiencyvermont.com/pages/Business/RebateCenter/)

- The Tax Incentives Assistance Project (Residential and Commercial)

<http://energytaxincentives.org/>



# What makes a mortgage “Energy Efficient”?

- lender accounts for energy cost savings on the income side when evaluating a borrower’s debt-to-income ratio.
- stretches debt-to-income qualifying ratios on loans for energy-efficient homes
- make lower-cost mortgages available to homeowners who implement approved efficiency measures as part of refinancing
- HUD, FHA, VA, Fannie Mae, and Freddie Mac all support Energy Efficient Mortgages, but their use has tended to be for new homes

## Energy efficient mortgages

- Energy Improvement Mortgage (EIM) - Finances the energy upgrades of an **existing home** in the mortgage loan using monthly energy savings
- Energy Efficient Mortgage (EEM) - Uses the energy savings from a **new energy efficient home** to increase the home buying power of consumers and capitalizes the energy savings in the appraisal



## Sample guidelines

- lender adds cost of energy improvements to purchase price of house when setting the terms of the mortgage. The appraisal must state the estimated market value after completion of the improvements
- lender sets up escrow account (up to 10% of mortgage) to cover the cost of improvements
- all improvements to be satisfactorily completed within 120 days
- lender certifies satisfactory completion by having the property inspected
- HERS ratings, before and after

# Mortgages

Loans secured by a lien on a home have pros and cons:

## Pros

- long terms, up to 30 years
- relatively low fixed interest rates
- Generally tax deductible

## Cons

- tend to be more complicated and difficult to obtain
- additional fees and paperwork required
- many people can't qualify
- rental market excluded

# Home equity line of credit

## Pros

- longer terms than consumer loans, up to 15 years
- relatively low interest rates
- Draw down as needed
- Generally tax deductible

## Cons

- floating rate
- additional fees and paperwork often required
- many people can't qualify



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## Additional resources – Energy efficient mortgages

- Financing Guidebook for Energy Efficiency Program Sponsors

[www.energystar.gov/ia/home\\_improvement/downloads/FinancingGuidebook.pdf](http://www.energystar.gov/ia/home_improvement/downloads/FinancingGuidebook.pdf)

- Understanding and Overcoming the Energy Mortgage Barrier

[www.veic.org/Libraries/Resource\\_Library\\_Documents/EIMS\\_Final\\_Paper-Faesy.sflb.ashx](http://www.veic.org/Libraries/Resource_Library_Documents/EIMS_Final_Paper-Faesy.sflb.ashx)

- Residential Energy Services Network  
[www.resnet.us/ratings/mortgages/](http://www.resnet.us/ratings/mortgages/)

# Clean Energy Assessment Districts – Property Assessed Clean Energy (PACE) in Vermont





## Why do we need PACE?

- For 150+ energy finance programs, participation has been  $< 0.5\%$
- Energy financing programs mostly serve those who least need them
- Short-term consumer financing (less than 7 years) is not effective unless there are substantial subsidies
- Positive cash flow is key
  - It reduces the risk perceived by lenders
  - It supports loans to those who would be judged unable to meet debt obligations without promised savings

## Vermont's Building Efficiency Goals

- Act 92 (2008) states that “it shall be goals of the state to improve substantially (>25%) the energy fitness of
  - at least 20 percent of the state’s housing stock by 2017 (more than 60,000 housing units), and
  - at least 25 percent of the state’s housing stock by 2020 (approximately 80,000 housing units).”
- Some studies have estimated that this would require an expenditure of \$40 million per year for 12 years = \$480 million.

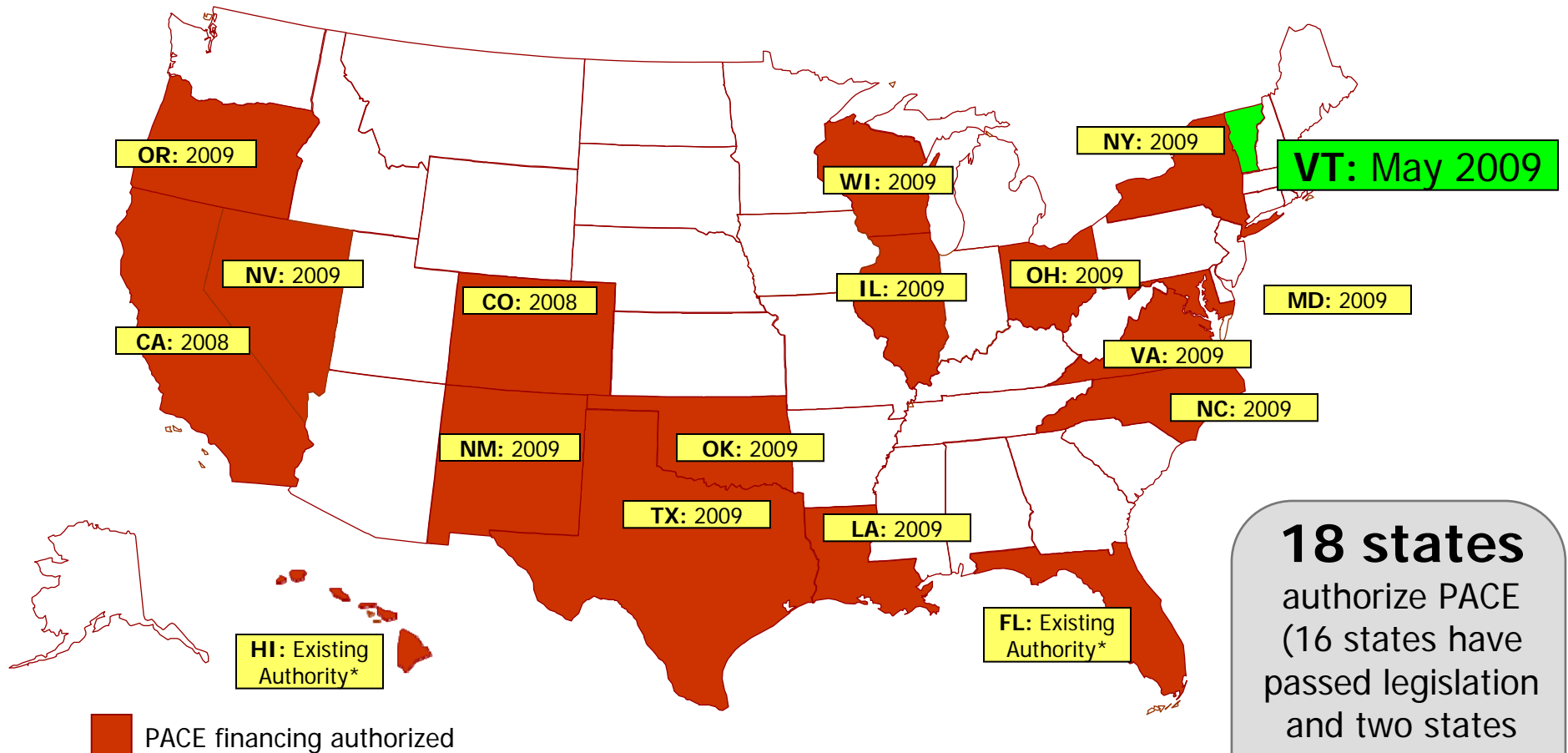
## How does PACE work?

- Voluntary mechanism allowing individuals to opt in to a special assessment district created by their municipality
- Eligible energy efficiency and / or renewable energy improvements are funded by taxable municipal bonds or other municipal debt
- Repayment period up to 20 years—may not exceed projected life of improvements
- Special assessment fees transfer to the new owner when the property is sold, or assessment obligation can be paid in full at time of transfer



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# Where PACE has been authorized



**18 states** authorize PACE (16 states have passed legislation and two states permit it, based on existing law)

Source: [www.dsireusa.org](http://www.dsireusa.org)

## Vermont PACE program parameters

- The cost of the project financed through PACE cannot exceed 15% of the assessed value of the property
- The loan-to-value ratio of any outstanding mortgages, plus the amount of the PACE assessment, cannot exceed 90% of the assessed property value
- Residential (owner-occupied, 1-4 units): the cost of the project financed through PACE cannot exceed \$30,000, or 15% of the assessed value of the property, whichever is less

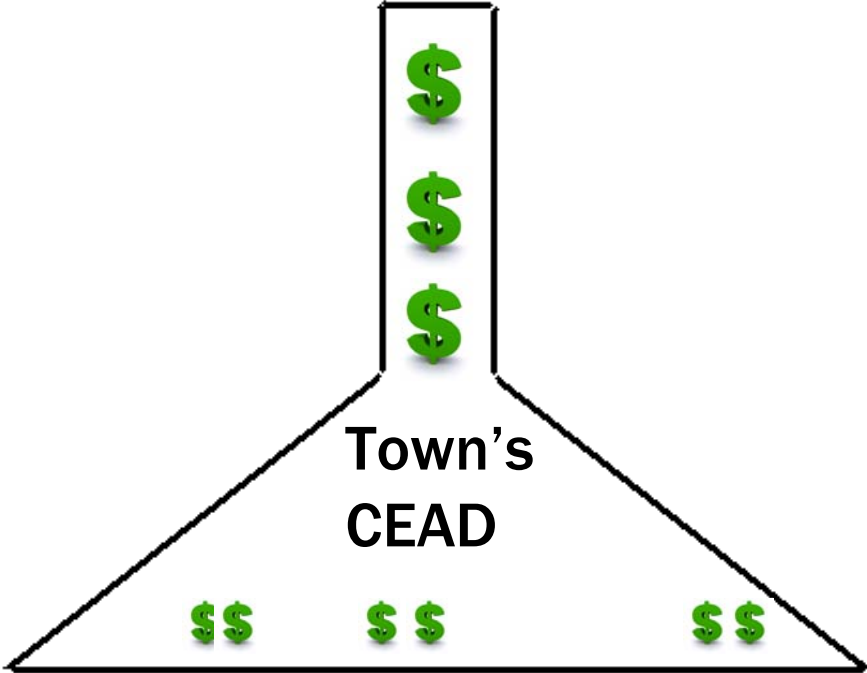
## Vermont PACE program parameters by municipality

- Typically \$5,000 project minimum for participation
- Municipalities could
  - **specify more restrictive loan-to-value requirements**
  - **impose lower \$ maximums or required ownership period**
  - **require that work be done by certified professionals**
  - **allow only projects with positive cash flow or savings to investment ratio >1**

# How PACE money flows



**Financing Source**



|                   |                              |                              |                   |                              |
|-------------------|------------------------------|------------------------------|-------------------|------------------------------|
| Property<br>Owner | Property<br>Owner<br>Opts In | Property<br>Owner<br>Opts In | Property<br>Owner | Property<br>Owner<br>Opts In |
|-------------------|------------------------------|------------------------------|-------------------|------------------------------|



## Process requirements

- Property owner notifies municipality of desire to opt in
- Municipality underwrites property
- Property owner has analysis performed to:
  - **quantify project costs and energy savings**
  - **quantify estimated carbon impacts**
  - **determine annual cash flow**
- Energy Efficiency Utility reviews and approves analysis
- Written agreement and analysis filed with the clerk of the municipality for recording in the land records



# What implementation might look like—



|                         | Once per municipality   | Once per property that opts in  | Once per property tax payment                | Once per debt payment    |
|-------------------------|---|---|--|--------------------------|
| <b>Property Owner</b>   | Support creation of district  | <ul style="list-style-type: none"> <li>•Identify measures</li> <li>•Apply for financing</li> <li>•Sign agreement</li> </ul>       | Pay special assessment                       |                          |
| <b>Municipality</b>     | <ul style="list-style-type: none"> <li>•Design program</li> <li>•Hold vote(s)</li> </ul>                        | <ul style="list-style-type: none"> <li>•Receive application</li> <li>•Attach lien to property</li> <li>•Disburse funds</li> </ul> | Collect special assessment with property tax |                          |
| <b>Aggregator</b>       | <ul style="list-style-type: none"> <li>•Design program with municipality</li> <li>•Provide documents</li> </ul> | Underwrite application  | Collect special assessments from town        | Make interest payment    |
| <b>Financing Source</b> | Add town to intermunicipal agreement  | Provide funding to all participants in cycle  |  | Receive interest payment |

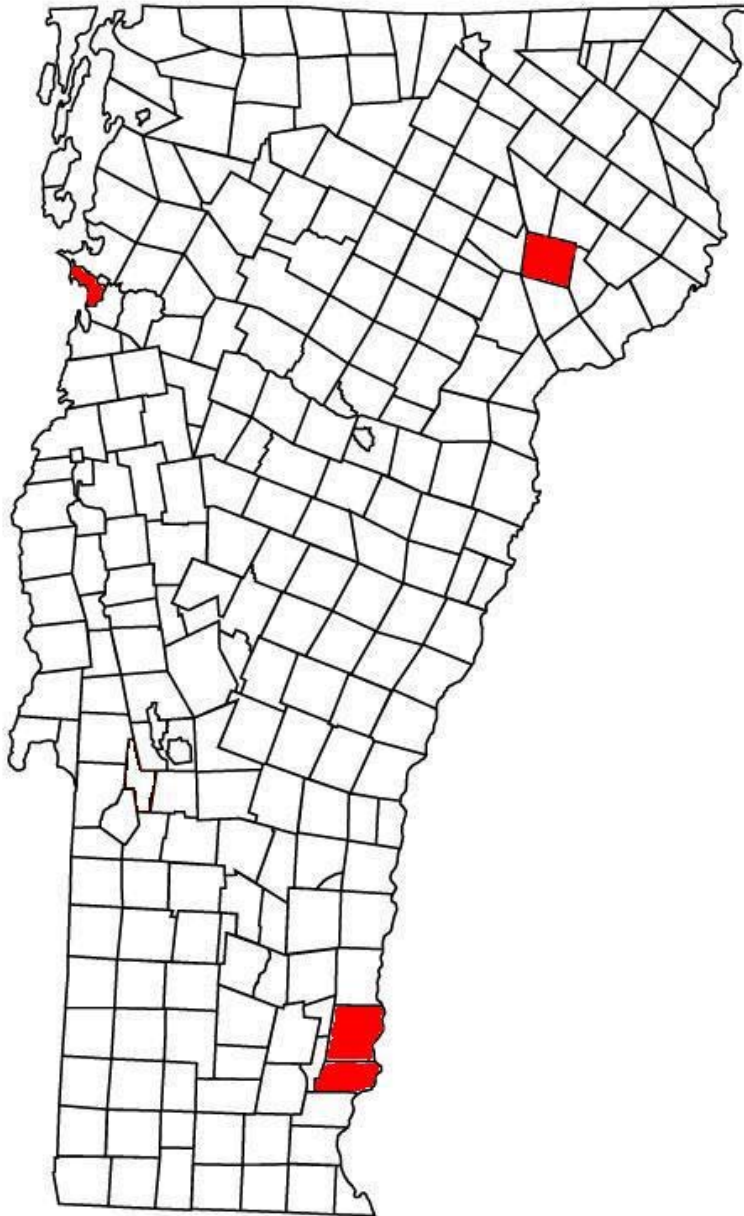


## PACE in Vermont – current implementation by towns

- Four towns have PACE resolutions on their ballots for March 2010
- Four towns are likely to receive EECEBG funds in May 2010 for PACE implementation under a grant from the state's Clean Energy Development Fund
- Additional funding is being sought for statewide implementation assistance
- More than 30 additional towns have expressed interest for 2011 implementation



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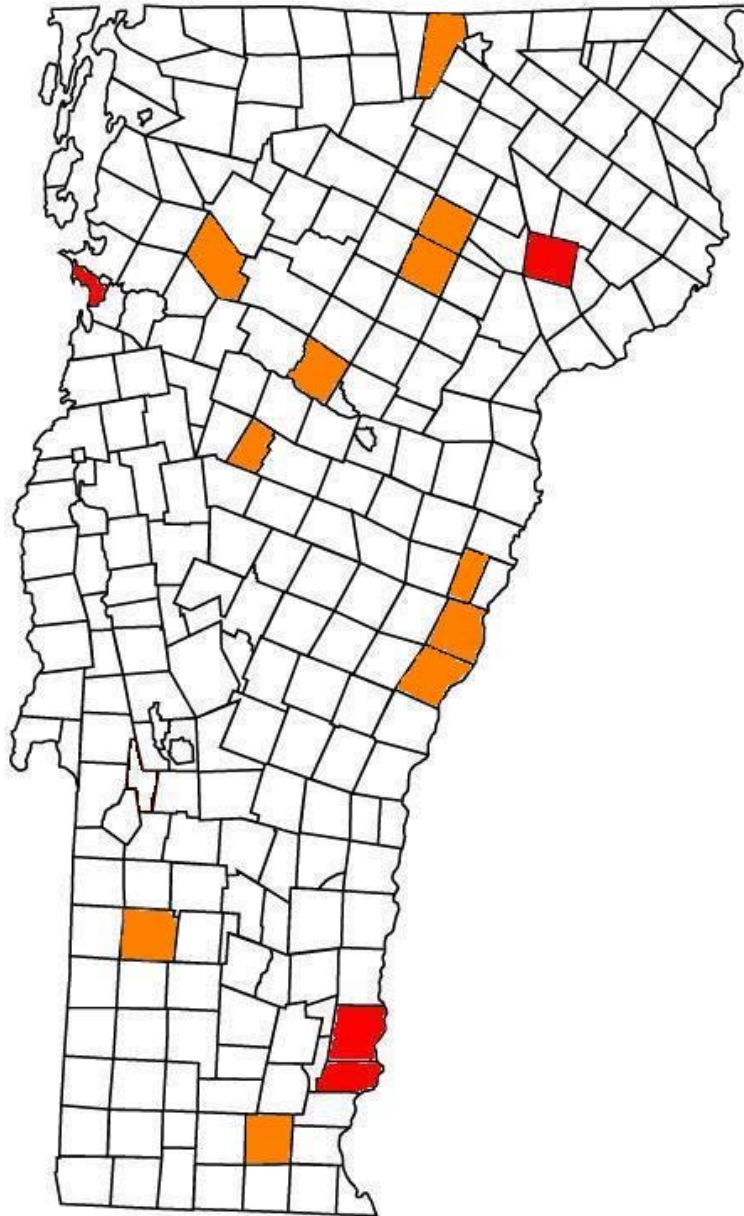




 PACE resolution on  
March 2010 ballot





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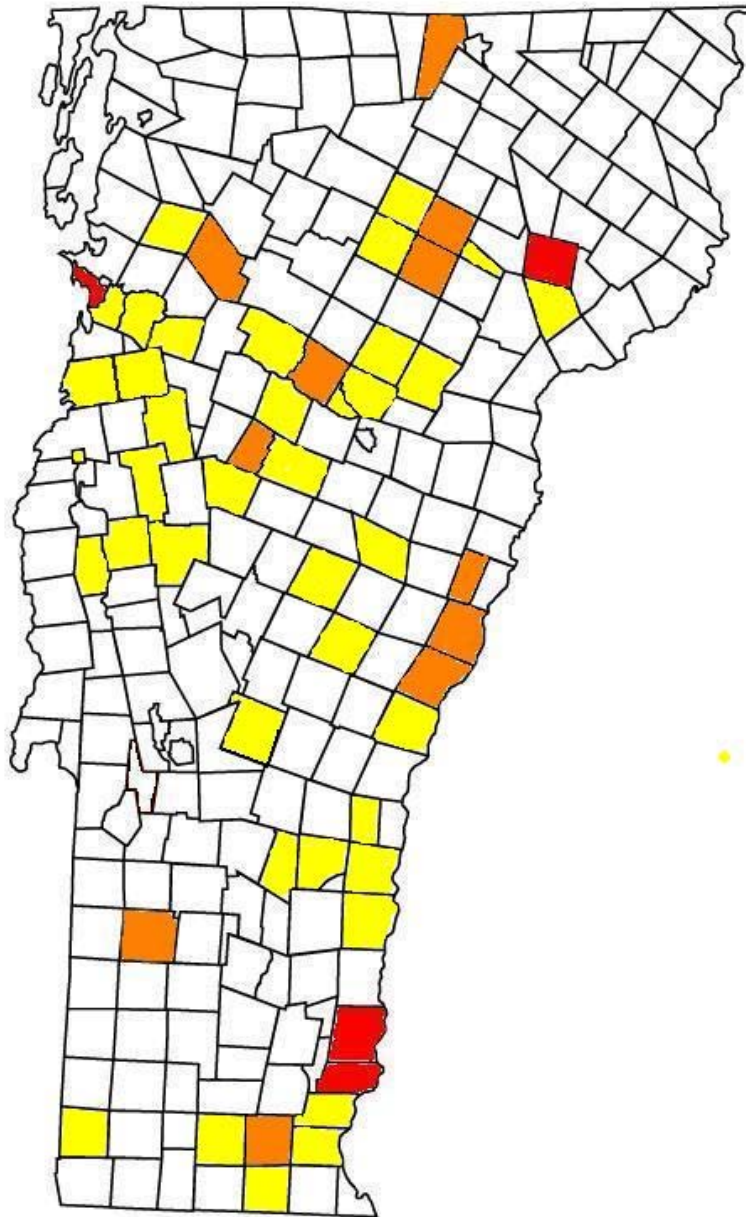





-  PACE resolution on March 2010 ballot
-  Actively pursuing





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-  PACE resolution on March 2010 ballot
-  Actively pursuing
-  Expressed interest



## Benefits to Vermont's towns and economy

- Contributes to meeting sustainability, climate, and energy goals
- Could inject millions of dollars directly into the Vermont economy, to make lasting energy and building infrastructure improvements
- Provides a steady and growing demand for good-quality sustainable jobs that cannot be outsourced
- No costs to property owners who do not participate

## Additional resources - PACE

- Vermont's Clean Energy Assessment Districts  
[www.veic.org/PACE](http://www.veic.org/PACE)
- White House Policy Framework for PACE Financing Programs  
[www.whitehouse.gov/assets/documents/PACE\\_Principles.pdf](http://www.whitehouse.gov/assets/documents/PACE_Principles.pdf)
- Other programs around the country  
[www.pacenow.org](http://www.pacenow.org)  
[www.dsireusa.org/documents/summarymaps/PACE\\_Financing\\_Map.ppt](http://www.dsireusa.org/documents/summarymaps/PACE_Financing_Map.ppt)
- Guide to Energy Efficiency & Renewable Energy Financing Districts for Local Governments  
<http://rael.berkeley.edu/financing/resources>

## More information

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