Efficiency Vermont



Financing Options for Energy Projects

Better Buildings by Design
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Session Description

Familiarize yourself with the concepts of cash flow and energy projects: comparing projected energy savings with loan costs so you can assess—and share—a project's true economic value. We'll look at Vermont-specific case studies, examining the economics of several projects. We'll also review the financing options available throughout the state, discussing the pros and cons of each.

Today's Agenda

- Definitions and concepts
- How Efficiency Vermont calculates energy savings
- Case studies
- Using energy savings in underwriting
- Case studies with financing options
- Overview of financing options
- Energy Efficiency Loan Guarantee Program
- Closing thoughts

Definitions

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*

Energy investments differ from traditional investments

Return on investment (ROI) is money that is NOT spent on future energy bills. To determine the ROI, compare the actual energy cost with *what it would have been*; the difference is the ROI.

Frequently, the most expensive option is to do nothing. This concept of “opportunity cost” is key to assessing different financial options.

Efficiency Vermont's credibility depends on accuracy in energy savings calculations.

Many customers rely on Efficiency Vermont as independent 3rd party for savings analysis when deciding about energy efficiency investments

- If we're not accurate, we risk jeopardizing future investments and our relationship with the customer

Efficiency Vermont savings claims are audited annually by Vermont's Public Service Dept.

- lowest realization rate has been 86.2%, average is 90.8%

Accurate analysis of electric bill and rate effects

Account No.	Service Location	Map Location	Service From	To	Days
30102	[illegible] ELECTRIC WAY	[illegible]	08/31/2012	09/30/2012	30

Meter Number	Pres Read	Prev Read	Mult	KWH Used	Read Type	Rate Schedule / Reference
[illegible]	[illegible]	[illegible]	1	560		A/RESIDENTIAL

Activity Since Last Bill	$ Amount
Previous Balance	105.00
Payment	-105.00
Balance Transfer	0.00
Other Adjustments	0.00
Balance Prior to this Billing	0.00

Current Bill Information	$ Amount
POWER RATE A ([illegible] KWH @ $0.0706)	39.48
TRANSMISSION A (560 KWH @ $0.0112)	6.33
DISTRIBUTION A (560 KWH @ $0.0368)	20.61
FACILITY COST ($0.3833 per day X 30 days)	33.80
PCA ($0.00006 PER KWH)	0.00
TAXES	4.73
COUNTY TAX	0.48
PUBLIC BENEFIT	1.87
ROUNDUP AMOUNT	0.66
TOTAL CURRENT BALANCE DUE 10/28/12	102.00

KWH USAGE HISTORY

OCT 11	682	APR 12	601
NOV 11	653	MAY 12	609
DEC 11	653	JUN 12	536
JAN 12	782	JUL 12	553
FEB 12	747	AUG 12	728
MAR 12	674	SEP 12	518
		OCT 12	560

Comparison	This Year	Last Year
KWH USAGE	560	682
DAYS OF SERVICE	24	31

Mailing Date	09/30/2012	Net Due	102.00
Due Date	10/04/2012		

$102.00 WILL BE DRAFTED ON 10/30/2012 — DO NOT PAY

A
B
C
D
E
F
G

“Investing in energy efficiency” is not always core to business thinking

“Growth” is a core business goal

Energy costs are often considered fixed costs

If business is growing, owners expect energy use (and costs) to increase, too.

“Reducing energy *costs*” or “improving bottom line” is consistent with goal of growing business

- Relate energy efficiency to revenue, profits, cashflow
- “Reducing energy *use*” phrase conflicts with business core value of growth

How do contractors and sales representatives estimate energy savings?

"Average" blended kilowatt hour costs or per gallon costs of oil, propane, etc.

"Rules of thumb" based on % saved – watch for 20%

Often verbal savings estimates

May rely on marketing "best case" scenarios for customer to extrapolate

Calibration to existing usage is rare

How does Efficiency Vermont calculate energy savings?

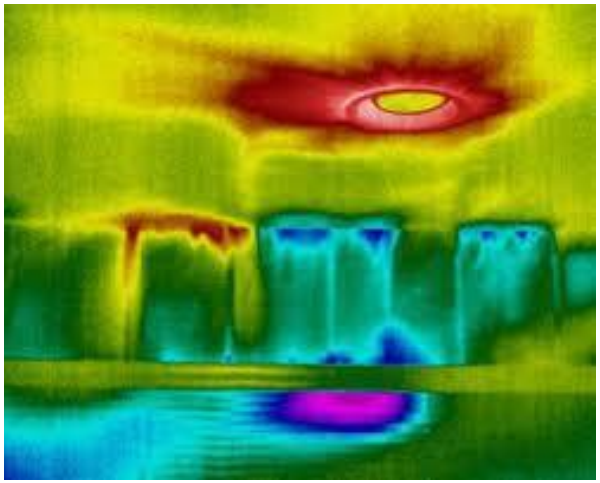
We analyze cost savings projections using actual electric load shapes or fuel rate structure

- Demand rates
- Time of day rates
- “Ratchet” rates
- “High use”/”low use” fossil fuel categories

Evaluate if energy reduction will change customer’s rate category

Interactive effects, calibrate to actual usage

Measuring for accurate analysis info



Using information for accurate calculations

Many improvements involve straightforward engineering calculation of watts, hours, etc.

Measure use pre- and post-metering when power draw is larger, more variable/interactive or complex

- EVT analysis tools developed over last 11 years that reflect key inputs and field experience

EVT's Technical Resource Manual covers hundreds of energy saving measures

Case Study: Variable speed drive on dust collection system

Project Cashflow

Project Costs

Total Project Cost:	$	40,000
EVT Incentive:	$	(8,000)
Other Incentive:	$	-
Net Project Cost:	$	32,000
Amount Financed:	$	-
Initial Customer Investment:	**$**	**32,000**

Investment Performance

Internal Rate of Return:		
Project Without Incentives:		57%
Project With Incentives:		72%
Payback Period (Years):		
Project Without Incentives:		1.7
Project With Incentives:		1.4
Average Monthly Expenses:		
First Year Average Monthly Savings:	$	1,908
First Year Average Monthly Payments:	$	-

Annual Electricity Savings

Energy (kWh):	178,961

Variable speed drive on dust collection system (cont.)

Year	Net Operation & Maintenance Savings (Costs)	Annual Electric Savings (Costs)	Annual Fuel Savings (Costs)	Water savings (Costs)	Annual Payments (Principal & Interest)	Net Annual Cashflow	Net Cumulative Cashflow
0						$ (32,000)	$ (32,000)
1	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ (9,109)
2	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 13,782
3	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 36,673
4	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 59,564
5	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 82,455
6	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 105,345
7	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 128,236
8	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 151,127
9	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 174,018
10	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 196,909
11	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 219,800
12	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 242,691
13	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 265,582
14	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 288,473
15	$ -	$ 22,891	$ -	$ -	$ -	$ 22,891	$ 311,364

The fine print!

1. This cash flow analysis assumes no inflation.
2. Numerical values projected in this analysis are estimates only. They are based on the professional judgment of Efficiency Vermont using information available about conditions prevailing when the analysis was performed. Efficiency Vermont makes no guarantee that these estimated outcomes will actually materialize.
3. Calculation of Internal Rate of Return (IRR) implicitly assumes that all interim cash flows are reinvested over the lifetime of the investment.
4. This cash flow analysis does not reflect tax consequences of the proposed investment. Consult your tax advisor for information on how this recommended project and financing method would affect your financial position for tax purposes.
5. First year cost savings may be lower than projected if the customer is subject to electric utility demand charges with "ratchets" that set current billing demand based or demand recorded over the preceding twelve months.

Case Study: Lighting for warehouse facility

Project Cashflow

Project Costs

Total Project Cost:	$	199,843
EVT Incentive:	$	(40,000)
Other Incentive:	$	-
Net Project Cost:	$	159,843
Amount Financed:	$	-
Initial Customer Investment:	**$**	**159,843**

Investment Performance

Internal Rate of Return:		
Project Without Incentives:		24%
Project With Incentives:		31%
Payback Period (Years):		
Project Without Incentives:		4.1
Project With Incentives:		3.2
Average Monthly Expenses:		
First Year Average Monthly Savings:	$	4,109
First Year Average Monthly Payments:	$	-

Annual Electricity Savings

Energy (kWh):	432,089

Lighting for warehouse facility (cont.)

Year	Net Operation & Maintenance Savings (Costs)	Annual Electric Savings (Costs)	Annual Fuel Savings (Costs)	Water savings (Costs)	Annual Payments (Principal & Interest)	Net Annual Cashflow	Net Cumulative Cashflow
0						$ (159,843)	$ (159,843)
1	$ -	$ 56,049	$ (6,743)	$ -	$ -	$ 49,306	$ (110,538)
2	$ 754	$ 56,049	$ (6,743)	$ -	$ -	$ 50,060	$ (60,478)
3	$ 3,036	$ 56,049	$ (6,743)	$ -	$ -	$ 52,341	$ (8,137)
4	$ (10,491)	$ 56,049	$ (6,743)	$ -	$ -	$ 38,814	$ 30,678
5	$ 23,591	$ 56,049	$ (6,743)	$ -	$ -	$ 72,897	$ 103,575
6	$ 2,831	$ 56,049	$ (6,743)	$ -	$ -	$ 52,136	$ 155,711
7	$ (8,209)	$ 56,049	$ (6,743)	$ -	$ -	$ 41,096	$ 196,807
8	$ (13,260)	$ 56,049	$ (6,743)	$ -	$ -	$ 36,045	$ 232,853
9	$ 12,239	$ 56,049	$ (6,743)	$ -	$ -	$ 61,545	$ 294,398
10	$ 23,318	$ 56,049	$ (6,743)	$ -	$ -	$ 72,624	$ 367,022
11	$ (9,026)	$ 44,523	$ (6,743)	$ -	$ -	$ 28,753	$ 395,775
12	$ 3,648	$ 44,523	$ (6,743)	$ -	$ -	$ 41,428	$ 437,203
13	$ 1,027	$ 44,523	$ (6,743)	$ -	$ -	$ 38,807	$ 476,009
14	$ 12,073	$ 44,523	$ (6,743)	$ -	$ -	$ 49,853	$ 525,862
15	$ (10,919)	$ 44,523	$ (6,743)	$ -	$ -	$ 26,860	$ 552,723

Underwriting considerations

Consider Efficiency Vermont incentive as component of down payment

- Based on projected energy savings
- ‘Seal of approval’ that project is cost effective

Compare to commercial real estate lending practices

- Difficulty of predicting future economics
- Debt coverage ratios
- Relies on extensive historical data

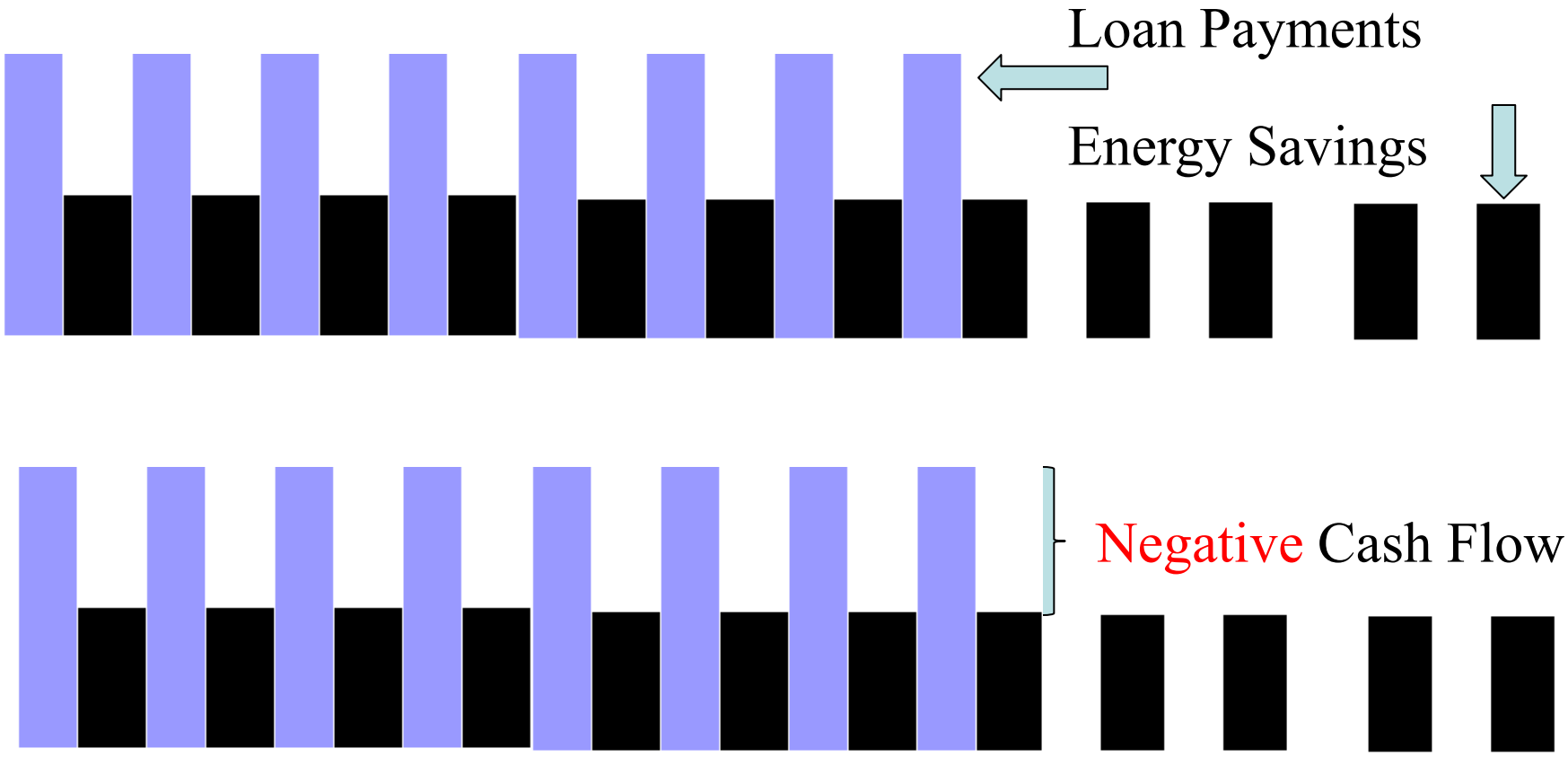
Additional considerations

Effects of

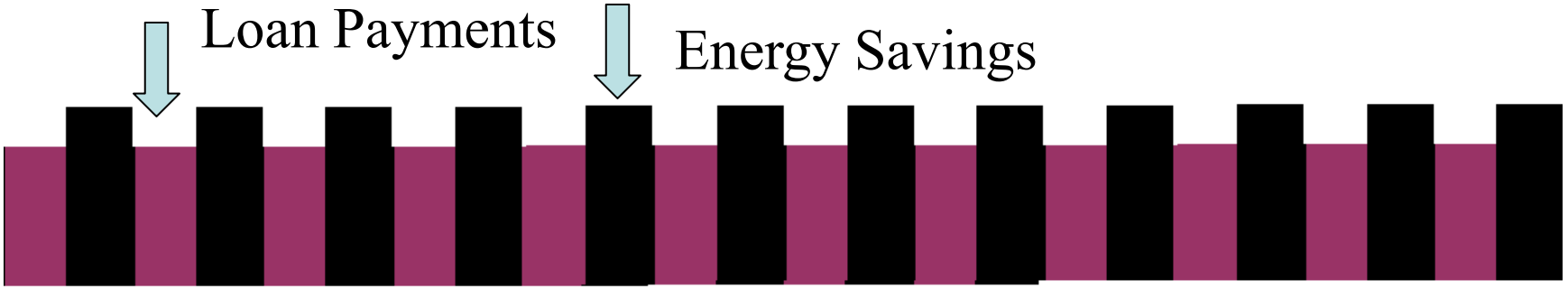
- occupancy behavior
- Heating Degree Days/Cooling Degree Days (HDD/CDD)
- Fuel and electricity prices

Project cash flow is additive to customer cashflow and may be helpful at the margin

The effect of loan term on cash flow

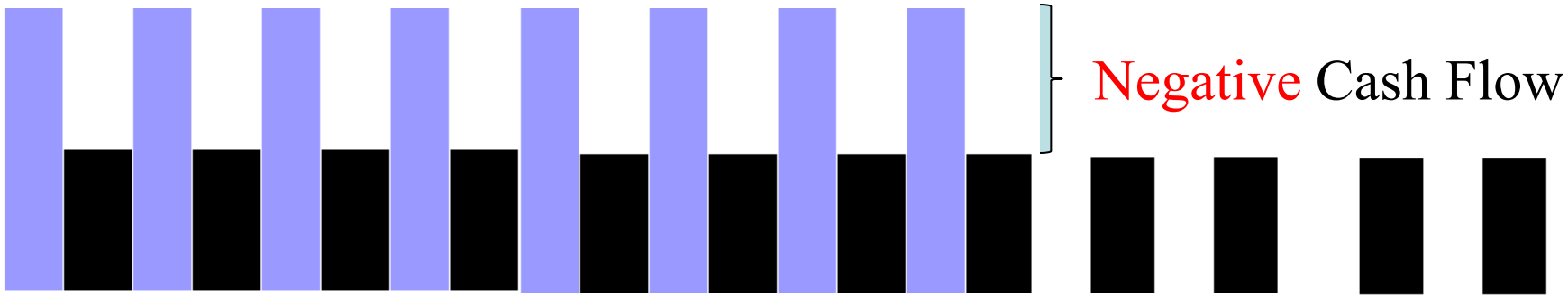


Align the period of payment with the period of the savings



Positive Cash Flow

Energy savings can make your loan payments for you



Positive Cash Flow

Example: project financing with negative cashflow

Project Cashflow

Project Costs

Total Project Cost:	$	199,843
EVT Incentive:	$	(40,000)
Other Incentive:	$	-
Net Project Cost:	$	159,843
Amount Financed:	$	(159,843)
Initial Customer Investment:	**$**	**-**

Financing Terms

Loan Rate:	5.0%
Loan Term (Months):	36

Investment Performance

Internal Rate of Return:		
Project Without Incentives:		24%
Project With Incentives:		31%
Payback Period (Years):		
Project Without Incentives:		4.1
Project With Incentives:		3.2
Average Monthly Expenses:		
First Year Average Monthly Savings:	$	4,109
First Year Average Monthly Payments:	$	4,791

Annual Electricity Savings

Energy (kWh):	432,089

Example: project financing with negative cashflow

Year	Net Operation & Maintenance Savings (Costs)	Annual Electric Savings (Costs)	Annual Fuel Savings (Costs)	Water savings (Costs)	Annual Payments (Principal & Interest)	Net Annual Cashflow	Net Cumulative Cashflow
0					$ -	$ -	$ -
1	$ -	$ 56,049	$ (6,743)	$ -	$ (57,488)	$ (8,182)	$ (8,182)
2	$ 754	$ 56,049	$ (6,743)	$ -	$ (57,488)	$ (7,428)	$ (15,610)
3	$ 3,036	$ 56,049	$ (6,743)	$ -	$ (57,488)	$ (5,146)	$ (20,757)
4	$ (10,491)	$ 56,049	$ (6,743)	$ -	$ -	$ 38,814	$ 18,058
5	$ 23,591	$ 56,049	$ (6,743)	$ -	$ -	$ 72,897	$ 90,955
6	$ 2,831	$ 56,049	$ (6,743)	$ -	$ -	$ 52,136	$ 143,091
7	$ (8,209)	$ 56,049	$ (6,743)	$ -	$ -	$ 41,096	$ 184,187
8	$ (13,260)	$ 56,049	$ (6,743)	$ -	$ -	$ 36,045	$ 220,233
9	$ 12,239	$ 56,049	$ (6,743)	$ -	$ -	$ 61,545	$ 281,778
10	$ 23,318	$ 56,049	$ (6,743)	$ -	$ -	$ 72,624	$ 354,402
11	$ (9,026)	$ 44,523	$ (6,743)	$ -	$ -	$ 28,753	$ 383,155
12	$ 3,648	$ 44,523	$ (6,743)	$ -	$ -	$ 41,428	$ 424,583
13	$ 1,027	$ 44,523	$ (6,743)	$ -	$ -	$ 38,807	$ 463,389
14	$ 12,073	$ 44,523	$ (6,743)	$ -	$ -	$ 49,853	$ 513,242
15	$ (10,919)	$ 44,523	$ (6,743)	$ -	$ -	$ 26,860	$ 540,103

Example: project financing with positive cashflow

Project Cashflow

Project Costs

Total Project Cost:	$	199,843
EVT Incentive:	$	(40,000)
Other Incentive:	$	-
Net Project Cost:	$	159,843
Amount Financed:	$	(159,843)
Initial Customer Investment:	**$**	**-**

Financing Terms

Loan Rate:	5.0%
Loan Term (Months):	48

Investment Performance

Internal Rate of Return:		
Project Without Incentives:		24%
Project With Incentives:		31%
Payback Period (Years):		
Project Without Incentives:		4.1
Project With Incentives:		3.2
Average Monthly Expenses:		
First Year Average Monthly Savings:	$	4,109
First Year Average Monthly Payments:	$	3,681

Annual Electricity Savings

Energy (kWh):	432,089

Example: project financing with positive cashflow

Year	Net Operation & Maintenance Savings (Costs)	Annual Electric Savings (Costs)	Annual Fuel Savings (Costs)	Water savings (Costs)	Annual Payments (Principal & Interest)	Net Annual Cashflow	Net Cumulative Cashflow
0					$ -	$ -	$ -
1	$ -	$ 56,049	$ (6,743)	$ -	$ (44,173)	$ 5,133	$ 5,133
2	$ 754	$ 56,049	$ (6,743)	$ -	$ (44,173)	$ 5,887	$ 11,019
3	$ 3,036	$ 56,049	$ (6,743)	$ -	$ (44,173)	$ 8,169	$ 19,188
4	$ (10,491)	$ 56,049	$ (6,743)	$ -	$ (44,173)	$ (5,358)	$ 13,829
5	$ 23,591	$ 56,049	$ (6,743)	$ -	$ -	$ 72,897	$ 86,726
6	$ 2,831	$ 56,049	$ (6,743)	$ -	$ -	$ 52,136	$ 138,863
7	$ (8,209)	$ 56,049	$ (6,743)	$ -	$ -	$ 41,096	$ 179,959
8	$ (13,260)	$ 56,049	$ (6,743)	$ -	$ -	$ 36,045	$ 216,004
9	$ 12,239	$ 56,049	$ (6,743)	$ -	$ -	$ 61,545	$ 277,549
10	$ 23,318	$ 56,049	$ (6,743)	$ -	$ -	$ 72,624	$ 350,173
11	$ (9,026)	$ 44,523	$ (6,743)	$ -	$ -	$ 28,753	$ 378,927
12	$ 3,648	$ 44,523	$ (6,743)	$ -	$ -	$ 41,428	$ 420,354
13	$ 1,027	$ 44,523	$ (6,743)	$ -	$ -	$ 38,807	$ 459,161
14	$ 12,073	$ 44,523	$ (6,743)	$ -	$ -	$ 49,853	$ 509,014
15	$ (10,919)	$ 44,523	$ (6,743)	$ -	$ -	$ 26,860	$ 535,874

Efficiency Vermont's Home Performance with ENERGY STAR®
Personalized Cash Flow Report

Multiple financing options and Efficiency Vermont incentives make it possible for the average homeowner to reap the benefits of maximum energy efficiency. Take a look at your Personalized Cash Flow Report below, and see how savings from energy efficiency improvements can offset the cost of your project.

This Report Has Been Prepared For **Typical Customer**

For Your Home At **Vermont Single Family Home**

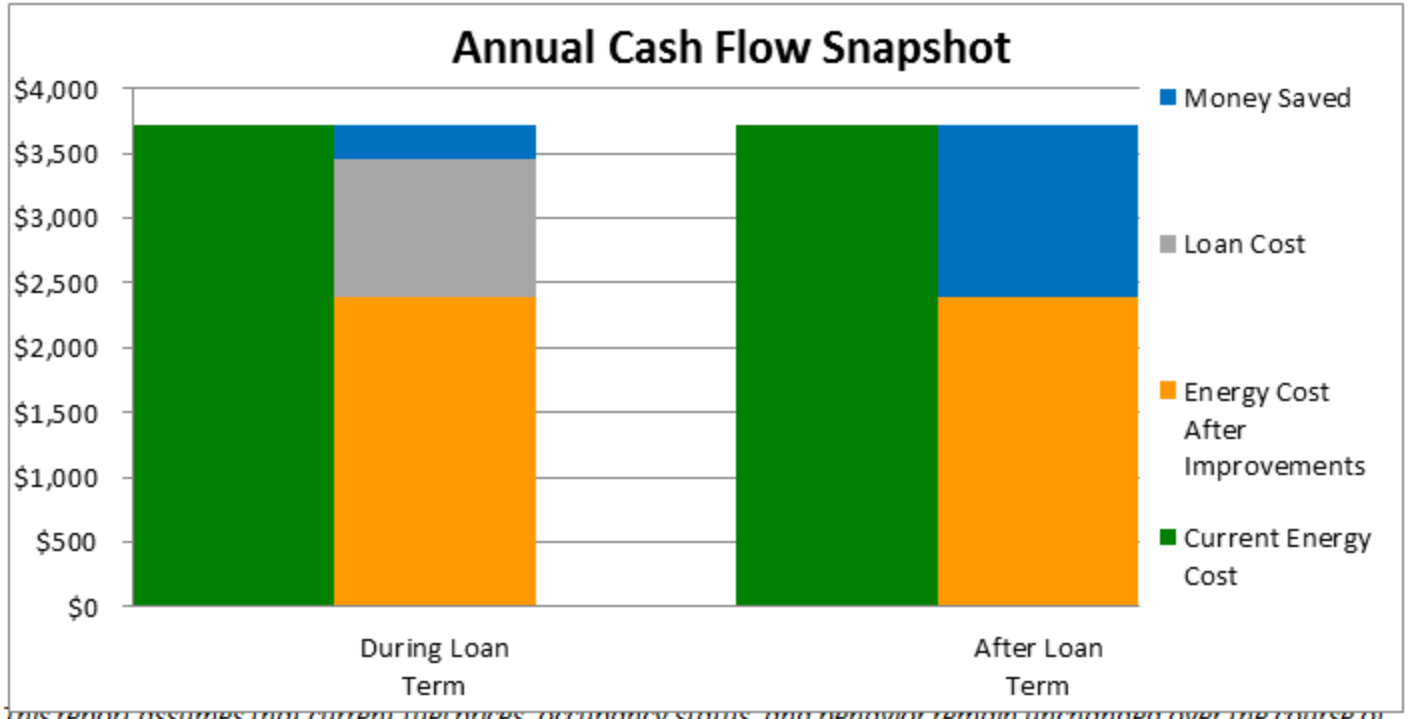
Project Information	
Total Project Cost *(input as negative)*	($7,600)
Efficiency Vermont Incentive	$1,560
Customer Down Payment	$540
Amount to Finance	($5,500)
Annual Energy Cost *(input as negative)*	($3,714)
Expected First Year Energy Savings	$1,318

Loan Information	
Annual Interest Rate	5.0%
Loan Term *(months)*	72
Monthly Payment	($89)
Total Loan Cost	($6,378)
Total Interest Paid	($878)

Cash Flow Summary - Annually	
Estimated Average Energy Savings	$1,318
Loan Cost	($1,063)
Net Cash Flow During Loan	$255
Annual Net Cash Flow After Loan	**$1,318**
Simple Payback *(years)*	**4.6**
Estimated 10 Year Net Cumulative Savings	**$6,802**

Total saved over 10 years after all loan and improvement costs. Calculated by multiplying the expected first year energy savings by 10 years and subtracting loan and improvement costs (assumes current fuel prices).

Residential Project Cashflow



This report assumes that current fuel prices, occupancy status, and behavior remain unchanged over the course of time. This information does not guarantee the savings you will see, but provides an estimate on what to expect based on current inputs.

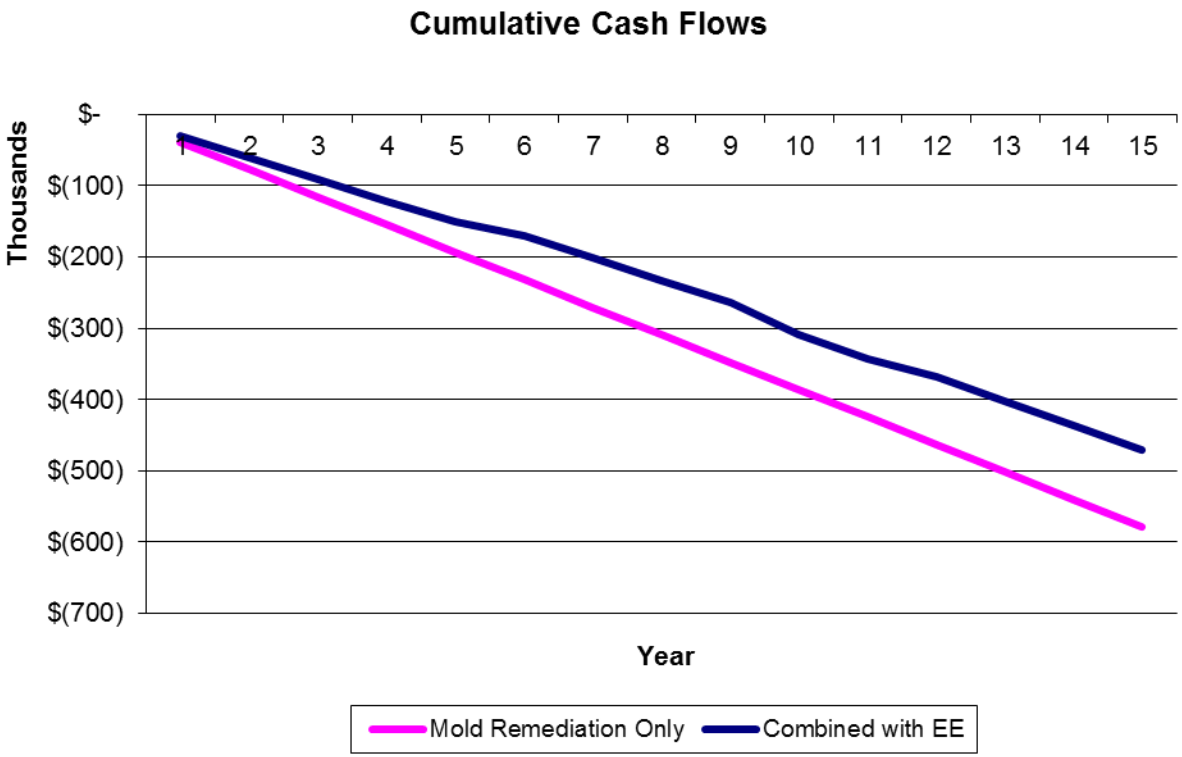
Paying for it

- Grants
- Efficiency Incentives
- Budget/Capital Reserves
- Performance Contracting
- Bonding
- Loans
- Tax-Exempt Lease Purchase

Combining Non-Energy and Energy Measures

Mold Remediation	
Total Amount Borrowed	$500,000
Rate and Term	2.0%, 15 yrs.
Total Cost	$579,158
Energy Efficiency Project - Lighting	
Total Amount Borrowed	$45,451
Total Cost	$52,647
Total Energy Savings (15 yrs.)	$152,765
Combined	
Total Amount Borrowed	$545,451
Total Net Cost	$479,040

Combining Non-Energy and Energy Measures



Leasing

- Leases affect operating expenses (income statement), not capital expenditures (balance sheet)
- Net positive cash flow reduces the risk perceived by lessor
- No penalty for early payoff

Tax-Exempt Leasing

- “Termination for non-appropriation“ - if lessee is unable to obtain funding for future payments, lessee can terminate the lease agreement without further obligation or penalty. This is an important provision for public entities that receive funding for one year at a time
- Interest income on a tax-exempt lease is generally not taxable for the lessor, so the cost can be lower
- Good overview and FAQ here: www.aglf.org/faq

- Modern, 3-story, 105K sq. ft., 500 K-8 students
- Inefficient lighting identified by SEMP
- Team formed: Facility Manager, Efficiency Vermont, Supplier, Contractor
- Team put together project scope, estimates for costs & savings. Efficiency VT calculated an incentive.
- Project presented to Tom Petit. Too big for budget, too small for bond. A tax-exempt lease allowed LTS to proceed with no upfront costs
- Project completed early 2011

Lyndon Town School

Project Economics

- Estimated Net Project Costs (after incentive): $70,800
- Estimated Annual Project Savings (estimates): $18,000 annually
- Estimated Rate of Return on Investment (pretax): 25%
- Simple Payback: 3.9 Years

Project Financing

- Tax-exempt lease obtained through Municipal Leasing Consultants
- 4 years, semi-annual payments, low interest rate
- Lease payments are paid from utility savings each year (savings exceeds lease payments)

Overview of Vermont Energy Efficiency Loan Guarantee Program

Why did Vermont win a Department of Energy grant?

The proposal addressed many DOE priorities:

- Public/private partnership
- Replicable and scalable
- Use of loan loss reserve as catalyst for private funding
- Existing infrastructure – Efficiency Vermont

Vermont Energy Efficiency Loan Guarantee Program

- Created by Act 87, enacted in June 2013
- Supported by DOE funds, in addition to VEDA
- Designed to encourage private capital for energy efficiency projects
- Any Vermont business or non-profit can borrow
- Can be used for electrical or fossil fuel energy saving projects

VEELGP Program Characteristics

- Loans made by individual banks or credit unions
- VEDA guarantees 75% of the loan, up to $250,000
- Fee of 3% of the loan guarantee amount – may be included in the loan
- Loan term and interest rate should reflect VEDA guarantee
- Underwriting will ‘consider value of energy savings’

Master Guaranty Agreement

"Each loan shall have been made for a project previously analyzed by EVT, and Lender utilized the financial benefits projected by EVT (including projected energy savings and direct cash incentives) to be derived from the energy efficiency elements of the project during the underwriting process of determining borrower qualification."

Key issues:
Energy efficiency financing

- financing is the *last* piece of the puzzle.
- 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.

Recommendations for thinking about energy efficiency financing

- It's an investment, not an expense.
- Understand the opportunity cost. Doing nothing might be the most expensive option!
- Show exactly where the savings are coming from, using conservative estimates. Efficiency Vermont can help you with this.
- Total cost is frequently less important than positive cash flow.

Contact information

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