

THANK YOU REV2024 SPONSORS!





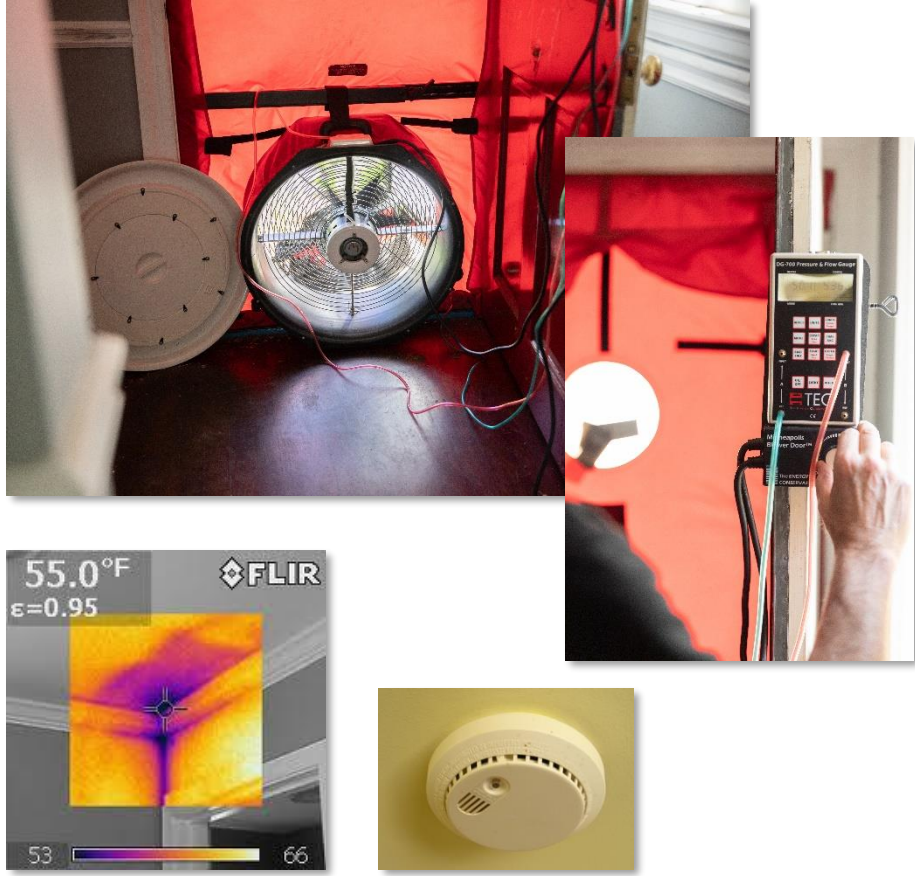
HEAT Squad Program

- Providing **support** to improve energy efficiency of buildings, regardless of income, since 2010
- **Reduced cost audits- \$50 or \$400**, audit reports, objective advice, help with contractors, in-house financing, QA/QC (fee based on sq.ft. & income)
- Addison, Bennington, Rutland, Windsor, (Windham), Essex, Orleans, Caledonia counties
- Completed over **6,300 audits; 2,300 projects**
- Partners: Efficiency VT, Local Utilities, Local Contractors, Energy Committees, Community Leaders, Agencies/Organizations, Clean Energy Development Fund, VLITE, VT Community Foundation, VT Weatherization Assistance Programs





HEAT Squad Energy Audit



2-3 hour diagnostic analysis by our certified auditors, year-round:

- Blower door test
- Complete visual inspection
- Infrared imaging (temp. dependent)
- Heating system efficiency testing
- Health & safety checks
- Year-round service
- **24-48 hr. audit report**



HEAT Squad Energy Audit Report

Your energy audit report will show you:

- Current building performance;
- Recommended energy upgrades;
- Estimates & incentive eligibility;
- Annual energy savings for upgrades, heat pumps, heating systems, renewables;
- Financing scenarios



BASEMENT

Approximate installed cost

\$3,600

Energy Savings

Approx. \$330

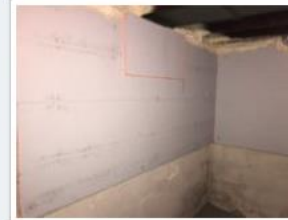
Why it matters

Insulating your basement walls will increase the overall temperature of your basement and make the floors above more comfortable. If heating systems are located in the basement the systems will function more efficiently. This is the most often recommended weatherization measure due to its relative simplicity, and high return on investment.

Insulate Basement Walls



Although exterior appears to have 1.5" of XPS insulation on the exterior, closer examination shows it is no longer adhered to the foundation in many places, leaving the walls virtually uninsulated.



Spray or install rigid foam insulation on the interior surface of at least the top 4' of basement walls or a minimum 2' below foundation exposed to the exterior where possible. Walk out walls should be full height.

Any exposed foam must include a 15 minute ignition barrier. It is recommended the entire height of the wall be insulated and is necessary where interior wall finishes will be installed.



Remove existing fiberglass if present in box sills and replace with either spray foam or rigid foam. If rigid foam is utilized, care should be taken to assure complete air sealing of box sills and top plate(s).



Advantages of Energy Improvements

- Lower Heating & Cooling costs, year round
- Improved Comfort:
 - Less Drafty
 - Warmer in Winters
 - Cooler in Summers
- Health & Safety Issues Addressed
- **Increased Value of Your Property**
- Rebates for Work Performed, **75% of WX cost up to \$9500 or \$4000 from Efficiency VT!!!**





Your Health and Safety

- Reduce incidence of rodents and pests

Our house and cellar are toasty warm and the amazing thing is- we have not seen a single mouse. Thank you.

-Lee & Jane

- Lower outside noise
- Eliminate moisture/mildew/mold (asthma)
- Address dangerous gas leaks and carbon monoxide issues
- Verify building tightness limit, not too tight
- *Have a safer home for you and your family*





Statewide Energy Loans

Home Energy Loan Project Verification Form

Effective May 28, 2024



The Home Energy Loan is a fast, easy, flexible way to finance eligible home weatherization and efficiency improvements, up to \$20,000.

Steps to Apply for Your Loan

- Ensure that this form has been completed and signed by you and your contractor. Eligible contractors can be found at efficiencyvermont.com/pro
- Review page 2 to ensure your project is eligible. (Note: VGS customers are only eligible to finance electric appliances, heat pump water heaters, and ducted, ductless, and ground source heat pumps.)
- Apply online or in person with one of the credit unions listed below. You will need to submit this completed form and a copy of your contractor scope of work, including price quote, with your Home Energy Loan application.

Household Income (see page 3)	Loan Term		
	Up to 5 years	>5 years, up to 10 years	>10 years, up to 15 years
Low	0%	1.99%	2.99%
Moderate	0%	2.99%	3.99%
High*	4.99%	5.99%	6.99%

Interest rates are subject to program and credit eligibility guidelines. *Households with income higher than moderate income levels on page 3.



To learn more and apply, call 802-371-5146 or visit vsecu.com/homeenergy



To learn more and apply, call 802-495-0680 or visit oppsvt.org/home-energy-loan



To learn more and apply, call 802-438-2303 or visit nwwvt.org/energy-loan

Customer Information

Customer Name _____

Customer Address (of installation location) _____ City/Town _____ State _____ Zip _____

Customer Mailing Address (if different) _____ City/Town _____ State _____ Zip _____

Customer Telephone # _____ Customer E-mail _____

Check to receive energy-saving offers and updates from Efficiency Vermont via email

Check to receive energy-saving offers and updates from Burlington Electric via email

Check if Vermont Gas customer (see terms & conditions) Household Size (number of people living in the home): _____

I certify that I meet the eligibility requirements of this loan program, and that all information submitted as part of this form, including the attached quote, is correct to the best of my knowledge. I agree to allow my lender to share project information with Efficiency Vermont.

SIGN HERE

Customer Signature _____ Date _____



Statewide Energy Loan

You know how important it is to take care of your home.



We did the insulation and a new heat pump, saw a 50% reduction in our heating bills and the house was so much cooler this past summer, almost halved our electric bill during summer months. Working with LoanWorks was not only educational and easy, but affordable because of the excellent lending products.

-Jonathan, Ludlow, VT

NeighborWorks of Western Vermont offers affordable financing up to \$40,000 unsecured so that you can make the energy upgrades that your home needs. Loan pre-approval in as little as 3-5 days.

OUR ENERGY LOAN CAN BE USED FOR:

- Air Sealing
- Insulation
- Heating Systems
- Health & Safety Repairs (siding, roofing, foundation, etc.)
- Heat Pumps
- Renewables

CALL OR EMAIL TODAY!

Lending Department (802) 438-2303 x2 | info@nwwvt.org

ENERGY LOAN AT A GLANCE:

6.0% for 5 years or 6.5% up to 10 years+ unsecured, up to \$40,000

*Rate subject to change without notice NMLS: 194008



NeighborWorks of Western Vermont
nwwvt.org (802) 438-2303

Rutland West NHS, Inc. d/b/a NeighborWorks of Western Vermont

2.2024



HEAT Squad Process

- After the audit, HEAT Squad **helps to connect** with local contractors for estimates.
- We help to **review estimates**, determine scope of work, connect with sub-contractors, project coordination.
- Provide lending options, **NWWVT Statewide Energy Loan** and **EVT Home Energy Loan**.
- Work complete, we perform a second audit and inspection the work. **Check for quality**, confirm work is to code, all work completed.
- Submit **paperwork for rebates** from Efficiency VT.

ZERO
ENERGY
NOW

2050

*An accessible and
customized approach
to meeting our climate
goals...*

You need to weatherize your home;

Have you heard about on-bill financing?

Solar is a good investment

There are low interest loans available;

You should get a heat pump;

The Inflation Reduction Act will
provide better incentives.

Wait. There are incentives available through Efficiency Vermont;

Just go to this website...

NeighborWorks has financing...

Vermont Gas has great
incentives...

If you go through Weatherization Assistance, it's free...

Get off fossil fuel!

TO MEET OUR 2050 GOAL – EVERY HOME HAS TO:

- Get off fossil fuel
- Embrace renewable energy

... IN A WAY THAT'S AFFORDABLE
FOR THE HOMEOWNER.

ZERO ENERGY NOW:

- Works with existing technologies, existing contractors – and existing programs here in Vermont.
- Provides the design, the strategy, and the coordination to reduce emissions by 90% or more.

2050



Zero Energy Now

A clear, coherent path that guides our homes and small buildings into a post-fossil energy future!

ZERO

ENERGY

NOW

How ZEN works:

1st: Assessment & Project Design

Envelope – Inspect & Measure

Heating System

Appliances

Solar siting options

Discuss the homeowner's priorities.

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How ZEN works:

2nd: Weatherization

Address all high value measures:

- attics
- basements
- air-sealing
- other cost-effective measures

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How ZEN works:

3rd: Install Non-Fossil Fuel Equipment

Many available options:

- Heat pump systems for heating & cooling
- Heat pump water heater
- Sometimes central wood-pellet systems
- Wood or pellet stove – helps provide backup
- Fossil equipment – retire? Or backup?

ZERO
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Now

How ZEN works:

4th: Renewable Energy

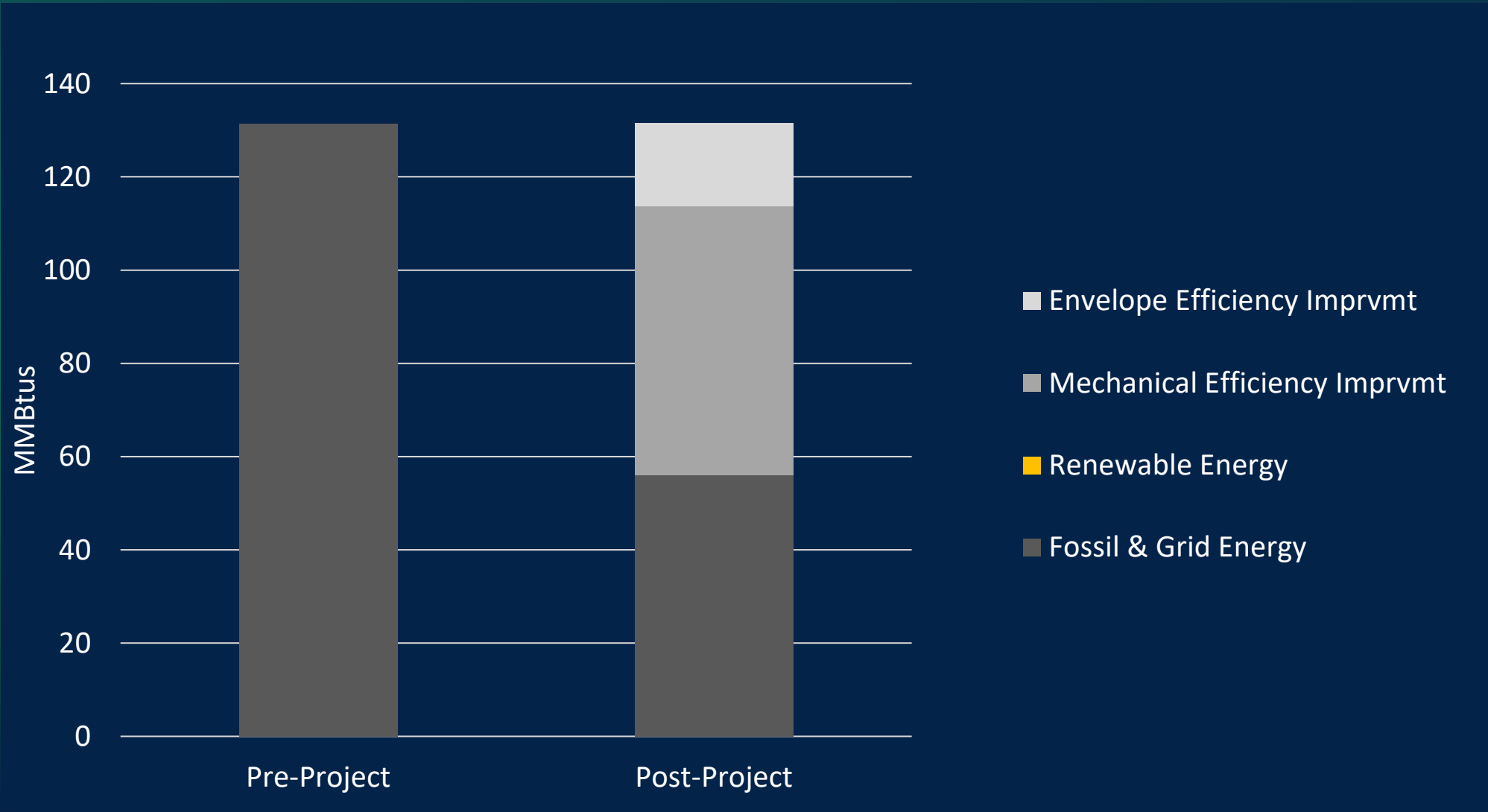
Usually Solar

- Rooftop
- Ground mount
- Off-site (community solar)

Biomass as an alternative

ZERO ENERGY NOW

How ZEN works:

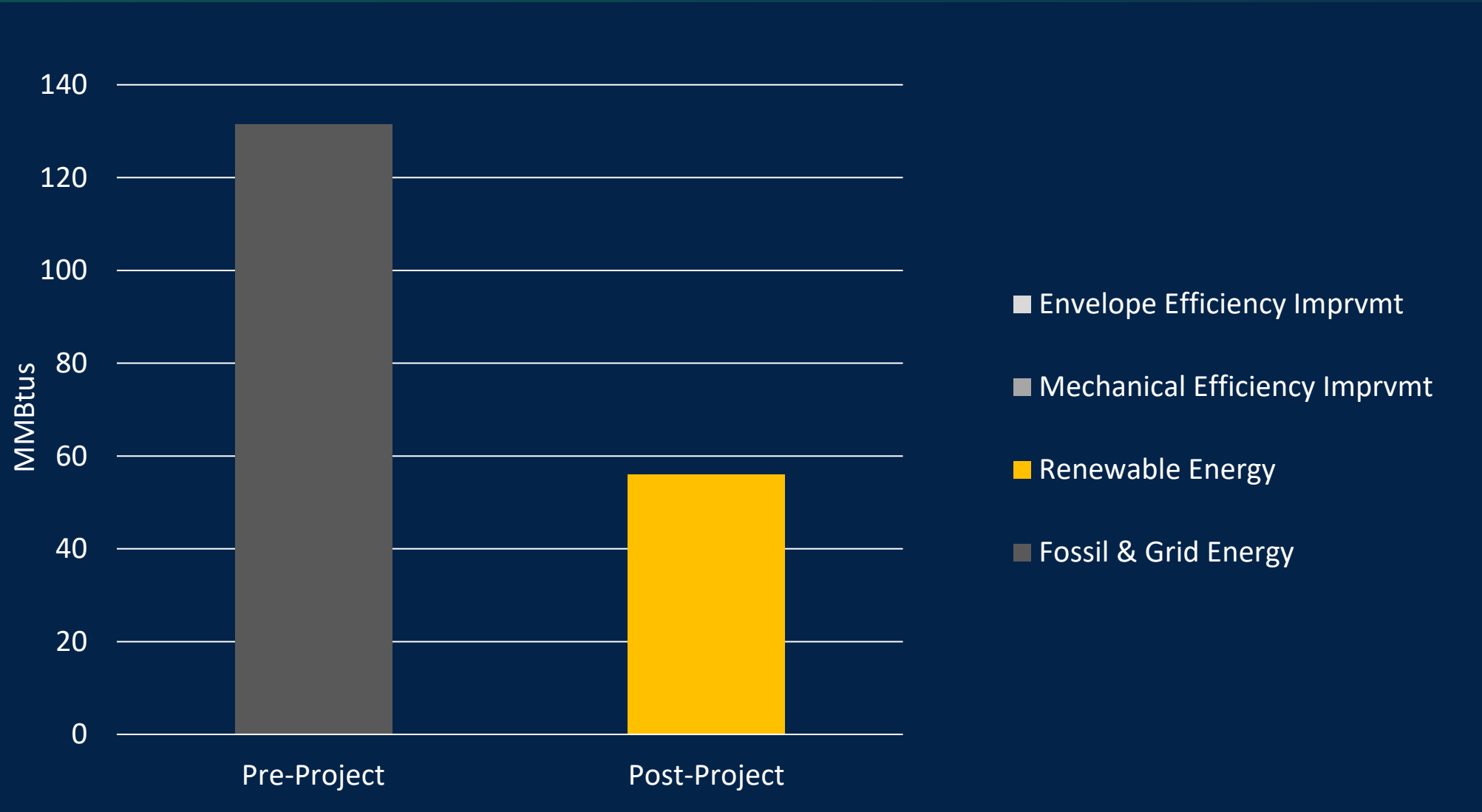


ZERO

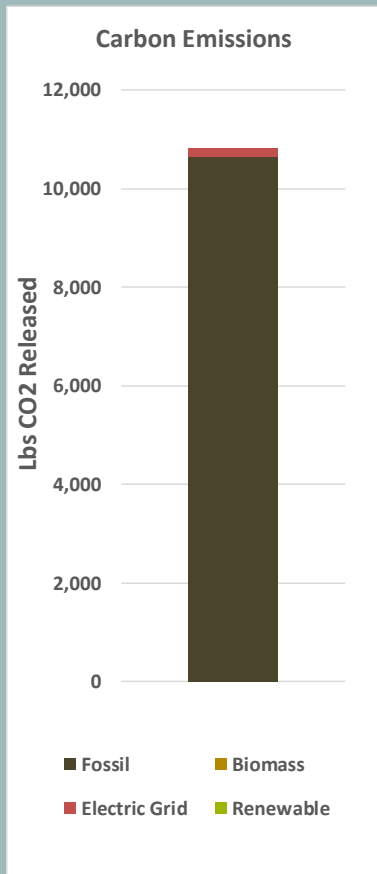
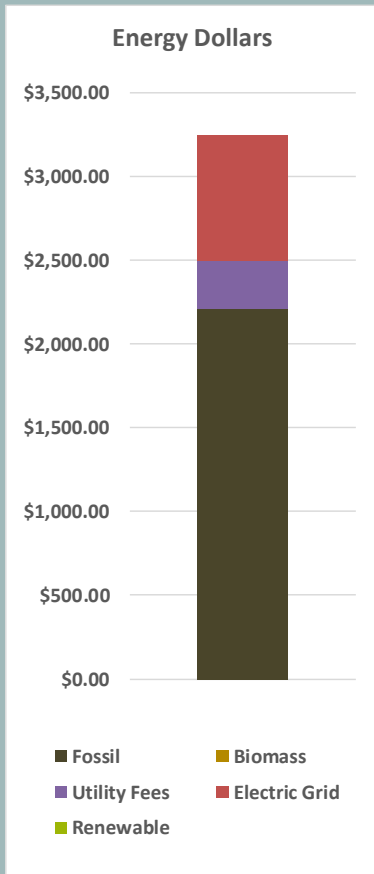
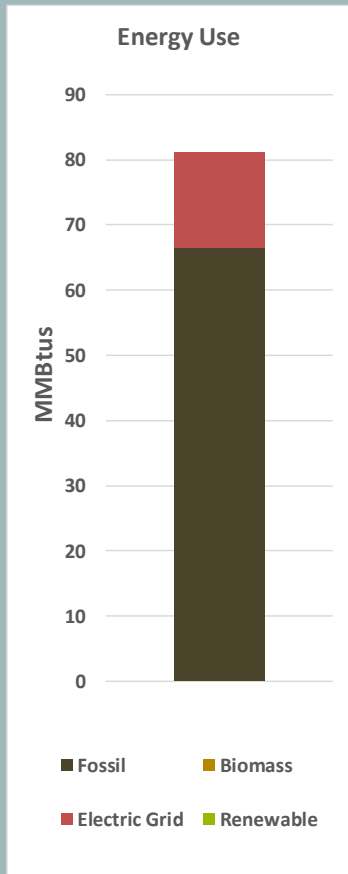
ENERGY

NOW

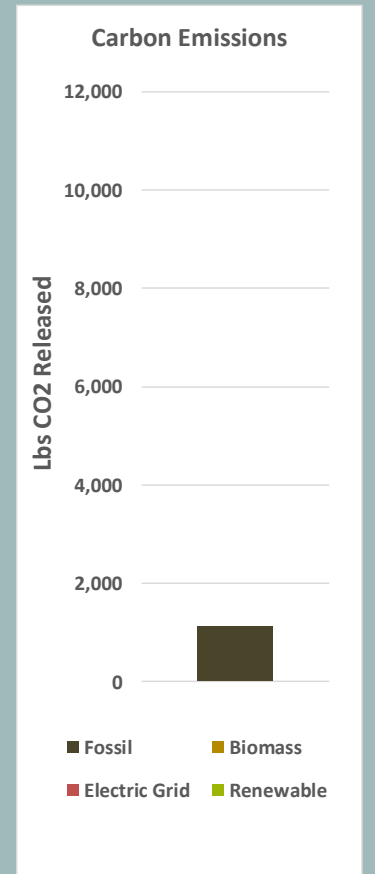
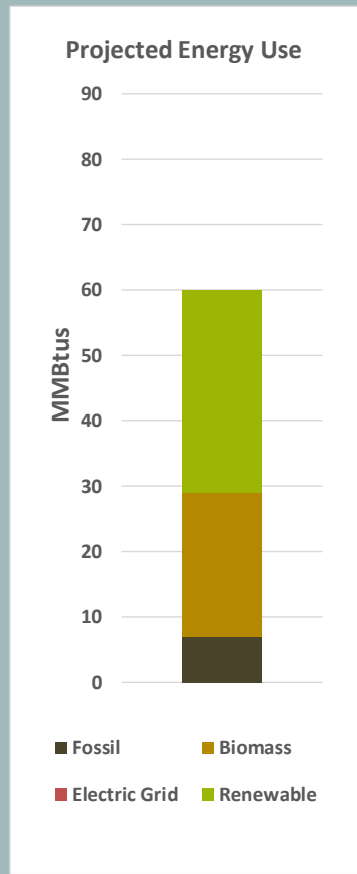
How ZEN works:



Your home's current energy profile



Your home's potential energy profile...





CLEAR

Clean Energy Assessment & Reinvestment
Analysis Tool

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BUILDING PERFORMANCE PROFESSIONALS ASSOCIATION

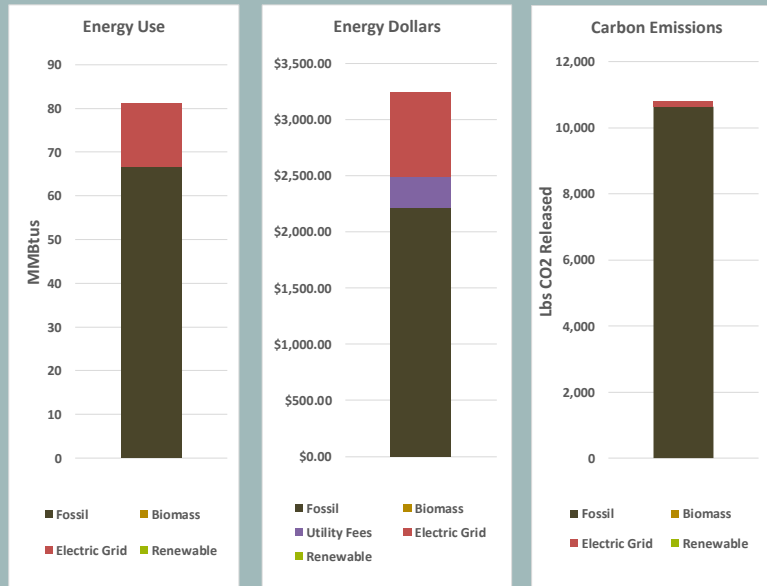
Zero Energy Now Program

Summary & Report

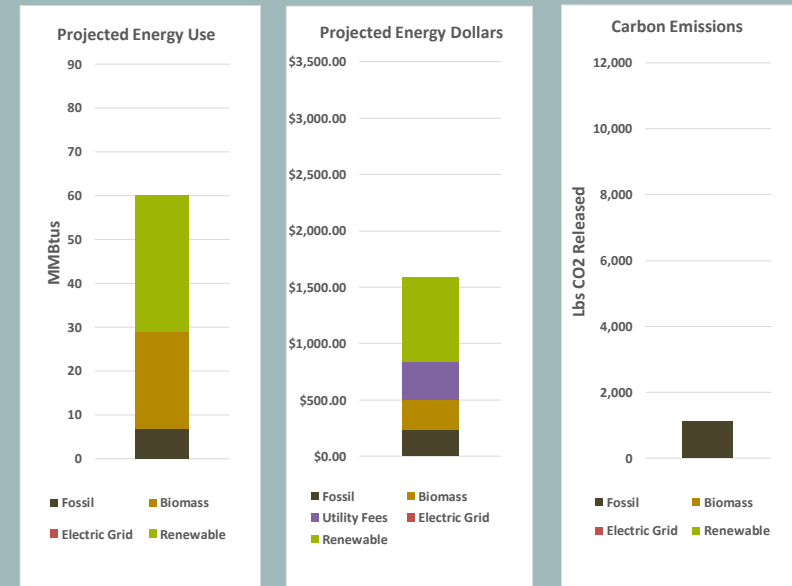
Coordinator: Brent Mellen / Tom Perry
Company: Building Energy
Location: Orange County Vermont
Raised Ranch
Audit Date: 6/12/2020

How does your home stack up on the path to Zero Energy?

Your home's current energy profile



Your home's potential energy profile...



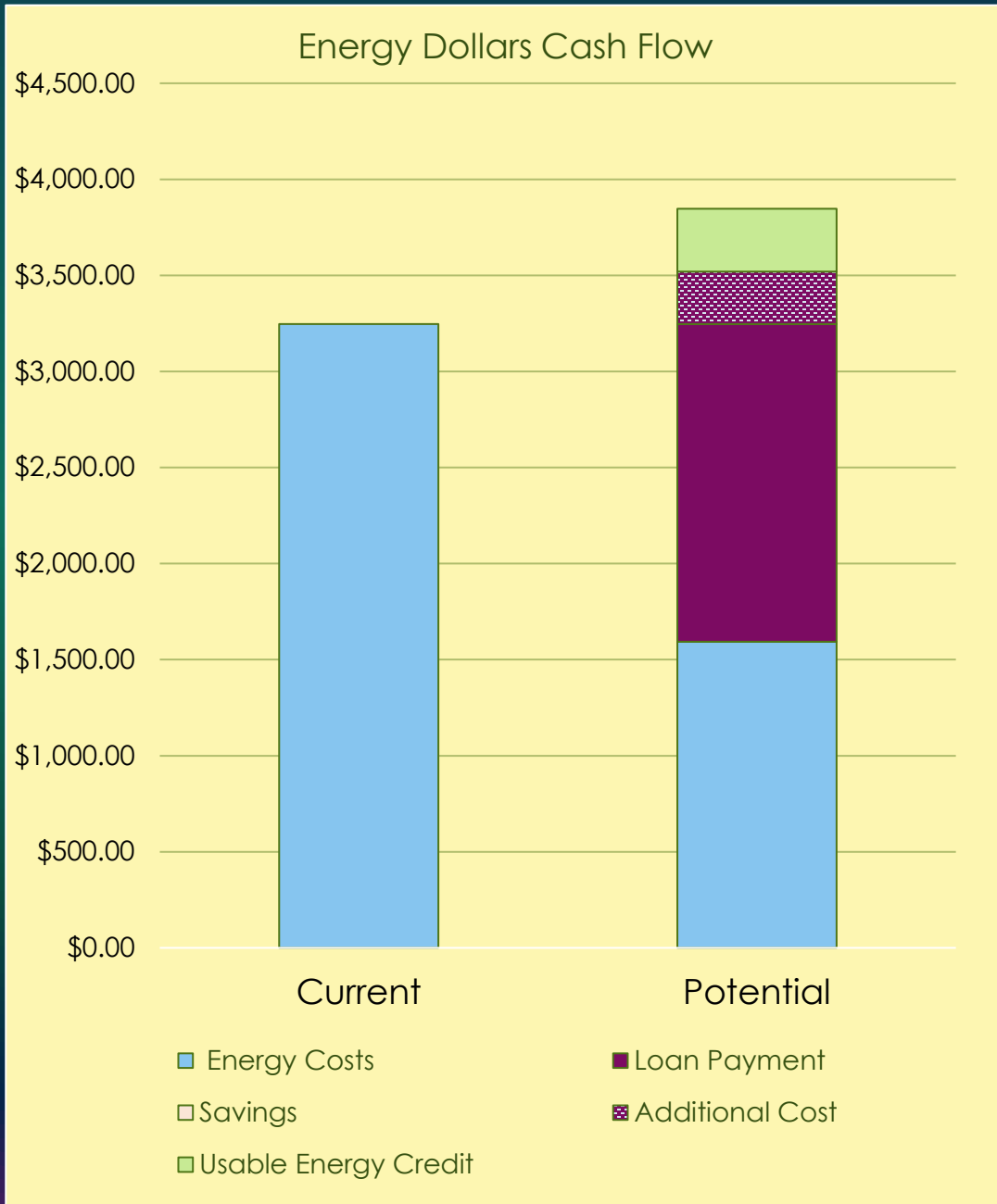
Orange County Raised Ranch

91% Fossil fuel & grid
electric reduction!

100% of home's
energy offset by
community solar.

59% energy cost
savings!

Net monthly cost: \$9.72



How ZEN works Financially:

In this home, energy costs and fees of almost \$3,250 a year have been reduced effectively by half – over \$1,600 a year.

A loan payment of \$1,800 per year combined with the remaining energy costs, amounts to just \$117 more than the energy costs before the project.

The out-of-pocket cost difference – on this \$50,000 project?

\$9.72/month



Orange County Farmhouse

98% Fossil & grid electric reduction
 94% Renewable
 98% carbon emissions reduction

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Clean Energy Assessment & Reinvestment

Analysis Tool

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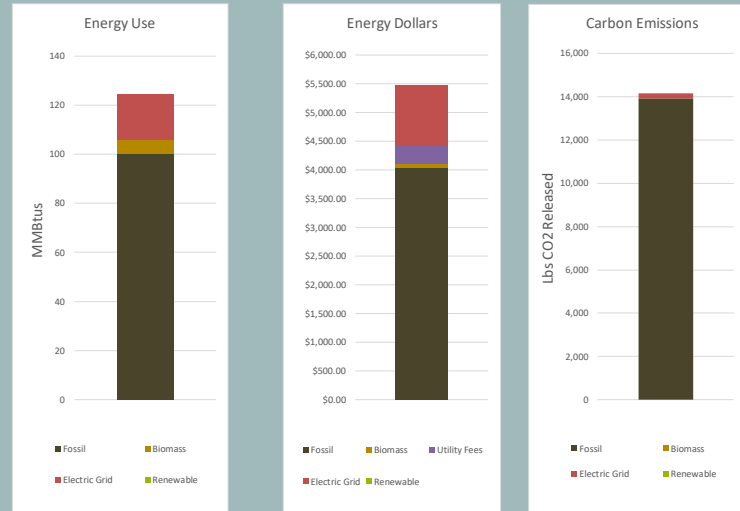
Zero Energy Now Program

Summary & Report

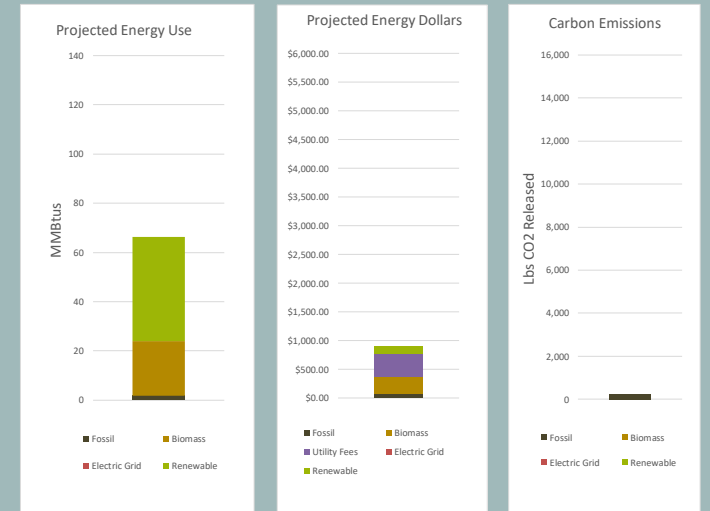
Coordinator: Chuck Reiss
 Company: Reiss Building & Renovation
 Client Name: Orange County Farmhouse
 Mailing Address:
 Audit Date: 7/28/2021

How does your home stack up on the path to Zero Energy?

Your home's current energy profile



Your home's potential energy profile...



Net Monthly Cost: \$33.17



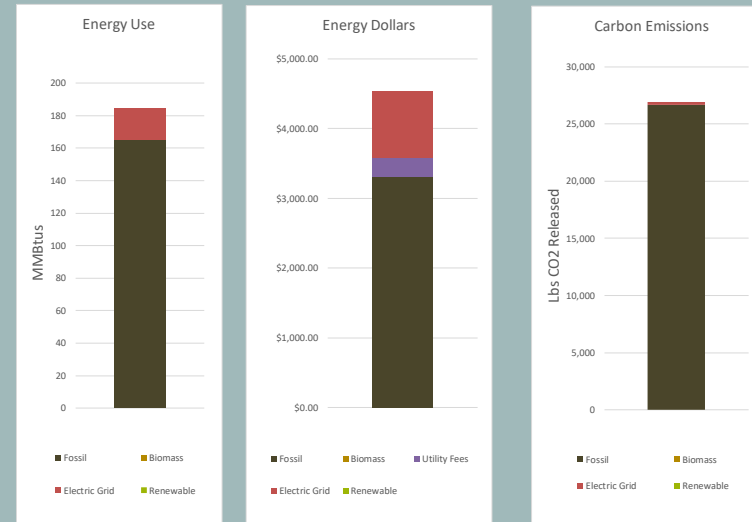
Windham County Victorian

91% fossil & grid reduction

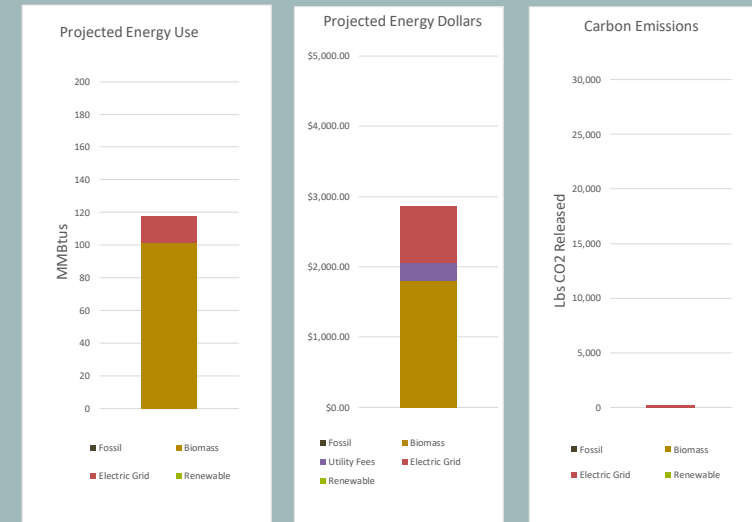
85% renewable energy (wood)

How does your home stack up on the path to Zero Energy?

Your home's current energy profile



Your home's potential energy profile...



Net monthly savings: \$28.75



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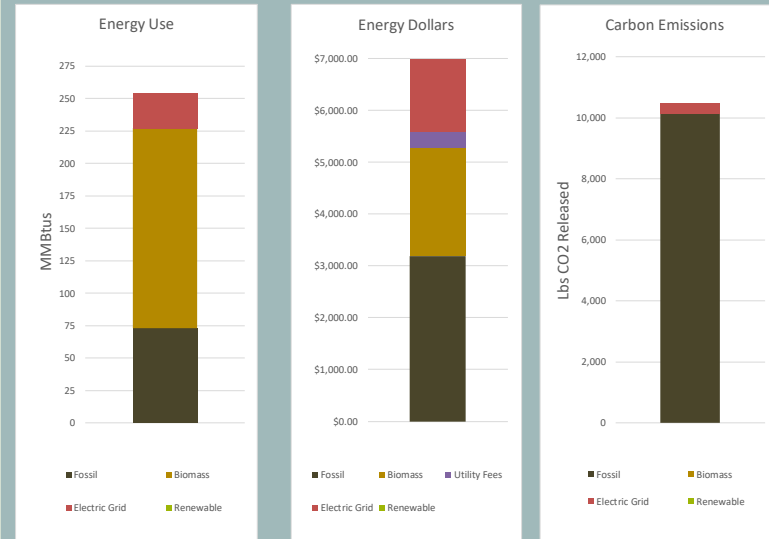
Zero Energy Now Program

Summary & Report

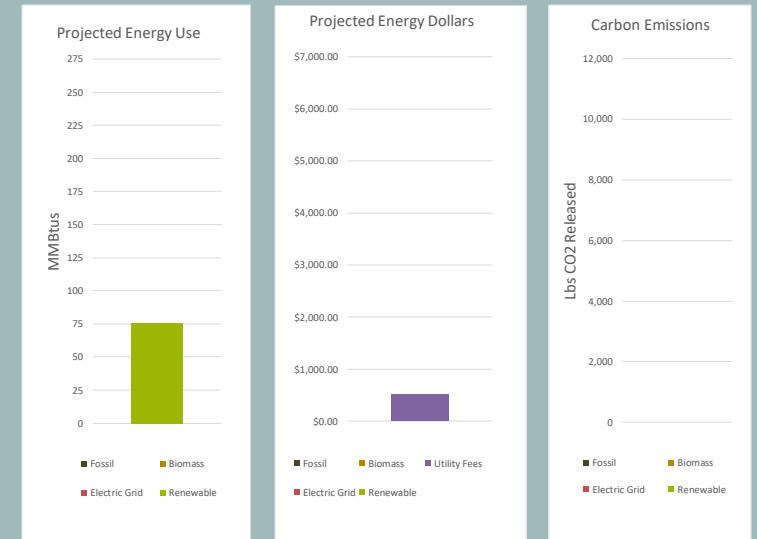
Coordinator: Chuck Reiss
Company: Reiss Building & Renovations
Client Name: Chittenden County Farmhouse
Mailing Address: _____
Audit Date: 4/1/2022

How does your home stack up on the path to Zero Energy?

Your home's current energy profile



Your home's potential energy profile...



Chittenden County
Farmhouse

100% Renewable

100% Fossil & Grid
Energy
Reduction

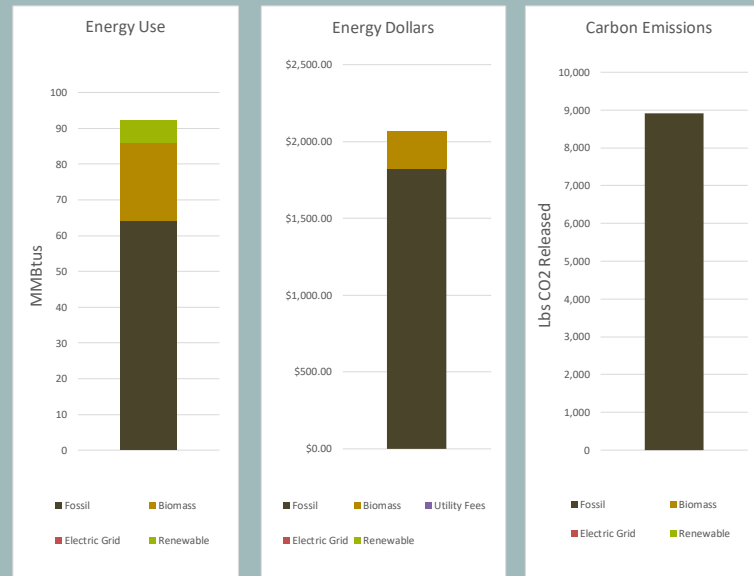
\$0.00 Energy Costs
(except fees)

Net Monthly Savings: \$50.72

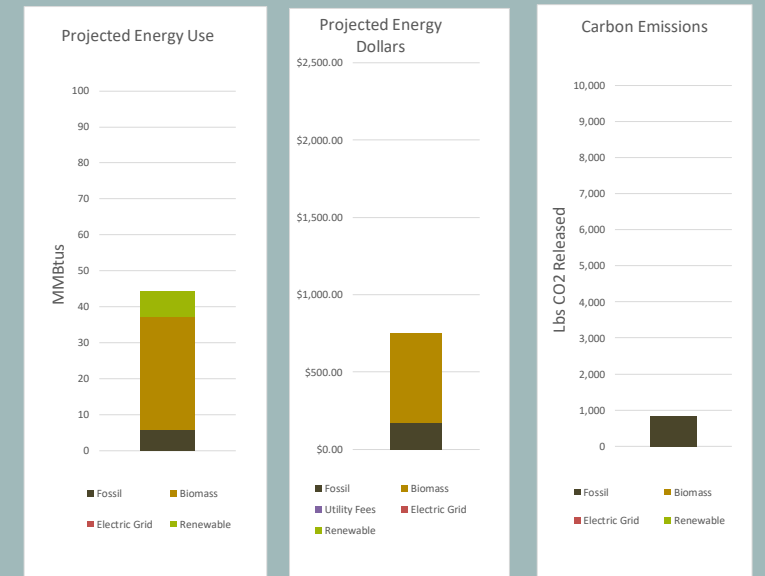


How does your home stack up on the path to Zero Energy?

Your home's current energy profile



Your home's potential energy profile...



Orange County
Garage Apartment

50% envelope improvement
91% fossil fuel reduction
88% renewable energy

Net monthly cost: \$24.46



Windham County Mansard

100% Renewable.

Zero Carbon Emissions!

Net Monthly Cost: \$6.71.

CLEAR

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Analysis Tool

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BUILDING PERFORMANCE PROFESSIONALS ASSOCIATION

Zero Energy Now Program

Summary & Report

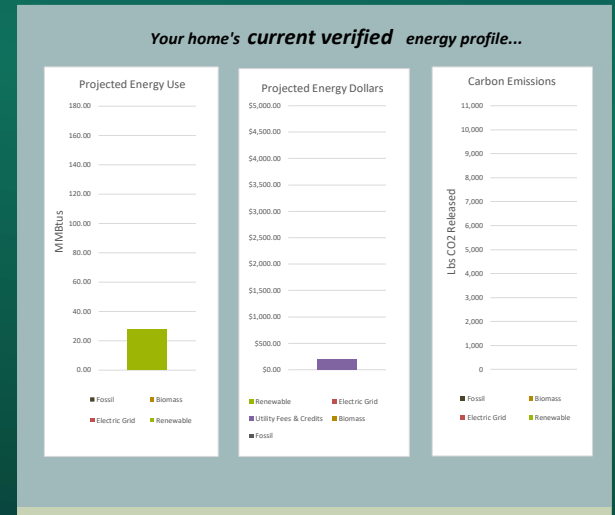
Coordinator: Katrina Wilson/Tom Perry
Company: Integrated Solar Applications
Windham County Urban Mansard
Audit Date: 6/18/2020

How does your home stack up on the path to Zero Energy?



ZERO ENERGY NOW GOALS

	Required Standards	Minimum Required	Projected Achievmt	Achieved	Meets ZEN	
Test 1	Envelope Load Reduction	10.00%	77.24%	86.50%	YES	VERIFIED!
Test 2	Fossil & Grid Energy Reduction	50.00%	98.71%	100.00%	YES	VERIFIED!
Test 3	Renewable Energy Component	50.00%	93.14%	100.00%	YES	VERIFIED!
Added Benefits		Recmnded	Projected	Achieved		
	Reduction in CO2 Emissions	90.00%	99.89%	100.00%	lbs elimntd:	22,872.54
	Energy Cost Savings	80.00%	98.01%	100.00%	in pre-project dollars	



Average Results *over 27 Projects*

Average Envelope Improvement:	28%
Average Fossil fuel and grid electric reduction:	91%
Average Carbon emissions reduction:	94%
Average Energy Cost Savings	68%
Average Renewable portion of total energy	85%
Average Total project cost	\$69,964
Average Incentives and tax credits leveraged	\$20,564

ZERO
ENERGY
NOW

Customization

- *To the home*
- *To the homeowner*

ZERO

ENERGY

NOW

Coordination

- *Understand the needs of the house and how they can be addressed with the available program components*
- *Understand the priorities and capacities of the homeowner*
- *Understand how to work with contractors*

ZERO
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NOW

A Comprehensive Design Tool

- *By optimizing potential strategies, helps the contractor or coordinator find the best and least expensive way to get off fossil fuel*
- *Shows the homeowner the path forward in their energy transformation*
- *Shows the homeowner how they can get the project done affordably*

ZEN can be done for almost any structure...

- A Suburban colonial
- A Ranch house
- A Vermont farmhouse
- A Queen Anne Victorian
- A Log home
- A Mobile home
- **Your house?**



ZERO
ENERGY
Now

*How to get in touch with
Zero Energy Now:*

Program Information:

info@zeroenergynowvt.com (802) 238-3478

Tom Perry:

info@zeroenergynowvt.com (802) 238-3478

HEATING & COOLING SYSTEMS to Pair w/ Electrification

Heat Pump Types

- Air-to-Air/ Air Source / Mini-split
- Air-to-Water / ATW
- Ground Source / Geothermal

Common Distribution Systems

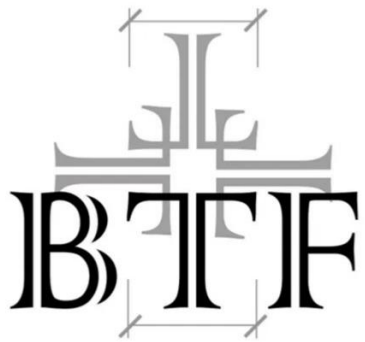
- Terminal Units
- Ducted Systems

Direct Electric Resistance

- Electric Baseboard
- Electric Underfloor Radiant
- Electric wall mounted units
ie. cabinet unit heaters,
air curtains, between studs

Discussion

- Pros & Cons
- Costs
- Efficiency of heat pump types in different seasonal operations
- Efficiency of direct electric resistance
- How to Choose / Typical & Ideal use cases in choosing the right system
- Importance of proper sizing & installation



VENTILATION AIR SYSTEMS *to Pair w/ Electrification*

WWW.BITETHEFROST.COM

Indoor Air Quality (IAQ) & Ventilation Air Fundamentals

- Elevated co2 levels in indoor environments can cause headaches, dizziness, and impaired cognitive function, as well as fatigue & poor sleep
- Particulates & Pollutants such as dust, pollen, household chemicals & smoke, can exacerbate respiratory issues, allergies, and asthma

Ventilation Air Systems

- Balanced Ventilation Air Systems: ERVs / HRVs
- Exhaust Only / Point Source: EFs & Hoods

Discussion

- Pros & Cons
- Costs
- Efficiency
- How to Choose / Typical & Ideal use cases in choosing the right system
- Importance of proper sizing & installation & Maintenance



BTF Net Zero Designs

SIMPLIFIED ARCHITECTURAL DESIGNS to Pair w/ Electrification

WWW.BITETHEFROST.COM

Simplified Architectural Designs

- Reduced Surface Area = Smaller HVAC Loads
- Reduced Seams = Home Longevity, reduced Infiltration + Smaller HVAC Loads
- Smaller footprints = Smaller HVAC Loads

New does not always equal energy efficient

Reliance on high end materials is not enough, we must design smarter shapes

Discussion - Architectectural Space, Energy and Resource Efficiency



BTF Net Zero Designs



Industry Problem
SPACE

Home Plans \leq 2000 sf



Industry Problem
ENERGY

Historical Shapes



Industry Problem
RESOURCE

Simplified Architecture

3 Quick & Easy Resources



SOUTH ELEVATION

MAPLE

1750 SF | 3-4 BED | 4 BATH



NORTH ELEVATION

GOLDEN BEECH

1300 SF | 3 BED | 3 BATH

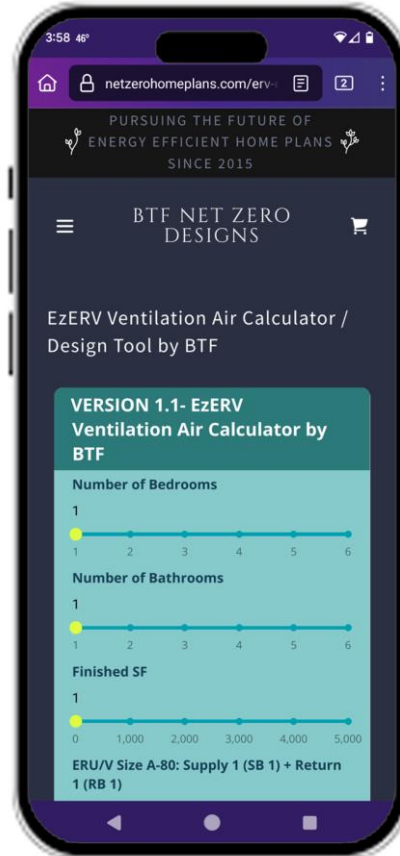


NORTH ELEVATION

GRAY BIRCH

890 SF | 2 BED | 1 BATH

EzERV Ventilation Air Calculator by BTF



Online, Self-Study Training

Manual J Load Calculations & Energy Modeling

Learn to build your own ACCA Manual J load calculations and energy models from scratch

Scan to learn more



Course Details

- ✓ Online, self-paced
- ✓ 1-year to finish the course
- ✓ Team discounts available
- ✓ Software agnostic - Use any Manual J software program

YOUR INSTRUCTOR



Gwendolen St. Sauveur

Founder and CEO,
BTF Net Zero Designs

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