

# Act 47 Building Energy Disclosure Working Group

Rating Subcommittee Report  
September 19, 2011

# Subcommittee Members

- Bob Hedden, Oil Heat Consultant and Educator (Vermont Fuel Dealers)
- Emily Levin, Efficiency Vermont (HERS Provider)
- Richard Faesy, Energy Futures Group (Energy Expert)
- Ward Smyth, Turtle Creek Builders (Home Builders)
- Ben Walsh, VPIRG (interested guest)

# Overview

- Introduction (Ward)
  - Where we are
  - Objectives
- Core principles (Emily)
- Review of rating options (Richard)
  - Residential
  - Commercial
  - Scoring options
- Feedback (Bob)

# Where we are

- Developed core principles
- Reviewed ratings
  - Demos and test drives
  - Presentations by experts and tool developers
- Preliminary recommendations
- Check-in with Working Group
  - Are we are track?
  - What have we missed?
  - Keep going?
  - Anyone want to join us?

# Subcommittee Objectives

- Develop core guiding principles for rating selection
- Develop a matrix comparing audit/rating options
- Prioritize options based on core principles to provide preliminary recommendations to the full working group

# Core Principles

# Core Principles

1. Reasonable cost to end user (\$0-300)
2. Rating can be presented as a single number or letter to allow market comparisons
3. Accurate
  - a) Repeatable, predictable results
  - b) Tool predicts energy use close to how an average occupant would use the house
4. Makes recommendations for upgrades to focus on high-priority areas
5. Smooth process to pursue upgrades based on rating
  - a) Optional link to home inspection

## Core Principles (con't)

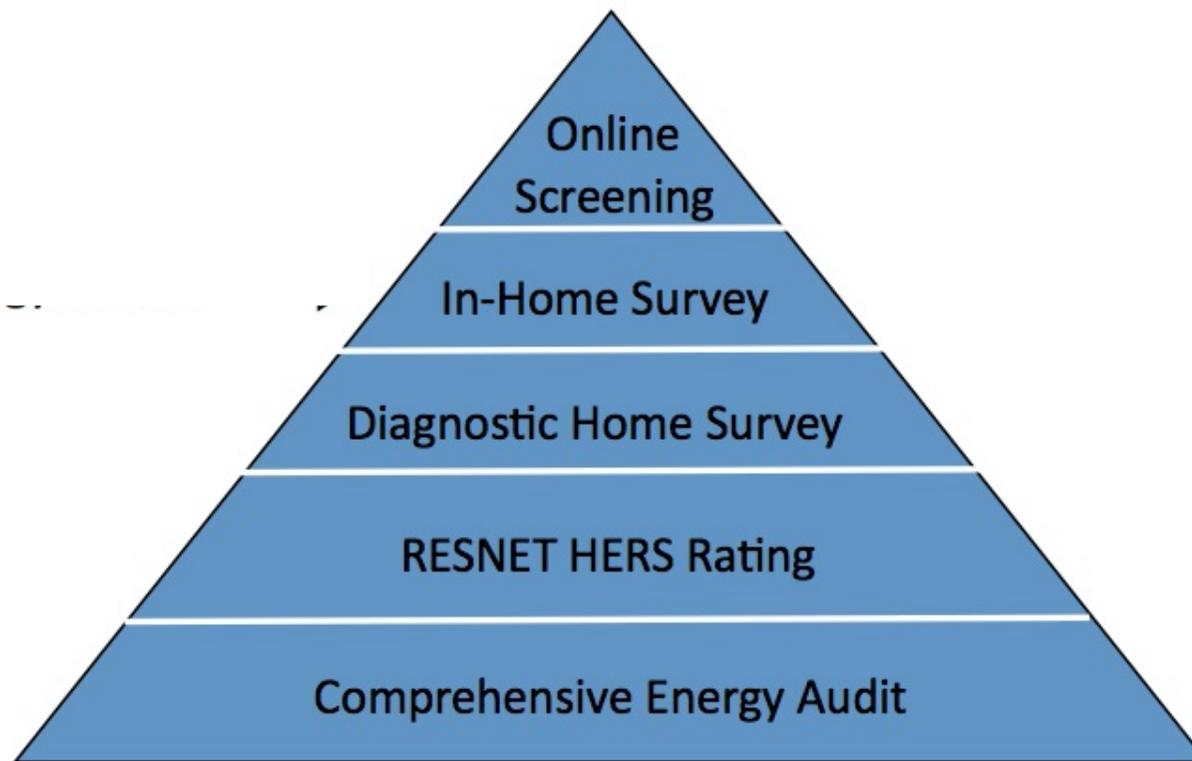
6. Residential: Asset rating – based on features of home rather than occupant behavior
7. Commercial/Institutional: Operational rating - occupant-based
8. HERS-compatible: If different than HERS, can be translated or linked to HERS (HERS-lite)
9. Tiered on-ramp - allowing drilling deeper if desired for more accuracy
10. Ability to customize and maintain for VT

# Residential Tools

# Tools Examined

- Online Screening
  - Home Energy Yardstick (U.S. EPA)
  - EnergySavvy (EnergySavvy)
  - EnergyMeasure View (Conservation Services Group)
- In-Home Survey / Diagnostic Home Survey
  - EnergyMeasure Home (CSG)
  - Home Energy Score (U.S. DOE)
  - Energy Performance Score (Earth Advantage Institute)
- RESNET Home Energy Rating System (HERS) Rating
  - REM/Rate (Architectural Energy Corp.)

# Rating Tool Hierarchy



*Time of Sale Energy Labeling of Homes: A Concept Paper, Philip Fairey (FSEC), Home Energy Magazine, July 2010 Issue.*

# Home Energy Yardstick (U.S. EPA)

Assess Your Home : ENERGY STAR - Windows Internet Explorer

https://www.energystar.gov

Hotwire: Airline Ticke... EnergyMeasure™ SUL... The Home Energy Sc... Assess Your Home...

Google Search Share Check Translate AutoFill Sign In

- Energy sources for your home: natural gas, electricity, fuel oil, propane, coal, wood and/or kerosene
- The square footage of your home.

Your Home	Your Fuel Types
What is your 5-digit zip code? <input type="text"/>	In addition to electricity, which fuel type(s) does your home use? <b>Select no more than 2.</b>
How many people live in your home? <input type="text"/>	
What is the square footage of your home, including the basement? <input type="text"/> <a href="#">More information</a>	

**Your Energy Use**

Would you like to use **annual** or **monthly** billing information to enter your household's energy use? [?](#)

Annual  
 Monthly

Select the Start Date for the year covered:   [?](#)

**Enter Totals for the year:**

Electricity  kWh  dollars [?](#)  
Max 70,000

**SUBMIT**

Would you like to include the Home Energy Yardstick on your website? [Click here for instructions](#) (196KB) or contact [Ted Lenkey](#) to find out how!

comfort through Home Performance with ENERGY STAR. A participating Home Performance contractor can evaluate your home using state-of-the-art equipment, recommend comprehensive improvements that will yield the best results, and help you to get the work done.

» [Find out if Home Performance with ENERGY STAR is available in your area](#)

# Home Energy Yardstick (U.S. EPA)

ENERGY STAR - Windows Internet Explorer

https://www.energystar.g... Hotwire: Airline Ticke... EnergyMeasure™ SUL... The Home Energy Sc... ENERGY STAR

Home > Home Improvement > Home Energy Yardstick > Home Energy Yardstick Results

## ENERGY STAR Home Energy Yardstick • RESULTS

The Home Energy Yardstick compares a household's energy use to similar homes and gives it a score between 0 and 10 (10 being the most energy efficient). An average household scores a 5.

**Yardstick Score: 9.6\*** [PRINT THESE RESULTS](#)

Annual pollution resulting from energy use in this household is **7 MtCO<sub>2</sub>eq of greenhouse gas emissions** - the equivalent of **1 car**.

**About Your Home** [\(edit\)](#)

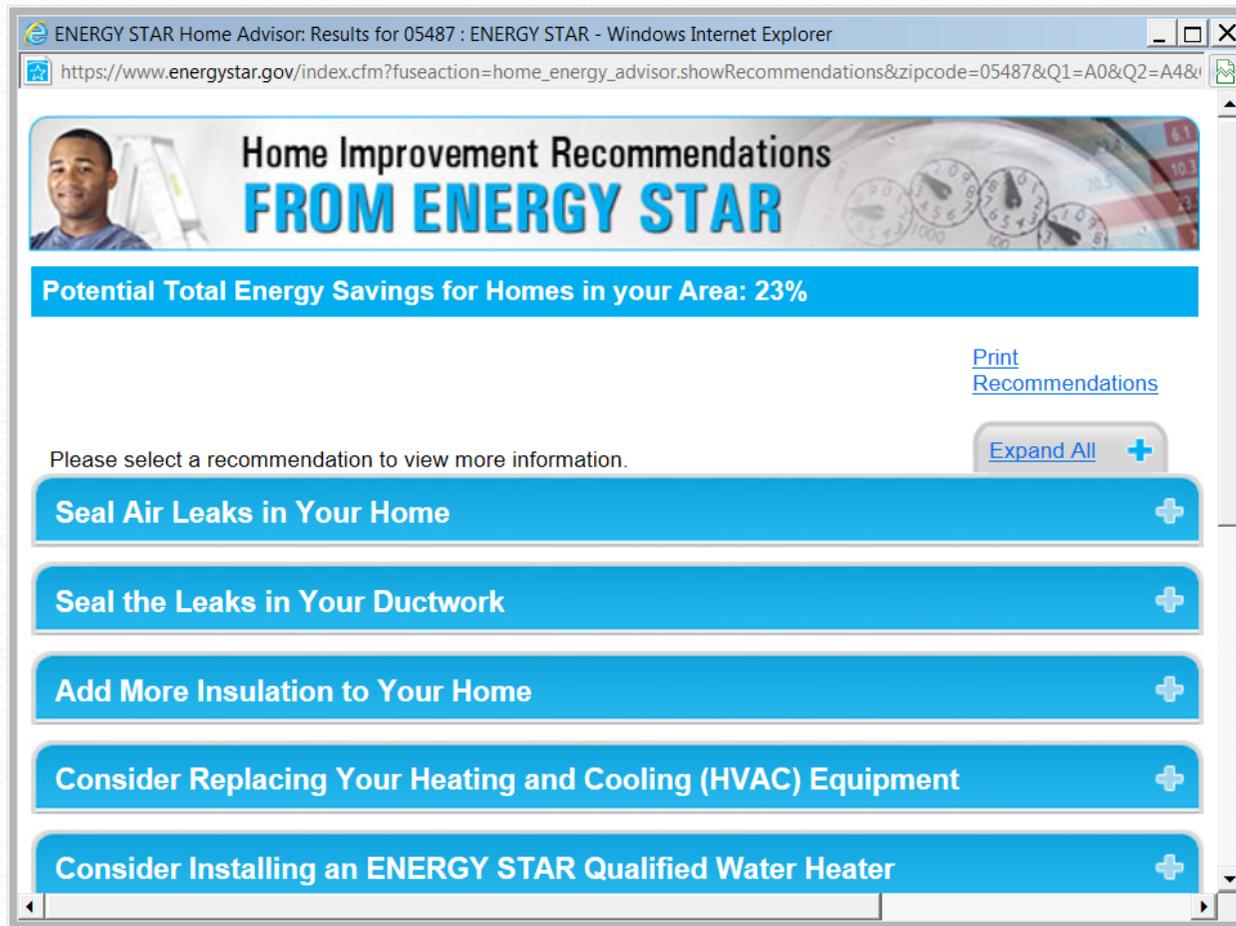
Zip code: 05487  
People living in your Home: 3  
Square Footage: 1,900  
Heating Degree Days: 6772  
Cooling Degree Days: 652

**Energy Use** [\(edit\)](#)

Electricity Use: 4,000 kWh Cost: \$720  
Propane Use: 250 gal Cost: \$900  
Wood Use: 2 cords Cost: \$300  
Total Source Energy Consumption: 104,125 kBtu

[Improve your Score](#) [Set Energy Use Goal](#)

# Home Energy Yardstick (U.S. EPA)



ENERGY STAR Home Advisor: Results for 05487 : ENERGY STAR - Windows Internet Explorer  
https://www.energystar.gov/index.cfm?fuseaction=home\_energy\_advisor.showRecommendations&zipcode=05487&Q1=A0&Q2=A4&

## Home Improvement Recommendations FROM ENERGY STAR

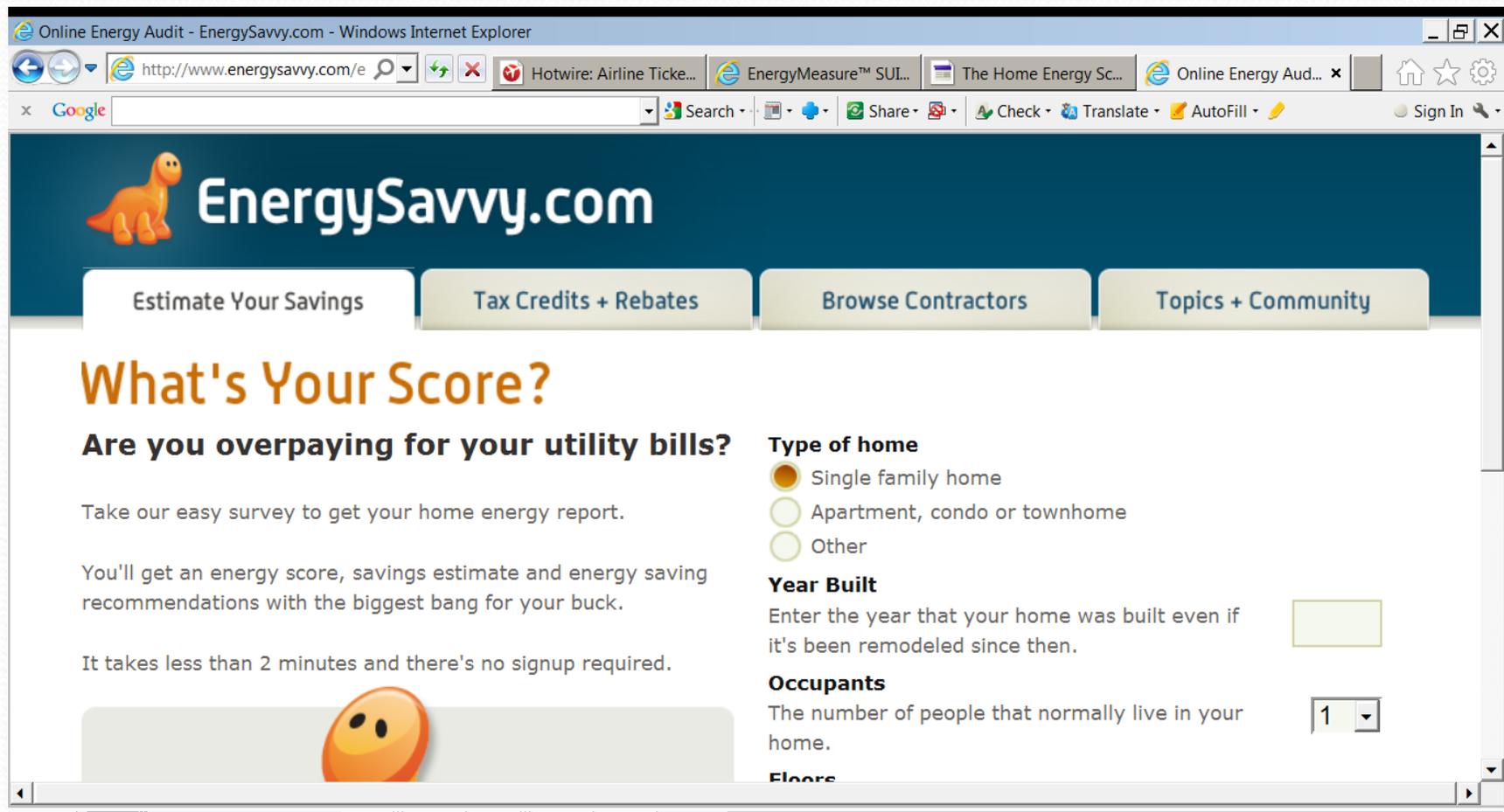
Potential Total Energy Savings for Homes in your Area: 23%

[Print Recommendations](#)

Please select a recommendation to view more information. [Expand All](#) +

- Seal Air Leaks in Your Home +
- Seal the Leaks in Your Ductwork +
- Add More Insulation to Your Home +
- Consider Replacing Your Heating and Cooling (HVAC) Equipment +
- Consider Installing an ENERGY STAR Qualified Water Heater +

# EnergySavvy (EnergySavvy)



Online Energy Audit - EnergySavvy.com - Windows Internet Explorer

http://www.energysavvy.com/e

Hotwire: Airline Ticke... EnergyMeasure™ SU... The Home Energy Sc... Online Energy Aud... x

Google Search Share Check Translate AutoFill Sign In

 **EnergySavvy.com**

Estimate Your Savings Tax Credits + Rebates Browse Contractors Topics + Community

## What's Your Score?

**Are you overpaying for your utility bills?**

Take our easy survey to get your home energy report.

You'll get an energy score, savings estimate and energy saving recommendations with the biggest bang for your buck.

It takes less than 2 minutes and there's no signup required.

**Type of home**

- Single family home
- Apartment, condo or townhome
- Other

**Year Built**

Enter the year that your home was built even if it's been remodeled since then.

**Occupants**

The number of people that normally live in your home.

**Floors**

# EnergySavvy (EnergySavvy)

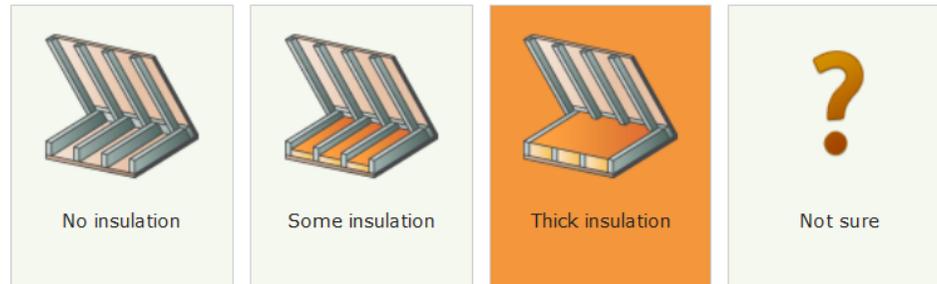
✓ STRUCTURE

✓ HEATING & COOLING

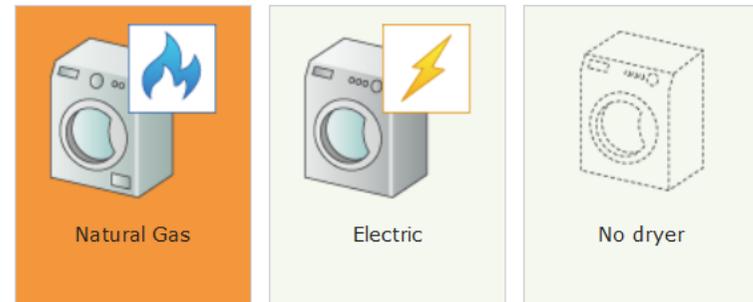
3 APPLIANCES

4 USAGE

How much attic insulation do you have?



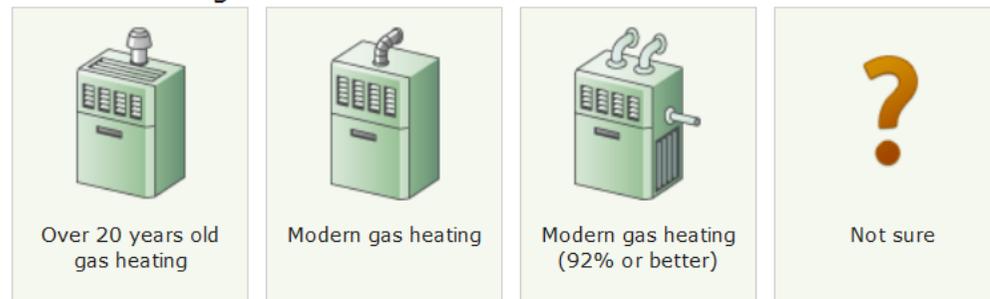
Is your clothes dryer natural gas or electric?



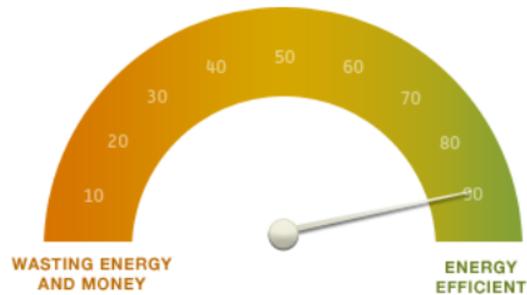
What fuel does your heating system use?

- Natural gas
- Electricity
- Oil

What kind of gas heater?



# EnergySavvy (EnergySavvy)



YOUR SCORE:	ESTIMATED 3 YEAR SAVINGS:
<b>91</b>	<b>\$558</b>

## Your Energy Score

You scored better than 90% of the homes in Addison County, VT. Your home is extremely efficient!

There may be a few cost-effective efficiency upgrades that you can still make, but your home is a great candidate for getting the maximum benefits from solar, geothermal or wind.

[Take The Next Step](#) →

[Save my score](#) | [Share my score](#) | [Start over](#)

## Your Customized Action Plan

### Air seal your ducts

Sealing your duct work, especially if it isn't located in your living space, can significantly reduce your HVAC system's energy waste. ([More info](#))

[Get Bids](#) →

### [Go beyond efficiency and consider going solar](#)

Typical 3 Year Savings: **\$558**

Heating



# EnergySavvy (EnergySavvy)

EnergySavvy will find the right contractor for your project. - EnergySavvy.com - Windows Internet Explorer

http://www.energysavvy.com/rt

Hotwire: Airline Ticke... EnergyMeasure™ SUI... The Home Energy Sc... EnergySavvy will fi...

Google Search Share Check Translate AutoFill Sign In

EnergySavvy will find the right contractor for your project.

\* All Fields Required

**Your Name**  
Richard Faesy

**City**  
Starksboro

**State**  
Vermont

**Zip**  
05487

**Email**  
rfaesy@energyfuturesgroup.com

**Phone**  
802-355-9153

**Project stage**  
Please Select One  
Please Select One  
Ready to Hire  
Planning & Budgeting  
Just Researching

**What's on your mind? (Optional)**  
Tell us about your project needs.

**Send Request**



Improve Your Score

**About Our Contractors**

We work hard to ensure you have a great experience with expert contractors who really understand energy efficiency.



ASK ABOUT ENERGY STAR

Our prescreened contractors and auditors



# EnergyMeasure View

EnergyMeasure™ VIEW powered by CS CONSERVATION SERVICES GROUP

 **Home Energy Survey**  
How efficient is your home? [CONTRACTOR LOGIN](#)



5	<b>Easy Steps</b> Only 5 steps to find you savings from your roof shingles to your light bulbs.
7	<b>Minutes to Complete</b> Save hundreds of dollars on your energy bills in as little as 7 minutes!
12	<b>Possible Ways to Save</b> We will show you energy recommendations and incentives in your area.
\$0	<b>It's Free</b>

How much insulation is in your attic?

- Covers the ceiling beams     Fills the ceiling beams     Some
- I don't know



How leaky is your house?

- Very Leaky     Somewhat Leaky     Very Tight

Okay, now we know about your home. Next up, we will learn a little bit about your windows and roof.

[CONTINUE TO WINDOWS AND ROOF](#) >

# EnergyMeasure View

1 YOUR HOME 2 WINDOWS & ROOF 3 HEATING & AIR 4 WATER HEATER 5 LIGHTING & APPLIANCES YOUR RESULTS

← BACK TO WINDOWS AND ROOF

## Heating and Air Conditioning

Your heating and air conditioning can greatly impact your energy efficiency. Please tell us about those components.

What is your usual setting for heating temperature?

68  I don't know

**TIP** Slide the green button above to select your choice. If you have a programmable thermostat, just use your best guess at the average temperature.

What is your main heating fuel?

Gas  Electric  Oil  I don't know

How is your heat delivered?

### Total Fuel Consumption

Category	Percentage
Appliances	43%
Refrigeration	21%
Lighting	32%
Air Handler	6%
Heating	12%

**TIP** Slide the green button above to select your choice.

If you have a pool, how big is it?

No pool  Wave  Small  Medium  Large  Very Large

If you have a spa/hot tub, what type of fuel does it use?

Gas  Electricity  Oil  Solar

I don't have a spa

Do you have a dehumidifier?

Yes  No

### Total Fuel Consumption

Category	Percentage
Appliances	41%
Refrigeration	20%
Lighting	31%
Air Handler	8%
Heating	11%

# EnergyMeasure View

EnergyMeasure™ VIEW powered by CS CONSERVATION SERVICES GROUP

1 YOUR HOME 2 WINDOWS & ROOF 3 HEATING & AIR 4 WATER HEATER 5 LIGHTING & APPLIANCES **YOUR RESULTS**

← BACK TO LIGHTING AND APPLIANCES

## Your Results

**RECOMMENDATIONS**

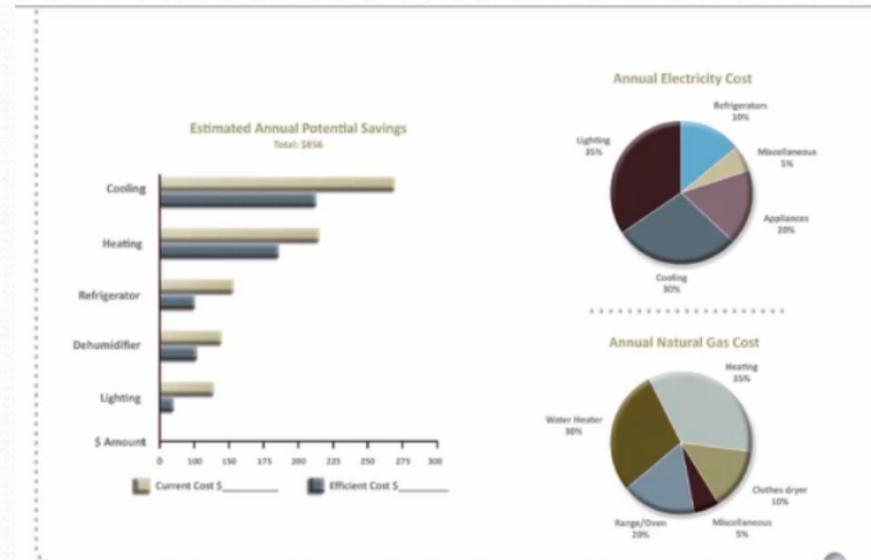
You may want to pursue the below recommendations in order to lower your energy use while increasing your living comfort. In addition to these benefits, installing these measures can also improve the health, safety, and durability of your home.

**POSSIBLE SAVINGS**

<b>\$284</b>	Seal areas of your home where air escapes.
<b>\$255</b>	Insulate your attic.
<b>\$424</b>	Insulate your walls.
<b>\$52</b>	Insulate your basement ceiling.
<b>\$114</b>	Replace your furnace with a high-efficiency model.

**AVAILABLE INCENTIVES**

**CHARTS**



Powered by Conservation Services Group

# EnergyMeasure View

- 10 Zero Energy Use
- 9 Superior
- 8 Excellent
- 7 Very Good
- 6 Good
- 5 Above Average
- 4 Average
- 3 Below Average
- 2 Poor
- 1 Very Poor



The above chart shows the Energy Performance Score (EPS) for your home, for other homes in your area for your home with all recommended energy efficiency measures implemented. By comparing your score the average score for other homes in your area and for your home with all recommended measures you can see the potential savings you may gain.

Estimated annual energy waste \$\_\_\_\_\_. Please see your attached recommendations to improve your ratings based on U.S. Department of Energy data in your area.

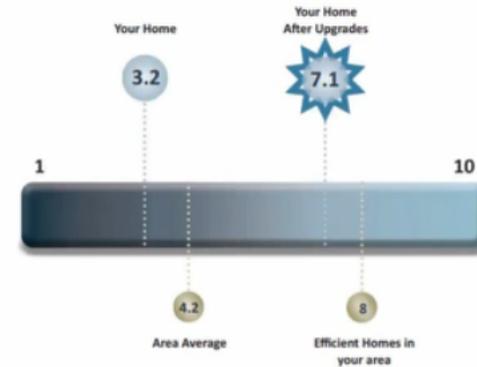
Powered by Conservation Services Group

2 of 1

## Key

- 10 Zero Energy Use
- 9 Superior
- 8 Excellent
- 7 Very Good
- 6 Good
- 5 Above Average
- 4 Average
- 3 Below Average
- 2 Poor
- 1 Very Poor

## Carbon Footprint Score



The savings are equivalent to removing the emissions of \_\_\_\_ cars or planting \_\_\_\_ trees.

Thank you for helping the environment by reducing your carbon footprint. For more information go to: [www.climateave.com](http://www.climateave.com).

Source: Estimated carbon savings from electricity are based on the EPA's attest e-GRID data for average emissions in your region. Estimated carbon savings from fuel combustion are based on emissions factors from the Regional Greenhouse Gas Initiative (RGGI) Model Rule. Estimated environmental equivalencies are 22

# EnergyMeasure Home

**EnergyMeasure HOME (user1) : Test**

File Edit Reports Tools Help

Work Queue Site Details Scenarios Search All Sites New Site

Editing Site: AAA Mick Quick Audit; 10 Henry Nashville, TN 37201. Project: Mick ETO Demo  
 Program: ETO Existing Homes (QM). Auditor: User1. Company: TradeMy1. Objective: Work Plan of all measures

Interaction Status: Open Save Project

**Summary**

- General Information
- Building
- Thermal Envelope
  - Attic
  - Exterior Wall
  - Band Joint
  - Crawlpace
  - Windows & Skylights
  - Doors
- Air Flow
- Mechanical
- Lighting
- Appliances
- Water Fixtures
- Miscellaneous Parts

**Windows & Skylights: , 270 ft<sup>2</sup> of Double, Wood**

**General**

	Amount	Face Fraction	Area (SqFt)
Front (South)	Average	15%	86.79
Back (North)	Average	15%	86.79
Left (West)	Average	12%	48.21
Right (East)	Average	12%	48.21

**Additional Window Properties**

**Windows**

Wall: Exterior Wall Building Face: Front Orientation: South

Qty: [ ] Size w: [ ] in x h: [ ] in = [ ] Sq.Ft. Total: 86.8 Sq.Ft.

Additional External Shading in Winter: Some in Summer: Some

Additional Internal Shading in Winter: None in Summer: None

Additional Data For : Windows

Wall: Exterior Wall Building Face: Left Orientation: West

Qty: [ ] Size w: [ ] in x h: [ ] in = [ ] Sq.Ft. Total: 48.2 Sq.Ft.

Additional External Shading in Winter: Some in Summer: Some

Last Sync: 3/24/2011 2:05:54 PM

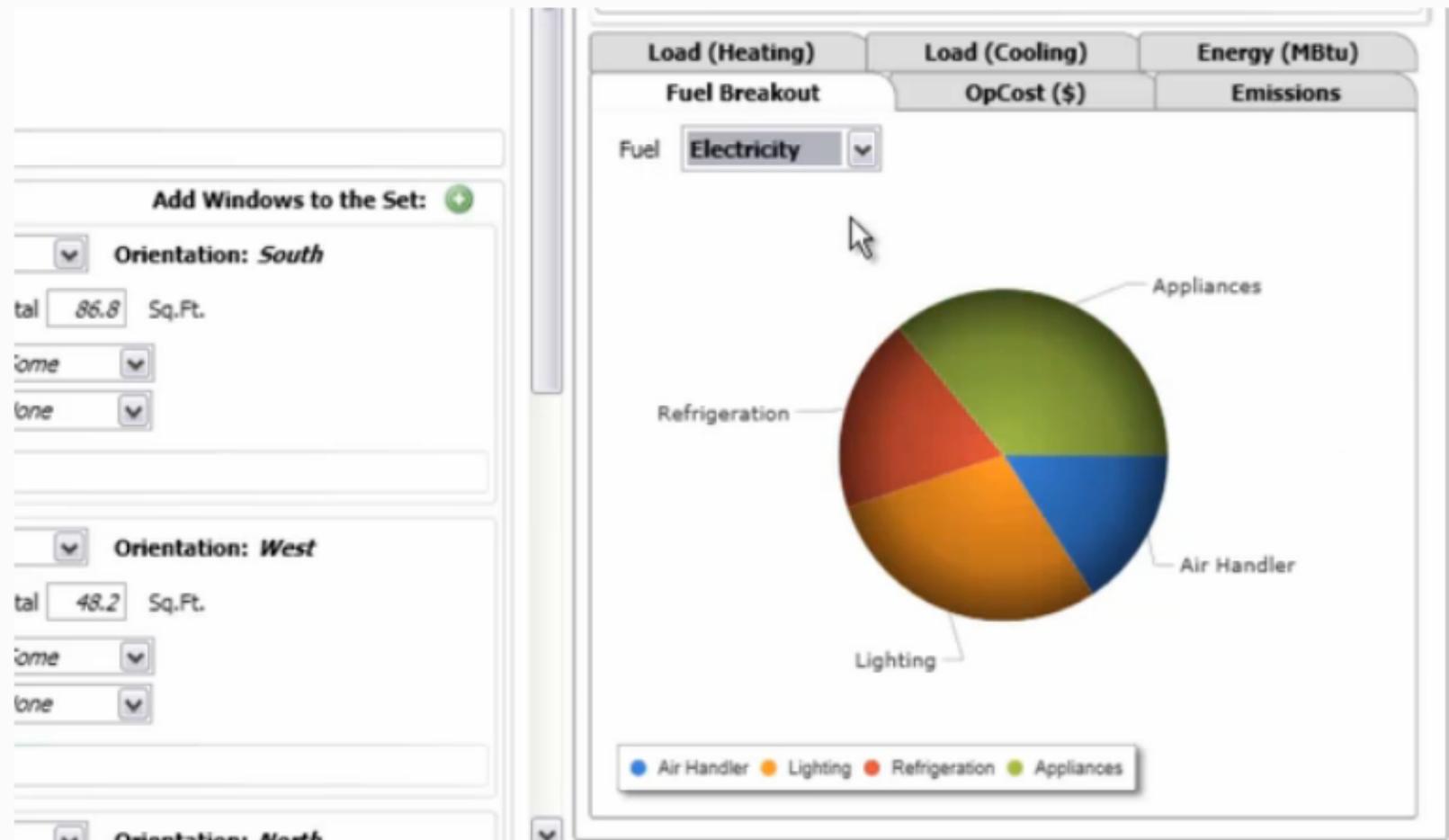
**Energy Usage** **Technical Bundles**

To Do Model Output (invalid)

Errors Only Expand All | Collapse All

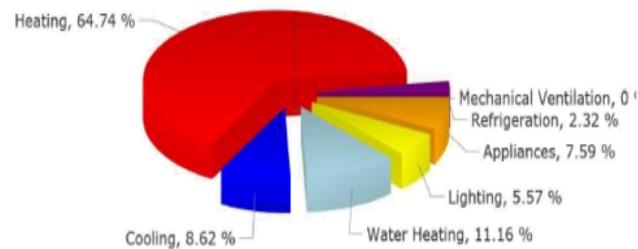
- Air Leakage (1)
  - \* Leakiness requires an explicit value
- Attic Floor (1)
  - \* Insul. Amount requires an explicit value
- Building (2)
  - \* Size requires an explicit value
  - \* Year Built is required
- Crawlpace Ceiling (1)
  - \* Insul. Amount requires an explicit value
- Exterior Wall (1)
  - \* Insul. Amount requires an explicit value
- Furnace (2)
  - \* Combustion Type requires an explicit value
  - \* Fuel Type requires an explicit value
- Storage Tank (1)
  - \* Tank Gallons requires an explicit value

# EnergyMeasure Home

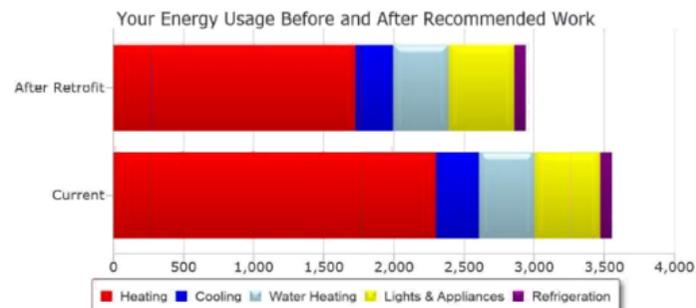


# EnergyMeasure Home

Your Home's Estimated Energy Use Breakdown



## ActOnEnergy<sup>®</sup> Home Energy Performance Report



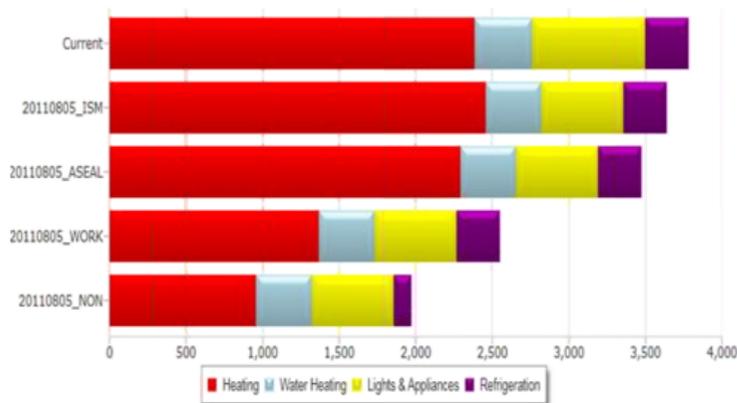
# EnergyMeasure Home

## Scenarios

### Active

20110805_ASEAL	- Cost: \$0.00, Savings: \$153.24, SIR: 0.00, Payback: 0.00	Proposed	Load Archive...
20110805_WORK	- Cost: \$3235.86, Savings: \$857.26, SIR: 10.34, Payback: 3.77	Proposed	Load Archive...
20110805_NON	- Cost: \$4900.00, Savings: \$480.86, SIR: 4.10, Payback: 10.19	Proposed	Load Archive...

### Energy Cost Comparison



Multiple scenarios are easily created and compared

# Home Energy Score



## Home Energy Scoring Tool Data Collection Sheet

Assessment Date: \_\_\_\_\_ Qualified Assessor: \_\_\_\_\_

### Location Information

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

### House Information

Year Built: \_\_\_\_\_ # of Bedrooms: \_\_\_\_\_ # of Stories Above Grade: \_\_\_\_\_

Conditioned Floor Area (sq ft): \_\_\_\_\_ Average Ceiling Height (ft): \_\_\_\_\_

Direction Front Door Faces: \_\_\_\_\_

# Home Energy Score

## Air Tightness

Air Leakage rate: \_\_\_\_\_ cfm50 or Has the House been air sealed?: Yes / No

## Roof

Roof Construction: Standard Roof / with Radiant Barrier / with Expanded Polystyrene Sheathing (EPS)

Exterior Finish: Composition Shingles / Wood Shake / Clay Tile / Concrete Tile / Tar & Gravel

Insulation Level (on roof): R-0 / R-11 / R-13 / R-15 / R-19 / R-27

Roof Absorptance ( number between 0.0 - 1.0): \_\_\_\_\_

## Attic

Attic or Ceiling Type: Unconditioned Attic / Conditioned Attic / Cathedral Ceiling

Attic Floor Insulation: R0 / R-11 / R-13 / R-15 / R-19 / R-21 / R-30 / R-38 / R-49 / R-60

## Foundation

Type: Slab-on-Grade / Unconditioned Basement / Conditioned Basement / Vented Crawlspace / Unvented Crawlspace

Foundation Insulation: None / R-5 (slab only) / R-11 (bsmt/crawl wall) / R-19 (bsmt/crawl wall)

Insulation over Basement or Crawlspace: R0 / R-11 / R-13 / R-15 / R-19 / R-21 / R-30 / R-38

# Home Energy Score

**Skylights: Yes or No (circle one):**

Total Skylight Area (sq. ft.): \_\_\_\_\_ Number of Panes: \_\_\_\_\_

Frame Type: Aluminum / Aluminum with Thermal Break / Wood or Vinyl

Glazing Type: Clear / Tinted / Solar Control low-E / Solar Control low-E, argon gas fill /  
Insulating low-E / Insulating low-E, argon gas fill

**Wall Characteristics: Front or All (circle one)**

Construction: Wood Frame / Wood Frame with Insulated Headers / Wood Frame with Expanded Polystyrene Sheathing (EPS) / Wood Frame with Insulated Headers and EPS / Wood Frame with EPS and Optimum Value Engineering / Wood Frame with Optimum Value Engineering / Structural Brick / Concrete Block / Straw Bale

Exterior Finish: Wood Siding / Stucco / Vinyl Siding / Aluminum Siding / Brick Veneer

Wall Insulation: R-0 / R-3 / R-7 / R-11 / R-13 / R-15 / R-19 / R-21

**Window Area (sq. ft.):**

Front: \_\_\_\_\_ Right Side: \_\_\_\_\_ Back: \_\_\_\_\_ Left Side: \_\_\_\_\_

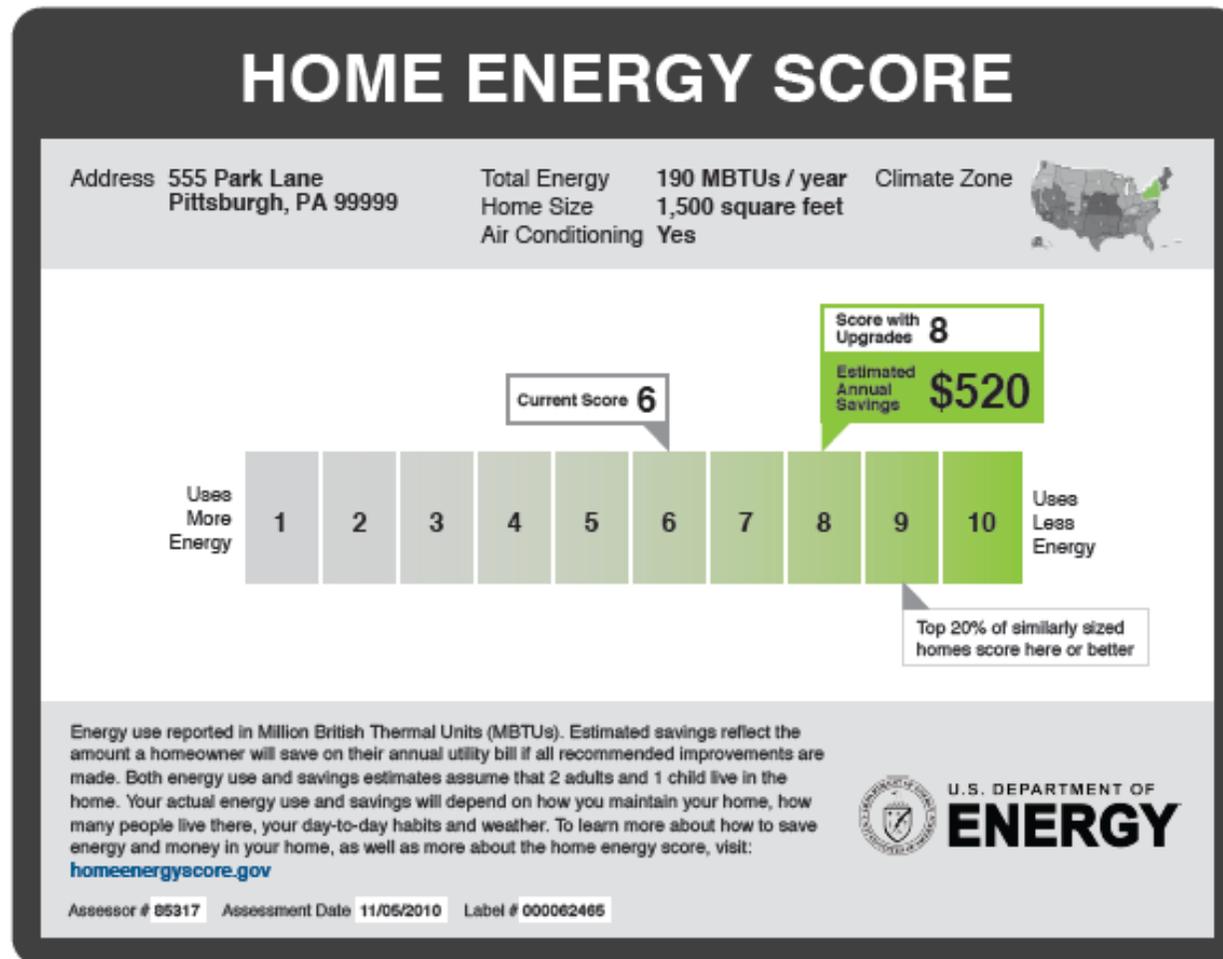
**Window Characteristics: Front or All (circle one)**

Number of Panes: \_\_\_\_\_ Frame Type: Aluminum / Aluminum with Thermal Break / Wood or Vinyl

Glazing Type: Clear / Tinted / Solar Control low-E / Solar Control low-E, argon gas fill /  
Insulating low-E / Insulating low-E, argon gas fill

Alternative Values: U-Factor (between 0.01-5): \_\_\_\_\_ SHGC (between 0-1): \_\_\_\_\_

# Home Energy Score



# Home Energy Score

## HOME UPGRADE RECOMMENDATIONS

Home Energy Score | Session # 000062465 | Page 3

Address 555 Park Lane | Pittsburgh, PA 99999

### Improvements recommended now

These upgrades can help you save energy right away.

	Estimated Utility Bill Savings (\$/year)	Simple Payback Period (years)	Greenhouse Gas Reductions (lbs CO <sub>2</sub> /year)
Basement: Add insulation to walls to R-11.	\$230	2	1,680
Air tightness: Have a professional seal the gaps and cracks that leak air into your home.	\$130	6	970
Attic: Increase attic floor insulation to R-38.	\$120	6	890

### Recommendations for when you need to replace equipment

These recommendations will help you save energy when it's time to replace or upgrade.

	Estimated Utility Bill Savings (\$/year)	Simple Payback Period (years)	Greenhouse Gas Reductions (lbs CO <sub>2</sub> /year)
Furnace: Pick one with an ENERGY STAR label.	\$160	3	1,150

It is important to consult a certified energy professional to ensure improvements are made properly and take into account health, comfort, and safety. Proper installation, including details such as complete coverage of rigid insulation and taping the seams, is critical to achieving energy savings. As with any major purchase, you should seek more than one cost estimate before making a buying decision.

#### How are savings calculated?

These estimates are based on standard energy use patterns of 2 adults and 1 child. Actual energy bills and projected savings will vary according to the number and type of appliances, the number of occupants and their behavior, and weather.

#### What do lbs of CO<sub>2</sub> mean in my everyday life?

On average, a car generates about 11,000 lbs of CO<sub>2</sub> each year.

#### What does payback period mean?

For improvements recommended now, simple payback reflects the number of years it will take to cover your upfront costs. For recommendations concerning future equipment replacement, payback time is the number of years it will take for your savings to add up to your upfront cost if you buy an Energy Star, or high-efficiency unit, instead of a lower-efficiency one. Payback periods will vary depending upon local energy costs and the costs of improvements in your area. Only measures with paybacks of 10 years or less are included. If you take into account the opportunity cost of money, the payback time is longer.

# Energy Performance Score



The screenshot shows the Energy Performance Score (EPS) website interface. At the top, there is a navigation bar with tabs for "For Homeowners", "For Professionals", "About", "FAQ", and "Contact". Below the navigation bar, there are three main content sections: "Audit Your Home", "Upgrade Your Home", and "Financing Options". A "Sign Up" modal form is overlaid on the page, prompting users to enter their information to begin the registration process. The form includes fields for First Name, Last Name, Email, Address, Address 2, City, State, and Zip Code. There are "Cancel" and "Next" buttons at the bottom of the modal. The background content is partially obscured by the modal.

**EPS**

For Homeowners For Professionals About FAQ Contact

« Back to home page

**Audit Your Home**

The first step is to analyze your home's energy efficiency and identify opportunities for improvement. An Energy Performance Score (EPS) audit can do just that! A certified EPS auditor can inspect your home and provide a Scorecard that assesses current energy consumption and predicts what the savings would be after making improvements. Along with the Scorecard, a detailed Energy Analysis and Upgrades report explains the auditor's recommended upgrades and analyzes their impact on energy and cost reduction.

**Upgrade Your Home**

After reviewing the results of your EPS audit, your next step is to implement the recommendations. While you can make some minor fixes yourself, we recommend that you contact a professional contractor that specializes in energy retrofit projects. Through our participating programs, we can help you find qualified contractors in your area.

**Financing Options**

Home improvement can be expensive, but luckily there are many tax rebates and financing programs available to help with these costs. We can help you learn about all the different options.

**Sign Up**

Please enter your information below to begin the registration process.

First Name Last Name

Email

Address

Address 2

City

State Zip Code

Cancel Next

Otherwise **Sign up now!**

chedule a time for him or her to visit your home for

Scorecard and Energy Analysis Report.

Scorecard, shows how much energy and carbon you would be using if you performed the recommended upgrades.

By providing you with detailed explanations of the auditor's recommended upgrades and cost reduction.



# Energy Performance Score



## ENERGY PERFORMANCE SCORE

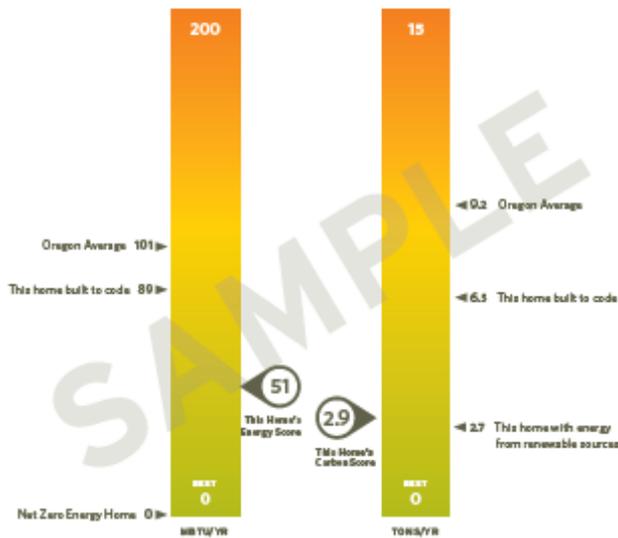
Independent assessment of energy consumption and carbon emissions.

### ENERGY CONSUMPTION

Measured in million BTU per year (MMBTU/yr).  
A million BTU = 293 kWh or 10 therms.

### CARBON EMISSIONS

Measured in tons of carbon dioxide per year (Tons/yr).  
One ton = 2,000 miles driven by average car (typical 21 mpg car).



REPORT FOR: 12345 Example Road, Portland, OR 97217

ISSUE DATE:  
02-01-2010

CO HEATED FLOOR AREA  
(ON MAIN FLOOR):  
2,000

ESTIMATED ANNUAL  
ENERGY USE \$:

Electric (kWh): 512  
Natural gas (Therms): 491

IDENTIFICATION #: 123456

TYPE:  
Single Family

ESTIMATE OF AVERAGE  
ANNUAL ENERGY COST<sup>1</sup>:

**\$598**  
monthly average: \$50  
<sup>1</sup>Actual energy costs may vary.

The EPS is brought to you by Energy Trust of Oregon. Energy Trust makes it easy for homes to identify ways to use energy more efficiently. We provide cash incentives for everything from energy-saving products to insulation to solar energy systems.

For more information visit [www.energytrust.org/eps](http://www.energytrust.org/eps).

## ENERGY PERFORMANCE SCORE



Address: 1234 Elm St, Portland, OR 97212

Reference Number: 410000000

Energy Use: 27,900 kWh/yr **\$1,640**

Carbon Emissions: 20,100 lbs/yr

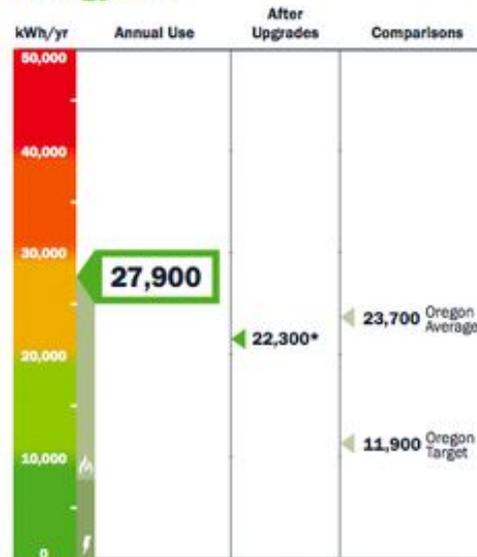
Electric: 8,900 kWh/yr \$730

Electric: 12,500 lbs/yr

Natural Gas: 650 therms/yr \$910

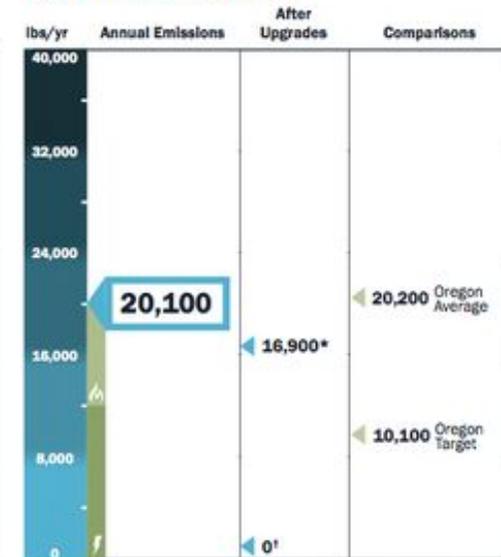
Natural Gas: 7,600 lbs/yr

### Energy Use



\*See Recommended Upgrades

### Carbon Emissions



\*See Recommended Upgrades

<sup>1</sup>With energy from renewable sources

# Energy Performance Score



## Energy Performance Score (EAR) Summary

The Energy Analysis and Upgrade report provides detailed explanations of the auditor's recommended upgrades and analyzes their impact on energy and cost reduction.

[View Full EAR Report](#)

	Current Home			After Upgrades		
	Energy (kWh) ?	Fuel Cost ?	Carbon (tons)	Energy (kWh) ?	Fuel Cost ?	Carbon (tons)
Heating	29,200	\$1,296	5.3	5,700 - 16,600	\$253 - \$735	1.0 - 3.0
Cooling	NA	NA	NA	NA	NA	NA
Water Heating	2,500	\$175	1.5	2,500 - 2,500	\$175 - \$175	1.5 - 1.5
Lighting & Appliances	5,300	\$370	3.2	5,300 - 5,300	\$370 - \$370	3.2 - 3.2
<b>Total</b>	<b>37,000 ?</b>	<b>\$1,841</b>	<b>9.9</b>	<b>13,500 - 24,300</b>	<b>\$798 - \$1,280</b>	<b>5.7 - 7.7</b>

## Next Step: Upgrade Your Home!

Now that you have the results of your home energy audit, the next step is to implement the recommendations.

[Next](#)



# Energy Performance Score

For Homeowners For Professionals About FAQ Contact

[Back to home page](#) 11919 SE Brookside Dr, Portland, OR 97266

## View Proposal

**Casey Bradley at Earth Advantage Institute**  
16280 SW Upper Boones Ferry Rd, Portland, OR 97224  
Phone: 9999999999  
Alt. Phone: 9999999999  
Email: [cb Bradley@earthadvantage.org](mailto:cb Bradley@earthadvantage.org)  
[View Full Profile](#)

Overall: ★★☆☆☆  
Service: ★☆☆☆☆  
Value: ★★★★★  
(1 review)

Proposal submitted on 12/09/2010

[Save For Later](#) [Not Interested](#)

### Profile Summary

### Notes to Homeowner

While I am providing an educated estimate of the costs associated with the work that your home requires, it will require an onsite estimate to provide you with an accurate bid. Most preliminary estimates that I provide are within \$500 of final cost.

### Response to Upgrades

<b>Air Sealing</b>	Based on the auditor notes I believe that with some targeted air sealing we can reduce your air leakage by 1500cfm. This would get your home to a tightness level that is near that of Energy Star New Homes. We will seal the crawl from the home, weatherstrip doors and attic hatch, build boxes to air seal recessed lights, and foam any obvious and accessible wire and plumbing penetrations. Cost: \$1500
<b>Wall Insulation</b>	We could dense pack your walls with cellulose, providing you with an R13 insulation level. Provided there are no out of the ordinary building practices or architectural features this could be done for \$3500. Energy Trust Rebates would apply.
<b>Heating System Upgrade</b>	Not Applicable
<b>Duct Sealing</b>	Not Applicable

[Back to All Proposals](#)



# Energy Performance Score

The screenshot shows a web browser window displaying the Energy Performance Score (EPS) website. The browser's address bar shows the URL <http://www.energyperformance.org>. The website's header includes a navigation menu with "Jane Smith, welcome to your EPS estimate portal", "Log Out", "Help", and a search bar. The main content area is titled "Contractor Estimates" and features a sidebar with navigation links: "About EPS", "My Home's EPS", "Schedule an EPS Audit", "Search EPS by Address", "Contractors" (highlighted), "Search for Contractor", "Rate Contractor", "Financial Incentives", "Energy Efficiency Tips", "News", "Forum", "FAQ", "Resources", and "Finance Your Project". The main content area displays a list of contractor estimates for the address "1234 Elm St, Portland, OR". The list includes three contractors: "Blue Steel Contracting", "Bogdanoff Construction", and "Cascade Builders and Associates". Each contractor listing includes a star rating, capabilities, and previous projects. A callout box at the bottom right of the contractor list says "View rankings and reviews from past clients . . .".

Web\_Info\_Portal.pdf - Adobe Reader

energyperformancescore - OpenDNS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.energyperformance.org

Jane Smith, welcome to your EPS estimate portal Log Out Help keyword search

**EPS**  
Energy Performance Score

## Contractor Estimates

About EPS

My Home's EPS

Schedule an EPS Audit

Search EPS by Address

**Contractors**

Search for Contractor

Rate Contractor

Financial Incentives

Energy Efficiency Tips

News

Forum

FAQ

Resources

Finance Your Project

Estimate listings are based on your EPS audit performed by a certified EPS auditor. Please note, all estimates subject to change based on the final scope of work you agree to with a chosen contractor.

Estimate results for [1234 Elm St, Portland, OR](#) sort... 1 to 5 of 23 1 2 3 . . .

**Blue Steel Contracting** ★★★★★

Capabilities: Heating & Cooling, Commissioning, Lighting, Contr...  
Previous Projects: Newburg, OR; Canyonville, OR; Ashland, OR...  
115 W 1st St  
Phoenix, OR 97535  
503.345.6789

**Bogdanoff Construction** ★★★★★

Capabilities: Energy Analysis, HVAC - Electric Heat Pump, Refrig...  
Previous Projects: Talent, OR; Tigard, OR; Sellwood, OR...  
2903 SE Elit Nibh Blvd.  
Phoenix, OR 97538  
503.345.6789

**Cascade Builders and Associates**

Capabilities: Plumbing, Heating & Cooling, Tankless Water Hea...  
Previous Projects: Milwaukie, OR; Vancouver, WA; Medford, OR...  
p

View rankings and reviews from past clients . . .

# Energy Performance Score



[My Audits](#) | [Find a Project](#) | [My Proposals](#) | [Documents](#) | [Homeowner Feedback](#)

## Find a Project

### Search Projects

Keywords:  Project Created:

Sort list by:

1 to 8 of 8

1

#### **[530001758 in Portland, OR 97266](#)**

**Project Created:** 12/09/2010

I would like to have air sealing performed on my home. I would also like to get quotes for blown in wall insulation.

**Upgrades:** Air Sealing, Wall Insulation, Heating System Upgrade, Duct Sealing

[View Details](#) [Submit a Proposal](#)

#### **[530001879 in Portland, OR 97220](#)**

**Project Created:** 11/30/2010

Dear contractors,

Please bid on the insulation, ductwork and air sealing pieces of work described for my house. I will not be replacing the furnace and water heater at this time.

Sean

**Upgrades:** Air Sealing, Attic/Ceiling Insulation, Wall Insulation, Floors, Heating System Upgrade, Duct Sealing, Water Heater Upgrade

[View Details](#) [Submit a Proposal](#)

#### **[530001874 in San Francisco, CA 94117](#)**

**Project Created:** 11/29/2010

I'm looking for someone who will help me upgrade my home.

**Upgrades:** Air Sealing, Wall Insulation, Heating System Upgrade, Duct Sealing, Duct Insulation (in unconditioned space)

[View Details](#) [Submit a Proposal](#)

#### **[530001116 in Austin, TX 78705](#)**

**Project Created:** 11/10/2010

Please bid on my job

**Upgrades:** Air Sealing, Attic/Ceiling Insulation, Wall Insulation, Floors, Windows, Heating System Upgrade, Duct Sealing, Duct Insulation (in unconditioned space), Water Heater Upgrade, Appliances

[View Details](#) [Submit a Proposal](#)



# Energy Performance Score



[Audits](#) | [Sites](#) | **Professionals** | [Reports](#)

## Manage Professional Accounts

[Enter a New Professional](#)

### Search Professionals

Keywords: 
 Status: Active Accounts

- Active Accounts
- Inactive Accounts
- All Accounts

1 to 20 of 22

1 2 next »

Name	Organization	BPI	BPI Exp. Date	Email	Auditor?	Contractor?	Last Login
<a href="#">Bradley, Casey</a>	Earth Advantage Institute			<a href="mailto:cbradley@earthadvantage.org">cbradley@earthadvantage.org</a>	Yes	No	11/30/2010
<a href="#">Brown, Ed</a>	Habitat for Humanity International			<a href="mailto:ebrown@habitat.org">ebrown@habitat.org</a>	Yes	No	09/04/2010
<a href="#">Cunningham, Dan</a>	City of Ashland			<a href="mailto:cunningd@ashland.or.us">cunningd@ashland.or.us</a>	Yes	No	10/26/2010
<a href="#">Demo, Brandon</a>	Demo Audits			<a href="mailto:brandon.gallagher@covelogroup.com">brandon.gallagher@covelogroup.com</a>	Yes	Yes	12/01/2010
<a href="#">diamond, rick</a>	Test Auditors R Us			<a href="mailto:rcdiamond@bl.gov">rcdiamond@bl.gov</a>	Yes	No	11/04/2010
<a href="#">dickey, glen</a>	Best Auditor Ever			<a href="mailto:ea@ea.com">ea@ea.com</a>	Yes	No	10/06/2010
<a href="#">Finlayson, Jan</a>	MADOER	aaaaaaaaaaaaaaaa	01/01/2012	<a href="mailto:jan.finlayson@state.ma.us">jan.finlayson@state.ma.us</a>	Yes	No	11/11/2010
<a href="#">Frost, Jack</a>	ACME Inc,	12345	10/21/2011	<a href="mailto:brandon.gallagher@covelogroup.com">brandon.gallagher@covelogroup.com</a>	Yes	No	11/18/2010
<a href="#">Gelb, Steve</a>	Sustainable Works			<a href="mailto:Steve.gelb@sustainableworks.com">Steve.gelb@sustainableworks.com</a>	Yes	No	11/15/2010
<a href="#">Heslam, David</a>	EAI			<a href="mailto:dheslam@earthadvantage.org">dheslam@earthadvantage.org</a>	Yes	Yes	12/09/2010
<a href="#">Heslam, David</a>	Earth Advantage Institute			<a href="mailto:dheslam@earthadvantage.org">dheslam@earthadvantage.org</a>	Yes	No	11/10/2010
<a href="#">Jackson, Alistair</a>	OBCO			<a href="mailto:alistair@obrenandco.com">alistair@obrenandco.com</a>	Yes	No	10/14/2010
<a href="#">Jobs, Steve</a>	adddd			<a href="mailto:steve@www.com">steve@www.com</a>	Yes	No	11/18/2010



# REM/Rate

The screenshot displays the REM/Rate v 12.91 software interface. The main window is titled "REM/Rate v 12.91 - BLDG #3UNIT#16WWMEWS.blg". The menu bar includes File, Building, View, Extras, Libraries, Reports, Tools, and Help. A dropdown menu is open under "Building", listing various building components for selection, such as Property/Builder Information, Organization/Rating Information, Site Information, Building Information, Foundation Walls, Slab Floors, Frame Floors, Rim/Band Joists, Above-Grade Walls, Windows and Glass Doors, Doors, Ceilings, Skylights, Mechanical Equipment, GSHP Well, Duct Systems, Infiltration/Ventilation, Lights and Appliances, Mandatory Requirements, Interior Mass, Active Solar, Photovoltaics, and Sunspace.

The main workspace contains a form with the following fields:

- BLDG#3 UNIT#16
- IN CARR
- ENT ROAD BLDG.#3 UNIT#16
- V MILFORD
- Zip: 06776
- 3-312-9445
- R CONSTRUCTION
- ENT ROAD
- V MILFORD, CT.06776
- RHOMES@CHARTER.NET
- 3-417-0277
- VNHOUSE INSIDE UNIT
- HING WELL MEWS

On the right side, there is an "Analysis" panel with the following data:

Updated: 09:51:22 PM

Design Loads (kBtu/hr)	
Heating	13.7
Cooling	8.4

Annual Loads (MMBtu...)	
Heating	19.5
Cooling	6.9
Water Heat...	10.2

Annual Consumption (...)	
Heating	4.8
Cooling	1.7
Water Heat...	10.4
Lights and ...	14.9
Photovoltai...	-0.0
Total	31.8

Annual Energy Costs ...	
Heating	153
Cooling	55
Water Heat...	336
Lights and ...	479
Photovoltai...	-0
Service Ch...	60

At the bottom left, an "Errors" panel shows "No errors or warnings exist."

# REM/Rate

REM/Rate v 12.91 - BLDG #3UNIT#16WWMEWS.blg

File Building View Extras Libraries Reports Tools Help

Above-Grade Wall Properties Summary

#	Name	Type	Gross Ar...
1	AGWall.FRONT	R-19,AVG****	221.0
2	AGWall.REAR	R-19,AVG****	221.0
3	AGWall.LEFT	R-19,AVG****	680.0
4	AGWall.RIGHT	R-19,AVG****	680.0
5	BSMT,STAIRS	R-13**	238.0

New Delete Copy

Above-Grade Wall Properties

Name: AGWall.FRONT

Type: R-19,AVG\*\*\*\* U=0.074

Gross Area (sq ft): 221.0 Exterior Color: Light

Location: Between conditioned space and ambient

Errors/Warnings

No errors or warnings exist

Analysis

Updated: 09:51:22 PM

Design Loads (kBtu/hr)

- Heating 13.7
- Cooling 8.4

Annual Loads (MMBtu...)

- Heating 19.5
- Cooling 6.9
- Water Heat... 10.2

Annual Consumption (...)

- Heating 4.8
- Cooling 1.7
- Water Heat... 10.4
- Lights and ... 14.9
- Photovoltaic... -0.0
- Total 31.8

Annual Energy Costs ...

- Heating 153
- Cooling 55
- Water Heat... 336
- Lights and ... 479
- Photovoltaic... -0
- Service Ch... 60

Energy Area Comp...

Detailed Hartford, CT 09/18/11

# REM/Rate

## Home Energy Rating Certificate

Lot 21 Thorn Bush Road  
Hinesburg, VT 05461



**5 Stars Plus  
Verified Condition**

### Uniform Energy Rating System

Uniform Energy Rating System					Energy Efficient				
1 Star	1 Star Plus	2 Stars	2 Stars Plus	3 Stars	3 Stars Plus	4 Stars	4 Stars Plus	5 Stars	5 Stars Plus
500-401	400-301	300-251	250-201	200-151	150-101	100-91	90-86	85-71	70-0

HERS Index: **55**

### General Information

Conditioned Area: 2146 sq. ft. House Type: Single-family detached  
 Conditioned Volume: 15473 cubic ft. Foundation: Unconditioned basement  
 Bedrooms: 3

### Mechanical Systems Features

Heating: Fuel-fired hydronic distribution, Propane, 92.0 AFUE.  
 Water Heating: Integrated, Propane, 0.85 EF, 80.0 Gal.

Duct Leakage to Outside: NA  
 Ventilation System: Exhaust Only: 169 cfm, 54.0 watts.  
 Programmable Thermostat: Heating: Yes Cooling: No

### Building Shell Features

Ceiling Flat: R-37 Exposed Floor: R-39, R-0  
 Vaulted Ceiling: NA Window Type: U:0.35, SHGC:0.30  
 Above Grade Walls: R-19 Infiltration:  
 Foundation Walls: R-10.0 Rate: Htg: 830 Cfg: 830 CFM50  
 Slab: None Method: Blower door test

### Lights and Appliance Features

Percent Fluorescent Pin-Based: 70.00 Clothes Dryer Fuel: Electric  
 Percent Fluorescent CFL: 0.00 Range/Oven Fuel: Propane  
 Refrigerator (kWh/yr): 460.00 Ceiling Fan (cfm/Watt): 0.00  
 Dishwasher Energy Factor: 0.66

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

REM Rate - Residential Energy Analysis and Rating Software v12.5 Vermont  
 This information does not constitute any warranty of energy cost or savings.  
 © 1985-2008 Architectural Energy Corporation, Boulder, Colorado.

Rating Number: 6038J685  
 Export Build Run No: 13723  
 Certified Energy Rater: Sara Davis  
 Rating Date: December 15, 2008  
 Rating Ordered For: Collin Frisbie

### Estimated Annual Energy Cost

Use	Verified Condition		
	MMBtu	Cost	Percent
Heating	71.7	\$2276	67%
Cooling	0	\$0	0%
Hot Water	3.9	\$125	4%
Lights/Appliances	22.6	\$868	26%
Photovoltaics	-0.0	\$-0	-0%
Service Charges		\$119	4%
<b>Total</b>		<b>\$3389</b>	<b>100%</b>

**This home meets or exceeds the minimum**

**criteria for all of the following:**

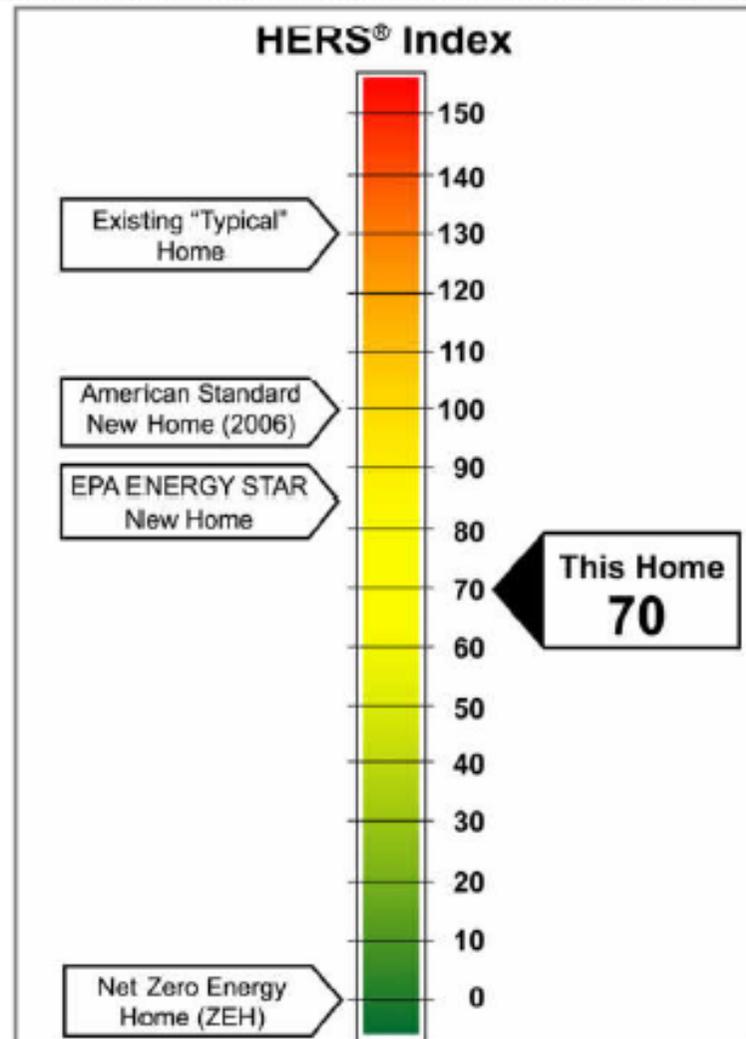
- Federal Energy Policy Act, 2005\*
- Vermont Energy Star Homes Criteria\*
- Vermont Residential Energy Code\*

\* Compliance with criteria for this program is determined by the rater.

Vermont Energy Investment Corp.  
 255 South Champlain St.  
 Burlington, VT 05401  
 800-639-6069  
 Fax 802-658-1643  
 www.veic.org



# REM/Rate



# Commercial & Public Buildings

# Rating Options

- EPA's Portfolio Manager
  - Most widely used, including all other cities with disclosure
  - DOE is now supporting and developing resources
- IMT provided several other recommendations:
  - ASHRAE Building EQ
  - ASTM Building Energy Performance Assessment (BEPA) standard
- Subgroup didn't have time to evaluate these tools by but could consider if the full group wants us to

# Portfolio Manager

The screenshot shows a web browser window displaying the Energy Star Portfolio Manager website. The browser's address bar shows the URL <http://www.energystar.gov/i>. The page features a blue header with the Energy Star logo and a navigation menu with buttons for Products, Home Improvement, New Homes, Buildings & Plants, and Partner Resources. A prominent banner for the "BATTLE OF THE BUILDINGS" competition is visible. The main content area is titled "Portfolio Manager Overview" and includes a description of the tool, a "How can Portfolio Manager help me?" section with a list of features, and a "Getting Started for..." sidebar. A "News" section on the right highlights recent announcements. The Windows taskbar at the bottom shows the system clock as 12:33 AM on 9/17/2011.

**ENERGY STAR**

**BATTLE OF THE BUILDINGS**  
EPA's NATIONAL BUILDING COMPETITION  
MIDPOINT TOP CONTENDERS ANNOUNCED!

About ENERGY STAR · News Room · FAQs · **KIDS**

Search

**Buildings & Plants**

Home > Buildings & Plants > Portfolio Manager Overview

## Portfolio Manager Overview

Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment. Whether you own, manage, or hold properties for investment, Portfolio Manager can help you set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

### How can Portfolio Manager help me?

- Manage Energy and Water Consumption for all Buildings
- Rate Building Energy Performance
- Estimate Your Carbon Footprint
- Set Investment Priorities
- Verify and Track Progress of Improvement Projects
- Gain EPA Recognition

**Getting Started for...**

- Government
- Healthcare
- Higher Education
- Hospitality/Entertainment

**News**

- [EPA Announces Top Contenders in ENERGY STAR National Building Competition](#)
- [City of Houston Wins Mayors' Climate Protection Award](#)

**2011 Buildings & Plants News Room**

**Portfolio Manager Login**

Username:

[Forgot your username?](#)

12:33 AM  
9/17/2011

# Portfolio Manager

- Commercial buildings eligible to receive a rating, representing over 50 percent of US commercial floor space, are:
  - Bank/Financial Institution
  - Courthouse
  - Data Center
  - Hospital (acute care and children's)
  - Hotel
  - House of Worship
  - K-12 School
  - Medical Office
  - Municipal Wastewater Treatment Plant
  - Office
  - Residence Hall/Dormitory
  - Retail Store
  - Senior Care Facility
  - Supermarket
  - Warehouse (refrigerated and non-refrigerated)

# Portfolio Manager

## Residence Hall/Dormitory:

### **Required:**

- \_\_\_\_\_ Gross floor area (SF)
- \_\_\_\_\_ # of rooms
- \_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)
- \_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)

### **Optional:**

- \_\_\_\_\_ Computer lab on-site – yes or no
- \_\_\_\_\_ Dining Hall on-site– yes or no

## Senior Care Facility:

### **Required:**

- \_\_\_\_\_ Gross floor area (SF)
- \_\_\_\_\_ # of units
- \_\_\_\_\_ Average Number of Residents
- \_\_\_\_\_ Total Resident Capacity
- \_\_\_\_\_ # of workers on the main shift
- \_\_\_\_\_ # of PCs owned by the community (does not include PCs owned by residents)
- \_\_\_\_\_ # of commercial refrigeration/freezer units
- \_\_\_\_\_ # of commercial washing machines
- \_\_\_\_\_ # of residential washing machines
- \_\_\_\_\_ # of residential electronic lift systems
- \_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)
- \_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)

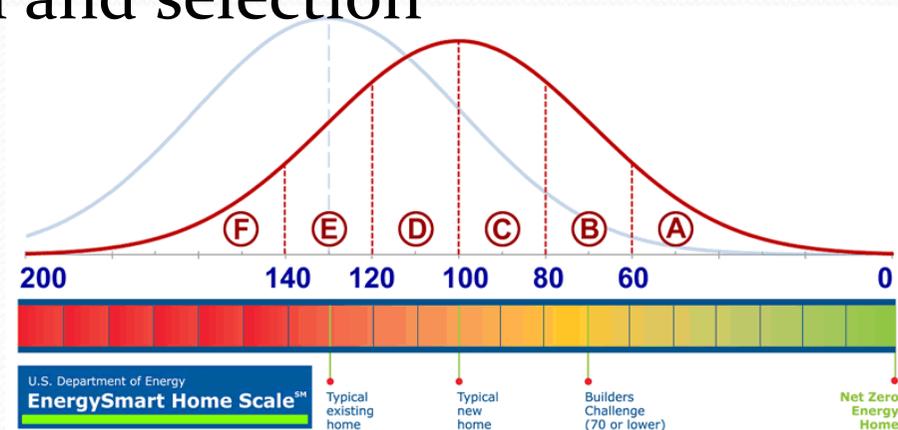
# Recommendations & Outstanding Issues

# Preliminary Tool Recommendations

- Residential
  - EnergySavvy
  - EnergyMeasure
  - Energy Performance Score
- Commercial
  - Portfolio Manager

# Outstanding Issues

- Additional tool research and selection
  - Residential
  - Commercial
- Score format
  - Absolute vs. normalized
  - 1-10 vs. A-F
  - The choice of tool/rating does not (in most cases) lock us into a particular score format
- Residential/commercial threshold
  - Ex.: doctors' office that used to be a house
- Who can perform and issue ratings?



# Working Group Discussion

# Feedback

- Are we on track?
- Core principles: ok?
- Tools: Are we headed in the right direction?
- New subcommittee members?
- Next steps

# Core Principles

1. Reasonable cost to end user (\$0-300)
2. Rating can be presented as a single number or letter to allow market comparisons
3. Accurate
  - a) Repeatable, predictable results
  - b) Tool predicts energy use close to how an average occupant would use the house
4. Makes recommendations for upgrades to focus on high-priority areas
5. Smooth process to pursue upgrades based on rating
  - a) Optional link to home inspection

## Core Principles (con't)

6. Residential: Asset rating – based on features of home rather than occupant behavior
7. Commercial/Institutional: Operational rating - occupant-based
8. HERS-compatible: If different than HERS, can be translated or linked to HERS (HERS-lite)
9. Tiered on-ramp - allowing drilling deeper if desired for more accuracy
10. Ability to customize and maintain for VT

# Preliminary Tool Recommendations

- Residential
  - EnergySavvy
  - EnergyMeasure
  - Energy Performance Score
- Commercial
  - Portfolio Manager