Welcome to the 2018 Summit!

HELIX
Home Energy Labeling Information eXchange

[Logos of partner organizations]
WELCOME

Carolyn Sarno Goldthwaite, NEEP
Welcome to the 3rd HELIX Summit!
“Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption 3% per year and carbon emissions 40% by 2030 (relative to 2001)”

Mission

We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

Vision

We envision the region's homes, buildings, and communities transformed into efficient, affordable, low-carbon, resilient places to live, work, and play.

Approach

Drive market transformation regionally by fostering collaboration and innovation, developing tools, and disseminating knowledge.
About NEEP
A Regional Energy Efficiency Organization

One of six REEOs funded in-part by U.S. DOE to support state and local efficiency policies and programs.
Thank you to our event sponsors!

State of Rhode Island Office of Energy Resources

nationalgrid

E4 THE FUTURE
\text{ENERGY \cdot ECONOMY \cdot EQUITY \cdot ENVIRONMENT}
Thank you to our Allies for their support!
Thank you to our State Partners for their support!

**CONNECTICUT**

**State Partners:** CT DEEP, CT Energy Efficiency Board, Eversource Energy, United Illuminating Company, Southern Connecticut Gas and Connecticut Natural Gas

*Partners in 2017 / 2018*

**NEW HAMPSHIRE**

**State Partners:** NH Office of Energy Policy and Planning, NH Public Utilities Commission, Eversource Energy, NH Electric Coop, Unitil and Liberty Utilities

*Partners in 2017 / 2018*

**NEW YORK**

**State Partners:** NYSERDA

*Partners in 2017 / 2018*

**RHODE ISLAND**

**State Partners:** RI Office of Energy Resources, National Grid RI, RI Department of Education and RI Energy Efficiency & Resource Management Council

*Partners in 2017 / 2018*

**VERMONT**

**State Partners:** Efficiency Vermont

*Partners in 2017 / 2018*
SO WHAT IS THIS HELIX I KEEP HEARING ABOUT?

Samantha Caputo, NEEP
Véronique Bugnion, ClearlyEnergy
The Home Energy Labeling Information Exchange (HELIX) is a database which automatically populates real estate listings with home energy information from the U.S. Department of Energy's Home Energy Score and other sources. The database was developed by regional stakeholders as a free software tool to allow home buyers access to home energy information in the real estate purchasing process. Learn how to get started.

Highlights of HELIX Database
What Is HELIX?

HELIX facilitates consolidation of energy data in a single portal.

Data Intake
- States
- Utilities
- NGOs
- Auditors

Flexible Data Management Solution
- Range of data sources (solar, efficiency, code...), data types and file formats
- Track & Report
  - States; Cities; Program Managers
- Compare & Export
  - Assessors; Realtors

Data Export
- MLS
Who Is Using HELX?

HELIX has 7 States in efficiency pilot; 20 solar States
# What Do States Want to Use HELIX For?

<table>
<thead>
<tr>
<th>National Program Certification Program Data</th>
<th>CT</th>
<th>ME</th>
<th>MA</th>
<th>NH</th>
<th>RI</th>
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<td>ENERGY STAR Certified Homes</td>
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<td>Home Performance with ENERGY STAR</td>
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<td>Indoor airPLUS</td>
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<td>Efficiency Maine rebate programs/measures installed</td>
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<td>✔</td>
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<td>✔</td>
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</tbody>
</table>
HELIX Structure

HELIX expands SEED open source framework

- HELIX expands the Standard Energy Efficiency Database: SEED
  - Variety of data sources and import methods
  - Handles residential certifications, solar, home consumption metrics, code compliance, home efficiency measures
  - Provides expanded export capabilities
- Open source
HELIX For Auditors, Realtors and Assessors

HELIX works across 7 pilot efficiency
HELIX for Cities & States
HELIX for MLSs

- Opt-out controls at certification level
- Bulk Export
- RESO Silver Standard
- Individual Home Lookup

Best for voluntary programs
Facilitates uptake by real-estate community
Can be part of compliance program

HELIX
Home Energy Labeling Information Exchange
Where Does HELIX Go From Here?

Geographic Expansion

- Continue incorporating regional program data
- Finish incorporating certification data
- Expand to NEEP’s 13 States

Scope Expansion

- Funded to collect, manage and export residential solar information for 20 States
  - Generic infrastructure to collect efficiency measures on home
- In discussions to include:
  - Code compliance
  - Efficiency program attributes
  - Green addendum attachment
DATA, DATA EVERYWHERE: WHAT KIND OF DATA IS OUT THERE AND HOW IS IT TRANSFORMING THE REAL ESTATE MARKET?

Ed Carley, NASEO, moderator
Madeline Salzman, U.S. DOE
Asa Foss, USGBC
Ryan Meres, RESNET
Robin LeBaron, Pearl Certification
Data, Data Everywhere! What kind of data is out there, and how is it transforming the real estate market?

December 7, 2019
Providence, RI
Presenters

- **Moderator**: Ed Carley, NASEO
- **Madeline Salzman**, U.S. DOE
- **Asa Foss**, USGBC
- **Ryan Meres**, RESNET
- **Robin LeBaron**, Pearl Certification
- **Katrin Klingenberg**, Passive House Institute US
Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS)

- EMPRESS is a State Energy Program funded grant

- GOALS:

1. Developed recommendations for consistent elements to be included in home energy labeling initiatives
   - E.g.- GHG impact, Mbtu/year, total energy cost, date of issue, etc.

2. Encourage Home Energy Score (HES) and Energy Rating Index software providers to use a single energy modeling engine (Energy Plus) to promote consistency and reduce confusion
How can the EMPRESS project help me?

The EMPRESS team has compiled:
- Background information on Home Energy Score and Home Energy Rating System, including cost
- Sample legislation and ordinances
- Pros and cons of voluntary and mandatory approaches
- Recommendations for elements that should be on all labels
- Examples of labels used in other jurisdictions
- Workforce identification and training recommendations
- Information on working with real estate professionals

http://empress.naseo.org for more
### Home Energy Labeling:

**A Guide for State and Local Governments**

Created by the EMPRESS Team

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### Sample Legislation & Ordinances

The EMPRESS Team is accepting comments on this material until October 19, 2018. To submit comments on any material on this page, please use the “Submit a comment” box at the bottom of this page.

<table>
<thead>
<tr>
<th>Label Component Metric</th>
<th>Policy Objective</th>
<th>Characteristic</th>
<th>Use</th>
<th>Double</th>
<th>Metric Characteristics</th>
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<td>TPHS (in SCFL)</td>
<td>Yes</td>
<td>Directly assesses the home's efficiency and cost to the reference code. [EIT 2008]</td>
<td>Use only</td>
<td>Yes</td>
<td>Energy Use Reduction</td>
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<tr>
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<td>Directly assesses home's energy use against the national average (derived from EPSCA's Energy Information)</td>
<td>Use only</td>
<td>Yes</td>
<td>Energy Use Reduction</td>
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<td>Residential gas use (in SCFL)</td>
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<td>Use only</td>
<td>Yes</td>
<td>Energy Use Reduction</td>
</tr>
<tr>
<td>Home energy use (in SCFL)</td>
<td>Yes</td>
<td>Directly assesses home's energy use against the national average (derived from EPSCA's Energy Information)</td>
<td>Use only</td>
<td>Yes</td>
<td>Energy Use Reduction</td>
</tr>
</tbody>
</table>

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### Case Studies & Sample Labels

The EMPRESS Team is accepting comments on this material until October 19, 2018. To submit comments on any material on this page, please use the “Submit a comment” box at the bottom of this page.

Advancing large-scale home energy labeling and harmonizing the disparate energy saving programs that have evolved over the past decades, requires a targeted evaluation of effective programs and the factors that have led to their success. What programs are in place now—and what does that tell us about the possible adoption of mandatory or voluntary building labeling in a country with 10 unique states?

This document offers case studies across each jurisdiction and gives State Energy Offices and other decision-makers information on home energy labeling programs and tools. These case studies explore characteristics of current programs, some of which are still working. The key lessons from these case studies include:

- Home energy labeling strategies include:
  - Monitoring energy bill disclosures at time of sale
  - Importance of existing programs
  - Other data to help homeowners: real estate, utilities, and market-driven needs
  - Homeowners obtain comprehensive energy performance information about the home

By and large, the market has driven the development of these tools, serving the interest of early adopters of home energy labeling. Many state energy programs and utility programs have focused on them as they emerged, using them to help satisfy energy reduction goals.
Resources

- **EMPRESS**: [http://empress.naseo.org](http://empress.naseo.org)
- **HELIX**: [https://neep.org/home-energy-labeling-information-exchange-helix](https://neep.org/home-energy-labeling-information-exchange-helix)
- **Home Energy Information Accelerator**: [https://betterbuildingsinitiative.energy.gov.accelerators/home-energy-information](https://betterbuildingsinitiative.energy.gov/accele rators/home-energy-information)
Thank you

Ed Carley
National Association of State Energy Officials
Senior Program Manager, Buildings
703-299-8800 x 119
ecarley@naseo.org
Home Energy Score

Data Everywhere Panel
HELIX Summit 2018
Residential Buildings Are...

- 95% of U.S. buildings
- 70% of U.S. building stock square footage
- 50% of peak demand on electricity grids
- 21% of U.S. energy use
Efficiency is Good for Residents

- **Helps Reduce Costs.** Energy burdens average higher than both property taxes and home insurance.

- **Smart Investment.** Efficiency features payback via energy savings over time.

- **Improves Quality of Life**
  - Increased comfort.
  - Reduced environmental impact.
  - Less draftiness.
  - Improved health outcomes.
  - Increased control.
  - Peace of mind.
Ideal World

Home Energy Use.
Homes are energy efficient, contributing to modern & livable building stock.

Energy Savings!

Data Collection & Access.
Data is standardized, useful, and protects personal information.

Efficiency Upgrade Packages.
Programs increase efficiency in targeted ways to meet energy goals & improve lives.

Data Management & Insight.
Data informs policy design, incentive packages, and goal setting.
*Actual* World

**Home Energy Use.**
Probably bad and wasteful but not exactly sure why…

**Data Collection & Access.**
No standard approach, all assessments are different. Do we have access?

**Efficiency Upgrade Packages.**
Impacts are difficult to measure and associated costs are high.

**Data Management & Insight.**
Solutions must be customized, unable to generate comparisons across users.
Home Energy Score

Features

✓ “Miles per gallon” rating for homes*
✓ Scale for easy-to-understand interpretation
✓ Building energy model estimates annual energy use, costs, emissions
✓ Recommendations for cost-effective improvements
✓ Easily show energy features and expected costs of comp homes
✓ Backend tool for various home energy assessments
✓ Can be included in home inspections
✓ Useful information for consumers, Home Energy Score Partners, real estate agents, lenders, appraisers, city & state governments

*Applicable for single-family homes and townhomes only.
Home Energy Score Report

For the Consumer: Easy to understand home rating, motivation to improve and compete.

For the Lender: Comparable home energy use & cost estimates between homes, estimated savings from improvements.

For the Partner: Analysis of home’s potential to help achieve energy-related goals.

For the Appraiser: Comparison of home’s energy use estimate to other homes in the region.
Why Not Use Energy Bills?

Data Privacy. Most utility bills are considered private information, which complicates their use in real estate and financing.

Occupancy Variables. Bills depend on more than just the home assets, like the number of residents and occupancy rate year-round.

Economic Variables. Energy use also depends on economic factors, such as energy price and resident income. These factors may not hold true for future occupants.

Asset scores rate the home features themselves, leaving residents, their private data, and their preferences out of the equation.
Home Energy Score

**Individual reports:** Like a miles-per-gallon rating or “nutrition facts” for a home
- Estimate energy costs, recommended upgrades
- Improve energy literacy

**Data in aggregate:** Consistent home energy information to understand sector wide issues, gains, and tracking
- Target upgrades and incentives
- Track sales rate, price, premiums; influence appraisal and financing
- Analyze efficiency gains
Data In Aggregate

Sample of 100,000+ Home Energy Scores Averages:

4.7  Score Today

7.3  Score with Improvements

Most Common Cost-Effective Upgrade Recommendations:

- Home Air Sealing
- Duct Air Sealing
- Attic Insulation
- ENERGY STAR Water Heater
- ENERGY STAR Heating System
- ENERGY STAR Air Conditioner

Annual Savings Potential

22%  $600  2.0

Energy  Energy Bills  TCO$_2$eq

Data Collected by

500+

Home Energy Score Certified Assessors™ nationwide
Accelerator Toolkit

Dozens of resources that help:

✓ Grow the inventory of home energy information
✓ Use common data standards
✓ Integrate with real estate

https://betterbuildingsinitiative.energy.gov/sites/default/files/attachments/HEIA%20TOOLKIT%20081318.pdf
EnergyPlus Harmonization Effort

Home Energy Score™ 3rd Party Software Providers
- SnuggPro
- ID Energy
- Design Avenue
- Franklin Energy
- AjO
- OptiMiser
- Pearl
- Energy Savvy

HERS® Software Providers
- Ekotrope
- PSD
- Wrightsoft
- Pivotal

Weatherization Assistance Program’s NEAT Tool

ANSI/RESNET 301 Energy Rating Index Ruleset / Agreed Upon Rulesets (As Applicable)

OpenStudio/EnergyPlus Building Energy Model Simulations
EnergyPlus Harmonization Effort

Benefits

✓ **Accelerates new technologies** into software tools
✓ **Increases consistency** across DOE/industry programs
✓ **Reduces developer effort** to use EnergyPlus
✓ **Lowers industry-wide costs** of maintaining multiple engines
✓ **Allows private-sector competition** around innovations for user interface, business support, etc.

![Scatter plots](image)
Questions?

Madeline Salzman
madeline.salzman@ee.doe.gov
(202) 586-2540
Asa Foss

Director, Residential Technical Solutions
Program Scope and Applicable Building Types

- Single-Family Homes
- High-Rise
- Low-Rise Multifamily
- Single-Family Production
- Gut Rehab
LEED Certifications (United States)

350,000 units certified

325,000 multifamily

24,000 single family
LEED Registrations (United States)

775,000 units registered

760,000 multifamily

14,000 single family
LEED Certifications (New England)

52,000 units certified

51,000 multifamily

1,300 single family
LEED Registrations (New England)

215,000 units registered

214,000 multifamily

1,000 single family
3.1 BILLION SQ. FT.
OF COMMERCIAL LEED® CERTIFIED PROJECTS
(CUMULATIVE)
WHAT’S THE VALUE OF LEED?

Occupants prefer to live in a sustainable building

8.9% rental premium

Lower Interest Rates

Fannie Mae – Green Financing Loans

Freddie Mac – Multifamily Green Advantage
WHAT’S THE VALUE OF LEED?

Added income of a property, adds value to the property when it’s time to refinance
ie $100,000 in added income, at 6% capitalization rate, increases added value by $1.6 Million

Institutional Investors prefer to purchase LEED properties
SINGLE FAMILY SALES PREMIUM

North Carolina: 9.5% premium for certified properties in metro markets

Maryland: 2-5% premium for ENERGY STAR

DC: 3.5% premium for homes listed with green features

California: 9% sales premium for green certified homes
Meta-Analysis of Green Home Premiums

Green certified homes sell for a 4.3% premium (+/-) 1.0% (90% confidence levels for the means)
WHY THE SALES PREMIUM?

1) Green = Quality
   Improved comfort, health and quality of home and reduced maintenance

2) Lower utility bills

3) Doing the right thing (for the environmental)
Texas study on RESALE price

6% premium for certified homes in general (primarily ENERGY STAR)

8% premium for LEED certified homes.
Green Building Information Gateway

GBIG

LEED

Special: California State Government LEED Projects

105 Buildings
Activities: 128 (27.36 Million sqft)
LEED EB 2009 (31) • LEED NC 2.2 (27) • LEED NC 2009 (23) ...
Gomes Way

ACTIVITY SUMMARY

LEED-HOMES v2008 Gold certified on 09/20/2010

77/136 Possible points

LOCATION

This project is located at:
1 Gomes Way, Harwich, MA, USA

ACTIVITY DETAILS

Activity Type: LEED
Space Type: Single-Family Home
CBSA: Barnstable Town, MA Metropolitan Statistical Area
USGBC Chapter: Massachusetts Chapter
Data on HERS Rated Homes

HELIX Summit ~ December 7, 2018 ~ Providence, RI

Ryan Meres, Program Director
RESNET
What is the HERS Index?

- The **national standard** by which a home’s energy efficiency is inspected and rated.

- A typical home built to 2006 energy efficiency standards scores 100 on the HERS Index.

- A 1-Point change in the HERS Index represents a 1% change in energy use.

- A lower Index Score means a home uses less energy.

- A home with a HERS Index Score of 0 produces as much energy annually as it uses.

- A simple, easy to understand system for prospective homebuyers, Realtors, Appraisers and utilities to compare the energy performance of homes.

The HERS Index accounts for a home’s energy consumption of heating, cooling, water heating, lighting and some appliances.
More Than 2 Million HERS Ratings

2,000,000

HERS-Rated Homes and Counting!
23% of all new homes in 2017 were HERS Rated!

Credit: Dave Roberts, NREL
Single Family HERS Ratings, 2014-17
Low-Rise Multifamily HERS Ratings, 2014-17
The average homeowner pays more for energy costs than property taxes or insurance. (U.S. Census Bureau)
Energy Data in the Real Estate Transaction

Real Estate Agents
- Need access to data to include in the listing
- Market a home’s EE and green features

Lenders/Underwriters
- Need data to support potentially higher loan value

Appraisers
- Need data to identify comparables and justify value.
- Need more data in the MLS to more easily compare EE features
A HERS API for MLS Data Providers

Auto-populate HERS Index scores into real estate listings!

RESO fields and corresponding RESNET Registry fields:
Green Verification Type: (HERS Rating)
Green Verification Year: (Date of Rating)
Green Verification Metric: (HERS Index Score)
Green Verification Status: (Confirmed/Sampled/Threshold Rating)
Green Verification Source: (RESNET Registry)
Green Verification URL: (Direct link to the home’s rating info on RESNET’s Public Access to the Registry: http://www.resnet.us/public-access-to-resnet-national-registry).
Lower Mortgage Default Risk

Report published by UNC Center for Community Capital and Institute for Market Transformation

- Loans on ENERGY STAR homes are **32 percent less likely** to go into default.
- Within efficient homes, the more efficient the house, the **lower the default risk**. For each point on the Home Energy Rating System (HERS) index of efficiency, the risk of default drops.
- This is the first report of its kind and is based on a sample of 71,000 home loans from across the country. The level of confidence is 99 percent.
Online Appraisal Portal

The HERS Index is the key to unlocking the value of green homes and the HERS Index Score, developed and introduced by RESNET in 2006, is the industry standard by which a home’s energy efficiency is measured. It has since grown to be regarded as a home’s MPG for energy efficiency.

The Appraisal Institute and RESNET have partnered to provide appraisers with access to RESNET’s National Registry of HERS Rated Homes through the new Appraiser Portal.

Accessing the Portal allows appraisers to begin to understand and value the energy efficiency of HERS-rated homes in their market including:

- HERS Index scores
- Estimated annual energy costs
- Energy cost savings
- HERS Index score range
- Builder
- Year of construction
- HERS rating company

Appraisers can search for HERS-rated homes in their area by city and state, zip code or address. Search results can be filtered by:

And best of all, the results can be downloaded as an Excel file so appraisers can print the results and access them offline.
Other Programs Use HERS

National Programs

[Energy Star Logo]

[Green Building Standard Logo]

Local/Regional Programs

[ZERO ENERGY READY HOME Logo]

[LEED FOR HOMES Logo]

Utility Programs
Thank you!

Questions?

Contact Info:
Ryan Meres
Program Director
RESNET
ryan@resnet.us
760-681-2391
Presentation at the HELIX Summit, Dec 7, 2018
the WHY of

“Everyone should have a home that is comfortable, healthy, safe and energy efficient”
60,000 HPwES upgrades in 2014 – the 800-year plan

Taking Home Performance to Scale

Pearl’s vision – millions of home upgrades per year
Staged improvements – at different times, by different contractors
Virtuous Circle of Visible Value

- More improvements
- Improvements valued at time of sale
- High performing home improvements
- Improvements made visible
Pearl Footprint

- 43 signed contractors in 12 states
- 11 brokerages in 8 states launched or in pilot
Your Neighbor is Pearl Certified

Over 3,000 homes certified, 400 more per month
All our installations are Pearl Certified.

When we finish our work, we’ll send you a Pearl Certification report.

Pearl’s report can increase the value of your home by 5% or more when you sell or refinance.
It’s my fiduciary responsibility to get you the best price for your home.

Buyers want and will pay more for homes that cost less to own and operate, have better indoor for their families, and are comfortable.

I’m going to ask you some questions about your home’s features that will help me uncover any hidden value we can market to interested buyers.

I do this with all of my listings to sell as them quickly as possible and for the best price.
In Their Own Words: Our Value Proposition

“We’re not just closing deals with Pearl, we’re opening the door with Pearl.”
John Kane
Home Solutions Expert
Allied Energy

“Pearl allows our agents to get maximum value for their homes.”
Carol Perry
CBDO
HomeSmart International

“Pearl not only provides a home certification but also documentation of the value we add.”
Josh Goldschmidt
President
Eagle Construction
Pearl Certification Reports

Pearl Home Certification Report

High-Performing Home
1577 Spring Hill Road, Vienna, VA 22182

Gold

Certification Date: March 15, 2018

W. Casey Murphy
Pearl VP of Quality Management
The Home at a Glance

What You Need to Know

This home has many high-performing features, including its attic insulation, attic hatch, air sealing, forced air ducts and windows.

This home will be healthier, more comfortable, cleaner and quieter, and cost less to operate, than most Virginia homes.

This Pearl Gold home has verified high-performing assets for a number of features that enhance the quality of life for its owners. Pearl Gold Certified: it’s what value feels like.

Certification Level

Gold
960 Pearl Points

U.S. Homes Eligible for Pearl Certification Levels

Pearl Home Certification Report | pearlcertification.com/catalog | Page 1
Is My Insulation Better than the Joneses’?

Special Performance Features of This Home

Central Air Conditioner: High efficiency unit

This home’s central air conditioner is very efficient, meeting the newest Federal standards that went into effect in 2016.

Forced Air Ducts: In conditioned space

This home’s ductwork is inside conditioned space—a big benefit for the lifetime of its systems. Installing ductwork in unconditioned space is bad building practice, as it not only wastes energy but also makes an expensive heating and cooling equipment work harder to cool the home—causing it to fail sooner.

Refrigerator: Very efficient

ENERGY STAR certified refrigerators are about 9-10 percent more energy efficient than models that meet the federal minimum energy efficiency standard.

Dishwasher: Very efficient

ENERGY STAR certified dishwashers use advanced technology to get your dishes clean while using less water and energy. Dishwashers that have earned the ENERGY STAR are, on average, about 5 percent more energy efficient and 15 percent more water efficient than standard models.

CFL/LED Lighting: Very efficient

This home has CFL and LED lighting, which means its lamps not only use less energy, they last a very long time. LED lights also produce better light along the color spectrum and are dimmable.

Filters: Very effective

The home’s special air filter unit attracts and captures airborne particles and allergens, such as pollen, pet dander, and mold spores—promising healthier indoor air for residents.
### Building Shell

#### Attic and Roof
- **Attic Hatch**: R-10 or higher
- **R-Value**: R-49
- **Insulation Type (predominant)**: Polyurethane
- **Installation Quality**: Grade 2

#### Wall Insulation
- **R-Value**: R-19
- **Insulation Type (predominant)**: Fiberglass
- **Installation Quality**: Grade 1
and yes, a completed AI Addendum

| EFFICIENCY FEATURES (Water, Energy, and Environmental) See types defined in glossary. |
|---|---|
| **Insulation** | ○ Fiberglass Blown-In ○ Foam Insulation ○ Cellulose ○ Fiberglass Batt Insulation ○ R-Value Wall R-19 ○ Ceiling R-49 ○ Other R-15 Conditioned basement |
| **Building Envelope** | Envelope Tightness: 4.0 Unit ○ CFM25 ○ CFM50 ○ ACH50 ○ ACH natural |
| **Windows** | ○ ENERGY STAR® ○ Low E ○ High Impact ○ Storm ○ Double Pane ○ Triple Pane ○ Tinted ○ Solar Shades |
| **Day Lighting** | # of Skylights: ○ # of Solar Tubes: ○ Other (Describe): ○ % of lighting LEDs: 20 |
| **ENERGY STAR® Appliances** | ENERGY STAR® ○ Dishwasher ○ Refrigerator ○ Washer/Dryer ○ Other ○ Energy Source: ○ Propane ○ Electric ○ Natural Gas ○ Other (Describe) ○ Note: ENERGY STAR® appliances do not result in an ENERGY STAR® Home. |
| **Water Heater** | ○ ENERGY STAR® ○ Size: <=55 gallons ○ Tankless ○ Solar (next page) ○ Heat Pump ○ Coil |
| **HVAC & Related Equipment** | Efficiency Rating % | Thermostat/Controllers? ○ Yes ○ No ○ Programmed Thermostat? ○ Yes ○ No ○ Auxiliary Heat Source? ○ Yes ○ No ○ Radiant Floor Heat? ○ Yes ○ No ○ Geothermal? ○ Yes ○ No ○ Electric Vehicle Ready? (car charger) ○ Yes ○ No |
| **Indoor Environmental Quality** | ○ Energy (ERG) or Heat Recovery Ventilator (HRV) ○ Other Measured Whole House Ventilation Device (See glossary) ○ Humidity Monitoring Device installed |
| **Water Efficiency** | ○ Reclaimed Water System (Describe) ○ Greywater reuse system ○ Water Saving Fixtures |
| **Utility Costs** | Annual Utility Cost: $/year, based on: (full year) Includes (check all that apply): ○ Electric ○ Heating ○ Water ○ Other: ○ # Of Occupants: |
| **Comments** | Include source for information provided in this section. |

The following property has a number of high-performing features as detailed in the Pearl Certification report. According to a 2017 study by Remodeling magazine, air sealing and attic insulation has the highest value-to-cost ratio of any home improvement and was the only improvement to have a ratio higher than 1.0 (i.e., the added home value was more than the cost to perform the work).

With the cooperation and approval of the Appraisal Institute, Pearl Certification has an AI REPORT® License Agreement. The Appraisal Institute makes no representations, warranties or guarantees as to, and assumes no responsibility for, the data, analysis or work product provided by the individual appraiser(s) or any other individual in the specific contents of the AI Reports®.

**Completed by:** W. Casey Murphy  **Title:** Vice-President of Quality Systems  **Date:** 03/15/2018  **Pearl Certification**
Learn more about this Pearl Certified home’s benefits: read the free report at www.pearlcertification.com/registry.

Pearl Certification is a national firm that provides third-party certification of high-performing homes: homes with “performance assets” that make them healthy, safe, comfortable, energy and water efficient. Pearl is an ENERGY STAR Partner.

This Pearl Gold home has verified high-performing assets for a number of features that enhance the quality of life for its owners. Pearl Certified: it’s what value feels like.

What You Need to Know

This home has many high-performing features, including its attic insulation, attic hatch, air sealing, forced air ducts and windows.

This home will be healthier, more comfortable, cleaner and quieter, and cost less to operate, than most Virginia homes.

Gold Certified: Special Performance Features of this High-Performing Home

<table>
<thead>
<tr>
<th>U.S. Homes Eligible for Pearl Certification Levels</th>
<th>Attic Insulation: Top 9% of VA homes</th>
<th>Attic Hatch: Well-insulated</th>
<th>Air Sealing: Top 2% of VA homes</th>
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<tr>
<td>PLATINUM</td>
<td>Forced Air Ducts: In conditioned space</td>
<td>Windows: Top 25% of VA homes</td>
<td>Thermostat: Smart home feature</td>
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<td>GOLD</td>
<td>Filters: Very effective</td>
<td>Room Ventilation: Lower indoor humidity</td>
<td>Whole House Ventilation: Better air and energy savings</td>
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<tr>
<td>MOST HOMES</td>
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<tr>
<td>SILVER</td>
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</table>
Pearl Certified
1577 Spring Hill Road,
Vienna, VA 22182

Certified on March 15, 2018
Pearl Gold Certificate | Pearl Score: 960

Attic Insulation: Top 9% of VA homes

This home’s attic is very well-insulated - it will keep you warmer in the winter and cooler in the summer. Feel at home in your home!

With the superior insulation installed in this attic, you’ll feel the difference right away: this house will be more comfortable - particularly in second floor rooms. Good attic insulation also protects against excessive winter heat loss that causes roof damage from snow melt.

Plus, enjoy lower utility bills year round.
Social Media Posts: 1577 Spring Hill Road, Vienna, VA

ATTIC INSULATION

New listing at 1577 Spring Hill Road, Vienna has been awarded Pearl Gold Certification in part because it scored very high for attic insulation. That's the stuff that keeps us cool and comfortable in the summer/warm and cozy in the winter. The US Department of Energy offers a good primer on insulation so you can see why it's all the rage. Link to: https://energy.gov/energysaver/insulation

AIR SEALING

Air sealing might not be as sexy as new windows, but it is the single most cost-effective way to reduce energy bills and improve comfort. It's reason enough to take a look at 1577 Spring Hill Road, Vienna, a Pearl Gold Certified property for its many high-performing features. You won't be able to see the impressive air sealing, but you'll feel the difference every season. [Link to listing]
Potential HELIX Data: Pearl Certification Levels

Pearl Certification Levels

- Pearl Silver: 700 points
- Pearl Gold: 825 points
- Pearl Platinum: 975 points
Potential HELIX Data: Home Feature Data

- Furnace: 92.5 AFUE, multistage gas valve
- Air conditioner: 20 SEER,
- Ducts: <5% leakage, R-6 insulation
- Air source heat pump 18 SEER / 10.5 HSPF, ENERGY STAR Verified HVAC Installation
- Gas storage water heater: UEF .72
- Attic insulation: fiberglass R-49
- Wall insulation: cellulose R-20
- Windows: U-factor 0.27, SHGC 0.35
- Wi-Fi thermostat
- Home Energy Management system
Potential HELIX Data: “Third Party”

Labels

- Energy Star
- RESNET® HERS Index
- EarthCraft House
- WaterSense
- U.S. Department of Energy Home Energy Score
Make your home’s value visible

www.pearlcertification.com

Robin LeBaron
robin@pearlcertification.com
646-416.2650
Networking Break - Thank you to our event sponsors!

- State of Rhode Island Office of Energy Resources
- National Grid
- E4 The Future (Energy • Economy • Equity • Environment)
FROM VOLUNTARY TO MANDATORY: HOW POLICIES AND PROGRAMS ARE SHAPING THE MARKET

Madeline Salzman, U.S. DOE, moderator
Julia Dumaine, CT DEEP
Kevin Rose, National Grid, RI
Ian Finlayson, Massachusetts Department of Energy Resources
Lisa Timmerman, City of Portland, Oregon
Lauren McNutt, Dunsky Energy Consulting
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<td>Pilot Basics</td>
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<tr>
<td>03</td>
<td>Lessons (so far)</td>
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### Drivers

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<th>Term</th>
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<tr>
<td><strong>Short term</strong></td>
<td>Increased retrofit conversion rate?</td>
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<td><strong>Mid term</strong></td>
<td>More “repeat customers”?</td>
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<tr>
<td><strong>Long term</strong></td>
<td>Market demand for efficiency&lt;br&gt;Data pipeline</td>
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</tbody>
</table>
Pilot Basics

150 Home Energy Scores

• Launched earlier this year
• Incorporated into our HPwES program
• Customers can opt-in to sharing

ETA for results: late 2019
03
Lessons (so far)
Customer Consent and Release: DOE Home Energy Score Program

The undersigned ("Customer") understands that The Narragansett Electric Company d/b/a National Grid ("National Grid") is collaborating with the United States Department of Energy ("DOE") to provide interested Customers who are homeowners with a Home Energy Score ("HES") report through the DOE's Home Energy Score Program ("Program"). Like a miles-per-gallon rating for a car, the Home Energy Score or HES provides an estimate of a home's energy use as well as associated costs and other information based on a standard assessment of its energy-related assets.

☐ By checking this box, the Customer hereby consents and agrees to the disclosure of Customer Information (as defined below) by National Grid or by its contractor, Rise Engineering, a division of Thielsch Engineering, Inc. ("Contractor"), to the DOE. "Customer Information" will include Customer's address, description of home (e.g. year built, dimensions), and energy feature details (e.g. window types, heating and cooling system characteristics). Customer Information is needed for the DOE to (i) produce a HES report for the Customer’s residence as set identified below ("Property") and (ii) deliver that report to the Customer. The Customer further understands that the DOE may publish or disclose analyses and aggregates using the Customer Information. Except as stated below, the DOE will not publish or disclose the Customer Information to any third parties and the DOE will not, directly or indirectly, identify the Customer in any publication or disclosure. Customers’ name and energy consumption/utility bill information are not shared with DOE.

☐ By checking this box, the Customer hereby further consents and agrees to the inclusion of the Customer’s HES report in future real estate listings and disclosure by the DOE of the HES report to any relevant multiple listing service, as well as to any intermediary databases serving to populate these listings, through accepted and secure methods of data transportation.

Customer agrees to release, indemnify and hold harmless National Grid, the Contractor and National Grid’s affiliates and its and their respective officers, directors, employees, agents, successors and assigns from any and all liability, claims, losses, damages or expenses arising out of, resulting from or in connection with (a) the disclosure of Customer Information by National Grid or by the Contractor to the DOE and (b) any use of the Customer Information or Customer’s HES report as described hereunder.

The undersigned represents and warrants that he or she read this Customer Consent and Release and fully understands the contents hereof.

Sign: _____________________ Date: _____________
Lessons (so far)

About 40% consent to sharing

- Customers reluctant to share if they don’t know what the score is going to be.

- We allow customers to change their mind later

Real estate professionals are interested

- AI chapter training events
Summary

Midway through 150 home pilot

Short, Medium, and Long-term drivers
No conclusions to be made yet

60% of customers don’t opt in to sharing

Can’t scale up if we can’t prove cost-effectiveness
nationalgrid
Home Energy Ratings in Connecticut: Driving Market Transformation

December, 2018
Julia Dumaine
Energize Connecticut

- Created in 1998 by the Connecticut Legislature
- $240 million, ratepayer-funded initiative dedicated to empowering Connecticut to make smart energy choices, save money, and use clean, affordable energy.
- Managed and administered by
  - The Connecticut Energy Efficiency Fund
  - The Connecticut Department of Energy and Environmental Protection
  - The Connecticut Green Bank
  - Eversource
  - United Illuminating
Conservation & Load Management
Mission: Public Act 98-28

Advance the Efficient Use of Energy

Promote Economic Development & Energy Security

Reduce Air Pollution
Energy Efficiency Market Driven by Consumer Demand in the Real Estate Market

**Home Buyers:**
Buyers become more aware of this information. Demand increases

**Home Sellers:**
Allows sellers to list information about their energy efficient investments in the property

**Assessor:**
Compiles DOE HES info

**U.S. DOE:**
Servers hold HES building files

**Universal Database (HELIX):**
Accessible Database with Privacy Restrictions

**MLS:**
Energy efficiency information auto-populated fields

**Homeowners:**
Increase efficient investments to maximize home value

Connecticut Department of Energy and Environmental Protection
Future State Vision

Connecticut Department of Energy and Environmental Protection

Homeowners: Increase efficient investments to maximize home value

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Energy Efficiency Market Driven by Consumer Demand in the Real Estate Market
Future State Vision

Energy Efficiency Market Driven by Consumer Demand in the Real Estate Market

- **Assessor:** Compiles DOE HES info
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- **MLS:** Energy efficiency information auto-populated fields
- **Home Sellers:** Allows sellers to list information about their energy efficient investments in the property
- **Home Buyers:** Buyers become more aware of this information. Demand increases
- **Homeowners:** Increase efficient investments to maximize home value

Connecticut Department of Energy and Environmental Protection
Engagement with the Real Estate Industry/HELIX

- **Home Energy Labeling Information eXchange (HELIX)**
  - “The purpose of this project is to develop a database capable of automatically populating real estate listings (whether they are accessed through local Multiple Listing Services (MLS) or portals like Trulia and Zillow) with home energy information from Home Energy Score and other sources when it is available and approved by the seller.”

- **Beta-testing HELIX**
  - Protection of customer data is primary concern
  - Identifying how and with whom information will be shared with by HELIX (automated versus manual data transfer)

- **NEEP and CT in discussions with the MLS**
  - Connecticut is not mandating scores (voluntary)
  - Quality assurance and consistency
  - Data sharing
  - Educating the industry
Integrating the DOE Home Energy Score

- Connecticut was the first statewide implementer in April 2015.
- Home Energy Score is a feature of all HES assessments in qualifying homes and all HES lead technicians are required to be Assessors.
- Beginning of 2018, moved to opt-in language.
Integrating the DOE Home Energy Score

• Lessons Learned after Opt-In
  – Significant decrease in HEScore participation
    • Data sharing concerns
    • Stigmatization of homes
    • Lack of understanding/training and support by contractors
  – Messaging and education must be consistent across the board—starting with the technicians and assessors

• DEEP & Utilities hosted trainings in Summer of 2018 to educate technicians
  – DEEP provided overview of state vision
  – DOE Home Energy Score Representative
  – Both covered topics related to technical knowledge and messaging
2. “A lower score may end up being detrimental to a home,”

**FALSE:** a more informed consumer makes a better decision.

a) **Studies** have shown that homebuyers like having energy information, and high bills or a low score do not necessarily “kill” a sale

b) A low score does not necessarily mean that a home is poorly built.
   – The score estimates a home’s total energy use, not energy per sq. ft.
   – A 4,000sq. Foot, beautiful home will likely be expected to use more energy each year than the average U.S. home
Key to Success: Consistent Messaging

3. “Why is a Score valuable in the residential real estate market?”

“Efficiency investments face a challenge in that they are not visible to buyers like new countertops or a remodeled bathroom. When improvements are done well, they are completely out of sight in attics or behind walls, with benefits that only become obvious after living in the home.” – Home Energy Information Guide

a) Most buyers consider location and character before other features (like energy)

b) The Home Energy Score allows sellers to showcase efficiency investments

c) The information can be used by appraisers and mortgage lenders for energy-related financing products

a) Ex: Fannie Mae Homestyle® Energy Mortgage
4. “What is the ultimate goal of the score?”

TO SAVE ENERGY!

a. The Score is used to make people more aware and drive efficiency improvements.

b. Energy plays a huge role in the comfort, safety, and affordability of a home.

c. This contributes towards Connecticut achieving our energy reduction and reliability goals, and environmental goals.
Key to Success: Technical Knowledge

4. “It is difficulty to predict a score and explain to a customer why they got what they did,”

a. A home’s unique feature are modeled to determine annual energy use

One-Story House

- 2000 sq/ft floor plan
- 5440 sq/ft exposed surface (walls, ceiling, floor)

Two-Story House

- 2000 sq/ft floor plan
- 4080 sq/ft exposed surface (walls, ceiling, floor)
Key to Success: Technical Knowledge

5. “Language being used to explain the score might be different between relevant players,”
   a. Real estate industry is embracing efficiency and the score more and more nationwide
   b. Many online resources both at the state and federal level
      • DOE Real Estate Professionals Fact Sheet
      • EnergizeCt.com is currently building out a “Trade Ally” landing page for real estate professionals that will use the same language as elsewhere on the site.
Next Steps: Begin Data Sharing with HELIX

• Utilities finalizing data sharing agreements with DOE to provide HEScores to HELIX and third parties

• Need for increased communication and collaboration with MLSs to streamline processes

• Working with NEEP to establish a payment mechanism to support HELIX
Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

Home Energy labeling: lessons learned in MA

Ian Finlayson, Deputy Director, Energy Efficiency Division

MA Dept. of Energy Resources
Why Scorecards in Massachusetts?

• Create Transparency for Consumers
• Help drive residential energy improvements, which will:
  ➢ Lower energy bills for homeowners & renters
  ➢ Improve home values; and
  ➢ Reduce greenhouse gas emissions
Lessons learned from Europe (EU)

• Study trips:
  ➢ Oxford University, UK – 2007
  ➢ Salzburg, Austria – 2008
  ➢ Wels, Austria – 2011
  ➢ Vienna, Austria – 2013

• Interviews & Lit. review
  ➢ 2008 – Denmark, Germany, Austria, UK
  ➢ 2012 – Denmark, Austria, Portugal, Ireland, UK
  ➢ 2017 – Germany, Ireland, Austria
Carrots, Sticks & Tambourines

Scorecards

1 leg of a 3-leg stool
Scorecard design matters

- Leverage behavioral research
  - Have a comparison to peers
  - Show potential for improvement
  - Units don’t matter (smiley faces, stars, letters, numbers)

- Plan for the long-term
  - Have a score(s) that is durable/replicable over decades
    - i.e. not $$ as the primary metric
  - Plan for an improving average over time
    - The point is to see an improvement in housing stock
    - Account for PV (rooftop solar) and EV (home charging)
  - There are reasons not to use a letter grade
    - E.g. EU: A, A+, A++
Voluntary disclosure doesn’t work: Critical mass is needed in MLS

• Ireland and Germany both started with voluntary disclosure in real estate listings

• Representatives from both countries said their EPCs were failing until they made a policy correction and required disclosure at time of listing

• Once the policy changed the market valuation improved rapidly
  • Ireland up to 10% premium for ‘B’ or better
Store the Score – (aka HELIX)

• EU initially split (2014)
  ➢ Nation-state dataset (19)
  ➢ Regional dataset (5)

• Trend towards a nation-state database model (28 in EU)

http://building-request.eu/content/overview-energy-performance-certificate-database-systems-across-europe
Lessons learned closer to home

• Field Studies: 2012-2014
  ➢ Home MPG pilot in Springfield area
  ➢ Cape Light Compact – DOE Home Energy Score pilot
• Current implementation: 2017-2018
  ➢ Home MVP pilot statewide
  ➢ ENE program for 19 Municipal Light Plants
Springfield Area Pilot
$2.6m 2012-2014

• 4 State U.S. DOE funded Pilot
• Massachusetts Pilot Municipalities
  ➢ Springfield, Belchertown, East Longmeadow, Hampden, Longmeadow, Monson, Palmer, and Wilbraham
• Utilities/ PAs
  • National Grid
  • Western Mass Electric (now Eversource)
  • Columbia Gas
• Lead Vendors
  • Honeywell – WME (now Eversource West)
  • CSG (now CLEAResult) - NGRID, Columbia)
Home MPG Results

- 3,866 audits / scorecards, 1,593 retrofits / updated scorecards
- 41% completed efficiency work
- Avg savings per home: 20 MMBtus
  - 25% more savings per household vs. Mass Save
- Outreach increased participation:
  - 25% more households completed installations over Mass Save
Springfield lessons learned

• Scorecard integrated in audit software is critical
  ➢ Avoid dual data entry
• Marketing and outreach takes time
• $$$ matter for selling efficiency, even if they don’t make a good scorecard metric
  ➢ Incentives inspire investment
• Homeowners (& auditors) like a scorecard
  ➢ And can handle more than one metric
• MA only state to meet the ambitious DOE goal of 20% energy savings in 2% of target market
Cadmus evaluation: Q’s on scorecards

• Easy to understand
  • 100% Phone survey (very 65%, somewhat 35%)
• Useful in decision to make improvements
  • 99% Phone survey (very 67%, somewhat 31%)
  • 84% On-line survey (very 44%, somewhat 40%)
• Useful in home-buying
  • 99% Phone survey – (very 74%, somewhat 25%)
  • 99% On-line survey – (very 70%, somewhat 29%)
• Include in Mass Save assessments
  91% on-line survey (strongly agree 44%, agree 47%)
Scorecard Design & Metrics

- Asset rating (not operational)
- Energy use metric: MMBtu/year
- Carbon footprint: carbon metric tons/year
- Compared to area average & expected score after implementing recommended measures
- Expected cost savings associated w/recommendations
- Post-implementation scores based on what was implemented & compared to prior scores
ENERGY PERFORMANCE SCORE

Address: 1107 NE Golf Ct Rd, Dracut, MA 01826
Reference Number: 410000091

- Energy Use: 126 MMBtu/yr $1,888
- Electric: 7,131 kWh/yr $570
- Natural Gas: 1,014 therms/yr $131
- Carbon Emissions: 8.4 tonnes/yr
- Electric: 3.4 tonnes/yr
- Natural Gas: 5 tonnes/yr

**Energy Use**

This score measures the total energy use (electricity, natural gas, propane, heating oil) of this home for one year. The lower the score, the less energy required for normal use. Actual consumption and costs may vary.

**Carbon Emissions**

This score measures the total carbon emissions based on the annual amounts, types, and sources of fuels used in this home. The lower the score, the less carbon is released into the atmosphere to power this home.

---

Type: Single Family
Bedrooms: 4
Year Built: 1962
Auditor: Earth Advantage Institute

Visit www.Energy-Performance-Score.com for tips to maximize energy savings

Source: Earth Advantage Institute
YOUR HOME'S ENERGY PERFORMANCE SCORE

Home MPG, a program within Mass Save®, provides you with your home's "miles per gallon" energy performance rating, called an "energy performance score" or EPS. By helping you better understand your home's energy use, Home MPG helps you make smart decisions about implementing improvements that make your home more energy efficient and reduce your energy costs.

PREPARED FOR
123 Test Street
testville, NY 14850
Ref #: GSN637

Year Built: 1975
Sq Footage: 1800
Bedrooms: 3
Primary Heating Fuel: Electricity
Assessment Date: 9/12/2012
Energy Specialist: Performance Manager

208 Your Home's ENERGY PERFORMANCE SCORE
This score shows the estimated total energy use (electricity and heating fuel) of your home for one year. The lower the score, the better!

Average

130

0

MMBtu/yr
BEST

208 Your Home's Score Before Improvements
208 Your Home's Score After Improvements
130 Average Home In Your Area

THE BOTTOM LINE

$0

ESTIMATED ENERGY SAVINGS
Based on implementing all of the recommended energy efficiency improvements

PER YEAR

13.4

Your Home's CARBON FOOTPRINT
This score shows the estimated carbon emissions based on the annual amounts, types, and sources of fuels used in your home. The lower the score, the less carbon is released into the atmosphere to power your home.

PER YEAR

$9989

CURRENT ESTIMATED ENERGY COSTS

For more information on Home MPG or to create an online account to manage your home’s information, visit masssave.energy-performance-score.com

Actual energy costs may vary and are based on many factors such as occupant behavior, weather and utility rates. Please see the Mass Save Program Guide for additional information on the recommended energy efficiency improvements.

Source: Honeywell & DOER
### Your Home’s Energy Performance Score

Your Home’s Energy Performance Score is 160. This score shows the estimated total energy use (electricity and heating fuel) of your home for one year. The lower the score, the better.

- **Average Home in MA**: 130
- **Your Home’s Current Score**: 160
- **Your Home’s Score After Recommended Improvements**: 92

#### Estimated Percentage of Energy Use by Fuel Type
- Electric: XX%
- Natural Gas: XX%

### Your Home’s Carbon Footprint

Your Home’s Carbon Footprint is 11.1. This score shows the estimated carbon emissions based on the annual amounts, types, and sources of fuels used in your home. The lower this score, the less carbon is released into the atmosphere to power your home.

- **Average Home in MA**: 9.7
- **Your Home’s Current Carbon Footprint**: 11.1

### Estimated Energy Savings

Estimated energy savings are $1,150 per year. Implementing all of the recommended energy efficiency improvements can save you money on your energy bills.

Source: CSG/CLEAResult & DOER
Your Massachusetts Home Scorecard

This scorecard compares home energy use and carbon footprint to an average home in MA, and shows improvements based on recommended technology.

ABOUT
Address
123 Main St., Whately, MA, 01903

Year Built
1850

# of Bedrooms
3

Assessment Date
N/A

Source: SnuggPro & DOER

HOME ENERGY USE

This shows the estimated total energy use (electricity and heating fuel) of your home for one year. The lower the energy use, the better!

HOME CARBON FOOTPRINT

This score shows the estimated carbon emissions based on the annual amounts, types, and sources of fuels used in your home. The lower the score, the less carbon is released into the atmosphere to power your home.

YEARLY ENERGY USE
Electricity
3,613 kWh

Fuel Oil
1,324 gallons

YEARLY COSTS & SAVINGS*

$ 4,343
Pre-upgrade Energy cost per yr

$ 2,798
Post-upgrade Energy Cost per yr

SAVE $ 1,545
Estimated Energy Savings per yr

Estimated percentage of energy use by fuel type:

<table>
<thead>
<tr>
<th>Propane</th>
<th>Fuel Oil</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4%</td>
<td>90%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Estimated average carbon footprint (tons/yr):

<table>
<thead>
<tr>
<th>Fuel Oil</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>93%</td>
<td>7%</td>
</tr>
</tbody>
</table>

* Estimated costs and savings. Actual energy costs may vary and are based on many factors such as occupant behavior, weather and utility rates. Please see next page for more on the EPS calculation. Projections for score improvements and energy savings are estimates based on implementing all of the recommended energy efficiency improvements. Ref# 91997.

Home Owner | 123 Main Street, Whatley, MA 01093

Brought to you by
Where are we now with scorecards in Massachusetts?

• 2019-2021 3-year Energy Efficiency Plan requires scorecards be integrated into the home audit
  ➢ “before” and “after” EE implementation
• DOER working to finalize scorecard design & requirements with input from Mass Save PAs
• Scorecards electronically provided to DOER on a quarterly basis
• MA Baker Administration plans to re-file scorecard disclosure legislation in December
Thank You!

Ian Finlayson
Department of Energy Resources
ian.Finlayson@mass.gov
617 626 4910
Oil Home in Wilbraham, MA
Year Built: 1956  Sq Footage: 2,891 ft²
Bedrooms: 5  Heating Fuel: Oil

Score BEFORE: 195
Score AFTER: 156
Est. Energy Savings: $908/year
Est. GHG savings: 3.5 tons/year

Total Mass Save incentive of $3672 for:
21 CFLs, and 1 LED bulb
11 hours of air sealing
Wall insulation ($2,740 from Mass Save)

Homeowner cost:
This household** - $913
Low-income household - $0
Moderate income household* - $274

2017 Zillow Home Value: $293,000

* Mass Save covers up to 90% of insulation costs, up to $3,000 for households at 61-80% of median income
** Mass Save covers up to 75% of insulation costs, up to $2,000 for households above 81% of median income
City of Portland Home Energy Score

HELIX Summit

December 7, 2018

Lisa Timmerman
Portland Bureau of Planning and Sustainability
City of Portland HOME ENERGY SCORE

Know the score. Outsmart energy waste.
How it works

Regulated party = Seller or homebuilder

Time of disclosure = At or before listing

Assessment completed by = 100+ authorized home energy assessors

Information disclosed = Home Energy Score and home energy report

Disclosure required in = Real estate listings and displayed in the home for prospective buyers
HOME PROFILE
LOCATION: 1234 SE 123rd Ave
Portland, OR 97206
YEAR BUILT: 1999
HEATED FLOOR AREA: 1,439 sq.ft.
NUMBER OF BEDROOMS: 3

ASSESSMENT
ASSESSMENT DATE: 02/28/2018
EXPIRATION DATE: 02/28/2026
ASSessor: John Smith
Energy Score Assessor.com
PHONE: 503-123-4567
EMAIL: John@EnergyScoreAssessor.com

CCB License #: 123456

Score Today: 4
Score with Improvements*: 7
Estimated energy savings with improvements: $273 PER YEAR
Estimated carbon reduction with improvements: 20% PER YEAR

TACKLE ENERGY WASTE TODAY!
Enjoy the rewards of a comfortable, energy efficient home that saves you money.

- Get your home energy assessment. Done!
- Choose energy improvements from the list of recommendations below.


- Select a contractor (or two, for comparison) and obtain bids.
- Check out www.energytrust.org/findacontractor or call toll free 1-866-368-7878.

PRACTICAL ENERGY IMPROVEMENTS | COMPLETE NOW OR LATER
To achieve the “score with improvements,” all recommended improvements listed below must be completed. Improvements all have a simple payback of ten years or less and may be eligible for mortgage financing. For a more detailed explanation of costs and payback, please get a bid from a contractor.

FEATURE | TODAY’S CONDITION | RECOMMENDED IMPROVEMENTS
--- | --- | ---
Cathedral Ceiling/Loft | Roof insulated to R-11 | Insulate cathedral ceiling to R-30 or maximum possible Insulate to R-4
Duct Insulation | Un-insulated | Insulate to R-4
Duct Sealing | Un-sealed | Reduce leakage to a maximum of 10% of total airflow Professionally air seal
Furnace | Not professionally air sealed | Replace with high efficiency model
Windshield | Natural gas furnace 80% AFUE | Standard natural gas furnace
Air Conditioner | None | Upgrade to ENERGY STAR, minimum 15 SEER Efficiency Factor
Attic Insulation | None | Attic insulated to R-30
Roof Insulation | None | Insulated to R-0
Foundation wall Insulation | None | None
Spray Foam | None | None
Interior Insulation | None | Insulated to R-3
Windows | Double-pane, low-E glass | None

Visit www.energytrust.org/solar to learn more (Note: Solar PV is not included in “Score with Improvements”)

YOU CAN DO IT YOURSELF!
Looking for low-cost ways to cut energy waste, boost your comfort and lower your energy bills? Visit the resources below to learn about easy changes you can make today:
www.energytrust.org/tips and www.communityenergyproject.org/services
### RMLSA Auto-population

| Price:   | $510,000 |
| Beds:    | 2        |
| Baths:   | 1        |
| County:  | Multnomah |
| Style:   | COLONIL / DTCHCOL |
| Year Built: | 1924 / REMOD |
| Status:  | ACT |
| SQFT:    | 1982 |

**ML#:** 18109625  
**Area:** Portland Northeast  
**Elem School:** Alameda  
**Middle School:** Beaumont  
**High School:** Grant  
**Short Sale Y/N:** NO  
**Bank Owned/REO Y/N:** NO  
**Waterfront:**  
**Body of Water:**  
**Tax/Year:** $6,840.22

**Prop Type:** DETACHD  
**Nbrhd/Bldg:** ALAMEDA  
**Levels:** 3  
**Garage:** 0  
**Roof:**  
**Exterior Desc:** ALUM  
**MstBdrm Level:** U  
**Fireplaces:**  
**Bsmt/Fnd:** FULLBAS  
**Acres:** 0.11  
**Lot Size:** 3K-4,999SF  
**Lot Dim:**  
**Lot Desc:**  
**Heat/Fuel:** FOR-AIR / GAS  
**Cool:** CENTAIR  
**Water/Sewer:** PUBLICWTR / PUBLICSWR  
**Hot Water:** GAS  
**Zoning:**  

**REMARKS:** Video/Virtual Tour #1 Video/Virtual Tour #2

Alameda Dutch Colonial on name brand street awaits! Perched high above the street this classic Dutch Colonial boasts large well proportioned rooms, high ceilings and gorgeous period finishes. Recently updated kitchen exudes period appropriate subway tile & wood grain finishes. High ceilings, french doors and the best schools are all here!! The incredible deep backyard and private spaces are an additional perk of this truly special home! Home Energy Score:3.00 HES report at https://api.greenbuildingregistry.com/report/hes/OR10064898-20180719
Carbon Emissions by Sector
(for Multnomah County, 2014)

- Residential, 19%
- Commercial, 23%
- Transportation, 40%
- Industrial, 17%
- Solid Waste, 1%
Portland Housing Units

SINGLE-FAMILY
160,250 Total Units

MULTIFAMILY
107,300 Total Units

Owner Occupied
125,000 Units

2+ Unit Rentals
103,000 Units

Rental Unit
35,250 Units

Other
Climate Action Plan Priority

Action 1B

Require energy performance ratings for all homes so that owners, tenants and prospective buyers can make informed decisions about energy costs and carbon emissions.
Stakeholder Engagement

• Professionally run consumer focus groups
• Facilitated discussions with real estate and energy efficiency industry
• Equity stakeholder discussion with CBOs representing low income, tenants and communities of color
• Individual meetings with realtor association
Real Estate Industry Response

– Makes housing even less affordable
– Unfairly impacts low income homeowners with sub-standard homes
– Pointless without mandatory upgrades
– Only addresses a small % of houses
– Punishes those selling older homes or buying fixers
Next Steps for 2019 and beyond

• Increase brand recognition and demand
  – Improve the score appearance in listings
  – Increase marketing/outreach through available networks

• Enforcement
  – Relationship with RMLS

• Analysis and evaluation
  – 8000+ scores analysis

• Financing
Thank you!

Program Website:
www.pdxhes.com

Email:
HESinfo@portlandoregon.gov

lisa.timmerman@portlandoregon.gov
Home Energy Labeling & Disclosure
From Voluntary to Mandatory:
The International Experience

December 7, 2018
1. **Overview** of international labeling & disclosure programs
2. **Opportunities & limitations** with voluntary & mandatory programs
3. **How** to get the most out of either approach
Overview of international labeling & disclosure programs
European Mandatory Programs

International analysis of experience worldwide

- EU (8 national programs):
  - Denmark
  - France
  - Germany
  - Hungary
  - Ireland
  - Portugal
  - Sweden
  - UK

- Australia (2 state programs):
  - ACT
  - Queensland
Opportunities & limitations with voluntary & mandatory programs
**Opportunities**

- **Increase awareness:** Educate industry and community
- **Easier to digest:** REALTORS® likely to be supportive
- **Address administrative capacity:** Establish and test systems before scaling up
- **Prepare the market:** Balance roll-out with industry capacity
- **Can move the market to some degree:** Prove the feasibility and value of a mandatory approach
Voluntary programs: Limitations

Limitations

- **Low participation**: Relies heavily on industry to promote
- **Scale** needed to build capacity (Energy Advisors)
- **Low community-wide energy savings**
- **May not be representative** of future mandatory program
- **Short timeframe** (of voluntary pilots) may not demonstrate conversion rate
**Opportunities**

- **Strong correlation between energy rating and sale price:** 2% to 6% increase in sale price for one letter improvement in EU
- **High rate of home improvements:** 12-37% homeowners conduct all or part of recommendations
- **Over time, provides an accurate inventory of building stock:** Benefits multiple stakeholders

**Home Energy Labeling & Disclosure Renovation Rates**

- Austin, TX
- ACT Australia
- France
- Netherlands
- Portugal
- UK
Mandatory programs: Challenges

Challenges

• **Poor program design** can lead to failure (or fall short of expectations)

• **Loss of trust** in the process, energy advisors and ratings can derail a program.

• **Privacy concerns** can limit what information is shared reducing impact

• **Costs/time to get a home energy assessment** needs to be addressed to alleviate homeowner and REALTOR® concerns
How to get the most out of either approach
How to get the most out of voluntary programs

PROVIDE OPPORTUNITY TO RAISE AWARENESS
- Educate industry/community on the value of, and need for, home energy labeling & disclosure
- Improve understanding of impacts on industry and how to mitigate

BUILD CAPACITY AND SUPPORT
- Develop, test and evaluate functional labeling & disclosure systems/processes, QA/QC, customer support etc.
- Help the market and homeowners transition

PROOF OF CONCEPT
- Set appropriate targets to reflect that Voluntary will not deliver on market transformation objectives
- Evaluate the appropriate metrics to show that Voluntary has built needed capacity to move ahead with Mandatory programs

Edmonton currently offers a $400 rebate on evaluations.
Moving from voluntary to mandatory: Example

**EXAMPLE: GERMANY**

**START DATE**
- 1997 (voluntary)
- 2007 (mandatory)

**BENEFITS**
- Voluntary was useful to socialize home energy labeling & disclosure prior to mandatory requirement

**CHALLENGES:**
- Dual system creates confusion
- Privacy concerns limits access to data
- Non-functional enforcement and quality assurance (although recent efforts have been made to improve this)
- Limited public awareness and acceptance
How to get the most out of mandatory programs

SET COMMITMENT AND GOAL
• Clearly outline the long-term market transformation goals
• Engage in extensive stakeholder consultation

ENCOURAGE AND ENFORCE COMPLIANCE
• Choose and adapt the rating system
• Create tools, offer training, assistance & support before enforcing fines

INCREASE HOME ENERGY IMPROVEMENTS
• Include upgrade recommendations and estimated cost/benefit
• Link to the home energy ecosystem
• Develop method of attributing GHG reductions to demonstrate impact

France’s compliance system has resulted in compliance rates of 85% and conversion rates of almost 40%

Denmark’s policies have given rise to industry-driven solutions to help homeowners on their renovation journey.
Questions?

Lauren McNutt
Consultant
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Lauren.mcнутt@dunsky.com

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WHAT’S IT WORTH: CHALLENGES WITH ACCESSING AND VALUING ENERGY EFFICIENCY IN THE REAL ESTATE TRANSACTION

Craig Foley, moderator
John Breault, State-Wide MLS, Rhode Island
Laurie Fielder, VSECU
Joe Buonannata, Connecticut Green Bank
Rob Lynch, Maine Appraisal Institute Chapter
Gayle Oberg, Little River Realty
What’s It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

Introduction: Baseline Challenges

Work our way from the end of the real estate transaction to the beginning

- Laurie Fielder, VGREEN Program Director, VSECU
- Rob Lynch, SVP, United Valuation Group, Scarborough, ME
- Gayle Oberg, Owner/Broker, Little River Realty, Stowe, VT
- John Breault, VP, MLS & Member Services, RIAR and Statewide MLS
- Joe Buonannata, Associate Manager, Residential Financing Programs, Connecticut Green Bank
What’s It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

2018 ACEEE State Efficiency Scorecard

Northeast / Mid-Atlantic Rankings
#1 - Massachusetts (8th year as #1)
#3 - Rhode Island (2nd year as #3)
#4 - Vermont (2nd year as #4)
#5 - Connecticut
#6 - New York
#10 - Maryland
#12 - Washington D.C.
#14 - Maine
#18 - Pennsylvania / New Jersey
#21 - New Hampshire
#22 - Delaware

Top 10
Most Improved
What’s It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

2016 New Home Construction Starts with HERS Scores
What's It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

Map of version of IECC building code adopted by state
What’s It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

2015 Map of installed solar PV capacity in New England
What’s It Worth? Challenges with Accessing and Valuing EE in the RE Transaction
A credit union for everybody in Vermont

MEMBER-OWNED  •  NOT-FOR-PROFIT  •  65,000+ MEMBERS
9 BRANCH LOCATIONS  •  MISSION DRIVEN  •  SOLAR POWERED
TRADITIONAL BANKING PRODUCTS & SERVICES, MOBILE & ONLINE

VSECU is committed to improving the lives of Vermonters by empowering the possibilities for greater social, environmental, and financial prosperity.

WHO CAN JOIN?
Anyone who lives or works in Vermont  •  NESEA members
VGREEN

CLEAN ENERGY FINANCE PROGRAM

Flexible, affordable financing options designed to maximize the benefits of the energy savings achieved through upgrades

- **ENERGY IMPROVEMENT LOANS**
  Flexible terms up to 20 years, maximum loan amount of $60,000

- **VGREEN ITC LOAN**
  12-year term and lower payments for first 15 months, maximum loan amount of $60,000

- **DISCOUNTED ENERGY IMPROVEMENT HOME EQUITY LOAN**
  Discounted rates, terms up to 15 years, no closing costs, no pre-payment penalties

- **ENERGY IMPROVEMENT MORTGAGE**
  Fixed rate, terms up to 40 years, energy audit required

- **OFF-GRID MORTGAGE**
  Fixed rate, 30-year term, maximum loan-to-value = 70%, estimate of cost to connect to the grid required
• Appraisal ordered by lender

• Tell lender about special ‘green’ certifications, labels, or features, for example:
  - HERS (Home Energy Rating Score)
  - Home Performance with ENERGY STAR® certified
  - Certifications from Efficiency Vermont
  - LEED certified
  - Solar PV

• Lender requests a ‘Residential Green and Energy Efficient Addendum’ for appraisal

http://www.appraisalinstitute.org/education/green_energy_addendum.aspx
What’s It Worth? Challenges with Accessing and Valuing EE in the RE Transaction
46 Intervale Rd, Freeport, ME 04032

HERS Index Score

- Builder's Name: BrightBuilt
- HERS Rating Company: 
- Year of Construction: 2016
- Date submitted to Registry: 2017
- Annual Energy Costs: $460
- Annual Energy Savings: $3193
- Energy Star Certified: Yes

< Back to search results
Green Customer Display

Energy Star Certified Home

NEREN VT

“certified as 5 Star Energy Rated by Efficiency VT”
Green Customer Display
Sold MLS Data Sheet:
Power Production: Photovoltaics

“Solar panels take a big bite out of monthly electrical costs”
Green Customer Display Sold MLS Data Sheet: Power Production: Photovoltaics
What’s It Worth?
Challenges with Accessing and Valuing Energy Efficiency in the Real Estate Transaction

Joe Buonannata

• HELIX Summit
• December 7, 2018
Rooftop Solar PV Potential

32,000 homes with solar, and growing rapidly.

Solar potential in CT...
At least 150,000 homes
Solar installations over time
What has CT Green Bank done so far?

- **Presented to industry groups**
  - Greater Hartford Association of Realtors
  - Eastern CT Association of Realtors
  - New Haven Middlesex Association of Realtors
  - New Hampshire Association of Realtors Green Symposium

- **Partnered with Craig Foley to craft message**

- **Advised on creation of online solar course for realtors**

- **Created resources for realtors, lenders, and appraisers**

- **Supported CT and Regional efforts**
Thank You!

**Joe Buonannata**  
Associate Manager, Residential Programs  
(860) 257-2172  
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**Visit:**  
[www.ctgreenbank.com](http://www.ctgreenbank.com)  
[www.energizect.com](http://www.energizect.com)  
[www.gosolarct.com](http://www.gosolarct.com)
THE FUTURE OF HELIX

Carolyn Sarno Goldthwaite, NEEP
Year 1: Research and Scoping

Year 2: Development and Testing

Year 3: Full Implementation
Capturing the sun!
Partnership with LBNL / DOE SETO

Photo credit: newportsolarri.com
What’s next .......

• Different kinds of home energy performance data
  • HES Assessors
• A.I. Green Addendum
• Energy Codes
  • Fostering code compliance
  • Energy Certificate repository
"Give me six hours to chop down a tree and I will spend the first four sharpening the axe."

— Abraham Lincoln, former U.S. President
The Business Plan

• Long term plan
  • looking beyond the grant period

• Stakeholder Input
  • State, Communities, Utility Program Admins etc.

• Cost scenarios $
  • Examples
    • All data publicly sourced
    • Both publicly sourced and local program data
    • Interface/integration with home energy audit tool, low level of in-house data management
  • States, Local Governments, MLS’s, data providers

Affordable, Flexible, Customizable Solution!
Training & Education
https://neep.org/initiatives/resilient-high-performance-buildings-communities/green-real-estate-resources

Photo Credit: SolarWorld Americas
89%  
20 Days
Feedback

- Presentations
- Location
- What do you know to know more about?
Thank you for attending today!
Happy Holidays!
For more information, contact:
cgoldthwaite@neep.org
Scaptuo@neep.org