

Welcome to the 2018 Summit!



HELIX

Home Energy Labeling Information eXchange



SUSTAINABLE REAL
ESTATE
CONSULTING
SERVICES





WELCOME

Carolyn Sarno Goldthwaite, NEEP

Welcome to the 3rd HELIX Summit!



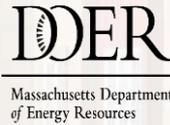
U.S. DEPARTMENT OF
ENERGY

ne
ep



HELIX

Home Energy Labeling Information eXchange



SUSTAINABLE REAL
ESTATE
CONSULTING
SERVICES



Northeast Energy Efficiency Partnerships



“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

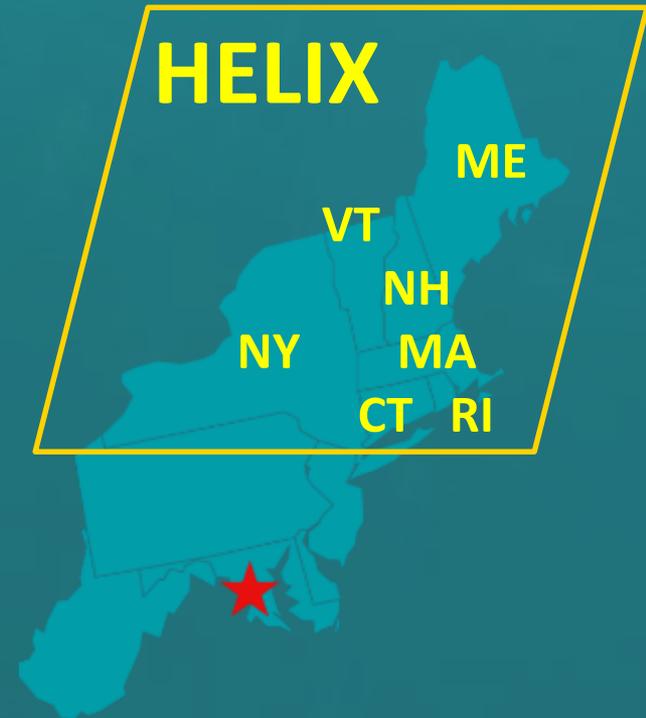
We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

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!

ne
ep



STATE OF RHODE ISLAND

OFFICE OF
ENERGY RESOURCES

nationalgrid



ENERGY • ECONOMY • EQUITY • 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



Susan Coakley, NEEP

SO WHAT IS THIS HELIX I KEEP HEARING ABOUT?

Samantha Caputo, NEEP
Véronique Bugnion, ClearlyEnergy



HELIX

Home Energy Labeling Information eXchange

Projects

Inventory

Data

Contact

HELIX

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.

Upload your buildings list

Getting Started Guide

Highlights of HELIX Database



SUSTAINABLE REAL ESTATE CONSULTING SERVICES



What Is HELIX?

HELIX facilitates consolidation of energy data in a single portal



Who Is Using HELIX?

HELIX has 7 States in efficiency pilot; 20 solar States

Data Intake

Data Front-End
&
Management

Data Export



NYStateMLS

What Do States Want to Use HELIX For?

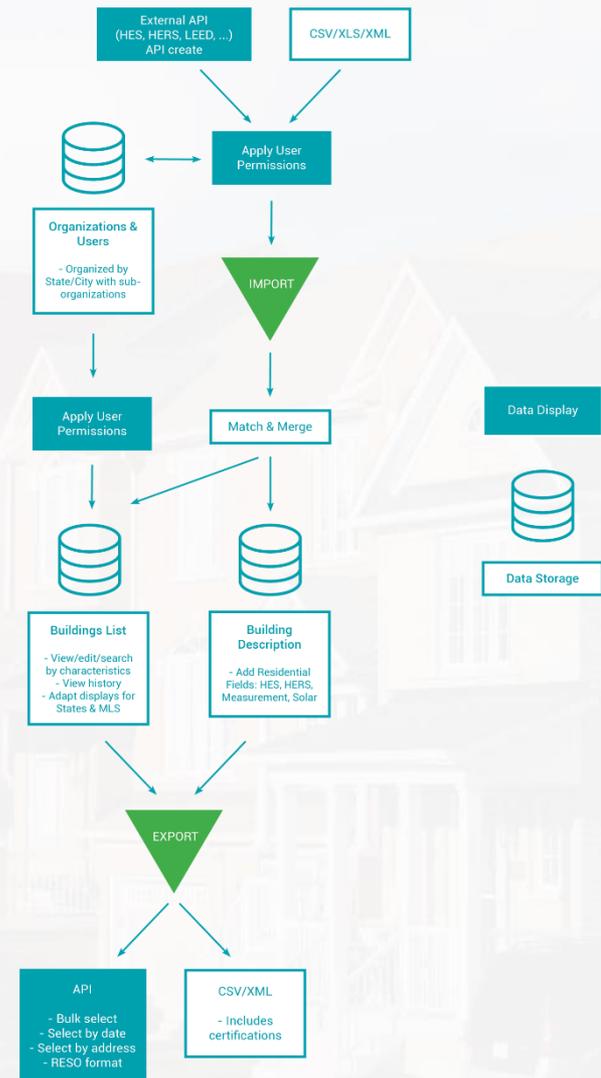
	CT	ME	MA	NH	RI	VT
National Program Certification Program Data						
Certified Passive House (Passive House Institute)	✓		✓	✓	✓	✓
ENERGY STAR Certified Homes	✓		✓	✓	✓	✓
HERS Index Score	✓		✓	✓	✓	✓
Home Energy Score	✓		✓	✓	✓	✓
Home Performance with ENERGY STAR	✓		✓	✓	✓	✓
Indoor airPLUS	✓		✓			✓
LEED For Homes	✓		✓	✓	✓	✓
NGBS New Construction						✓
PHIUS+ (Passive House Institute US)			✓			✓
WaterSense	✓		✓		✓	
Zero Energy Ready Home	✓			✓	✓	
Other Home Energy Performance Data						
Annual modeled fuel consumption (native units)			✓			✓
Annual modeled total MMBtu			✓			✓
Annual modeled energy costs						
Solar PV data						
Blower door test results	✓	✓	✓	✓	✓	✓
Energy code compliance			✓			✓
Energy efficient products		✓	✓			

	CT	ME	MA	NH	RI	VT
State/Local Program Certification Data						
Mass Save Tier III home			✓			
Mass Save Tier II home			✓			
Mass Save Tier I home (New construction program)			✓			
Connecticut Home Energy Solutions	✓					
Connecticut Home Energy Solutions-Income Eligible	✓					
Connecticut Weatherization Assistance Program (WAP)	✓					
Efficiency Maine rebate programs/measures installed		✓				
Efficiency Vermont Certified						✓
Efficiency Vermont Certified- High Performance						✓
Vermont Home Energy Profile						✓
Efficiency Vermont Home Improvement Certification						✓

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

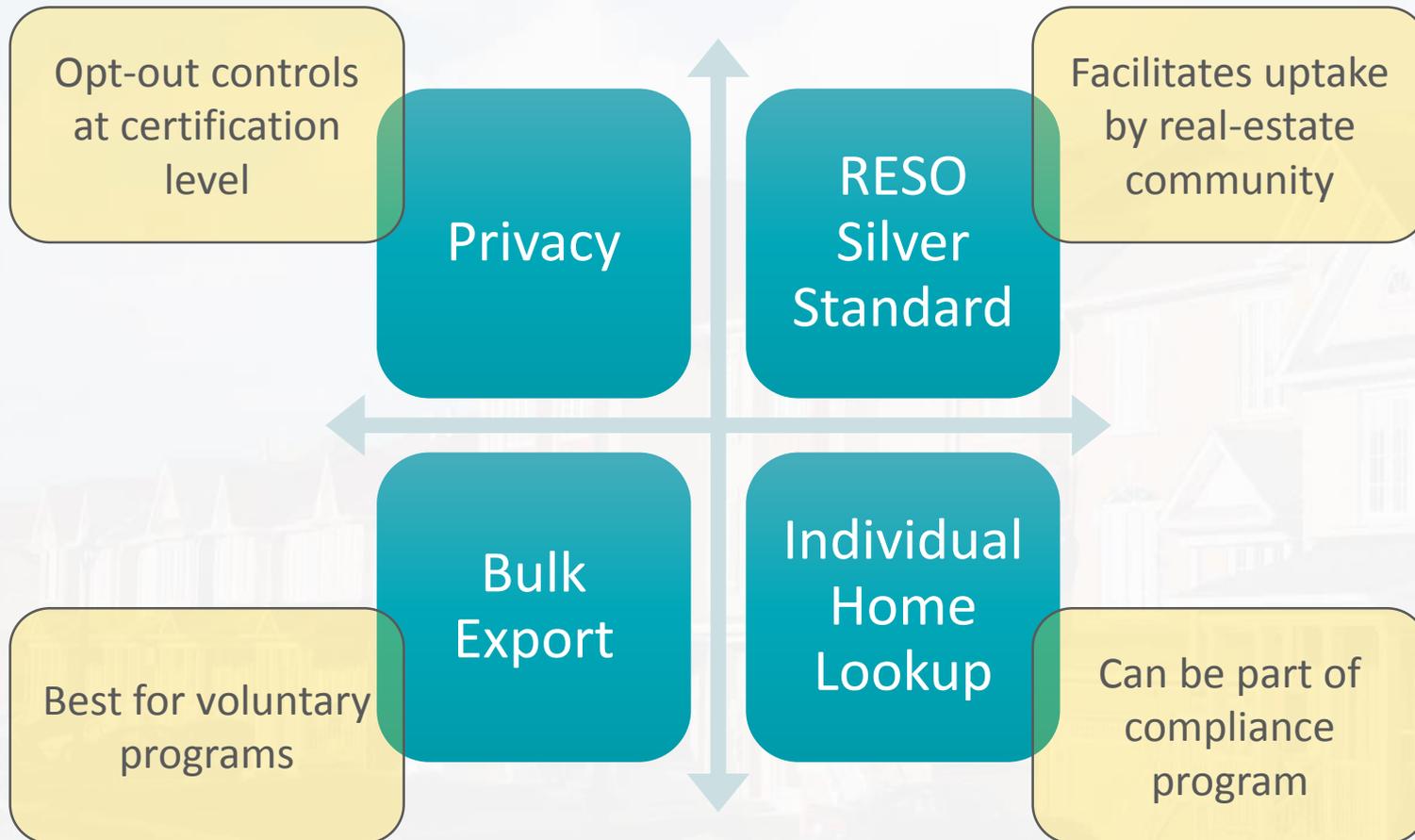
HELIX works across 7 pilot efficiency



HELIX for Cities & States



HELIX for MLSs



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



Massachusetts Department
of Energy Resources



SUSTAINABLE REAL
ESTATE
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SERVICES



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



Home Energy Labeling:

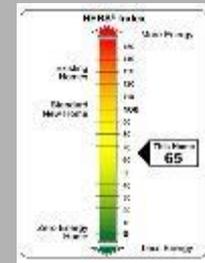
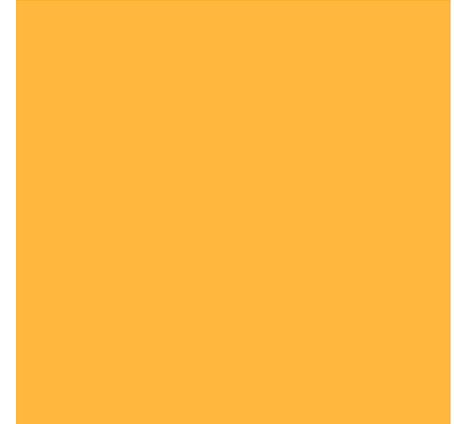
A Guide for State and Local Governments

Created by the EMPRESS Team



The EMPRESS (Energy Metrics to Advance Residential Energy Scorecards in States) project is a State Energy Office-led 2017-2020 project supported by funding from the U.S. Department of Energy State Energy Program and private sector partners. The project is focused on enhancing large-scale residential home energy labeling and harmonizing existing energy scoring programs to better support the market valuation of energy efficient homes.

Project Partners include: the Rhode Island Office of Energy Resources, the Massachusetts Department of Energy Resources, the Missouri Division of Energy, the Arkansas Energy Office, the Oregon Department of Energy, the National Association of State Energy Officials, Earth Advantage, Energy Futures Group, and Vermont Energy Investment Corporation.



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



Resources

- EMPRESS: <http://empress.naseo.org>
- HELIX: <https://neep.org/home-energy-labeling-information-exchange-helix>
- Home Energy Information Accelerator: <https://betterbuildingsinitiative.energy.gov/accelerators/home-energy-information>





Thank you

Ed Carley

National Association of State Energy Officials

Senior Program Manager, Buildings

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ecarley@naseo.org





Home Energy Score

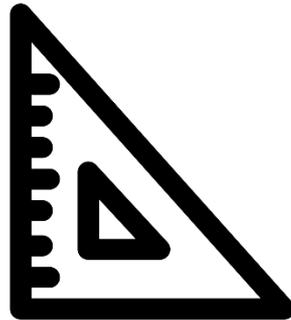
Data Everywhere Panel
HELIX Summit 2018

Residential Buildings Are...



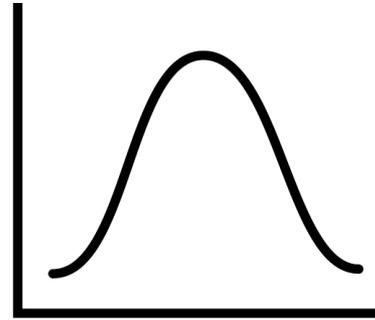
95%

of U.S. buildings



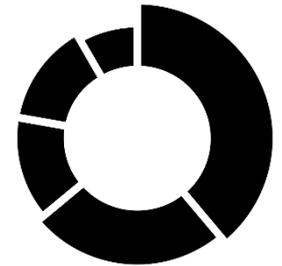
70%

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



Reduce environmental impact.



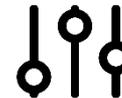
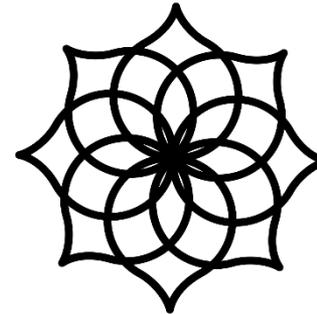
Increased comfort.



Improved health outcomes.



Less draftiness.



Increased control.



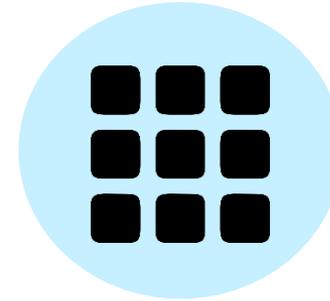
Peace of mind.

Ideal World



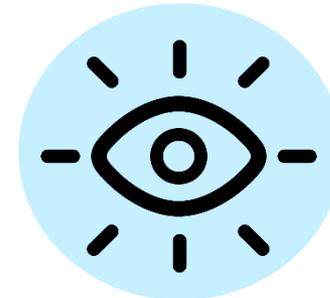
Home Energy Use.

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



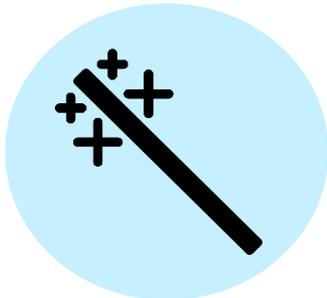
Data Collection & Access.

Data is standardized, useful, and protects personal information.



Data Management & Insight.

Data informs policy design, incentive packages, and goal setting.



Efficiency Upgrade Packages.

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



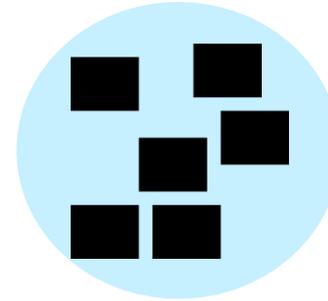
Energy Savings!

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?



Data Management & Insight.

Solutions must be customized, unable to generate comparisons across users.



Efficiency Upgrade Packages.

Impacts are difficult to measure and associated costs are high.



Home Energy Score

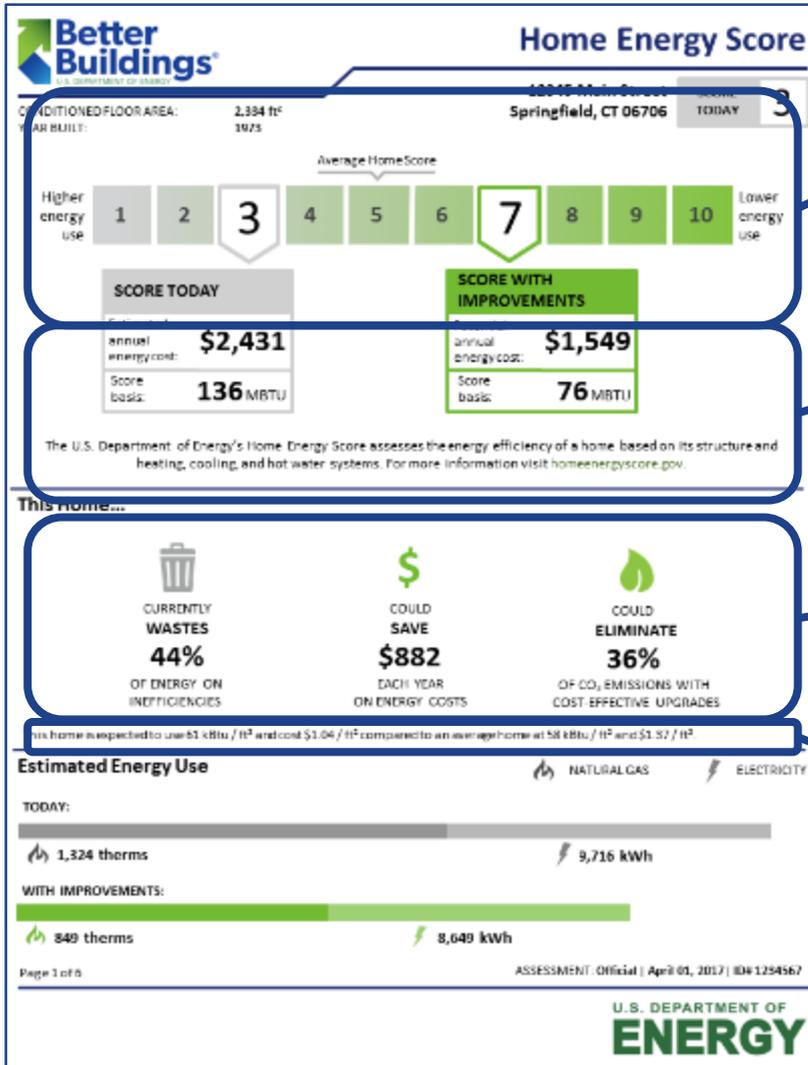
U.S. DEPARTMENT OF ENERGY
Home Energy Score



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

Home Energy Score Report



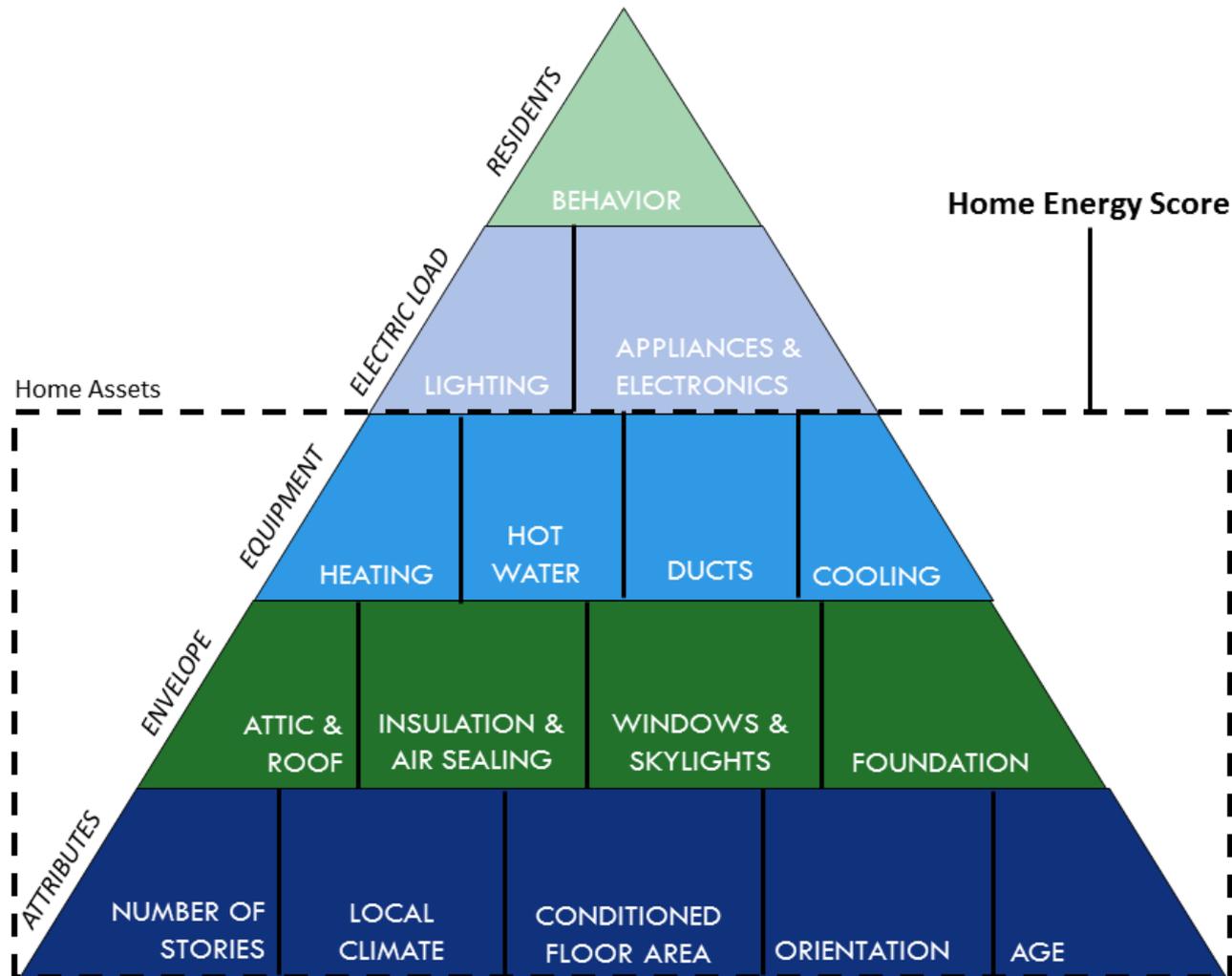
For the Consumer: Easy to understand home rating, motivation to improve and compete.

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.

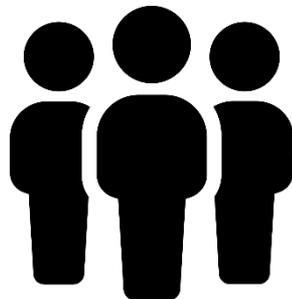
An Asset Rating



Why Not Use Energy Bills?



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



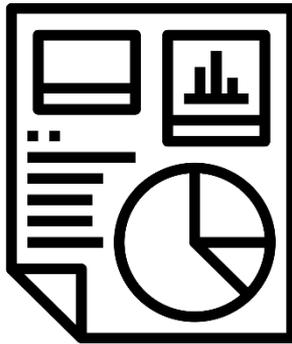
Occupancy Variables. Bills depend on more than just the home assets, like the number of residents and occupancy rate year-round.



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.

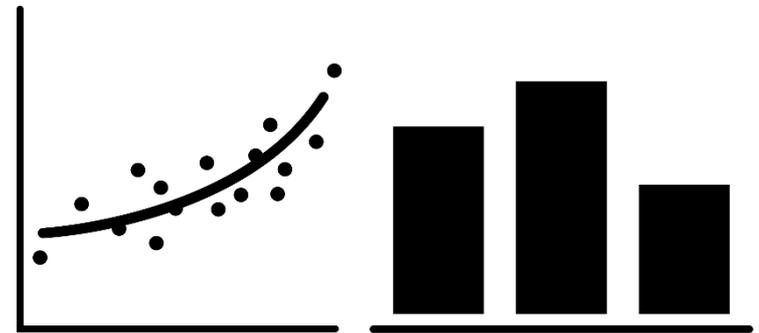
Asset scores rate the home features themselves, leaving residents, their private data, and their preferences out of the equation.

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

Annual Savings Potential

22% **\$600** **2.0**

Energy

Energy Bills

TCO₂eq

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

Data Collected by

500+

Home Energy Score Certified Assessors™
nationwide

Partners & Collaborators Nationwide



nationalgrid



CLEARResult[®]



focus on energy[™]
Partnering with Wisconsin utilities



energize CT[™]
CONNECTICUT



walker-miller
Energy Services



PSEG **LONG ISLAND**



IDENERGY[®]



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>



Home Energy Information Accelerator: Toolkit to Bring Home Energy Data to the Real Estate Market

AUGUST 2018

U.S. DEPARTMENT OF
ENERGY

EnergyPlus Harmonization Effort

Home Energy Score™ 3rd Party Software Providers

SnuggPro

ID Energy

Design
Avenue

Franklin
Energy

AJO

OptiMiser

Pearl

Energy
Savvy

HPXML

API

Output

Home Energy Score™
Scoring Tool

HERS® Software Providers

Ekotrope

PSD

Wrightsoft

Pivotal

Weatherization
Assistance Program's
NEAT Tool

HPXML

API

Output

HPXML

API

Output

HPXML

API

Output

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

HPXML

HPXML

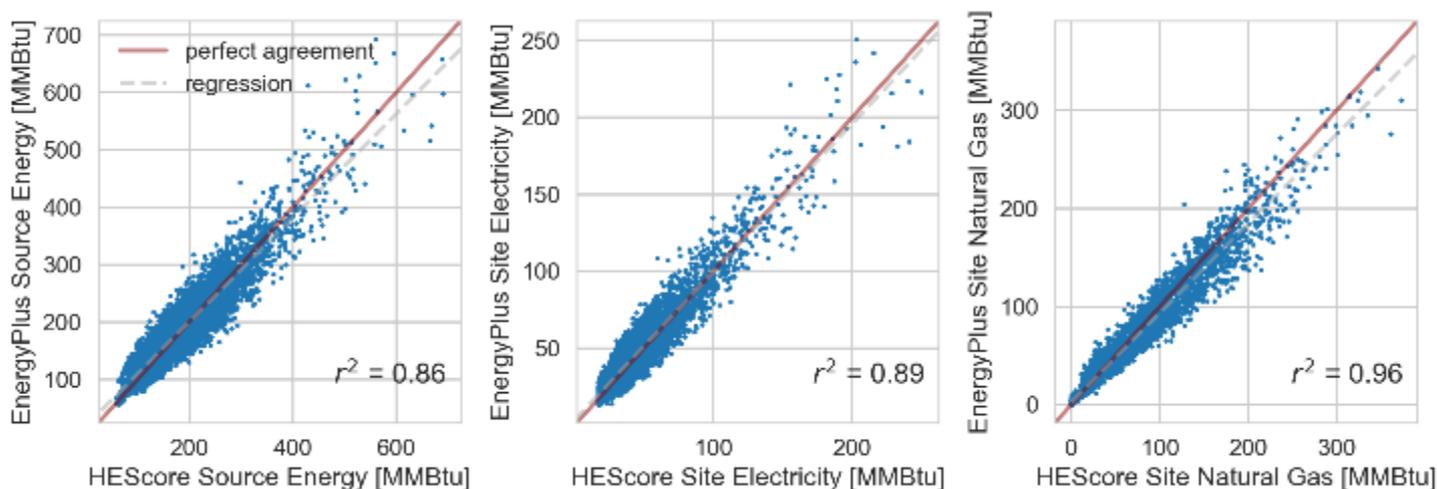
HPXML

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.



Questions?

Madeline Salzman

madeline.salzman@ee.doe.gov

(202) 586-2540



LEED

RESIDENTIAL

ASA FOSS

Director, Residential Technical Solutions



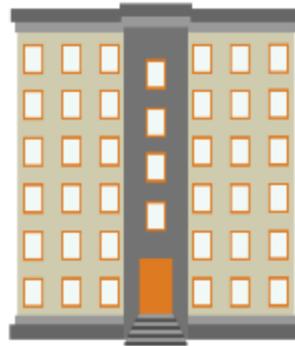
Program Scope and Applicable Building Types



Single-Family Homes



Low-Rise Multifamily



High-Rise



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

SINGLE FAMILY SALES PREMIUM

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)

LEED PREMIUM

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

SEARCH 🔍

BUILDINGS

LEADERS



Search 🔍

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

Overview Collections (0)

Save This 

ACTIVITY SUMMARY

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



77/136
Possible points

LOCATION



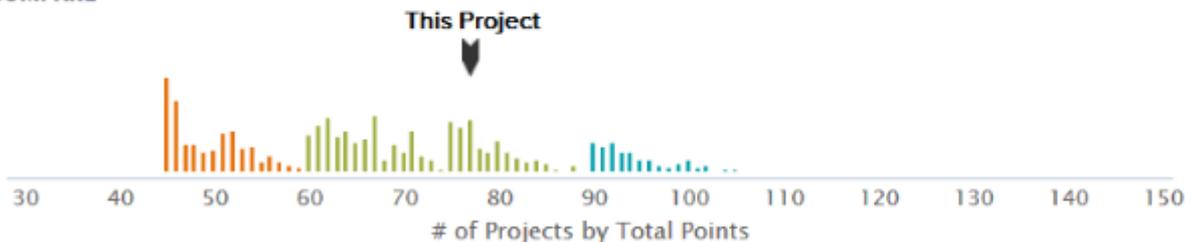
This project is located at:

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

COMPARE



Data on HERS Rated Homes

HELIX Summit ~ December 7, 2018 ~
Providence, RI

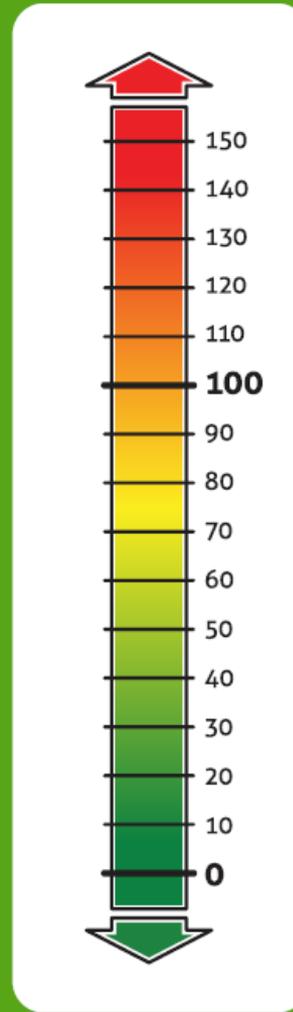
**Ryan Meres, Program
Director
RESNET**



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.



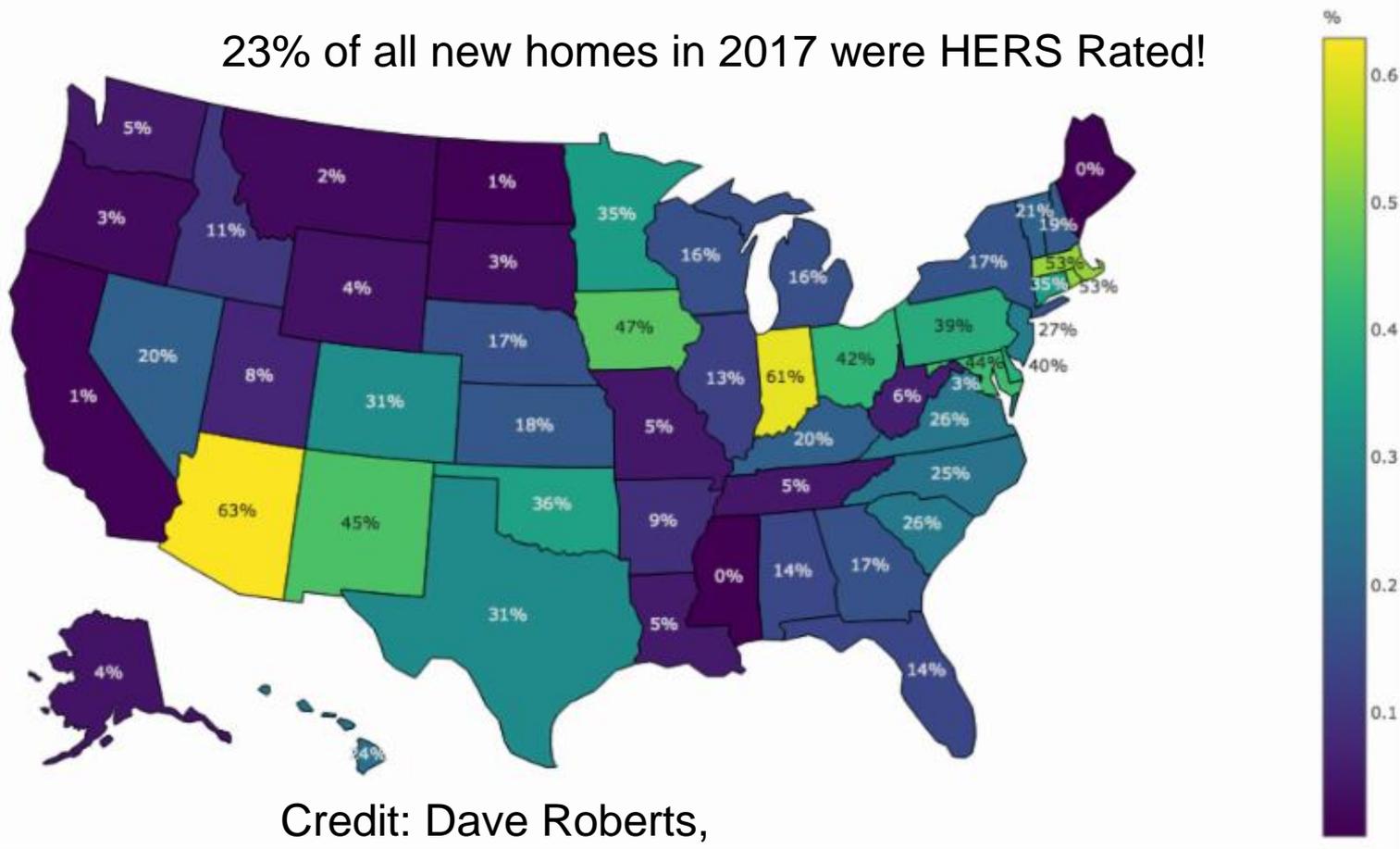
The HERS Index accounts for a home's energy consumption of heating, cooling, water heating, lighting and some appliances.

More Than 2 Million HERS Ratings



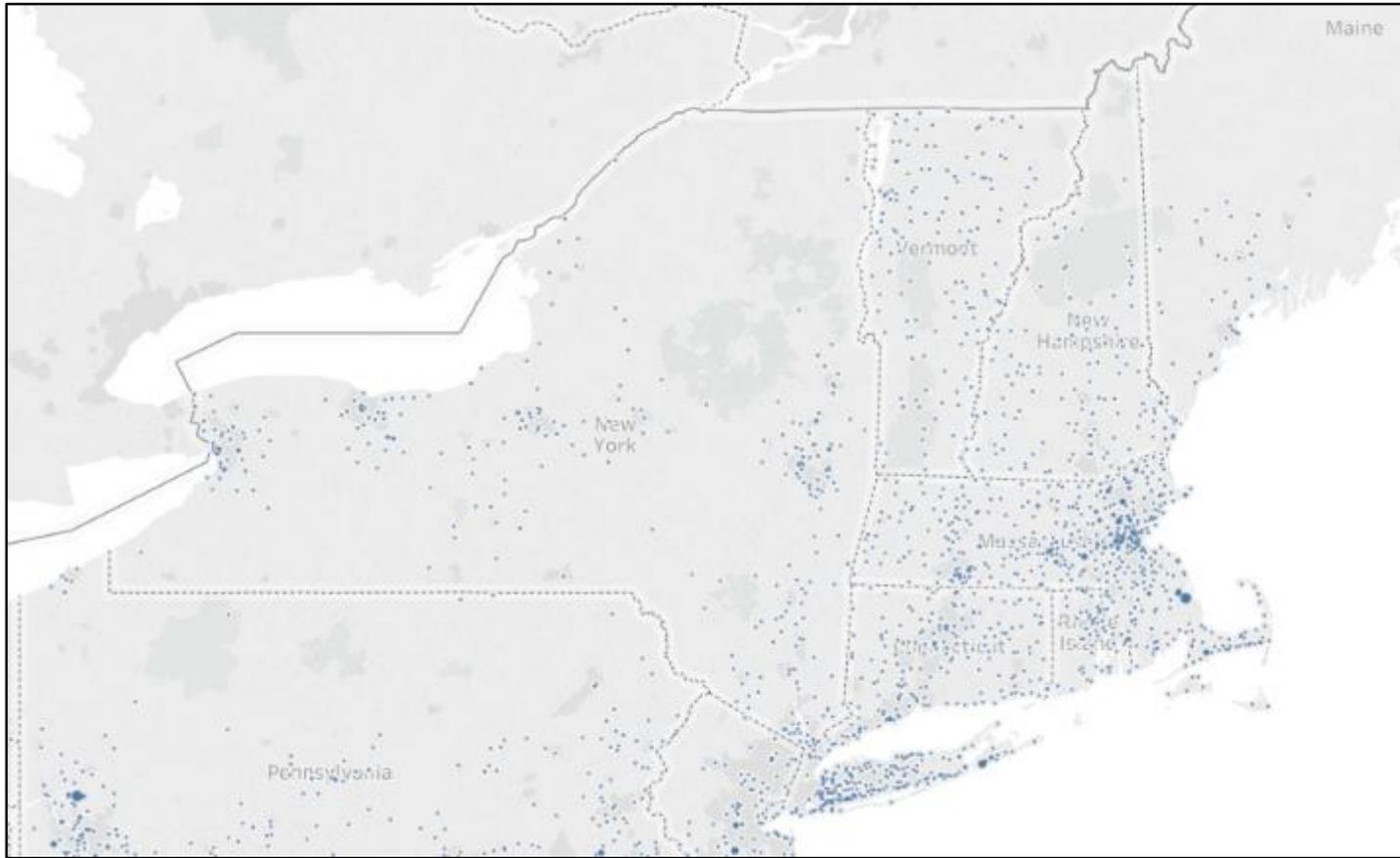
Percentage of New Homes HERS Rated

23% of all new homes in 2017 were HERS Rated!

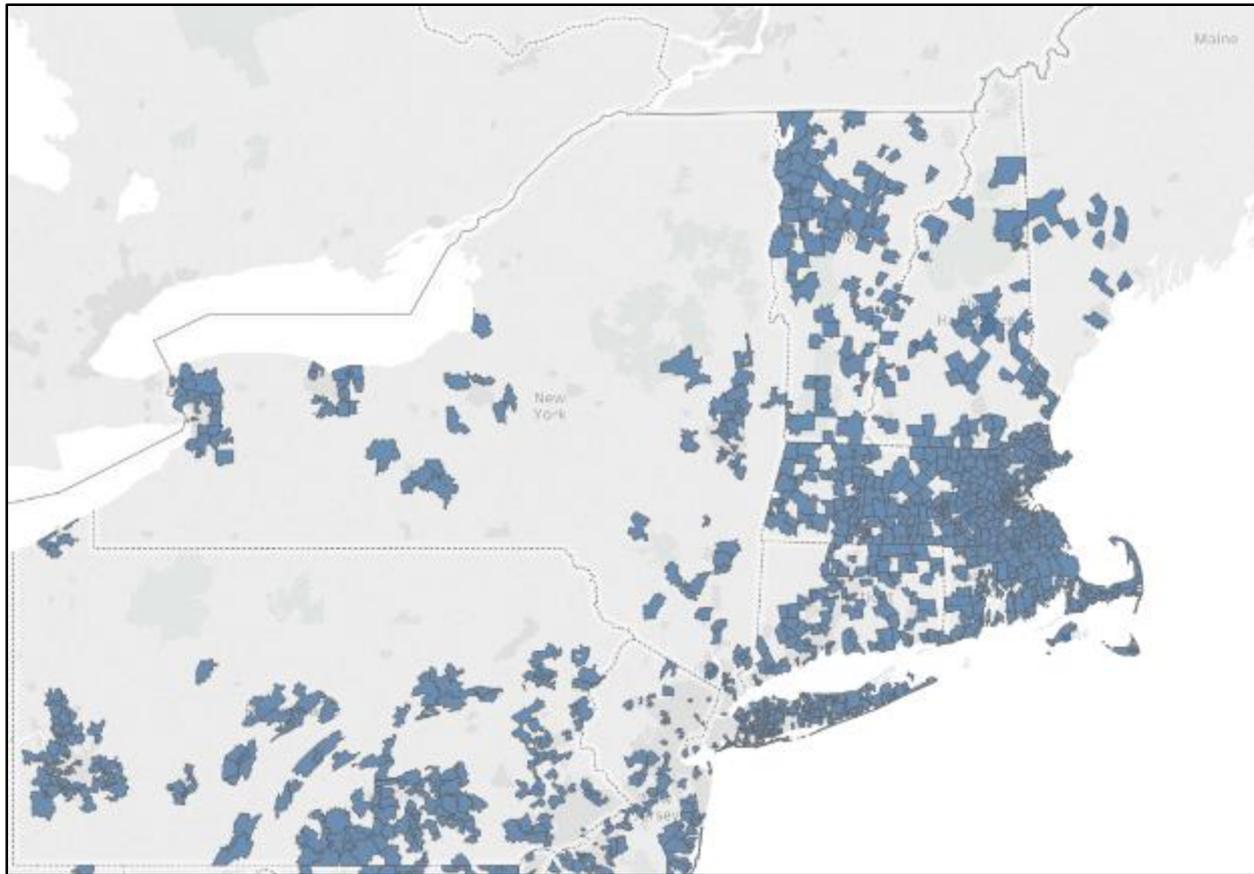


Credit: Dave Roberts,
NREL

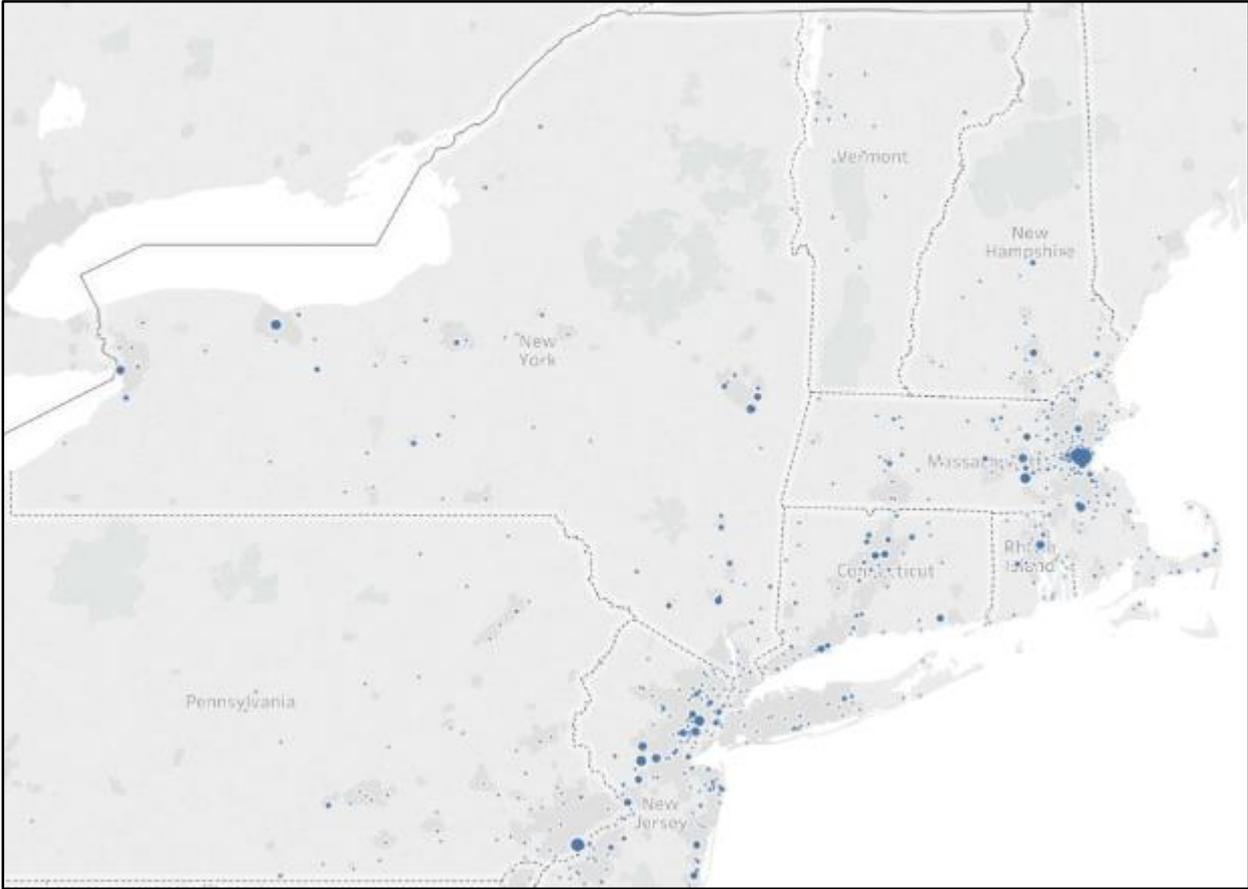
Single Family HERS Ratings, 2014-17



Single Family HERS Ratings by Zip Code, 2017

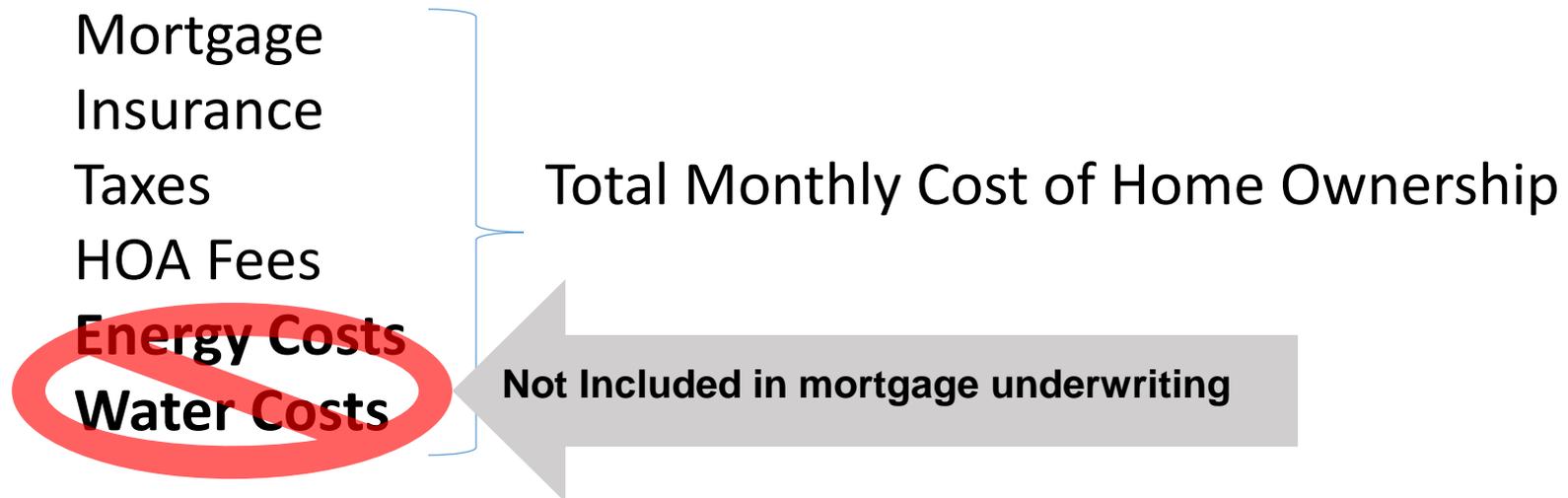


Low-Rise Multifamily HERS Ratings, 2014-17



Energy Costs More than Property Taxes or Insurance

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



RESEARCH REPORT

March 2013

Home Energy Efficiency and Mortgage Risks

Research funded by the Institute for Market Transformation

UNC CENTER for COMMUNITY CAPITAL • INSTITUTE for MARKET TRANSFORMATION

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.

Appraiser Portal

RESNET
RESNET® ENERGY SERVICES NETWORK

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

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

HERS Index score range

Builder

Year of construction

HERS rating company



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



Local/Regional Programs



Utility Programs

Thank you!

Questions?

Contact Info:

Ryan Meres

Program Director

RESNET

ryan@resnet.us

760-681-2391



Setting the Standards for
Home Energy Efficiency



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

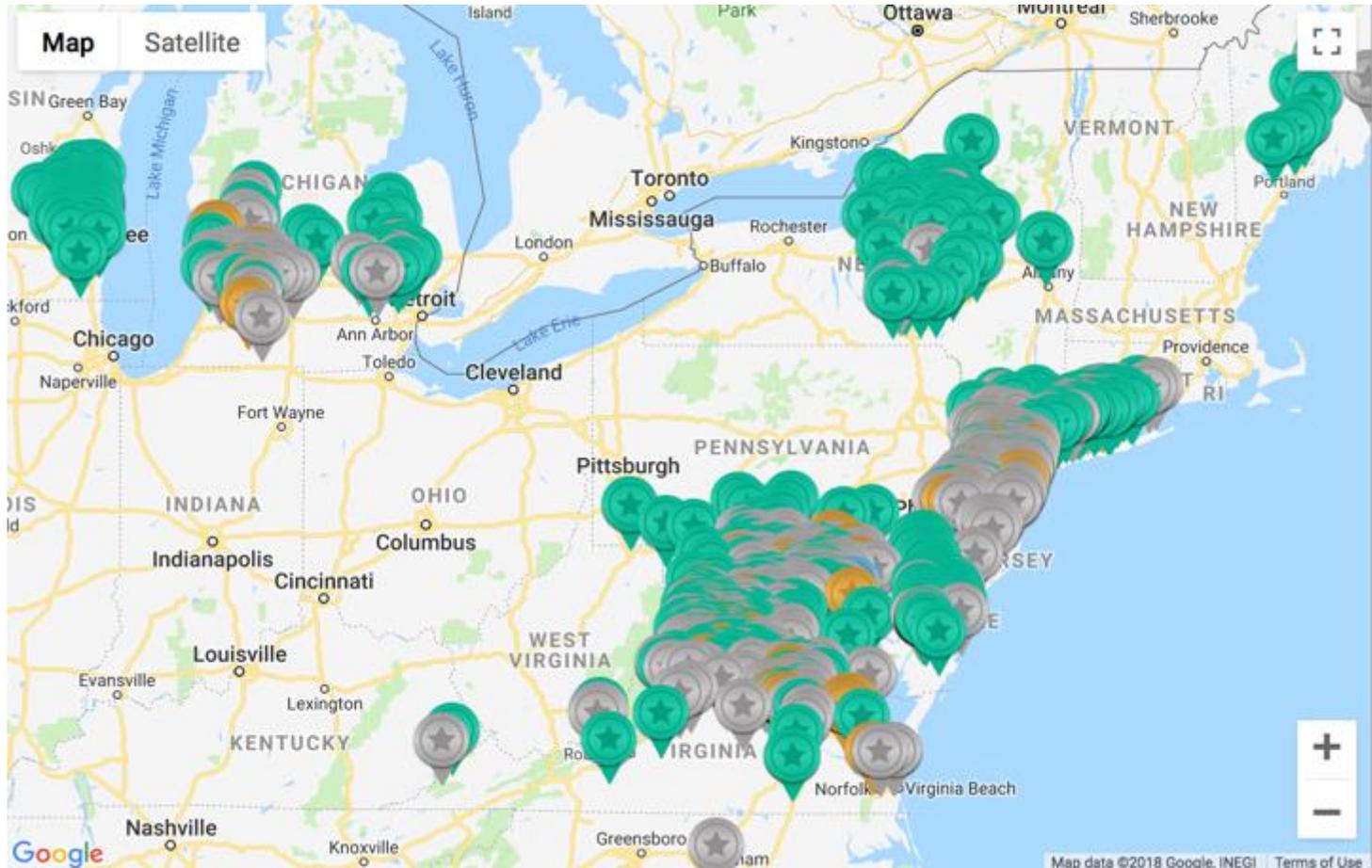


Pearl Footprint



- 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



The Pearl Contractor Advantage Network

“

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

”



The Pearl Broker Advantage Network

“

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

1577 Spring Hill Road
Vienna, VA 22182

Gold Home
Certificate No. H-007171



Pearl Home Certification Report



007171



Certification Date: March 15, 2018

High-Performing Home

1577 Spring Hill Road, Vienna, VA 22182

Gold

High-performing asset specifications can be found in the Pearl Certification Report and Appraisal Institute's *Residential Green and Energy Efficient Addendum* that accompany this certificate.

A handwritten signature in black ink that reads "W. Casey Murphy".

W. Casey Murphy
Pearl VP of Quality
Management

The Home at a Glance



1577 Spring Hill Road,
Vienna, VA 22182

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

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



Building Shell:
281 / 300 points



Heating and Cooling:
254 / 360 points

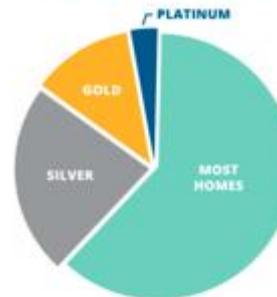


Baseload:
201 / 240 points



Home Management:
224 / 300 points

U.S. Homes Eligible
for Pearl Certification Levels



Pearl Home Certification Report | pearlcertification.com/registry | Page 1

Is My Insulation Better than the



1577 Spring Hill Road,
Vienna, VA 22182

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

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 2015.



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.

Detail for the Early Adopter Geeks



1577 Spring Hill Road,
Vienna, VA 22182

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

HOME ASSET DETAILS
Building Shell



Platinum Level: **244**
This Home: **281**
Average Home: **150**

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

Pearl Home Certification Report | [pearlcertification.com/registry](#) | Page 8



and yes, a completed AI Addendum

Client:	Jane Doe	Client File #:	
Subject Property:	1577 Spring Hill Road, Vienna, VA 22182	Appraisal File #:	

EFFICIENCY FEATURES (Water, Energy, and Environmental. See types defined in glossary).			
The following items are considered within the appraisal analysis of the subject property:			
Insulation	<input type="checkbox"/> Fiberglass Blown-In <input checked="" type="checkbox"/> Foam Insulation <input type="checkbox"/> Cellulose <input checked="" type="checkbox"/> Fiberglass Batt Insulation <input checked="" type="checkbox"/> R-Value Wall R-19 Ceiling R-49 <input checked="" type="checkbox"/> Other R-15 Conditioned basement		
Building Envelope	Envelope Tightness: 4.0 Unit: <input type="checkbox"/> CFM25 <input type="checkbox"/> CFM50 <input checked="" type="checkbox"/> ACH50 <input type="checkbox"/> ACH natural Instructions: Insert the rating as a number that could be 0.5 to 7ACH50 or higher. The lower the number, the more air tight the envelope. Building Codes for area show maximum Envelope Tightness allowed based on the climate zone. Not all areas have adopted a building code. http://hcap-energy.org/		
Windows	<input type="checkbox"/> ENERGY STAR® <input checked="" type="checkbox"/> Low E <input type="checkbox"/> High Impact <input type="checkbox"/> Storm	<input checked="" type="checkbox"/> Double Pane <input type="checkbox"/> Triple Pane	<input type="checkbox"/> Tinted <input type="checkbox"/> Solar Shades
Day Lighting	<input type="checkbox"/> # of Skylights:	<input type="checkbox"/> # of Solar Tubes:	<input type="checkbox"/> Other (Describe): % of lighting LEDs: 20
ENERGY STAR® Appliances	ENERGY STAR®: <input checked="" type="checkbox"/> Dishwasher <input checked="" type="checkbox"/> Refrigerator <input type="checkbox"/> Washer/Dryer <input type="checkbox"/> Other Energy Source: <input type="checkbox"/> Propane <input type="checkbox"/> Electric <input type="checkbox"/> Natural Gas <input type="checkbox"/> Other (Describe): Note: ENERGY STAR® appliances do not result in an ENERGY STAR® Home.		
Water Heater	<input checked="" type="checkbox"/> ENERGY STAR®	Size: <=55 gallons <input type="checkbox"/> Tankless	<input type="checkbox"/> Solar (next page) <input type="checkbox"/> Heat Pump <input type="checkbox"/> Coil
HVAC & Related Equipment Describe in comments area.	<input type="checkbox"/> High Efficiency HVAC SEER: 14.0 Efficiency Rating % AFUE* 85.0% *Annual Fuel-Utilization Efficiency	<input type="checkbox"/> Heat Pump Efficiency Rating: COP: HSPF: SEER: EER:	Thermostat/Controllers? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Programmable Thermostat? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Auxiliary Heat Source? <input type="checkbox"/> Yes <input type="checkbox"/> No Radiant Floor Heat? <input type="checkbox"/> Yes <input type="checkbox"/> No Geothermal? <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Vehicle Ready? (car charger) <input type="checkbox"/> Yes <input type="checkbox"/> No
Indoor Environmental Quality	<input checked="" type="checkbox"/> Energy (ERV) or Heat Recovery Ventilator (HRV) <input checked="" type="checkbox"/> Other Measured Whole-House Ventilation Device (See glossary) <input type="checkbox"/> Humidity Monitoring Device installed		<input type="checkbox"/> Non Toxic Pest Control <input type="checkbox"/> Radon System: <input type="checkbox"/> Active <input type="checkbox"/> Passive
Water Efficiency	<input type="checkbox"/> Reclaimed Water System (Describe): <input type="checkbox"/> Greywater reuse system <input type="checkbox"/> Water Saving Fixtures		<input type="checkbox"/> Rain Barrels Used in Irrigation <input type="checkbox"/> Cistern size: gallons <input type="checkbox"/> Location of cistern:
Utility Costs	Annual Utility Cost: \$ /year, based on: to (full year). Includes (check all that apply): <input type="checkbox"/> Electric <input type="checkbox"/> Heating <input type="checkbox"/> Water <input type="checkbox"/> 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 REPORTS® 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
-------------------------------	--	------------------

The objective of this Addendum is to standardize the communication of the high performing features of residential properties. Identifying the features not found on the appraisal form provides a basis for comparable selection and analysis of the features. Builders, contractors, homeowners, and third party verifiers are encouraged to complete this Addendum and present to appraisers, agents, lenders, and homeowners. Complete the pages that apply to the property appraised and provide to appraiser prior to the completion of an appraisal. Provide the Addendum to the lender at the time of loan application to assist them in understanding the property type so an appraiser with sufficient knowledge of this property type will be engaged to provide an appraisal to meet secondary mortgage market guidelines.



One-Page “Home Highlights” Flyer



1577 Spring Hill Road,
Vienna, VA 22182

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

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

U.S. Homes Eligible for Pearl Certification Levels



Attic Insulation: Top 9% of VA homes

Attic Hatch: Well-insulated

Air Sealing: Top 2% of VA homes

Forced Air Ducts: In conditioned space

Windows: Top 25% of VA homes

Thermostat: Smart home feature

Filters: Very effective

Room Ventilation: Lower indoor humidity

Whole House Ventilation: Better air and energy savings



House Tour Placards



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



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

Level

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



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

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STATE OF RHODE ISLAND
**OFFICE OF
ENERGY RESOURCES**

nationalgrid



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

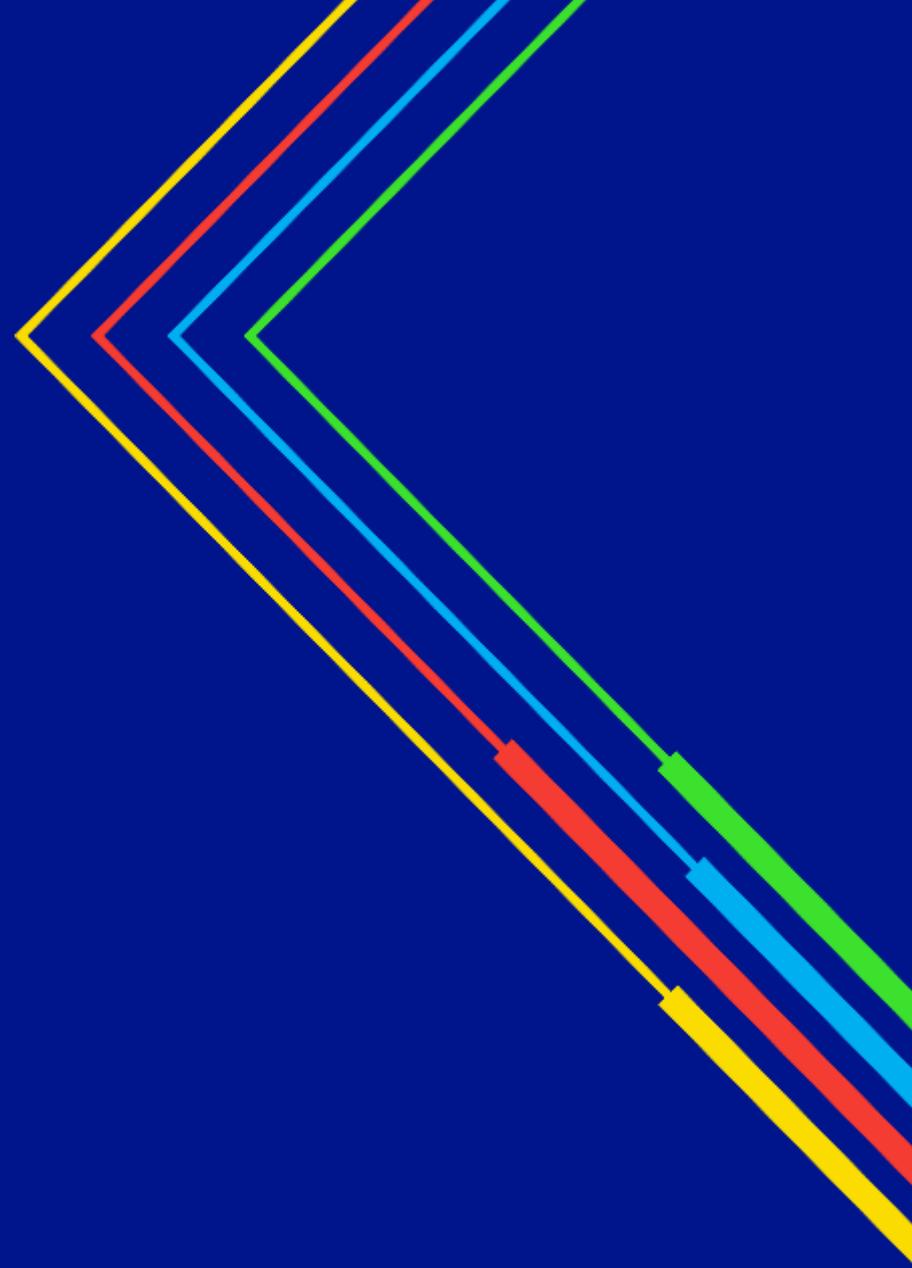
Lisa Timmerman, City of Portland, Oregon

Lauren McNutt, Dunsky Energy Consulting

R.I. DOE HES Pilot

Kevin Rose
12/7/18

national**grid**



Agenda

01 Drivers

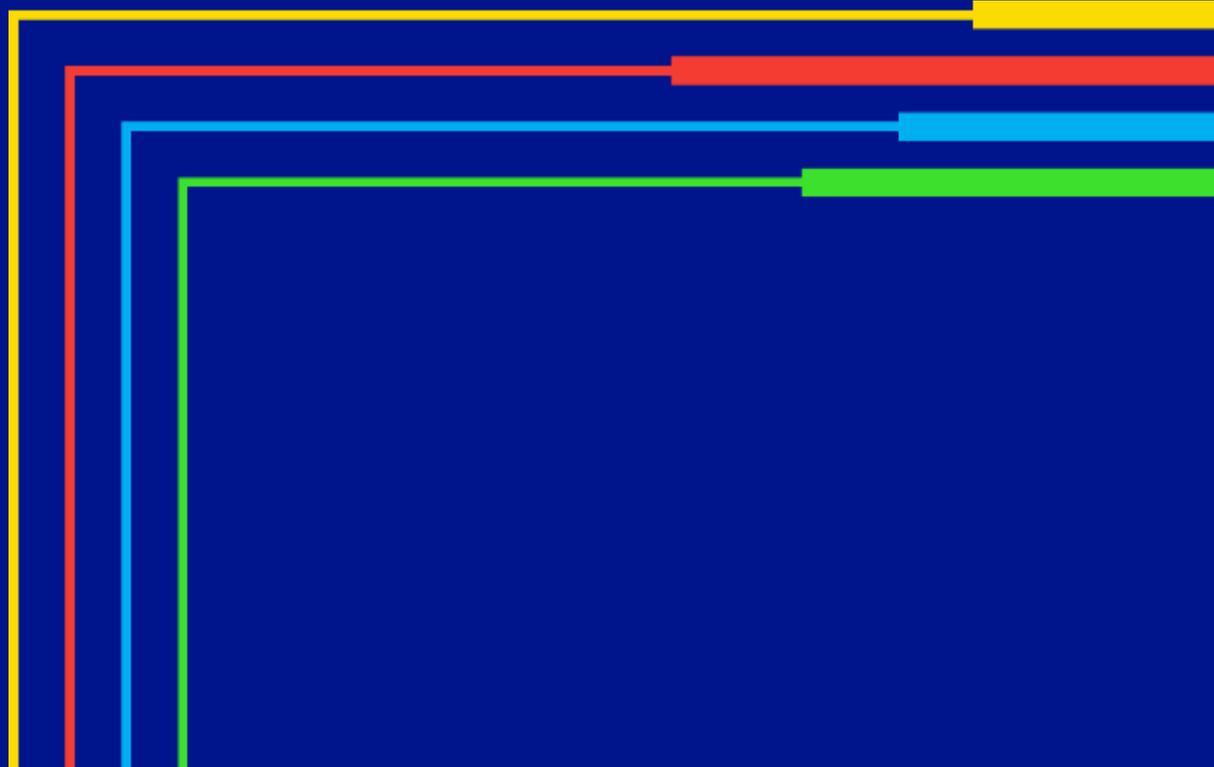
02 Pilot Basics

03 Lessons (so far)

01

Drivers

nationalgrid



Drivers

Short term

Increased retrofit conversion rate?

Mid term

More “repeat customers”?

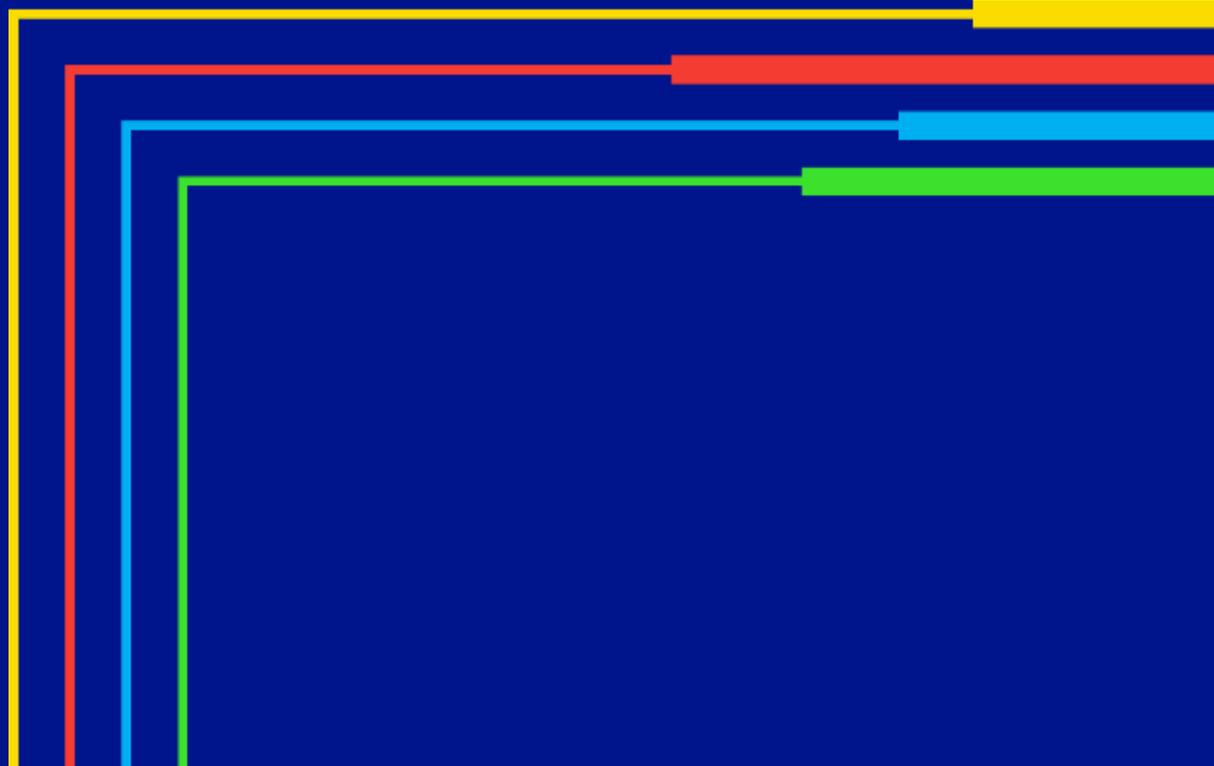
Long term

Market demand for efficiency
Data pipeline

02

Pilot Basics

nationalgrid



Pilot Basics

150 Home Energy Scores

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

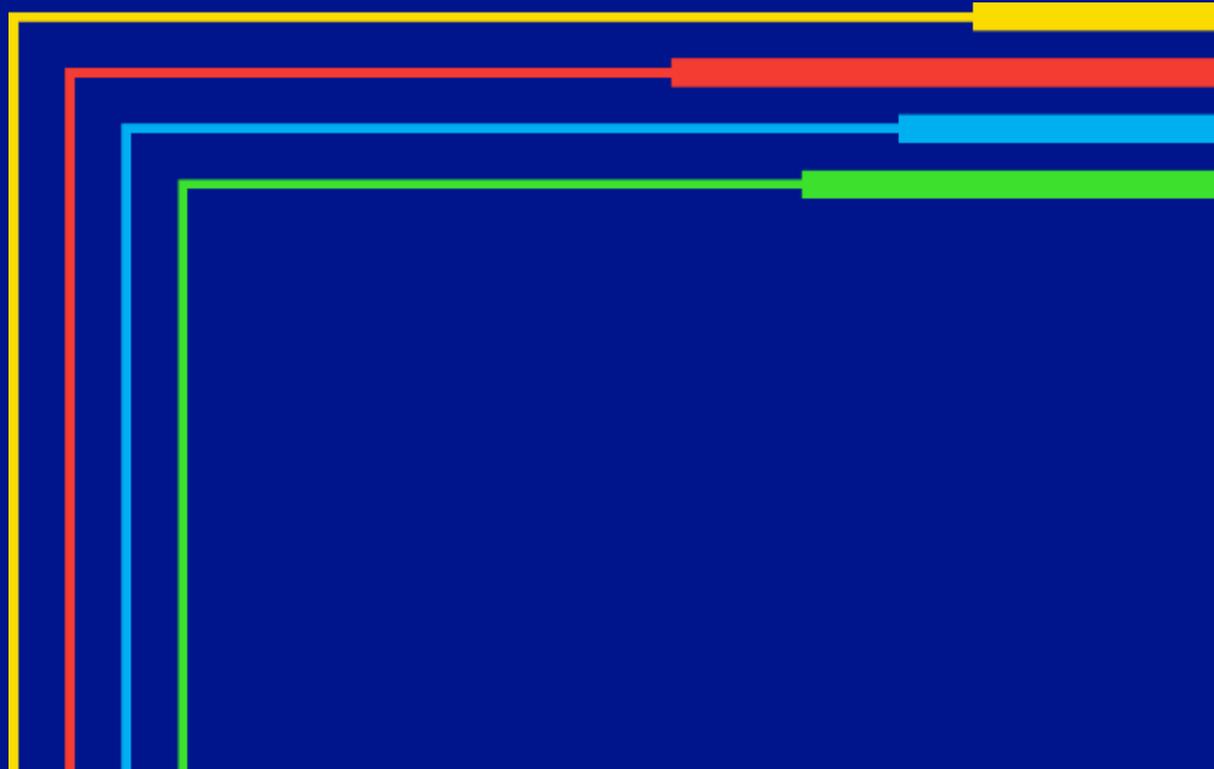


ETA for results: late 2019

03

Lessons
(so far)

nationalgrid



Opt-in Consent Form

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



Connecticut Department of Energy and Environmental Protection

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



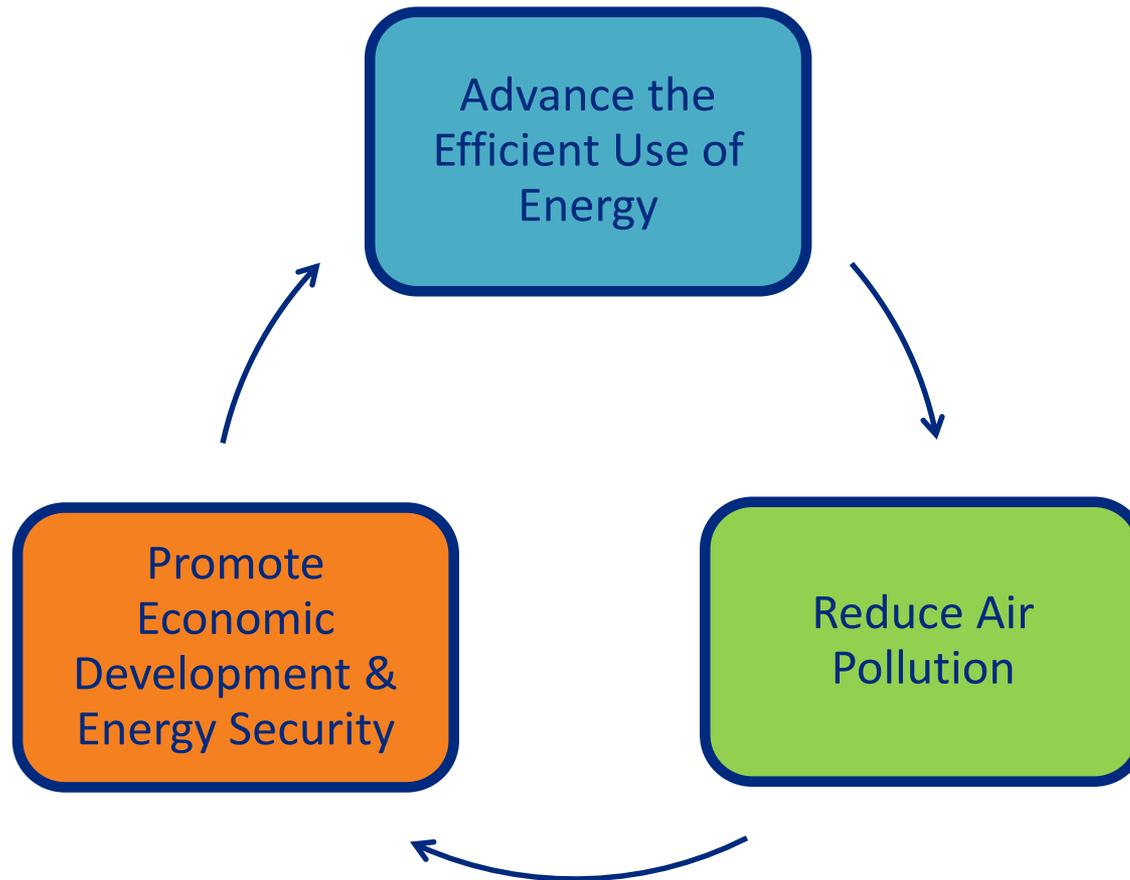
Empowering you to make
smart energy choices



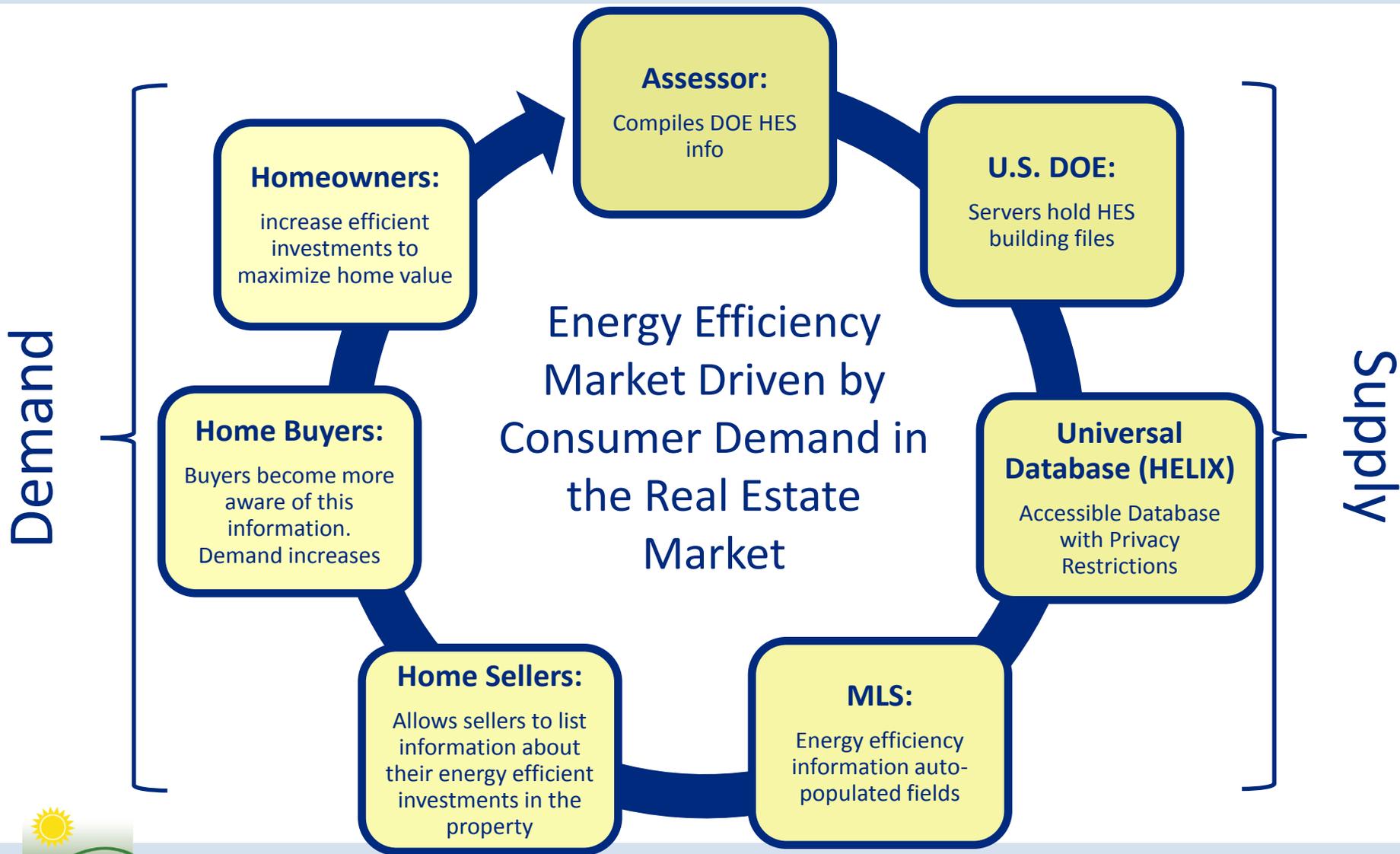
Connecticut Department of Energy and Environmental Protection

Conservation & Load Management

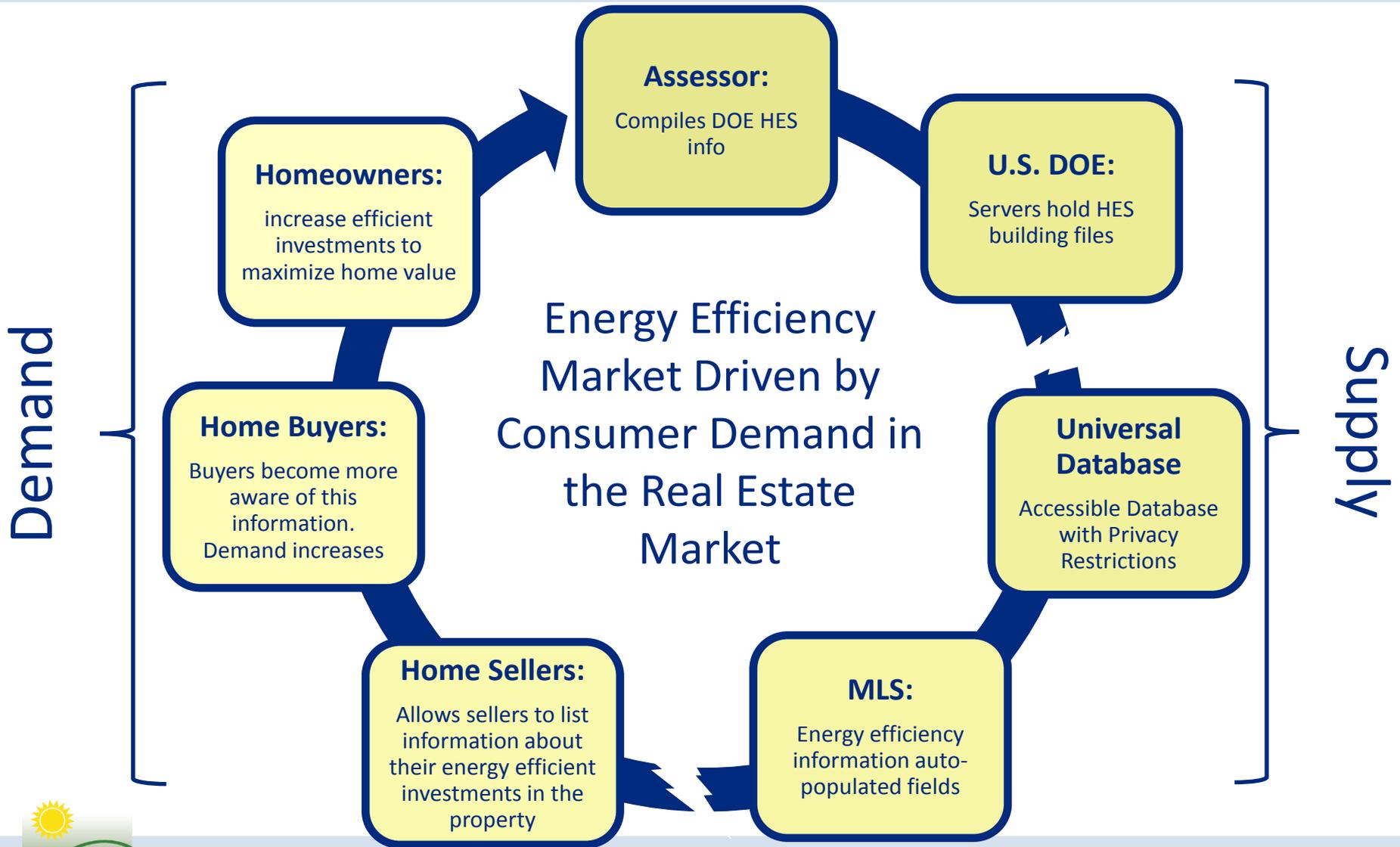
Mission: Public Act 98-28



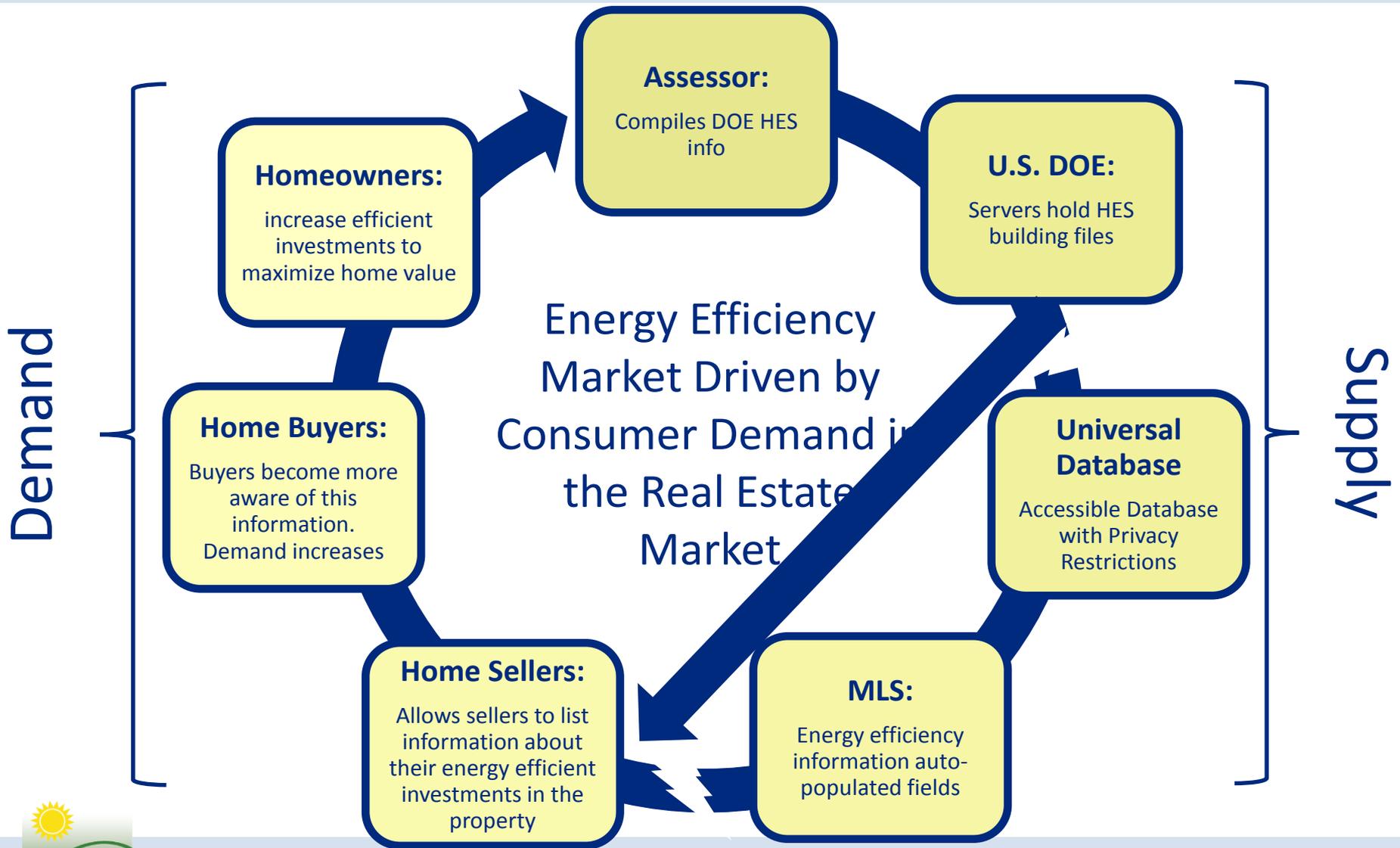
Future State Vision



Future State Vision



Future State Vision



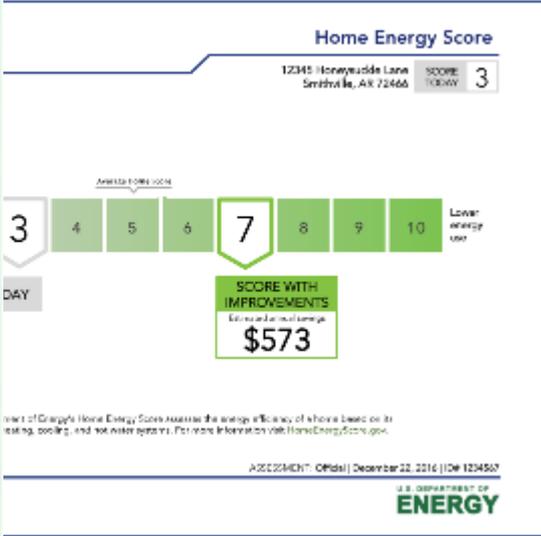
Engagement with the Real Estate Industry/HELIX

- 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 state to implement HES
- Home Energy Score is required for all HES assessments of homes and all HVAC technicians are required to be HES Assessors
- Beginning of 2017, HES will be implemented in Spanish 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

Key to Success: Consistent 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



Key to Success: Consistent Messaging

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.



Connecticut Department of Energy and Environmental Protection

Key to Success: Technical Knowledge

4. “It is difficult to predict a score and explain to a customer why they got what they did,”
 - a. A home’s unique features 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.



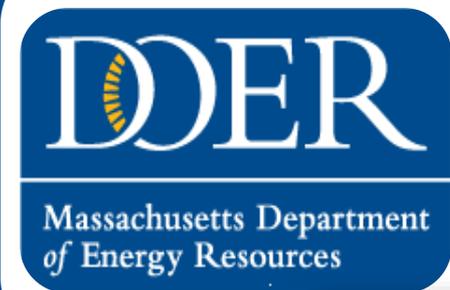
Next Steps: Begin Data Sharing with HELIX

- 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

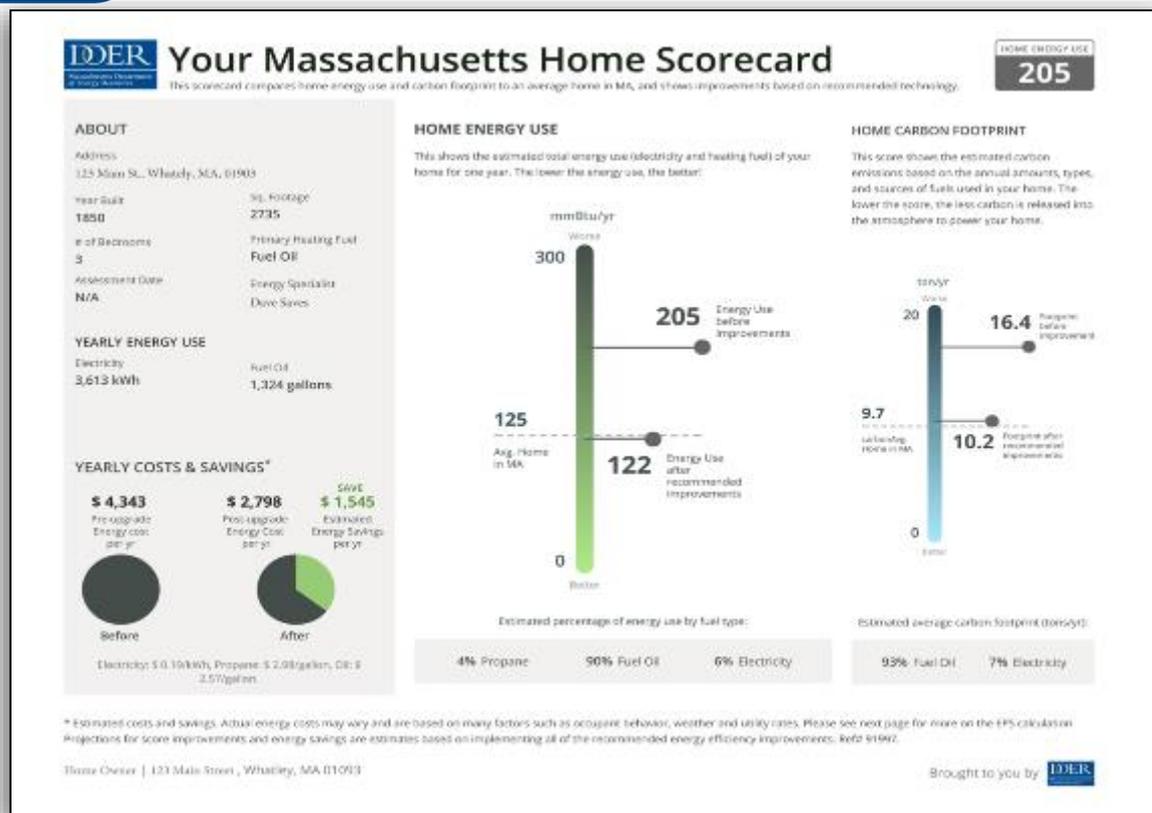




Connecticut Department of Energy and Environmental Protection



Home Energy labeling: lessons learned in MA



Ian Finlayson, Deputy Director, Energy Efficiency Division

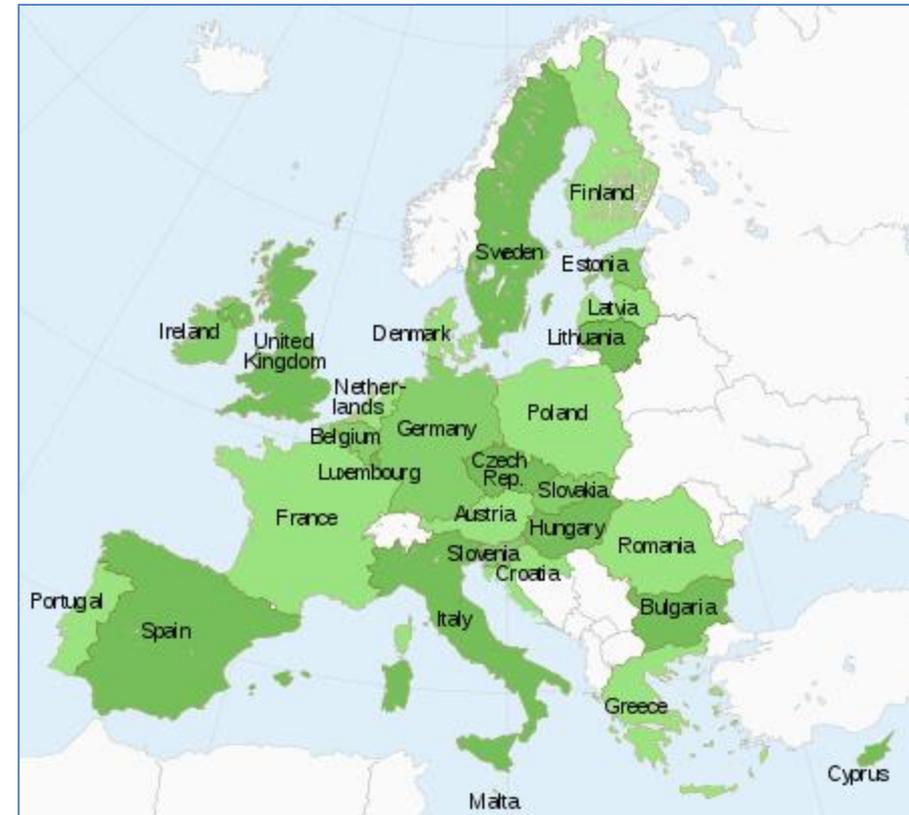
MA Dept. of Energy Resources

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)



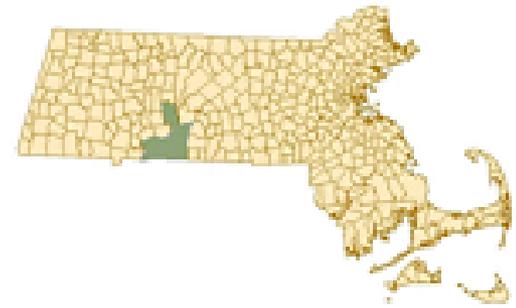
Lessons learned closer to home

- 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



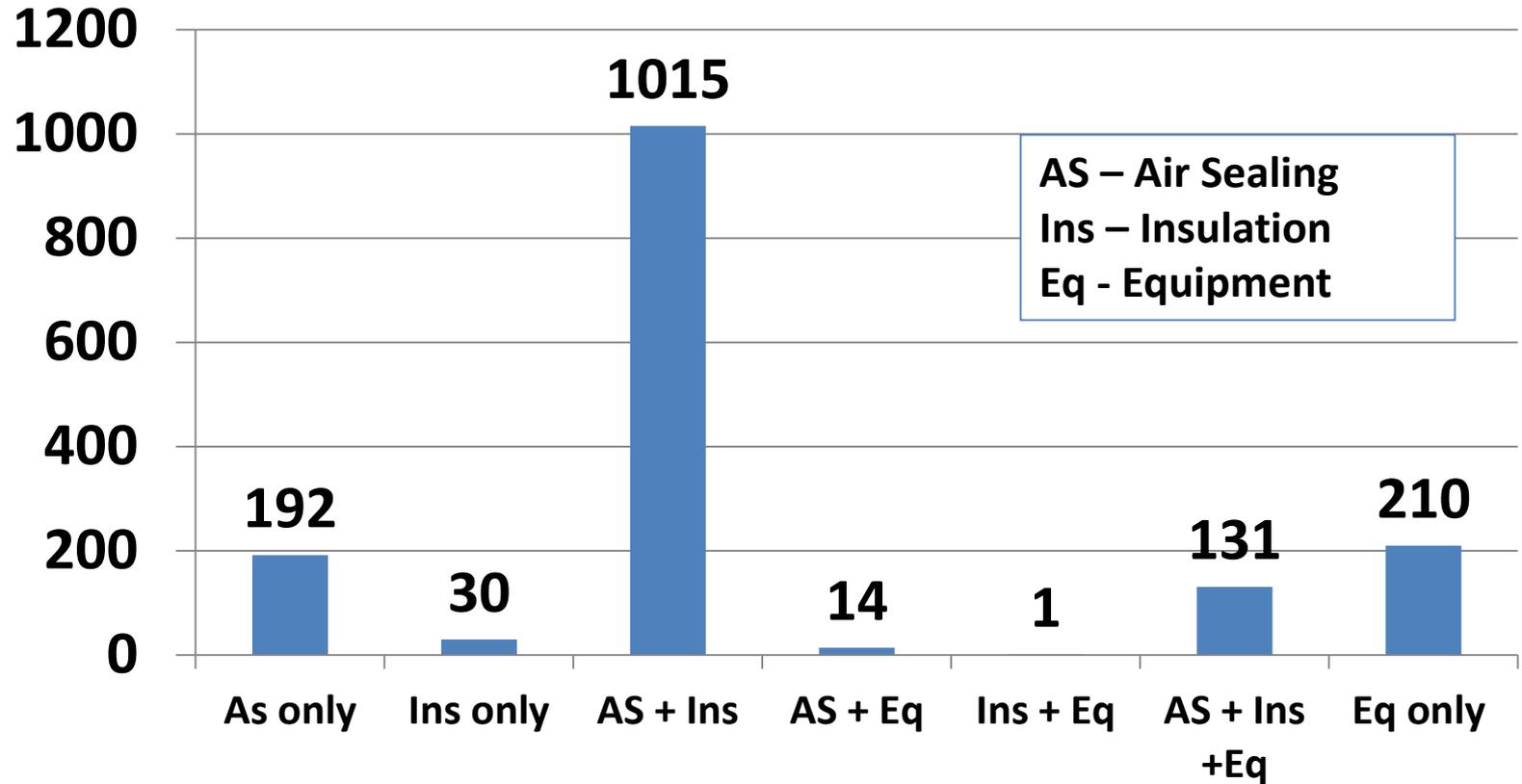
Springfield Area Pilot

\$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: 1407 NE Golf Ct Rd, Dracut, MA 01826 Reference Number: 410000091

● Energy Use: 126 MMBtu/yr	\$1,888	● Carbon Emissions: 8.4 tonnes/yr
⚡ Electric: 7,131 kWh/yr	\$570	⚡ Electric: 3.4 tonnes/yr
🔥 Natural Gas: 1,014 therms/yr	\$1318	🔥 Natural Gas: 5 tonnes/yr

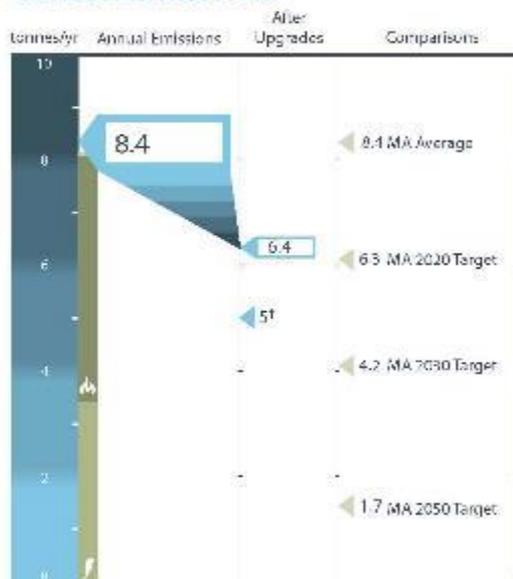
Energy Use



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.

Measured in millions of British Thermal Units (MMBtus/yr).

Carbon Emissions



*With energy from renewable sources

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.

Measured in metric tonnes of carbon per year (tonnes/yr).

Type: Single Family	Audit Date: 10/29/08	 Massachusetts Department of Energy Resources	 Save through energy efficiency
Bedrooms: 4	Auditor: Earth Advantage Institute		
Year Built: 1962	Denvers, MA		
	Ryan		

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



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

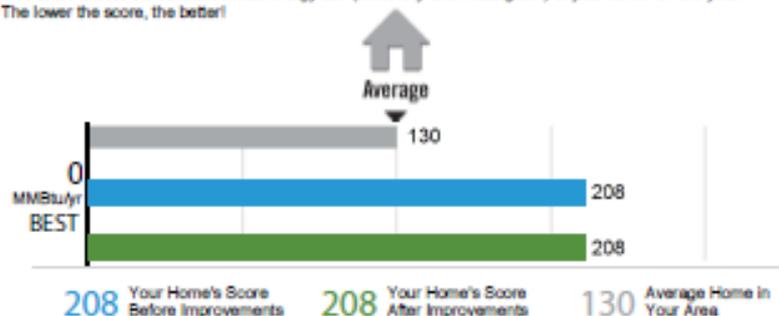
123 Test Street
Testville, NY 14850
Ref #: GSN637

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!



Estimated percentage of energy use by fuel type: Electric: 86% , Natural Gas: 14%
Estimated percentage of energy use by end use: Heating 80%, Cooling 5%, Hot Water 25%,
Appliances and Lighting 10%

THE BOTTOM LINE

PER YEAR

\$0

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

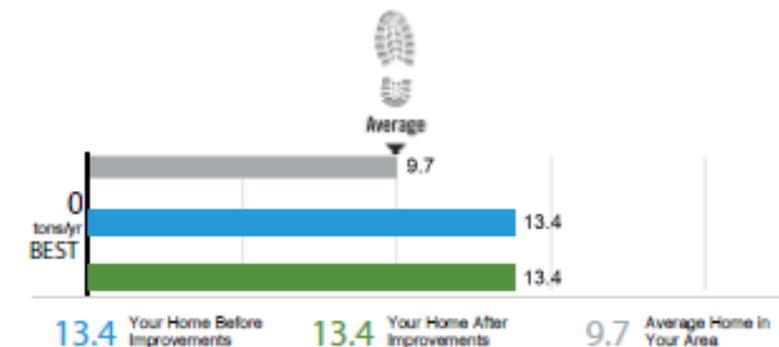
PER YEAR

\$9989

CURRENT ESTIMATED ENERGY COSTS

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.



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 reverse for more on the EPS calculation. Projections for ratings and energy savings are estimates based on implementing all of the recommended energy efficiency improvements.



Western Massachusetts Electric

A Northeast Utilities Company



mass save
Smarter through smart efficiency

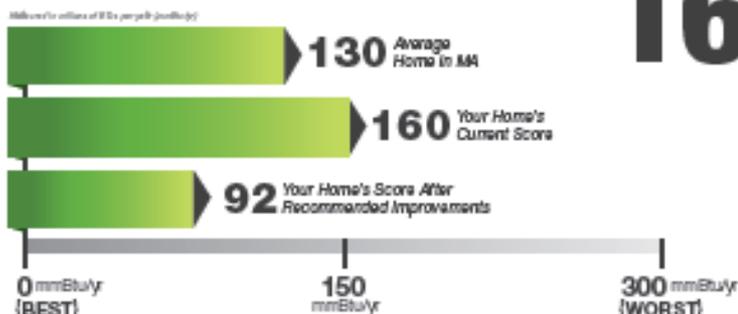


YOUR HOME'S ENERGY PERFORMANCE SCORE

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.

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!



160

Estimated percentage of energy use by fuel type: Electric: <XXXX>, Natural Gas: <XXXX>

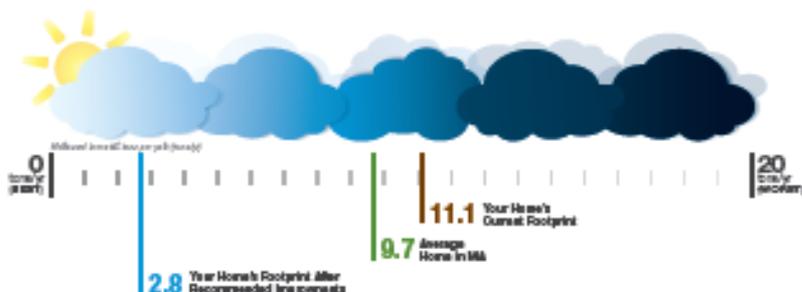
PREPARED FOR
<Customer Name>
<Customer Address>
<City>, <State> <Zip>
Ref #: <Site ID>

Year Built: <XXXX>
Sq Footage: <XXXX>
Bedrooms: <X>
Primary Heating Fuel: <XXXX>

EPS Report Date: <XX/XX/XXXX>
Energy Specialist: <Energy Specialist Name>

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.



11.1

Estimated average carbon footprint (tons/yr): Electric <XX>, Natural Gas <XX>

DOLLARS & SENSE

Current Estimated Energy Costs **\$2000** Per Year



ESTIMATED ENERGY SAVINGS

\$1150

Per Year

Based on implementing all of the recommended energy efficient improvements

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., Whatley, MA, 01903

Year Built 1850	Sq. Footage 2735
# of Bedrooms 3	Primary Heating Fuel Fuel Oil
Assessment Date N/A	Energy Specialist Dave Saves

YEARLY ENERGY USE

Electricity 3,613 kWh	Fuel Oil 1,324 gallons
---------------------------------	----------------------------------

YEARLY COSTS & SAVINGS*

\$ 4,343

Pre-upgrade
Energy cost
per yr



Before

\$ 2,798

Post-upgrade
Energy Cost
per yr



After

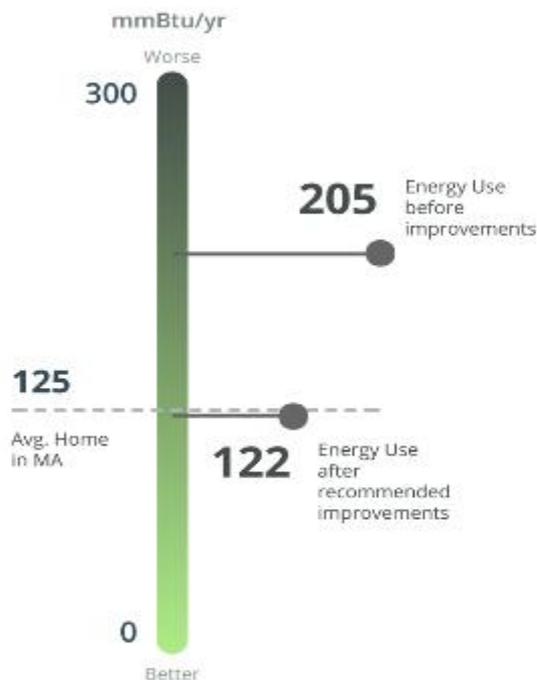
**SAVE
\$ 1,545**

Estimated
Energy Savings
per yr

Electricity: \$ 0.19/kWh, Propane: \$ 2.98/gallon, Oil: \$ 2.57/gallon.

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!

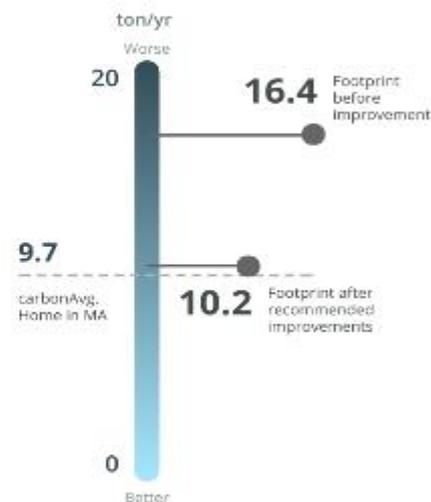


Estimated percentage of energy use by fuel type:

4% Propane 90% Fuel Oil 6% Electricity

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.



Estimated average carbon footprint (tons/yr):

93% Fuel Oil 7% Electricity

* 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.

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



Home MPG Pilot Examples – Large Home

Oil Home in Wilbraham, MA

Year Built: 1956 Sq Footage: 2,891ft²
Bedrooms: 5 Heating Fuel: Oil

Score BEFORE: 195

Score AFTER: 156

Est. Energy Savings: \$908/year

Est. GHG savings: 3.5 tons/year

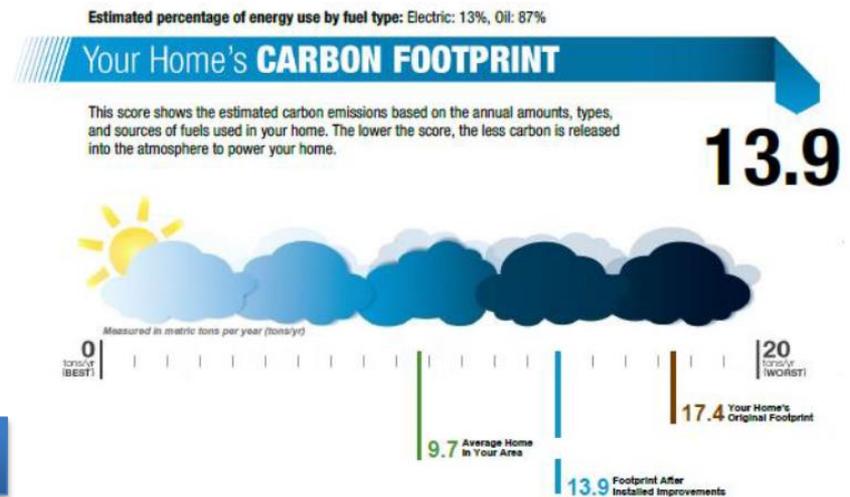
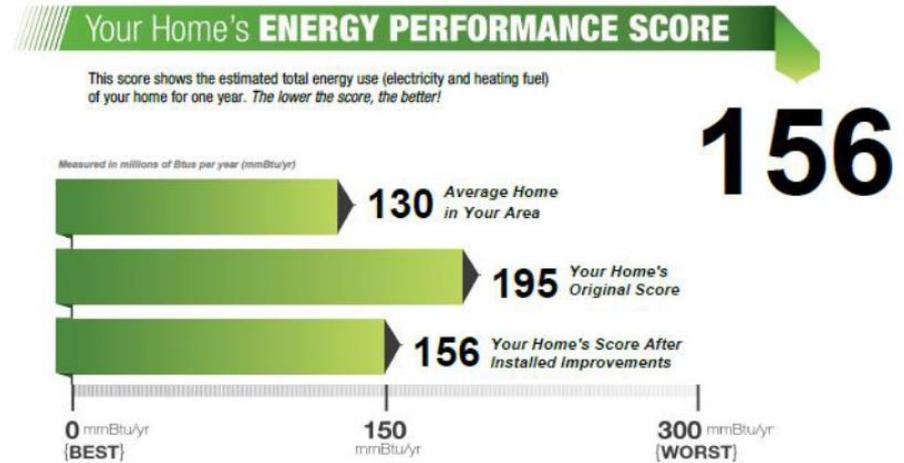
Total Mass Save incentive of \$3672 for:

- 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



U.S. DEPARTMENT OF ENERGY
THIS HOME'S SCORE **4** OUT OF 10

THIS HOME'S ESTIMATED ENERGY COSTS
\$1,507 PER YEAR

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.
 - Need help deciding what to do first? Non-profit Enhabit offers free 15-minute phone consults with expert home advisors. Call 855-870-0049.
- Select a contractor (or two, for comparison) and obtain bids.
 - Checkout www.energytrust.org/findacontractor or call toll free 1-866-368-7878.
- Explore financing options at www.enhabit.org or www.energytrust.org.

*** 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/Roof	Roof insulated to R-11	Insulate cathedral ceiling/roof to R-30 or maximum possible
Duct insulation	Un-insulated	Insulate to R-8
Duct sealing	Un-sealed	Reduce leakage to a maximum of 10% of total airflow
Envelope/Air sealing	Not professionally air sealed	Professionally air seal
Heating equipment	Natural gas furnace 80% AFUE	Upgrade to ENERGY STAR
Water Heater	Standard natural gas tank	Upgrade to ENERGY STAR, minimum 0.67 EF (Energy Factor)
Air Conditioner	None	
Attic insulation	Ceiling insulated to R-30	
Basement wall insulation	None	
Floor insulation	Insulated to R-0	
Foundation wall insulation	None	
Skylights	None	
Wall insulation	Insulated to R-3	
Windows	Double-pane, low-E glass	
Solar PV	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



Home Energy Score



Official Assessment | ID# 193810

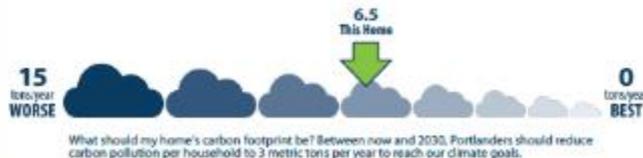
The Home Energy Score is a national rating system developed by the U.S. Department of Energy. The Score reflects the average energy efficiency of a home based upon the home's structure and heating, cooling, and hot water systems. The average score is a 5. Learn more at HomeEnergyScore.gov.

HOW MUCH ENERGY IS THIS HOME LIKELY TO USE?

Electric: 6,153 kWh/yr..... \$701
 Natural Gas: 739 therms/yr..... \$806
 Other: _____ gal/yr..... \$0
TOTAL ENERGY COSTS PER YEAR \$1,507

How much renewable energy does this home generate?
 _____ kWh/yr

THIS HOME'S CARBON FOOTPRINT:



What should my home's carbon footprint be? Between now and 2030, Portlanders should reduce carbon pollution per household to 3 metric tons per year to reach our climate goals.

- Actual energy use and costs may vary based on occupant behavior and other factors.
- Estimated energy costs were calculated based on current utility prices (\$0.11/kWh for electricity; \$1.09/therm for natural gas; \$2.58/gal for heating oil; \$2.21/gal for propane).
- Carbon footprint is based only on estimated home energy use. Carbon emissions are estimated based on utility and fuel-specific emissions factors provided by the OR Department of Energy.
- Revisiting 2-7 years after the assessment date requires a free reprint of the Report from www.greenbuildingregistry.com/portland to update energy and carbon information.
- This report meets Oregon's Home Energy Performance Score Standard and complies with Portland City Code Chapter 17.10B.

HOME PROFILE

LOCATION:
 1234 SE 123rd Ave
 Portland, OR 97206
 YEAR BUILT:
 1939
 HEATED FLOOR AREA:
 1,439 sq.ft.
 NUMBER OF BEDROOMS:
 3

ASSESSMENT

ASSESSMENT DATE:
 02/28/2018
 SCORE EXPIRATION DATE:
 02/28/2026
 ASSESSOR:
 John Smith
 Energy Score Assessor.com
 PHONE:
 503-123-4567
 EMAIL:
 John@
 EnergyScoreAssessor.com
 CCB LICENSE #:
 123456

Flip over to learn how to improve this score and use less energy!



RMLS Auto-population



[Click here to view more photos](#)

Price: 637,000
Beds: 2
Baths: 1
County: Multnomah
Style: COLONIL / DTCHCOL
Year Built: 1924 / REMOD
Status: ACT
SQFT: 1982

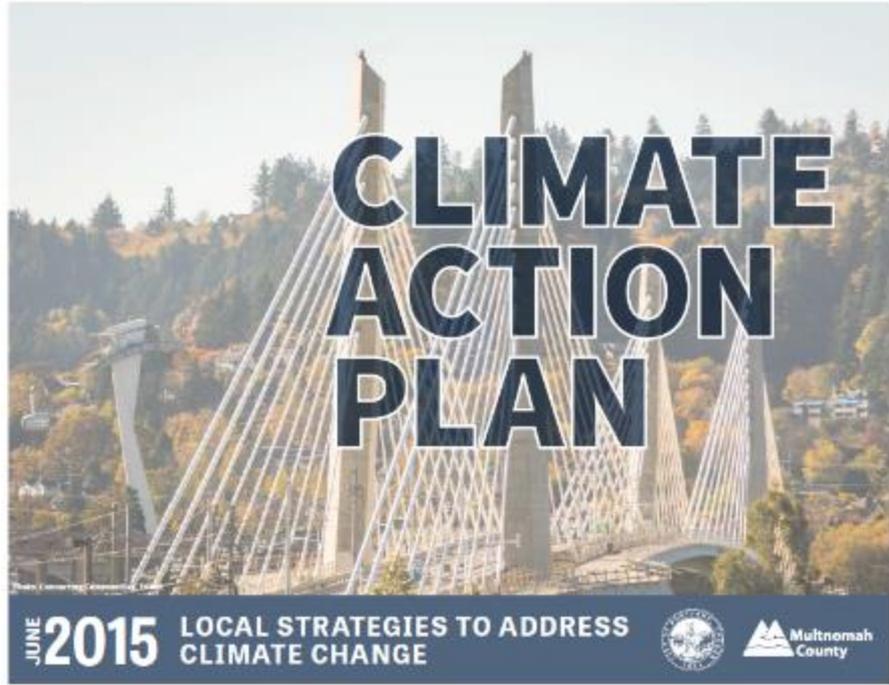
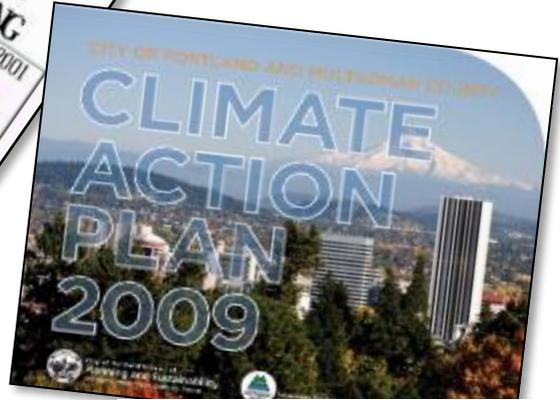
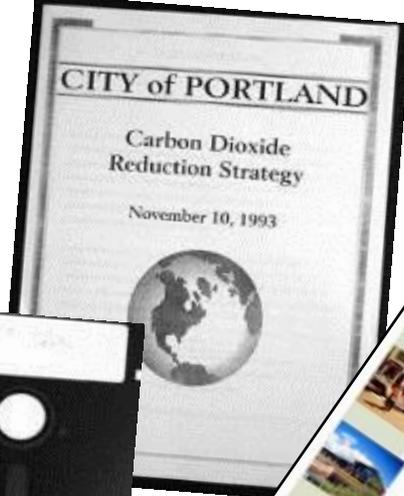
ML#: 18108125
Area: Portland Northeast
Elem School: Alameda
Middle School: Beaumont
High School: Grant
Short Sale Y/N: NO
Bank Owned/REO Y/N: NO
Waterfront:
Body of Water:
Tax/Year: 56,640.22

Prop Type: DETACHD
Nbrhd/Bldg: ALAMEDA
Levels: 3
Garage: 0
Roof:
Exterior Desc: ALUM
MstBdrm Level: U
Fireplaces:
Bsmt/Fnd: FULLBAS
View:

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:

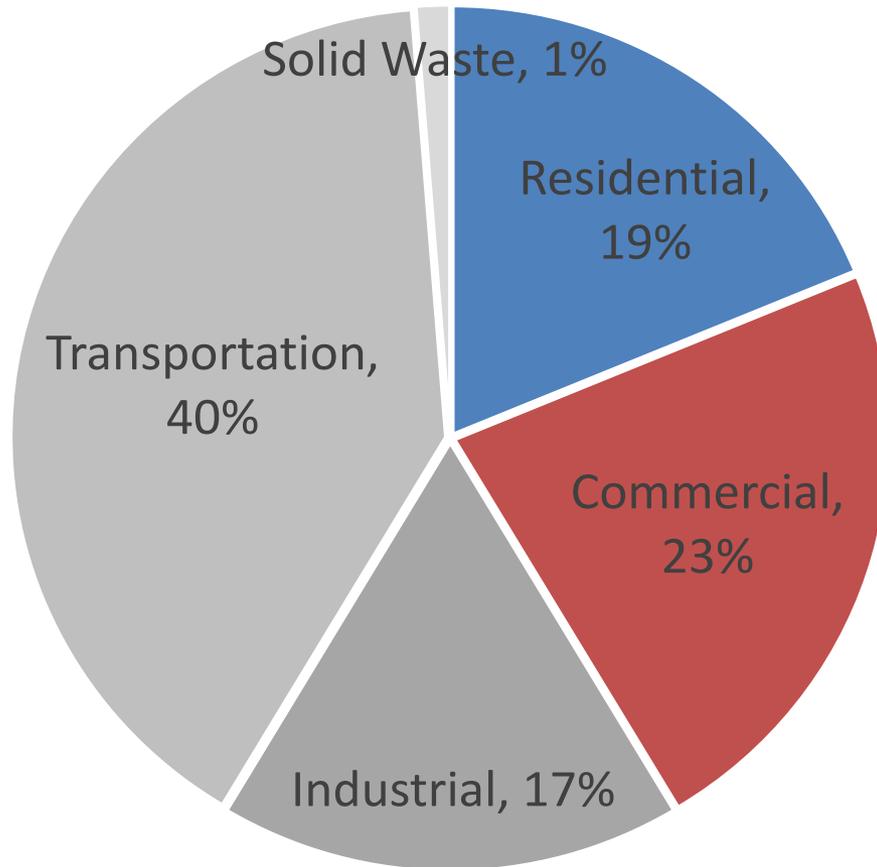
REMARKS: [Video/Virtual Tour #1](#) [Video/Virtual Tour #2](#)

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>

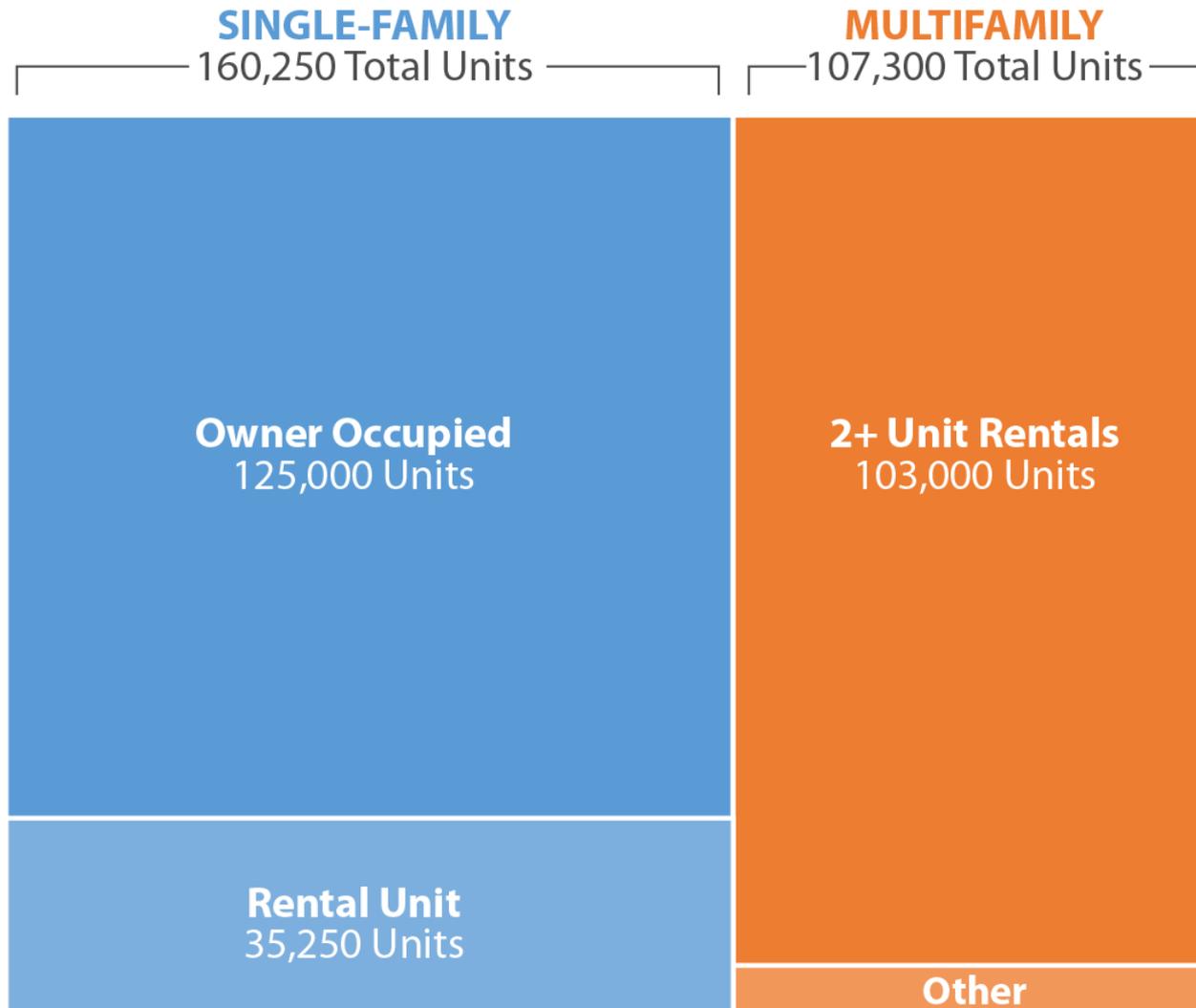


Carbon Emissions by Sector

(for Multnomah County, 2014)



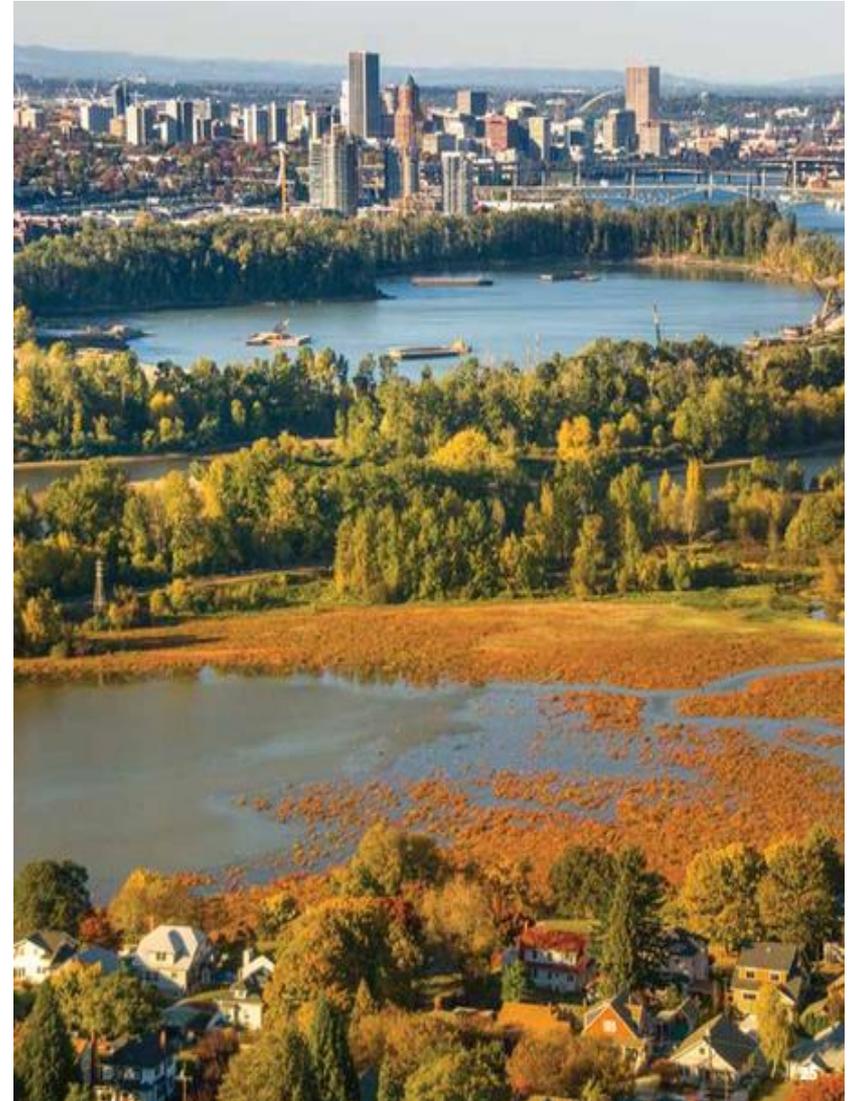
Portland Housing Units



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

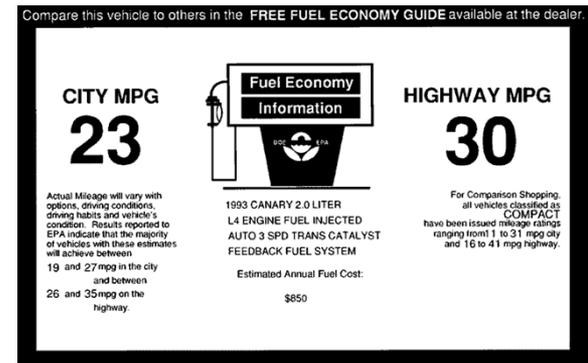
- Professionally run consumer focus groups
- Facilitated discussions with real estate and energy efficiency industry
- Equity stakeholder discussion with CBOs representing low income, tenants and communities of color
- Individual meetings with realtor association

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:

HEInfo@portlandoregon.gov

lisa.timmerman@portlandoregon.gov

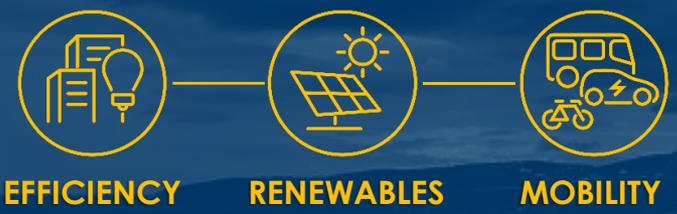


Home Energy Labeling & Disclosure From Voluntary to Mandatory: **The International Experience**

December 7, 2018

Photo: [Home for Sale Sign](#) by Mark Moz, Creative Commons

EXPERTISE



EFFICIENCY

RENEWABLES

MOBILITY

SERVICES



ASSESS
opportunities

DESIGN
strategies

EVALUATE
performance

CLIENTS



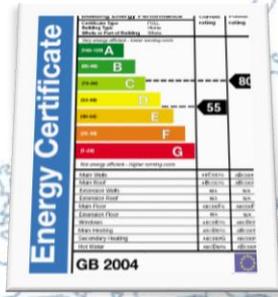
* selection of clients

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

HOME
FOR
SALE

EU 28 National Mandatory Programs



AU 2 State Programs



International analysis of experience worldwide

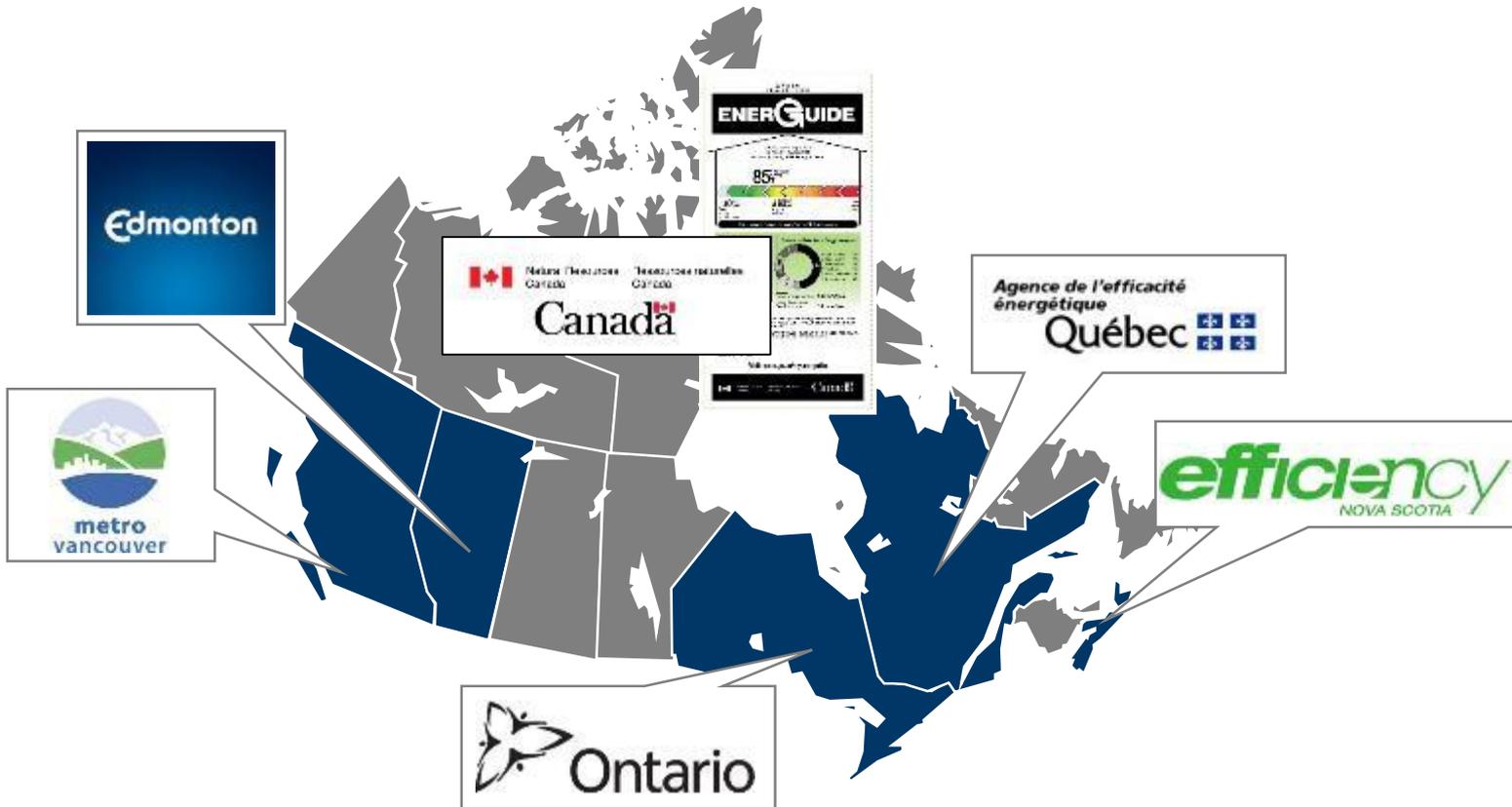
• EU (8 national programs):

- Denmark
- France
- **Germany**
- Hungary
- Ireland
- Portugal
- Sweden
- UK

• Australia (2 state programs):

- ACT
- Queensland

Canadian Voluntary Programs



The background image shows a two-story house with a white porch and columns. In the foreground, a white sign on a post reads 'HOME FOR SALE' in large, dark letters. The entire scene is overlaid with a semi-transparent blue filter.

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



Limitations

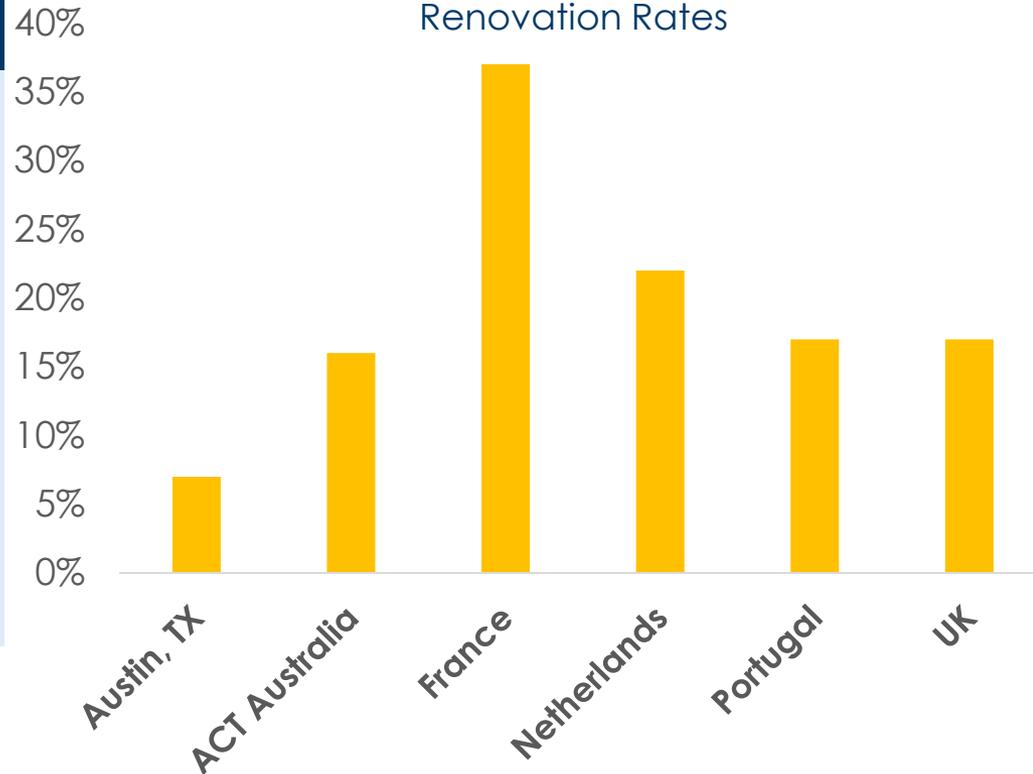
- **Low participation:** Relies heavily on industry to promote
- **Scale** needed to build capacity (Energy Advisors)
- **Low community-wide energy savings**
- **May not be representative** of future mandatory program
- **Short timeframe (of voluntary pilots)** may not demonstrate conversion rate



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



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

Germany



How to **get the most out of either**
approach

HOME
FOR
SALE

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

A dark blue callout box with a white border and a pointer pointing towards the 'BUILD CAPACITY AND SUPPORT' section. It contains text about a rebate in Edmonton.

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



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

(514) 504 9030 ext. 29

Lauren.mcnutt@dunsky.com



Thank you to our event sponsors!



STATE OF RHODE ISLAND
**OFFICE OF
ENERGY RESOURCES**

national**grid**

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



HELIX

Home Energy Labeling Information eXchange



SUSTAINABLE REAL
ESTATE
CONSULTING
SERVICES



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

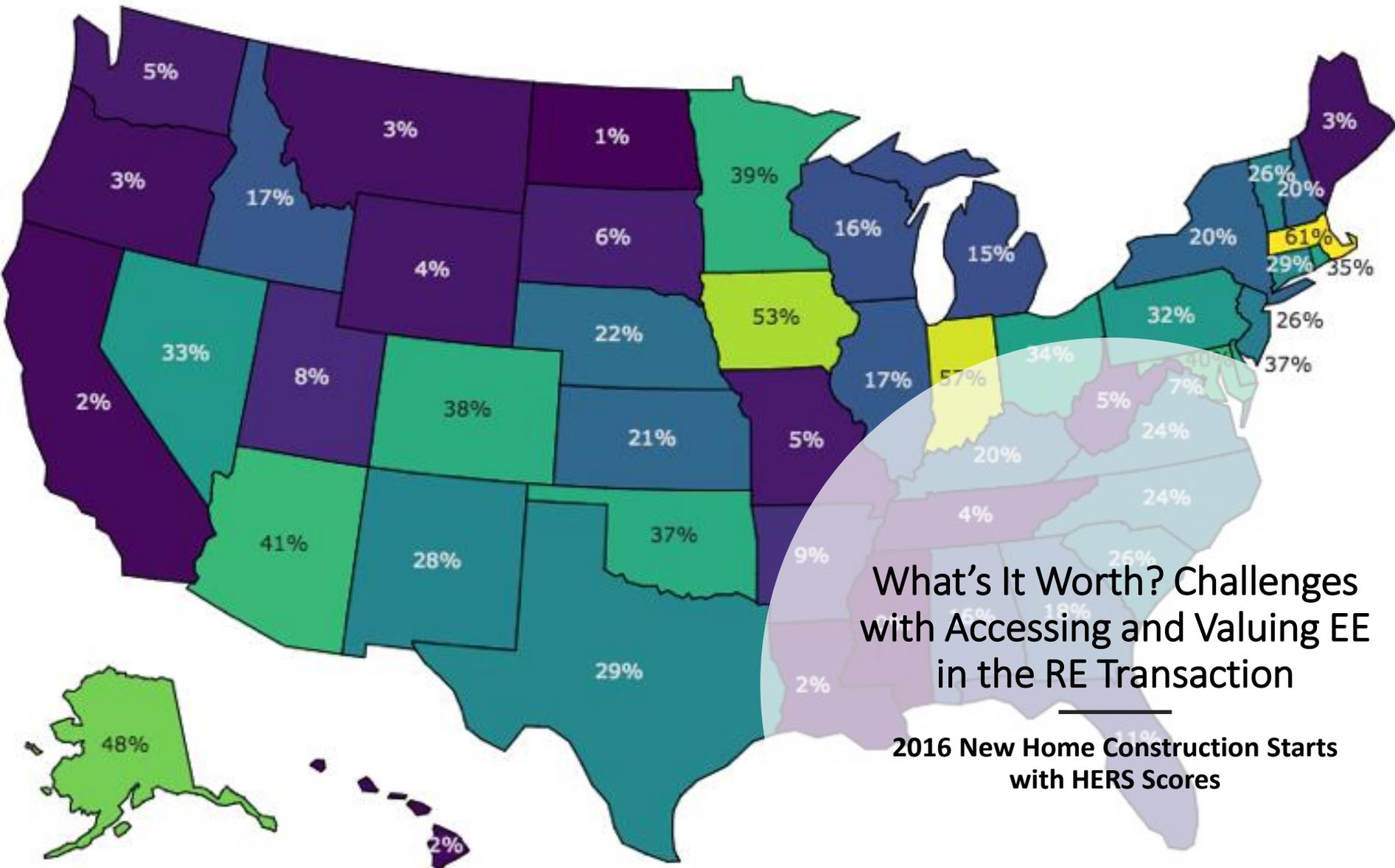
2018 ACEEE State Efficiency Scorecard

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



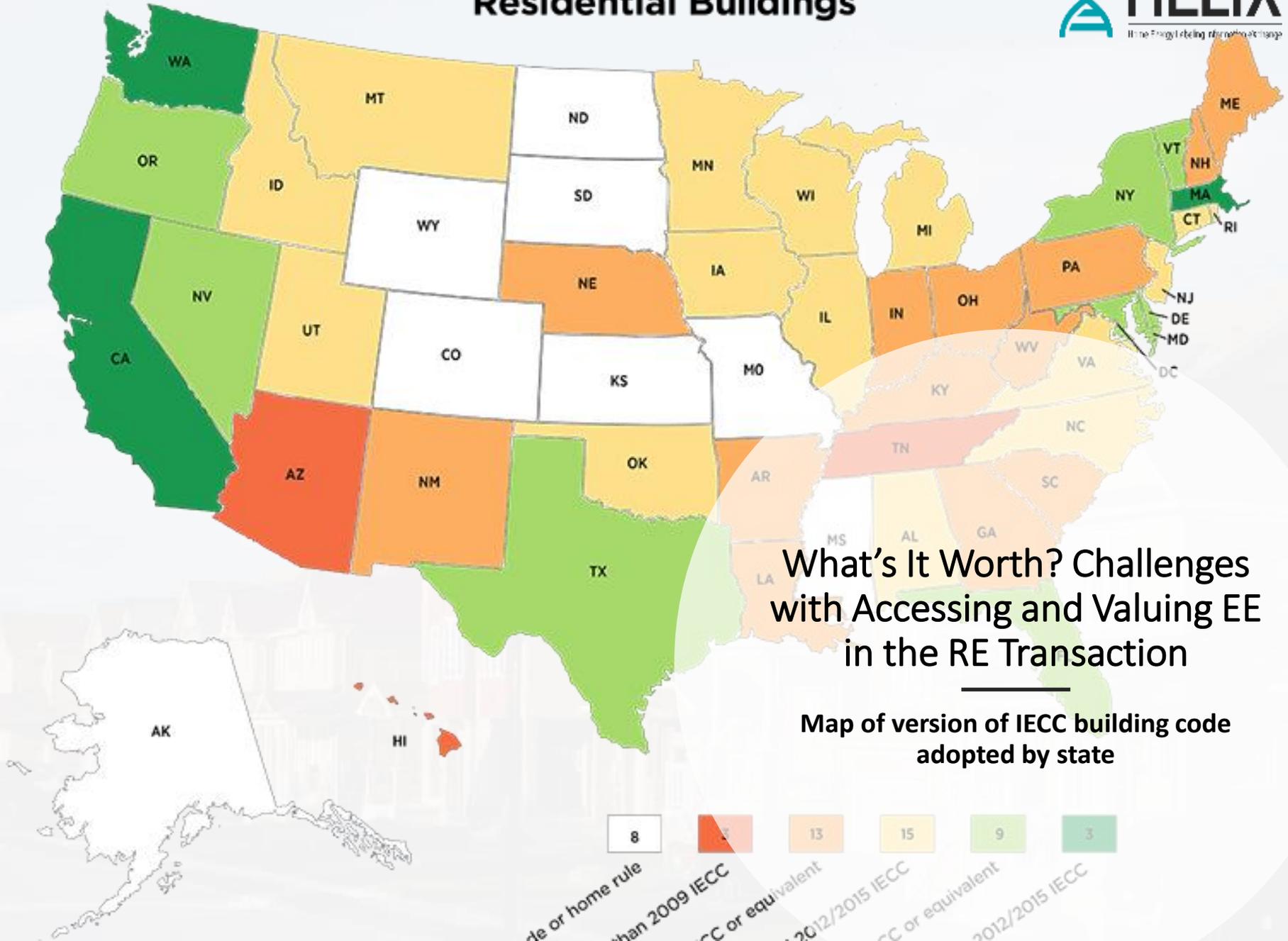
 Top 10
 Most Improved



What's It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

2016 New Home Construction Starts with HERS Scores

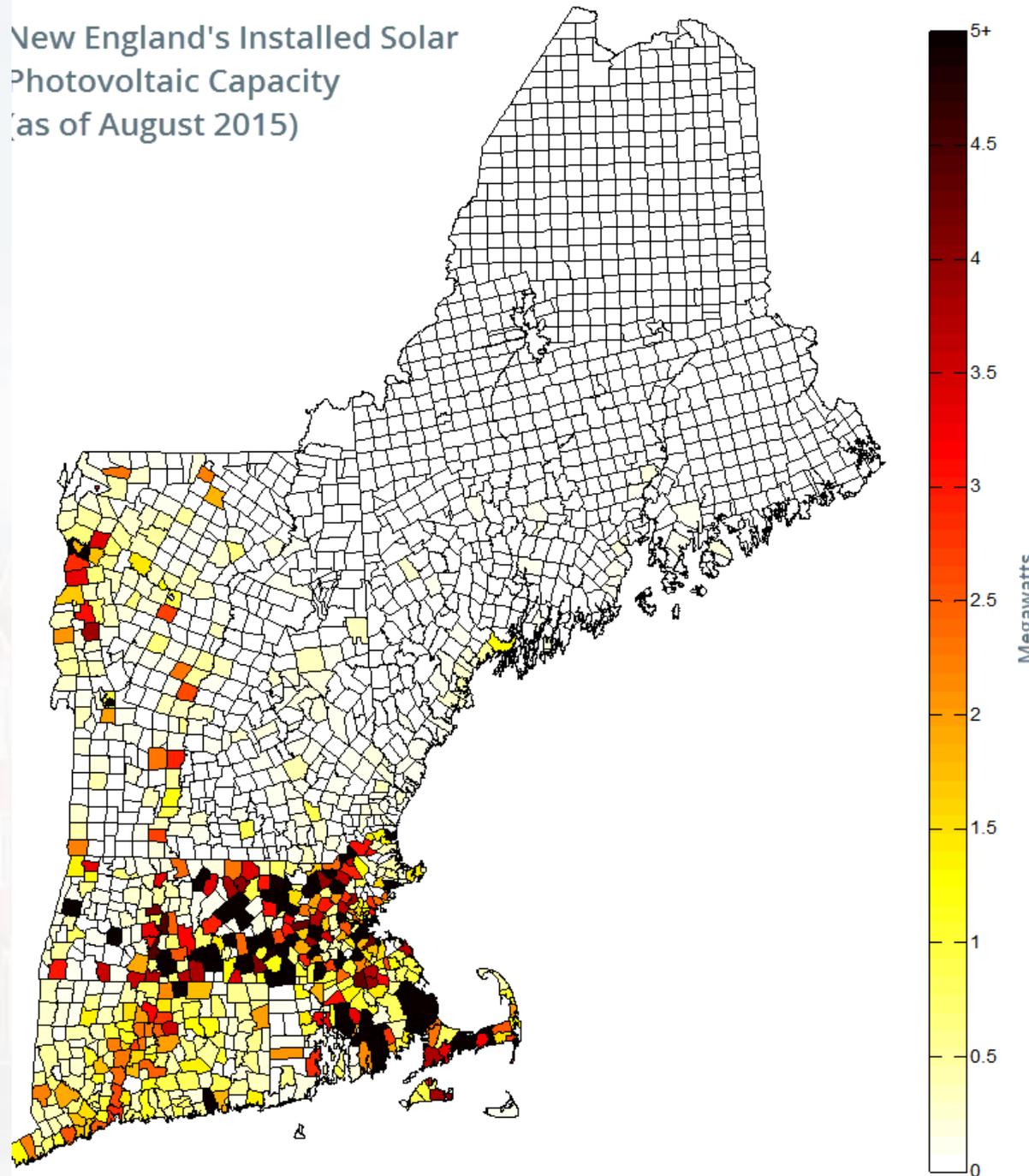
Residential Buildings



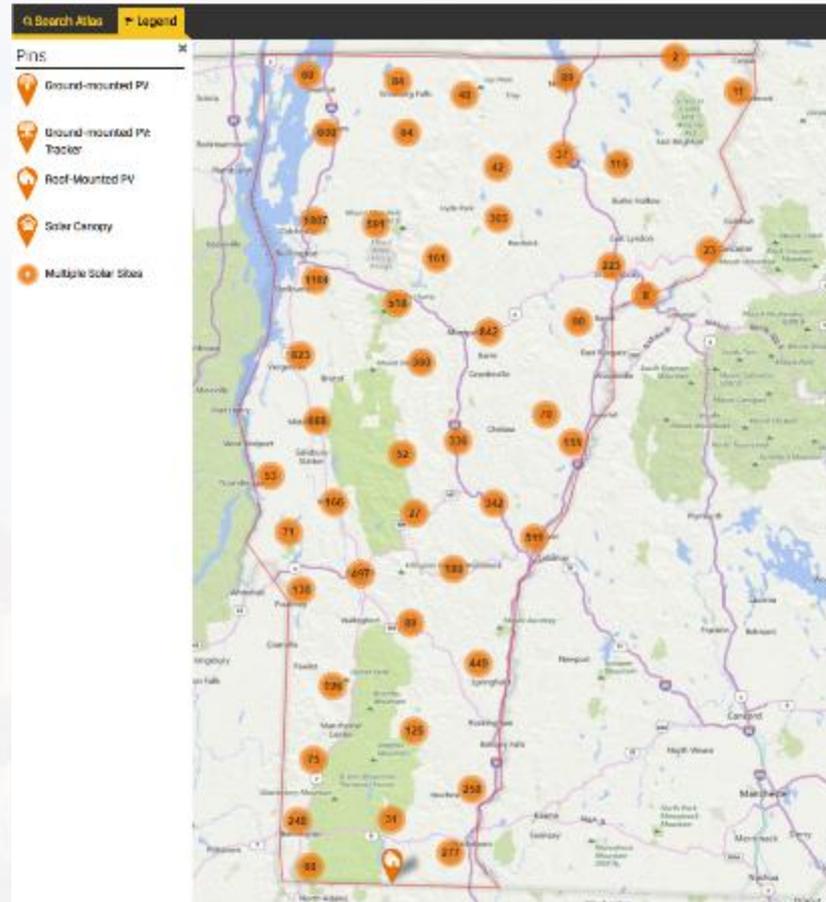
What's It Worth? Challenges with Accessing and Valuing EE in the RE Transaction

2015 Map of installed
solar PV capacity in
New England

New England's Installed Solar
Photovoltaic Capacity
(as of August 2015)



What's It Worth? Challenges with Accessing and Valuing EE in the RE Transaction



VSECU



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?

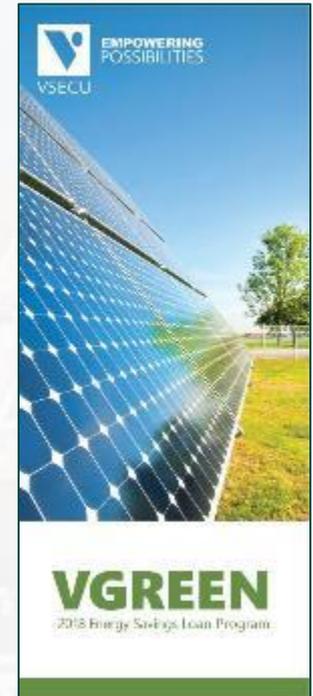
Anyone who lives or works in Vermont • NESEA members

VGREEN

CLEAN ENERGY FINANCE PROGRAM

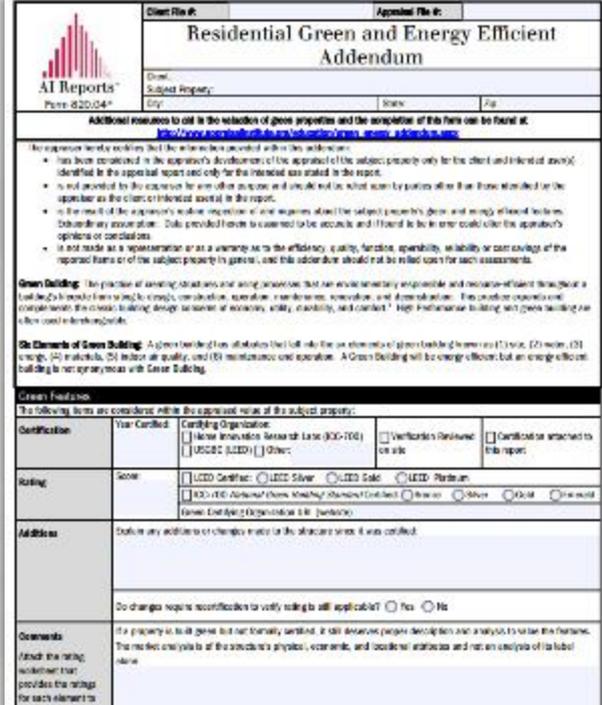
Flexible, affordable financing options designed to maximize the benefits of the energy savings achieved through upgrades

- **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



THE GREEN APPRAISAL

- 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



Client File #: **Appraisal File #:**

Residential Green and Energy Efficient Addendum

Client: _____
Subject Property: _____
City: _____ **State:** _____ **Zip:** _____

Additional resources to call in the selection of green properties and the completion of this form can be found at:
http://www.appraisalinstitute.org/education/green_energy_addendum.aspx

The appraiser hereby certifies that the information presented within this addendum:

- has been developed in the appraiser's development of the appraisal of the subject property only for the stated and intended use(s) identified in the appraisal report and only for the intended use stated in the report.
- is not intended by the appraiser for any other use or purpose and is not to be used in any other way other than those intended by the appraiser as the client or intended user(s) in the report.
- is the result of the appraiser's subjective inspection of one or more aspects of the subject property's green and energy efficient features. Substantive verification: Data provided herein is assumed to be accurate and if found to be in error could affect the appraiser's opinion(s) or conclusion(s).
- is not made as a representation or as a warranty as to the efficiency, quality, function, operability, availability, or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments.

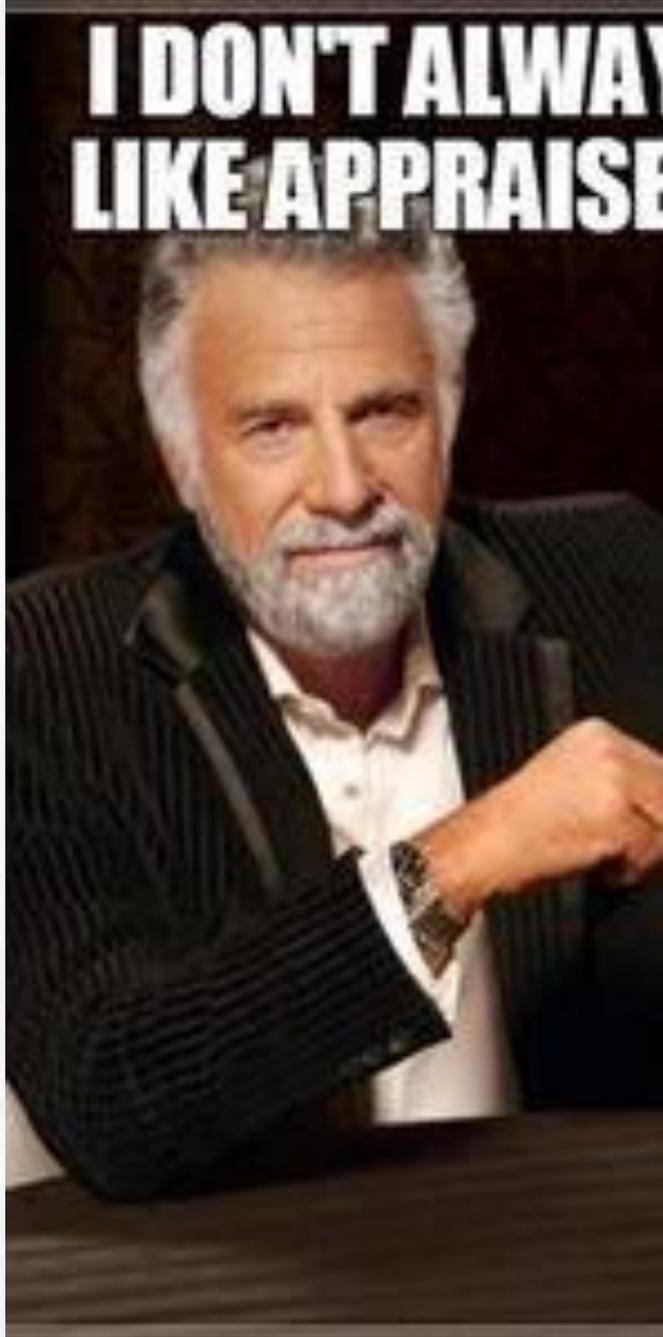
Green Building: The practice of saving resources and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and demolition. The product or process and components that create building design solutions of economic, utility, efficiency, and comfort. High Performance Building sets green building as a focus (see <http://www.enr.com/resources/special>).

The Elements of Green Building: A green building has attributes that fall into the six elements of green building: (1) site, (2) water, (3) energy, (4) materials, (5) indoor air quality, and (6) maintenance and operation. A Green Building will be energy-efficient but an energy-efficient building is not synonymous with Green Building.

Green Features:
 The following items are considered within the appraisal report of the subject property:

Certification	Year Certified:	Certifying Organization:	Verifications Reviewed:	Certification attached to this report:
		<input type="checkbox"/> Inter-University Research Lease (IUR-LEED)	<input type="checkbox"/> on site	<input type="checkbox"/>
		<input type="checkbox"/> USGBC (LEED) <input type="checkbox"/> Other:		
Rating	Score:	LEED Certified: <input type="radio"/> LEED Silver <input type="radio"/> LEED Gold <input type="radio"/> LEED Platinum		
		<input type="checkbox"/> HERS (HERS Performance Score) <input type="checkbox"/> Energy Star <input type="checkbox"/> GreenSource <input type="checkbox"/> GreenSource <input type="checkbox"/> Silver <input type="checkbox"/> Gold <input type="checkbox"/> Emerald		
		Name: _____ (Organization & City/State)		
Additional	Describe any additional or changing matter for the appraisal series it was certified:			
	Do changes require recertification to verify rating is still applicable? <input type="radio"/> Yes <input type="radio"/> No			
Comments	If a property is to be green but not formally certified, it still deserves proper description and a analysis to set the features. The method analysis to of the structure's physical, economic, and local level analysis and not an analysis of its total value.			
	Attach the rating, recertification, that provides the ratings for each element to:			

http://www.appraisalinstitute.org/education/green_energy_addendum.aspx



income approach to support energy efficient contributory value.

THIRD-PARTY VERIFICATIONS (See types defined in glossary).
 The following verified items are considered within the appraisal analysis of the subject property:

Green Certification Certifications attest that the home meets certain minimum thresholds.	Environmental Protection Agency (EPA):	<input type="checkbox"/> Indoor airPLUS	<input type="checkbox"/> WaterSense	<input type="checkbox"/> ENERGY STAR		
	Energy Department (DOE):	<input type="checkbox"/> Zero Energy Ready Home (ZERH)				
	Home Innovation Research Labs NGBS Home Remodel:					
	Home Innovation Research Labs NGBS New Home:	<input type="checkbox"/> Bronze	<input type="checkbox"/> Silver	<input type="checkbox"/> Gold	<input type="checkbox"/> Emerald	
	Living Building Challenge (LBC):	<input type="checkbox"/> Living Building Certified			<input type="checkbox"/> Petal Certification	
	Passivhaus Standard:	<input type="checkbox"/> PHI Low Energy			<input type="checkbox"/> EnerPHit	<input type="checkbox"/> Passive House
Passive House Institute US:	<input type="checkbox"/> PHUS+ 2015					
USGBC LEED:	<input type="checkbox"/> Certified			<input type="checkbox"/> Silver	<input type="checkbox"/> Gold	<input type="checkbox"/> Platinum
Other:						
Date Verified: / /	Green Certification Version: _____	ABOVE VALID ONLY IF CHECKED:				
	Organization URL: _____	<input type="checkbox"/> Verification reviewed on site				
		<input type="checkbox"/> Verification attached to this report.				
Energy Label Labels disclose the state of the home's energy assets.	RESNET's HERS Rating (0 to 150): _____ <input type="checkbox"/> Sampling Rating <input type="checkbox"/> Projected Rating <input type="checkbox"/> Confirmed Rating	Estimated energy savings for this home: \$____/year ____ cKWh rate dated ____/____/____ Energy Savings includes electricity, heating & Cooling. Score below 100 indicates energy costs are expected to be lower than average code-built home. HERS Index Report occupancy estimates energy cost based on number of bedrooms plus one. Only a "confirmed rating" is diagnostically tested.				
	DOE's Home Energy Score (1 to 10): _____	Estimated energy savings for this home: \$____/year ____ cKWh rate dated ____/____/____ Energy Savings includes electricity, heating & Cooling. Score above five indicates energy costs are expected to be lower than average local				

What's It Worth? Challenges with Accessing and Valuing EE in the RE Transaction



Dashboard

HERS Index Search

My Profile

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46 Intervale Rd, Freeport, ME 04032



HERS Index Score



Builder's Name:	BrightSuit
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](#)



Property Panorama VT URL

County VT-Washington
 Village/Dist/Locale
 Construction Status Pre-Construction
 Year Built 0
 Style Cape
 Color
 Total Stories 2
 Zoning res
 Taxes TBD Yes
 Tax - Gross Amount \$0.00
 Tax Year 2016
 Tax Year Notes
 Owned Land
 Lot Size Acres 0.320000
 Lot - Sqft 13,939
 Common Land Acres
 Basement Yes
 Basement Access Type Interior

Rooms - Total 6
 Bedrooms - Total 3
 Baths - Total 3
 Baths - Full 2
 Baths - 3/4 0
 Baths - 1/2 1
 Baths - 1/4 0
 SqFt-Apx Fin Above Grade 1,616
 \$/SqFt Fin. Above Grade
 SqFt-Apx Fin AG Source Builder
 SqFt-Apx Unfn Above Grade 0
 SqFt-Apx Unfn AG Source
 SqFt-Apx Fin Below Grade 0
 SqFt-Apx Fin BG Source
 SqFt-Apx Unfn Below Grade 900
 SqFt-Apx Unfn BG Source Builder
 SqFt-Apx Total Finished 1,616
 Days On Market 1034
 Delayed Showing No
 Date - Showings Begin

Remarks - Public Waterbury Commons is another great Waterbury neighborhood! These custom homes incorporate contemporary design elements with wonderful Vermont farmhouse architecture. You are going to love central living in the heart of Waterbury. Close to an incredible array of amenities. Amazing home designs with impressive features in a wonderful neighborhood setting. Built by award winning Arnot Development Group where attention to detail is their trademark. Employing contemporary building theory each home is constructed to incredible standards. Every Waterbury Commons Home is certified as 5 Star Energy Rated by Efficiency Vermont. Other home designs available! Choose your favorite finishes and make this house your own! Municipal sewer & water. Attached specs may not represent main photo. Final sale price subject to buyer customizations. Priced with the Chelsea design at 290k. Buyers can choose any ADG package or create a custom design.
Directions Stowe St, in Waterbury, to Lincoln St. Take right up Perry Hill and development is on your right. Bear left for Carrie Lane and phase 2.

Water Body Access	ROW - Parcel Access	Current Use No	Timeshare/Fract. Ownrshp No
Water Body Type	ROW - Length	Flood Zone No	T/F Ownership Amount
Water Body Name	ROW - Width	Seasonal No	T/F Ownership Type
Water Frontage Length	ROW to other Parcel	Land Gains To Be Determined	Foreclosed/Bank-Owned/REO No
Water Restrictions		Resort	

Kitchen 1	Bath - Full 2	Map	School - District Washington West
Dining Room 1	Bath - Full 2	Block	School - Elementary Thatcher Brook
Mudroom 2	Bath - 1/2 1	Lot	Primary Sch
Family Room 1		SPAN Number 696-221-11770	School - Middle/Jr Crosssett Brook
		Property ID	Middle School
Master Bedroom 2		Deed - Recorded Type Warranty	School - High Harwood Union High
Bedroom 1		Deed - Book 341	School
Bedroom 2		Deed - Page 250-254	
		Deeds - Total	

Green Verification Program ENERGY STAR Certified Homes	Power Production Type
Green Verificatn Program 2	Power Production Type 2
Green Verificatn Program 3	

Features - Exterior Porch - Covered, Window Screens
Features - Interior Dining Area, Fireplace - Gas, Laundry Hook-ups, Master BR w/ BA, Walk-in Closet

“certified as 5 Star Energy Rated by Efficiency VT”

Green Customer Display
 Page 1 of 2

Energy Star Certified
 Home

NEREN
 VT

Residential Single Family 483 Twin Peaks Road Listed: 8/2/2018 \$399,500
 4710685 Closed Waterbury VT 05677 Unit/Lot Closed: 10/12/2018 \$375,000



County VT-Washington
 Village/Dist/Locale
 Construction Status Existing
 Year Built 1980
 Style Cape, Contemporary
 Color Cedar
 Total Stories 1.75
 Zoning Res
 Taxes TBD No
 Tax - Gross Amount \$5,862.24
 Tax Year 2018
 Tax Year Notes
 Owned Land Yes
 Lot Size Acres 2.800000
 Lot - Sqft 121,968
 Common Land Acres
 Basement No
 Basement Access Type

Rooms - Total 7
 Bedrooms - Total 3
 Baths - Total 2
 Baths - Full 0
 Baths - 3/4 2
 Baths - 1/2 0
 Baths - 1/4 0
 SqFt-Apx Fin Above Grade 2,163
 \$/SqFt Fin. Above Grade
 SqFt-Apx Fin AG Source Municipal
 SqFt-Apx Unfn Above Grade 0
 SqFt-Apx Unfn AG Source Measured
 SqFt-Apx Fin Below Grade 0
 SqFt-Apx Fin BG Source Measured
 SqFt-Apx Unfn Below Grade 0
 SqFt-Apx Unfn BG Source Measured
 SqFt-Apx Total Finished 2,163
 Days On Market 23
 Delayed Showing No
 Date - Showings Begin

Property Panorama VT URL

Remarks - Public: Welcome to this country home, just minutes from the Village. Nestled on the Stowe side of Waterbury, this Cedar sided contemporary... has combined design elements that harmonize with its natural surroundings. River-run stone landscaping walls curve around area planting beds for vegetables & blooming flowers. Relax on the deck, in the hot tub or in front of the firepit and absorb the peace and tranquility of the mature trees and wildlife. Inside you'll find a Kitchen-Living room with large center island, perfect for entertaining. The dining room has direct access to the outside deck for grilling. Rich Mahogany hardwood floors accent the first floor. Pleasant Master bedroom features a nook area with curved wall ideal for additional storage and bookshelves. The huge bonus room over the garage has access from both the master bedroom and first floor providing more living area, hobby room or home office space. Most time will be spent relaxing in the nicely appointed 3 season enclosed front porch with ceiling fans and wall lights. Owned solar panels take a big bite out of the monthly electrical costs. Most of the home has been updated with spray foam insulation that ease heating costs. Heated 2 car garage will keep the snow off your cars in the winter. Take a walk (or bike) in the wooded path out back that neighbors lands of the private Country Club of Vermont.
Directions: From Route 100 north just past Ben & Jerry's turn onto Guptil Road, 0.9 miles to Kneeland Flats Road, 0.4 miles to right on Twin Peaks Road, home #483 on Left.

Water Body Access	ROW - Parcel Access	Current Use	Timeshare/Fract. Ownrshp No
Water Body Type	ROW - Length	Flood Zone No	T/F Ownership Amount
Water Body Name	ROW - Width	Seasonal No	T/F Ownership Type
Water Frontage Length	ROW to other Parcel	Land Gains	Foreclosed/Bank-Owned/REO No
Water Restrictions		Resort	

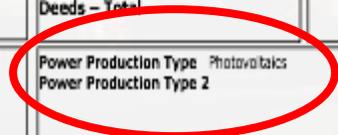
Kitchen 1 10 x 16	Map 13	School - District Harwood UHSD 19
Living Room 1 11 x 13	Block 214	School - Elementary Thatcher Brook Primary Sch
Dining Room 1 12 x 17	Lot 0	School - Middle/Jr Harwood Union Middle/High
Bedroom 1 10 x 12	SPAN Number 969-221-11050	School - High Harwood Union High School
Master Bedroom 2 15 x 17	Property ID 514-0483	
Bedroom 2 13 x 15	Deed - Recorded Type Warranty	
Bonus Room 2 11 x 25	Deed - Book 179	
Laundry Room 1 9 x 11	Deed - Page 64	
	Deeds - Total	

Green Verification Progrm	Power Production Type Photovoltaics
Green Verificatn Progrm 2	Power Production Type 2
Green Verificatn Progrm 3	



Green
 Customer
 Display
 Sold MLS Data
 Sheet:
 Power
 Production:
 Photovoltaics

“Solar panels take a big bite out of monthly electrical costs”



4710685		Assessment Year	
Development / Subdivision: Twins Peak		Assessment Amount	
Planned Urban Developmt		Tax Class: Homestead	
Covenants: Yes		Tax Rate	
Essements: Yes			
Condo Name		Mobile Park Name	
Building Number		Mobile Co-Op	
Floor Number		Mobile Park Approval	
Units Per Building		Mobile Must Move	
Condo Limited Common Area		Mobile Make	
Assessments - Special		Mobile Model Name	
		Mobile Serial Number	
		Mobile Anchor	
Deed 2 - Book		Rented	
Deed 2 - Page		Rental Amount	
Deed 3 - Book		Residence	
Deed 3 - Page			
Deed 4 - Book			
Deed 4 - Page			
Deed 5 - Book			
Deed 5 - Page			
Surveyed: Yes			
Surveyed By: Valley Surveyors, Inc.			
Plan Survey Number			
Footprint			
Area Description: Adult Golf Course, Near Country Club, Near Golf Course, Near Paths, Near Skiing		Beads: Curbside, Devel, Public	
Lot Description: Country setting, Walking trails, Wooded		Road Frontage: Yes	
Construction: Wood Frame		Road Frontage Length: 101	
Foundation: Slab - Concrete		Possession: At Closing	
Interior: Cedar, Stain, Wood		Items Included:	
Roof: Metal, Standing Seam		Documents Available: Covenants, Deed, Property Disclosure, Survey, Tax Map	
Appliances: Dishwasher, Microwave, Range - Gas, Refrigerator		Auction: No	
Equipment: Air Conditioner, CO Detector, Smoke Detector, Stone Wood		Date - Auction:	
Flooring: Carpet, Concrete, Hardwood, Slate/Stone, Tile		Auction Time:	
Garage: Yes		Auction Price Determined By:	
Garage Capacity: 2		Auctioneer - Responsible:	
Garage Type: Attached		Auctioneer License Number:	
Garage Description: Auto Open, Direct Entry, Finished, Heated			
Driveway: Gravel/Stone			
Parking: Garage, Off Street, Parking Spaces: 3			
Features: Accessibility: 1st floor 2nd bathroom, 1st floor bedroom, bathroom w/drop in shower, 1st floor laundry			

Green
Customer
Display
Sold MLS
Data Sheet:
Power
Production:
Photovoltaics



Gayle Oberg
Cell: 802-279-2316
gayle@theobergteam.com



Little River Realty
Off: 802-253-1553



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What's It Worth?

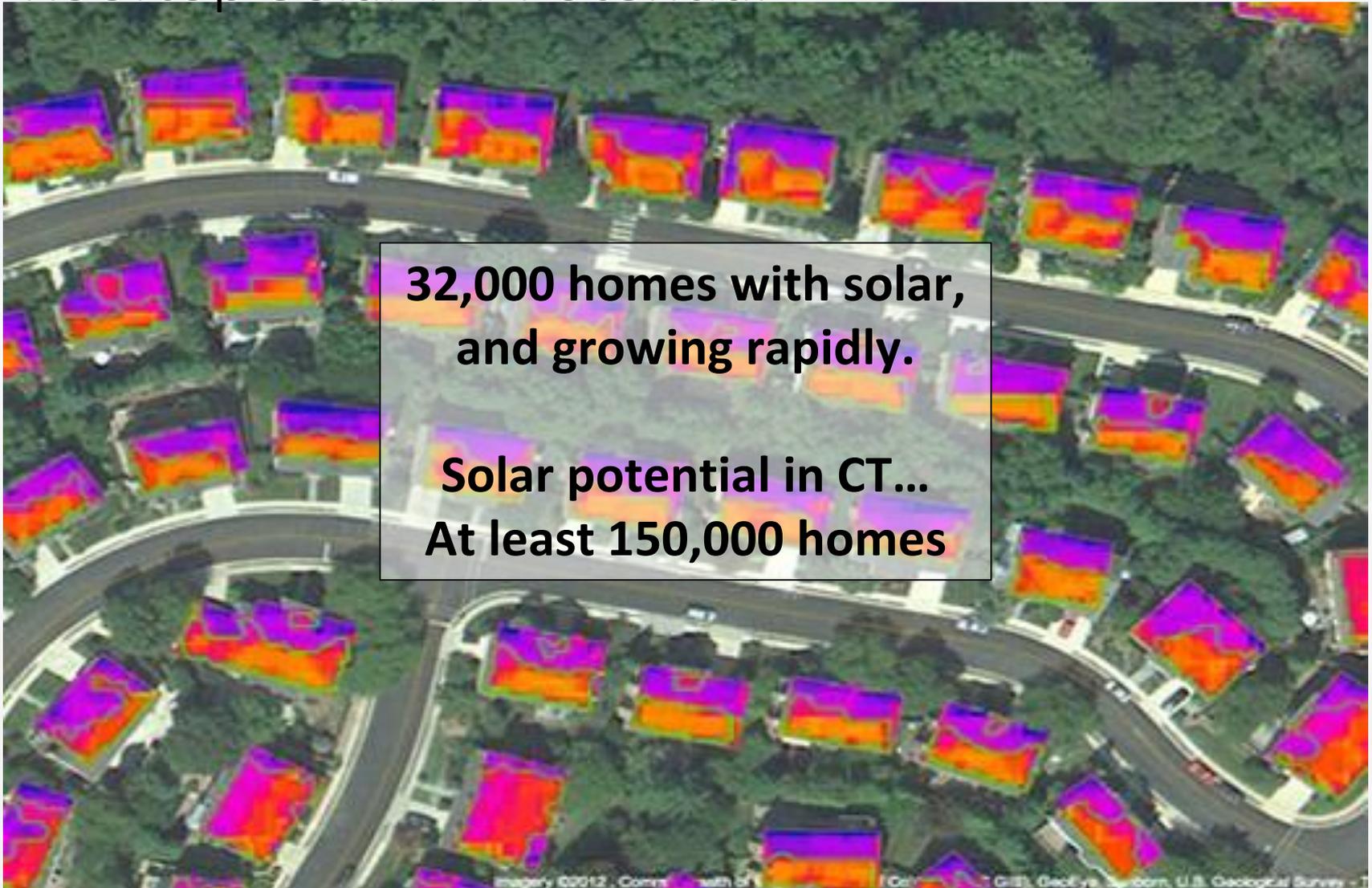
Challenges with Accessing and Valuing Energy Efficiency in the Real Estate Transaction

Joe Buonannata

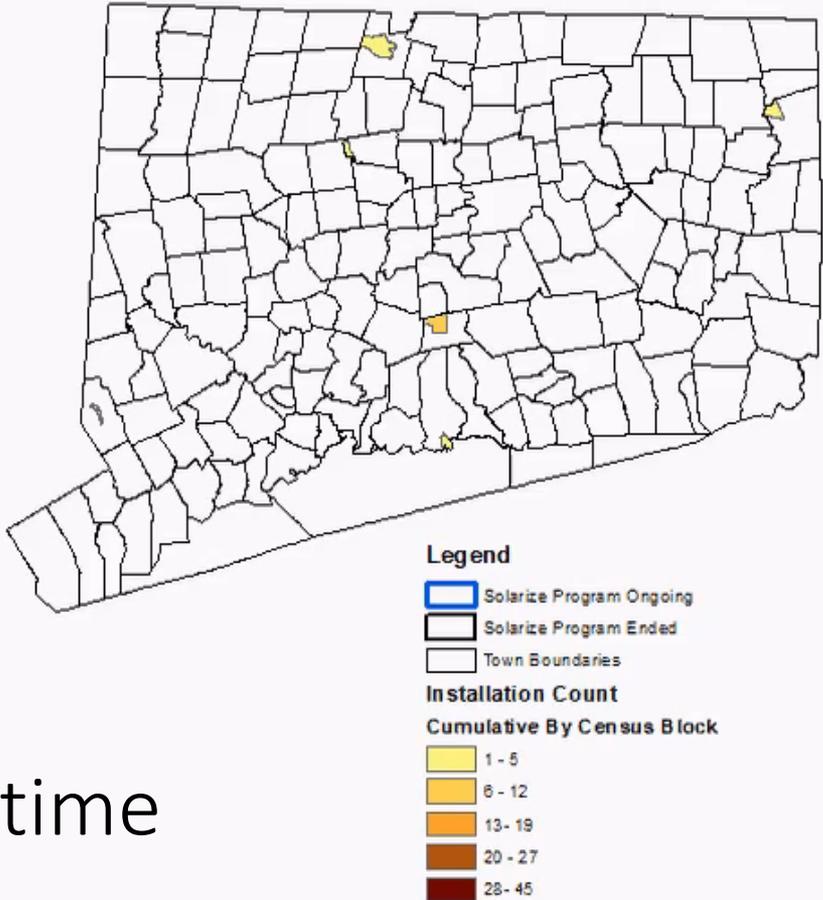
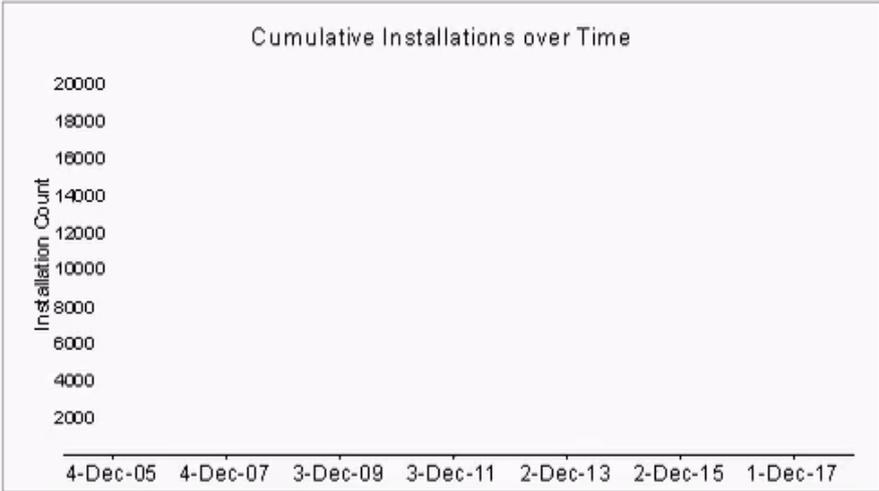
- HELIX Summit
- December 7, 2018



Rooftop Solar PV Potential



Time: 1/26/2005
Residential Solar Installations In Connecticut



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
Joe.Buonannata@ctgreenbank.com

Visit:

www.ctgreenbank.com

www.energizect.com

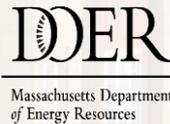
www.gosolarct.com





HELIX

Home Energy Labeling Information eXchange

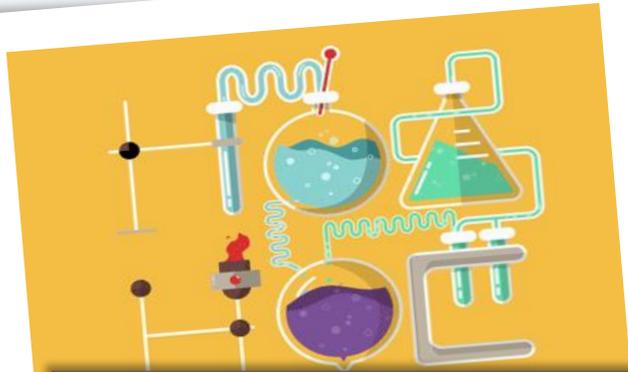


SUSTAINABLE REAL
ESTATE
CONSULTING
SERVICES



THE FUTURE OF HELIX

Carolyn Sarno Goldthwaite, NEEP



Year 1:

Research and Scoping

Year 2:

Development and Testing

Year 3:

Full Implementation



Pilot

**Solar
PV**

Capturing the sun!

Partnership with LBNL / DOE SETO



[Photo credit: newportsolarri.com](http://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%

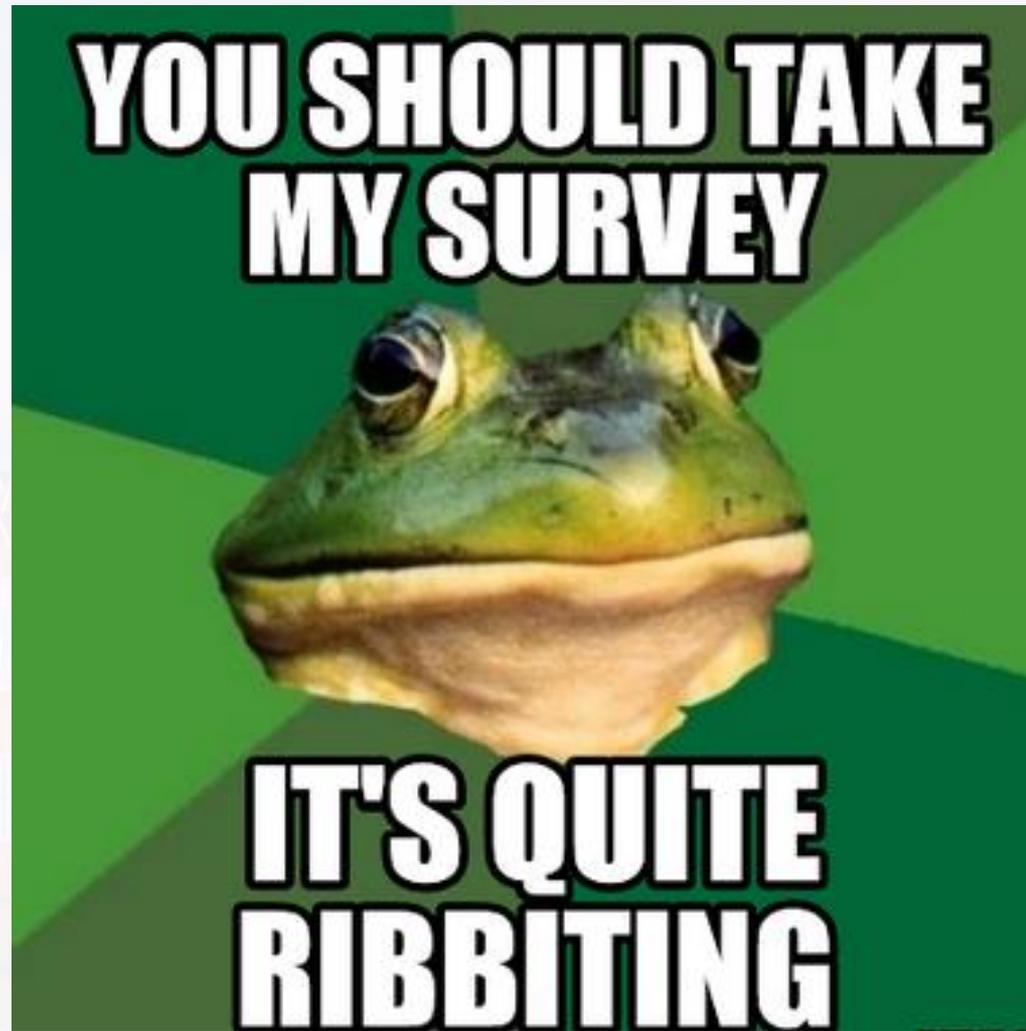
20 Days

NEW LISTING

SALE

Feedback

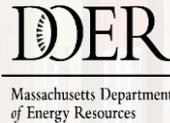
- *Presentations*
- *Location*
- *What do you know to know more about?*





HELIX

Home Energy Labeling Information eXchange



SUSTAINABLE REAL
ESTATE
CONSULTING
SERVICES



Thank you for attending today!



ne
ep

Happy Holidays!



For more information, contact:
cgoldthwaite@neep.org
Scaptuo@neep.org