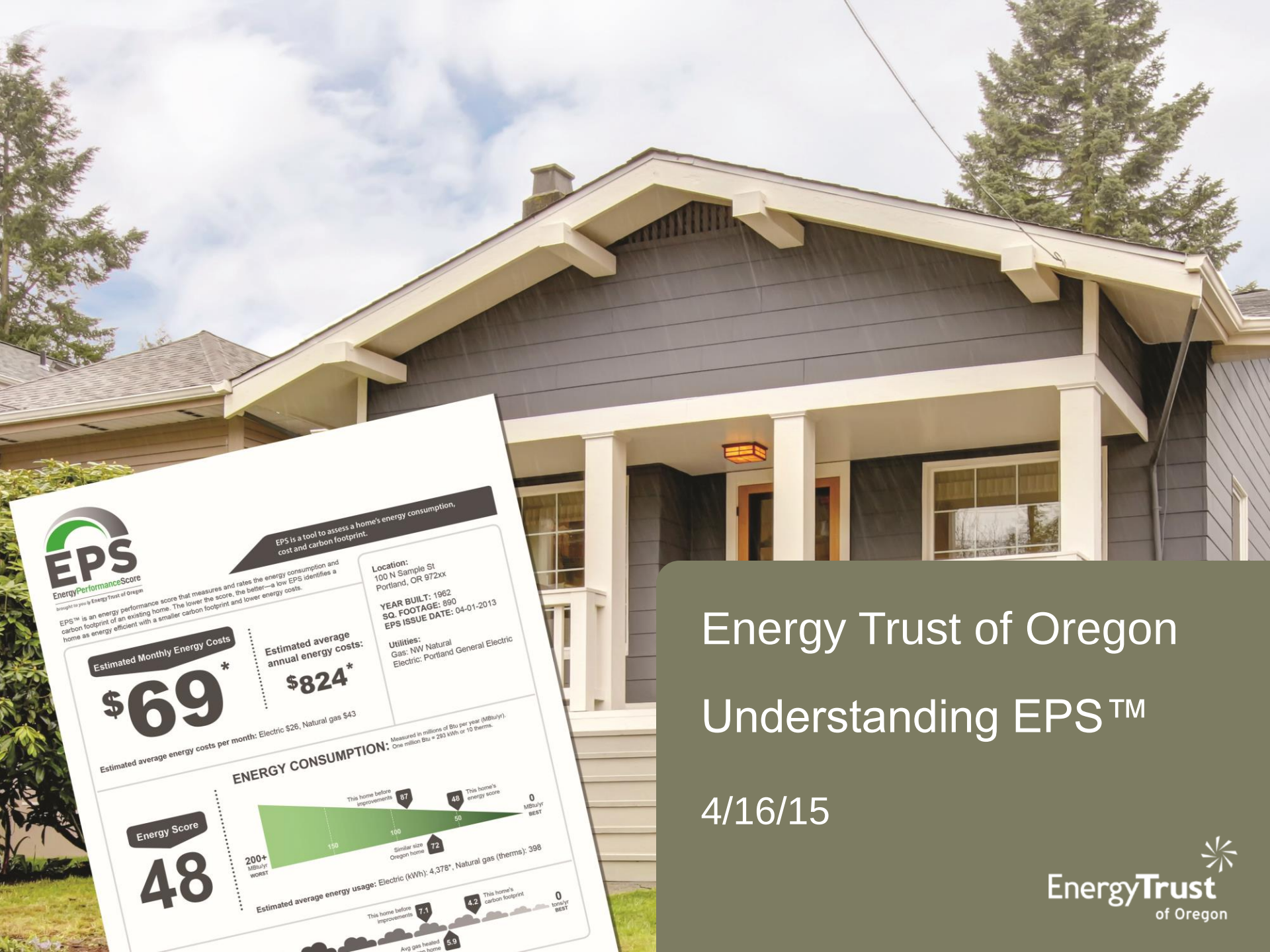


Energy Trust of Oregon

Understanding EPS™

4/16/15

Energy Trust of Oregon

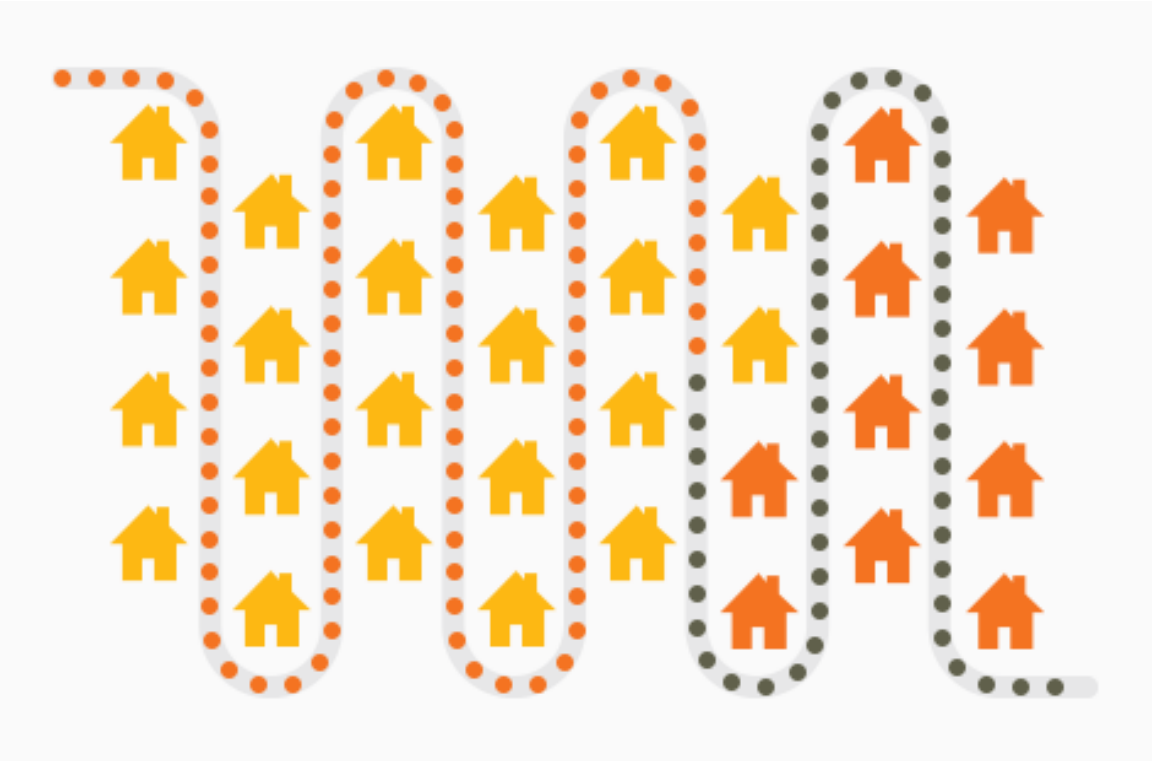
Learning objectives

1. Energy Trust of Oregon
2. What is EPS?
3. Why should you care?
4. How do you get an EPS?

About Energy Trust

About

- Independent nonprofit
- Serving 1.5 million customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas
- Providing access to affordable energy
- Generating homegrown, renewable power
- Building a stronger Oregon and SW Washington



A clean energy power plant

- 436 average megawatts saved
- 112 aMW generated
- 33 million annual therms saved
- Enough energy to power 425,000 homes and heat 65,000 homes for a year
- Avoided 10 million tons of carbon dioxide

EPS

Why was EPS developed?

To create an easy way for homebuyers and homeowners to compare:

- Estimated utility costs
- Energy efficiency
- Environmental impact

Motivate consumers to make energy-efficiency improvements

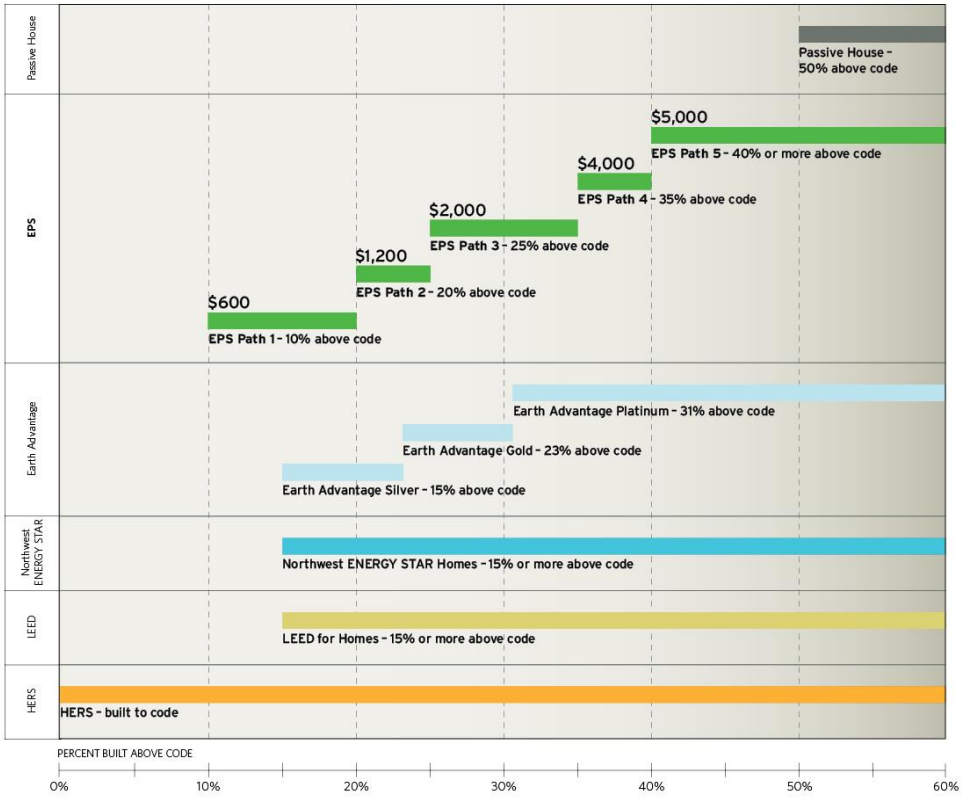
EPS is

- A performance metric
- A tool that works with all programs and all homes, regardless of their certifications
- Focused on the energy consumption, cost and associated carbon for a home

IMPROVE YOUR EPS AND EARN YOUR REWARDS

EPS works with other energy ratings and certifications, and is the only option that provides a cash incentive* for qualified projects in Oregon. The more efficient the home, the better the EPS and the higher the incentive.

See below for example incentive ranges and how EPS lines up with common ratings and certifications.



*The above image represents the approximate minimum energy requirements for each certification or score. In many cases the actual energy performance is better than the value that is listed. For additional information on these scores and certifications, speak to your verifier or contact the New Homes trade ally coordinator at **1.877.283.0698**, option 1.*

To learn more about EPS, visit **www.energytrust.org/eps**.

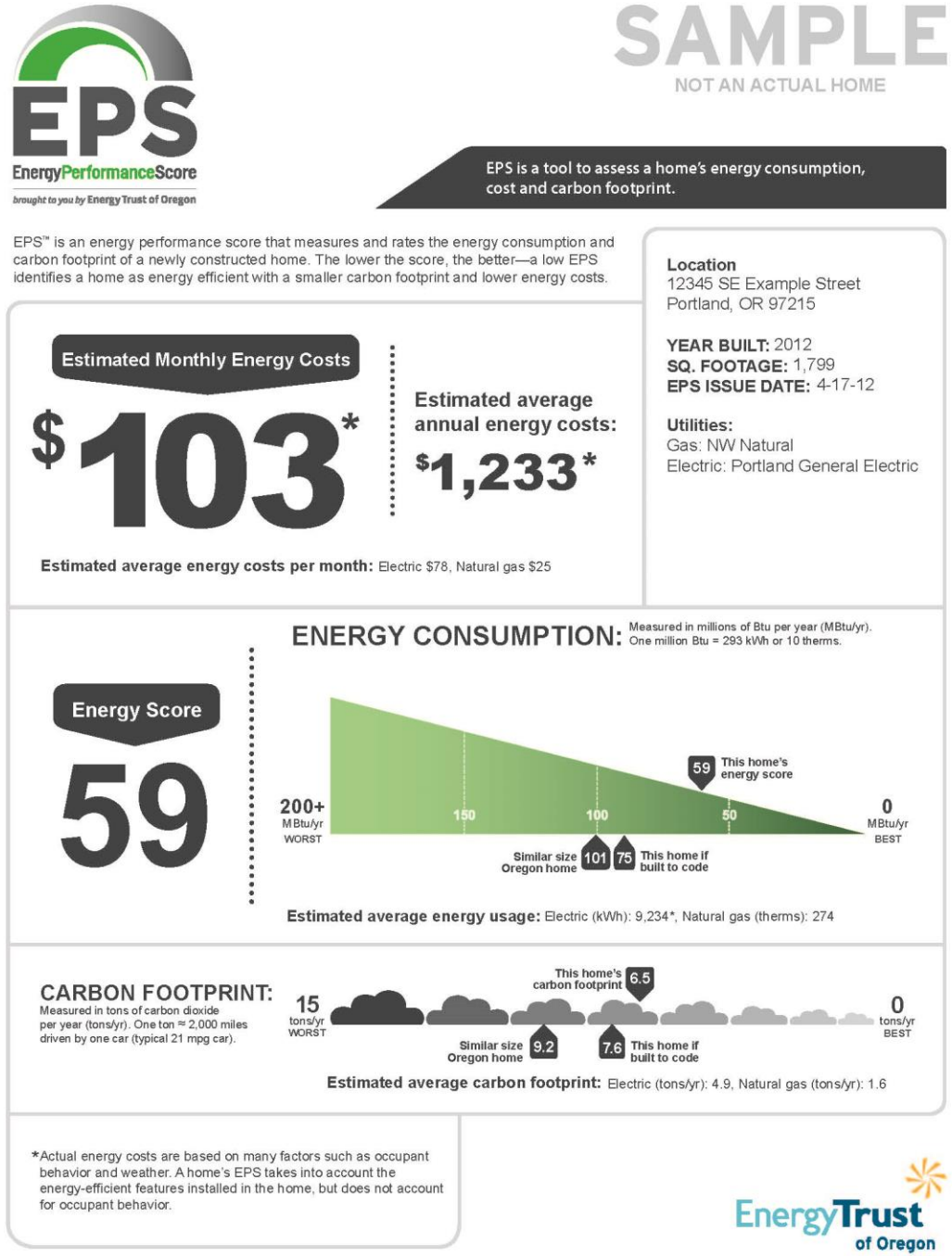
**EPS incentive offers are subject to funding availability and may change.*

EPS Energy Performance Score

Energy Trust of Oregon 421 SW Oak St., Suite 300, Portland, OR 97204 1.866.368.7878 503.546.6862 *fax* **energytrust.org**

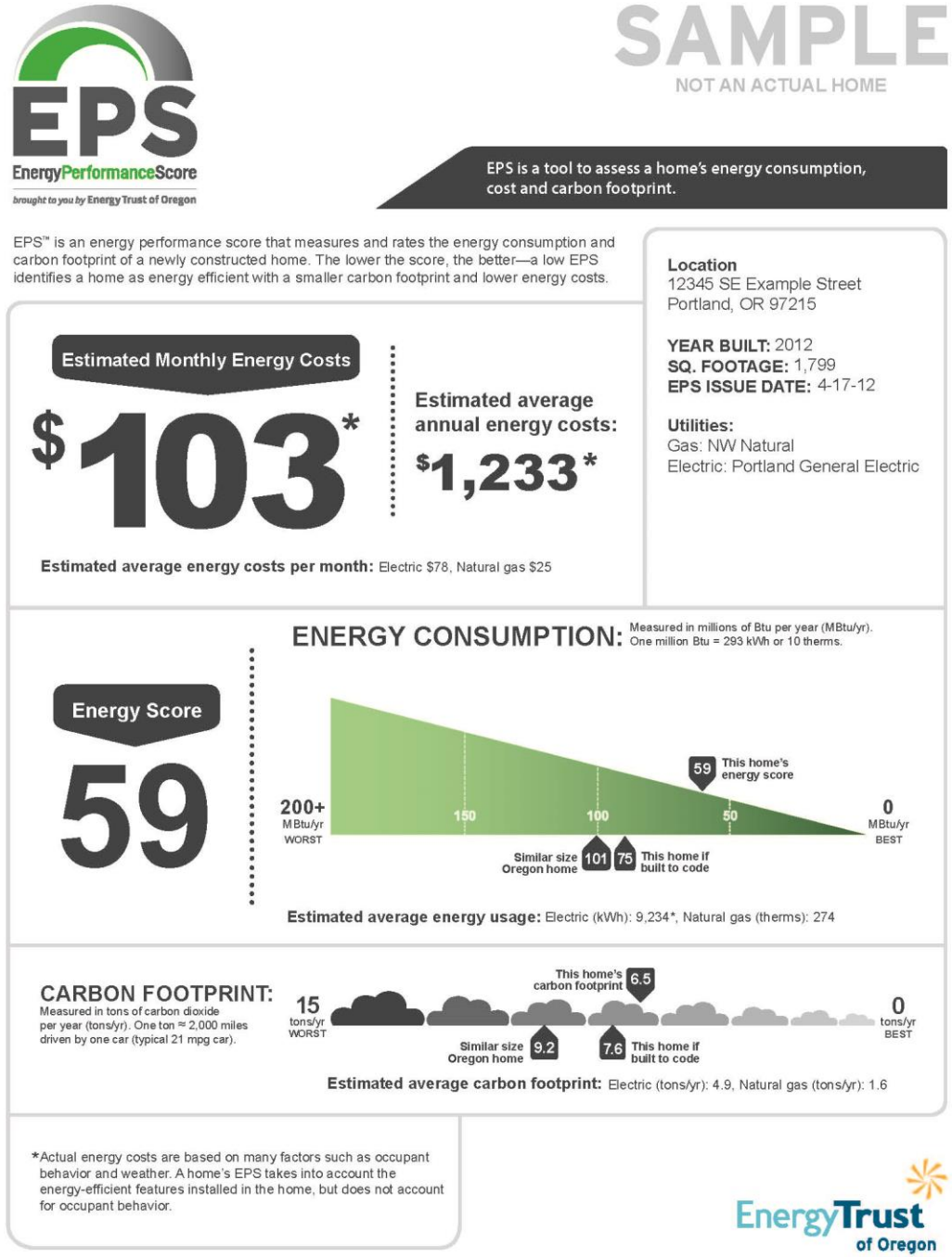
Energy Efficiency Family Tree

- Explains EPS and shows how it works with common scores and certifications
- ENERGY STAR®
- LEED® for Homes
- Earth Advantage®
- Passive House



EPS for New Homes

- Launched in 2009
- Over 7,000 homes to date
- 2,183 in 2014
- 186 builders
- 30 verifiers



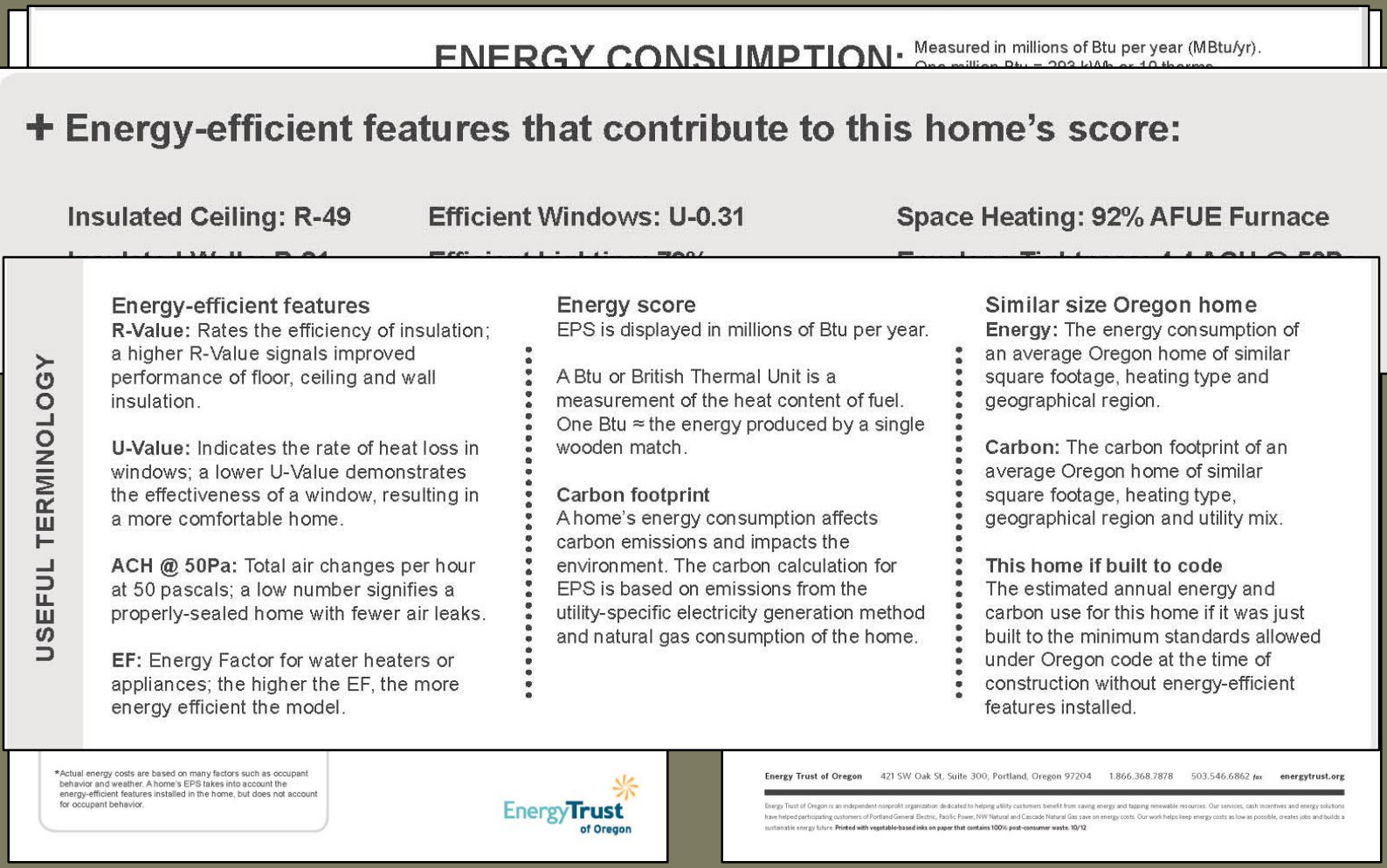
EPS for Existing Homes

- Launched in 2012
- Over 900 homes to date
- 100 in 2015 YTD
- 14 contractors

New construction vs. existing EPS

New homes	Existing homes
✓ Work with builders, contractors and verifiers (energy inspectors) throughout the building process	✓ Homeowners can request an EPS from a Home Performance contractor to find out their home's current efficiency and how to improve it

What does the EPS sheet tell you?



ENERGY CONSUMPTION: Measured in millions of Btu per year (MBtu/yr).

+ Energy-efficient features that contribute to this home's score:

Insulated Ceiling: R-49

Efficient Windows: U-0.31

Space Heating: 92% AFUE Furnace

USEFUL TERMINOLOGY

Energy-efficient features

R-Value: Rates the efficiency of insulation; a higher R-Value signals improved performance of floor, ceiling and wall insulation.

U-Value: Indicates the rate of heat loss in windows; a lower U-Value demonstrates the effectiveness of a window, resulting in a more comfortable home.

ACH @ 50Pa: Total air changes per hour at 50 pascals; a low number signifies a properly-sealed home with fewer air leaks.

EF: Energy Factor for water heaters or appliances; the higher the EF, the more energy efficient the model.

Energy score

EPS is displayed in millions of Btu per year.

A Btu or British Thermal Unit is a measurement of the heat content of fuel. One Btu ≈ the energy produced by a single wooden match.

Carbon footprint

A home's energy consumption affects carbon emissions and impacts the environment. The carbon calculation for EPS is based on emissions from the utility-specific electricity generation method and natural gas consumption of the home.

Similar size Oregon home

Energy: The energy consumption of an average Oregon home of similar square footage, heating type and geographical region.

Carbon: The carbon footprint of an average Oregon home of similar square footage, heating type, geographical region and utility mix.

This home if built to code

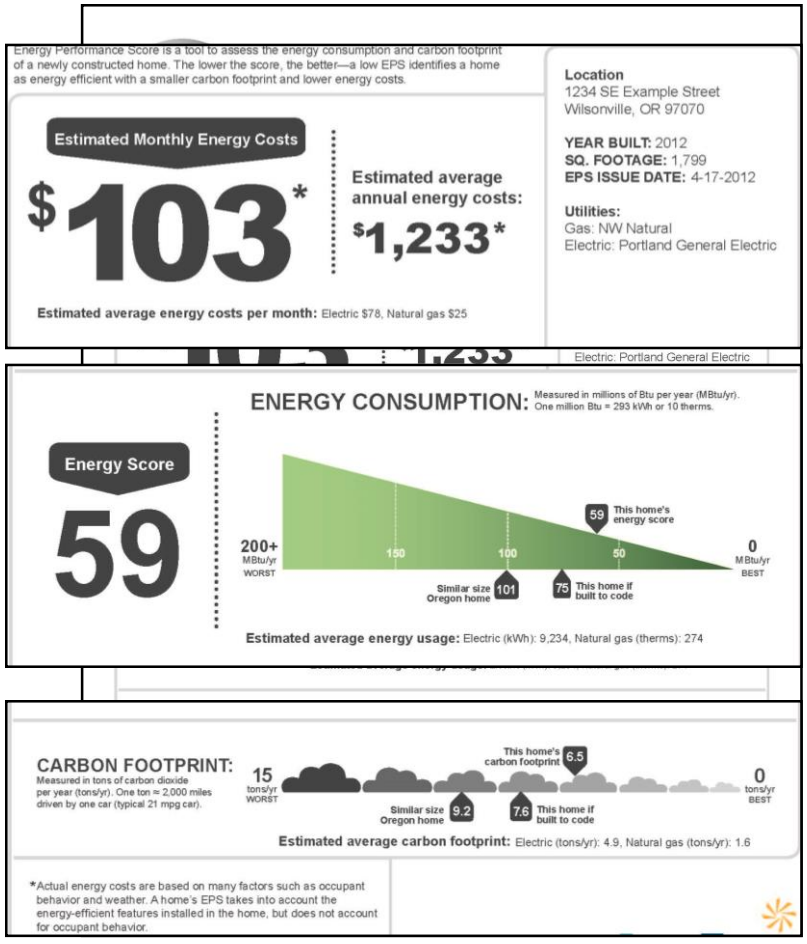
The estimated annual energy and carbon use for this home if it was just built to the minimum standards allowed under Oregon code at the time of construction without energy-efficient features installed.

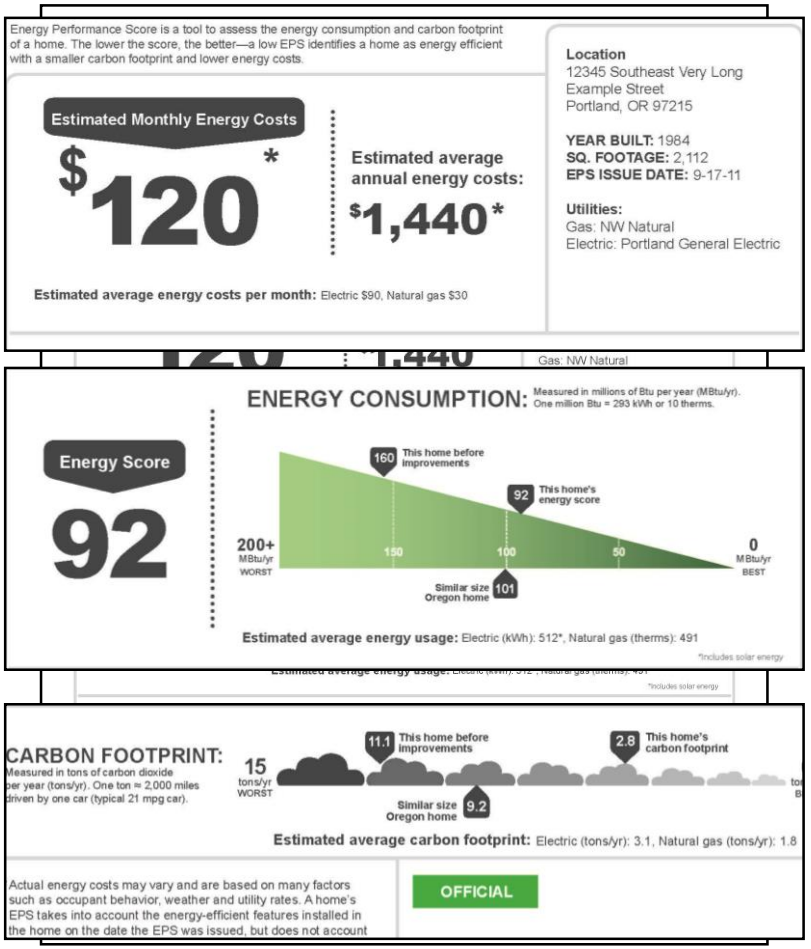
*Actual energy costs are based on many factors such as occupant behavior and weather. A home's EPS takes into account the energy-efficient features installed in the home, but does not account for occupant behavior.

EnergyTrust of Oregon

Energy Trust of Oregon 421 SW Oak St, Suite 300, Portland, Oregon 97204 1.866.368.7878 503.546.6862 fax energytrust.org

Score sheet – New vs. Existing Homes





Various factors impacting EPS

- Square footage
- Climate location
- Insulation level
- Air leakage / Infiltration
- Heating and cooling systems
- Water heating
- Lighting
- Major appliances
- Renewable energy systems such as solar

EPS requirements

- Compliance with NW ENERGY STAR® Thermal Enclosure Checklist, TEC
- Blower Door test
- Insulation and framing inspections
- Duct sealing and testing
- Installation of zonal pressure relief
- Heat pump commissioning*
- Combustion Appliance Zone testing

EPS requirements cont.

- Non-ducted gas heating equipment requirements for primary space heat
- Installation and verification of whole-house mechanical ventilation system
- Heat pump water heaters
- Proper installation of solar ready equipment

Northwest ENERGY STAR® Homes, Version 3 (Rev. 02)
Thermal Enclosure System Verifier Checklist

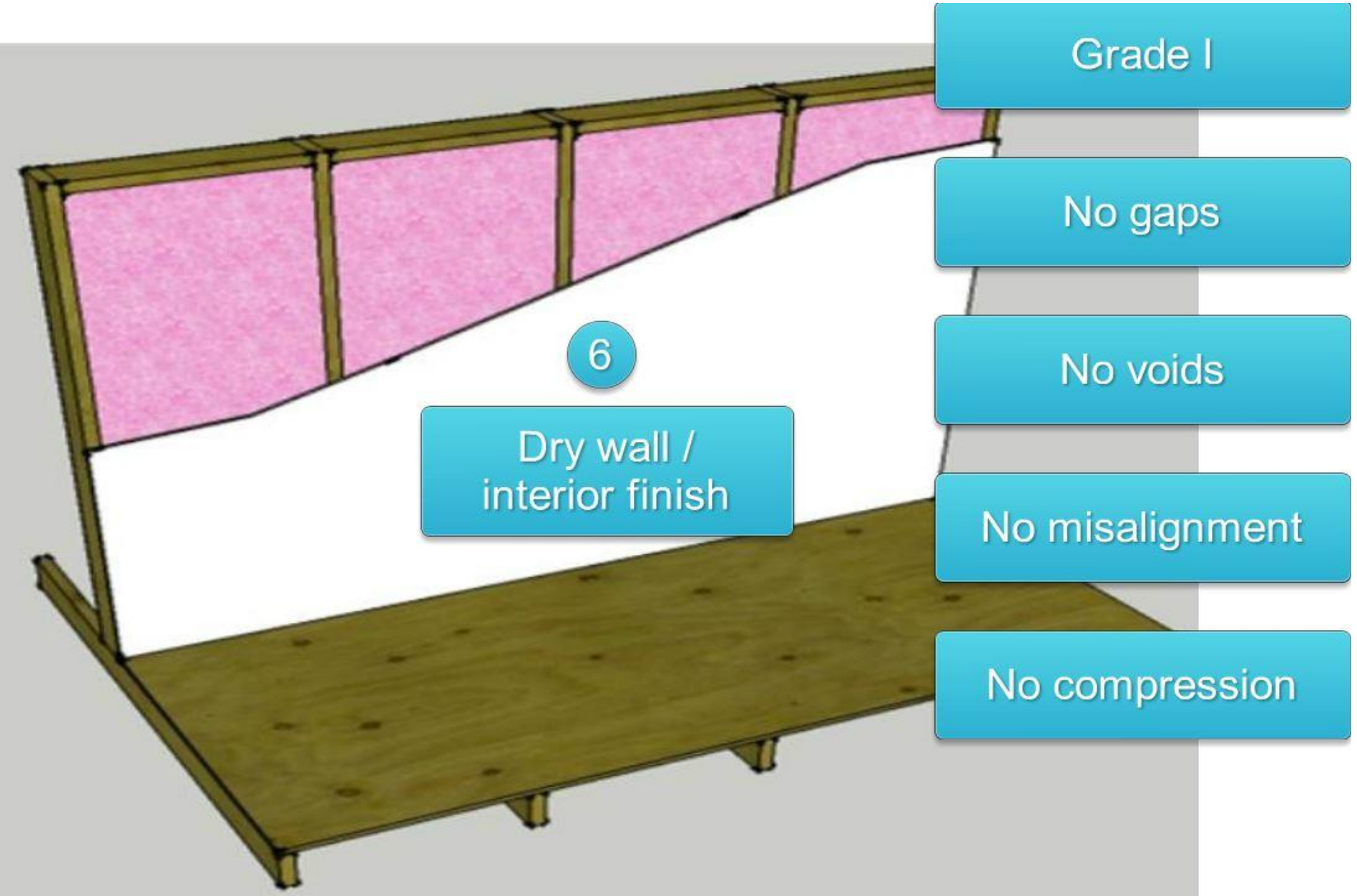
Home Address: _____ City: _____ State: _____

Inspection Guidelines	Must Correct	Builder Verified[1]	Verifier Verified	N/A
1. High-Performance Fenestration				
1.1 Fenestration shall meet or exceed Northwest ENERGY STAR Homes BOP or TCO [2]	☐	☐	☐	☐
2. Quality-Installed Insulation				
2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed Northwest ENERGY STAR Homes BOP Prescriptive Path or TCO requirements [3,4,5]	☐	☐	☐	☐
2.2 All ceiling, wall, floor, and slab insulation shall achieve RESNET-defined Grade I installation or, alternatively, Grade II for surfaces that contain a layer of continuous, air impermeable insulation ≥ R-3 in Climate Zone 4, ≥ R-5 in Climate Zones 5 & 6.	☐	☐	☐	☐
3. Fully-Aligned Air Barriers[6]				
At each location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: • At interior surface of ceilings. Also, include barrier at interior edge of attic eave using a wind baffle that extends to the full height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays. • At exterior surface and interior surface of walls [7] • At interior surface of floors, including supports to ensure permanent contact and blocking at exposed edges [8,9]				
3.1 Walls [10]				
3.1.1 Walls behind showers and tubs	☐	☐	☐	☐
3.1.2 Walls behind fireplaces	☐	☐	☐	☐
3.1.3 Attic knee walls	☐	☐	☐	☐
3.1.4 Skylight shaft walls	☐	☐	☐	☐
3.1.5 Wall adjoining porch roof	☐	☐	☐	☐
3.1.6 Staircase walls	☐	☐	☐	☐
3.1.7 Double walls	☐	☐	☐	☐
3.1.8 Garage rim / band joist adjoining conditioned space	☐	☐	☐	☐
3.1.9 All other exterior walls	☐	☐	☐	☐
3.2 Floors				
3.2.1 Floor above garage	☐	☐	☐	☐
3.2.2 Cantilevered floor	☐	☐	☐	☐
3.2.3 Floor above unconditioned basement or vented crawlspace	☐	☐	☐	☐
3.3 Ceilings [10]				
3.3.1 Dropped ceiling / soffit below unconditioned attic	☐	☐	☐	☐
3.3.2 All other ceilings	☐	☐	☐	☐
4. Reduced Thermal Bridging				
4.1 For insulated ceilings with attic space above (i.e., non-cathedralized ceilings), Grade I insulation extends to the inside face of the exterior wall below meets or exceeds Northwest ENERGY STAR Homes BOP or TCO or, when using alternative in Footnote 11, ≥ R-21. [3,11]	☐	☐	☐	☐
4.2 For slabs on grade, insulation under slab and at 100% of slab edge meets or exceeds Northwest ENERGY STAR Homes BOP or TCO or, when using alternative in Footnote 11, ≥ R-5 at slab edge. Slab insulation shall be aligned with thermal boundary of the walls. [3,4,5,11]	☐	☐	☐	☐
4.3 Insulation beneath attic platforms (e.g., HVAC platforms, walkways) ≥ R-49, or when using alternative in Footnote 11, ≥ R-38. [3,11]	☐	☐	☐	☐
4.4 Reduced thermal bridging at above-grade walls separating conditioned from unconditioned space (rim / band joists exempted) using one of the following options: [12,13]				
4.4.1 Continuous rigid insulation sheathing, insulated siding, or combination of the two; ≥ R-3 in Climate Zone 4, ≥ R-5 in Climate Zones 5 & 6 [14,15], **OR**;	☐	☐	☐	☐
4.4.2 Structural Insulated Panels (SIPs), **OR**;	☐	☐	☐	☐
4.4.3 Insulated Concrete Forms (ICFs), **OR**;	☐	☐	☐	☐
4.4.4 Double-wall / staggered stud framing [16], **OR** (see next page);	☐	☐	☐	☐

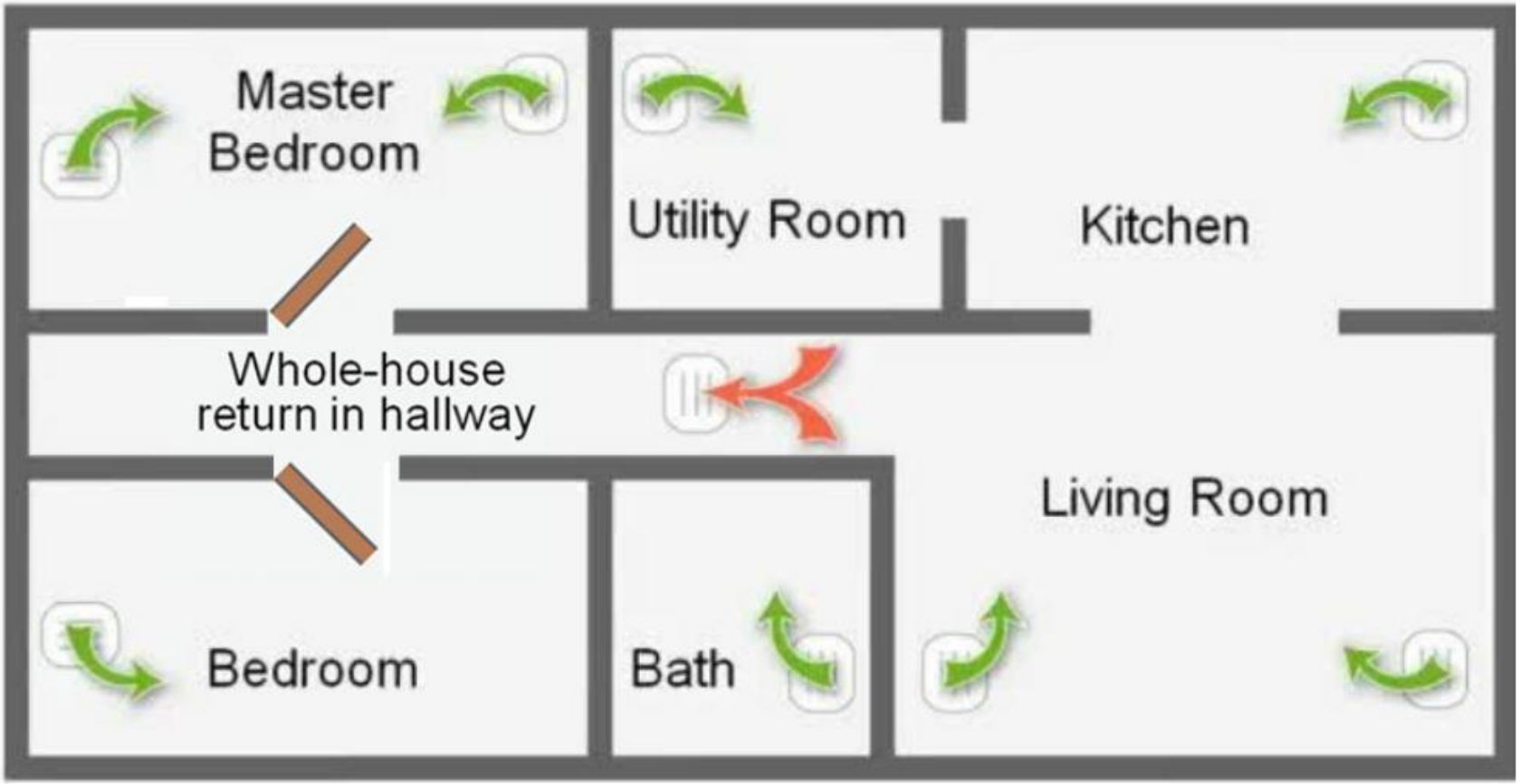
Framing

Air sealing

Insulation


Grade I
No gaps
6
No voids
Dry wall /
interior finish
No misalignment
No compression

Nickel-thick mastic application



Zonal pressure relief is required in all homes with ducted heating systems.

Combustion Appliance Zone

Ventilation rates

Simplified ASHRAE 62.2

Minimum cfm =

(bedrooms + 1) 7.5 + (.01 * conditioned area)

Example:

(3 bedrooms + 1) 7.5 + (.01 * 2200 sq ft) = 52 cfm

Program verification requirements

- Hire a third-party verifier
- Two site inspections
  - First inspection pre-drywall
  - Second inspection post-construction

Value of EPS

Why get an EPS?

- Energy and customer benefits
- Movement of EPS in the state
- Incentives
- MLS sales

Benefits of EPS

- Comfort
  - Increased customer satisfaction
- Health
  - Fewer customer complaints
- Safety
  - Avoided risk or liability
- Durability
  - Fewer repair call backs

- Quantify savings
  - Energy and financial
- Influence decisions
  - Educate customers
- Show upgrades
  - Highlight your work

Consumption defines energy rating

Both homes have an energy rating (HERS) of 70

EPS of 189

EPS of 38

Compares energy usage to code

Large home (4,218 sq. ft.)

Built energy efficient
EPS of 189

Built to code
EPS of 238

Compares energy usage to code

Small home (1,677 sq. ft.)

Built energy efficient
EPS of 38

Built to code
EPS of 55

Oregon State progress

Program market share – New Homes

Program year	EPS homes	Market share
2009	673	12 %
2010	602	12.5%
2011	812	20%
2012	1320	25.3%
2013	1,750	27%
2014	2,186	34%

House Bill 2801

July 1, 2014

- Only state approved ‘Home Energy Assessors’ can provide EPS
- Only state approved providers can produce energy scores in Oregon
- Energy Trust is applying to become an approved provider in 2015

House Bill 2801

- Enrollment through ODOE and CCB
- Verifiers or HP contractors = Home Energy Assessors

Benefits

- Oregon State approved score
- Territory expansion
- Regulated network

EPS in the MLS

- PDF of score sheet
- Other green certifications obtained
- Energy-efficient features of the home
- Score

RESIDENTIAL Status: SLD 10/30/2013 3:57:36 PM
ML#: 13620027 Area: 142 List Price: $559,900
Addr:2714 NE 60th AVE Unit#:
City: Portland Zip: 97213 Condo Loc:
Map Coord: 597/D/3 Zoning: List Type: ER LR: N
County: Multnomah Tax ID: Not Found
Elem: Roseway Heights Middle:
High: Madison PropType: DETACHD
Nhood/Bldg: Rose City CC&Rs: N
Legal: To Follow
Internet/Address/No Blog/No AVM: Y/ Y/ N/ N Offer/Nego:CALL-LA
PDF Doc(s): 2
Supplements: 1

GENERAL INFORMATION

Lot Size: 3K-4,999SF # Acres: Lot Dimensions: 40x100
Wtfrnt: View: Lot Desc:
Body Water: Seller Disc: EXEMPT Other Disc:

RESIDENCE INFORMATION

Upper SQFT: 1051 SFSrc: floorplan #Bdrms: 3 #Bth: 2/1 #Lvl: 3 Year Blt: 2013 / NEW 55+ w/Affidavit Y/N: N
Main SQFT: 1060 TotUp/Mn: 2111 Style: OLD-PDX, BUNGALO Green / Yr / Obtained: LEED-HS / 2013 / YES
Lower SQFT: 348 Parking:STREET, DRIVWAY #Garage: 1/ATTACHD Home Wrnty: Y#Fireplaces:1/ INSERT, GAS
Ttl SQFT: 2459 Addl. SQFT: Roof: COMP Exterior: FIBRCEM Bsmt/Fnd: PARTBAS, SLAB, PARTFIN

REMARKS

XSt/Dir: I-84E; Take exit 2: 39th Ave; L on NE Cesar Chavez; 2nd R- NE Sandy; R onto NE 60th
Private: Move-In Ready!! $40k price reduction!Air Conditioning! Great street! Irrigation in yard. Close to shops, parks, restaurants. Utility estimate for gas/electric -$93/month.
Public: Move-In Ready! Just completed! New LEED certified Vintage-inspired home by PDX's #1 Builder in Rose City! Air Conditioning! Bungalow style w/ HWs on main, box beams, fireplace w/ built-ins, spacious kitchen w/pantry, granite, master ste w/ WI closet&soak tub. Fenced yard. Rm in bsmt finished w/ extra unf rm as storage. Close to shops, parks, restaurants. Utilities $93/month.

APPROXIMATE ROOM SIZES AND DESCRIPTIONS

Living: / /
Kitchen: M/ 10 X 13 / GASAPPL, PANTRY, GOURMET
Dining: M/ 12 X 11 / HARDWOD
Family: M/ 14 X 17 / FIREPL, BEAMS, HARDWOD
BONUS: L/ 15 X 13 / WW-CARP
Mstr Bd: U/ 15 X 13 / SOAKTUB, WI-CLOS, SUITE
2nd Bd: U/ 12 X 10 / WI-CLOS, WW-CARP
3rd Bed: U/ 12 X 10 / WW-CARP, WI-CLOS
DEN/OFF: M/ 10 X 11 / FNCH-DR, WW-CARP
UTILITY: U/ / AIRCLEN, SINK, LINS-FL
Bths - Full/Part
Upper Lvl: 2/0
Main Lvl: 0/1
Lower Lvl: 0/0
Total Bth: 2/1

FEATURES AND UTILITIES

Kitchen: PANTRY, GASAPPL, GRANITE, DISHWAS, DISPOSL, BI-MICO, D-DRAFT, PLB-ICE, ESTARAP, FS-RANG
Interior: BN-RDY, LINS-FL, SOAKTUB, TILE-FL, HARDWOD, GAR-OPN, OWSECUR, GRANITE, AIRCLEN
Exterior: COVDECK, VYW-DBL, YARD, GASHKUP, PORCH, SPRNKLR, SEC-LIT, DECK, FENCED
Accessibility: BINLITE
Energy Eff: FOR-90, TNKLESS, VYW-DBL, INSU+CL
Cool: CENTAIR Heat: FOR-90
Water: PUBLIC Sewer: PUBLIC Hot Water: RECIRC, TNKLESS Fuel: GAS, ELECT

FINANCIAL

Property Tax/Yr: $0.00 Spcl Asmt Balance: Tax Deferral: BAC: % 2.7
Terms: CASH, CONV, VA Short Sale/Pre-Approv$: N/ 3rd Party: N Total Comm Differs: Y
Escrow Pref: Laurie Wood-Lawyers Bank Owned/REO: N
HOA: N Dues: Other Dues: Rent, If Rented:
HOA Incl:

BROKER / AGENT DATA

BRCD: RENA01 Office:Renaissance Development Corp. Phone: 503-636-5600 Fax:503-635-8400
LPID: ANDRUSSA Agent:Amanda Andruss Phone: 503-969-4939 Cell/Pgr:503-969-4939
Email(s) AG: aandruss@renaissance-homes.com Agent Ext:
CoLPID: WELLSLEE CoBRCD: RENA01 CoAgent: Lee Wells CoPh: 503-899-7754
ShowHrs: 24 hr Tran: 9/10/2013 List: 6/25/2013 Exp: Occ: VACANT Poss: CLOSING
LB/Loc/Cmb: front door Owner: Renaissance Homes FIRPTA: N Phone:
Show: RMLSLBX, VACANT Tenant/Other: Phone:

COMPARABLE INFORMATION

Pend: 8/4/2013 DOM/CDOM: 40 / O/Price: $574,900
Sold: 9/6/2013 Terms: CONV Sold Price: $555,000
SPID: CHASECYN S/Agt: Cynthia Chase S/Off: RGIC02 S/Off Phone: 503-284-7755

Incentives

Incentive Framework

Sliding scale incentives

- Pathways
  - Stepping stones
- Performance
  - Modeled performance

Verifier incentive

- 25 percent of builder incentive
- $300 minimum

Home Performance

- $75 incentive

EPS INCENTIVE OVERVIEW

2015 CASH INCENTIVES FOR ENERGY-EFFICIENT NEW HOMES

EPS℠ brought to you by Energy Trust of Oregon, is an energy performance scoring tool that measures a newly built home's energy consumption, carbon footprint and utility costs. Homes that have an EPS qualify for cash incentives from Energy Trust depending on the energy-efficiency improvements installed during construction. Review the chart below for guidance on specifications that improve a home's energy performance and related incentives.

NEW HOME INCENTIVE OPTIONS

These examples are for illustration only and are a small fraction of the options available to trade ally builders for improving a home's EPS and maximizing energy savings. Incentives are available for building homes based on one of five prescriptive pathways, or based on a sliding scale of performance above code, starting at 10 percent improvement. Incentives will vary depending on energy-efficiency improvements.

	Path 1 or 10% Improvement	Path 2 or 20% Improvement*	Path 3 or 25% Improvement	Path 4 or 35% Improvement	Path 5 or 40% Improvement	Your Efficient Home Path
Potential Incentive†	$600	$1,200	$2,000	$4,000	$5,000	
Ceiling	R-49	R-49	R-49	R-60	R-60	
Wall	R-23	R-23	R-23	R-25	R-40	
Floor	R-30	R-30	R-30	R-38	R-38	
Window	U-0.30	U-0.30	U-0.30	U-0.25	U-0.20	
Gas Furnace	92 AFUE	94 AFUE	94 AFUE	94 AFUE	85 AFUE Non Ducted	
Heat Pump	8.5 HSPF‡	8.5 HSPF‡	8.5 HSPF‡	8.5 HSPF‡	9.0 HSPF Ductless Heat Pump	
Ducts	Mastic Sealed and Tested	Mastic Sealed and Tested	Ducts Inside and Sealed§	Ducts Inside and Sealed§	No Ducts	
High-Efficiency Lighting %	80%	80%	80%	100%	100%	
Gas Water Heater	0.61 EF	0.82 EF	0.82 EF	0.82 EF	0.82 EF	
Electric Water Heater	0.93 EF	2.0 EF	2.0 EF	0.93 EF	0.93 EF	
Air Sealing ACH50	4.0	4.0	4.0	2.5	2.5	
Ventilation	ENERGY STAR®	ENERGY STAR	ENERGY STAR	Qualified HRV/ERV	Qualified HRV/ERV	

Incentives above are calculated by computer modeling of a 2,200 sq. ft. house plan in full Energy Trust service territory. Incentives are based on improvements in the home's annual energy use over minimum code requirements, as demonstrated by energy modeling. Incentives are subject to funding availability and may change. Incentive examples are based on the 2011 Oregon Residential Specialty Code.

*Achieving Northwest ENERGY STAR certification will qualify homes for Path 2 and will help guide you towards higher performance paths.
†Homes can qualify for an additional incentive of up to $200, if built to be solar ready. For more information, contact a program-approved verifier.
‡9.0 HSPF for Climate Zone 5.
§All HVAC equipment and ducting must be located inside a conditioned space to qualify for this path.

EPS: prescriptive or performance

	Path 1 or 10% Improvement	Path 2 or 20% Improvement*	Path 3 or 25% Improvement	Path 4 or 35% Improvement	Path 5 or 40% Improvement
Potential Incentive†	$600	$1,200	$2,000	$4,000	$5,000
Ceiling	R-49	R-49	R-49	R-60	R-60
Wall	R-23	R-23	R-23	R-25	R-40
Floor	R-30	R-30	R-30	R-38	R-38
Window	U-0.30	U-0.30	U-0.30	U-0.25	U-0.20
Gas Furnace	92 AFUE	94 AFUE	94 AFUE	94 AFUE	85 AFUE Non Ducted
Heat Pump	8.5 HSPF‡	8.5 HSPF‡	8.5 HSPF‡	8.5 HSPF‡	9.0 HSPF Ductless Heat Pump
Ducts	Mastic Sealed and Tested	Mastic Sealed and Tested	Ducts Inside and Sealed§	Ducts Inside and Sealed§	No Ducts
CFL Lighting %	80%	80%	80%	100%	100%
Gas Water Heater	0.61 EF	0.82 EF	0.82 EF	0.82 EF	0.82 EF
Electric Water Heater	0.93 EF	2.0 EF	2.0 EF	0.93 EF	0.93 EF
Air Sealing ACH50	4.0	4.0	4.0	2.5	2.5
Ventilation	ENERGY STAR®	ENERGY STAR	ENERGY STAR	Qualified HRV/ERV	Qualified HRV/ERV

How to get an EPS

Obtain an EPS – New Homes

1. Engage with a trade ally
2. Submit plan set to a verifier for modeling
3. Receive unofficial EPS
4. Schedule inspections
5. Receive final EPS and incentives

Obtain an EPS – Existing Homes

1. Home Performance with ENERGY STAR contractor that's an approved EPS Rater
2. Home evaluation and EPS before work is done
3. If making energy-saving improvements
4. Home re-assessment
5. Get updated EPS

Next Steps

- Reach out to a verifier or HP contractor
- Enroll as a trade ally http://energytrust.org/trade-ally/programs/new-homes/resources/

Thank You

Mike Lillesand
Trade Ally Coordinator
Mike.lillesand@clearesult.com
Direct: 503.575-4225

EnergyTrust of Oregon