EPS

EnergyPerformanceScore

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Energy Performance Score
Existing Homes – Existing Homes

February 15, 2012

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The Energy Performance Score

- An asset-based performance metric
- Purpose
  - A tool for strategic engagement of customers and markets
  - A resource to give visibility and awareness to energy efficient features of a home
- Key Metrics
  - Energy Score
  - Operating Costs
  - Carbon Impacts

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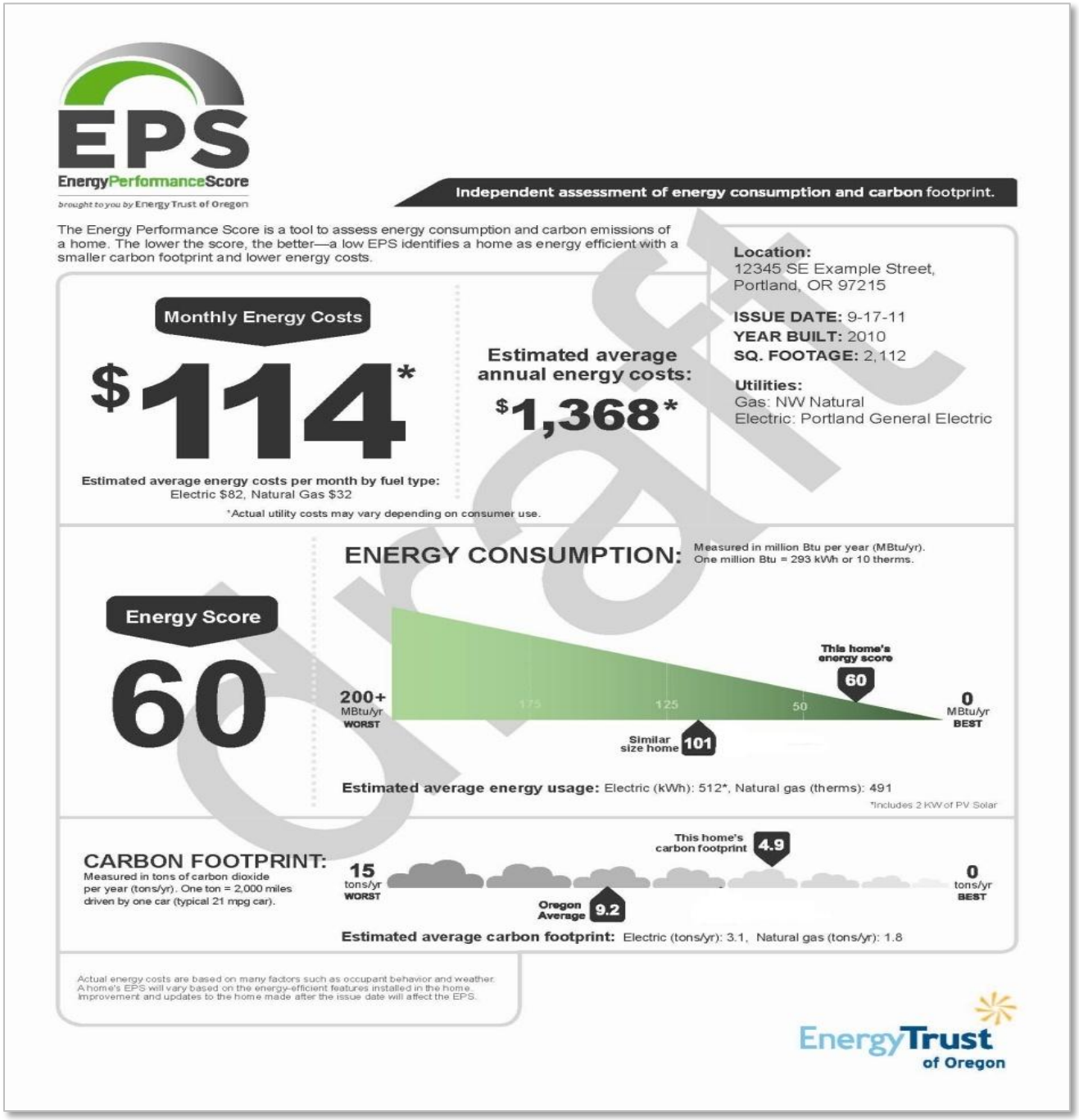

EPS
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Independent assessment of energy consumption and carbon footprint.

The Energy Performance Score is a tool to assess energy consumption and carbon emissions of a home. The lower the score, the better—a low EPS identifies a home as energy efficient with a smaller carbon footprint and lower energy costs.

Location:
12345 SE Example Street,
Portland, OR 97215

ISSUE DATE: 9-17-11
YEAR BUILT: 2010
SQ. FOOTAGE: 2,112

Utilities:
Gas: NW Natural
Electric: Portland General Electric

Monthly Energy Costs

$114*

Estimated average energy costs per month by fuel type:
Electric $82, Natural Gas $32

*Actual utility costs may vary depending on consumer use.

Estimated average annual energy costs:
$1,368*

Energy Score

60

ENERGY CONSUMPTION: Measured in million Btu per year (MBtu/yr). One million Btu = 293 kWh or 10 therms.

200+ MBtu/yr WORST
175
125
50
0 MBtu/yr BEST
This home's energy score 60
Similar size home 101

Estimated average energy usage: Electric (kWh): 512*, Natural gas (therms): 491

*Includes 2 KW of PV Solar

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

15 tons/yr WORST
This home's carbon footprint 4.9
Oregon Average 9.2
0 tons/yr BEST

Estimated average carbon footprint: Electric (tons/yr): 3.1, Natural gas (tons/yr): 1.8

Actual energy costs are based on many factors such as occupant behavior and weather. A home's EPS will vary based on the energy-efficient features installed in the home. Improvement and updates to the home made after the issue date will affect the EPS.

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draft

Goals of the EPS Pilot

- Does an EPS motivate a customer to act, in terms of sooner, deeper or both?
  - Which information is most useful?
    - Score or no score, energy usage & savings representation
    - How do consumers relate carbon footprint information?
  - What are the customers' visual preferences?
- Does an EPS have efficacy in:
  - Directing customers to do the right sorts of things
  - Assigning a comparative ranking without diagnostic testing
  - Predicting energy saved without diagnostic testing
  - Which of the model(s) perform better?

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Key Findings

1. Based on survey responses and participation rates, the score does not appear to **yet** be driving reported energy-efficiency actions or investments
2. Despite confusion participants had favorable opinion of EPS
3. Conservation measures will have only small impacts on scores - unless several are done at once
4. Goal of a scoring method is achievable
5. Consistency among tools is an issue

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Issue: An Absolute MPG Rating is Problematic

- Site-based MM BTU scores can not be a comparative measure of operating costs across fuels
  - Heat pumps get relatively lower scores but cost more to operate compared to a gas furnace
  - Confuses the “buy efficiency—save money” message

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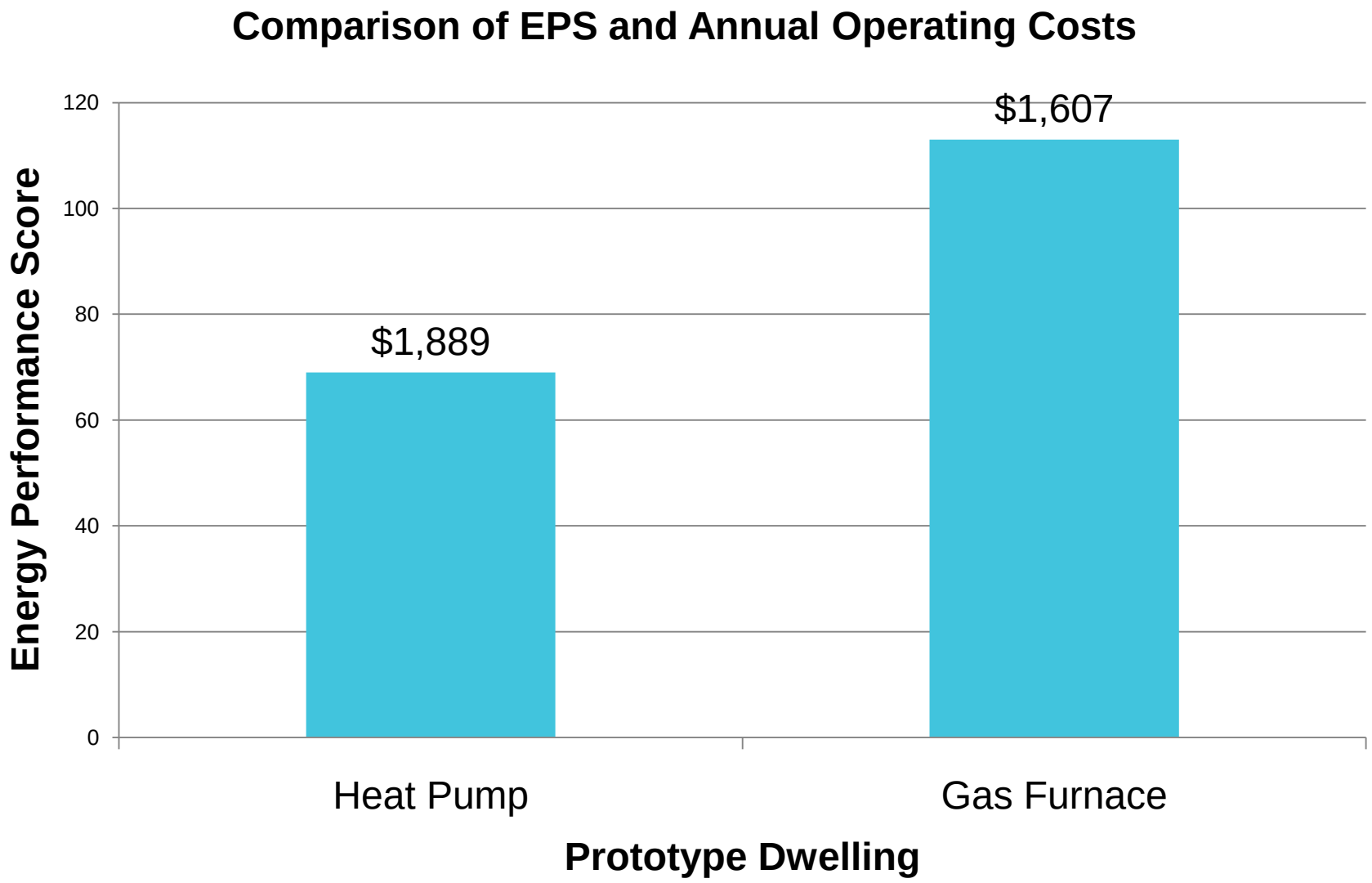
Save Money or Save Energy?



Another Example

	EPS	$$	CO2
25 Year old Gas Furnace	130	1,800	7
New 92% Gas Furnace	↓ 110	↓ 1,600	↓ 5
New 8.5 HSPF Heat Pump	↓ 70	↑ 1,900	↑ 9

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Additional Issues

- Lack of fuel neutral EPS for existing homes
  - Site-based MM BTU scores favor heat pumps
  - Source energy scores favor gas
- Hosting a score is an expensive effort
  - Multiple plausible models exist
  - Models need updating and validating
  - One tool or multiple tools

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Possible Solutions

- Index scores to eliminate fuel bias
  - making fixes to existing models
- Using a score not quantitatively linked to energy use
  - e.g., one point for duct sealing, three for ceiling insulation
- Develop a single mathematical engine that
  - works with different vendor rating products,
  - regularly, and
  - reflects energy use in Oregon homes.
- Choose a single customer-facing product through RFP
- Defer to DOE's index

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What We Heard

- The market is ready to go and wants a score to use
- Disagreement from stakeholders on the best way to show the score

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Next Steps

- Taking written comments through today (or Friday!)
- Absorb and develop straw proposal
  - Continue dialogue with key stakeholders
  - Bring to CAC on April 18th
  - Get more written comment
- Finalize next steps in late April/early May

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Thank you!

Questions or comments.

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Findings from Initial EPS Research

1. Complicated models were no better at forecasting energy savings than less complex models.
2. The best performing non-complex model had an apparent error band of plus or minus 30%.
3. Comparisons to billing data are not the accurate test of a model's forecasting efficacy, due to homeowner behavior.
4. A set of enhancements to the less-complex energy models might improve accuracy.
5. More tests of improved models in comparison to a standardized baseline (non-bill) should be conducted.

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EPS Studies

- *Energy Performance Score Modeling Comparison*, Dave Robison, Stellar Processes, December 2011

- *Energy Trust Residential Home Energy Review: Analysis of Pilot Group Internet Survey Results and Energy Trust Fast Track Data*, Jennifer Stout and Steven Scott, MetaResource Group, December 2011

- *Homeowner Communications Research,* DHM Research, October 2011

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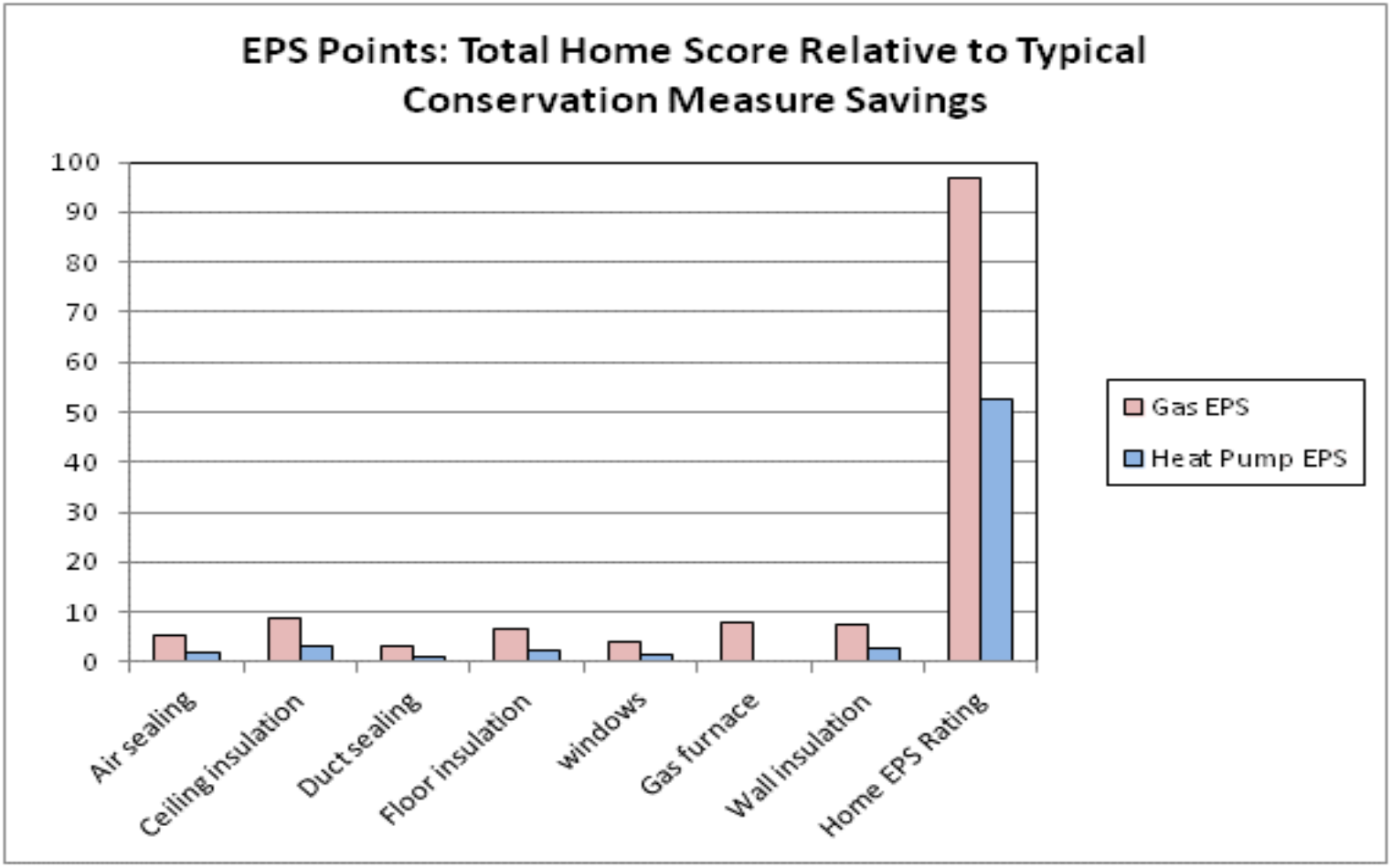

- Conservation measures will have only small impacts on scores unless several are done at once

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