



Beyond HERS: Measuring Savings for Homes Built to Exceed Energy Star Standards.

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Agenda

- Background
- Measuring Savings
- Findings
- Discussion



BACKGROUND

OG&E Program

- Operational since 1995
- Always ahead of Energy Star requirements
- Now part of 2010-2012 DSM portfolio
- About 45 participating builders
- 146 homes in 2010, 702 homes in 2011, 500 to the end of June 2012

HERS Raters/Ratings

Tons of measurements and multiple reports

HERS Index

- DOE says a typical resale home scores 130; the 2006 IECC standard new home scores 100.
- A home scoring 70 is 30% MORE efficient than the 2006 IECC standard
- OG&E requires homes to score less than 70 or be 50% more energy efficient than a standard existing home (assumed to be 120 in Oklahoma)



MEASURING SAVINGS

Three Methods to Estimate

- ***One size fits all.*** Use the average savings estimate from the potential study for each participating home.
- ***HERS Comparison.*** The HERS Index and estimated energy use from the Fuel Summary Report are compared to the base case reference home Index of 100 (2006 iecc).
- **Modeling.** Use the BEST model to determine savings for a statistically representative sample of homes.

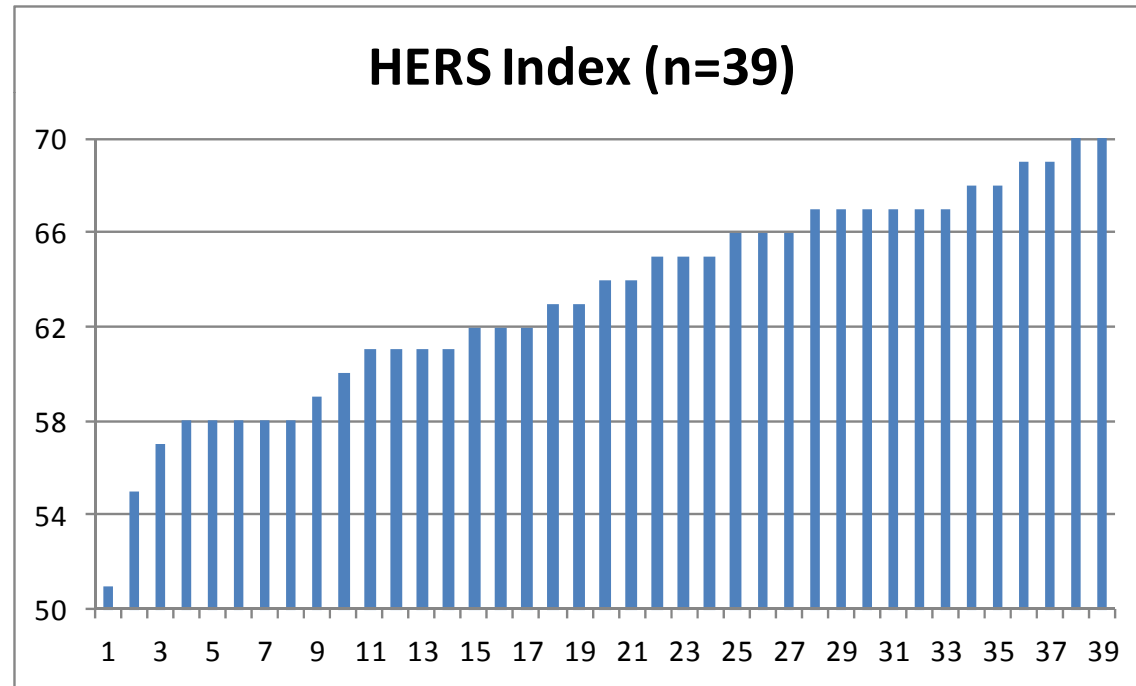
HERS Comparison

kWh savings = (Annual kWh ÷ HERS Index/100) - Annual kWh

END USE	kWh	Savings	
		HERS Index = 69	HERS Index = 67
Heating	260	117	128
Cooling	2,048	920	1,009
Water Heating	3,404	1,529	1,677
Lighting & Appliances	4,776	2,146	2,352
Total	10,488	4,712	5,166

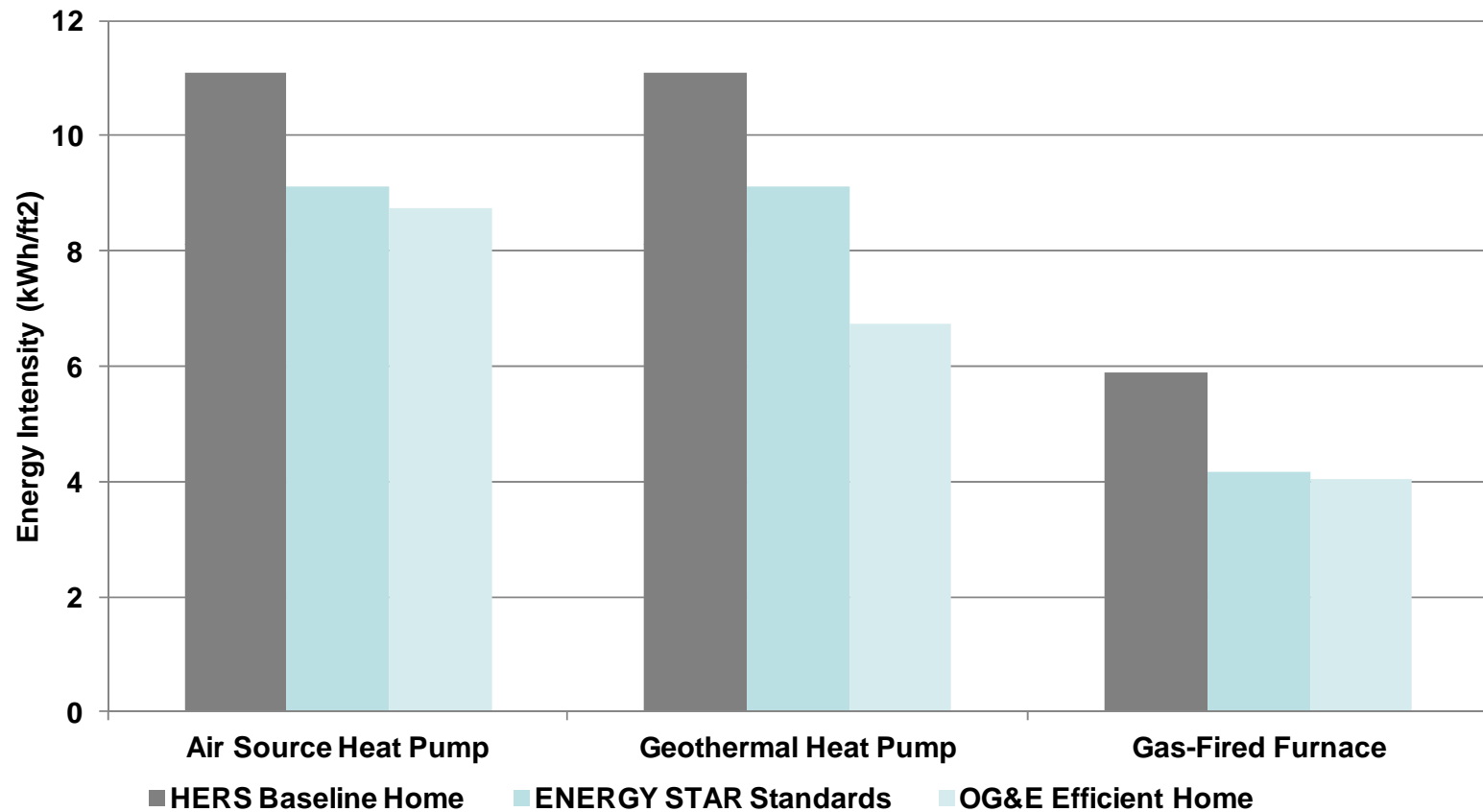
BEST Model

Statistically valid sample of 40 homes. HERS ratings vary widely.



OG&E New Homes vs. Standards

OG&E home more efficient for all fuel types.



Comparison Parameters

Parameter	ENERGY STAR	OG&E New Construction Average
Central AC SEER	14.5	15.3
Air Source Heat Pump HSPF	8.2	8.7
Geothermal Heat Pump COP	-	3.7
Wall Insulation R-Value	12.2	17.0
Ceiling Insulation R-Value (Low Vaulted Ceiling Fraction)	25.6	34.4
Infiltration Level (Natural ACH)	0.35	0.15 or 0.35
Outside Duct Leakage	6.00%	0.00% or 3.35%
Ceiling Insulation R-Value (Envelope Home or High Vaulted Ceiling Fraction)	25	21 or 30

Based on ENERGY STAR Qualified Homes, Version 3 (Rev. 05) except for Natural ACH and Outside Duct Leakage which are based on Version 2 Standards



FINDINGS

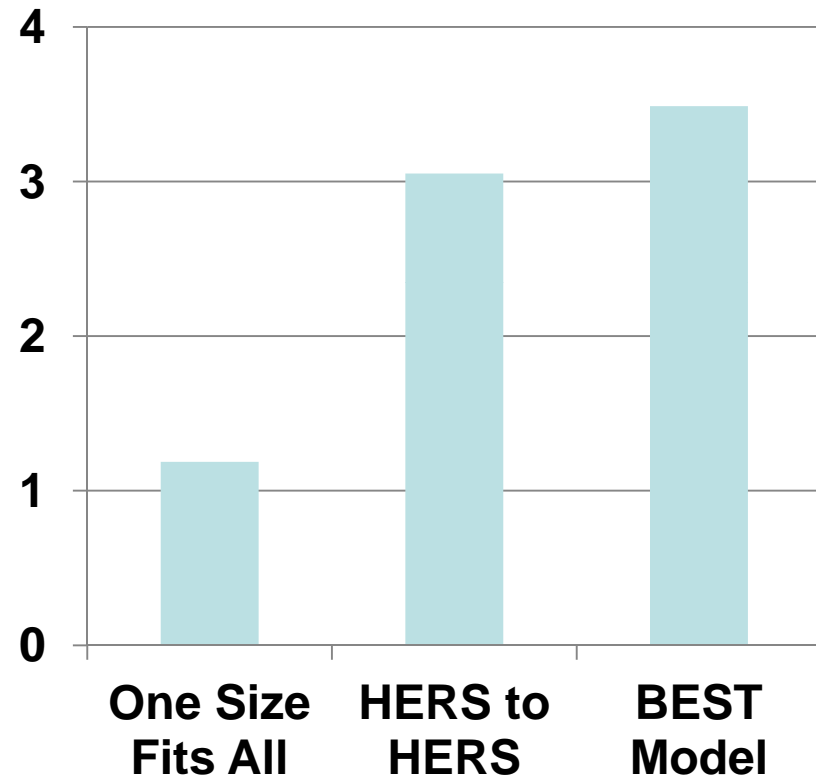
Annual Savings (MWh) by Method

Notes

Had all 3 estimates for 14 homes

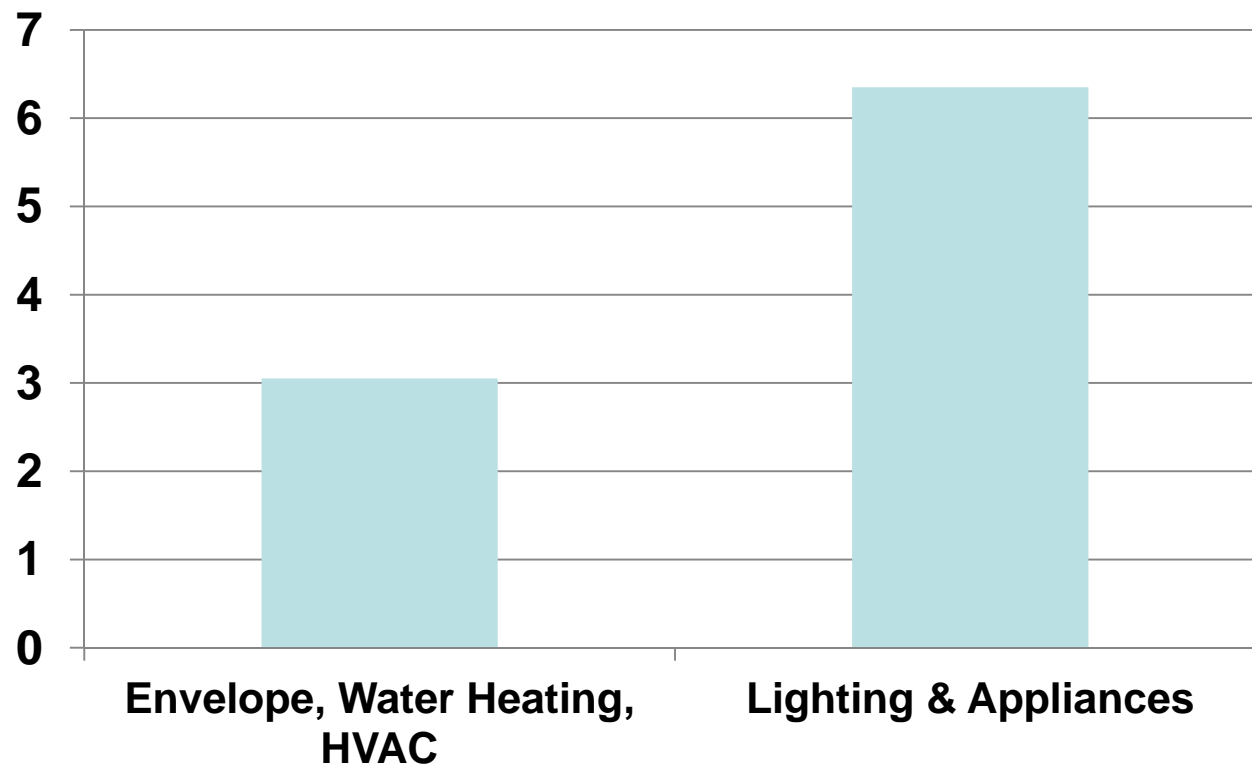
Excluded lighting & appliances from HERS-to-HERS estimate as BEST does not model these

BEST and HERS-to-HERS are similar.



What about lighting & appliances?

Estimated savings are double that from envelope, water heating & HVAC.

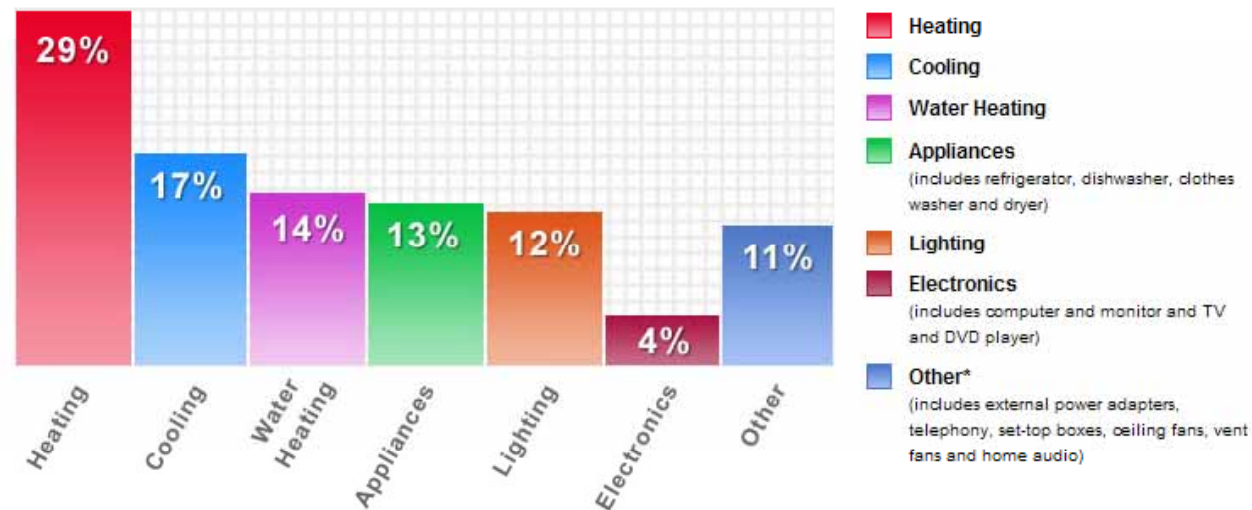


NEED A BETTER ESTIMATE

But lighting & appliances only account for 25% of energy use compared to 60% for heating, cooling, and water heating.

Where Does My Money Go?

The annual energy bill for a typical single home is approximately \$2,200.



Source: Typical House Memo, Lawrence Berkeley National Laboratory, 2009 and Typical house_2009_Reference.xls spreadsheet.

Average price of electricity is 11.3 cents per kilo-watt hour. Average price of natural gas is \$13.29 per million Btu.

* "Other" represents an array of household products, including stoves, ovens, microwaves, and small appliances like coffee makers and dehumidifiers.

DISCUSSION

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Save the Date

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Long Beach, CA

Jan. 28-31, 2013

AESP's 23rd National
Conference & Expo
Orlando, FL

Apr. 29-May 1, 2013

AESP's Spring Conference
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