RESNET Summit: Using HERS to Help Builders

EEBA High Performance Home Summit
October 10-12, 2017
Abe Kruger
Agenda/Outline

- High Performance Homes (HPH) market
- How we use HERS
- How our clients use HERS
- Q&A
Why Build Green/Energy Efficient?

1. Marketing benefits
2. Required for financing
3. Buyer wants it
4. Utility incentives
5. Risk mitigation
6. Better way to build/true believer
EE Homes Sell For More, Faster

Certified homes sell for 9.6% more.
Certified homes sell for 4.2% more & 18 days faster.

PACE homes delivered $199 to $8,882 in savings above cost of improvements.

Homes that disclose energy costs sold 20 days faster.
Homes that use “green” fields consistently perform better on market indicators.

ENERGY STAR homes sold at $5,566 premium at $2.99 per ft² more, & 89 days faster.

New certified homes sold for 12.9% more, $13.82 per ft² more, & 42 days faster.

Homes designated relatively energy efficient sold for an average $3,416 premium.

Certified homes sold for a higher percentage of their asking price & 31 days faster.

Houses with one or more green elements sell for 5.9% more.


*Not all studies shown have been peer reviewed.
What Do Consumers Want the Most

Importance of Home Features to Clients

- Comfortable living space: 71% Very important, 24% Somewhat important, 4% Neutral
- Proximity to frequently visited places (e.g., grocery store, school, highway, etc): 40% Very important, 47% Somewhat important, 10% Neutral, 2% Not very important, 1% Not at all important
- Windows/Doors/Siding (e.g., age, quality): 39% Very important, 49% Somewhat important, 10% Neutral, 2% Not very important, 2% Not at all important
- A home’s utility bills/operation costs: 28% Very important, 51% Somewhat important, 15% Neutral, 3% Not very important, 1% Not at all important
- Commuting costs: 18% Very important, 40% Somewhat important, 22% Neutral, 14% Not very important, 6% Not at all important
- A home’s efficient use of lighting (e.g., natural light, Energy Star fixtures, LED bulbs, smart hubs): 12% Very important, 38% Somewhat important, 32% Neutral, 14% Not very important, 4% Not at all important
- Smart/Connected home: 8% Very important, 32% Somewhat important, 38% Neutral, 16% Not very important, 5% Not at all important
- Green community features (e.g., bike lanes, green spaces, placemaking, etc): 8% Very important, 29% Somewhat important, 34% Neutral, 20% Not very important, 8% Not at all important
- Landscaping for water conservation: 8% Very important, 24% Somewhat important, 36% Neutral, 22% Not very important, 9% Not at all important
- Renewable energy systems (e.g., solar, geothermal, etc): 3% Very important, 20% Somewhat important, 42% Neutral, 24% Not very important, 10% Not at all important
Consumer Demand

1. On average, energy costs are higher than either property tax or insurance for U.S. homes at $2,506 per year (U.S. Census).

2. Attic insulation achieves highest return on investment of all home improvement projects studied at 116.9% (Remodeling Report).

3. Energy efficient homes can improve occupant health outcomes related to asthma, hypertension, and allergies (DOE).

4. 70% of households report that EE is important (Demand Institute).

5. 84% of homebuyers said that HVAC costs are at least somewhat important factors in their home purchase (68% appliances and 67% lighting) (NAR).
High Performance Homes: Benefits for Today and Tomorrow

As of 2016, over 1.5 million homes are considered High Performance Homes. These are new and existing homes that have third-party verifications identifying energy upgrades.
Buyers need access to energy efficiency information that is credible and easy to understand.

Sellers need tools that can accurately appraise the value of improved energy performance.
Certification Programs
How We Use HERS

- Green building certification
- Utility rebates
- Green renovation loans
- Georgia QAP compliance
For all single-family detached homes, townhomes, rowhomes, duplexes, triplexes, and quadplexes, calculate the Size Adjustment Factor (SAF) using the following equation:

\[ SAF = \left[ \frac{\text{CFA Benchmark Home}}{\text{CFA Home To Be Built}} \right]^{0.25}, \text{not to exceed 1.0} \]

Where:
- \( \text{CFA Benchmark Home} \) = Conditioned Floor Area of the Benchmark Home, using Exhibit 1 below
- \( \text{CFA Home to be Built} \) = Conditioned Floor Area of the Home to be Built

### Exhibit 1: Benchmark Home Size

<table>
<thead>
<tr>
<th>Bedrooms in Home to be Built</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditioned Floor Area</td>
<td>1,000</td>
<td>1,000</td>
<td>1,600</td>
<td>2,200</td>
<td>2,800</td>
<td>3,400</td>
<td>4,000</td>
<td>4,600</td>
<td>5,200</td>
</tr>
</tbody>
</table>

Additional info:
EarthCraft

- EarthCraft
  - ENERGY STAR HERS Index Target
LEED for Homes

- **LEED for Homes v2009**
  - ENERGY STAR v2 qualified
  - Points for <85 Index or ASHRAE model

- **LEED for Homes v4**
  - ENERGY STAR v3 qualified
  - Points for <70 Index or ASHRAE model
Georgia Power Rebates

- **HEIP**
  - 25% Energy Efficiency Improvement (Beacon)

- **EarthCents**
  - HERS 74 for SF and HERS 77 for MF
  - 15% Better than ASHRAE 90.1-2007
  - $500 for SF and $150/unit for MF
Green Loans

- **Fannie Mae**
  - Min 20% reduction in energy or water
- **Freddie Mac**
  - Min 15% reduction in energy or water
### Freddie Mac Green Assessment

- **Built in 1988 in Atlanta, GA**
- **Goal is 15% savings**

<table>
<thead>
<tr>
<th>Energy Conservation Measure</th>
<th>QTY</th>
<th>Estimated Total Cost</th>
<th>Annual Total Savings (kWh)</th>
<th>Annual Total Savings</th>
<th>Estimated Payback</th>
<th>Electric Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 SEER AC</td>
<td>764</td>
<td>$581,404</td>
<td>640,996</td>
<td>$76,920</td>
<td>7.6 Years</td>
<td>9.6%</td>
</tr>
<tr>
<td>Attic Insulation</td>
<td>304</td>
<td>$638,400</td>
<td>90,288</td>
<td>$10,835</td>
<td>58.9 Years</td>
<td>1.4%</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>442</td>
<td>$260,780</td>
<td>344,539</td>
<td>$41,345</td>
<td>6.3 Years</td>
<td>5.1%</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>442</td>
<td>$123,318</td>
<td>105,417</td>
<td>$12,650</td>
<td>9.7 Years</td>
<td>1.6%</td>
</tr>
<tr>
<td>22W CFL</td>
<td>15,640</td>
<td>$33,782</td>
<td>695,520</td>
<td>$83,462</td>
<td>&lt; 1 Year</td>
<td>10.4%</td>
</tr>
</tbody>
</table>
## Fannie Mae Green Assessment

- **Built in 1950s in Atlanta, GA**
- **Goal is 20% savings**

<table>
<thead>
<tr>
<th>ECM Item No.</th>
<th>Energy Conservation Measure Name</th>
<th>Annual Electricity Savings kWh</th>
<th>Annual Natural Gas Savings Therms</th>
<th>Projected Whole Property Source Energy Savings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Replace windows (U-0.32/SHGC-0.27)</td>
<td>43,179</td>
<td>11,003</td>
<td>6.7%</td>
</tr>
<tr>
<td>2</td>
<td>Install attic insulation (≤ R-38)</td>
<td>6,618</td>
<td>3,246</td>
<td>1.7%</td>
</tr>
<tr>
<td>3</td>
<td>Replace water heaters (0.95 EF)</td>
<td>(447,534)</td>
<td>27,623</td>
<td>-7.8%</td>
</tr>
<tr>
<td>4</td>
<td>Replace in-unit lighting (100% CFL or LED)</td>
<td>185,442</td>
<td>-</td>
<td>8.2%</td>
</tr>
<tr>
<td>5</td>
<td>Replace HVAC (14 SEER/8.2 HSPF) &amp; repair ductwork</td>
<td>(365,765)</td>
<td>61,926</td>
<td>10.7%</td>
</tr>
<tr>
<td>6</td>
<td>Install WaterSense showerhead (≤ 2.0 GPM) &amp; lav faucet (≤ 1.5 GPM)</td>
<td>-</td>
<td>1,145</td>
<td>0.5%</td>
</tr>
<tr>
<td>7</td>
<td>Install WaterSense toilet (≤ 1.28 GPF)</td>
<td>-</td>
<td>-</td>
<td>0.0%</td>
</tr>
<tr>
<td>8</td>
<td>Install ENERGY STAR Refrigerator</td>
<td>67,932</td>
<td>-</td>
<td>3.0%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td>(510,128)</td>
<td>104,943</td>
<td>23.0%</td>
</tr>
</tbody>
</table>
Q&A

- Questions
- Discussion