Matt Belcher

Remodeling and Retrofits
The “Green” Business Case

Midwest Energy Efficiency Research Consortium

VERDATEK Solutions

Hibbs Homes

NAHB

NAHB Green

Building America
U.S. Department of Energy Research Toward Zero Energy Homes

Energy Star
Builders Challenge Partner
Housing

128,649,000
Housing Units in the USA

-U.S. Census Bureau

At its peak: new Construction added about 1.6% to this number per year
(Approximately 10 years)

-About 2.5% of all Homes
Residential sector consumes 21.9% of the Energy in the U.S.
Housing

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- It also Produces 21% of green House Gas (GHG) Emissions
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- It also Produces 21% of green House Gas (GHG) Emissions
- **Homes built today are 100% More Energy efficient than homes built prior to 1991 (Amounts to 2.5% of all Homes)**
Homeowners Staying Put

- Mobility at 11.6% - Lowest since 1948
- First Time Home Buyers - 9 years
- Repeat Buyers - 15 years
- 52% planning on Home Improvement Over $3,500

2011 NAR Profile of Home Buyers & Sellers/Census.gov/AP
Green Remodeling Preferences
Energy Savings A Must

Energy Savings
  Windows
  Insulation
  HVAC
Better Indoor Air Quality
Water Efficiency
Sustainable Materials

Motivations: #1 Save Money, #2 Improved Living

Source: EcoHome Magazine
Building Codes

- International Code Council (ICC)
  - ”Family of Codes”
- Reference Standards (e.g.; ANSI, ASTM, NFPA)
  - As many as 350 standards developed by 50 standards generating organizations.
Advances in Codes

Currently:

Approximately 25% of the cost of a housing unit is from regulatory considerations.

Source: Survey and Housing Policy Research
National Association of Homebuilders
Basics:

As voted and passed last fall at ICC Conference:

Will require **30%** above 2006 IECC

More testing and verification.

Energy Labeling (MPG Sticker for Home)
Moving Housing forward

- Affordability (cost effective)
  $1000 increase in price of the median-priced new home would mean 217,000 U.S. Households from being able to qualify for a mortgage to purchase that home.

  *Source: U.S. Census*
“Above and Beyond Code”

- National Green Building Standard
- Energy Star
- Building America’s Builder’s Challenge (Challenge Home)
- Active House
- LEED-H
Greenhouse vs. Green House

Green means different things to different people
“Holistic” Basics in Building

- Site Planning and \textit{Design}
- Resource Efficiency
- Energy Efficiency
- Water Efficiency
- Indoor Environmental Quality
- Homeowner Education
Passive Solar Heating/Cooling Design

- Proper solar orientation and extending overhangs can reduce cooling by at least 20%
Rehab vs. Demolition

- Re-use/re-cycling of materials (Recycle a Building!)
- Diversion of materials from landfills
- Due to cost to produce new materials, re-used materials are now considered commodities instead of consumables
“Green” Codes: LEED EB & H

- Currently going through the revision process (LEED v4)
- Building Certification, marketing and information through USGBC
- Professional Designation (LEED AP) information, marketing through USGBC
- Industry advancements in Knowledge & Experience
“Green” Codes: ANSI ICC-700 (NGBS)

- Currently going through the revision process (Issued early 2013)
- New Chapters for Remodel and “Rehab”
- Building Certification, marketing and information through NAHBRC
- Professional Designation (CGP, MCGP) information, marketing through NAHB Education
- Industry advancements in knowledge & Experience
Occupant Behavior:

- Plug Load
- Habits
- Comfort
- Education
3 Regions with Greatest Green Opportunity by Builders and Remodelers

- **Pacific:** #1
  - 81% builders
  - 85% remodelers

- **West North Central:** #2
  - 76% builders
  - 79% remodelers

- **New England:** #3
  - 75% builders
  - 64% remodelers

Remodeling Market and Share of Green on the Rise

Home Remodeling Market 2009 to 2016 (projected) ($ billions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Less than 16% of projects green</th>
<th>16%-60% of projects green</th>
<th>More than 60% of projects green</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>78%</td>
<td>11%</td>
<td>22%</td>
</tr>
<tr>
<td>2011</td>
<td>66%</td>
<td>34%</td>
<td>14%</td>
</tr>
<tr>
<td>2013-2016</td>
<td>35%</td>
<td>45%</td>
<td>20%</td>
</tr>
<tr>
<td>2016</td>
<td>23%</td>
<td>43%</td>
<td>34%</td>
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“Baseline” Testing
Panelized, Systemic Re-construction
Foam is a good thing...
Non-Wood Clad SIPS
Combining Technologies
A Study of the Energy Impacts of Skylights in Different Climates

- November 15, 2011

Use of overhead daylight
- More Consistency
- Less glare
- Energy source
Quality Skylights provide more than twice the light as vertical widows:
Quality Management:
“You don’t get what you expect, You get what you inspect!”
Quality Management

- Moisture Control testing prior to cover up.
Quality Management

- Final Testing/verification and Commissioning
Incremental Cost of New Green Homes Has Decreased According to Builders

Incremental Cost of New Green Homes Has Decreased According to Builders

11%  10%  7%

2006  2008  2011

Green Remodelers Find Low Additional Cost to Build Green (2011)

Average Additional Cost

- All Respondents – 8%
- Dedicated Green – 5%

More than 60% Find Customers Are Willing to Pay More for Green

Builders

- 61% willing to pay more
- 30%
- 41%
- Dedicated Green Average – 6%
- Average – 3%

Remodelers

- 66% willing to pay more
- 28%
- 31%
- 7%

Bottom Line:

- Education

Builders

Industry Professionals
Bottom Line:

- Education

✓ Consumers
Bottom Line:

- Education
- Consumers
- Lenders
Bottom Line:

- Education
- Consumers
- Lenders
- Appraisers
Bottom Line:

- Education
- Consumers
- Lenders
- Appraisers
- Jobs
Lender Specification

“This Home is being built/renovated/updated to standards above prevailing code. It is designed and constructed with unique features and materials and with high efficient equipment and in accordance with high efficiency standards. The Lender shall choose an Appraiser educated and knowledgeable in this type of valuation of these specialized Homes. It is understood that unless said Appraiser can provide verification of education and knowledge, they will not be permitted to conduct the appraisal for this project.”
Impact on Marketing for Home Builders

# Impact on Marketing for Home Builders

<table>
<thead>
<tr>
<th>Year</th>
<th>More Difficult</th>
<th>No Difference</th>
<th>Easier</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>29%</td>
<td>31%</td>
<td>40%</td>
</tr>
<tr>
<td>2011</td>
<td>20%</td>
<td>34%</td>
<td>46%</td>
</tr>
</tbody>
</table>

Firms Dedicated to Green Will Increase Dramatically by 2016

Dedicated to Green: 90% of their projects are green

Builders Dedicated to Green: 17% in 2011, 31% in 2016
Remodelers Dedicated to Green: 8% in 2011, 22% in 2016

Key Takeaways

- New green homes have grown through the protracted downturn and are expected to continue to grow during the recovery
  - Total value expecting a five fold gain in five years.
- Builders are currently doing more green work than remodelers, but remodelers are catching up
  - The number of remodeling firms doing largely green work is going to triple in the next 6 years.
- Experience with green carries strong business benefits.
  - Dedicated green firms have stronger business results across the board.
  - Trend since 2008 for all builders: Green is more affordable and easier to implement.
- Association with quality drives green: most important trigger for builders and second for remodelers
Energy “Equity”

Here’s how we spend our energy $:

A typical single family home has an annual energy bill of about $2,200. Here’s how the bill breaks down based on energy use.

- Heating & Cooling: 43%
- Water Heating: 12%
- Lighting: 11%
- Computers & Electronics: 9%
- Refrigeration: 8%
- Appliances: 9%
- Other: 8%

(The heating or cooling numbers will change based on how far north or south you are.)
Bottom Line = Bottom Line

- “Right Sized Home”
- Competitively Priced
- Energy Savings
- Reduced Maintenance
- = Equity
Conclusion:

Not a linear process, integrated systems
(Affordability = Sustainability!)

Thank You!
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