TRENDS AND OPPORTUNITIES IN THE U.S. BUILDING MATERIALS MARKET

2018 International Builders’ Show
Home Innovation Research Labs

- Founded in 1964 as wholly-owned subsidiary of NAHB
- Independent, for-profit researchers assisting development and commercialization of new building technologies
  - Engineering research & development
  - Market & field research
  - Laboratory testing
- Leader in green home building movement (NGBS)
- Key role in building codes and standards development
- Partnership with ICC-ES to fast-track issuance of ESRs
Purpose and Outline of Presentation

Aimed primarily at manufacturers and suppliers of building materials to the U.S. market

1. Review of building materials trends in new homes and remodeling
2. Explore issues with offering new building products & services
Annual Building Product Tracking, Custom Market Research Studies

- Home Innovation has been tracking annual materials purchases since 1995
  - Builder Practices Survey of 1,500 U.S. Builders
  - Consumer Practices Survey of 100,000 U.S. households
- Decades of custom market research, sponsored by hundreds of building materials manufacturers
- Observational research of materials installation issues
Above-Grade Walls are Largely Site-Built with Wood Products
Shares of Single Family Detached Homes, 2016

- Site built wood frame: 80%
- Panelized wood frame: 7%
- Concrete block: 6%
- Poured concrete: 3%
- Modular wood frame: 1%
- Structural insulated panels: 1%
- Post & beam or Logs: 1%
- Insulated concrete forms: 1%
- Precast concrete: 0%

Slow, evolutionary change is hallmark of U.S. construction…but not always.

Source: Annual Builder Practices Reports
Shares of **Insulating Foam Wall Sheathing** in New US SFD Homes

Source: Annual Builder Practices Reports
As Energy Efficiency Increases, 2 x 6 Walls (vs. 2 x 4) are More Common
Shares of 2 x 6 Exterior & Interior Walls

Source: Annual Builder Practices Reports
Industry Favors Evolutionary Change, Drop-In Replacements
Basement Wall Materials, New Homes in 2016

<table>
<thead>
<tr>
<th>Material</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poured concrete</td>
<td>77%</td>
</tr>
<tr>
<td>Concrete block</td>
<td>13%</td>
</tr>
<tr>
<td>Insulated concrete forms</td>
<td>5%</td>
</tr>
<tr>
<td>Precast concrete</td>
<td>3%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
<tr>
<td>Pressure treated wood</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Annual Builder Practices Reports

Revolutionary change happens builder by builder and market by market.
Ceiling Height of New SFD Homes, First or Main Floor

Source: Annual Builder Practices Reports
Ceiling Height of New SFD Homes, Second and Upper Floors

Source: Annual Builder Practices Reports
Wood Trusses Trending Upward

Labor-saving engineered solutions, like trusses are expected to continue to grow in popularity.

Source: Annual Builder Practices Reports
Trus-Joist Successfully Introduced a Better Structural Floor

Shares of Floors in Single Family Homes

Source: Annual Builder Practices Reports
Floors Now Have Less Bounce and Total $ Spend per New Home is Up

Floor Joist Depth in New U.S. Homes

Source: Annual Builder Practices Reports
Differentiation in a Commodity Market—
Shares of Premium & Commodity OSB Subflooring

Source: Annual Builder Practices Reports
Spray Foam Insulation Market Share by Assembly, 2016 US Homes

- Cathedral Ceilings: 21.1%
- Interior Wall Sound Insulation: 20.5%
- Second Story Floor: 14.8%
- Garage Walls: 12.3%
- Combined House Insulation: 11.7%
- Ground Floor Over Basement: 11.4%
- Exterior Wall Cavity: 10.9%
- Garage Ceilings: 10.8%
- Flat Ceilings: 10.1%
- Total Floor Insulation: 9.7%
- Crawl Space Wall: 6.9%
- Ground Floor Over Crawl Space: 6.5%
- Basement Wall: 5.3%

Source: Annual Builder Practices Reports
Whole-House Ventilation Systems in New US SFD Homes

Source: Annual Builder Practices Reports
Roofing Material Installed in Home Replacements

Source: Annual Consumer Practices Reports
Roofing Materials Installed in New SFD Homes

Source: Annual Builder Practices Reports
Exterior Cladding in New SFD Homes

Source: Annual Builder Practices Reports
Exterior Cladding in Home Remodeling

Source: Annual Consumer Practices Reports
Exterior Cladding in Home Remodeling (Lower Tier)

Source: Annual Consumer Practices Reports
To Own a Market, You Educate a Market
Shares of Housewrap, 2016 New SFD Home Market

- DuPont Tyvek, 56%
- Green Guard, 2%
- James Hardie, 2%
- Owens Corning, 5%
- TYPAR, 8%
- REX Wrap, 2%
- All Others, 11%
- CertainTeed, 6%
- Dow, 4%
- Barricade, 3%

Source: Annual Builder Practices Reports
Trend Towards Hard Surfaces Continues

Source: Annual Builder Practices Reports
Finish Flooring in New SFD Homes
Engineered Wood with Steep Growth

Source: Annual Builder Practices Reports
Windows In New US SFD Homes

Source: Annual Builder Practices Reports
Shares of Raised Porch and Decking Material in New SF Homes

- Treated Lumber
- Untreated Lumber
- Composite & Plastic
Shares of Raised Porch and Decking Material in Residential Remodeling

- Treated Lumber
- Untreated Lumber
- Composite and Plastic

Home Innovation Research Labs
Some Pitfalls to New Building Product Introductions

- Product benefits someone other than specifier, purchaser or end-user (such as some labor saving innovations)
- Product requires systemic change
  - Drop-in replacements have higher likelihood of success
- Wrongly assuming little emotional content in purchase decision
- Benefits are difficult or disadvantageous to convey
  - When more than multiple logical points need to be made, or if benefits rest on a hard-to-understand engineering principle
  - Involves mentioning disasters, sickness, raises questions
Common Mistakes with New Market Introductions

- Entering the most regulated or complex applications first
  - Wall systems in very cold or high-wind areas, for example
- Sellers create value proposition that relies on purist view, requires all-or-nothing decision
  - Exterior trim & molding is a prime example: a single house may have four or more different exterior trim materials
- Failure to realize that home building & remodeling companies are businesses
  - Sales, design, marketing, regulations, code approvals, coordinating construction, financing, hiring & training & retaining employees
  - Your product can improve their home—how about their business?
  - Some offer program assistance—bidding, scheduling, financing, etc.
Common Mistakes with New Building Product Introductions

- New products address complaints or nuisances, but fail to really **solve problems or create opportunities**
  - Contractors will not always pay more for a product that is less heavy, less dusty, or less itchy

- Some new product benefits create unintended consequences—examples of issues with early Green homes
  - Ultra-low-flow fixtures and long wait times for hot water
  - Very high efficiency AC and high indoor humidity
  - Very tight homes and poor indoor air quality

- True advantages are not typically discovered until after the product has been on the market a while
How Switching to a New Product Can Impact Builders & Contractors

- Switching Costs—new place of purchase, training installers & supervisors, new tools and more
  - “Tool Programs” are one popular way to reduce switching cost
  - Field techs, design assistance, code help are common services
- There is an implied “risk premium” required by contractors for switching—so your product/service advantage need to have substantially greater benefits
- Remember that most installers do not read instructions, and they want the contractor to make decisions on how to install
Your New Product Installs So Easy, Anyone Can Do It?

- Anticipate resistance from some skilled trades
- Learn how product improves installation, then demonstrate to contractors
- Consider non-traditional users, like remodeling generalists or handymen who welcome alternative that doesn’t require special tools or training
- Consider do-it-yourselfers (prosumers, weekend warriors, etc.)
Strategies That Can Build Upon Construction Labor Shortage

- Reduce skills required (unskilled worker to do job of journeyman)
- Reduce crew size (run more crews with same workforce)
- Eliminate need for a trade—one trade does work of two
- Fewer trips to the jobsite
- Reduce fatigue & jobsite injuries to keep workers longer
- Allow for easier payment of workers by piece rates
- Cautions: saving time for one worker does not always translate into overall time savings
- Focus on savings in time-consuming activities
Management Labor Deficit

- Recent HI study of ASHRAE members revealed that there is a deficit management levels of construction companies—not just skilled tradespeople—
  - The primary lack was project coordination and management
  - The skills were particularly lacking a deep knowledge of construction (not engineering) need jobsite experience and maturity to anticipate issues
- Technologies/apps/software solutions are available, but only tech savvy younger generation was inclined to use them
  - Webinars to facilitate face-to-face contact
  - Tracking software to communicate real-time with building team
  - Communications apps
## Industry Concentration Among New Home Builders

<table>
<thead>
<tr>
<th></th>
<th>Share of 2016 Total Starts</th>
<th>Total 2016 Starts of Smallest in the Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation's Largest Builder</td>
<td>3%</td>
<td>41,652</td>
</tr>
<tr>
<td>Top 5 Builders</td>
<td>10%</td>
<td>14,229</td>
</tr>
<tr>
<td>Top 10 Builders</td>
<td>13%</td>
<td>6,098</td>
</tr>
<tr>
<td>Top 20 Builders</td>
<td>16%</td>
<td>2,790</td>
</tr>
<tr>
<td>Top 100 Builders</td>
<td>22%</td>
<td>403</td>
</tr>
<tr>
<td>Top 200 Builders</td>
<td>24%</td>
<td>149</td>
</tr>
<tr>
<td>All Builders Under 149 Starts</td>
<td>76%</td>
<td>1</td>
</tr>
</tbody>
</table>

Calculations Based on Builder Magazine’s Builder 100 and NAHB-reported housing starts.

- Multifamily Apartments, 28%
- Single Family Starter, 20%
- Single Family Moveup, 27%
- Single Family Luxury, 13%
- Townhouses, 12%

Source: U.S. Census and Annual Builder Practices Reports

<table>
<thead>
<tr>
<th>Type</th>
<th>Average SF of Finished Floor Area</th>
<th>Average Selling Price (USD)</th>
<th>Total Value (Billions USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Townhouses</td>
<td>1,745</td>
<td>$327,091</td>
<td>$48</td>
</tr>
<tr>
<td>Multifamily Apartments</td>
<td>1,118</td>
<td>$191,640</td>
<td>$66</td>
</tr>
<tr>
<td>Single Family Starter</td>
<td>1,700</td>
<td>$183,428</td>
<td>$46</td>
</tr>
<tr>
<td>Single Family Moveup</td>
<td>2,535</td>
<td>$364,136</td>
<td>$121</td>
</tr>
<tr>
<td>Single Family Luxury</td>
<td>3,931</td>
<td>$767,320</td>
<td>$119</td>
</tr>
</tbody>
</table>

Source: Annual Builder Practices Reports
Is the Remodeling Market Opportunity Primarily for Pros or DIYers?

DIY Share of Remodeling Materials Purchases

Source: Annual Consumer Practices Reports