

# A New Role for Home Energy Raters - Interfacing with the Building America Program



## 2006 RESNET Building Performance Conference

"Embracing the Future"

February 27 - March 1, 2006

Plaza San Antonio  
San Antonio, Texas

Neil Moyer



Break Out Session 6  
3:30 - 5:00 p.m.

# Building America Research Teams

- Advocates a systems engineering approach to home building that unites segments of the building industry that traditionally work independently of one another.
  - It forms teams of architects, engineers, builders, equipment manufacturers, material suppliers, community planners, mortgage lenders, and contractor trades.
  - Currently, there are 5 Building America teams who have worked with more than 525 industry partners



# 5 Research Teams

## Building Industry Research Alliance (BIRA)



## Building Science Consortium (BSC)



## Consortium for Advanced Residential Buildings (CARB)



## Industrialized Housing Partnership (IHP)

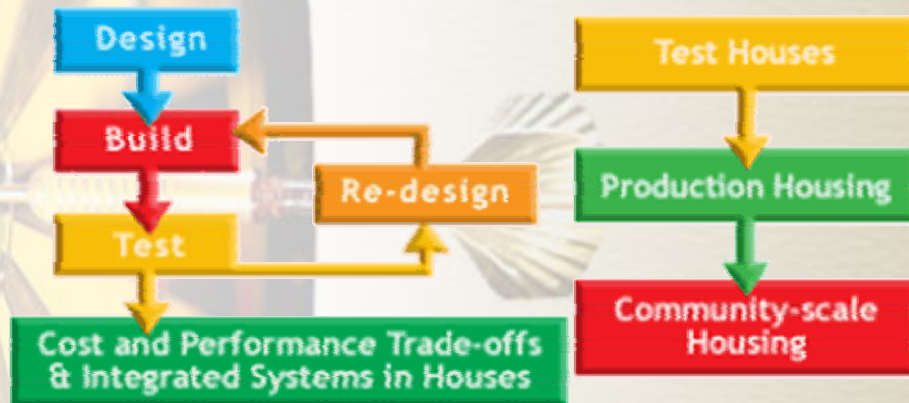


## Integrated Building and Construction Solutions (IBACOS)





# Building America...



[www.buildingamerica.gov](http://www.buildingamerica.gov)

## *Advantages to Builder:*

- Reduces callback and warranty problems
- Reduces construction costs
- Improves productivity
- Improves building performance
- Allows innovative financing due to predictable lower utility bills
- Gives builder a competitive advantage.

## *Advantages to Consumer:*

- Increases quality without increasing cost of ownership
- Increases comfort and performance
- Doesn't detract from the aesthetic value
- Reduces utility bills
- Allows greater financing options.



## Industrialized Housing Partnership



Overview

Activities

Case Studies

Current Data

Partners

Publications

Researchers

Contact Us



Conducted by  
**Florida Solar Energy Center**  
A Research Institute of the  
University of Central Florida

### Partnership Goals



Cost effectively reduce the energy use of industrialized housing by up to 50% while enhancing indoor air quality, durability and productivity.



Assist in the construction of thousands of energy efficient industrialized houses annually.



Make our team members pleased and proud to be working with us.

Funded by USDOE Office of Building Technology  
and  
Administered by National Energy Technology Laboratory

[www.baihp.org](http://www.baihp.org)

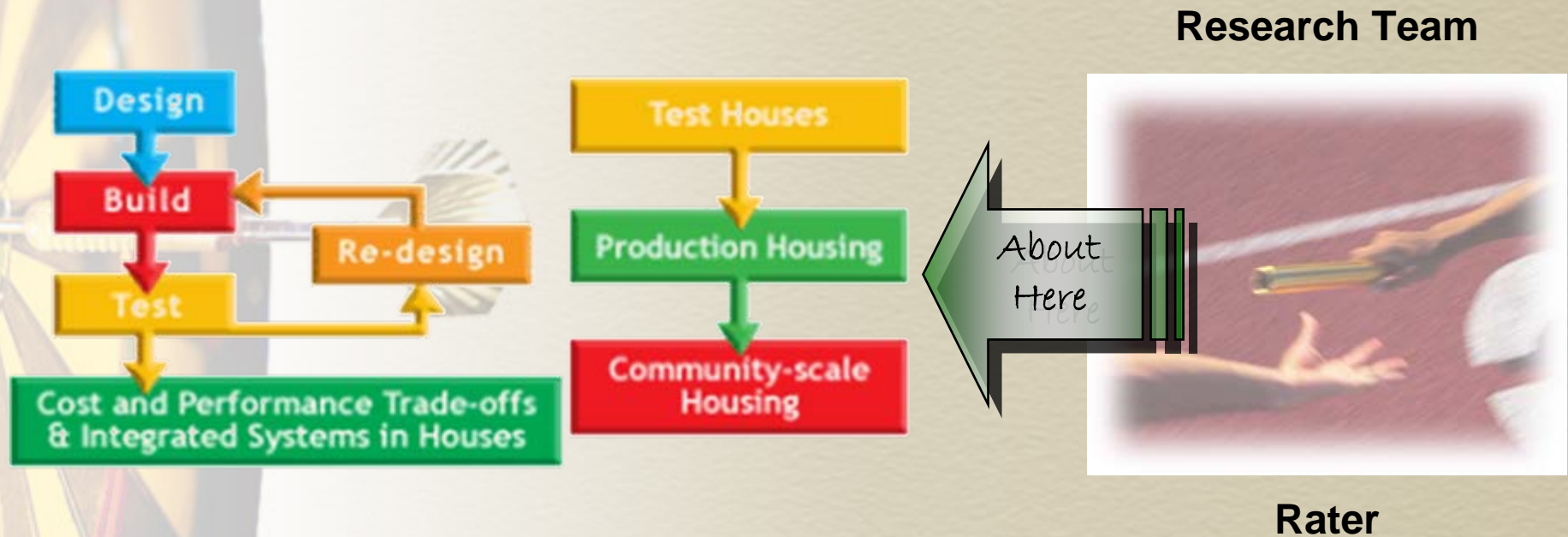


# Forming Partnerships...

- **Florida HERO**
- **Habitat For Humanity**
- **Calcs-Plus**



# Passing the Baton...





# Community Scale

- **Florida HERO**



### Show Me the Money: Selling Builders on Systems Engineering

(Apr 2003)



Atlantic Design & Construction is a small, privately held residential construction company located in Gainesville, Florida. Founded in 1985, the firm now directly employs 15 full-time employees and sells about 50 - 60 homes a year. Like any business, Atlantic Design & Construction is interested in both short-term

and long-term profitability. Showing this multiple award-winning company how they could increase their profits when they actively promoted Energy Star and Building America was the key to a successful partnership.

florida  
**H.E.R.O.**<sup>sm</sup>

Part of the Solution...One Home at a Time

### Sandspur Housing Completes 176 Energy Star Units

#### ***Gainesville, Florida***

Sandspur Housing completed a 176-unit complex in June 2003, at Brookside in Gainesville, Florida. Each apartment was individually tested for envelope and duct leakage as part of the BAIHP testing protocol. Energy ratings were conducted by BAIHP partner, Florida Home Energy and Resources Organization ([Florida H.E.R.O.](#)), of Newberry, Florida with testing assistance from FSEC staff.



**Newly Constructed Brookside Apartments**

## Show Me the Money: Selling Builders on Systems Engineering

### Atlantic Design & Construction

#### MEETING BUILDING AMERICA STANDARDS

<b>Treatment</b>	<b>Before</b>	<b>After (89 HERS Score)</b>
Windows	double pane, clear	double pane, low-e SHGC .35
Ceiling Insulation	R-30 unfaced	R-30 unfaced
Wall Insulation	R-11 faced	R-13 unfaced
Air Conditioning SEER	10 to 12	13
Natural Gas Heating	AFUE .80	AFUE .92+
Natural Gas Water Heating	.57 efficiency	.57 efficiency
Combustion	unsealed	sealed
Outside Air	none	yes
Return Air	none	pressure balanced
Duct Leakage @ 25 Pa	30% of fan flow	<5% of fan flow
A/C Sizing	standard rule-of-thumb	right sizing
Thermostat	standard mercury	programmable
Recessed Lighting	standard	air loc



## Show Me the Money: Selling Builders on Systems Engineering

# LESSONS LEARNED



Completion of HVAC rough-in with return plenum on the upper left, supply plenum on the upper right, sealed combustion pipes on the bottom and refrigerant line between pipes.

- Learn decision-making structure of targeted organization.
- Be persistent.
- Provide assistance in verifying construction and design procedures.
- Engage key decision-makers in the verification process.
- Present results to a builder in ways he or she can appreciate.
- Make recommendations that are within the builders budget, price points and available skill level of trades using available materials and home designs.
- Follow-up with technical training, information and/or assistance as needed to keep builder and staff engaged in the program.
- Conduct performance testing on every home to insure quality control during the commissioning process.





# Organizational Scale

- **Habitat For Humanity**

# Habitat for Humanity

- Partners:
  - Habitat for Humanity International (Parent Organization)
  - Habitat Affiliates throughout U.S. (1600+)
- Types of outreach:
  - Recommendations on policy and standards
  - Design and construction detailing assistance
  - Hands-on training before and during blitz builds
  - Regional workshops on energy efficiency



# Habitat for Humanity

## Blitz Building:

### Energy efficient construction in the blink of an eye



**Day 1** - House dried-in with rough trades finished by end of day.

Energy tasks: *Framing details, floor insulation, and air sealing.*

**Day 2** - Sheet rock installed with first coat of sheet rock mud. Begin siding and roofing.

Energy tasks: *Window installation, insulation, ventilation baffles, duct and AHU sealing.*

**Day 3** - Drywall, drywall, drywall. Siding, siding, siding. Roofing, roofing, roofing

Energy tasks: *Duct and AHU sealing with mastic, sealing fixture/outlet boxes.*

**Day 4** - Painting, trimming, finishing. Cabinets, fixtures, finish trades, flooring.

Energy tasks: *Fix faulty ducts, trouble shoot.*

**Day 5** - Finish work, hardware, switch plates, supply and return registers, punch list.

Energy tasks: *Testing whole house and duct air tightness.*

*Houses are usually dedicated on the afternoon of Day 5.*



# Congress Building America Project

Habitat for Humanity affiliates will be partnering with local Congress members to build energy efficient, affordable homes with technical assistance from Building America teams under a concurrent resolutions adopted by the U.S. Senate (Resolution 43) and House (Resolution 184).

## Energy Features

- Air sealing details to prevent drafts
- High Performance Windows with Optimal Orientation
- Increased insulation levels in floors, walls, and ceiling
- High efficiency heating and cooling systems sized using ACCA Manual J methods
- Air tight duct systems sized using ACCA Manual D methods and performance tested
- Energy Star Appliances and compact fluorescent lighting
- Checklists for insulation, air sealing, and other energy efficiency details
- Estimated whole house energy savings goal = 35% - 50%

## Indoor Air Quality Features

- Passive fresh air ventilation with filter
- Passive return air pathways from bedrooms
- Moisture control strategies
- Passive return air pathways from bedrooms
- Low VOC materials and VOC Source Control



# Learn More...

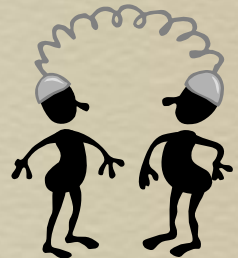
## Opportunities with Habitat for Humanity - The Building America Experience

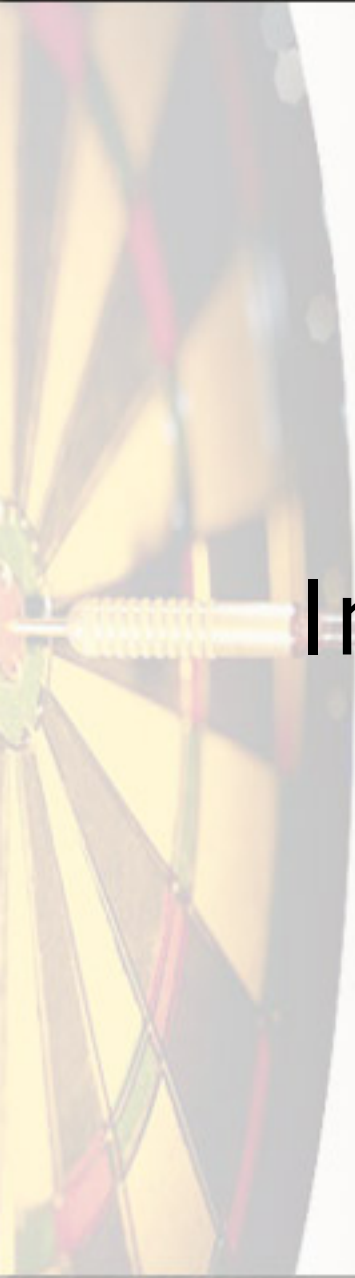
Presenters:

Janet McIlvaine, Florida Solar Energy Center  
Dennis Storer, Calcs-Plus

Break Out Session 8 10:30 – Noon

The Building America Program and Habitat for Humanity International has partnered with RESNET on the Jimmy Carter Blitz and the Congress Building America effort. This effort involved raters in verifying the homes as ENERGY STAR. This session will explore how raters from across the nation can partner with their Habitat affiliates.





# Internal to Research Team

- **Calcs-Plus**



# As Consultant...

- Part of the BA team, performing tasks within their field of expertise...
- For example - Calcs-Plus
  - Class A HVAC Contractor
  - 25 years in the business of air conditioning and heating design, installation, & service
  - Certifications
    - NBI Test & Balance
    - ACCA Manual J V8 Instructor
  - Memberships
    - ACCA
    - ASHRAE



# THANK YOU



"And God gave Solomon wisdom and understanding exceeding much, and largeness of heart, even as the sand that is on the sea shore." 1 Kings 4:29