Reducing Energy Cost for Affordable Housing

sponsored by
Florida Housing Finance Corporation’s Catalyst Program
www.flhousing.org
DEFINITION OF A GREEN HOME

A green home is an energy-efficient home that incorporates multiple environmental, ecological and sustainability features that materially enhance the built environment.

GOAL OF A GREEN HOME

- Enhance health and safety,
- Enhance building durability, comfort,
- Enhance energy efficiency, and
- Enhance efficient use of resources.
GREEN FEATURES

Elements that enhance or increase:

- Disaster resistance
- Excellent indoor air quality
- Universal design
- Resource efficient materials
- Low water use
- Reduced energy consumption
- Native landscaping

IMPORTANCE TO AFFORDABILITY

- Energy efficiency is encouraged in affordable housing programs.
- Many improvements can be made for minimal cost.
- Reduced utility expenses are a major incentive particularly for lower income households.
- All homeowners benefit from a healthier home that is free of toxins.
SHIP rules on Green

SHIP statute:
(14) Each county and eligible municipality shall include initiatives in the local housing assistance plan identifying **current** and **emerging** green building and design techniques and explain how these techniques are to be integrated into its **housing strategies** both for **sustainability** and promote greater **affordability** pursuant to Section 420.9075(3)(d), F.S.

SHIP Statute

- **420.9075** Local housing assistance plans; **partnerships** (d) Each county and each eligible municipality shall describe initiatives in the local housing assistance plan to encourage or **require** innovative design, **green building** principles, **storm-resistant** construction, or other elements that **reduce** long-term costs relating to maintenance, utilities, or insurance.
LHAP Requirements

T - Describe efforts to incorporate Green Building and Energy Saving products and processes:
   - Make sure that you follow the process and include the products that has been outlined in the LHAP
   - You can do more, not less
   - Include these products in your specifications and plans

Presenters

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• The Master’s Touch – Transform, LLC
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IMPROVING REHAB INSPECTIONS WITH BUILDING PERFORMANCE

Reducing Energy Cost for Affordable Housing (Webinar)
7 September 2016

1990’S HABITAT HOUSES AVERAGE USAGE

BUILDING IS A SYSTEM

Hereditary Characteristics
Environmental History
Operational Choices

PEOPLE

Enclosure

BUILDING
Fit & Finish
Sub-System

Heat

Moisture

Personal
ENVIRONMENT
Exterior
Interior

KNOW THE ENEMY
-Solar Radiation
-Water Vapor

From Builder’s Field Guide, written by Building Science Corporation.
**REDUCE ENERGY USE CAUSED BY...**

### Solar Radiation
- **Roof**
  - Light colors
  - Metal
- **Attic**
  - Air Sealing
  - Insulation
  - Radiant Barrier
  - Ventilation
- **Walls**
  - Landscape
  - Light colors
- **Windows**
  - Landscape
  - Sunscreen
- **HVAC**
  - Efficiency

### Water Vapor
- **Pressure Boundary**
  - Air Sealing
- **HVAC**
  - Right sized
  - Efficiency
  - Tight ducts
  - Exhaust fans
  - Pressure balance
**REDUCE ENERGY USE CAUSED BY...**

**Water Heating**
- Flow Resistors
- Leaks

**Refrigeration**
- EnergyStar®

**Lighting**
- LED / CFL

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**BENEFITS**

**Potentially**

Performance homes have:

- LOWER ENERGY BILLS
- MORE COMFORT
- SMALLER COOL/HEAT EQUIPMENT
- IMPROVED INDOOR AIR QUALITY
BUILDING PERFORMANCE: VISUAL ANALYSIS

Visual Confirmation

• Simulation
• Energy Usage
  • Lifestyle
• Insulation
• Moisture
• Air pathways
• Mech Equipment

BUILDING PERFORMANCE: TEST ANALYSIS

Diagnostic Tools

• Micromanometer
  • Pressure differences
• Blower Door
  • Building airtightness
  • Air leakage pathways
• Duct Tester
• Air Flow Tester
• Moisture Meter
**TOO LEAKY-TIGHT-OR JUST RIGHT**

Sometimes obvious

Sometimes not so much

**BLOWER DOOR TESTING**

Blower door testing is used to quantify and locate air leakage by using a calibrated fan to depressurize a house.
**Know the Enemy**

Solar Radiation  Water Vapor

**Air Barrier Continuity & Air Tightness**
PENETRATIONS-
PLUMBING

PENETRATIONS-
ELECTRICAL
OPEN FLOOR CAVITIES

DUCT AND ELECTRICAL PENETRATIONS

Connects attic space to conditioned space
**BUILDING CAVITIES**

--- Before & After---

Connects attic space to conditioned space

Note: When air sealing around chimneys or combustion vent pipes, non-combustible materials must be used.

**THEN TO TIGHT...**

**CONCRETE HOUSE – ALL 6 SIDES**

Very tight –

high interior moisture
DUCT TESTING –

Pressure Pan          Duct Tester

--- Duct Leakage ---
MISSING INSULATION

Kneewall insulation problem
MECHANICAL VENTILATION

**Strategies:**

- Point-source ventilation
  - Remove Pollutants
- Whole-building ventilation
  - Dilute Pollutants

**Types:**

Exhaust-Only  Supply-Only  Balanced

GREEN HOME

ONE WAY OR ANOTHER

Right Thing
- Right thing happens

Wrong Thing
- Wrong thing happens

Right Thing
- Right thing may or may not happen

Wrong Thing
- Wrong thing happens
“Transforming the acceptable to exceptionable”

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Presenters

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• Executive Director of St. Johns Housing Partnership. For 24 years, he has worked with affordable housing programs in Duval, St. Johns and Clay Counties. Since 1999, the SJHP has provided home repairs to over 225 homes annually. In 2002, SJHP created Home Buyer, Credit Counseling and Foreclosure Prevention services as a critical part of their housing program.
ENERGY EFFICIENCY
IN REHAB WORK

Improving Sub–Standard Housing–Home Repairs

- Start with Health and Safety Focus
- Energy Conservation= IAQ
- Accessibility promotes Aging In Place
- Basic Green Building
The office uses available state and federal funds to develop and manage energy efficiency, renewable energy and energy education programs throughout the state.

http://www.myfloridahomeenergy.com/

An interactive energy consumption site

Maximizing Efficiency

- Improving building performance is the first step
- Improving the whole house, extends the value of the energy retrofit measures

Knowing what to replace/upgrade and when, is key
Energy and Water Conservation

OVERLAP BETWEEN E.E. MEASURES AND HEALTHY HOMES PRINCIPLES

× 1. Dry = Air Sealing, Duct Sealing, Ventilation, Water Mgmt.
× 2. Clean = Air Sealing, Duct Sealing, Materials Selection
× 3. Pest-Free = Air Sealing, Duct Sealing
× 4. Ventilated = Ventilation
× 5. Safe = Lead, Asbestos, Mold, Radon, Fire Hazards, Structural
× 6. Contaminant-Free = Ventilation, Air/Duct Sealing
× 7. Maintained (Durable) = HVAC/Ventilation, Water Management, Structural
× 8. Energy Efficient
UTILITY COMPANIES SELL POWER

- And they provide conservation programs-
  - JEA- Jacksonville Electric Authority
    - Discount on Light bulbs
    - Lots of info on Tips, financing for conservation
    - Certain Programs with Rebates on residential
  - FPL-
    - On Call program- monthly discount
    - Consumer education
    - Quality Control Training with Specialty Trades

UTILITY COMPANIES ARE A RESOURCE

- Rebates for measures installed
- http://www.dsireusa.org/

- Conservation education
  - For Clients/Customers-
    * Evaluate actual energy consumption
    * Understand the Impact of behavior on consumption
  - For Staff-
    * implementing conservation measures effectively
    * Training contractors/inspectors
CLIENT EDUCATION

- Instructions on equipment operation and maintenance
- Tips on energy-saving actions
- Information on carbon monoxide and other hazards

TRAINING AND PARTNERSHIPS ARE CRITICAL

- **Weatherization Plus Health** - improve the energy efficiency, health, and safety of low-income homes
- There are many, many homes that need weatherization but have needs beyond the scope of the program
- A unified approach that includes weatherization, rehab, as well as “health” issues such as lead, mold, and pest control
- This approach requires a level of cooperation yet to be achieved
Weatherization Measures

- Air seal / tighten building envelope
- Add cellulose attic insulation to R-38
- Install energy star bath exhaust fans
- Install compact fluorescent light bulbs
- Test, seal & insulate duct systems
- Replace refrigerator, when inefficient
- Properly size heating & cooling systems
SHIP AND WEATHERIZATION

- Ms. Floyd
- Weatherization
  - Air Sealing
  - HVAC
- SHIP
  - Roof
  - Wall Insulation
  - Siding
  - Painting with Volunteers

RESOURCES:

- Florida Weatherization Network [www.flwap.org](http://www.flwap.org)
- Florida Solar Energy Center [www.fsec.ucf.edu](http://www.fsec.ucf.edu)
- Florida Green Building Coalition [www.floridagreenbuilding.org](http://www.floridagreenbuilding.org)
- From Florida DACS- an interactive energy consumption site
Resources – Funding Partners

SHIP
Older Americans Act
USDA – Section 504
Utility Companies
Medwaiver / Medicaid Programs

Weatherization
HUD-CDBG
Foundations/United Way
Federal Home Loan Bank
Local government support

Growing Trends:
Hospitals/Health Insurance Companies/Employers
Healthy Housing and Home Performance


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The Neighborhood Energy Saver Program
Duke Energy

Helping Neighbors Save Energy And Money

Goals & Objectives

- Assist families in income eligible neighborhoods by installing up to 20 FREE energy conservation measures
- Educate families on energy efficiency techniques and best practices
- Change the way they think about using energy
- Control energy usage
Eligibility Requirements

- Meet Fla. Department of Economic Opportunity’s income guidelines
- Duke Energy residential metered customer
- Reside in the selected census data block group

Home Improvements
Visiting your home

Home Improvements

Small changes can make a big difference.
Air Infiltration Reduction/Caulking Penetrations

Air Infiltration reduction
➢ Through out home
➢ Caulking around window A/C

Weatherization Improvements

2 doors per home
➢ Weather-stripping
➢ Door sweeps
# Hot water Improvements

<table>
<thead>
<tr>
<th>Water flow restrictors</th>
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<tbody>
<tr>
<td>➢ 3 per Home</td>
</tr>
<tr>
<td>➢ 1, Swivel head – Kitchen</td>
</tr>
<tr>
<td>➢ 2, Fixed – Bathrooms</td>
</tr>
<tr>
<td>➢ Temperature check</td>
</tr>
</tbody>
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<th>Hot water Improvements</th>
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<tbody>
<tr>
<td>➢ Water heater wrap</td>
</tr>
<tr>
<td>➢ Water heater pipe wrap</td>
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</table>
A/C Improvements

- Digital wall plate thermometer

A/C Improvements

- 4 Central A/C
  - Measure for filter size
- 2 Wall Unit
- 1 Window HVAC Cover
Insulation upgrade

Basic Air-Conditioning Maintenance
Questions?

• Please complete the evaluation that will be emailed at the end of the webinar.
• Contact me if you need additional technical assistance at Andujar@flhousing.org

Our technical assistance hotline:
• 1800-677-4548