Making affordable housing green
Agenda

- What will you gain from this workshop?
- Who is GreenHOME?
- What is Building Green?
- Why Build Affordable Green?
- Building Green
  - Integrated Design
  - Green Building Components
- Case Studies
- Green Building and You
- Summary and questions
You Will Leave This Workshop and…

- **Reconsider**
  your image of a green building

- **Realize**
  green is more than materials—it’s the design process

- **Renew**
  your commitment to creating the highest quality homes for you and your residents

Waverly Gardens, MD
Waterfront Housing, VT
HIP Artist’s Housing, MD
Maverick Landing, MA
High Point, WA
GreenHOME

Our mission is to make affordable housing green
What’s Meant by **Building Green**?
You may be building greener than you think.
What’s Meant by *Building Green*?

Green provides many benefits

- **Better Performance**
  - Energy, water, & waste
- **Healthier places**
  - Landscape, sense of place, choice

- **Greater value**
  - For the individual, community, & marketplace

For the individual, community, & marketplace

*Courtesy Casey Trees, UVA School of Architecture*

BEFORE

AFTER
Is affordable green housing worth it?

We think it is.

Healthier, more resource efficient, longer lasting, and less polluting buildings are better for us, the environment, and business.
How Do You Build Green?
LEED Rating Program: Commonly used standard

- Developed by the US Green Building Council
- Evaluates environmental performance
- Provides a definitive standard

Leadership in Energy and Environmental Design (LEED)
Accelerate the implementation of green building policies, programs, technologies, standards and design practices

CREDITS ACHIEVED ACROSS FIVE BROAD AREAS
1. Sustainable Sites
2. Water Efficiency
3. Energy and Atmosphere
4. Indoor Environmental Quality
5. Materials and Resources

FOUR LEVELS OF CERTIFICATION
- Certified 26-32 points
- Silver 33-38 points
- Gold 39-51 points
- Platinum 52+ points
How Do You Build Green?
Enterprise Green Communities Initiative:
A standard for affordable green housing

- Integrated Design Process
- Location and Neighborhood Fabric
- Site
- Water Conservation
- Energy Conservation
- Materials and Resources
- Healthy Living Environment
- Operations and Management
How Do You Build Green?
Enterprise Green Communities Grants

- Planning
- Construction
- Tracking
- Certification
- Property management and resident education
- Website: www.greencommunitiesonline.org
D.C. Green Building Act Timeline Program

2007:
- 6/1/2007: DC established a Green Building Advisory Council to monitor compliance and recommend policies to improve and update the Act.

2008:
- 1/1/2008: DC submits construction code revisions to council.
- 10/1/2008: DCRA to employ at least one green building permit reviewer to expedite process.

2009:
- 10/1/2009: DCRA to employ at least one green building inspector to expedite process.

2010:
- 10/2010 (and every 3 years thereafter): DC submits construction code revisions to council.

2011:
- 1/1/2012: Incentives begin thru 12/31/2015 for LEED Silver of non-residential buildings.
D.C. Green Building Act Timeline Impacts

- **2007**: Construction permit fee will increase to create Green Building Fund.
- **10/1/2008**: DC gives priority to leasing space in LEED Silver certified buildings.
- **10/1/2008**: Improvements to DC tenant spaces >30K gsf must meet LEED certification.
- **All FY 2009 budgeted projects**: New construction or significant rehab of DC facilities are required to be designed & constructed to green building standards.
- **1/1/2009**: All non-residential private construction >50K gsf must include green scorecard (but does not require certification).
- **DC property disposed by sale to private entities**: Must meet LEED certification.
- **1/1/2012**: All new construction or significant rehabilitation of a building >50K gsf in DC shall fulfill or exceed LEED certification or Green Communities.
Integrated Design Process

Vision and Inspiration

Green Building Components

Marketability
Energy and Water Efficiency
Indoor Air Quality
Materials Selection
Waste Management
Community
Performance/Commissioning
Economics
Planning and Landscaping

Multidisciplinary Design Team

Developers
Architects
Energy Engineers
Policy Planners
Contractors
Resident/Occupant
Landscape Architects
Integrated Design
Multi-disciplinary Design Team

- Develop vision and goals for project
- Determine green building priorities for the project
- Discuss strategies:
  - Identify options
  - Evaluate
  - Refine
  - Select

Developers
Contractors
Multi-disciplinary Design Team
Architects
Energy Engineers
Policy Planners
Resident/Occupant
Landscape Architects
Integrated Design
Timeframe for Cost Effectiveness

- Early goal setting fosters integrated design solutions
- Early green decisions = lower implementation costs
Building Green

Green Building Components

- Marketability
- Economics
- Performance/Commissioning
- Community
- Planning and Landscaping
- Energy and Water Efficiency
- Indoor Air Quality
- Materials Selection
- Waste Management
Green Building Component
Planning and landscaping

- Evaluate location
- Study relationship between building and site
- Limit impacts to the site
- Landscape for sustainability
- Design to foster community
Green Building Component

Energy efficiency

- Energy
  - Reduce leakage
  - Right-size equipment
  - Select Energy Star efficient lighting and appliances
  - Incorporate innovation
Green Building Component

Water efficiency

- **Water**
  - Reduce potable water use
  - Use innovative wastewater technologies
  - Install water-efficient landscaping
Green Building Component
Indoor air quality

- Build tight, vent right
- Reduce toxins and VOCs
Green Building Component
Material selection

- Minimize consumption and reduce waste
- Improve indoor air quality
- Use recycled and recyclable products
- Select high-quality, durable finish materials
- Give preference to locally manufactured materials
Green Building Component
Waste management

- Salvage reusable materials
- Recycle construction and demolition waste

35% of U.S. landfill is construction and demolition debris
Green Building Component
Community

- Include residents in the design process
- Design for safety
- Provide communal space
- Encourage walking and bicycle use
Green Building Component
Performance/Commissioning

- Ensures fundamental building elements and systems are designed, installed, and calibrated to operate as intended
- Minimizes costly change orders
- Optimizes performance of building and systems
Green Building Component Economics

- Costs
  - Incremental costs of green vs. conventional is typically 2% of development costs*

- Savings
  - Net present value of operational savings can range between 5-10%*

*New Ecology and Tellus Institute’s 2005 report, *The Costs and Benefits of Green Affordable Housing*
Green Building Component
Economics

**Developer’s costs/savings: Non-green vs. Green**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unvented crawl space</td>
<td>-$400</td>
</tr>
<tr>
<td>Advanced framing techniques</td>
<td>-$250</td>
</tr>
<tr>
<td>Downsized heat pump</td>
<td>-$300</td>
</tr>
<tr>
<td>Reduced duct system</td>
<td>-$150</td>
</tr>
<tr>
<td>Low-E windows</td>
<td>+$240</td>
</tr>
<tr>
<td>Cellulose over fiberglass</td>
<td>+$150</td>
</tr>
<tr>
<td>Upgraded exhaust fans</td>
<td>+$150</td>
</tr>
<tr>
<td>Controlled ventilation system</td>
<td>+$450</td>
</tr>
<tr>
<td>Low VOC paint, caulks, foam</td>
<td>+$ 50</td>
</tr>
<tr>
<td><strong>Total Incremental Cost</strong></td>
<td><strong>-$ 60</strong></td>
</tr>
</tbody>
</table>

Costs comparison from Habitat for Humanity Richmond project

**Residents’ savings: Non-green vs. Green**

<table>
<thead>
<tr>
<th>Item</th>
<th>Heating</th>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-green</td>
<td>$60</td>
<td>$50</td>
</tr>
<tr>
<td>Green</td>
<td>$22</td>
<td>$20</td>
</tr>
<tr>
<td><strong>Savings:</strong></td>
<td><strong>$38</strong></td>
<td><strong>$30</strong></td>
</tr>
</tbody>
</table>

**Annual savings: $816**

The residents of Waterfront are paying nearly 40% less than a non-green Housing Vermont resident.
### Green Building Component Economics


<table>
<thead>
<tr>
<th>Affected Technology</th>
<th>Tax Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Photovoltaics</td>
<td>30% (residential limit is $2,000 credit)</td>
</tr>
<tr>
<td>• Solar Thermal System</td>
<td>30% (residential pool credits eliminated)</td>
</tr>
<tr>
<td>• Microturbines</td>
<td>10% (up to $200/kW credit)</td>
</tr>
<tr>
<td>• Energy conservation investments for HVAC, envelope, lighting, and water-heating systems</td>
<td>$1.80/ft² federal tax deduction if exceeding 50% savings vs. ASHRAE 90.1-2001 standard; up to $0.60/ft² for lighting retrofits alone</td>
</tr>
<tr>
<td>• New homes exceeding 50% energy savings vs. model code</td>
<td>$2,000 credit for site-built homes</td>
</tr>
</tbody>
</table>
Green Building Component
Marketability/Aesthetics

- **Marketability**
  - Social and environmental responsibility
- **Economics**
  - Higher Initial Quality & Sales Price
  - Less Exposure to Rising Materials and Energy Costs
- **Comfort and health**
- **Market Differentiation**

- Loved buildings are maintained and preserved
Waste Management
Pre-fabricated
Waste Management

Reuse
Performance Commissioning

- Aesthetics
- Economics
- Energy and Water Efficiency
- Indoor Air Quality
- Materials Selection
- Performance/Commissioning
- Planning & Landscaping
- Community
- Waste Management
Economics
Costs

- Constructed for a net value of $73/sq ft.
- State sets a construction limit for materials and labor at $85/sq ft for affordable housing projects
- Estimate a 1 ½ -2% increase in overall costs
- Estimate a 35% decrease in operating costs by greening the project
Aesthetics

Energy

Efficiency

Economics

Indoor

Air Quality

Performance/Commissioning

Materials Selection

Community

Planning & Landscaping

Waste Management

Aesthetics

Economics

Energy and Water Efficiency

Indoor Air Quality

Performance/Commissioning

Materials Selection

Community

Planning & Landscaping

Waste Management
Green Building and You
Opportunities

What are the project’s goals and how might they be achieved by incorporating green practices?
Green Building and You
Collaboration

Who can your project teams work with to support their sustainable goals?

- Government agencies
- Financial institutions
- Trade associations
- Education, training & technical assistance providers
- Green building professionals
Green Building and You
Barriers

How will you overcome barriers you and your development teams will face in greening your projects?
Green Building and Your Grantees

Getting started/moving forward

- Assemble a responsive, experienced team
- Demand vision, motivation and commitment
- Incorporate green early and foster an integrated design approach
- Determine available financial/technical assistance
- Utilize life-cycle costing to evaluate project economics
- Be persistent and vigilant during design and construction