Energy Star and Green Building Programs: Working Together
NC Solar Center Program Areas

- Policy Analysis & Outreach
- Research & Demonstration
  - Solar, Wind, Alternative Fuels
- Consumer Education/Outreach
  - Solar House
  - Solar America Initiative
- Technical Assistance & Training
  - Renewable Technologies
  - Transportation
  - Industrial Program
  - Commercial Buildings
  - HealthyBuilt Homes Program
  - LEED for Homes

DBSH Workshop-Graduation Day
Raleigh, NC
May 2007

www.ncsc.ncsu.edu

Advancing Renewable Energy for a Sustainable Economy
Solar Center: Housing Activities

- Provide Design Reviews for Homeowners and Building Professionals
- NC HealthyBuilt Homes Developer/ Admin
- LEED for Homes Provider

Websites:
- www.healthybuiithomes.org
  - Information on green building
  - List of builders working in the NC HBH program
- www.greenprofessionals.org
  - Searchable Database of building professionals
- www.ncgreenbuilding.org
  - Searchable Database of buildings with green technologies
- www.greennctradeshow.com
- www.ncsc.ncsu.edu
  - Main Solar Center website: Solar and other technology factsheets
Commercial Green Building Resources

• Continuing Education
  - Green Building
  - Special Topic Workshops
  - Presentations

• Design Reviews

• Technical Assistance
  - General
  - Working with groups such as USGBC

• Policy
  - Technical assistance for green building policy

• Online Resources
  - Websites
  - Factsheets
  - Financial Incentives

Advancing Renewable Energy for a Sustainable Economy

GreenNC layout for 2008
September 9, 2009
Raleigh Convention Center
### NC Professional Directory

**North Carolina Professional Directory**

Professionals with a commitment to sustainable buildings and renewable energy for North Carolina

**North Carolina Professional directory.**

**Current Selections:**
- Profession (All Professions)
- Technologies (All Technologies)
- Counties (All Counties)
- Sectors (All Sectors)
- Keywords

**Filters:** You can select multiple values by holding the Ctrl key down while clicking on entries in the selection list.

**Display** 10 results per page.

**by Profession**
- Energy Rater
- Engineer
- Finance
- General Contractor

**by Technology**
- Energy Analysis
- Passive Solar
- Daylighting
- Solar Water Heating

**by County**
- Person
- Pit
- Ranch
- Residential

**by Sector**
- All Sectors
- Commercial
- Industrial

**Keyword search**

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**282 Professionals match your search criteria.**

Click on the name to view more detail about the professional.

<table>
<thead>
<tr>
<th>Name</th>
<th>Company Name</th>
<th>Profession</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur Dougherty</td>
<td>Solar Guys</td>
<td>Specialty Installer</td>
<td>828 890 8380</td>
<td><a href="mailto:solartest@boll.com">solartest@boll.com</a></td>
</tr>
<tr>
<td>Raymond Ellsworth</td>
<td>High Tech Pool Systems Inc.</td>
<td>Specialty Installer</td>
<td>704 543 9080</td>
<td><a href="mailto:raytron@att.net">raytron@att.net</a></td>
</tr>
<tr>
<td>Alicia Ravetto</td>
<td>Alicia Ravetto Architect PA</td>
<td>Architect</td>
<td>919 933 0999</td>
<td><a href="mailto:alicia@aliciaravettoarchitect.com">alicia@aliciaravettoarchitect.com</a></td>
</tr>
<tr>
<td>Ross Ritchie</td>
<td>Ross Ritchie Architect</td>
<td>Architect</td>
<td>704 503 4532</td>
<td>none</td>
</tr>
<tr>
<td>Joseph Rybak</td>
<td>Joseph's Full Service Plumbing</td>
<td>Plumbing Contractor</td>
<td>336 449 0130</td>
<td>none</td>
</tr>
<tr>
<td>Christopher Senior</td>
<td>Anchorage Building Corp.</td>
<td>General Contractor</td>
<td>910 686 3353</td>
<td><a href="mailto:csenior@ccrr.com">csenior@ccrr.com</a></td>
</tr>
</tbody>
</table>
The NC Solar Center hosts DSIRE - a comprehensive national source of information on state, local, utility, and federal incentives that promote renewables and energy efficiency.
Solar Center Contact Information

Passive Solar and Green Buildings:
  dona_stankus@ncsu.edu

Residential Green Programs:
  wmdunlap@ncsu.edu [LEED]
  jennifer_stutzman@ncsu.edu [HBH]

Solar Thermal/ Energy Analysis
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  telupo@ncsu.edu

Wind
  brian_miles@ncsu.edu

Renewable Energy Diploma Series
  maria_ofarrell@ncsu.edu

Policy
  Brian_lips@ncsu.edu

www.ncsc.ncsu.edu
Advancing Renewable Energy for a Sustainable Economy
Energy Star Initiative in North Carolina

1. Energy Efficiency is 15% better than IECC 2004 benchmark
2. Uses a Certified HERS rater

24 Energy Raters listed
Green Home Builders of the Triangle (GHBT)

• Based on NAHB Model Green Building Home Guidelines
• Similar Checklist program to HBH, mostly verified by the builder but some items require 3rd party verification
• Has requirements for most sections, similar to NC HBH
• If a home complies with NC HBH, would generally expect it to meet GHBT as well. Level of certification may vary.

The HBA of DOC and Wake County GB program in NC:

Energy Star is not required but strongly encouraged

- Does not REQUIRE indoor air quality compliance measures
- Does not REQUIRE 3rd party verification although most use it

Website

1. GBI DOC and Wake program as of 1/18/08 (Calculator in forms is 12/07):
   http://www.hbadoc.com/displaycommon.cfm?an=1&subarticlenbr=207 (forms)
   http://www.hbadoc.com/displaycommon.cfm?an=1&subarticlenbr=201 (website)
ANSI National Green Building Standard Development

- Checklist STANDARD, expected to be **adopted as building code** in some areas, mostly verified by the builder but higher levels of certification require 3rd party verification. May also be used to create Programs.
- Has requirements for the typical areas of green building, similar to other major programs
- If a home complies with NC HBH, would generally expect it to meet ANSI as well. Level of verification may vary.
- Currently, **Certified level does not require Energy Star verification**
- NC HBH is participating in ANSI process with NAHB, as chair of the remodeling task group.

Energy Star is not required at lower levels, but is required at upper levels.
LEED for Homes (USGBC)

- Just emerging from Pilot stage-current status: the business model and some of the specific implementation measures are under development.

- NC HBH has been designated as a LEED for Homes Provider in NC but is still developing the green rater/business model.

- NC Solar Center/NC HBH: Cost in the $1500 range per home, not including Energy Star rating.

- Most projects to date have been multi-family.

Energy Star is essentially required.

Website

1. LEED for Homes, current version as of 1/08:
EarthCraft House

• Green Building Program originally developed and used in Atlanta, Georgia

• Southface, a non-profit organization, out of Atlanta is the home of the program

• Partners in Atlanta include Southface and the Atlanta Home Builders Association

• Active in SC and Tennessee, Virginia (cities)

Energy Star is required.
NC HealthyBuilt Homes Program

a Vision for NC

Current Partners

Energy Star is required.

Blue- WNCGBC HBH & the Greater Asheville HBA

Red- NWNC HBH

Green- Statewide HBH

Independent Inspectors in Training
NC HealthyBuilt Homes Program

Tommy Cleveland, PE
NC Solar Center

NORTH CAROLINA SOLAR CENTER
NC STATE UNIVERSITY
College of Engineering
A Statewide Program promoting & assisting Residential Green Building

The EPA Energy Star program is the base of HBH energy requirements

- Provides a green building checklist with choices for HBH home certification
- Provides builder access to HBH workshops, design reviews, and marketing materials
- www.HealthyBuiltHomes.org

First NC HBH Home - 2004
First NC HBH Gold Home - 2005
The NC HealthyBuilt Homes Program consists of …

A *Statewide Support Partner* organization (NC Solar Center at NCSU) supporting several….

*Community Partner* organizations throughout the state

- Implementation has a local face and feel
- This becomes more critical as we begin to work with other programs/localities:
  - Asheville-Community Partner
  - Boone-Community Partner
  - Charlotte
  - Durham/Orange/Chatham HBA
  - Independent Inspectors
Current Program Status

- Total homes projected to be in program (registered and certified) as of December 2008: **1000**
- Total homes registered/under construction as of October 2008: **348**
- Total Homes HBH certified homes: **213**
- Total Builders enrolled: **116**
  - Total Builders enrolled in Asheville Area: **82**
  - Total Builders enrolled in Boone Area: **8**
  - Total Builders enrolled in Triangle: **8**
  - Total Builders in Mecklenburg: **6**
1) Compliance with existing federal, state, local requirements
2) EPA Energy Star certificate
3) Blower Door Test
4) Duct Blaster Test
5) All HVAC equipment sized using ACCA Manual J and cooling equipment within ½ ton
6) Combustion equipment requirement
7) Ventilation requirement
8) Attached garage requirement
9) Enrolled in the NC HealthyBuilt Homes Program
## Categories and Point Requirements

*North Carolina Statewide Checklist*

<table>
<thead>
<tr>
<th>Category Opportunities</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Opportunities:</td>
<td>7 pts</td>
</tr>
<tr>
<td>Water Opportunities:</td>
<td>9 pts</td>
</tr>
<tr>
<td>Energy Opportunities:</td>
<td></td>
</tr>
<tr>
<td>Building Envelope</td>
<td>10 pts</td>
</tr>
<tr>
<td>Comfort Systems:</td>
<td>18 pts</td>
</tr>
<tr>
<td>Appliances, Lighting and Renewables:</td>
<td>10 pts</td>
</tr>
<tr>
<td>Indoor Air Quality Opportunities:</td>
<td>15 pts</td>
</tr>
<tr>
<td>Materials Opportunities:</td>
<td>18 pts</td>
</tr>
<tr>
<td>Bonus Opportunities:</td>
<td>2 pts</td>
</tr>
</tbody>
</table>

*There are many item choices within each Category*
The points that a house must earn to qualify as a certified NC HealthyBuilt home:

100-150 points: Certified
151-200 points: Bronze certified
201-250 points: Silver certified
251+ points: Gold certified

These points are in addition to the PREREQUISITES which are required for ALL NC HealthyBuilt homes.
Basic Annual Enrollment Fee Includes
(for statewide program members only)

- Orientation Workshop (required)
- 1 Design Review or On-Site Consultation
  (3 hours consultation per builders’ needs and location)
- Use of the NC HBH logo (per guidelines)
- Marketing Collateral
- NC HBH Reference Manual (Excel)
- No-fee topic workshop attendance (1 per member per workshop)

Until January 1, 2009

- 1 Home Registration (required for each home)
- 1 Final Site Inspection (required for each home*)
  *Sampling protocol available
Brochures, Yard Sign

A HealthyBuilt Home!
NC HealthyBuilt Homes Program
HBH Builder Member, Inc
1-888-888-8888
www.healthybuiltthomes.org

- For builders, homebuyers, designers, and others
- HBH Builder listing on site
- Downloads of Marketing Collateral and educational content
- Links to HBH members’ websites
NC HealthyBuilt Homes

Current Partners

Independent Inspectors in Training

Blue- WNCGBBC HBH    Red- NWNC HBH    Green- Statewide HBH
**Fee Structure** (for statewide program members only)

**Until January 1, 2009** *(includes 1 registration/inspection)*
- Initial Enrollment: $725
- Re-enrollment is $650 annually

**After January 1, 2009** *(does not include registration/inspection)*
- Initial Enrollment: $500
- Re-enrollment is $425 annually and occurs on the day you joined the program

- To register/inspect a Home:
  - Home Registration--$60.00
    » Required per home: bulk rates available
  - Final Site Inspection--$180.00
    » Required per home: bulk rates available in bundles of 15 or more, depending on inspection needs
Program Content-
Energy Raters/ Designers/ Consumers/ Other Building Professionals

- Independent Inspector program under development
- Designer Membership is under development

Consumer Benefits
- Tax credit and other financial incentives/options education
- Access to builders who want to build green through a directory
- Third party review of specific items in their home
- A yard sign that advertises their involvement
- HBH program guidelines and specifications
- Helping to grow the infrastructure of sub-contractors

Other targeted audiences include: realtors, developers, lenders, appraisers and government entities.
Builder Enrollment in Program
(minimum steps)

• **Step 1:** Complete Builder Enrollment Form (and Pay fee), send to HealthyBuilt Homes

• **Step 2:** Attend NC HBH Program Orientation
  » (required prior to issuing certificate)
  » will credit pre-attendance of one builder member

• **Step 3:** Build green homes!
Fee Structure

• **Further Services Available** (for Members Only)
  • Additional Site Consultation--$180 (3 hour minimum, $60/hr includes any travel time)
  • Additional Design Reviews--$60/hr, 3 hour minimum
  • Energy Modeling Analysis--$600 per house
  • ResCheck Model Energy Code Analysis--$180 per house
  • Passive Solar Calculations--$360
What does it cost to get to HBH?

• **Given:** 2000sf home of good quality that uses design professionals and meets the HBH certified level as a starter home

• 1 house/ 1\textsuperscript{st} year, minimum costs
  - HBH Enrollment fee \$725 (year 2, \$650)
  - Energy Star Rater \$1000
  - Energy Star upgrades in labor/materials \$1500
  - HBH upgrades in labor/materials \$742

- **Total projected cost Energy Star:**
  • \$2500, minimum

- **Total projected cost HBH** (includes Energy Star)
  • \$1467 + \$2500 = \$3967, minimum [1\textsuperscript{st} house] + 750 inflation
  • \$982 + \$2500 = \$3482, minimum [2\textsuperscript{nd} house] + 750 inflation

($725 - \$240 = \$485; \$240 + \$742$ (material upgrade) = \$982$)
What does it cost to get to HBH?

- **HBH upgrades (wholesale cost)**
  
  **Adds may include...**
  
  - Sealed garage $0.50/ sf, 575 sf = $287
  - Tree planting, 0.5 acre = 6 trees at $50/ each= $300
  - Low flow-5 Faucet restrictors at $2 each=$10
  - Upgrade clothes washer=$250
  - Upgrade dishwasher=$15
  - Raised heel trusses= $5/ truss x30=$150
  - Insulate hot water pipes= $100, includes labor
  - Low e windows= code requirement as of 1/ 1/ 07
  - Increase overhang=120 sf x $3=$360
  - Increase south windows = 2x $200=$400
  - Transfer grills= 3x$100= $300, includes labor
  - Upgrade refrigerator=$300
  - Upgrade florescent bulbs: $2each x 20= $40
  - Add Exhaust fans in bath w/ shower, 2 x $300=$600, includes labor
  - Metal drip edge = 120 linear feet x 1.50= $180
  - Covered rear entry (front already covered) $500
  - Upgrade interior doors to be non Lauan-10x $20=$200

- **Deducts may include...**
  
  - *Decrease East and West windows* = 5 x $200=$1000
  - *Right sized HVAC=Decrease tonnage by ½ ton*=$500
  - *Donate $1500 in excess material and get a $500 tax credit (33% tax bracket assumed)*
  - *Slightly smaller house, 50 sf x $75/ sf =$3750 (assume you pay $2500 for extra design fees to get a smaller home—net is $1250.*