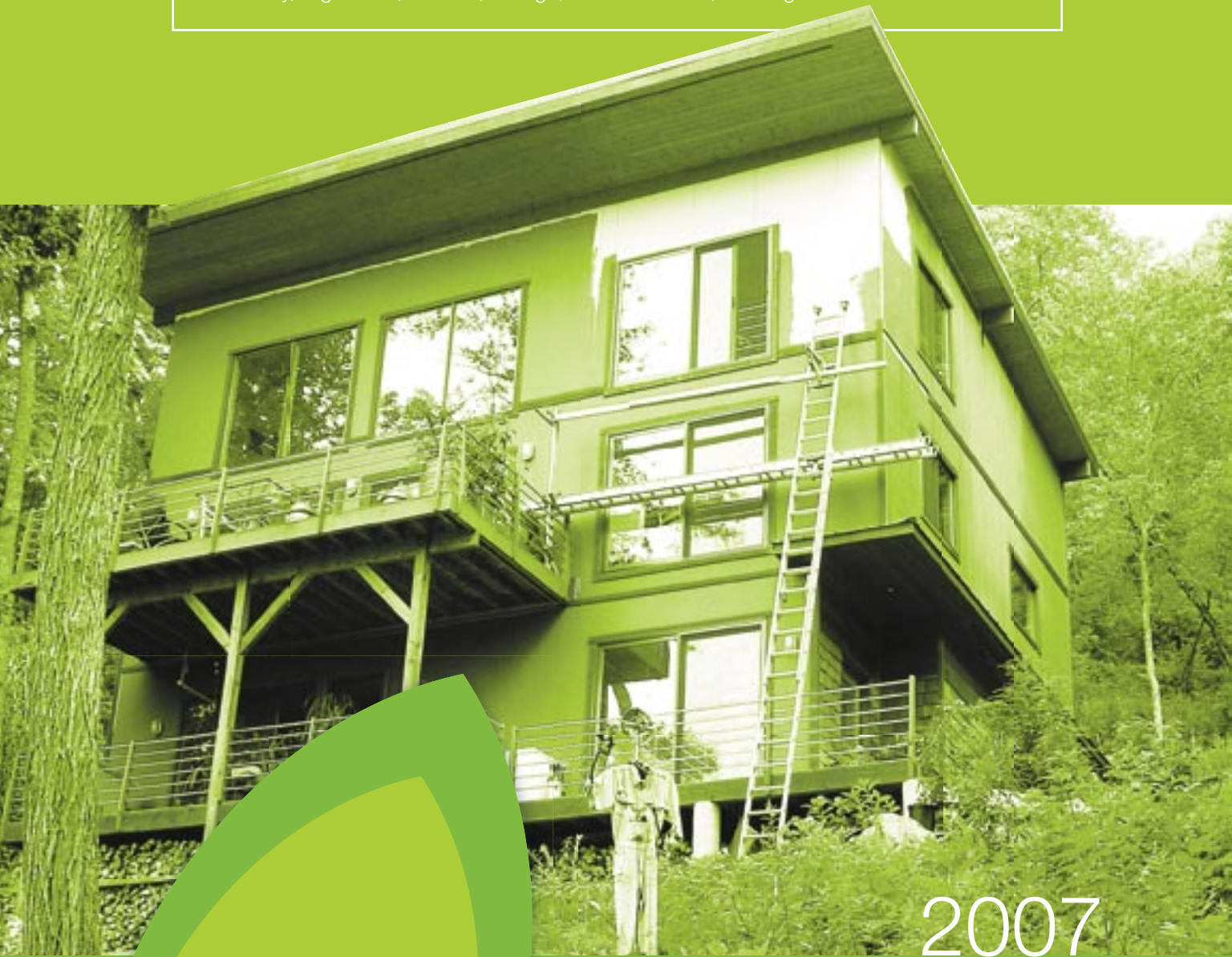


Asheville, Boone, Chapel Hill, Charlotte, Durham, Greensboro, Greenville, Hendersonville,
Hickory, High Point, Manteo, Raleigh, Southern Pines, Wilmington and Winston-Salem



2007

GREEN

building & solar tour



*presented by NCSEA and CREE
as part of the National Solar Tour*

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NC Sustainable Energy Association



... from the
mountains

... to the
coast

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NCSEA

2007 NC Green Building & Solar Tour

As part of the National Solar Tour sponsored by American Solar Energy Society

NCSEA hosts an annual statewide Green Building and Solar Tour as part of the American Solar Energy Society's national tour, which includes 47 US states. Through this tour, NCSEA, our community partners and sponsors are educating and empowering thousands of North Carolinians and communities on sustainable energy issues and solutions involving green building, energy efficiency, renewable energy and biodiesel.

Historically, the NC Tour has increased awareness of solar energy and other alternative sources of powering our homes in four to six communities. In 2006, the Green Building and Solar Tour shattered all previous records by offering 12 tours in over 35 communities and featured over 75 buildings and facilities. The tour was the 5th largest in the country!

The tour is valuable because it educates citizens with the most up to date information on a wide range of issues and technologies, all across our state. The education and outreach the tour provides, helps bring together dozens of communities on green building, energy efficiency and renewable energy and how energy affects their everyday life. By learning about green building applications, citizens begin to realize that they have an opportunity to implement these solutions in their homes and offices.

NCSEA believes that green building is good business and good stewardship and we present examples of residential, commercial, state and local government and industrial green buildings. By increasing awareness and allowing citizens to interact with homeowners, businesses and community members, the market at the local and state level continues to mature and grow. NC has a chance to showcase the many home grown energy sources that continue to increase economic development for NC by providing jobs and using local sources to meet energy demands.

This year the following communities will be participating: *Asheville, Boone, Chapel Hill, Charlotte, Durham, Greensboro, Greenville, Hendersonville, Hickory, High Point, Manteo, Raleigh, Southern Pines, Wilmington and Winston-Salem.*

Green Building 101

Green building significantly reduces environmental impact of a building while increasing the quality, comfort and efficiency of the building. Green building encourages a holistic approach which begins at the planning stage and includes everything from efficient use of water, energy and materials to the transport and construction waste management systems. In order to understand green building as a concept, it is divided into categories that make it easier for industry professionals and homeowners to focus on.

Community, Site Planning, Lot Design & Preparation

The best way to make sure you incorporate as many green building technologies and applications as possible is to PLAN, PLAN, PLAN! When deciding where to build it is important to keep a few things in mind:

- > *Avoid environmentally sensitive areas*
- > *Look at using an infill, greyfield, or brownfield site*

- > *Clustering homes to enable more open space*
- > *Landscaping/Xeriscaping*
- > *Construction and waste management plans*

Energy Efficiency

Whether building a new residence, commercial, industrial or state and local government building or retrofitting and existing building, energy efficiency can be one of the most beneficial techniques to increasing comfort and quality while reducing utility bills.

Heating and cooling can use over 40% of a building's energy and with an efficient HVAC design and system, you can have an upwards of 30% gain. In existing homes and buildings, it may be beneficial to contact a Home Energy Rater (HERS) to perform an energy audit. There are many layers of energy efficiency in green building, starting with implementation of building



orientation, increased insulation, sealed crawl space and duct work, Energy Star appliances and compact fluorescent light bulbs. These technologies have a visible impact and a short rate of return.

Another layer of energy efficiency would include lighting for indoor and outdoor use. Daylighting, compact and other fluorescent lighting, LED lighting and dimmers and other programmable controls can contribute largely to energy efficiency and savings.

The next layer of energy efficiency would include solar and other renewable energy implementation. Other sources of renewable energy such as geothermal heat pumps, photovoltaics, wind, micro-hydro, passive solar and daylighting are available for tax credits.

Water Efficiency

There are two types of water usage in building – indoor and outdoor water use.

Typical indoor water use includes:

- > Toilets
- > Appliances: clothes washers, dishwashers, cooling and heating
- > Faucets
- > Leaks
- > General use: rinsing, showers, car washing, product/service requirements (example: restaurant, manufacturing, etc.)

Typical outdoor water use includes:

- > Landscaping
- > Runoff from concrete and other impervious materials
- > Irrigation
- > Wastewater treatment

Several water efficiency techniques can be applied to existing and new buildings. For example, low-flow toilets, faucets and showerheads can be built in or replaced. Building efficiently can ensure that piping and plumbing are leak free and existing buildings can provide regular maintenance to ensure there are no leaks in or outside of the building. Testing water quality is also important and water sampling for lead, copper, pH, arsenic and other chemicals is recommended. Other systems such as rain water harvesting, filtration, catchment, pump systems, tanks and cisterns can be implemented for many of the above listed water uses.

Resource Efficiency

When deciding what materials to use in a building, there are several factors to take into consideration.

- > **Durability:** Expected maintenance, quality and life of the product
- > **Recycled content:** Originated from a recycled material or has the ability to be recycled as a waste product
- > **Embodied energy:** Amount of energy that goes into creating, packaging, transporting, recycling or disposing of a selected material
- > **Reusability:** Use materials from deconstructed buildings, reclaimed products, salvaged and scrap materials when possible
- > **Renewability:** Materials that are manufactured from rapidly renewable resources
- > **Quantity:** Reduce amount of materials used by designing an efficient and functional floor plan

Indoor Environmental Quality (IEQ)

The Environmental Protection Agency (EPA) found that levels of air pollution inside the home are two to five times higher than outside. A major part of IEQ is Indoor Air Quality (IAQ). Poor indoor air quality can lead to and irritate asthma, allergies, eye irritations, headaches and respiratory problems. Mold and mildew issues, especially in the southeastern United States are at the root of several of these problems.

Some issues to consider for IEQ and IAQ are as follows:

- > Moisture control
- > Ventilation systems
- > Pest management
- > Acoustics
- > Light intensity
- > Building materials
- > Radon control
- > Tobacco products
- > Carbon monoxide

Many of our Business Members provide the above listed products and services and can be found by visiting our Business Member Directory.





Kitty & Ske Boniske

(Riverwind) Asheville

Active solar system(s): 48 3.2kw Solar PVs. Connected to Progress Energy (PE) with their “Sell All System” consisting of two meters (one furnishing our home with PE electricity and the other selling PE all of our green PV generated electricity). PE charges about \$0.11/kw and pays us about \$0.04/kw. We are also under the NC GreenPower Program which pays us an additional \$0.18/kw for all of the electricity we sell to PE. We are also purchasing 3 blocks of NC GreenPower from PE at \$4.00/block/month (one block equals 100 kw).

Passive solar elements: 15’x36’ greenhouse on south side of the house heats Mexican tile floors and planters. Operable wooden shutter inside greenhouse controls amount of sun/insulation at night/winter.

Energy conservation measures: All ceiling, exterior and 12” north facing walls have maximum insulation (fiberglass, Styrofoam and icynene). All windows and glass are thermopane, low-e. Sun Frost 19 cubic ft. refrigerator/freezer (each compressor only uses 100 watts when running). Nine timers throughout the house (fans, electronics, dehumidifier, battery charger).

Low cost solar system(s): Eight 4’x 10’ drain down solar flat plate hot water collectors rated about 300,000 btu/sunny day. 4 solar light tubes.

Unique solar features: Four remote controlled skylights with shade screens and automatic sensors close them when it rains. 4,000-gallon stainless steel, double insulated, vented tank, wrapped in radiant heat foil in a room blown with cellulose insulation to supply the water for the radiant floor heat and for domestic use. Eight drain-down flat plate solar hot water panels provide heat for the water in this tank. Twelve solar parking lot/walkway lights.

Other renewable energy features: Two 24” x 75’/each plastic corrugated culverts buried 6’ under ground are used to draw outside air through for cooling.

Use of sustainable materials: A recycled spiral metal staircase to bedroom loft. All finishes, sealers and paints are water base and non-toxic.

Site description: Connected to Progress Energy with “Sell All System” in June 2006. Adding solar roof top exhaust fan(s).

Passive solar elements: Passive solar is the main energy feature of this home design.

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Energy efficiency measures: Walls insulated with formaldehyde-free fiberglass R19 and R30, roof insulated with foil face rigid foam and sealed with spray foam to R42. All HVAC duct work is internal to the insulation envelope of the home. SEER 14 variable speed Trane heat pump. Supplement heat-high efficiency German wood stove with built-in cooking oven. Average energy use \$75/month.

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Indoor air quality: Low-VOC paints, formaldehyde-free insulation, cabinets, and finish woodwork. Natural acid base termite protection.

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Ventilation systems: Low radon levels due to foundation venting.

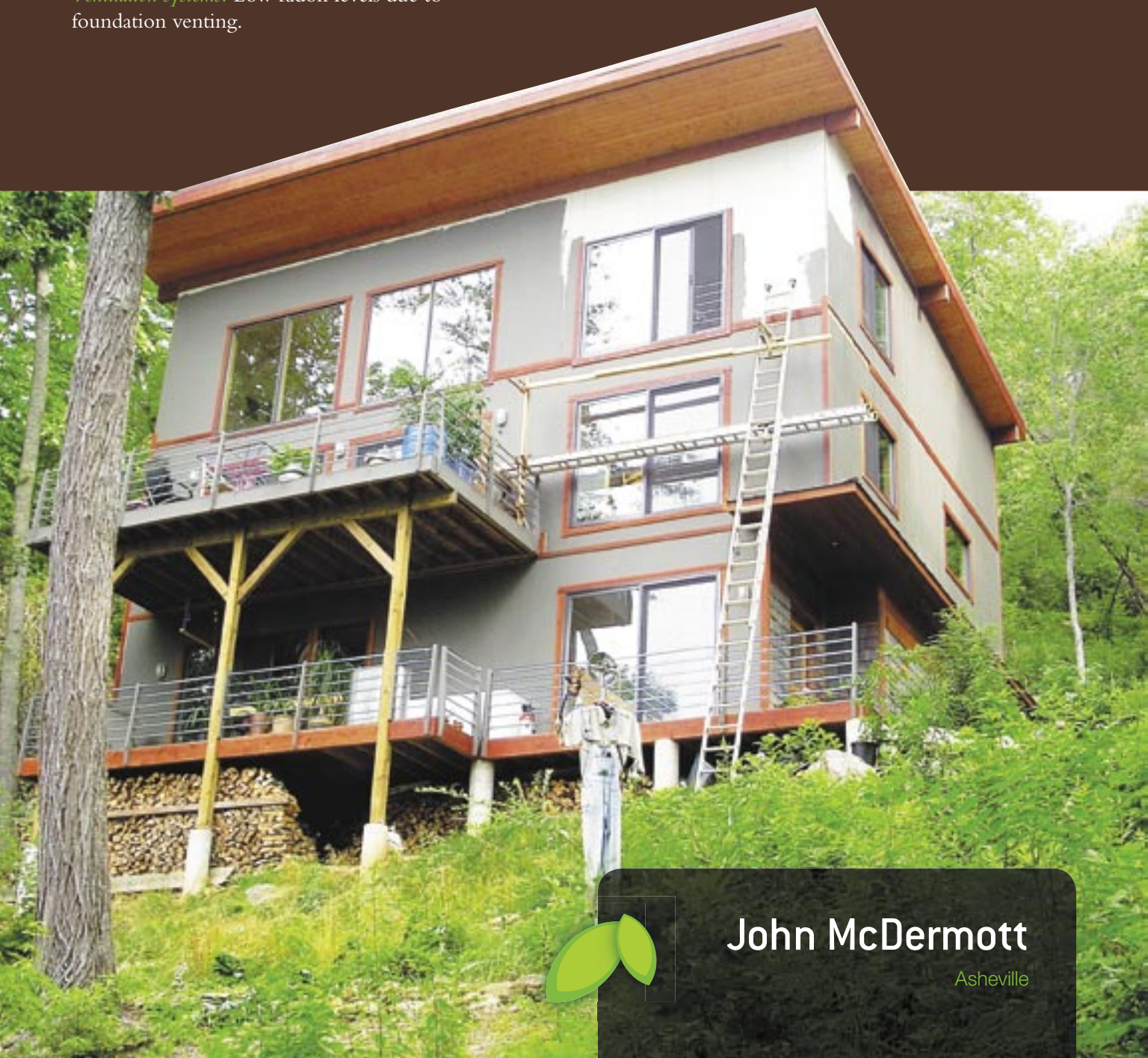
Techniques/design: Most of the trees were saved during construction and supply excellent shading during the hot summer months.

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Landscaping: Landscaping design has an edible plant focus using blueberries, strawberries, service berry, cherry trees, fig tree, and vegetable garden. Soil amendment is 100% organic compost, most of which was produced on-site.

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Use of sustainable materials: Salvaged and rebuilt kitchen cabinets. Locust wood decking and all hardwood flooring and trim were cut on-site, milled in Asheville using wind fallen and site removed trees. Hardy panel exterior siding, metal roof, standing seam. Rock walls and landscaping rocks were found within one mile of site.



John McDermott

Asheville



Zero Energy Home

Habitat for Humanity of Catawba Valley

The goal for this net zero energy home is to produce as much energy as it consumes over the course of a calendar year. In addition to selling power back to Duke Energy, the home is also a provider for the NC Green Power program. Adapted from the original design by architect Rick Thompson, the home is 1,150 square feet with three bedrooms and two bathrooms.

Active solar system(s): 4.5 kw grid-tied photovoltaic system; solar hot water system.

Passive solar elements: Bank of windows facing due south, insulated slab with ceramic tile, extended overhangs.

Energy conservation measures: Energy Star appliances and lighting; extra insulation in walls and ceiling.

Use of sustainable materials/energy: Geothermal heating and cooling; ERV; advanced framing.

Building, site, vehicle description: The Zero Energy Home is the result of a partnership between Habitat for Humanity of Catawba Valley and the Appalachian State University Energy Center with funding from the State Energy Office and the Beaver Family Foundation.





Advanced Energy's N.C. Sustainable Building Design Competition [NCSBDC] is a program to engage students in the state's universities and community colleges to learn and apply the lessons of sustainable design and construction. The competition is being held in conjunction with the US Green Building Council Natural Talent Design Competition.

Student teams design a home for a particular region in North Carolina incorporating a sustainable approach to design that includes:

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energy efficiency
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renewable energy
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building science
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water conservation
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indoor air quality
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universal design
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material selection
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community & historic preservation
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hazard mitigation
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By participating in this program, all students become better prepared to incorporate sustainable design methods into their work and this experience into the design and construction professions.



NC Sustainable Building Design Competition

Hickory



Pacifica Cohousing

Community Residences, Carrboro



Pedestrian paths, children's play spaces, and small gardens are prominent features of this cohousing community.

46 homes — a mixture of town homes, detached homes, and stacked condominium homes — using compact footprints (from 610 square feet up), plus Common House, built on five acres of an eight-acre site. One acre is for play fields and ponds and two acres will remain undeveloped woods. Common gardens, play areas, and pathways knit the community together. PV-powered pole lights illuminate parking and path areas. The site is less than one mile from the center of Carrboro and close to a bus line and bike paths.

All houses feature passive solar design and guaranteed solar access; many are heated with radiant floors using active solar water heaters and/or high-efficiency instantaneous water heaters. All homes were built to System Vision specifications, ensured by random duct testing, blower door tests, and insulation inspections. All land trust homes received an energy cost guarantee.

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Common House: 2,700 s.f. dining and gathering facilities with kitchen, laundry, reading, living, and playrooms; mail box/communication board. Large photovoltaic

array and six-collector solar water and space heating systems are designed to make this a net zero energy building. Roof water is directed into a 15,000-gallon cistern and used for toilet flushing, clothes washing, and irrigation. Breezeway links to two guest suites (775 s.f.).

The Common House and several individual houses will be open for the tour. The Common House will also be the headquarters for the day-of-tour registration and information.

Shawn and Candy, the homeowners went through an extensive interview and written analysis of what they wanted to achieve in the house design. They credit the successful design of the home to their ability to vision the final product and the extensive planning process, including choosing fixtures and completing external elements

Features: Passive solar design with acid-etched concrete floors in basement and first floor. 2kW grid-tied photovoltaic system with battery backup (excess electricity contracted for resale to grid). Active solar water heating system with a DC pump powered by its own photovoltaic panel. High-efficiency three-zone HVAC system.

All appliances are Energy Star rated and house attained best Energy Star rating yet recorded in NC.

Extensive landscaping with rocks from site excavations and reused stone sidewalk curbs, meadow instead of lawn, drought-resistant and native plantings.

3,200 heated s.f. includes home business suite with separate entrance. Large stone patio and two-story screened porch tower.



Canino-Slome

Chapel Hill



Steps are reclaimed Durham city curbs; terrace walls from site stones.





Piedmont Biofuels

Pittsboro



Active solar system(s): Biodiesel pumping station and solar thermal.

Passive solar elements: Daylighting.

Energy efficiency measures: CF, high efficiency rated 3 phase motors.

Other renewable energy features: Biodiesel.

Catchment/harvesting systems: Rainwater.

Appliances: Energy Star.

Wastewater treatment: For industrial wash water treatment and reuse.

Additional: Solar hot water.

Indoor air quality: Plant wall biofilter and "No Idling" Policy.

Landscaping: Biodiversity project.

Community aspects: Abundance Foundation, music and art events like "Third Shift at the plant," soccer nights.

Use of sustainable materials: Blue jean insulation, re-use of old lab furniture.



Terri Holt

Southern Pines

Active solar system(s): 2.4kW PV electric system.

Passive solar elements: Seven Solatube daylights, 4' eaves, building orientation, thermal mass in structure.

Energy efficiency measures: Straw bale walls, low-e windows, on-demand water heater, CFL's throughout.

Appliances: All appliances are Energy Star labeled.

Ventilation systems: Whole house fan for use in transition seasons.

Mechanical system design: 13 SEER heat pump.

Landscaping: Natural and wooded.

Use of sustainable materials: Straw bales for wall & insulation, backyard compost tumbler.

Jan Leitschuh

Southern Pines



Active solar system(s): Solar hot water heating system (installed in the last year).

Site description: The parcel has a section of it that is inside the Southern Pines municipal boundary. But it is not served with water or sewer by Southern Pines.



Passive solar elements: Back of the house redesigned to include passive solar. Two solar tubes were installed in dark areas of the house.

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Energy efficiency measures: The house is Energy Star rated. Half the lighting fixtures use fluorescent light bulbs.

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Other renewable energy features: Insulated with Demilec. We have a instant hot water heater. A/C is a 15 SEER rating. Heating is radiant heat.

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Catchment/harvesting systems: 3,000-gallon cistern for irrigation and toilets.

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Water efficient landscaping: Landscaping less than a year old. Will continue to change/modify fall and spring '08. Hoping for native or drought tolerant planting.

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Appliances: Low flow toilets, energy star appliances, front load washer.

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Ventilation systems: Venmar Hepa 4000 Energy Recovery system.

Techniques/design: Back-of-house redesigned to include passive. Interior rooms relocated to move most-used rooms to the east/south side of home.

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Landscaping: Compost bin for kitchen scraps built into the kitchen counter. Two leaf compost bins are located in the yard. Mature trees removed due to root rot — new trees planted. Kudzu, along with other invasive vines, were removed from half of the back yard and from the mature shrubs around the base of the house.

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Use of sustainable materials: Primary focus to reuse materials. Kitchen counters and secondary office use antique heart of pine rafters and siding from demolition sites for shelving and countertops. Additional doors, hardwood floors, and brick came from demolition sites. Laundry room reuses old sink and includes old door for the counter surface. Marmoleum (linoleum product) installed in 3rd floor bathrooms.

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Certifications: Healthy Built Home silver level certification



**Elaine Scott
Jerry Tylman**

Charlotte



ImaginOn will be the first USGBC LEED-certified public building in Charlotte. The architects selected materials for their “green” qualities — each with a story of their own.

Glazed Tiles made with +/- 35% post-consumer and post-industrial recycled waste — a formula that Tom Sawyer with Quarry Tile created specifically for ImaginOn.

Stone of the helix represents the architect’s innovative use of a remnant material. The Split-Face Ashlar is the by-product of monument slabs when the polished slabs are cut to size.

The **Concrete** was specified to have a high content of fly ash. Fly ash is a fine, glass-like powder recovered from gases created by coal-fired electric power generation. U.S. power plants produce millions of tons of fly ash annually, which is usually dumped in landfills. Fly ash is an inexpensive replacement for portland cement used in concrete and it actually improves strength, segregation, and ease of pumping of the concrete.

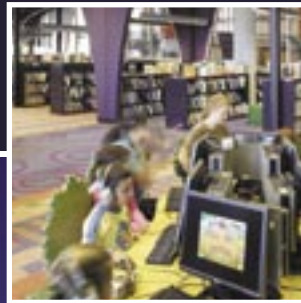
The **Ramp Flooring** was fabricated by Eco Surface with recycled SBR rubber tires and colorful EPDM flecks. It is 100% recyclable and has a low VOC content.

The **Wool Carpet** and the **Linoleum Flooring** were selected because they are rapidly renewable resources.

The **Paint** is Benjamin Moore’s EcoSpec — a low odor, low VOC acrylic paint.

The **Toilet Partitions** are manufactured by Yemm & Hart. The colored “streaks” are made from post-consumer detergent bottles.

The **Millwork** was created with WOODSTALK Gold MR Fiberboard by Dow BioProducts and is coated with a low VOC water-based stain. This product is made from a rapidly renewable resource – wheat straw fiber – with a non-formaldehyde binder.





David Neal

Hillsborough

Active solar system(s): Solar hot water and solar assisted radiant floor heat.

Passive solar elements: Some in breakfast area and lower level family room stained concrete slab.

Energy efficiency measures: 16 SEER variable speed 2 zone heat pump.

Other renewable energy features: Structural Insulated Panels (SIP) panels and Insulating Concrete Forms (ICF) in new addition, additional insulation in attic, blown in cellulose in walls, sealed crawspace, in line on demand gas water heater, double pane low-e glass windows.

Appliances (including low flow, Energy Star, etc.): Yes.

Ventilation systems: HEPA Filter.

Community aspects: Restored/renovated 900 SF cottage, retrofitted and restored with much re-claimed and salvaged wood preserving historic character of neighborhood. Use of salvaged wood and reclaimed materials from buildings torn down by the county, prevented these materials from being put into landfills.

Use of sustainable materials: All flooring, kitchen cabinets, interior and exterior doors, wood wainscoting and beaded board ceiling are all re-claimed salvaged materials. Very little new wood was used in the interior. SIP panels uses composite sheathing.

Embodied energy techniques: All the re-claimed salvaged materials have embodied energy, e.g. no new energy had to be used to create them and all were salvaged from within the county minimizing transportation costs.

Retrofitted solar system/elements: 2.3.kwh system through 12 roof mounted solar panels, feeding a grid-tied system with 400 amp hours battery backup. Solar Hot Water System, 2 Solar Collectors on the roof heating an 80 gallon tank. Glycol closed loop.

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Energy efficiency measures: CFL's used throughout the home. Programmable Thermostats, Radiant Guard insulation in the attic, "Watt Stoppers" to reduce Phantom Loads, a Drying Room in our attic space for drying our clothes so we have no clothes dryer (essentially we line dry everything but within our house). <http://nearto.us/OurSolarRoof>

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Appliances: Energy Star Washing Machine, no dryer (by choice) and low flow aerators.



**Darrell &
Jo Kay Edgley**

Durham





Proximity Hotel

Greensboro



Active solar system(s): 100 flat plate solar hot water panels on the hotel's 4,000 square foot rooftop.

Energy efficiency measures: Geothermal energy for restaurant refrigeration, low-e clear glass windows, employing "energy recovery" technology where the outside air is tempered by the air being exhausted from the hotel, Otis Gen2 elevator that uses energy collected from the descend for the ascend.

Water efficient landscaping: Use of native, adaptive plants, low amounts of turfgrass and drip irrigation in all places except for on grass.

Appliances: Energy Star refrigerators, computers, printers, copiers. Low flow showerheads, faucets, toilets and waterless urinals help us to save 30% in water.

Ventilation systems: The HVAC system is built with individual thermostats in each guestroom and separate spaces throughout the building (event spaces, offices, etc.). We used low VOC paints, sealants, adhesives, carpet, carpet padding and particleboard. We also set up monitoring equipment throughout the building to detect carbon dioxide levels as well as outdoor monitoring systems.

Mechanical system design: Four-pipe water cooled system.

Techniques/design: Located site to be close to shopping and urban activity, yet still close enough for those flying in to town.

Landscaping: Restore 700 linear feet of stream by reducing erosion, planting local, adaptable plant species and rebuilding the buffers and banks.

Community aspects: Use local vendors, farmers and distributors to be "in and of the community."

Use of sustainable materials: 75% of construction materials were diverted from the landfill and 20% of the materials contain recycled content.

Certifications: Seeking LEED Gold certification for New Construction from the USGBC.

Vehicle description: Vehicle fleet consists of two London Taxis, 1975 Checker Marathon and Sprinter van (all which run on diesel) as well as a Suburban and van for larger groups.



Piedmont Environmental Center

Greensboro

Environmental education using hands-on teaching methods. Founded in 1972 on 376 acres of completely protected land. PEC's programs consist of classes, workshops, and trips for children, adults, and families. Nature Adventure Camp (Summer, Winter, and Herp), Annual Yard Sale and Wildflower Sale and Halloween Safari are examples of special programs and activities.

Passive solar elements: Solar hot water, solar chimney effect.

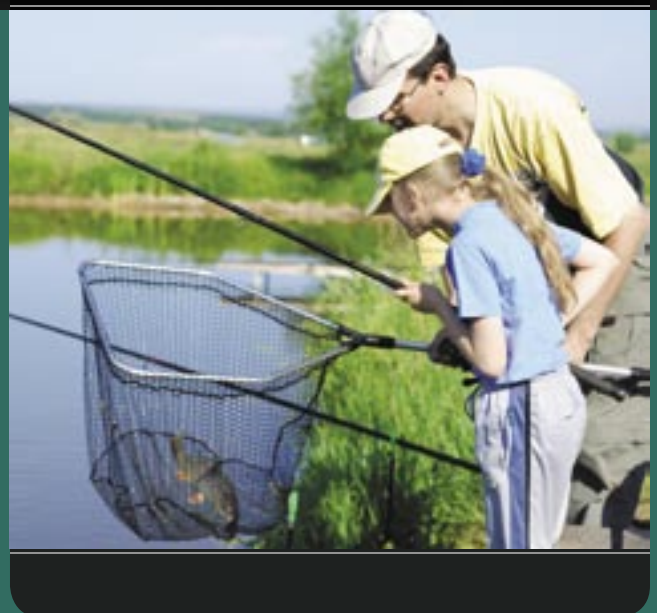
Energy efficiency measures: Convection cooling.

Other renewable energy features: Many recycled building products used in construction.

Catchment/harvesting systems, water efficient landscaping, wastewater treatment: Pending project completion.

Ventilation systems: Air exchange system driven by passive solar.

Use of sustainable materials: Many recycled building elements used in construction.



www.piedmontenvironmental.com



Green Building Events



On Saturday October 27 at 4 PM in the Kaplan Auditorium of the Henderson County Public Library, James Wilhide, LEED Accredited Professional Architect and Senior Associate with Moseley Architects of Charlotte will present a program on the LEED Certified Schools that will be built in Henderson County. It is quite exciting that these two new schools will be the first LEED certified public schools built in Henderson County and Western North Carolina. His presentation will include LEED certification requirements, benefits, and how they will be implemented in the two new school construction projects. He will be assisted by Mr. Bo Caldwell, Senior Director Facilities Management for Henderson County Schools.

The Global Warming Task Force of Henderson County (savetheearthnc.org) will be sponsoring this program. The Task Force along with the Four Seasons Sierra Committee played a significant role in acquiring LEED certification for the Mills River and Hillandale School projects. The Global Warming Task Force of Henderson County is a nonpartisan and nonprofit organization working to reduce carbon dioxide emissions and pollution. The Task Force encourages informed and active participation of citizens in their government and seeks to influence public policy through education and advocacy.




OUTER BANKS TRAINING EVENT

Brought to you by: NCSEA, Coastal Studies Institute and Outer Banks Home Builders Association In February of 2008 at the North Carolina Aquarium

The following topics will be covered:

- Energy Efficiency Overview (Energy 101) • Tax Incentives (State and Federal)
- NAHB Green Building Initiative – Overview (given by a member of the HBA-DOC)
- Products/Supplier Vending (Organized “fair” of vendors who would display products focusing on energy efficiency, moisture management, insulation, etc.)
- Solar Thermal – Installing, cost and rate of return (given by a business in the field)

This is an event that showcases the partnership opportunities between state and local organizations, businesses and industry professionals. If you have any questions, please contact John McCord with Coastal Studies Institute at (252) 475-3663.



Greenville Area Green Building & Energy Efficiency Tour

Energy survey program: Greenville Utilities Commission (GUC) offers free Energy Surveys for residential and light commercial structures. One of GUC's Energy Specialists can make an on-site evaluation, checking for insulation, caulking, weather-stripping, heating system efficiency and other energy-related items. After careful analysis of your specific situation, the Specialist will suggest measures to reduce energy usage. The followup written report will enable you to make informed decisions on energy improvements. Another recent addition to GUC's Energy Survey Program is the duct blaster, which detects leaks in duct systems.

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E-300 program: Greenville Utilities' E-300 award program for residential and light commercial structures sets the standard for energy efficiency in the community. To meet E-300 program requirements, builders and homeowners submit plans for evaluation by an Energy Specialist. Recommendations for insulation and other energy-saving features are made on the basis of a computerized load calculation. If the structure's heat loss falls within acceptable levels, the house qualifies for the E-300 award. To verify installation of energy efficient features, the structure is carefully inspected at several stages of construction.

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Appliance energy efficiency information: Some appliances are more efficient than others. So when it comes time to buy your next appliance, call GUC first for the energy efficiency rating. They have information to help you select most home appliances and heating/cooling systems.

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Fuel cost comparisons: Cost comparisons are available for various types of fuel such as electricity, natural gas, propane, fuel oil and kerosene. This service can help you answer the energy question: "Which fuels are the most economical?"

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Consulting services: Specialists in GUC's Energy Services Office are available for consultations at no charge. Customers may get advice on proper sizing of heating and cooling equipment, new construction, remodeling, and other energy-related matters.

In addition, and while supplies last, each registered tour participant will receive a free gift of a compact fluorescent light bulb (CFL), a switch and outlet plate gasket, a low-flow shower head, or a similar item.

Additional information on the tour, including times and location and procedures for registering, will be forthcoming. Keep an eye on the local tour webpage: www.personal.ecu.edu/chinr/pittcountygreenbuildingtour.pdf



Active solar system(s): Solar powered attic ventilation.

Passive solar elements: Extended roof overhang and porches, site orientation, extensive daylighting through the use of high performance windows and doors.

Energy efficiency measures: High performance multi-zone HVAC, high performance windows and doors, soy-based foam & cellulose insulation with pre-sealed exterior walls and floors.

Catchment/harvesting systems: Storm water control with sub-surface catch basin for irrigation.

Water efficient landscaping: Xeriscape design with drip system irrigation.

Appliances: Energy Star rated appliances, low flow fixtures, Rinnai tankless water heater, pre-wired structured cable and smart home technology.

Ventilation systems: Low VOC paint stains, carpets and other building materials along with fresh air intake, integrated humidity control and Infinity air purifier.

Mechanical system design: Carrier Infinity multizone variable speed, 19 SEER heat pump.

Techniques/design: Park Ridge Pointe is a multi-family condominium development designed with maintenance free exteriors and a strong sense of

community for a wide variety of homeowners. Developed around a core elevator, each of these three story energy efficient homes is designed as a 'perpetual asset', able to support the changing requirements of the homeowner's lifestyle. Maintenance free exteriors and high energy efficiency contribute to the ease of living in this urban infill development built within existing city infrastructure.

Landscaping: Xeriscape design with Thermal Island heat reduction from tree shading.

Community aspects: Urban site location convenient to schools, public transportation, hospitals, parks.

Use of sustainable materials: Synthetic slate roofing, bamboo & cork flooring, soy based foam & cellulose insulation, brick cast in wood molds constructed in the 17th century, synthetic stone, recycled glass ceramic tile, aluminum clad wood windows, granite counter tops, engineered framing products, radiant barrier sheathing, insulated ground floor and garage concrete slab, we are also utilizing a Packer 750 to grind our construction waste for reuse in our site development.

Certifications: Energy Star HERS Rating of 67, LEED & NC Healthy Home ratings in progress.

Please visit our web site www.greenpointeproperties.com for more information.



Park Ridge Pointe

Winston Salem



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MANAGEMENT

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Energy Star
Verification

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SEM is a proud co-founder of GreenPros Training, providing half-day workshops on renewable energy, green design and construction. For more info and a list of upcoming workshops, visit: <http://www.greenprostraining.com>



SUSTAINABILITY

defines how we do business
now and into the future

Social
Working
towards
realizing our
vision of
operating
Incident and
Injury Free

Economic
A commitment
to occupying
and building
green around
the world

Environmental
Sustainability
means
contributing
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www.aliciaravettoarchitect.com



Prairie Ridge

Raleigh

Solar panels: 5.2 kilowatt solar photovoltaic array.

Garden pavilion: 180 square foot green roof with an additional 30 gallon rain barrel, Trex recycled plastic decking.

Outdoor classroom: 2,100 square foot galvalum roof with 1,600-gallon cistern for gray water use (toilet flushing). Passive seasonal solar shading from roof overhang. Open-air design utilizes natural cross ventilation. Forest Stewardship Council certified lumber and parallam beams.

Water efficient landscaping: Native species of plants are naturally adapted to the region's climate and thus require minimal irrigation.





Mainstream Greenhome

Raleigh



William McDonough + Partners is assisting with plan review, keeping cradle-to-cradle principles in mind.

Landscaping, xeriscaping: Will be eligible for certification by the National Wildlife Federation Backyard Habitat Program.

Stormwater management: Swales along the sidewalks and driveway facilitate groundwater infiltration of stormwater runoff and diversion into a series of interlocking RainTanks.

Sustainable materials: In-home recycling, certified and salvaged wood, mold and radon mitigation, air testing, sealed garage and central vacuum system.

Reduced building footprint: Designers utilized the topographical characteristics of site to achieve a reduced building footprint by integrating the garage below the home.

- Renewable energy credits and green power
- 9.7 kW Sunslates PV System
- Advanced framing
- Solar thermal hot water
- Radiant floor heating



John Hill & Chrysanthi Mitchell

Deep Gap

Active solar system(s): Drainback domestic water heating.

Passive solar elements: Winter space heating/summer shading.

Energy efficiency measures: Compact floorplan, highly insulated, daylighting, appliances, heat recovery ventilation.

Other renewable energy features: Woodstove heating.

Catchment/harvesting systems: Gutter piped to vegetable garden.

Water efficient landscaping: Natural meadow areas.

Appliances: Energy Star washing machine, dishwasher.

Wastewater Treatment: Conventional septic.

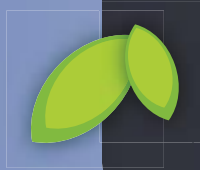
Ventilation systems: Heat recovery ventilation.

Mechanical system design: Radiant floor heating.

Use of sustainable materials: Some local/recycled materials.

Certifications: Energy Star home (HERS score 92).






Ned Trivette

Sugar Grove

Renewable energy features:

- Wind turbine
- 1kW Whisper Link from Southwest Windpower
- Batteryless gridtie
- Produces about 10% of Mr. Trivette's energy





Dixon Stetler's Weaving Studio

Wilmington



The weaving studio sits behind the Wabi Sabi Warehouse at IAC, an operating artist' studio facility in downtown Wilmington (itself an adaptive reuse of an old 70s light industrial warehouse building).

A small, square building with a simple slanting roof, the structure sits on the edge of the IAC's herb, vegetable and fruit garden.

Constructed and designed by local artist Dan Brawley, the weaving studio consists primarily of recycled 4" x 12" heart pine timbers which were salvaged from the Love Grove Park industrial complex after its razing.



The corrugated metal roofing was a post-consumer purchase from Horton Iron and Metal Recyclers. The sliding door to the studio was salvaged from the St. John's Lodge during its renovation by the Children's Museum of Wilmington. The total cost of construction was under \$300.

Age/location: Less than one year; urban

Energy conservation measures: Operational windows on all sides of building with roof vents for heat escape.

Climate control landscaping: Organic garden to south of studio replaced asphalt parking lot (light-industrial use), reduction of 'heat-island effect' of paved surfaces.

Use of sustainable materials: All materials in the building are recycled, except for six sheets of plywood, paint and hardware.



Chris Senior
Wilmington



Built on a bluff on the Intracoastal Waterway, the 9,000-square-foot, three-story, three-family residence in the Porter's Neck neighborhood is a unmistakable, high-performance green-built house.

It has 50 photovoltaic solar panels located on both the main house and a two-story detached carriage house. The house shelters the owner/contractor's extended family and generates an around 1,000 kilowatts a month from a 10 kilowatt solar-powered system, and is grid-tied to Progress Energy in the NC GreenPower program.

Oriented for maximum active and passive solar performance, the structure has all 'green' materials, a series of large overhangs & porches to provide shading and cooling breezes.

Active solar system(s): 10kw net-metered system (50 GE Solar 200w panels, three inverters).

Passive solar elements: First floor concrete mass, two-foot overhangs above all southern windows.

Energy conservation measures: Icynene insulation, conditioned attics, Rinnai on-demand water heaters, engineered HVAC system, one mini-split, detergent-free washing machine, three families (eight people) under one roof on one footprint.

Climate control landscaping: Indigenous, salt-tolerant plantings, pervious driveway.

Low cost solar system(s): Solar path lights.

Unique solar features: Net-zero-energy home (NC Greenpower member), two solar boat lifts.

Other renewable energy features: Ample daylighting, 100% compact fluorescent bulbs throughout, recycled furniture (NC antiques).

Use of sustainable materials: New, indigenous, managed, Southern Yellow pine floors throughout, all Hardipanel (cement board exteriors), low-VOC paints, Pella high-performance casements (located/sized to catch coastal breezes), Energy Star appliances/fixtures.



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- I can help NCSEEA at the Southern Homes Show in Raleigh (Fall '08).
- I can help find new members.
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Members of NCSEEA have the benefit of joining the American Solar Energy Society (ASES), our parent organization, or receiving their publication, at a reduced rate. If you are interested, please check the appropriate box below and add the pertaining amount to your total below.

- \$34 ASES Basic membership
- \$79 ASES Professional membership
- \$29 Solar Today (Free for ASES members) Bi-monthly magazine of ASES

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Overview of North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard (REPS)

North Carolina is at a crossroads with regard to how it generates and consumes energy. With the state's energy demand projected to increase by 32% by 2030, the state's current electricity infrastructure will not be sufficient to meet the energy demands of the future. On August 2, 2007, the NC General Assembly passed Senate Bill 3 authorizing the NC Utilities Commission to create a Renewable Energy and Efficiency Portfolio Standard (REPS). The REPS will require electric utilities to generate 12.5% electricity they sell using renewable energy by year 2021.

Technical Facts

- > 12.5% REPS by 2021 and thereafter for public utilities
- > First phase requires 3% from renewable energy in 2012
- > Eligible renewable resources include locally abundant biomass, solar, hydro, landfill gas, ocean and wind resources
- > Up to 5% may be met with low-cost energy efficiency
- > 10% REPS by 2018 and after for electric cooperatives and municipal utilities
- > Creates renewable energy certificate (REC) trading market to ensure requirements are achieved
- > Creates specific requirements for solar, hog waste, and poultry litter
- > Directs NCUC to establish a mechanism for electricity providers to recover costs associated with energy efficiency and demand-side management programs

Cost & Benefits

- > Will add ~2,500 MW of new renewable energy facilities at an incremental cost of \$2.5 billion
- > Will create at least 2,700 new jobs in North Carolina
- > \$3 billion in investment will go towards developing local energy solutions
- > Keeps energy dollars in-state, working for North Carolina
- > Spurring new and distributed economic development, especially for rural counties
- > Cost caps will ensure ratepayers and economy benefit from REPS

Extensive Support

Major bill supporters included:

- > Public utilities, electric cooperatives, and municipal utilities
- > Industrial organizations
- > Renewable energy and energy efficiency businesses and organizations

Significance

- > Sixth U.S. state to mandate both renewable energy AND energy efficiency
- > Creates the first Renewable Energy Certificates market in the Southeast United States
- > Offers the fifth largest simplified interconnection standard for renewable energy systems
- > Potential to become the fifth largest "net metering" state in the nation
- > One of the few states to include solar thermal hot water and combined heat-and-power systems

Challenges

- > The NC Utilities Commission must adopt rules that motivate electric utilities to comply and will create a robust RECs market in North Carolina

Southern Ideal Home Show: Green Building Pavilion

NCSEA is anchoring the Green Building Pavilion, a new feature of the Southern Ideal Home Show. Some of the Green Building Pavilion features include a 400 square foot Green Home showcasing a variety of green building technologies and solutions, over 20 green building businesses who will be exhibiting, answering questions and demonstrating products and services and Sunday is Green Building Discovery Day on the Main Stage.

Green Home Contributors:

- Designed by Ellen Cassilly Architect • Baker Roofing
- BJ Green Insulation • Brentwood Carpets
- Buckley Lumber • Carolina Concrete Masonry Assoc.
- Contractor Yard • Earth Paint • Fiora Lynne Designs
- Fitch Lumber • Healthy Home Insulation
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- Pella Window and Door • Performance Builder Supply
- PPW • Rain Water Solutions • Solar Solutions
- Southern Energy Management • Wood Wise

If you are interested in exhibiting at the Green Building Pavilion as part of the Southern Spring Home and Garden Show in Charlotte this spring, please contact McCayne Miller, Business and Outreach Manager at mccayne@energync.org. For more information on the show, visit www.southernshows.com/sss/



Join NCSEA!
 (details on page 31)



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Appalachian Regional Initiative for Sustainable Energy

Nikki Rezvani: nicole.rezvani@gmail.com
Brent Summerville: vwshaft@yahoo.com
www.ariseboone.net

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Quint David
q5quint@gmail.com • www.asuses.appstate.edu

Charlotte

North Carolina Sustainable Energy Association

McCayne Miller
919-832-7601
mccayne@energync.org • www.ncsustainableenergy.org

Chatham and Orange County

Alison Carpenter
ac.surge@gmail.com • www.surgenetwork.org
Tom Wills
tom@solarconsultants.com

Durham County

Clean Energy Durham

Darrell Edgley
darrell@near.to.us • www.cleanenergydurham.org

Raleigh

North Carolina Sustainable Energy Association

Shana
919-832-7601
shana@energync.org • www.ncsustainableenergy.org

Triad

Forsyth Technical Community College

Rosa Otero
rotero@forsythtech.edu
Donna Juselis
yellowmini@triad.rr.com

Greenville

East Carolina University

Robert Chin
chinr@ecu.edu
[energync.org/media/pittcountygreenbuildingtour\[1\].pdf](http://energync.org/media/pittcountygreenbuildingtour[1].pdf)

Hendersonville

Global Warming Task Force of Henderson County

Eva Ritchey
elritchey@bellsouth.net • www.savetheearthnc.org

Manteo

Coastal Studies Institute

John McCord
jmccord@csi.northcarolina.edu • www.csi.northcarolina.edu

Hickory

Habitat for Humanity Catawba Valley

Rob Howard
rob@homeenergysol.com • www.hickorysolartour.com

Southern Pines

Sustainable Sandhills

Jon Parsons
910-484-9098
jonparsons@sustainableandhills.org
www.sustainableandhills.org

Wilmington

Cape Fear Green Building Alliance

Scott Ogden
scott@b-and-o.net • www.cfgba.org



NCSEA

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Business & Outreach Manager
mccayne@energync.org

Paul Quinlan
Economics & Policy Analyst
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