FLORIDA SOLAR ENERGY CENTER®

Creating Energy Independence

FINAL REPORT

Southern Energy Efficiency Center (SEEC)

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Submitted by:

Robin K. Vieira
Jeffrey K. Sonne
Charles Withers
James Cummings
Florida Solar Energy Center

Malcolm Verdict
Energy Systems Lab, Texas A&M University

Sydney Roberts
Southface

Submitted to: U.S. Department of Energy

1679 Clearlake Road
Cocoa, Florida 32922, USA
(321) 638-1000

www.floridaenergycenter.org

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Final Report [Draft]

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DOE Project Officer:	Mr. Brett Aristegui, DOE / NETL
SEEC Partners:	Florida Solar Energy Center (FSEC) Southface Energy Institute, Inc. Texas A&M Energy Systems Laboratory (ESL)
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For questions concerning this report please contact:
Robin Vieira, SEEC Director
Florida Solar Energy Center
321-638-1404
Email: robin@fsec.ucf.edu

EXECUTIVE SUMMARY

The Southern Energy Efficiency Center (SEEC) is a pilot, high-performance buildings technology application center serving a 12-state southern U.S. region. Its overall mission is to leverage the existing interactions and outreach activities of the SEEC principals and partners to substantially increase the deployment of high-performance, beyond-code buildings across the region. Primary funding was from the U.S. Department of Energy Building Technologies Program, administered by the National Energy Technology Laboratory. Additional cost-share funding was provided by the State of Florida, Texas A&M, South Carolina (in-kind), Southface Institute and Earthcraft House.

In its first phase, SEEC created many new resources to facilitate dissemination of information on high-performance, beyond code buildings via new workshops, documents, conferences, websites and meetings. Many building professionals were educated about energy efficient techniques and DOE Building Technology programs.

With the more recent push toward improving efficiency of existing buildings, and new federal and state directives, the demand for knowledge is increasing. The green building movement has also created demand; however real world green building performance has been mixed. Building professionals will continue to need pertinent information from qualified regional building science professionals. More activities and programs like those listed here should be conducted with emphasis on reaching local groups through ASHRAE, USGBC, ACCA and other

organization chapters. The level of effort and funding should increase in order to realize true performance gains.

SEEC program major accomplishments include:

- Development of the *www.southernbuildings.org* website that provides an overview of SEEC and its structure, as well as a number of resources including links to educational materials and information on DOE Building Challenge and Energy Smart programs, as well as pertinent upcoming training and other events in the region.

- "Regional Energy Baselines and Measurement and Verification Protocols" report by Energy Systems Lab. This report presents comparisons of energy policy for each of the twelve SEEC states.

- "Review and Recommendations of Existing Methods and Tools for Building Energy Analysis" report by Energy Systems Lab. This report presents a comparison and recommendations for conducting building analysis.

- "Top Ten Energy Efficiency Tips for Commercial Buildings" Energy Note by FSEC. This document provides recommendations for creating energy efficient commercial buildings in the SEEC region.

- "Energy-Efficient Approaches to Relative Humidity Control in Schools" Energy Note by FSEC. This paper provides an in-depth discussion of energy-efficient strategies designed to control relative humidity in schools.

- "Improving Energy Efficiency in Relocatable Classrooms" Energy Note by FSEC. This note discusses the big impact "temporary" classrooms can have on the energy footprint of a school.

- Collaborating to co-host the 16th Symposium on Improving Building Systems in Hot and Humid Climates, December 16-17, 2008 in Dallas, Texas.

- Co-hosting the GreenPrints conference in Atlanta, GA in March of 2008 and 2009, reaching 300 professionals.

- Development and initial offering of a 12-course "Achieving Zero Energy Green Homes" webinar series which shows participants how to take a home design from "Code level" to net zero energy use featuring DOE's Builders Challenge. Course three in the series is on Energy Star Water Heating systems, a program introduced in 2008 by DOE. Instructors also prepared a page of links to resources for each of the topics, which include home design, envelopes, HVAC, solar systems and plug-loads.

- Delivered training and presentations to over 1,000 attendees.

- Development of state resources:

    - Analysis of Above-Code (2009 IECC) Residential Energy Efficiency Measures in ONCOR Service Area (Texas)
      The purpose of this report is to provide an analysis of residential energy efficiency and renewable measures that would exceed the 2009 edition of the International Energy Conservation Code (IECC) in the ONCOR service territory.

This information is useful to homebuilders, utility demand side energy managers, homeowners and others who wish to construct buildings that exceed the minimum national energy code requirements.

- Energy Efficiency Cost-Effectiveness Tests for Residential Energy Code Update Processes (Florida)
  To assist in developing a rule for a cost effectiveness test for the Florida Building Code, the Florida Department of Community Affairs (DCA) has contracted with the Florida Solar Energy Center (FSEC) to draft this report on economic indicators and to make recommendations on economic assessment standards that might be included in a cost effectiveness test rule.

- Florida Model Green Building Ordinance
  This model green building ordinance was developed by the Florida Green Building Workgroup, made up of local and state officials, building officials, industry representatives and conservation advocates

- Appliance and Equipment Efficiency Standards for Florida
  This report examines cost effective appliance and equipment standards not covered by federal energy legislation. Per the Governor's Executive Order 07-127, this report identifies and recommends Florida energy conservation standards for products that consume electricity. A total of 17 standards are recommended, each including an estimate of potential energy and emissions savings. Total year 2020 electrical savings from all recommended standards is estimated at 32,817 GWh, or 14.7 percent of Florida's 2006 net electricity generation of 223,751.6 GWh.

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OBJECTIVES

The overall objective is to substantially increase the deployment of high-performance "beyond-code" buildings across the southern region of the U.S. This will be accomplished by effectively delivering information from existing resources and emerging Building Technologies Program-developed technologies, as well as processes and tools that meet DOE priorities. Project efforts will align with efficiency goals of states, utilities and energy-efficiency partnership-based programs to promote DOE Building Technology Program goals for advanced energy-efficient building codes, standards and zero energy buildings.

SCOPE OF WORK

The Southern Energy Efficiency Center (SEEC) builds collaborative partnerships with: state and local governments and their program support offices, the building delivery industry (designers, contractors, realtors and commissioning agents), product manufacturers and their supply chains, utilities and their program implementers, consumers and other stakeholders in order to forge a strong regional network of building energy efficiency allies. Through a project Steering Committee composed of the state energy offices and building industry stakeholders, the SEEC works to establish consensus-based goals, priorities and strategies at the regional, state and local levels that will materially advance the deployment of high-performance "beyond code" buildings. In its first Phase, SEEC will provide limited technical and policy support assistance, training, certification and education to a wide spectrum of the building construction, codes and standards, and the consumer marketplace.

TASKS PERFORMED

The tasks of the Southern Energy Efficiency Center included:

Task 1: Partnership Development
Task 2: Resource Development
Task 3: Develop Technical and Policy Support Assistance
Task 4: Outreach, Education, Training and Certification.

Task 1: Partnership Development

SEEC will seek out, develop and maintain strong and meaningful partnerships with industry and government allies as well as the media and large end user groups. One representative from each of the 12 state energy offices will be invited to participate in a core steering group to develop overall project goals. This core "Group of 12" (G-12) will help define stakeholder partnership rolls and responsibilities and identify potential stakeholder partners. The G-12 will also assist in prioritizing the technical and policy support assistance to be provided by SEEC (see Task 3). The G-12 and the SEEC stakeholder partners will make up a project Steering Committee of 30-50 active program partners. In addition to setting overall direction for the project, the Steering Committee will serve as a major networking mechanism for the SEEC and will assist in identifying and procuring regional resources and assist in educational and outreach programs.

Subtask 1.1 Establish State Energy Office Group of 12 (G-12) (Lead: All)

A State Energy Office Group of 12 was established at a SEEC kick-off meeting for State Energy Office Directors that was held February 3rd 2008 in Washington DC at the start of the NASEO meeting. After SEEC principals from FSEC, Texas A&M ESL and Southface made program and activities overview presentations, state energy office attendees provided information on pertinent activities in their states and suggestions for SEEC training and other possible undertakings. Representatives from three state energy offices attended the meeting and a forth representative provided some additional comments after the meeting.

A follow-up email was sent to the kick-off meeting participants as well as energy office directors who were not able to attend. The email included a one-page SEEC mission statement to introduce SEEC to the directors, minutes from the meeting and a request for additional input. The SEEC mission statement, meeting minutes and post-meeting input from Louisiana and South Carolina are included in the Appendix.

Subtask 1.2 Develop and Adopt Stakeholder Partnership Requirements (Lead: All)

A draft SEEC Partner Agreement was developed during the 1st quarter of 2008 that provided stakeholders with a number of ways to partner with SEEC, including providing cost-share, service on the SEEC steering committee, and assistance with materials preparation and dissemination. The draft Agreement was presented to the other principals at a March 2008 meeting of the principals in Atlanta (see agenda in the Appendix) and then revised and adopted by the group. The final version is included in the Appendix.

Subtask 1.3 Recruit Steering Committee Partnerships (Lead: All)

Steering committee partnerships were pursued by all three SEEC partners through a variety of outreaches. A listing of the 50+ SEEC partners is provided in the Appendix and on the SEEC website at: http://www.southernbuildings.org/partners/index.htm.

A SEEC steering committee meeting was held during the December Symposium with over 20 in attendance in person and by phone. The main goal of the meeting was to obtain feedback from on how to use limited DOE and other resources to get more efficient buildings. The meeting also included a SEEC December 2008 Update presentation and a review of SEEC educational materials currently being developed. The meeting minutes are included in the Appendix.

Subtask 1.4 Maintain Partnership Program (Lead: All)

Once steering committee partnerships were established, collaboration took on a number of forms. Many partners actively participated in our conferences, including providing presentations. State leaders participated in a meeting jointly organized by SEIA and SEEC. South Carolina held workshops on energy efficiency and green building programs.

Task 2: Resource Development

This task consists of four subtasks designed to provide the resources that will be needed by SEEC and its partners to substantially increase the implementation of high-performance buildings in the southeast.

Subtask 2.1 Develop SEEC Web Presence (Lead: FSEC)

The SEEC web site was launched during the 3rd quarter of 2008. The site includes an overview of SEEC and its structure, a page of programs that provide brief descriptions and links to DOE building programs such as DOE Building Challenge and Energy Smart programs, as well as pertinent upcoming training and other events in the region. There is a page that provides links to all partner websites. The website also includes a number of resources created under this contract described further in this report including case studies, energy notes and reports.

Case studies of five high performance buildings, three homes and one land development were developed in May 2008 for use on the cost-shared MyFloridaGreenBuilding.info web site that is linked from the SEEC website. This consumer-oriented Florida site also has a number of resources including calculators for energy efficiency, conservation tips, a printable "6 Simple Steps to Energy Efficiency" flyer, descriptions of each green building rating system and links to those ratings. It also has a page of links to local government ordinances including the model Florida green building ordinance developed under this contract and Florida cost share. The document was created by FSEC under the direction of the Florida green building workgroup appointed by the Florida Building Commission.

SEEC also contributed suggestions to Washington State University for a multi-regional Center website that would then link to all Building Application Center sites. This would allow one site to be publicized by DOE and then link to the regional sites. WSU used *energyexperts.org* site as the platform. Consumers can link from that home page to the Northwest or Southern Building Application Center websites. The energyexperts.org website offers a large database of resources that has helpful search steps and serves consumers, building professionals and the utility industry.

The SEEC website continues to be maintained and updated and can be visited at: http://southernbuildings.org (see the Appendix for image of home page).

Subtask 2.2 Develop Regional Efficiency Measures Cost Database (Lead: FSEC)

This task was replaced with increased educational activities over time due to lack of partner interest in creating and maintaining a regional cost database. However, in Florida SEEC helped the state determine the economics of meeting Governor Crist's plan for reducing energy use in the state and improving the building codes. Two reports were prepared.

Cost-Effective Energy-Efficiency and Florida's Residential Energy Code

The first report was completed in February 2008 and was titled, "Cost-Effective Energy-Efficiency and Florida's Residential Energy Code," written by Philip Fairey of FSEC. Using a criteria that the internal rate or return must greater than 10%, 23 of 27 energy conservation measures (ECMs) were found cost-effective. If the costs of measures were inflated 150%, 20 of the measures would still meet the test. Table 1 indicates the measures and savings. Some measures simulated are not part of the current code and thus do not show under the energy code column.

Table 1. Cost effective ECMs using Baseline Assumptions and IRR Criteria

Energy Conservation Measure	Internal Rate of Return	% Savings(of Total)	% Savings (of Code)**
Shng	10005.8%	1.5%	3.3%
Wwalls	7758.5%	0.8%	1.6%
HW2 (gas)	448.5%	5.7%	11.2%
Lgts*	447.2%	6.9%	NA
Ducts	338.2%	3.9%	8.3%
Fridg*	333.7%	1.1%	NA
effPool*	269.9%	9.0%	NA
dWash*	222.6%	0.5%	NA
HW1 (gas)	220.1%	1.5%	3.0%
Pstat	200.8%	2.2%	4.7%
HAcloths*	195.8%	0.7%	NA
cFan*	156.4%	2.7%	NA
Furn1 (gas)	128.7%	0.8%	1.6%
HW	114.7%	0.5%	1.0%
Furn2 (gas)	98.2%	1.2%	2.4%
HVAC2	84.2%	6.1%	13.2%
HPWH	74.7%	7.9%	16.9%
WinU	64.7%	2.7%	5.7%
Package***	57.2%	24.9%	53.5%
SHW	54.6%	10.4%	22.4%
RBS	40.7%	3.2%	7.0%
HRU	35.9%	4.4%	9.4%
IDucts	32.0%	8.6%	18.5%
HVAC3	13.9%	8.7%	18.6%

Energy Efficiency Cost-Effectiveness Tests for Residential Energy Code Update Processes

A second report by Fairey and Rob Vieira, titled "Energy Efficiency Cost-Effectiveness Tests for Residential Energy Code Update Processes," provides an overview of methodology for how to evaluate efficiency measures and levels of cost-effectiveness. Recommendations on methodology can apply to any state:

- For present value cost-to-benefit ratio (PVCB) a value of 1.0 or greater is recommended based on the fact that the investment will fully recover its cost during the typical home mortgage period.
- For the internal rate of return (IRR) on investments, a value equal to 8% is recommended. The recommended value is approximately 1.5% greater than the guaranteed return on State of Florida DROPS (retirement account) investments and is considered large enough that any rational investor would consider the investment wise compared with any other long-term investment.
- For the levelized cost of conserved energy (LCCE), a value equal to the statewide residential revenue-based retail cost of electricity adjusted at the fuel escalation rate over one-half of the life of the measure (yields average over the measure life) is recommended. This is based on the fact that, over their life, accepted measures will cost consumers the same or less than purchasing electricity from the utility, where:

  LCCE criteria = (current price) * [(1+fuelEsc)(life/2)]

- The use of simple payback (SP) is not recommended as an economic indicator of cost effectiveness for the purposes of energy code consideration. This recommendation is based on the consideration that SP is a poor indicator of investment value in that it does not accurately consider out of pocket costs and savings and the time value of money. The energy code is promulgated to provide protection of all consumers from excessive future energy costs, including the future purchasers of homes built today. It is also in the interest of the citizens to defray cost increases due to electric generation demand growth, which the code impacts directly. Options that have the least first cost, which simple payback tends to measure, do not meet these goals when there are other, more life-cycle economical options available at the time of construction.

Approximately 90 sets of EnergyGauge USA® simulation results were produced which included approximately 30 sets for each of 3 Florida climates. The simulations examine a large number of envelope, equipment and appliance upgrades to the Florida "baseline" code home.

Cost data for these improvements has been collected from RSMeans as well as other sources and proposed economic indicators (CCE, IRR, simple payback, and mortgage LCC) were programmed into analysis spreadsheets for use with the simulation and cost data. Table 2 shows the improvements that were evaluated for the simulated 2200 square foot home.

Table 2. Description and Costs for ECMs Evaluated

Acronym	Description of Measure	Incremental Total Cost
HVAC2:	SEER-15; HSPF-9.0 high efficiency heat pump (not counting $300 federal tax credit)	$1,000
HVAC3:	SEER-17; HSPF-9.2 ultra high efficiency heat pump (not counting $300 federal tax credit)	$2,500
RBS:	Attic radiant barrier system	$563
Ceil38	Increase ceiling insulation to R-38	$308
Ducts:	Tight ducts (normalized leakage from 0.10 to 0.03)	$165
Roof:	White metal roof (solar reflectance = 70%)	$2,941
SHW:	Solar hot water system* (closed loop; 40 ft^2-80 gal; PV pumped – not counting 30% federal tax credit + $500 Florida rebate)	$3,592
Lgts:	50% fluorescent lighting	$240
IDucts:	Entire forced air distribution system inside conditioned space boundary	$1,650
Fridg:	Energy Star refrigerator (~80% of baseline energy use)	$50
WinU:	Window upgrade to vinyl frame; U=0.39; SHGC=0.28	$396
Pstat:	Programmable thermostat with 2 ^oF setup/setback	$150
cFans:	Energy Star ceiling fans (Gossamer Wind – 140 cfm/watt)	$200
Shng:	White composite shingles (solar reflectance = 25%)	$3
HW:	50 gal hot water heater EF increased from 0.90 to 0.92	$50
WallS:	Add R-3 wall sheathing	$406
Wwalls:	White walls (solar reflectance = 60%)	$2
HAcloths:	Horizontal axis cloths washer (1.5 gpd hot water savings)	$50
HRU:	Heat recovery water heater	$750
HPWH:	Heat pump water heater (COP = 3.0)	$1,092
dWash	Energy Star dishwasher (EF=0.58; 1.06 gpd hot water savings)	$30
2kW-PV:	2.1 kW-peak PV system (not counting $2000 federal tax credit + $4/peak watt Florida rebate)	$16,800
effPool:	Efficient, downsized pool pump and oversized piping (40% energy savings)	$500
Furn1:	High-efficiency non-condensing furnace (AFUE=90%)	$150
Furn2:	High-efficiency condensing furnace (AFUE=95%)	$400
HW1:	Medium efficiency gas hot water heater (EF=0.63)	$100
HW2:	High efficiency gas hot water heater (EF=0.80)	$300
eStar:	eStar heat pump; eStar windows; ach50=7; 3-eStar light fix; Ducts; Shng; Fridg; WallR; dWash	$1,516
TaxC:	HVAC2; Ducts; IDucts; WallR; Pstat; WinU	$3,737
Pkg1:	HVAC2; Ducts; RBS; SHW; Lgts, Fridg; WinU; Pstat; cFan; Shng; Wwalls; HAcloths; dWash	$6,660
* For solar hot water systems closed-loop systems were assumed in north Florida and open-loop systems were assumed in central and south Florida.		

2007 Florida Code Requirements and ASHRAE 90.1 Comparison

A Comparison of the 2007 Florida Code requirements with those of ASHRAE 90.1 was also completed. Table 3 shows the relative stringency of the two systems for performance-based compliance.

Table 3. 2007 Florida Code and ASHRAE 90.1 Energy Use and Savings Comparison

City	ASHRAE Climate Zone	Energy Use (MBtu/Yr)			% Savings	
		Current Code Baseline	90.1-2007 Baseline	ASHRAE Design Guide	90.1 2007 Baseline	ASHRAE Design Guide
Jacksonville	2	668	606	552	9.3%	17.4%
Orlando	2	649	602	553	7.2%	14.8%
Tampa	2	672	624	571	7.1%	15.0%
Miami	1	721	678	625	6.0%	13.3%

The Florida Building Commission adopted a performance based Code that requires 15% improvement over the 2007 baseline. The code became effective March 1, 2009.

Subtask 2.3 Develop Informational and Educational Materials (Lead: FSEC)

A number of new educational materials were produced with the help of the SEEC program. Some of these include:

FSEC wrote three Energy Notes titled "*Top Ten Tips for Energy-Efficient Buildings for the Southern United States*," "*Energy Efficient Approaches to RH Control in Schools for Hot and Humid Weather*," and "Improving Energy Efficiency in Relocatable Classrooms" Both of these Energy Notes were sent to partners, revised and are available on the SEEC website. A SEEC cover template was developed for future Energy Notes.

Top Ten Tips for Energy-Efficient Buildings for the Southern United States

The Top Ten Tips Energy Note provides practical information on creating energy-efficient commercial and institutional buildings in areas with hot and humid summers using these ten strategies:

1. Create a high performance building envelope through effective air, thermal, and vapor barriers, and limiting heat entry through window and roof systems.

2. Optimize lighting systems through high-efficiency lamps, use of daylighting, and shutting off lights during unoccupied periods.

3. Control ventilation through occupancy-based modulation and use of a dedicated outdoor air system.

4. Manage humidity effectively and efficiently by controlling bulk water, stopping water vapor entry, and use of AC systems that dehumidify effectively.

5. Install high efficiency DX or chilled water AC systems with high efficiency fans.

6. Reduce fan and pump energy use by means of VFDs and static pressure reset.

7. Manage building and HVAC system air flows, including avoiding uncontrolled air flows, locating the air distribution system inside the air and thermal envelope, and operating the building at positive pressure during hot and humid weather.

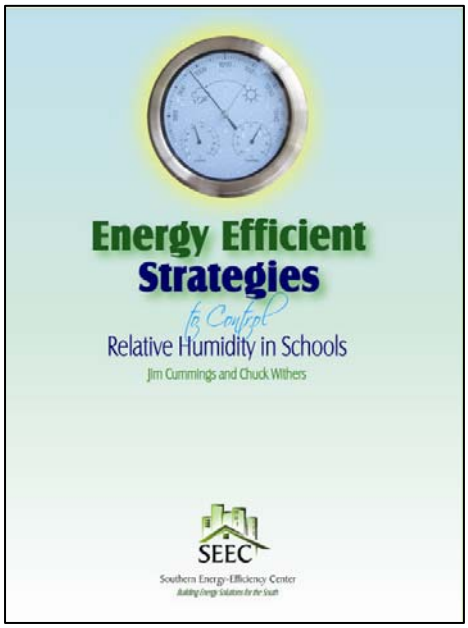
8. Optimize the scheduling of energy consuming systems, including shutting down energy consuming systems or relaxing setpoints during unoccupied periods.

9. Perform commissioning on new buildings and recommissioning on existing buildings to achieve and maintain optimum system and building performance.

10. Analyze building energy use by means of an energy information system.

Energy Efficient Strategies to Control Relative Humidity in Schools

The "*Energy Efficient Strategies to Control Relative Humidity in Schools*" Energy Note provides information on conditions and moisture concerns in southern climate buildings and information on twelve common conditioning and ventilations systems used in buildings. Of the 12 AC system types, four are rated as poor or very poor, two are rated as good, and six are rated as very good or excellent at controlling indoor RH. The report notes that the key to effective moisture removal and good RH control is for the cooling coil to be cold when air is moving across the coil, because a cold coil strips away moisture. A warm or even cool coil does not effectively remove moisture. A brief discussion of each system type follows and is summarized here (an estimate of likely average indoor RH that would result from the operation of this system during hot and humid weather is presented in parentheses after the name of each system type):



1. *Standard Direct Expansion (DX) – fan AUTO (54% RH).* This is the type of system that most of us have in our home with fan control set to AUTO. A constant volume AHU fan is cycled ON/OFF in sync with the compressor operation. Apart from the first 30 to 60 seconds after compressor start up, the cooling coil is cold whenever the fan moves air across the coil causing latent cooling performance to be good.

2. *Standard DX – fan ON (70% RH*). This is the same as System Type 1 except with fan control set to ON. A constant volume AHU fan operates continuously while the compressor cycles. After the compressor shuts off, the cooling coil becomes warm within about 30 seconds, after which the mixed return air and outdoor air are not conditioned. Furthermore, moisture that has accumulated on the coil evaporates into the warm air stream returning moisture to the room air and producing elevated room RH.

3. *Standard DX – continuous cold coil with reheat (46% RH)*. This is the same as System Type 2 except that the compressor is forced to run continuously. Because of continuous compressor operation, the cooling coil remains cold and therefore provides excellent dehumidification. To prevent overcooling of the space, a heating source such as electric resistance elements, a hydronic coil, or hot gas reheat (waste condenser heat) is activated.

4. *Two-stage DX with two speed fan – fan AUTO (50% RH).* This is similar to System Type1 except there is a two-stage compressor and two fan speeds. If there is no cooling load, then the compressor and AHU fan turn off. If the cooling load is small, then the first-stage compressor will operate and the AHU fan will operate at low fan speed. Since the fan speed is proportional to the compressor capacity, the coil remains cold whenever air flows across the coil causing latent cooling performance to be good.

5. *Two-stage DX with face-split coil, constant fan – fan ON (54% RH)*. This system has a two-stage compressor, a face-split cooling coil (in effect, two separate coils, typically one above the other), and one fan speed. If there is no cooling load, then the compressor is off but the AHU fan continues to run. If the cooling load is small, then the first-stage compressor will operate and make the first-stage coil cold. At full capacity, both the first and second stage compressors operate and both the first and second stage coils are fully cold. Because the first-stage coil is cold most of the time, latent cooling performance is good. When the second stage coil ceases to be active, the moisture that remains on that coil evaporates, causing some introduction of water vapor to the space and increase in room RH.

6. *Two-stage DX with row-split coil, constant fan – fan ON (80% RH).* This system is the same as System Type 5 except that it has a row-split cooling coil. The row-split coil is one coil, but alternating rows of the coil are active. In a four-row coil, for example, coil rows 1 and 3 would be active in first stage operation while 2 and 4 would be active in second stage. If there is no cooling load, then the compressor is off but the AHU fan continues to run. If the cooling load is small, then the first-stage compressor will operate and make the coil cool but not cold. At full capacity, both the first and second stage compressors will operate and the coil will be fully cold. Because the system will operate in first-stage the majority of the time, the coil will be cool but not cold most of the time, so little moisture will be removed from the air stream. During the intermittent periods when the system goes to second stage operation, moisture will condense on the cooling coil, but then evaporate when the system returns to first stage. Since first-stage provides little or no latent cooling and much of the moisture remaining on the coil after second stage operation evaporates back into the room air, the end result is very high indoor RH.

7. *Two-stage DX with face-split coil, constant fan – fan AUTO (50% RH*). This is the same as System 5 but with fan AUTO. Performance-wise the only difference is that the AHU fan shuts

off when there is no cooling load, thus eliminating most of the evaporation of moisture from the first-stage coil when the first-stage compressor shuts off. As a result, indoor RH is slightly lower.

8. *Two-stage DX with row-split coil, constant fan – fan AUTO (75% RH)*. This is the same as System 6 but with fan AUTO. Performance-wise the only difference is that the AHU fan shuts off when there is no cooling load, thus eliminating some evaporation of moisture from the coil when the compressors are off. As a result, indoor RH is slightly lower.

9. *Face and bypass Chilled Water (CW) system with constant and continuous fan (50% RH)*. In this system, there are two air flow pathways. One path takes the air through a cooling coil (the "face") that remains cold all of the time. The other path allows air to bypass the cooling coil – this air is therefore not conditioned at all. A thermostat senses room temperature and modulates the face and bypass dampers. As the damper in front of the coil modulates towards closed the bypass dampers modulate towards open. Conversely, when the dampers in front of the coil open, the bypass dampers close. Because the coil remains cold all of the time, the air that passes through the "face" is well dehumidified and as a result indoor RH is well controlled most of the time. Latent cooling performance is enhanced if the OA is directed to the face rather than the bypass.

10. *Zoned CW system with constant and continuous fan (44% RH)*. This system, which is sometimes called "hot deck, cold deck", also has two air flow pathways. One path takes the air through a cooling coil ("cold deck") that remains cold all of the time. The other path takes air across a heating coil ("hot deck") that remains hot all of the time. A matrix of mixing dampers (controlled by zone thermostats) meter a mixture of the cold and hot air streams into individual supply ducts that serve specific zones within the building. If the heating source of the hot deck were turned off, this system would operate much like a face and bypass system. Because of the heat provided to the space by the hot deck, a greater proportion of the air flow goes across the cooling coil (compared to a face and bypass system). Therefore, the resulting indoor RH is even lower than that from the face and bypass system, but the energy use is higher. It is possible for the Building Automation System to modulate the temperature of the hot deck in real time in response to space RH (e.g., move toward no heat source if space RH is below the desired setpoint).

11. *Constant Volume Modulating Valve CW system with continuous fan (70% RH)*. This system modulates cooling output by raising the temperature of the coil during reduced load periods. This is done by modulating the flow rate of chilled water through the coil. Because the coil is warm or cool but not cold, a majority of the time, this system is not effective at removing water vapor from the room air.

12. *Variable Air Volume (VAV) CW system with continuous fan (50% RH)*. This system modulates cooling output by increasing or decreasing the air flow rate across the cooling coil. The coil is maintained at a cold temperature to provide (typically) 55^{o}F supply air to the space. In theory, the air flow rate can modulate from 0% to 100% of full flow. However, because OA is normally integrated into the system, the minimum air flow rate is often around 30% of full flow. If 30% of full flow (with 55^{o}F air) provides too much cooling then two options are available. First, reheat can be used to warm the supply air to prevent space overcooling. Second, the cooling coil temperature can be raised (by reduced CW flow) to prevent space overcooling. The

first provides the greatest RH control but at a considerable energy penalty. The second saves energy but tends to produce somewhat higher indoor RH during low-load periods, because the coil is too warm to dehumidify effectively. If a DOAS is used, as discussed earlier in this paper, then the AHU fan speed can be controlled down to near 0% reducing the overcooling potential.

Improving Energy Efficiency in Relocatable Classrooms

This energy note makes recommendations for existing and new relocatable classrooms. The authors also provide summary results from research projects in North Carolina and Florida. It is intended for school district purchasing decision makers and their facility/energy engineering staff. The document prioritizes the following measures for existing classrooms:

Cooling and Heating

Use timer schedule or occupancy sensor control to turn off units when unoccupied.

Ventilation

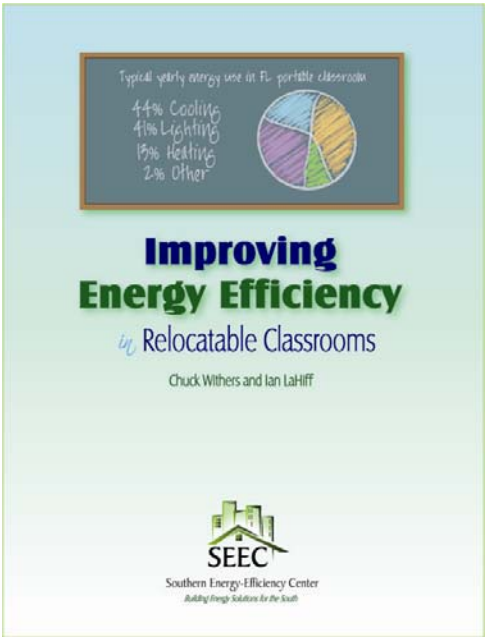
Efficiency - Use Enthalpy Recovery Ventilator (ERV) to help transfer cool dry energy of exfiltrated air to incoming ventilation air.

Control - Use carbon dioxide (CO2) controls technology to minimize over-ventilation by modulating outdoor air damper. Annual periodic calibration of sensors is also important.

Envelope

Air tightness - In general commercial-type buildings should be around 4-6 ACH50. Since portable classrooms have a high ventilation density, they can still perform well around 10 ACH50. The average portable air tightness is a very leaky 23 ACH50! Much of this is due to ceiling space and floor space leakage. Airtighten penetration points such as the wall-mount AC unit, electrical and plumbing. If there is a vented attic space, the ceiling should not be acoustical tile. Also realize that the leakier the building is, the harder it is to control moisture during unoccupied periods.

Windows - Consider adding awnings to shade windows and doors.



Electric Lighting

Type - Revamp lighting as follows: Eight fixtures having three T8 32W lamps each, threefixtures having one T8 32W lamp each, total of twenty ballasts and three 15 W CFLs keep interior power density to 0.9 W/ft2 for the average size portable. The outdoor entry should be lit by one 15W CFL controlled by a photo sensor.

Control - Use occupancy sensor or time of day to turn off lights after hours.

Daylighting

Considering that portables have very little overhang over windows, sidelighting through windows in walls is not a great option. Glare issues and local comfort must be controlled with interior blinds if exterior awnings are not present. With the right circumstances, photo sensor control could be added with dimmable ballasts that would allows energy conservation through daylighting when ample ambient light is present.

The document provides a longer list of recommendations for new classrooms:

Cooling and Heating

Use heat pump wall mount units with 12 SEER and 7.5 HSPF. Duct and air handler leakage to outside tested at 25 Pa of pressure should be less than 5% of the maximum rated airflow.

Variable Capacity - Use units capable of operating at least at two-different capacities (twostage compressor). Downsize auxiliary strip heat on heat pumps to prevent excessive morning use of inefficient resistance heating. This also helps to avoid thermostat "overshoot" during morning temperature recovery.

Schedule - Use time of day/week schedule control to turn off units overnight and weekends. Noise Reduction-Use vibration reduction isolation between unit and wall and a ducted supply.

Thermostat - Try implementing a cooling set point goal of 74oF-78oF (This will be easier in improved newer portables with well-insulated and sealed envelopes.)

Ventilation

Amount - Follow ASHRAE Standard 62.1- 2007 which calls for 10 cfm/person AND 0.12 cfm/square foot of classroom space. This is about 15 cfm per person for the average classroom with about 25 occupants.

Efficiency - Use Energy Recovery Ventilator (ERV) to help transfer cool dry energy of exfiltrated air to incoming ventilation air.

Control - Use carbon dioxide (CO2) controls to minimize over-ventilation by modulating outdoor air damper. The damper can be set to a minimum that will meet the 0.12 cfm/ft2 during school hours with little or no occupancy and then go to maximum when CO2 levels reach about 1,000 parts per million (ppm). The damper will go to the closed position during after hours while the unit is off.

Envelope

Roof - Use white reflective membrane roof instead of shingles since composite shingles have much lower reflectivity.

Insulation - R-30 insulation in ceiling, R11 insulated walls and R19 insulation under floor deck.

Airtightness - In general commercial-type buildings should be around 4-6 ACH50. Since portable classrooms have a high ventilation density, they can be around 10 ACH50. The average portable airtightness is a very leaky 23 ACH50! Much of this is due to ceiling space and floor space leakage. Ceiling space should be reasonably airtight with no intentional venting to outdoors. Expanding insulating foam was used in the Florida PERC to provide air tightness and insulate the ceiling cavity.

Windows - U=0.28, SHGC=0.39 and VLT=0.71. The U-value is the inverse measure of

thermal resistance so U-value of 0.28 has R-value of about 3.5. The solar heat gain coefficient (SHGC) is a measure of how well the window restricts solar radiation. The lower the number, the more radiation is restricted. Visible light transmittance (VLT) is how much of the visible portion of solar radiation is transferred. The higher the number, the more light that comes through. Also consider using roof overhang or awnings to shade windows and doors from direct sunlight.
Concrete modular classrooms have existed for awhile in Florida and have merits such as: They are relocatable; High mass roof, floor and walls slows heat transfer minimizing peak load; They can be stacked on top of one another minimizing ground footprint and heat load on ground unit. Some manufacturer models even meet Florida hurricane building code.

Lighting
Type - Eight fixtures having three T8 32W lamps, three fixtures having one T8 32 W lamp each, total of 20 ballasts and three 15 W CFL keep interior power density to 0.9 W/ft2. The outdoor entry is lit by one 15W CFL controlled by a photo sensor.
Control - Use occupancy sensor or time of day to turn off lights after hours. Photo sensor control used with dimmable ballasts allows energy conservation through daylighting.
Daylighting - Considering that portables are located in close proximity to each other, sidelighting through windows in walls may not be the best option. Minimizing windows allows more wall space for instructional use. Clerestory window design works well, but orientation is important and especially difficult to control in relocatables. Height during transportation is also an issue for clerestory design. Skylighting has been demonstrated to work well. Tubular-style skylights with a controllable light damper allow interior illumination control during use of different types of instructional media. Six 21 inch diameter skylight tubes work well in a 900 ft2 portable.

Other Material Development

Poster-sized US DOE EnergySmart Home Scale displayed by Southface at the June 2008 Southern Home Show in Atlanta (see the Appendix).

In April and May 2008 ESL vetted an internal proposal for creation of a Texas Energy Efficiency Resource Center (TEERC) to support the design and operation of high performance public buildings and research by Texas investor-owned utilities (see Appendix for overview). The goals of TEERC would be similar to US DOE's high performance building initiatives and would leverage and compliment SEEC activities in Texas. In May 2009, the Texas Senate Finance Committee directed ESL to seek funding for the TEERC from federal stimulus funds administered by the Texas State Energy Conservation Office (SECO). An application for $5 Million was submitted by SECO to US DOE to the Denver Support Office. DOE denied the application on grounds that was research-related and did not qualify under federal guidelines for the State Energy Conservation program, although the application clearly stated the "purpose was to test and evaluate commercially available HVAC equipment and controls." This decision was appealed to SECO but was denied. ESL will continue to seek internal and external funding for this worthwhile project.

In the summer of 2008 FSEC added ASHRAE AEDG K-12 recommendations for DOE climate zones 1-2 (focus on Florida hot and humid) to a design charrette summary of recommendations for high performance relocatable classrooms. US DOE Building Technologies Program and Energy Star Schools program were also referenced in the document. The charrette and summary document were highlighted in Southeast Rebuild Collaborative August Newsletter and posted online and available through publications search on www.fsec.ucf.edu.

Presentation slides were developed promoting US DOE programs and initiatives for high performance schools in the summer of 2008. Slides highlight current DOE Building Technologies Program resources at www.energysmartschools.gov, ASHRAE AEDG for K-12 schools, and the new DOE / USDA initiative for high performance schools seeking 50% reduction in energy compared to ASHRAE 90.1-1999. Slides showing other resources that can be used to help schools decrease energy use were also developed. The promotional and educational slides were used in two presentations given at Florida School Plant Managers Association (FSPMA) conference discussed further in section 4.1 and can be used in future presentations.

SEEC supported the expansion of the Southface ENERGY STAR for K-12 Schools to include information on EnergySmart Schools and the ASHRAE AEDG for K-12 Schools (see the Appendix for screenshot of front page).

Southface released a paper in January 2009 entitled *Energy Efficiency: Georgia's Highest Priority*. The paper examines the energy savings potential in the residential building sector in Georgia and compares the cost to save a kilowatt-hour through energy efficiency to the cost of new coal and nuclear generation.

Southface continues work on an online database that will allow quick tracking and reporting of the environmental impacts from homes going through various green certification programs.

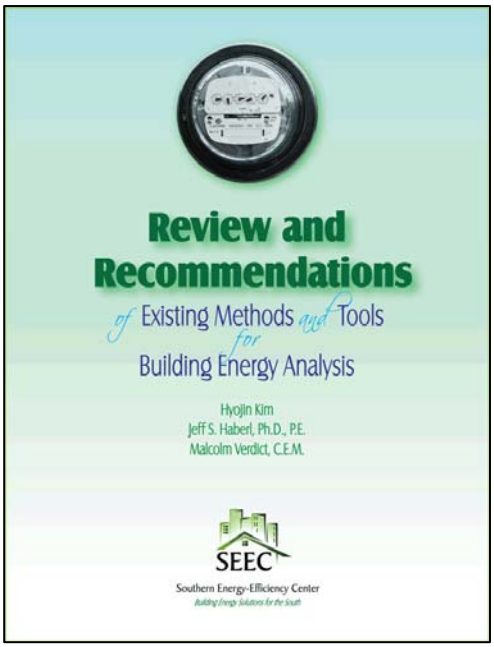
Southface is developing resources for energy efficient renovations of historic commercial buildings.

NeighborWorks rolled out the first release of the Green Roadmap for Affordable Housing Development and has a shortened version available on their website at: http://www.nw.org/network/green/documents/GREENRoadmap.pdf. They are still working towards a final version for adoption by other national green building and affordable housing organizations.

In May 2009, Sydney Roberts of Southface met with the team that co-authored Sustainable Modern Residential Design (Wiley, 2009). This 352 page book, with a chapter by Sydney on building science, offers lessons for architects, interior designers, and builders who want to conceptualize and implement sustainable design strategies in modern residential design. It outlines solutions for incorporating sustainable aspects into a home design from conceptualization to implementation. The publisher has approached the team about a second edition.

Subtask 2.4 Expand the Use of Existing Methods and Tools (Lead: ESL)

Review and Recommendations of Existing Methods and Tools for Building Energy Analysis



A report titled "Review and Recommendations of Existing Methods and Tools for Building Energy Analysis," was drafted by Energy Systems Laboratory in April 2009 and sent out for review. Comments were received from Dru Crawley at DOE and others. The final version was released in September 2009 and is on the SEEC website. The report provides a list of available building energy analysis tools and strategic recommendations, intended to encourage the use of a number of existing tools that are not currently widely used but provide valuable information and insight on the benefits of building energy efficiency in the SEEC member states.

To identify the existing methods, procedures and tools for building energy analysis in the US DOE EERE's Building Energy Software Tools Directory were reviewed along with tools included on the websites of major power companies, utilities, manufacturers, national laboratories and research organizations. General search engines such as Google and Yahoo were also used. From this exhaustive search, 58 tools were identified.

To capture the feature of each tool, a systematic comparison spreadsheet that defines the technical and practical characteristics of the tools has been developed. All 58 identified tools were mapped onto this matrix and presented in the report. The selected 13 technical and practical characteristics of the tools are as follows:

General
1) Availability, Web-based or Disk-based
2) Building Type, Residential Buildings or Commercial Buildings
3) Approach, Whole Building or Component

Input
4) Survey Information Level (Basic, Medium, or Detail)
5) Site/Weather Description (Zip-Code) (Yes or No)
6) Actual Energy Usage (Utility or Monitoring) (Yes or No)

Output
7) Weather Normalization (including Simulation Approach) (Yes or No)
8) Interval Energy Data Monitoring (Yes or No)
9) Diagnostics on Data (including Alarm Function) (Yes or No)

10) Utility Billing Error Check (Yes or No)
11) Parametric Run (Baseline Modifications and Comparisons) (Yes or No)
12) Recommendations/Suggestions (Yes or No)
13) Energy Benchmarking Information (Yes or No)

By scrutinizing the information gathered, recommendations were developed for each of nine predefined categories:

A. Utility Bill Monitoring/Analysis Tools
B. Smart Metering Tools
C. Retrofit/ECM Implementation Simulation Tools
D. Energy Profile Analysis Tools
E. Code Compliance/Rating Simulation Tools/ HERS Software
F. Field Auditing Tools
G. Data Display Tools
H. Utility Bill Disaggregation Tools based on Energy Audit Survey
I. Energy Calculation Tools.

Other Tool Development

FSEC developed an on-line solar water heating tool that provides consumer information on the energy, cost and environmental savings potential of residential solar hot water systems. This tool currently is set up for Florida use. However, by selecting North Florida, it can be applicable to the rest of the region. This is because selecting North Florida will regard freeze protection of the collectors in a way suitable for the SEEC region. It is available at MyFloridaGreenBuilding.info/resources.

ESL continued the development of IC3 (International Code Compliance Calculator) to Version v3.4. This new release includes City of Houston amendments for mandatory blower door and duct testing inputs, improved ceiling models, 2-page code compliance certificate, and external wall cladding. Information can be found at the ecalc website. http://ecalc.tamu.edu/gui/home/.

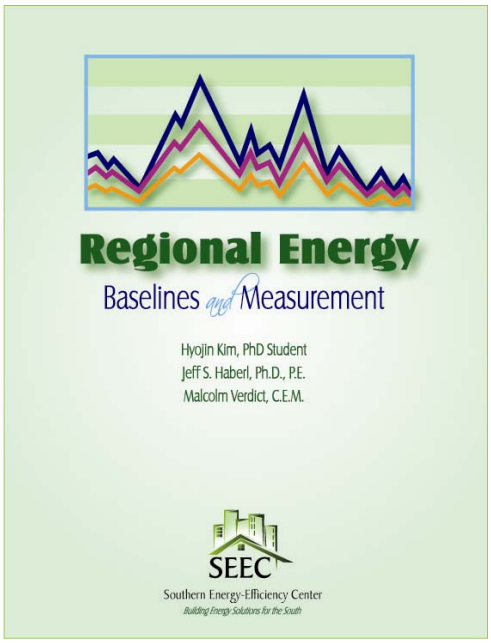
ESL completed the development of the City of Austin version of IC3 which is customized for the city's building energy code requirements which is 15% above IEEC 2006. This calculator is known as the Texas Climate Vision Calculator and is currently in use by the City of Austin.

In April 2009, Southface researched the NAHB Green Building Standard to explore the way that the standard will affect EarthCraft programs. The research compared and contrasted the programs to assess strengths and weaknesses from the consumer, builder, and program provider perspectives.

Task 3: Develop Technical and Policy Support Assistance

This task will develop technical and policy support assistance needed for implementation of high-performance, beyond-code building energy efficiency initiatives within the project region.

Subtask 3.1 Define Regional Baseline(s) and Measurement and Verification Protocols (Lead: ESL)



Regional Energy Baselines and Measurement and Verification Protocols

The report "Regional Energy Baselines and Measurement and Verification Protocols," by the Energy Systems Laboratory, was drafted in March 2009 and sent out for comments. The final version was provided in August 2009 and is available on the SEEC website. The report provides the state energy offices with a comparison tool of energy use either by total or per-capita. This tool is expected to allow the state energy offices to compare their energy use pattern against other states' and the national average energy use by end-use sector. In addition, they can use this tool for a comparison of energy use within their state by end-use and by fuel-source. Another goal of this subtask is to demonstrate the usability of public-available data such as the US Department of Energy's Energy Information Agency (DOE EIA) data sets and the US Census Bureau data sets. This approach has been successfully demonstrated by the ESL as part of the Comptroller of Public Accounts and the State Energy Conservation Office report on Texas Energy Future. To define the baseline energy patterns within the SEEC 12-state region (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia), the raw data were downloaded from the following websites: the U.S. DOE EIA and the U.S. Census Bureau. The report consists of four parts:

- Energy use per capita ranked by state for 2006 (latest year data available)—see Figure 1 with SEEC region states shown as red bar.
- Historical energy use per capita for the SEEC 12-state during 1960-2006
- Energy use and energy use per capita by end-use sector and fuel source during 1960-2006 for the U.S. and each state.
- Recommended measurement and verification (M&V) protocols - ASHRAE/CIBSE/USGBC Performance Measurement Protocols (PMP) for Commercial Buildings.

The data provide the basis by which extensive state by state analysis can begin. In addition, the recommended measurement and verification (M&V) protocols for an individual building or facility, ASHRAE/CIBSE/USGBC Performance Measurement Protocols (PMP) for Commercial

Buildings, can be used as a bottom-up approach for energy efficiency improvements of buildings within the SEEC 12-state region.

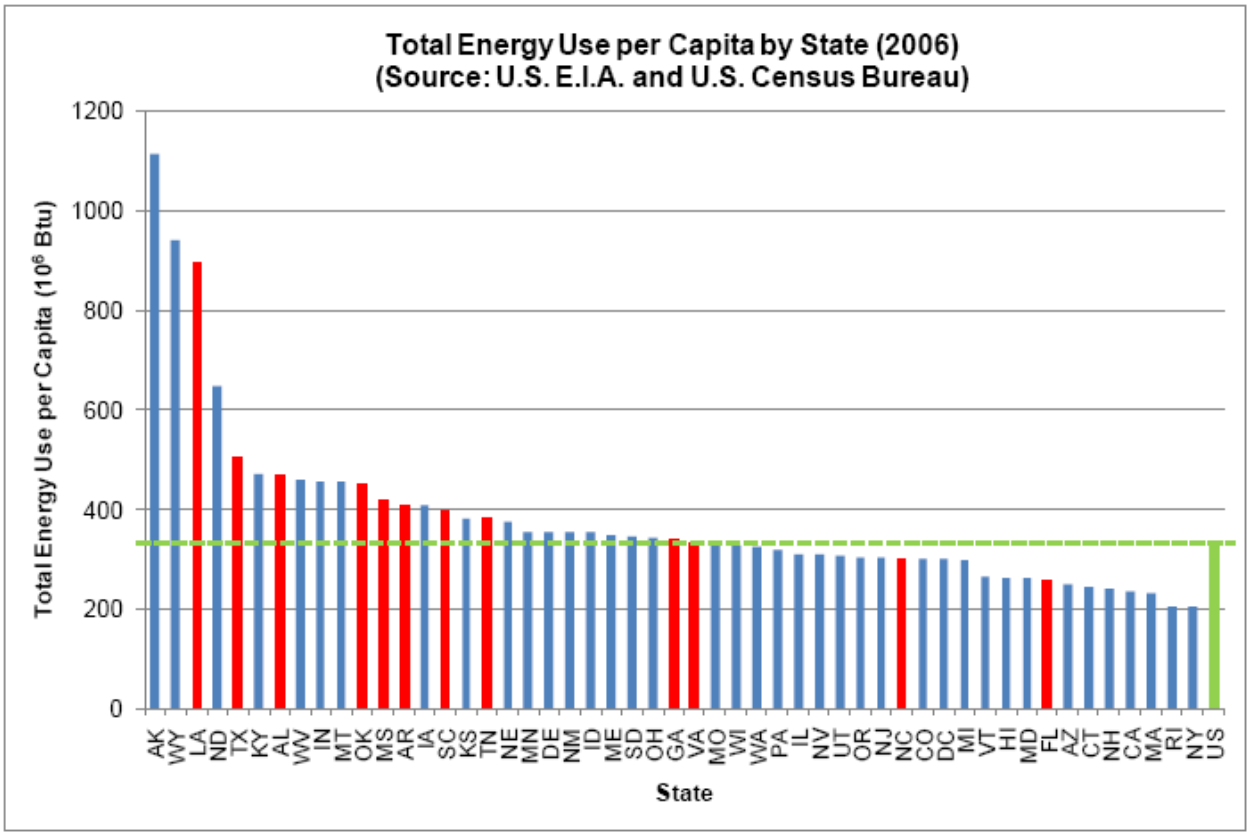


Figure 1. Total Energy Use per Capita by State

Subtask 3.2 Develop Top-10 "Beyond Code" Initiatives (Lead: Southface)

Significant effort went into reaching out to and expanding the beyond-code efforts. SEEC promoted many DOE tools and programs from EnergySmart Schools and the Advanced Energy Design Guidelines to the Builders Challenge and zero energy homes. Working with green building groups in a number of states, SEEC was able to push to maintain or strengthen energy efficiency provisions and/or promote the use of green buildings as a means to achieve energy efficiency. SEEC also worked to improve appliance standards (those standards not covered by the federal government).

Appliance and Equipment Efficiency Standards for Florida

A presentation titled "*Appliance and Equipment Efficiency Standards for Florida" was given* at a Florida Department of Community Affairs Rule Development Workshop in October 2007. Workshop attendees provided feedback. A report titled "Appliance and Equipment Efficiency Standards for Florida," was prepared in February 2008. This report examines cost effective appliance and equipment standards not covered by federal energy legislation. Per the Governor's Executive Order 07-127, this report identifies and recommends Florida energy conservation standards for products that consume electricity. A total of 17 standards are recommended, each

including an estimate of potential energy and emissions savings. Figure 2 shows the estimated 2020 savings from each of the proposed standards (all savings are in site million Btus, and standards are ordered from highest to lowest savings). Total combined 2020 savings for both electricity and gas benefits is estimated at 113,741,528 million Btus. Total combined 2020 electrical savings from the standards is estimated at 31,465 GWh, or 14.1% of Florida's 2006 net electricity generation of 223,751.6 GWh. These proposed gas and electric standards will yield reductions in state greenhouse gas emissions equivalent to 15% to 18% of those produced through electric-generation. The report is available on the SEEC website.

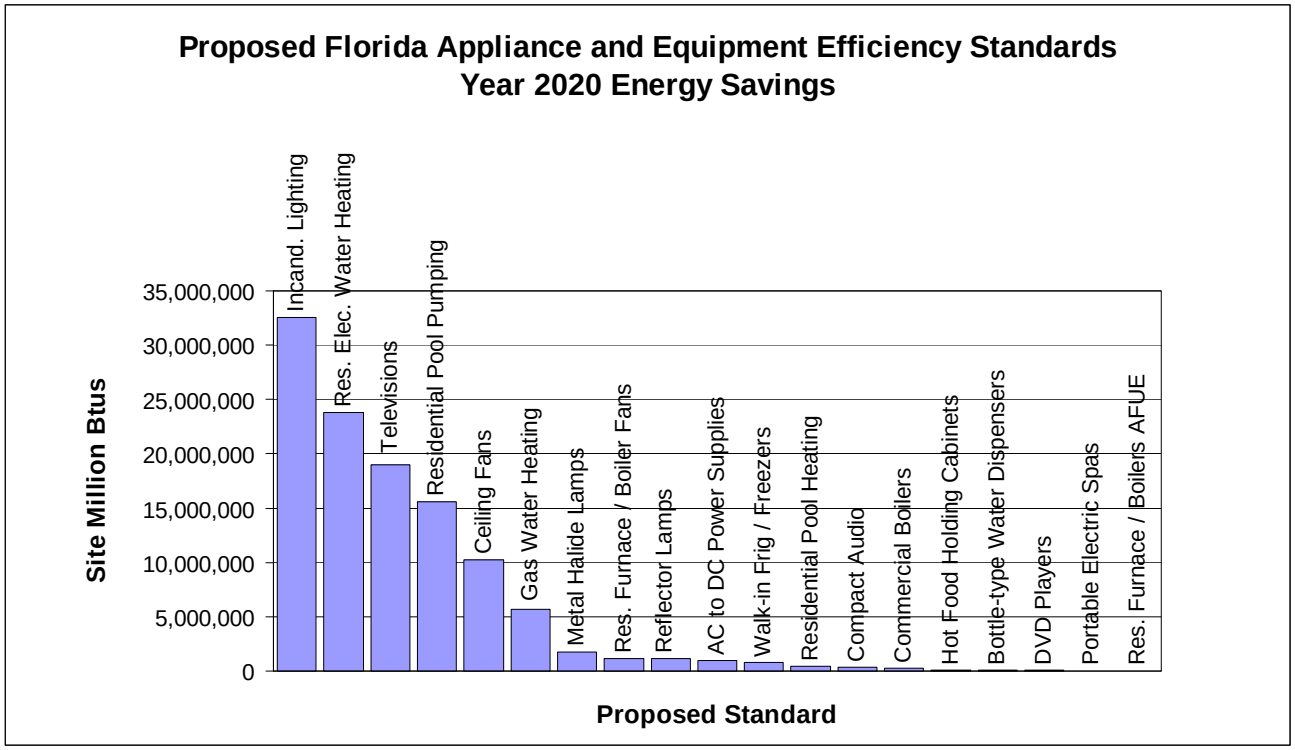


Figure 2. Proposed Florida appliance and equipment efficiency standards ordered by estimated 2020 savings.

Residential Above Code Top-10 Recommendations for Texas

The *Residential Above Code Top-10 Recommendations for Texas* report was developed with State funds in support of the Texas Emissions Reduction Program, energy efficient code initiatives. This report presents detailed information about the recommendations for achieving 15% above-code energy performance for single-family residences. The analysis was performed using a simulation model of an International Energy Conservation Code (IECC)-compliant, single family residence in Houston, Texas. To accomplish the 15% annual energy use reductions, twelve measures were considered including: tankless water heater, solar domestic water heating system, natural gas water heater without the standing pilot light, HVAC system including ducts in the conditioned space, improved duct sealing, increased air tightness, window shading and redistribution, improved window performance, and improved heating and cooling system efficiency. A copy of these recommendations is web accessible at ESL's digital library http://handle.tamu.edu/1969.1/86083.

Commercial Building Above Code "Top-10"Recommendations for Texas

The *Commercial Building Above Code "Top-10"Recommendations for Texas* report presents detailed information about the recommendations for achieving 15% above-code energy performance for commercial office buildings complying with ASHRAE Standard 90.1-19991. To accomplish the 15% annual energy consumption reductions, ten measures were considered. A copy of these recommendations is web accessible at ESL's digital library http://repository.tamu.edu/handle/1969.1/86084

Analysis of Above-code (2009 IECC) Residential Energy Efficiency Measures in ONCOR Service Area

A report titled, "Analysis of Above-code (2009 IECC) Residential Energy Efficiency Measures in ONCOR Service Area" was prepared and is provided on the SEEC website. The report provides an analysis of residential energy efficiency and renewable measures that would exceed the 2009 edition of the International Energy Conservation Code (IECC) in the ONCOR service territory. This information is useful to homebuilders, utility demand side energy managers, homeowners and others who wish to construct buildings that exceed the minimum national energy code requirements. A total of 17 measures based on the energy savings above the base-case house were selected. These measures include renewable power options, heating ventilation and air Conditioning (HVAC), fenestration, envelope, lighting and domestic hot water (DHW) options. Individual measures were then categorized into four groups: 0 to 5%, 5 to 10%, and 10 to 15% and above 15% source energy savings above the base-case house. After categorizing, three example groups were formed combining the individual measures so that the combined source energy savings of the group is 15% above the base-case 2009 code-compliant house as shown in the Table 4.

Table 4. Saving Potential of Measures for ONCOR

Groups 15% Above 2009 IECC Code	Base Case with Natural Gas			Base Case with Heat Pump		
	EEM #	Measures	Savings Above Base case (Source %)	EEM #	Measures	Savings Above Base case (Source %)
Group 1	**3**	4 kW PV Array	27.8%	**3**	4 kW PV Array	26.4%
Group 2	**6**	Mechanical Systems Within Conditioned Spaces	17.6%	**18**	Solar DHW System (80 gal tank)	19.4%
	15	50% Energy Star CFL Indoor Lamps		**15**	50% Energy Star CFL Indoor Lamps	
Group 3	**7**	Improved SEER (from 13 to 15)	15.1%	**6**	Mechanical Systems Within Conditioned Spaces	15.3%
	10	Decreased SHGC (from .3 to .2) & U Value (from .5 to .35)		**7**	Improved SEER (from 13 to 15)	
	14	25% Energy Star CFL Indoor Lamps		**10**	Decreased SHGC (from .3 to .2) & U Value (from .5 to .35)	
	13	Radiant Barrier in Attics				

The savings achieved by each group ranged from 15 to 28%. The photovoltaic options presented the most savings in the range of 12 to 42% for all base-case houses. The analysis was performed using an ESL simulation model based on the DOE-2.1e simulation of a 2009 IECC code-compliant, single-family residence. Two sets of simulations based on the choice of heating fuel type were considered: (a) an air-conditioned house with natural-gas heating/domestic water

heating (i.e., gas-fired furnace for space heating and gas water heater for domestic water heating), and (b) an air-conditioned house with electric heating/domestic water heating (i.e., heat pump for space heating and electric water heater for domestic water heating). Version 3.03.02 of the Energy Systems Laboratory's International Code Compliance Calculator (IC3) was used with the appropriate TMY2 weather files. Different counties in the ONCOR territory were grouped according to 2009 IECC Climate Zone; and finally, two zones—Climate Zone 2 and 3—were identified and analyzed.

South Carolina Energy Office Partnership

SEEC partner, The South Carolina Energy Office (SCEO), was instrumental in establishing a chapter of the U.S. Green Building Council (USGBC) in their state, and has continued in that supportive role ever since. SCEO serves as a repository for AIA and engineering Professional Development Hour tracking for USGBC sponsored activities in the state.

During the period of the grant, SCEO assisted in the organization of the Midlands Branch of the South Carolina Chapter. Trish Jerman, the SEEC point of contact, served on the board of the organization. The Midlands Branch encompasses approximately a 10 county area in the center of the state, and has a disproportionate level of membership from state and local government officials. This presents challenges—notably fewer companies available to sponsor events—as well as opportunities to influence state and local policy and law.

The Energy Office sponsored a LEED for Homes Workshop held in Greenville on October 27, 2007. The workshop attracted 58 attendees, who also participated in a reception and casual presentation by the instructor which drew additional members of the design/build community for the less formal presentation. High performance, low-footprint building in sensitive coastal areas is especially important. With that in mind, SCEO was pleased to also sponsor a LEED for Homes workshop on September 28, 2008 at Litchfield Beach, SC, along the state's "Grand Strand." The workshop attracted approximately 45 attendees, and was associated with a pre-conference reception and lecture by the instructor, which drew an additional 30 participants.

SCEO was also active in organizing and presenting a 7-week LEED Exam prep course in the spring of 2008. Many of the attendees chose to take the exam upon completion of the course, and most of those were successful. We believe that even if individuals do not take the exam, they learn so much about high-performance buildings that they can't help but improve their approach to designing, building, or regulating new construction.

In conjunction with several other state agencies, the SCEO has sponsored development of the South Carolina Green Building Directory. (See http://www.scgreenbuildingdirectory.org/.) The directory lists "green" products produced within 500 miles of South Carolina, which is particularly useful for those seeking LEED certification, and also lists services related to green building.

SCEO hosted a workshop entitled "Saving More Than Money: Energy Efficiency in the Home" jointly with Upstate Forever in Spartanburg. The workshop was aimed at realtors and builders, as well as homeowners. (See poster in the Appendix.) Approximately 70 individuals attended the workshop on August 28, 2008.

As members of the planning committee for the regional Green is Good for Business conferences, SCEO has been able to organize sessions devoted to energy efficient building at each of the last two conferences. One such session was a joint effort between the conference and the Green Building Council of the Midlands Chapter of the Homebuilders Association, which was the first time members of the Homebuilders Association and the local chapter of the U.S. Green Building Council had worked closely together. SCEO has worked with Southface to publicize and in some cases sponsor EarthCraft workshops around the state. Our sponsorship of those activities is addressed through another grant, but publicizing Southface/EarthCraft events and activities transcends all of our activities.

A major accomplishment during the 2009 South Carolina legislative session was the reform of the state building code to eliminate a 15 year old provision that allowed residential builders to opt out of the state energy code and utilize "rule of thumb" R-values established in 1992. The change was effected by a broad-based coalition of environmental groups, architects and engineers, and regulators. It is estimated that it will result in significant savings for owners of new homes and will reduce utility demand.

During the 2008 session, South Carolina also successfully created both a sales tax elimination and a $750 state income tax credit for purchasers of ENERGY STAR certified manufactured homes. SCEO has worked closely with the Manufactured Homes Institute of South Carolina, manufacturers and retailers to develop and publicize the program, which became effective July 1, 2009.

SCEO staff members have been active participants in the development of a state "green purchasing" initiative, which includes energy efficiency and green building elements. SCEO staff also served on a committee to assist the hospitality industry in developing a "green hospitality" checklist and certification program.

Interest in energy-efficient residential building from the state's utilities prompted the formation of a task force to ensure that the state had sufficient HERS raters, as well as suitable provider(s), able to respond to South Carolina needs in a timely fashion. That task force consisted of utility representatives, potential instructors and providers, and major potential "demand centers" such as the state's HUD agency and its affiliates. SCEO was also poised to create a non-profit organization to oversee support and development of a HERS network in the state when the economic downturn eliminated some of the urgency utilities were experiencing. The future direction of the group will be determined in the coming months.

Other Beyond Code Initiatives

ESL contacted the Louisiana Department of Natural Resources concerning a possible above codes training partnership, utilizing new software developed under US DOE grant funds in cooperation with City of Austin.

Southface incorporated ASHRAE Energy Design Guidelines and other standards into the EarthCraft Light Commercial Worksheet, including Energy Star, DOE's COMcheck and ASHRAE 90.1, 2004 standards.

Southface hosted two meetings of the Sustainable Atlanta Green Building Task Force. This working group has prepared and vetted a commercial green building ordinance that will be presented to the Atlanta City Council.

The executive director of Southface sponsored a seminar on the Greening of Building Codes attended by over 100 people.

ESL staff met with numerous legislative staff, high performance buildings advocates, utilities and others in February and March 2009 concerning legislation that would raise the minimum state energy code to the 2009 IECC for residential construction, and the ANSI/ASHRAE/IESNA Standard 90.1-2007, as referenced in the 2009 IECC for commercial buildings. If this passes, Texas will be the first state in the SEEC region and one of the first in the nation to adopt the new model energy code which is approximately 15% more efficient than the previous version.

ESL staff continued to meet with legislative staff and special interest groups including builders and raters in April 2009 concerning draft legislation that would raise the minimum residential and commercial codes to the latest 2009 versions that are currently being promulgated by DOE and others.

Southface continued to work on BPI Standards Technical Committee during the 2nd quarter of 2009 to develop Comprehensive Home Energy Auditor standard in conjunction with RESNET and DOE. The two Southface employees working to become NAHB trainers completed their Certified Green Professional Designation and one has completed becoming a Verifier Trainer for the new NAHBRC Green Building Program.

Subtask 3.3 Develop Model Residential Energy Efficiency Ordinances (Lead: FSEC)

Model ordinance efforts took place in three states: Florida, Georgia, and Texas.

Florida

In Florida, FSEC subcontracted with the Conflict Resolution Consortium (CRC) to preside over meetings of a state workgroup of the Florida Building Commission meeting. FSEC presented the scope of the state-funded public awareness campaign to the committee and the commission. FSEC and CRC organized green building workshops on October 31, 2007 in Gainesville and in West Palm Beach on November 28, 2007 and presentations were given to the building commission in October and December.

Based on input at the public forum and the first green building workgroup FSEC developed a draft of possible ordinance language for the November meeting. As an outcome of items discussed during the public forum and the first workshop the ordinance covered more than just energy efficiency for residences. This draft was designed to be very inclusive going from broad local government green goals to green building incentives. The workgroup, through a test of concept process, determined that the ordinance should consist of possibilities for local governments and not be a template that indicated much actual ordinance language. The

committee also recommended that the ordinance should have a voluntary nature, not be a minimum or maximum green ordinance. The agendas, minutes and other supporting documents for this activity can be found at:http://consensus.fsu.edu/FBC/GBW.html.

The committee passed the final ordinance at the November meeting. The ordinance resides at the MyFloridaGreenBuilding.info web site. Although there is no official tracking, the ordinance has been mentioned by various city and county officials at green building workshops in the state.

Georgia

By leveraging the efforts of Sustainable Atlanta, Southface is leading the effort to develop a Green Building Ordinance for the City of Atlanta that can serve as a model for the State of Georgia and possibly the rest of Climate Zone 3. Existing energy efficiency and green building ordinances have been surveyed and collected. A climate-appropriate model ordinance for commercial buildings based on draft ASHRAE Standard 189, and including green building certification programs such as LEED NC and EarthCraft Light Commercial, has been developed with stakeholder input and will be presented to the Atlanta City Commission. Energy modeling is ongoing to quantify potential energy and carbon savings from this ordinance. Southface continues as a Lead Partner for the Atlanta Sustainable Building Ordinance, which seeks to implement high performance building standards as the minimum standard for all commercial construction including mid and high rise residential. After over a year of work, the ordinance was introduced to council on July 14, 2009.

Texas

In April and May 2008, ESL continued to respond to requests for above code information from Houston and the North Texas Council of Governments. ESL staff worked closely with the Code Committee in Dallas to document requirements above code. The City of Dallas has drafted an ordinance to raise their minimum energy code requirements as follows:

The ordinance would be implemented in two phases. The first phase, starting in 2009, requires that homebuilders construct their homes to be 15 percent more efficient than the base energy code and meet four out of six high-efficiency water reduction strategies. In phase 2, beginning in 2011, it requires all homes to be built to either the LEED standard or the Green Built North Texas (GBNT) standard and include points toward a 20 percent water use reduction and a minimum 17.5 percent more efficient than the base energy code or equal the performance of ENERGY STAR for homes with a HERS rating of 83 or less. The base energy code is the Texas Building Energy Performance Standards based on the ICC's International Energy Conservation Code (IECC) (as it existed May 1, 2001).

For commercial projects, Phase 1 of the new Dallas ordinance requires buildings *less than* 50,000 square feet to be 15 percent more efficient than the base energy code, use 20 percent less water than required by the current Dallas Plumbing Code, all roof surfaces with a slope of 2:12 inches or less meet the EPA's ENERGY STAR low-slope roof requirements, and meet outdoor lighting restrictions, except for safety and security reasons as applicable.

For commercial projects *over* 50,000 square feet, phase 1 requires buildings to meet 85 percent of the points required under the appropriate LEED rating system for a certified level, including

one point for 20 percent water use reduction, and a minimum two points for being 14 percent more efficient than the base energy code.

Phase 2, beginning in 2011, requires all commercial projects to be LEED certifiable under the appropriate LEED rating system, including one point for 20 percent water use reduction, and a minimum three points for being 17.5 percent more efficient than the base energy code.

Subtask 3.4 Accelerate Deployment of Building America Homes (Lead: FSEC)

FSEC's Building America team has begun monitoring three near-zero energy homes with its builder partners. These homes will provide important dissemination information for SEEC. More information on these homes can be found at the FSEC led Building America team site, at http://www.baihp.org/data/index.htm.

One home was designed to go to zero energy. This home was used as the example in the 12-course series of webinars (See Subtask 4.1). The home, whose construction has been delayed due to economic conditions, will likely be built in 2010. The energy analysis of the home design was made into a Building America case study by SEEC staff. It shows how important energy efficiency measures are in achieving zero energy (See Figure 3). The case study is on the SEEC web site and included in the Appendix. Recently, a small production builder, Tommy Williams, is in the construction stage of a zero energy home (0 on the EScale) and documents will be prepared by the BAIHP team, and this unit will be featured in future training courses.

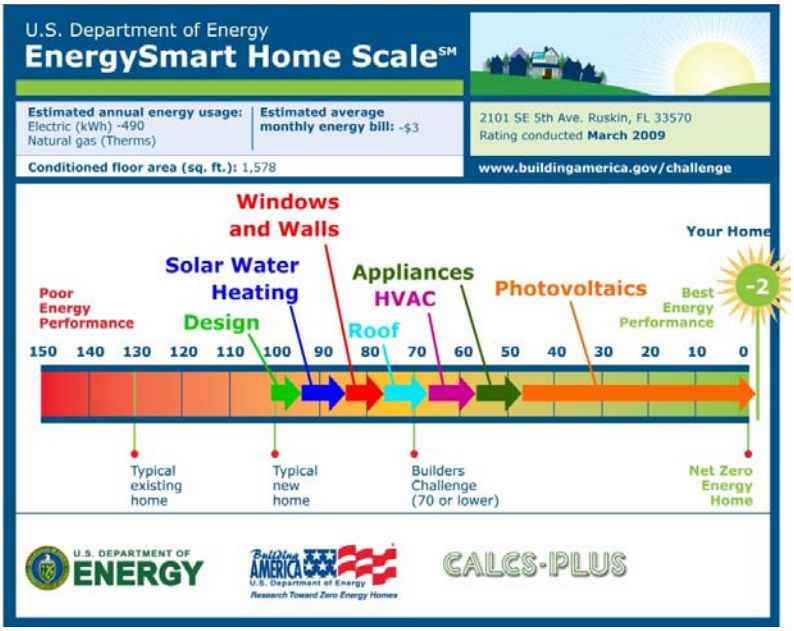


Figure 3. U.S. Department of Energy EScale

SEEC staff at FSEC directed building inquiries to the Building America team which has recruited many contractors to meet the Builders Challenge.

Southface staff, including EarthCraft House technical advisors were educated on the Building America Builders Challenge and encouraged to recruit builders to join the program. They were also briefed on Building America research efforts and instructed to act as recruiting arms for that program. Southface staff members are serving on the Builders Challenge Technical Committee and on the Builders Challenge Marketing Committee.

The EarthCraft House has joined as one of only two program partners of the Building America Builders Challenge. The EarthCraft House Gold level of certification (mid-level) has been aligned with the Builders Challenge Quality Criteria. A new EarthCraft House worksheet for Climate Zone 3 has been released on the EarthCraft House website with this update.

Southface staff worked with the Builders Challenge team to finalize the Quality Criteria by providing feedback from a real-world green building program that was incorporated into the final document.

In the third quarter of 2008 Southface worked with the DOE Builders Challenge team to publish an article in the Atlanta Building News announcing the EarthCraft House Program Partnership to members of the Greater Atlanta Homebuilders Association and Metro Atlanta building professionals. The article focused on the market differentiation advantages to the builder as well as the ease of achieving certification through an established green building program.

In December 2008, Southface promoted Building America Builders Challenge to EarthCraft House Technical Advisors (TAs), independent contractors working directly with EarthCraft House builders throughout the Southeast to certify homes in this Builders Challenge Program Partner green building program. To date, at least five (5) TA's have registered as verifiers with the DOE. Southface also hosted a technical conference call for all LEED for Homes Provider Representatives to discuss the Building America Builders Challenge and encourage them to register as providers and educate participating builders on quality criteria and other requirements.

Southface is working with Haven Custom Homes, a modular home builder, to incorporate additional high performance features, possibly including a Builders Challenge package, into their production. Southface is also working with Haven Custom Homes to offer ENERGY STAR and EarthCraft House.

Southface met with KB Homes in January 2009 to discuss the Builders Challenge.

Southface met with Oglethorpe Power in January 2009 to discuss Builders Challenge and high performance buildings and potential for DSM program linkages.

Southface held half day strategic planning meeting in January 2009 with Greater Atlanta HBA on collaboration with SEEC and Builders Challenge.

Southface presented Builders Challenge, Energy Star and other high performance residential building programs at a January 2009 DSM Working Group meeting for Georgia Power.

FSEC assisted the Building America Industrialized Housing Project team in February 2009 with information on the suitability and potential problem of open-cell and closed-cell foam insulation application in attics for the southeastern U.S. climate.

As a Builders Challenge Program Partner, EarthCraft House submitted 22 homes for Building America Builders Challenge certification in February 2009 (all were accepted). Southface is working with Architectural Energy, makers of REM/Rate energy modeling software, to streamline the submission process.

Southface hosted an annual EarthCraft House Builder Breakfast in February 2009 at Whirlpool Inspiron Studios in Atlanta. Over 90 builders and developers from across the Southeast met to network, meet with industry sponsors, and attend the awards presentation.

Southface collaborated with DOE on establishing a Residential Green Building Programs Working Group for program directors working with the Builders Challenge.

Southface analyzed confirmed HERS ratings of EarthCraft Houses in February 2009 (single family) that were rated in-house to find out how many of them met the 2005 EPACT Tax Credit compliance requirements for reduction in energy use. These data will be used to help educate builders and homeowners on the impact that EarthCraft Houses have on both saving energy long term, and also on how the program has been successful in helping builders qualify for the Tax Credit up front.

Southface's EarthCraft Multifamily has started exploring the viability of certifying multifamily projects under the Department of Energy's Building America Builders Challenge. The team completed energy model analysis on existing projects to evaluate which enhancements to design would be necessary in order to meet the minimum HERS Index of 70. Future research is needed in order to service the first eligible project.

In April 2009, EarthCraft Multifamily registered the nation's first multifamily project under the Department of Energy's Building America Builder's Challenge. CHRIS Kids, a nonprofit dedicated to healing children, strengthening families, and building communities, is building a resource center to help foster children who age out of the system. The Safety Net project will gut rehab four present buildings and construct one new building to create 39 living spaces in Atlanta.

Southface continued development of the Southface Residential Database which will aid in sorting and reporting of data for Builders Challenge, ENERGY STAR, and other high performance building programs

Task 4: Outreach, Education, Training and Certification

SEEC will reach target groups through a variety of activities including websites, online learning modules, workshops and presentations, print and electronic media and direct outreach at each of the three energy education centers operated by the SEEC principals.

Subtask 4.1 Expand Training and Certification of Building Industry Professionals (Lead: Southface)

The SEEC principal organizations developed new training and continued to provide existing buildings energy efficiency training throughout the SEEC project period.

Designing and Maintaining the High Performance Green Building

During the 1st quarter of 2008 quarter the SEEC principals began discussing possible collaborations in developing, marketing and offering training in the SEEC region. Although there are a number of residential programs offered, there are few courses for designers, engineers and facility managers about the interaction of commercial building envelopes and HVAC system and other building science topics. Specifically, discussions were held on developing a course entitled *Designing and Maintaining the High Performance Green Building* which would build on existing FSEC and Southface training courses and take advantage of the current wave in green building registrations. FSEC held several internal planning meetings in May 2008 to modify courses for the *Designing the High Performance Green Building* series. FSEC then reviewed and added speaker notes to all Power Point presentations for Courses 1 and 2 of series to meet USGBC requirements in order to help with publicity. Work was also completed on refining course objectives, student activities and exams, and reviewing USGBC submission materials including FSEC capabilities, course content, and instructor bios. In June 2008 FSEC modified and added notes to a number of presentation slides for Course 3 to meet USGBC requirements, provide general material improvements and make the presentation suitable to audiences in a wider range of climate zones (representative of SEEC).

FSEC completed development of the *Designing and Maintaining High Performance Green Building* five course series. Activities here included completing Courses 3, 4 and 5 materials, developing a Course 3 class exercise (based on FSEC's UCF Student Union building recommissioning work) and adding quiz questions to Courses 1-3 to evaluate student comprehension. FSEC also began submitting course materials to USGBC to obtain approval as USGBC accredited course, and began assembling material for application submission to State of Florida Contractors Insurance Licensing Board (CILB) for continuing education credit of licensed contractors.

A draft *request for sponsors* brochure (latest version included in the Appendix) was also developed for the 5 course *Designing and Maintaining High Performance Green Building* series. The purpose of the brochure is to publicize the series to organizations that may be willing to sponsor a location and lunches, as well as help with marketing. Location and dates were set for the first offering of the five course series to be held in February 2009 in Cocoa, Florida. Unfortunately attendance, perhaps due in part to the economy, was low in February 2009 and only the energy modeling course (course 5) was held. Jacksonville Electric Authority has

indicated their desire to bring the series to Jacksonville and have scheduled dates for the first three courses in February and March 2010. Other states have shown interest, but no firm sponsors have emerged.

Beyond Code Improvement Course

Another possible course, *"Obtaining 15%, 30% and 50% Energy Improvement Beyond Code,"* was also discussed. North Carolina funded training at Appalachian State University to create a 30% course for their government buildings. In April 2008 FSEC contacted Jeff Tiller of Appalachian State University (ASU) who has a contract to prepare a course on making State Buildings 30% more efficient than ASHRAE Standard 90.1. Mr. Tiller suggested several ideas about how FSEC could collaborate with ASU within the SEEC framework on course development for buildings that would use 15%, 30%, and 50% less energy than 90.1. Mr. Tiller asked for information about our training, air handler leakage study, *EnergyGauge* energy rating software, and research on impacts of radiant barrier retrofits in residential applications, which was sent to him. By fall, Jeff had developed some material on the topic which he presented at a conference during the fourth week of October, and from which he intends to develop the materials for a full one-day course. Due to time frame it was determined that after the ASU training is completed SEEC will look into taking the curriculum to other states – this would be beyond the first year scope of SEEC.

FSEC SEEC staff attended a three hour webcast on-line course titled *Exceeding the Requirements of Standard 90.1-2007* on May 7th, 2008. FSEC held an additional planning meeting in May 2008 to begin to develop a course for the SEEC project to make buildings 30% more energy efficient than 90.1 which included a review of the *Exceeding the Requirements of Standard 90.1-2007* presentation materials. FSEC SEEC staff attended two 90-minute ASHRAE Advanced Energy Design Guidelines webinars, one focused on lighting on July 31, 2008 and the other on HVAC systems on August 14, 2008

In the 3rd quarter of 2008 FSEC completed about 20% of the development of a 1-day course (course outline and PowerPoint presentation) on *Creating Buildings Which Are 15%, 30%, and 50% More Energy Efficient*. As part of the course development work, FSEC performed a detailed review of Appendix G of Standard 90.1 (2004) in order to better define the rules under which a "30% better than" building can be designed and be able to determine what types of energy reduction improvements can be claimed against 90.1. A summary write-up was made of the rules which will become, in part, the basis for a portion of the 1-day course. A draft agenda for the course was also completed (see the Appendix). Future work was left for the next phase of SEEC.

Designing the High-Performance Green Relocatable Classroom

FSEC developed the objectives and agenda for, and moderated a one and a half-day 2008 design charrette in Palm Beach Gardens called "Designing the High-Performance Green Relocatable Classroom". The main charrette objective was to acquire ideas to be included into a state standard for what a "green" relocatable should be in hot and humid climates. Attendees included architects, engineers, and facility managers familiar with school building construction in south and central Florida districts, as well as representatives from Broward, Palm Beach, and Hillsborough county school districts.

The June 2008 charrette included an FSEC presentation on a monitored study of improved relocatable classrooms that indicated that overall reductions in energy use of 80% can be obtained compared to control buildings. Other charrette presentations included a talk on the Collaborative for High Performance Schools (CHPS) program and its six-volume Best Practices Manual, and a talk on the latest technology developments. Ideas and comments developed at the charrette were drafted and were provided to attendees for comments and corrections. A document titled, "Overview and Summary of Design Ideas From The High Performance Green Relocatable Classroom Charrette" was written and sent to attendees and made available through online resources at FSEC and through the Southeast Rebuild Collaborative website.

LEED Related Training

Southface created a three-quarter-day training focused on educating architects, engineers, facility managers and others about the goal, benefits, and process of achieving LEED Existing Building (EB) certification. This US Green Building Council certification geared toward operations and maintenance of existing commercial buildings uses ENERGY STAR Portfolio Manager as the backbone of the energy efficiency section. Southface presented this training to Grainger Corporation in Chicago. As a result of the ongoing relationship between Southface and Grainger, Grainger is engaged with Southface in pursuing LEED NC certification on three branch buildings in Louisiana. In October 2008 Southface taught LEED Existing Building training to approximately 40 building professionals.

In October 2008 Southface taught four (4) LEED NC Accredited Professional Preparation courses across the Southeast in October reaching over 150 architects, designers, and other building professionals. Southface also taught one (1) LEED for Engineers course and one course on its high-performance small commercial office building, Eco Office.

In January 2009, Southface trained 248 building professionals in various energy efficiency and green building courses taught across the Southeast. Courses included four LEED 2.2 Test Prep courses, one USGBC LEED NC Technical Review, one LEED for Homes Program Review, a Home Energy Rating (HERS) course and an EarthCraft House Builder training. Southface also hosted a LEED Faculty Training.

In addition to the January 2009 training, Southface taught three LEED trainings in March: two LEED 2.2 course and one LEED for Homes course. The LEED 2.2 courses had 98 attendees. Southface also taught 3 LEED for New Construction test preparation courses for over 160 participants across two Atlanta locations and the Savannah College of Art and Design in Savannah.

Southface held a USGBC LEED NC Tech Review in March 2009 for 46 professionals.

In April 2009, Southface taught seven test preparation courses on LEED for New Construction or Existing Building for over 180 participants at four North Carolina and four Georgia locations. In order to present the LEED for Existing Buildings, Southface staff members developed a slide show covering energy and water reduction, sustainable procurement, green cleaning, ENERGY STAR, and advanced energy design guides.

Southface conducted a LEED for Homes Program Review as a preconference workshop for Greenprints. The 17 participants were very engaged with the program and enjoyed getting to see many of the program criteria implemented at Southface. Southface taught the new 300 level USGBC course: *Green Design and Development: The LEED for Homes Process* for the Middle TN USGBC Chapter in Nashville, TN during the 2nd quarter of 2009. The training was a big hit with an added product expo for the participants.

FSEC also held a *LEED for Homes for Field Agents* course in April, 2009 for 35 participants.

Energy-Efficient Florida Home Building and Energy-Efficient Green Home Building

FSEC conducted a one-day Energy-Efficient Florida Home Building workshop on April 30, 2008 in Cocoa, FL. The workshop covers a wide range of efficiency topics from design to construction to equipment and amenities. It also includes discussion of beyond-code recognition programs including the Builder's Challenge. This course was renamed to Energy-Efficient Green Home Building and attendance increased to 27 for the August 2008 course and 13 attended in April 2009. A course agenda is included in the Appendix.

Achieving Zero Energy Green Homes

FSEC largely completed development of the new 12-course webinar series, *Achieving Zero Energy Green Homes* during the SEEC project period. The series features the Builders Challenge E-Scale as a way to see the effect of the various efficiency improvement strategies described. There is also a case study home shown in video segments throughout. A Building America case study example was written and is described in section 3.4. A reference page for each course was created and provides links to DOE and other resources. A short on-line quiz was written for each course. Overall students fared well on the quizzes. An overall perception survey of the training will be made after the twelfth course. There have been many favorable comments after most courses.

Figure 4. Online Advertisement.

E ach course in this series is being submitted for 1.0 to 1.5 hours of education credits to RESNET, the Florida Contractor License Board, the USGBC, the AIA and the Florida Engineering Society.

The webinars were offered on the first and third Wednesdays of each month. The first offering was on June 3rd, 2009, and through October 7, 2009, nine of the twelve webinars had been presented to a total of 112 participants:

- Course 1: *Defining a Zero Energy Green Home* was held June 3rd. Provides an overview of a number of principles (good design, efficiency, conservation and then solar) and a number of near-zero and zero energy example homes. Students see how ENERGY STAR® Builders Challenge, and green home program energy performance compares with zero energy homes using the DOE EScale. Reference Materials (19 participants)
- Course 2: *Designing a Zero Energy Green Home* was held June 17th. This course considers many design stage parameters, from solar orientation and shading to location of

HVAC and renewable equipment, and material selection. Heavy focus on passive heating and cooling design principles. Follow our case study through the design stage. Reference Materials. (11 participants)

- Course 3: *Selecting ENERGY STAR Water Heating Systems* was held on July 1st. A direct response to DOE's desire to have more dissemination about this new product offering. Students learn the great savings potential from solar water heating systems, electric dedicated heat pump water heating and gas tankless systems. Learn how each of these systems works, including savings potential of combining solar with a heat pump or gas tankless. Instructors show how to rate different systems and describe any maintenance considerations. Reference Materials (10 participants)

- Course 4: *Selecting Solar Water Heating for Zero Energy Green Homes* was held on July 15th. Participants learn how to achieve renewable energy savings by providing solar water heating. Explore various types of solar water heating systems, typical savings and costs, and key features to specify based on climate and operation considerations. (X attendees) Reference Materials

- Course 5: Selecting Windows and Walls for a Zero Energy Green Home was held on August 5, 2009. Students learn what matters when selecting windows and walls for your climate and your application. Our experts will tell you the energy savings you may expect and the important characteristics to look for when choosing windows and walls. Reference Materials

- Course 6: Constructing Roofs and Attics for a Zero Energy Green Home was held on August 19, 2009. Roof materials, attic insulation, duct location and radiant barrier systems are all covered in this Webinar. Make the right roofing system choice to reduce energy use in your home. Reference Materials

- Course 7: HVAC Systems for Zero Enrgy Homes was held on September 2, 2009. The heating, cooling and ventilation systems are large energy users, so achieving a zero energy home means learning how to select super high-efficiency equipment and ductwork. Learn the impact of correct sizing, duct layout and duct tightness. This course covers air circulation systems in conjunction with heat pumps, geothermal heat pumps, and gas furnaces. Radiant heating and evaporation cooling systems will also be discussed. Reference Materials

- Course 8: Selecting Appliances and Plug Loads for a Zero Energy Green Home was held on September 16, 2009. Students learn how to reduce energy by selecting ENERGY STAR® appliances and electronics, efficient pumps (such as for pools and wells), ceiling fans, and minimizing lighting requirements. Reference Materials

- Course 9: Sizing and Selecting Solar Electric Systems for a Zero Energy Green Home was held October 7. Students learn how to size a solar photovoltaic system and why it is important to follow the efficiency steps provided in earlier Webinars. Learn the pros and cons of selecting different system types such as efficiency, durability and price. Reference Materials

Course 10: Using Your Home Solar Electric System for Emergency Power was scheduled October 21, 2009. This Webinar explores how you can install your grid-connected solar system within code regulations to supply emergency power when the grid is down. Recommendations for managing and storing the power for the emergency system will also be provided

- Course 11: Installation Consideration for Solar Electric Systems is scheduled for Nov. 4, 2009. This course will examine locations for the solar system based on shading considerations, roof mounting, electrical runs, inverters, meters and monitoring. Learn how to install a system right the first time!

- Course 12: Monitoring and Operating the Zero Energy Green Home is scheduled for Nov. 18, 2009. This course is designed as a guideline for an occupant in a zero energy green home. It will cover more than 30 considerations to maximize savings, comfort and occupant satisfaction.

For the first nine courses, there was an average paid attendance of 12 participants. Additionally some FSEC staff watched from a common room. One of the paid attendees was the National Institute of Standards and Testing (NIST) which also opened it up to a group from a common room.

The *Achieving Zero Energy Green Homes* webinar series has considerable production expense, but after these initial costs, should be able to be repeated relatively inexpensively. FSEC staff is looking into additional advertising channels. Unfortunately with limited funding, production costs are being born by non-SEEC funds, requiring attendees to pay $69 for each course. Since there are a number of webinars fully funded by DOE or others, the cost may be a deterrent to some potential interested customers.

Advertising consisted of promotion on the SEEC website, a video about zero energy homes on the front page of the FSEC web site that included information on the classes, a brochure given out at conferences (see the Appendix) and an online advertisement that ran for two months on the Home Energy website (see Figure 4). Some staff also added a promotional link to the end of their emails (Figure 5). The webinar series is scheduled to run again in 2010 with some options to view the webinar material (the presentation with audio) at times other than the webinar schedule.

Figure 5. Email signature promotion.

EarthCraft Training

EarthCraft House Builder Training and EarthCraft House Realtor Training were updated to include Building America Builders Challenge inclusion in EarthCraft House at the Gold Level in 2008. SEEC resources were used to recruit builders to join the Builders Challenge both during Builder Training and during design reviews for Single Family and Multi-Family programs.

Southface has continued modifying the EarthCraft House Technical Advisor training in 2008. Several new Technical Advisors have been brought on, and it is anticipated that another 7 will certify in 2009. The Technical Advisors help promote DOE programs directly to builders and developers throughout the seven Southeastern states with active EarthCraft House programs. They also work in their local arenas to push policy advocating for green building.

Green Rater Training

Southface continued working in the 3rd quarter of 2008 with RESNET, Davis Energy Group, Guaranteed Watt Savers and Jay Hall, Inc. to develop the RESNET Green Rater training course. A proposal was submitted to teach the 2-day Green Rater course on February 14-15 as a preconference workshop for the 2009 RESNET Building Performance Conference. Southface also submitted a session proposal for the conference to cover new opportunities for HERS Raters which will include the Building America Builders Challenge certification program.

In January 2009 Southface completed the Green Rater training lesson plans, PowerPoint, student activity book and resources and glossary document for RESNET. The training will be revised based on feedback from its pilot presentation at the RESNET Conference Feb 14-15 in New Orleans. RESNET had over 160 signed up for the training (although it's felt that the maximum number of participants moving forward should be 40).

NeighborWorks America Training

Southface has been working with NeighborWorks America, a national nonprofit organization created by Congress to provide financial support, technical assistance, and training for community-based revitalization efforts, to green their curriculum. In July 2008, Southface attended the Construction and Production retreat for the NeighborWorks Training Institute (NTI) to coordinate efforts in greening the NTI curriculum. In August, Southface taught the Residential Green Building training for the Chicago NTI providing participants clear access to learning more about DOE programs and services.

Southface also helped NTI design a Green in Action course for their February 2009 NTI in Atlanta. Green in Action toured participants from around the country at various green projects in the Atlanta area. The curriculum included information on DOE programs and guidelines. Unfortunately attendance was low depicting the impact of the current economy on trainings (10 attendees). The participants that were able to come did have a great time learning about sustainable building techniques for affordable housing. Topics covered included materials, process, technical specifications, home buyer education and diagnostic testing.
Southface continues to consult NeighborWorks America on the greening of their organization and participates in monthly Green Consultant Team Meetings.

Southface continues working with NeighborWorks America on the Integrated Design Roadmap for Affordable Housing. An initial draft of the roadmap was presented to the following organizations: National Center for Healthy Housing, Enterprise Community Partners, and LISC. Their initial feedback was very positive and we will next work on the delivery process for the roadmap to affordable housing stakeholders.

Southface updated the Residential Green Building curriculum for NeighborWorks America in March 2009 using the Enterprise Green Communities Criteria in place of the NAHB Green

Building Guidelines. The course will still cover the NAHB Green Building Program and LEED for Homes.

The workshops, clinics and symposium held in May 2009 on Greening Your Roadmap to Succeed in a Changing Landscape were very successful. Neighborworks held the Charting Your Green Certification Roadmap with presenters from NAHB, USGBC LEED for Homes, Enterprise Green Communities and Environments for Living with over 35 participants. The home counselor training on Helping Homeowners Maintain a Green and Healthy Home had over 25 participants and was well received. NeighborWorks is considering making the clinic a standing course at their institutes. The symposium had over 180 participants representing affordable housing markets across the US.

Partners in Sustainability

Southface worked with Jay Hall, Inc. in the 3rd quarter of 2008 to develop a two day advanced green building training for Habitat for Humanity International's Partners in Sustainability. Partners in Sustainability is a pilot effort to incentivize HFH affiliates to build energy efficient and green homes funded by The Home Depot Foundation. Southface hosted the National Partners in Sustainable Building training in October 2008 for approximately 25 Habitat for Humanity International Affiliates. The two-track training featuring Southface and national speakers included both an introduction to energy efficient building track and an advanced track for affiliates already participating in energy efficient or green building programs. Sydney Roberts gave a presentation on the Building America Builders Challenge. Southface is working with The Home Depot Foundation on this and other efforts to establish green building goals and requirements for Habitat Affiliates. Amy Beley, a member of the Builder Challenge implementation team, made a site visit for training to meet with Habitat International and Southface staff. The pilot ran through April of 2009. Southface has worked to connect the HFHI representatives with representatives for the DOE Building America Builders Challenge program in hopes that the Builders Challenge certification can qualify for the incentives.

Other Educational Activities

A workshop summary for 2008 is provided in Table 5.

Table 5. Summary of 2008 SEEC Partner Workshops and Training

Event	No. of Times Held
Building Energy-Efficient Green Homes workshop	2
Energy Efficiency and Green Building training for 25 Habitat for Humanity International affiliates	1
RESNET Green Rater training session, taught at 2008 national RESNET conference (planned again for 2009 RESNET conference)	1

Presentation on Builders Challenge at NC ENERGY STAR Conference	1
Updated EarthCraft House Builder training incorporating Building America Builders Challenge	5
Updated EarthCraft House Realtor training incorporating Building America Builders Challenge	1
LEED EB training	1
LEED for Homes training	3
LEED NC 2.2 Test Prep	19
Florida Green Home Designation Certification Course	8

The State of Geogia is in the process of initiating builder licensing requirements for the first time. Southface is working with the Greater Atlanta Homebuilders Association to ensure that the technical content of their residential curriculum meets the requirements for continuing education units for these new requirements.

Sydney Roberts gave a presentation on Building America Builders Challenge at the North Carolina ENERGY STAR Conference in Raleigh, NC on October 27-28, 2008. Verifier registration in North Carolina doubled following recruitment effort from 2 to 4.

FSEC participated in an October 2008 conference call with NREL, WSU/DOE NW application Center, provided ideas and advice on NREL's task to develop training for AEDG k-12.

Southface led a green building, renovation, and facilities management charrette at Woodford College in October 2008 addressing dormitories, academic buildings and food service buildings.

In October 2008 Southface led a charrette with a large, national organization dedicated to girls on incorporating sustainability into their business practices and their ethos. The goal was to equip the organization with the tools to develop strategies that their members can use to effect change in their homes, schools, and places of worship. Southface is working to develop a pilot program that will role out across the U.S. in stages over the next three years.

Southface staff worked an informational both at the October 2008 grand opening event of the Children's Museum of Atlanta Bob the Builder exhibit featuring sustainable building and living practices.

In October 2008 Southface presented on energy efficiency in existing homes at Concerned Black Clergy meeting for an audience of approximately 100 civic and community leaders. Southface also consulted with for-profit Black Energy on program to bring energy efficiency retrofit services to historically underserved neighborhoods.

In November 2008 Southface developed presentation on energy efficiency programs for K-12 schools including Energy Smart Schools, and gave a presentation to a group of educators with emphasis on greening existing buildings.

ESL is working with Cedar Valley Community College in South Dallas to develop curriculum and training modules for building operators and enhanced operations and maintenance training, based on Continuous Commissioning® re-commissioning process. A regional training workshop was conducted by ESL staff on CC® at Cedar Valley. Future plans call for development of distance-based teaching modules for web-based delivery with technical assistance provided by ESL.

Sydney G. Roberts of Southface was a contributor to the Building Performance Institute Standards Technical Committee.

Sydney Roberts and Mike Barcik of Southface met with the Institute of Classical Architecture in January 2009 to plan training for Institute members focusing on residential design decisions and specifications for new construction and remodeling.

ESL met with representatives of the Texas Workforce Commissioning in February 2009 concerning the training needs of the commercial buildings sector and a tentative proposal to train engineers and technicians to operate and re-commission commercial buildings.

Southface developed a 20 minute video on combustion safety testing for gas water heaters in February 2009 to be incorporated into Southface trainings. The video was showed at the RESNET Green Rater training with great response. The video followed the combustion appliance zone testing protocol in the Building Performance Institute Building Analyst national home performance contracting standard.

Southface presented on *Energy Code Stories – from the Trenches*, including the lessons learned, at RESNET's February 2009 conference in New Orleans. The training was very well received by 170 attendees and Southface is now working on updating the training based on participant feedback. Southface hopes to provide additional trainings and updates before releasing the curriculum to RESNET Accredited Green Rater Training Providers.

In February 2009 Southface presented and participated on a panel for the February More Green for Green event at the EPA LifeCycle Conference reaching 40 people.

Southface taught High Performance Renovation, based on EarthCraft House Renovation, to 40 renovation contractors, code officials and building inspectors in Greenville, SC.

Southface gave a presentation in February 2009 on reducing residential energy usage at Atlanta City Council Member Natalyn Archibong's 8th annual FUSS (Focus Upon Senior Services).

NINE WAYS TO SAVE ENERGY was handed out on the back of a printout entitled *Equation*. There were approximately 100 senior citizens in attendance.

Southface taught EarthCraft House Renovation to 25 participants in February 2009.

FSEC held its *Florida Green Home Designation Certification* course in April and June 2009, with attendances of 75 and 29 respectively.

Southface spent time developing a proposal for a 3 hour training session for the Georgia Department of Community Affairs Main Street Program (as reported in February activities), but the DCA did not pick up the training due to its cost. This session would have included an overview of commercial building renovation strategies related to green building and certification, materials based on Department of Energy standards, NPS Preservation Briefs, and Energy Code related to historic buildings.

Two Southface employees are working to become NAHB Trainers. They attended the Green Building for Building Professionals training in March 2009 as a step towards becoming trainers. They were disappointed in the low level of knowledge expected to become a Certified Green Professional and hope to work with the NAHB to improve the rigor associated with this highly recognized designation.

Southface worked with the Portfolio Program in March 2009 in an effort to make Southface a USGBC education provider for training and course development.

Southface is developing a curriculum focusing on energy modeling using eQuest. The intended audience is architects so that they will have access to a simple energy modeling tool to use early in the design process.

Southface continues to update the EarthCraft House Builder Training curriculum by syncing the EarthCraft House Worksheet and the Power Point Teaching Presentation to reflect the increased level of commitment.

Southface taught 22 professionals in March 2009 at the now monthly Home Energy Rating System (HERS) training. In addition, 18 builders attended the EarthCraft builder training in Greenville, SC.

Southface hosted two Grants to Green meetings in March 2009 with 95 attendees. The program is designed to help non-profit organizations in the 23-county Atlanta region to assess their facilities, identify energy-, water- and resource-efficiency upgrades and adopt best management practices in sustainability.

Southface held a Green Roofs for Healthy Cities training in March 2009 for 15 attendees to increase the awareness of the economic, social, and environmental benefits of green roof infrastructure and rapidly advance the development of the market for green roof products and services.

Southface participated in a March 2009 Energy Town Hall Meeting Hosted by the Concerned Black Clergy in Atlanta. This monthly meeting attended by approximately 150 leaders of historically black congregations and universities provided an opportunity to discuss opportunities to increase energy efficiency in both public buildings, as well as the necessity to provide homeowners with resources to improve the energy efficiency of their homes. Attendees were referred to the Southface Grants to Green program, Home Performance with ENERGY STAR, and the Southface website for additional information on do-it-yourself projects and green jobs training.

Southface led 144 online trainings from March to June 2009, the breakdown as follows:

- 108 HVAC Management for High Performance Existing Commercial Buildings
- 14 Building Commissioning: Ensuring High Performance Green Buildings
- 13 Planning and Conducting Green Design Charrettes
- 5 Basics of Daylighting in a Green Environment
- 2 Commercial Building Waste Management
- 1 Water Efficiency for High Performance Commercial and Institutional Buildings
- 1 Overcoming the Barriers to Green Building

A Southface project manager met with the RESNET Executive Director in April 2009 to discuss increased training and technical assistance for raters and improved quality assurance for providers. She also discussed opportunities to leverage international support for energy efficiency policy work.

Southface also is preparing for the AIA SAR Conference in September 2009 where staff members will teach a full 8-hour LEED 2009 course as well as a 1 ½ hour session called *High Performance Building Drivers* for representatives from the South Atlantic region.

The EarthCraft House project manager conducted a comprehensive contractor integration training in April 2009 for two code officials, two HVAC contractors, two insulation technicians, an area manager, and a site supervisor for DR Horton, a national production builder. The information was well received by all parties and the builder is likely to include more energy efficient techniques to their standard building practices in future homes.

EarthCraft house taught a builder training in Alabama for the Alabama Habitat for Humanity. This two day April 2009 event included an afternoon training for the executive director as well as local developers and a full day training for builders.

Southface developed a presentation “Green It & Mean It” for the Retail Design Institute at Home Depot’s corporate offices. The presentation focused on green building as it pertains to retail under the following programs & guidelines: LEED, EarthCraft Light Commercial, ASHRAE Design Guide for Small Retail Spaces. The class reached 45 attendees.

ESL continued to meet with representatives of the Texas Workforce Commissioning concerning the training needs of the commercial buildings sector and a tentative proposal to train engineers and technicians to operate and re-commission commercial buildings.

Subtask 4.2 Publicize "Research that Works" (Lead: FSEC)

Schools

Two energy notes for schools were developed (see Subtask 2.3).

FSEC assisted the DOE team at the Energy Smart Schools booth at the National School Boards Association Conference held in March, 2008 in Orlando Florida.

In October 2008 FSEC referred South Miami High School teacher who is interested in incorporating energy conservation into his curriculum to U.S. DOE www.eere.energy.gov/education/ website.

FSEC discussed SEEC and other programs that offer resource information to schools with the Director of Facilities for the Volusia County School District in October 2008. The discussion included occupancy control strategies and energy savings in portable classrooms. Follow-up information was also sent on the DOE USDA initiative.

In November 2008 FSEC passed on interest of Annabelle Wright in facilities maintenance with Broward County schools to Brett Aristegui of DOE. Ms. Wright is looking for program information and a contact person with DOE/USDA to assist an associate in Jackson County schools.

FSEC discussed SEEC and other programs that offer resource information to schools with the Director of Facilities for the Volusia County School District. The November 2008 discussion included occupancy control strategies and energy savings in portable classrooms. Follow-up information was also sent on the DOE USDA initiative.

In January 2009 FSEC forwarded a list of 25 Florida school contacts to inform them about "EnergySmart Schools National Financing Roundtables".

FSEC staff participated in the February 2009 EnergySmart Schools National Financing Roundtable held in Tampa Florida.

Reports

ESL has published a number of reports on high performance buildings for a wide range of target audiences including airports, off-grid residential housing and K-5 schools. The following 2008 reports can be accessed via the web at http://esl.eslwin.tamu.edu/reports-3.html.

1) *Simulation of Off-grid, Single-family Detached Residences in U.S. Climates* (Malhotra), SimBuild Conference '08 paper
2) *Development of a Simplified Simulation Tool for High Performance K-5 Schools in Hot and Humid Climates*
3) *Development of a Simulation Toolkit for the Selection of High-Performance Systems for Office Buildings in Hot and Humid Climates (Phase I: Calibrated Simulation of the Case Study, Building)* (Cho), SimBuild Conference '08 paper
4) *Statewide Air Emissions Calculations from Wind and Other Renewables Summary Report* (ESL-TR-08-08-02)

5) *NOx Emissions Reduction From Continuous Commissioning® Measures for the Dallas-Fort Worth International Airport* (ESL-TR-08-09-04).

South Carolina Publicity

SEEC partner, the South Carolina Energy Office provides information about energy efficient building through its website www.energy.sc.gov. See in particular, "Green Homes and Building Codes" and, "Design and Construction." SCEO also promote energy efficient building through a newsletter, as well as through targeted communications. SCEO has produced several energy briefs related to home energy efficiency and/or green building. These may be accessed through the SCEO website at http://www.energy.sc.gov/publications/Res_Green_Building_Fact_Sheet.pdf and http://www.energy.sc.gov/index.aspx?m=3&t=102, which contains an extensive listing of energy briefs related to home energy efficiency.

SCEO frequently is called upon to speak about issues related to green building. In addition to speaking about our low and moderate income housing initiatives at the "Hot/Humid Building Symposium" in December 2008, SCEO has spoken about building energy efficiency to a variety of groups, including Green Building Council branches around the state, ASHRAE chapters, Sustain 09, a statewide green building/sustainability conference, and many other venues.

Other Publicity Activities

ESL has selected the new, state-of-the art, LEED Silver AT&T Conference Center in Austin, Texas for the 2009 International Conference on Enhanced Building Operations (ICEBO) to be held Nov. 17 – 19, 2009 (see the ICEBO Save the Date flier in the Appendix). The conference focus will be on enhancing the performance of new and existing building by as much as 20 % through enhanced commissioning techniques. The save-the-date flyer and Call for Papers were mailed in spring. ICEBO 2009 will be co-hosted by Austin Energy and co-sponsored by the Texas State Energy Conservation Office.

Subtask 4.3 Provide for Consumer Outreach (Lead: FSEC)

A Florida public awareness campaign plan draft was presented at the November green building workgroup meeting based on input at the October 1 public forum and the first workgroup meeting. The committee was largely approving of the campaign plan but emphasized to keep the goal to that which could be measured –that is the public's awareness. FSEC is furthering developing the plan for the January 16 meeting and will submit a final plan for Florida Building Commission approval by the end of January. As part of the campaign, a new informational web site was created: MyFloridaGreenBuilding.info.

Met with *Hometown News* reporter in December 2007. Provided overview presentation of SEEC project and tour. Interview to be published in Brevard County Florida newspaper.

The Atlanta Home and Garden Show featured a high performance EarthCraft House demonstration home. Southface produced an interactive display of energy efficiency tips and techniques to accompany the home display and worked at the home show to answer questions and walk homeowners through the exhibit explaining the benefits of each measure. A new,

consumer-focused glossy flier was developed incorporating the Energy Smart Home Scale to highlight the fact that the average EarthCraft House is 27% more efficient than a "typical new home".

Southface staff worked with City of Atlanta, local businesses, and ABC affiliate WXIA on 60-minute Earth Hour television special on energy efficiency and climate change which aired March 29. The number of media impressions for this show was 160,000. A link to the story can be found at http://preview.tinyurl.com/62mf4f.

The local Fox television affiliate covered the Greenprints Conference and Tradeshow on 5:00 News on March 13, 2008. Southface staff, including Dennis Creech, were interviewed. This story resulted in 287,500 media impressions, and an additional 4 million impressions from the website http://preview.tinyurl.com/65vgqc.

The Southface Visionary Dinner was reported by the *Atlanta Business Chronicle* with description and photos generating 185,000 media impressions on March 21, 2008.

Local weekly *Creative Loafing* wrote a wrap-up article about Greenprints and included an interview with Dennis Creech on March 8, 2008. This article was followed on March 26 with an article also featuring Dennis Creech on energy efficiency and financial incentives. Each articles created 325,000 medial impressions.

In February 2008, *Atlanta Homes and Lifestyles* produced an issue entitled The Little Green Book. Southface was profiled as an organization leading the way toward a more sustainable future. Southface staff worked with the magazine staff on the issue, and several Southface partners, including EarthCraft House and ENERGY STAR builders and developers, were also highlighted. A Building America House, the Kendeda Sustainable Home, was featured in the story *High Style, Low Cost*.

FSEC presented "Recent State Activities Regarding Green Building" to the Florida Green Building Coalition, Inc., April 25, 2008, Palm Harbor, FL. Presentation featured the recent Florida activities of new building codes, potential appliance standards, and the Florida model green building ordinance.

FSEC presented "Efficiency: The Biggest Energy Boom in Going Green," at the Florida Economic Development Conference, May 19, 2008, in Tampa, Florida. The presentation provided a quick overview of green building standards and then indicated the great financial benefits to the economy of energy efficiency in buildings.

FSEC presented "A Green and Profitable Workplace," at a Hillsborough County, Florida *Take the Green Lead* Workshop, May 19, 2008, Tampa, Florida. This presentation included the Green and Profitable guide to building cleaning and maintenance that FSEC developed for the state of Florida in 2003. The guide features many energy and environmental suggestions on best practices for existing buildings.

FSEC gave two presentations at the Florida School Plant Managers Association (FSPMA) Conference in Daytona Beach September 17, 2008 with 25 in attendance. The two presentations

were titled: "Measured Results of a High Performance Relocatable Classroom" and "Selecting AC Systems That Effectively Control Relative Humidity; Avoiding Six Types of AC Systems That Do Not Effectively Dehumidify the Classroom". The two presentations included information on EnergySmart Schools, Utility Report Cards, the Southeast Rebuild Collaborative and the new DOE / USDA initiative for high performance schools seeking 50% reduction in energy compared to ASHRAE 90.1-1999. The Brevard County school district has expressed preliminary interest in participating in this project, with communications ongoing. DOE resources were also handed out at the conference.

In 2008 Sydney Roberts was recruited to serve on the Mohawk GreenWorks Dealer of the Year Selection Committee. Winners will be chosen based on economic, social, and environmental sustainability. The contest and Southface participation has been covered by trade publications including Floorcovering News, Floorcovering Weekly, *floordaily.net*, and *floortalk.com*.

Sean Blything of Southface served as a judge in the Johns Manville Best Installers Contest, which recognizes proper insulation installation practices. Southface has been working closely with Johns Manville to develop their Energy Bill Guarantee program. Mr. Blything also consulted with Johns Manville on the Guarantee program, new product development, and unique product installation opportunities.

Southface staff met with the Independent School Council during the 3rd quarter of 2008 to discuss energy efficiency resources, including EnergySmart Schools.

Additional Southface outreach during the 3rd quarter of 2008 included meetings with the Home Depot Foundation Board of Directors (on high performance buildings), the Atlanta Museum of Design (advised on an exhibit on high performance buildings), Fannie Mae (advised on effective strategies for energy efficient mortgages), business leaders and policy experts (advancing energy efficiency in Georgia) and the Georgia Insurance and Safety Fire Commissioner (on polices to advance residential energy efficiency).

Daniel Harvey, EarthCraft Renovation Project Manager, appeared on the local radio show "Real Estate for Real Life" speaking about energy efficient and green renovation strategies on August 23, 2008.

Southface provided consumer outreach on residential energy efficiency and indoor air quality at the Fall Atlanta Home Show (Sept 25-28).

On November 19, 2008 Southface participated in the celebration of Habitat for Humanity of Atlanta building their 1000th and 1001st homes with the presentation of the DOE EScale for each home. These are the first homes on which Southface and EarthCraft House have used the EScale as part of their participation as program partners. All homes built by Habitat Atlanta are EarthCraft Houses. Southface continues to work with the affiliate to encourage improved energy efficiency and durability with the eventual goal of achieving the Builders Challenge.

In February 2009 Southface completed a drawing and specification review for a Hospital in Lincolnton, NC to suggest strategies for making the facility more sustainable (energy and water savings, resource conservation, etc). The hospital system, Carolinas HealthCare System (CHS),

has over 24 facilities and is interested in learning strategies that can be applied to the other existing facilities as well as approach high-performance building strategies on new construction projects that are coming up in the near future. This DOE / EREE tool was referenced in the analysis so that the CHS facilities staff is aware of this document once it is published in 3rd quarter of 2009: *ASHRAE 30% Advanced Energy Design Guide for Small Healthcare Facilities*

In February 2009 Southface completed its online building dashboard system that displays and reports in real time electricity usage, solar photovoltaic production, water usage, and rainwater collection levels in the Eco Office.

The Southface Commercial Team is planning and organizing the YMCA Camp High Harbor project that is researching the applicability of various green building programs for a "unique" 30 acre camp site for the Metro Atlanta YMCA . The team has scheduled a charrette in May where six different team members (Residential, Communities, and Commercial) from Southface will be present to help the YMCA client brainstorm about the programs and their site.

EarthCraft is an ongoing partner with the Georgia Chapter of the Certified Professional Home Builders (CPHB), which is a second-tier training and quality assurance association for builders in the state of Georgia. CPHB and EarthCraft have created stronger ties by sharing the annual membership booklet which is distributed to Georgia CPHB Members, the Georgia National Association of Realtors, Metropolitan Listing Services, First Metropolitan Listing Services and other influential residential real estate offices. The booklet gives descriptions of both CPHB and EarthCraft, education sessions for the programs, member listings and resources for realtors and home owners in Georgia.

Southface participated in Coca Cola's Earth Day event where representatives hosted a booth where 75 attendees learned about EarthCraft House, Radon, the suite of LEED programs, ENERGY STAR, and the Home Performance with ENERGY STAR program.

Southface has begun preliminary discussions with NAHBRC and NeighborWorks America on tapping into exiting MLS systems to better market and report green homes throughout the country.

Southface continues to work with the Georgia Solar Energy Association and are planning multiple educational events for 2009 including: Summer Solstice, two Southern Solar Summits, Hands On Solar Day, Solar Festival and the Georgia Solar Tour. The last GSEA meeting hosted at Southface in May had over 80 attendees.

FSEC provided DOE and FSEC literature on high performance buildings and homes at their GreenBuild booth in November 2008.

Subtask 4.4 Support High-Performance Buildings Conferences (Lead: Southface)

The major conferences supported under this contract task were the 2008 Building Symposium for Hot and Humid Climates and the 10th and 11th GreenPrints Conference. There was also limited support for the Clean Air through Energy Efficiency conference in San Antonio, Texas December 17 and 18, 2007.

2008 Greenprints Conference and Tradeshow

Southface hosted the 2008 Greenprints Conference and Tradeshow, which drew over 600 building, industry, and policy professionals together for two full days. SEEC principals from Texas A&M ESL, FSEC and Southface presented at the conference. Malcolm Verdict from Texas A&M ESL presented in the session entitled *Energy Policy: Climate Change in the South* and Subrato Chandra from FSEC presented with EPA's Eric Werling in the session entitled *Breathing Easier: Steps for Ensuring Better Indoor Air Quality*. Sydney Roberts of Southface introduced the Designed to Meet ENERGY STAR program in *Designed to Last: The Importance of Sustainable and Disaster Resistant Construction.* Additionally, all other sessions were aimed at enabling the Southeastern community to build high performance commercial buildings and homes. The program for the conference can be found at http://www.southface.org/web/greenprints_conference/gp08/program.htm.

The Southface Visionary Dinner with keynote speaker Richard Fedrizzi, President and CEO of the US Green Building Council, was held immediately preceding Greenprints and was attended by over 540.

2008 Symposium on Improving Building Systems in Hot & Humid Climates

All three SEEC members agreed at the March 2008 meeting in Atlanta to participate in the 2008 Symposium on Improving Building Systems in Hot & Humid Climates (aka "Hot & Humid Conference"). In April, ESL staff surveyed by email the SEEC members about their type of support and suggestions on how the symposium can further the SEEC goals. Substantive agreement was reached to support the next conference planned for December 2008 in Dallas. ESL staff surveyed local conference hotels. In May, SEEC steering committee and ESL staff met by telecom to discuss the symposium's agenda, outreach, advertisement, content, and SEEC involvement. In June, SEEC partners participated in several additional planning meetings for the Symposium.

During the 3rd quarter of 2008, preparation for the December 2008 Symposium on Improving Building Systems in Hot & Humid Climates continued. Activities included abstract and paper reviews and workshop planning. SEEC staff submitted a number of papers for the Symposium as well. A SEEC track presentation session and steering committee meeting were also incorporated into the Symposium schedule. Invitations for keynote addresses were extended to David Rodgers, OBT at EERE and Mr. Edward Johnson, Executive Director of Texas State Facilities Commission. A Symposium brochure is included in the Appendix.

SEEC staff held the Hot & Humid Symposium December 15-17, 2008 in Plano, TX. The Symposium included two keynote addresses and 21 breakout sessions with a total of 50

presentations. The over 75 attendees included state energy office personnel, builders, developers, utility representatives, university staff and students, manufacturers, researchers, and state and federal policy makers. All three SEEC principal organizations were well represented at the event, each providing a number of presentations and a variety of support functions. Southface staff also provided an all-day LEED® 2.2 NC Accredited Professional Test Prep Workshop on the 17th.

2009 Greenprints Conference and Trade Show

The 2009 Greenprints Conference and Trade Show Planning and Curriculum Committees met during the 3rd quarter of 2008 to form a conference topic, Green Cities, and have sent out a call for papers. Speakers have been invited, including DOE staff. The theme of the March event is Sustainable Communities by Design.

In November 2008 Southface continued planning for the 2009 Greenprints Conference and Tradeshow. Southface secured speakers representing many DOE programs and initiatives, including Ed Pollack, Joe Lstiburek, Subrato Chandra, and Duncan Prahl. The keynote speaker will be Ed Mazria, founder of the Architecture 2030.

Southface held the Greenprints Conference and Tradeshow and Southface Visionary Dinner in March 2009. The Visionary Dinner and Greenprints Conference were separate events this year that reached 350 and 400 participants respectively. Ed Mazria, the keynote speaker, discussed his work with the Architecture 2030 Challenge - the effort to make all new and renovated buildings carbon neutral by the year 2030. Joe Lstriburek, the commercial master speaker, demonstrated how to make energy models more accurate and final products more efficient. Edward Pollock, the residential master speaker, spoke on the latest building science and construction techniques. Ellen Dunham-Jones, the community master speaker, presented her community research on urbanizing the suburbs. In addition, Peter Yost held a workshop on using wood efficiently to minimize dumpster waste. For the full curriculum, see the Greenprints 2009 Program in the Appendix.

A unique feature this year at Greenprints was the Urban Land Institute Conference within a Conference. Through a partnership with the Urban Land Institute - Atlanta, this joint conference included sessions on real-world delivery of green. These themes included: the green market-finding the ideal balance between environmental green and financial green; brownfield development - opportunities and challenges; and the value of green in commercial real estate, to name a few.

SUMMARY

The Southern Energy Efficiency Center was one of two pilot regional building application Centers funded by DOE. The Northwest Building Application Center led by Washington State University was the other funded center. The team of SEEC principals was able to match dollar for dollar the federal funding with state and private funding to create a million dollar first phase. The tasks funded by DOE were those proposed which happened to match the goals of the states

providing the cost share. Although DOE created and funded the application centers, the DOE headquarters staff tended to focus on their national program teams (e.g., Energy Smart Schools, Building America and also relied on National Labs) for materials. This top-down approach has provided many useful materials, but it still lacks achieving the local dissemination and communication needed to greatly affect change. The information provided by SEEC has been very pertinent to the region, assisting in improving codes, training professionals and providing new materials that focus on humidity and other local parameters. It is unlikely that the national contractor focus would provide the same level of local support.

SEEC and the Northwest Building Application Center each participated in a peer review in Washington DC in March 2009. The summary of the peer review was favorable towards each Center.

Reaching the building professional must happen through a number of means, from research, publications, web pages, on-line tools, videos and educational courses. Simply learning about a program or setting a goal is not sufficient. Based in part on advice received during the SEEC stakeholder meeting in December 2008, we conclude there must be regular activity at the local level. The latest technology and program information needs to be provided by knowledgeable, regional building scientists to local chapters of building professionals, e.g., ASHRAE, ASME, ACCA, and USGBC.

APPENDIX

SEEC Mission Statement

G-12 Kick-off Meeting Minutes

Post G-12 Kickoff Meeting Input from Louisiana and South Carolina Energy Offices

Agenda for March 25th 2008 SEEC Principals Meeting in Atlanta

SEEC Partner Agreement

SEEC Partner Listing

SEEC December 2008 Hot Humid Symposium Steering Committee Meeting Minutes

SEEC Website Home Page

U.S. DOE EnergySmart Home Scale from Home Show

Texas Energy Efficiency Research Center Overview

Southface Energy Star for K-12 Schools Screenshot

Saving More than Money: Energy Efficiency in the Home Workshop Poster

ZEH "Dog Park" House Case Study

Designing and Maintaining the High Performance Green Building Sponsor Brochure

Creating Buildings Which Are 15%, 30%, and 50% More Energy Efficient Draft Outline

Energy-Efficient Green Home Building Agenda

Achieving Zero Energy Green Homes Webinar Brochure

ICEBO Save the Date Flier

Improving Building Systems in Hot Humid Climates Symposium Brochure

Greenprints 2009 Program

SEEC

SOUTHERN ENERGY EFFICIENCY CENTER

Building Energy Solutions for the South

Statement of Mission

The Southern Energy Efficiency Center (SEEC) is a pilot, high-performance buildings technology application center serving the southern United States. Its overall mission is to leverage the existing interactions and outreach activities of the SEEC principals and partners to substantially increase the deployment of high-performance, beyond-code buildings across the southern region of the U.S. Primary funding is from the US Department of Energy Building Technologies Program (BTP), administered by the National Energy Technology Laboratory.

SEEC Principals

The three SEEC principals are the Florida Solar Energy Center, Southface, and Texas A&M Energy Systems Lab. These regional building energy leaders are currently implementing a wide range of technology transfer activities to building design and construction professionals through extensive training, high-performance builder assistance programs, and hosting conferences -- *Hot-Humid Climate Symposium*, *International Conference on Enhanced Building Operation,* and *GreenPrints*. SEEC principals are actively transferring building science knowledge into improved buildings by extensive participation in code development, through organizations such as ASHRAE, AIA, USGBC, and RESNET, and by means of training courses.

SEEC Partners

The energy directors of each of the twelve regional states (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia) will serve as one advisory panel. A second larger steering committee will consist of representatives of various stakeholder groups who will assist in the dissemination of unbiased energy information.

SEEC Tasks

The SEEC principals and partners will develop consensus-based goals and strategies for deployment of high-performance buildings. These goals will include technical and policy support to states and local jurisdictions based on established priorities; providing of training and certification to the building design and construction community, to those developing and implementing codes and standards, and to the consumer marketplace; establishing a regional network of general and trade media sources, and provide frequent opportunities for interviews with SEEC staff, stakeholder partners and Steering Committee members.

SEEC Delivery and Process

Leveraging of current activities and resources is the key to the success of SEEC. Collaborative partnerships will be developed with state and local governments, the building delivery industry (designers, contractors, realtors and commissioning agents), product manufacturers and their supply chains, and utilities, consumers, and other energy efficiency stakeholders. SEEC staff will assist the DOE BTP by publicizing their many dissemination programs (Building America, EnergySmart Schools, energy codes, energy analysis tools, Advanced Energy Design Guides, energy notes, and case studies).

Look for more information at www.southernbuildings.org

Minutes of February 3, 2008 SEEC G-12 Meeting
Washington, DC

In attendance:

Cyrus Bhedar, Georgia Energy Program
Jim Cummings, FSEC
Sydney Roberts, Southface
Larry Shirley, Director, North Carolina Energy Office
Jeff Sonne, FSEC
Dub Taylor (post meeting met with SEEC staff), Director, Texas Energy Office
Malcolm Verdict, Texas A&M
Rob Vieira, FSEC
Steve Walz, Senior Advisor for Energy Policy, Virginia Energy Office

After introductions, Rob Vieira presented the background of the Southern Energy Efficiency Center (see attached slides). The primary purpose of SEEC is to help disseminate energy-efficient building information throughout twelve Southern states –Virginia, Tennessee, North Carolina, Oklahoma, Arkansas, South Carolina, Texas, Louisiana, Mississippi, Alabama, Georgia and Florida. The current 18-month contract period goes through March 2009, with planned annual DOE renewals through March 2012. If full funding is provided, the project will last for 4.5 years. The DOE funding has been matched during the first year with a number of state and partner contributions and commitments. The Center has been organized so that the energy directors of the twelve states would serve on a "G-12" advisory committee, providing input to the project principals.

The stated purpose of this meeting was to obtain input form the member states as to their needs, and how the SEEC program could help address those needs.

Rob described some of the work being done for the State of Florida Department of Community Affairs which has provided funds that serve as cost-share to the SEEC program. It includes a model green building ordinance and a draft outreach campaign, a cost effectiveness study of various building improvement measures, possible new appliance standards, and a new web site MyFloridaGreenBuilding.org.

Sydney Roberts of Southface presented some of their dissemination programs (see attached). Jim Cummings of FSEC presented a series of courses that FSEC would like help with coordinating throughout the region, beginning in the southern-most tier of states during 2008-2009.

The committee suggested that staff develop a one-page mission-goals-tasks statement and send it to the state energy offices.

Steve Walz indicated that Virginia is scheduled to update codes in the next two years.

Need incentives –could there be a property tax break for buildings that achieve 30% savings?

Association of Physical Plant Administrators should be targeted.

Larry Shirley indicated that North Carolina has made a commitment to reduce energy use all new government buildings by 30% and all existing buildings by 20% compared to ASHRAE Standard 90.1 (2004). He would like to see a training program on how best to achieve the 30% goal. The group discussed developing a course to reduce building energy use by 10%, 20% and 30%. Malcolm Verdict indicated that this type of course would help attract professionals trying to achieve LEED credits as well as those reaching programs with various government incentives. Maybe develop tax credit also incentives for improved efficiency.

Larry Shirley has a number of courses including two-week courses provided by consultants. There is considerable interest from mayors. They have a retrofit program with $90 million in savings.

He also recommended that a follow-on meeting of the SEEC partners could be held at the 5th annual NC Sustainable Energy Conference April 8 and 9.

Cyrus spoke about Georgia's effort with a Commercial Building Assessment Center. He is also working on programs for training local governments.

Go Green Virginia - has a 200 point rating system for local governments – [see http://www.arlingtonva.us/Departments/Communications/PressReleases/58335.aspx and http://www.gogreenva.org/]

Clearinghouse function could be a role that SEEC could play. Tables comparing programs among states could be developed. SEEC should focus on the intersection of energy and water.

SEEC could provide one-page handouts [energy notes and case studies].
SEEC should list available programs in the region (from FSEC, Southface, Texas A&M and others). Also a list of publications.

Get word to CEOs from Fortune 500 companies in the region. Obtain them as partners. Share a vision. Bank of America, Wachovia, AIG, Home Depot, CocaCola all have headquarters in the region. Ask utilities to anti-up to help develop training/webinars.

Discussed upcoming GreenPrints conference.

Next meeting a teleconference. Alternative – Southern States Energy Board meeting, Future meetings could be held at GreenPrints or Hot Humid conferences, or future NASEO meetings.

Louisiana

Paula Ridgeway from the Louisiana Energy Office wrote:

"Of course, we are thrilled to be able to get the assistance and help that I know the trio of experts can provide along with the shared resources from all of the states involved.

The clearinghouse and tables comparing programs and legislation, incentives, tax credits, etc. would be very beneficial and a great start.

Since I was not at the NASEO, I just wanted to give you a heads up, of some of our interests on the table now.

Because Louisiana has passed a statewide residential code (IRC 2006) and updates are to be adopted as released, our office has been training on REScheck for architects and engineers throughout the state for the last twelve months…with great success.

1. need a training course for *enforcement officials to show code compliance on the energy efficiency component*. It appears if REScheck certificate is attached, it's considered in compliance. We would like to develop some sort of educational campaign for consumers to know what they should expect, some items enforcement officials should check for the energy component, etc.

Louisiana has also passed legislation for a solar and wind tax incentive for residential.

2. Train the Trainer at technical colleges for solar training/certification (there may already be movement on this with a group called Louisiana CleanTech)

Our office has been providing rater training, certification and quality control of energy raters throughout the state and we want to further develop this initiative with organizations such as Southface to assist in providing training and quality control. Our office is legislatively responsible for rater certification.

3. Enhance DNR statewide rater training, certification and quality control, utilizing partners that are listed as providers in Louisiana.

We appreciate the opportunity to comment and work with the group. As I am sure Florida has in the past, we've had numerous groups and organizations come to Louisiana (specifically New Orleans) and are aware and/or involved in many initiatives moving forward since the hurricanes. As a state entity, we must develop programs/projects/training/materials that would serve the entire state and would hope that SEEC would coordinate any work with local jurisdictions after the initial phase of working and development of programs, state priorities, issues, obstacles to better enhance any programs at the local level."

South Carolina

Trish Jerman from the South Carolina Energy Office suggested course on “Energy-efficiency for Green Home Building Programs,” that would discuss the process and activities to reach Energy Star and beyond for the energy portion of green building programs.

March 25, 2008

Purpose: First organizational meeting of SEEC directors and staffs to review project goals, progress to date and discuss new opportunities/partnerships and/or need for refinement of goals and deliverables.

Draft Agenda

10:00 Welcome

10:15 Review of SEEC Goals and Deliverables -- Updated Rob's presentation from NASEO meeting

10:45: Task 1.0 Partnership Development
- Update on engagement of G12 (can we leverage SEEA or others?)
- Strategy to move forward with G12
- Draft partnership requirements
- Update on established stakeholders/partners

11:15: Brainstorming for Big Hits for SEEC

12:00 Working lunch served – Brainstorming discussion continued

12:15 Task 2.0 Resource Development
- Update on Website
  - What should the educational content be?
  - What do we need to contribute?
- Update on regional cost database
  - Opportunities for synergies

12:45 Task 3.0 Technical and Policy Assistance
- Draft Top 10 Regional Goals
- Update on additional activities

1:45 Task 4.0 Education and Training
- Update

2:00 Brett Aristegui - Conference Call with NETL Program Manager, Overview of the vision for successful SEEC

2:15 New Partnership Opportunity: Ben Taube, Director. Southeast Energy Efficiency Alliance

2:45 Next Steps

3:30 Tour of Southface Eco Office

SEEC

SOUTHERN ENERGY EFFICIENCY CENTER

Building Energy Solutions for the South

Southern Energy Efficiency Center Partner Agreement

Whereas _____ [insert name of firm or "we"] is [are] interested in promoting energy efficiency in buildings, and the Southern Energy Efficiency Center (SEEC) program also shares this goal, we are pleased to become a SEEC partner and to make a commitment to support the activities of the SEEC program in the following manner [check appropriate boxes]:

☐ Will serve on the SEEC project steering committee by:

- ☐ Attending the first annual meeting of the project steering committee and giving serious consideration to attending future annual project steering committee meetings.
- ☐ Attending all annual meetings, and to provide project advice and oversight to the Center.

☐ Will contribute cash cost-share to the SEEC program in the amount of $_____.

☐ Will contribute in-kind product or services to the SEEC program having total value of $_____.
Description of product or services: _____
_____

☐ Will collaborate in the development of regional, state, local, and/or utility consensus-based goals, priorities, and strategies for increased deployment of high-performance buildings in SEEC's region.

☐ Will advertise SEEC programs, activities and resources (on our web-site, in our newsletters, etc.) and encourage our network of stakeholders and interested parties to take advantage of these resources, etc.

☐ Will assist in inviting stakeholders and interested parties to meetings and activities that are held within SEEC's geographic jurisdiction (or spheres of influence) and possibly host such gatherings.

☐ Will provide or assist in the development of "case studies" or other educational materials that can be incorporated into the resources and activities of SEEC.

☐ Will serve as a content provider (and/or peer reviewer) for articles and materials that will be incorporated into the SEEC web site (energyMD.net) or into marketing materials.

☐ Will serve as a technical resource within SEEC's geographic region or sphere of influence.

☐ Will serve as a point of distribution for consumer and stakeholder materials developed by SEEC.

☐ Will assist the SEEC program with other activity/contribution to advance the broad objectives of the project as described in the following space.
Description: _____
_____

Name _____ Signature _____
Title _____ Date _____
Company _____

Please complete and send to:

Robin@fsec.ucf.edu
OR
Robin Vieira, SEEC Director
Florida Solar Energy Center
1679 Clearlake Road
Cocoa, FL 32922

Current SEEC Partners

ACEEE
AIA New Orleans
Alabama Dept. of Economic & Community Affairs
Arkansas Energy Office
Atlantic Trust - Kendeda Fund
Building Performance & Comfort, Inc
Cambridge Homes
Center for the Commercialization of Electric Technologies
Cosella-Dorken Products
Dallas Fort Worth International Airport Board
EarthCraft House
EarthCraft Virginia
Electric Power Research Institute
Electric Utility Marketing Manager of Texas
Energy Conservatory
Energy Knowledge Group
Enterprise
Federation of American Scientists
Florida Dept. of Community Affairs
Florida Dept. of Environmental Protection
Florida Natural Gas Association
Florida Public Utilities
Florida Solar Energy Research and Education Foundation
G.W. Robinson
GA Environmental Facilities Authority
GA Tech / College of Architecture
Global Green USA / New Orleans
Greater Atlanta Home Builders Association
Greenprints 2009
Habitat for Humanity International
Home Builders Association--Metro Orlando
Home Depot Foundation
Jacksonville Electric Authority
Johns Manville
Liberty Building Forensics Group
Louisiana Dept. of Natural Resources
LSU Ag Center
NAIMA
New Orleans Regional Planning Commission
North Carolina State Energy Office
Oncor
PolySteel
Progress Energy
RESNET
South Carolina Energy Office
Southeast Energy Efficiency Alliance
Southface Cost Share
Texas A&M / College of Architecture
Texas A&M Engineering
Texas State Energy Conservation Office
Tommy Williams Homes
USGBC - Atlanta Regional Chapter
WCI Communites, Inc.

SEEC Steering Committee Meeting at Hot Humid Symposium
Meeting Minutes

December 17, 2008

Meeting Attendance

Present:
Energy Knowledge Group: Donnie Herrin
Florida Solar Energy Center: Rob Vieira, Jeff Sonne, Subrato Chandra and Chuck Withers
Mississippi Energy Office: Linda Perry
National Energy Technology Lab: Brett Aristegui
Southeast Energy Efficiency Alliance: Alex Tapia
Southface: Sydney Roberts
Texas A&M ESL: David Claridge, Malcolm Verdict

By Phone:
Arkansas Energy Office: Evan Brown, Susan Ruskin
Building Performance & Comfort: Doug Garrett (joined late)
Ferrier Companies: Don Ferrier (joined late)
Florida Energy Office: Rob Vickers
Florida Solar Energy Industries Association: Linda Tozer
Jacksonville Electric Authority: Bruce Doueck
Louisiana Department of Natural Resources: Paula Ridgeway, Buddy Justice, Louis McArthur, Claudette Reichel
Texas State Energy Office: Dub Taylor

Meeting Minutes

Rob Vieira started by sharing the meeting goal: To obtain feedback from stakeholders on how to use limited DOE/other resources to get more efficient buildings.

Rob directed phone participants to southernbuildings.org., then reviewed the SEEC Overview/Update PowerPoint presentation (including updates on Southface activities including Green Cities, Builders Challenge update to Earthcraft Homes and commercial code project).

Claudette Reichel noted that their database is something that she gets a lot of questions about.

Alex Tapia noted some work in this area—agrees that the information could be valuable, but asked about end use? "What's the story that SEEC is telling—here's where were at—where do we want to go?" Alex also noted that a cost database could be effective.

Susan Ruskin asked if some of this available through Energy Star or other sources. Rob Vieira noted that there is some information on the cost difference between green buildings and standard. The best data is usually school buildings because there are often comparable buildings available. ACEEE did a report on residential saving potential for Florida –the report is not public though, they charge for it.

Rob Vieira to get back with Susan on title of ACEEE report.

Subrato Chandra suggested that it would be good to link on SEEC website to cost info we have.

Question was asked whether SEEC funding can be used to get rights to put ACEEE report on website? Rob replied that this may be possible.

Malcolm Verdict noted that Texas has robust home rating system: 100,000+ homes this year via Texas HERO, and that these raters will know costs—may be most ideal/timely info. Said he will send link.

A question was asked on providing training in other places. Rob stated that others would need to come alongside; Sydney Roberts suggested it could be on a fee-per basis.

Rob Vieira then brought up the 2010 Hot Humid Symposium conference; suggested it not be held in December, and that we should be looking for a city that will provide buy-in from local organizations, other support; also good to get cost share from utilities. Paula Ridgeway noted that New Orleans in August could be a good opportunity- a lot of local people are "sponsored out" with all the recent conferences in the city though.

Alex Tapia noted the SEEA associate meeting…probably being held late spring…would be good piggyback opportunity (Rob indicated that the next hot/humid would be in 2010 but thought holding it at the same location as an associate meeting would be a good idea.

Malcolm noted that it will important to get other states (e.g. Alabama or Mississippi) involved to make the next event a success.

Linda Perry said she would be interested in checking on if Mississippi might be a possibility for hosting the next Hot Humid Symposium.

Rob Vieira then turned to the Designing and Maintaining the High Performance Green Building series handout. Chuck Withers discussed the reason/need for courses and provided an overview of course contents. Rob and Chuck then also noted interest in sponsorship in-kind assistance—venue, lunches and getting the word out to bring attendees. Question arose as to the cost of bringing course out. Rob suggested that if the venue and lunch are procured and covered, we can then charge $269 per workshop—so we just need a local champion. A question was asked about partnering with e.g. an AIA to give them a cut? Rob suggested that we can say, for example, that we get $X for up to 30 attendees, then the partner group gets all additional.

Arkansas Energy Office noted their interested as well. Rob indicated we should start planning to bring those courses there in 2010. In Arkansas and some other states the plan is to update the course with some more heating concerns, thus 2010 for Arkansas, Oklahoma, Tennessee, N. Carolina and Virginia.

Also discussed intended audience…including commissioning agents and schools.

The Achieving Zero Energy Green Homes webinar series handout was then discussed, including potential offering times. Linda Perry asked if we can convert this to NAHB use as they want

programs on meeting that green standard? Rob noted that this is directed more to going about accomplishing the energy efficiency, not just describing a given rating system.

Rob then directed the group to the Top Ten Checklist draft. Alex Tapia said that the list needs to be included on cover page without the details. Also, Alex requested that language be understandable to policy people. David Claridge requested that the document include an executive summary. Subrato Chandra noted that the summary list could serve as the executive summary. The group also discussed if to add word "commercial" to the title. Linda Perry suggested that in using this type of material, it would be great to have partner names. Alex recommended these items should have similar appearance for branding. Possibly partners listed on back. Brett Aristegui suggested that we possibly brand different versions for policy people, technical, etc…. Donnie Herrin noted that this is new construction, so it goes in the AIA bucket; if want to educate through document, for facility managers/engineers, they may immediately not be interested because they think it's for new construction. For facility engineers…we need to speak to them about money and savings. Alex Tapia noted that seeing FSEC on the document, some will dismiss it immediately; should only be SEEC for public documents-- branding organization is what we want….when people want information…they should immediately think SEEC.

Discussion of residential energy notes. Sydney, Rob and Malcolm indicated there are documents available that could be expanded.

Alex Tapia suggested that policy documents need to b as brief as possible. Rob indicated primary audience is the professionals in the industry. SEIA's documents are aimed at policy.

Donnie Herrin suggested to maybe direct them to website, then to fine tune audience.

Linda Perry suggested versions where you add state.

Rob then referred participants to mission statement and task overview.

Alex provided an overview of the Southeast Energy Efficiency Alliance. Potential analysis work e.g. for Southern Governors, policy work, also major industries, state energy offices, 11 southeast governors meeting, competitive bid to replicate Cambridge Energy Alliance award of $500K to one city. A lot of hand holding. Rob noted that SEEA has lead for legislation; SEEC has expertise on the technical side. So back to who do we publish for…not to duplicate, our SEEC focus is on practitioner as opposed to policy. Malcolm Verdict noted that SEEC and SEEA came together and realized there's a natural connection… and that Ben Taube immediately jumped on idea. Alex noted that SEEC is technical best practice, SEEA is all areas; SEEA can then give to policy makers. Rob noted that SEEC should not be limited to new construction. Syndey noted Southface is involved in policy as well…as is FSEC. Rob then asked, as far as SEEC, what is best focus? Malcolm responded that the dollars are in existing homes, and that we should find out the needs and drivers from the states.

Rob also noted the Southern Rebuild Collaborative, Florida Energy Office with Cadmus Group--- SC, GA, AL, FL, Miss, and that schools, universities, and local governments are a narrow part of market, and that he's not sure of what they will have going forward.

Rob then summarized that we're focused on practitioners vs. policy makers (including sub groups). David Claridge suggested owners as well. There was a question about consumers—noted that while it's an area to consider as well, it's expensive to serve…so with our funding, need to go to professions. Sydney noted that we all do media.

Claudette Reichel Mission statement and leverage. Haven't discussed non-principal activities/leveraging. How do we connect SEEC with smaller partners? Rob suggested that we get back to this later.

Rob then asked about how do we best deliver information? David Claridge suggested interfacing with providers rather than consumers…noting that they're in the best position to work with consumers, and we need to look at avenues that go to the group we want to reach. Malcolm suggested we become a catalyst to cooperation. A comment from a phone participant suggested we support with curricula, materials to energy offices and extension services…because that's what we do, and need that we need to do so free of charge because of limited resources. Subrato Chandra noted that we could try to get on as speakers at national conferences such as ACCA. Malcolm suggested sharing resources. A phone participant asked if this is proprietary? Rob noted that SEEC is a small portion of funding, plus expertise is needed to do e.g. the 5 course series…so not anyone could teach. Webinars can be low cost means of getting info out to large region with a particular expert.

Dub Taylor noted that there are weather related risk challenges…and asked if communicating with insurance industry is something that's been looked at yet? Post Rita, did some with individual requirements; Dub noted that the response was receptive but a busy time so not a teaching opportunity. Dub went on to suggest that this group could educate that industry…assuming people don't pay cash, insurance industry will have a say. Malcolm noted that this is ongoing discussion in DC, and that the finance community is a big draw. Linda Tozer noted that the concrete industry wants to talk about this, but insurance industry says we won't pay; we'll go bankrupt…new codes and moving away from coast. So at this stage, insurance industry is not as receptive to this kind of thing. A comment from a phone participant suggested combining building durability with EE, that it's the insurance industry that's driven the codes, and there's also opportunity to bring in third party code plus programs. Alex Tapia suggested that to pitch high performance building (storm resistance, energy efficiency…) we need to craft a message that's resistant beyond the hot topic of the day.

Donnie Herrin brought the discussion back to the mission statement, noting that building owners and asset managers have the money. He suggested that we maybe don't go back to consumer level, but because of low budgets, go for medium that gets to engineers, possibly every Tuesday a brown bag webinar, then on Thursday it's another talk for engineers on VAV boxes. Also include the ability to go back to previous webinars-- SEEC is the "go to"-- so go where people will implement, to people with dollars.

Alex suggested that if the target is technical…gear to, and fund raise off of them. DOE likes to get things started, we need to build long term. Alex also mentioned the logo—"Building Energy Solutions for the South"…should only work one way—we need to define what is meant.

Another comment noted that the logo [image] suggests 5x focus on commercial…but this is probably o.k.

Dub Taylor noted that webinars are very useful/efficient—not frequent enough networking, and that we should get them on the calendar routinely per Donnie's suggestion.

A phone participant noted that some tools that are already available, be made available, and state specific versions also be created and shared at reasonable cost.

Donnie—Go to partner level to have them drive events—partner really gets message out. This needs to be coordinated effort—so handhold to some extent.

D. Claridge—not every week event, so SEEC helps coordinate.

A phone participant suggested that this should be something from State Energy Office.

Dub Taylor noted ACOR—webinar calls with local sponsorship—that can be attended with others in actual room, providing more benefit. Have host facility which gets more focused attention.

Linda Perry - as far as high performance…how can pieces be applied to low income residential? Subrato Chandra noted that Janet McIlvaine is working on that and we'll be putting up case studies. Linda also asked about foreclosure housing…how can state energy offices touch every house to have the resold house be improved? Rob noted that that's being looked into. Malcolm noted that people like to get through inventory asap…FHA energy efficient mortgage feature…help emphasis this option. Linda noted that these are not being offered. Subrato stated that the utilities need to get involved somehow. Linda noted that they need assistance with energy policy, to which Rob suggested that SEEA be the organization to help with that.

Rob in closing noted that we'll be getting back to DOE with key proposals for next cycle…and that we should be thinking on more ideas.

Southern Buildings.org (Southern Energy Efficiency Center - SEEC) - Mozilla Firefox

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http://www.southernbuildings.org/

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SEEC

SOUTHERN ENERGY EFFICIENCY CENTER

Building Energy Solutions for the South

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Energy-Efficient Buildings

Reduce Costs...Improve Performance...Increase Comfort

The Southern Energy Efficiency Center guides you to information, programs, incentives or people with the expertise you need to implement your project:

- Training and special events
- Data, facts, research reports, software tools
- Product and technology reviews
- Engineering analysis, design review or site assessments

FSEC Offers 12 Course Webinar Series: Achieving Zero Energy Green Homes

Learn the key strategies to design, build and operate a zero energy home - a home that produces as much energy as it uses. Course 1 begins June 3, 2009, Sign up now!

Click here to register | **View brochure**

Mission Statement

The Southern Energy Efficiency Center (SEEC) is a pilot, high-performance buildings technology application center serving the southern United States. Its overall mission is to leverage the existing interactions and outreach activities of the SEEC principals and partners to substantially increase the deployment of high-performance, beyond-code buildings across the southern region of the U.S. Primary funding is from the U.S. Department of Energy Building Technologies Program, administered by the National Energy Technology Laboratory.

What is DOE's New E-scale?

The **E-Scale** is an easy-to-understand graphic that allows homebuyers to see — at a glance — how the performance of a particular home compares to that of others.

See the Builders Challenge on the **Programs page** for more information.

FSEC

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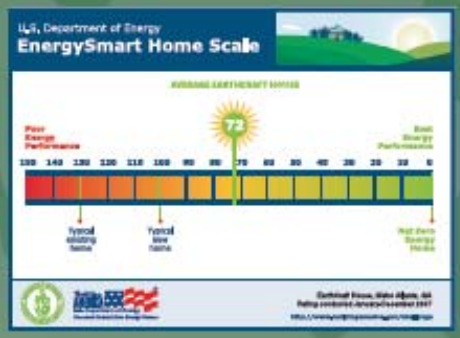
High Performance

The average code-built house scores 100 on the EnergySmart Home Scale. The average EarthCraft House scores a 72, which is a savings of 28% in energy efficiency over standard code-built homes.



	HERS	kWhr	Therms	CO2	Estimated Annual Costs*
Standard House	100	19,203	1,461	20.64	$3,965
EarthCraft House	72	16,875	962	16.47	$3,035

SAVINGS of $930 per year

EARTH CRAFT HOUSE™

Every Certified EarthCraft House gets two inspections, meets ENERGY STAR™ Certification and gets an energy rating. Building to EarthCraft standards typically runs an additional 1% - 3% of construction costs.

* Based on 3,000 square foot home with estimated costs of $.10 per kWhr and $1.40 per therm based on RESNET standards

earthcrafthouse.com

Greater Atlanta Home Builders Association

Southface

EarthCraft House is a program of the Greater Atlanta Home Builders Association and Southface with support from government and industry leaders.

Institution: Texas Engineering Experiment Station

Proposed Center: Texas Energy Efficiency Research Center (TEERC)

Program Description: The objective of the Texas Energy Efficiency Research Center is to reduce the State's utility expenditures and future load growth while reducing air emissions from electricity generation. The Center will:

- Testing and evaluation of high-efficiency and alternative energy technologies at its laboratory facilities.
- Support of utility energy efficiency programs such as benchmarking existing buildings by type and climate zone, base lining of selected Public Utility Commission standard offer programs, and monitoring and verification of demand reduction strategies.
- Technical assistance to tax-supported institutions, including initial energy assessments, training, and energy optimization of existing building systems.
- Workforce development and education of Texas A&M engineering students to meet the growing need for energy efficiency and renewable energy technical skills by industry, utilities, and public sector institutions.

Benefit to the State / Results:

- Significant State interest in building energy efficiency driven by high-energy prices, global climate change concerns, EPA Clean Air mandates, Federal and State goals, and a growing interest in sustainable communities.

- Buildings use more energy than any other sector of the economy, including transportation and industry, and account for over 40% of all U.S. energy use, 72% of electricity demand and 55% of all natural gas demand. These figures can be significantly decreased by 10-20% by application of enhanced building operations and controls and by 50% or more with use of advanced systems.

- The success of this initiative will be reflected in: (1) tax mitigation through a reduction in utility expenditures at public institutions and agencies; (2) Increased ability of Texas utilities to meet their mandated electric demand reduction goals; (3) reduction in air pollution due to less electrical use in new and existing building; and (4) Workforce development to better design and maintain energy and resource efficient buildings.

- This initiative supports the State's goals of furthering the development and application of knowledge through teaching, research and commercialization, and conserving and protecting our state's natural resources.

Southface ▶ HOME

| ENERGY STAR for K-12 schools |

Green Schools Toolkit | Green Building Decision Guide | School Case Studies

ENERGY STAR Tools and Resources

- K-12 website
- Portfolio Manager
- Target Finder
- Kids website
- ENERGY STAR labeled Schools
- ENERGY STAR Challenge
- FREE web training

Top performing ENERGY STAR labeled schools cost 40¢ less per square foot to operate than the average performers.

Green Schools Toolkit

Tools and Resources for K-12 Schools

This website resource is designed to provide K-12 schools with resources specifically geared for school designers and builders, energy and facility managers, superintendents and boards of education, as well as teachers, students and parents. By simply clicking on the appropriate button below, you can start taking advantage of the abundant *AND FREE* resources available to you today.

- **Architects, Designers, and Contractors**
- **School Facility and Energy Managers**
- **Superintendents, Boards of Education & Administrators**
- **Teachers, Students, Parents**

Southface has been awarded a grant from the Department of Energy to help school districts in Georgia learn more about the free resources provided by the ENERGY STAR™ program. Together with the Georgia Environmental Facilities Authority (GEFA) and Southeast Rebuild Collaborative (SRC), our goal is to improve efficiency in our schools and institutions by at least 10% in the upcoming year.

Allied Organizations

SRC Southeast Rebuild Collaborative — www.southeastrebuild.org — Rollover for info

Georgia Green & Healthy Schools — www.greenandhealthy.org — Rollover for info

State of Georgia 1776

Georgia PTA everychild.onevoice. — www.georgiapta.org

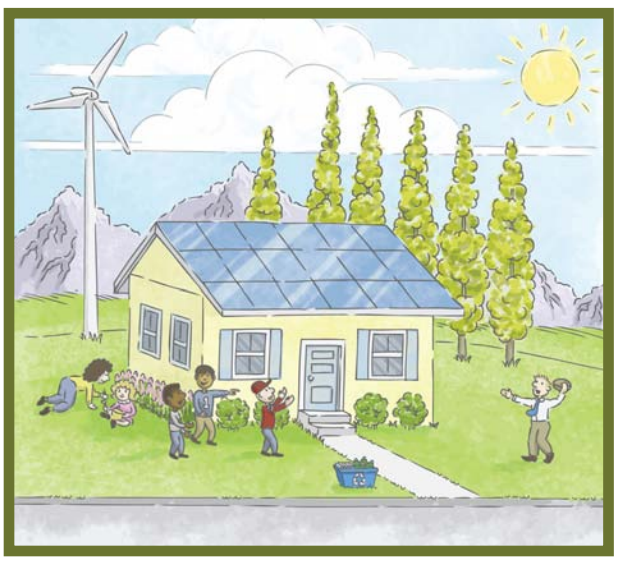
Georgia Environmental Facilities Authority — Rollover for info

SEEC Southern Energy Efficiency Center

Southface Commercial Green Building Services — Webpage link - Rollover for info

Southface Energy Institute is located at 241 Pine Street NE, Atlanta, Georgia 30308
Phone: (404) 872-3549 Fax: (404) 872-5009

Saving More Than Money: Energy Efficiency in the Home



A Free Workshop for Realtors, Builders, Homeowners,

Architects, Renovators, and Residents

Thursday August 28, 2008
1 pm - 6 pm
Barrett Room
Spartanburg County Public Library
151 South Church Street

- Green Homes: Energy Star, EarthCraft House, LEED and Do-It-Yourself
- Saving Money in Your Home, Car, and Office
- Green Remodeling

Green Building products and services will be on exhibit throughout the workshop.

Special Thanks to our Sponsors
Eco-Realty International
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To register for this free event, please call Upstate Forever at (864)327-0090, or email nbarrett@upstateforever.org.

Upstate Forever is a 501(c)(3) membership-based organization. Visit our website at www.upstateforever.org

This workshop will provide 3 hours AIA continuing education credits and engineering PDHs.

September 25, 2009

Building America U.S. Department of Energy

Research that Works
www.buildingamerica.gov

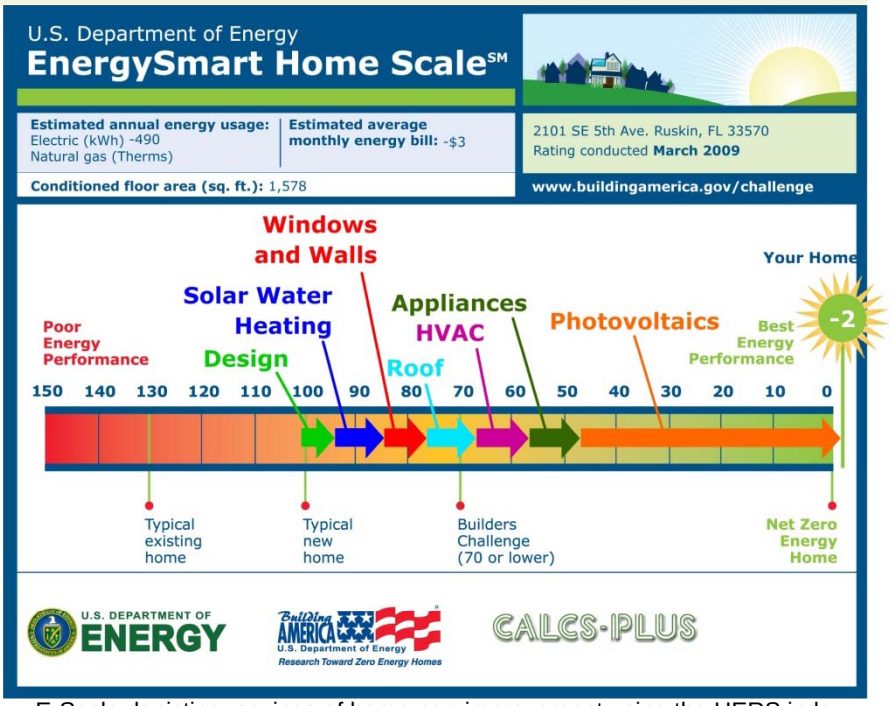
Achieving Zero: Design of a Ruskin Florida "Dog Park" House

A home is planned to serve as a caretaker residence on a dog park site in Ruskin, Florida. The owner and architect have designed the home to achieve the goal of **Net Zero Energy** combining high efficiency and on-site grid-connected solar power. An energy rater modeled the home using Energy Gauge USA to determine measures (see table) to meet this goal. The home is designed to obtain a Home Energy Rating System Index (HERS) of -2 (see scale).

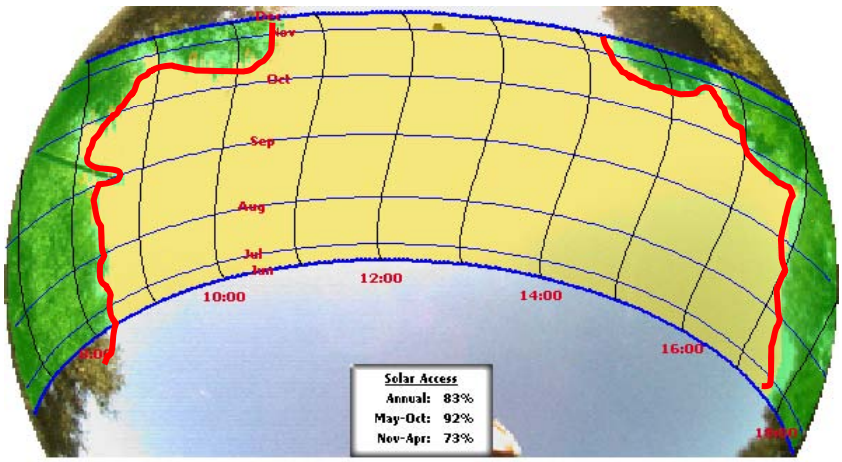
Measure	From	To
Orientation	All walls and windows are of equal size	More windows on North and South
Overhang	0 foot overhang	2 foot minimum
Tile Floors	20% of floors are tile	100% of floors are tile
Solar Hot Water Heater	Standard water heater installed	Installed with closed loop
Windows	U-Value: 0.75 SHGC Value: 0.4	U-Value: 0.35 SHGC Value: 0.31
Walls	Insulation: R-13.7 Framing Fraction: 0.23	Insulation: R-20 Framing Fraction: 0.06
Tight Infiltration	ACH-0.36	ACH-0.076
Roof	Composite shingle	Unfinished Galvalum Metal
Duct Tightness	Qn: 0.08	Qn: 0.00
Attic	Vented attic with R-27 on roof	Unvented attic with R-26.2 on ceiling
Ducts Location	Supply and return in attic	All interior
HVAC	SEER 13, HSPF 7.7	SEER 19, HSPF 9
Appliance	Standard	Energy Star
Programmable Thermostat	None	Installed
PV	None	5,130 Watts

*Note: Colors in table pertain to E-Scale

The Florida Solar Energy Center (FSEC) then created a typical HERS Index 100 level home with the same floor plan. A step-by-step procedure provided savings of measures. The categories were: design, solar water heater, windows and walls, roof, HVAC, appliances, and Photovoltaic's. Ideally a zero energy home maximizes efficiency to relieve expenditure on photovoltaics.



E-Scale depicting savings of home per improvement using the HERS index that goes from 100 for typical new home to 0 for a net zero energy home.



Data by Solmetric SunEye™ -- www.solmetric.com

Solar path tool indicates time of day and year where trees or neighboring buildings will shade panels. This analysis should be made for any solar installation

Case study contributed by:

SEEC Southern Energy Efficiency Center
Building Energy Solutions for the South

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

Research and Development of Buildings

Our nation's buildings consume more energy than any other sector of the U.S. economy, including transportation and industry. Fortunately, the opportunities to reduce building energy use—and the associated environmental impacts—are significant.

DOE's Building Technologies Program works to improve the energy efficiency of our nation's buildings through innovative new technologies and better building practices. The program focuses on two key areas:

- **Emerging Technologies**
  Research and development of the next generation of energy-efficient components, materials, and equipment
- **Technology Integration**
  Integration of new technologies with innovative building methods to optimize building performance and savings

For more information contact
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U.S. Department of Energy
Energy Efficiency and Renewable Energy

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George S. James • New Construction • 202-586-9472 • fax: 202-586-8134 • e-mail: George.James@ee.doe.gov
Terry Logee • Existing Homes • 202-586-1689 • fax: 202-586-4617 • e-mail: terry.logee@ee.doe.gov
Lew Pratsch • Integrated Onsite Power • 202-586-1512 • fax: 202-586-8185 • e-mail: Lew.Pratsch@hq.doe.gov
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Building Industry Research Alliance (BIRA)
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Consortium for Advanced Residential Buildings (CARB)
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Davis Energy Group
David Springer • Davis Energy Group • 123 C Street • Davis, CA 95616 • 530-753-1100 • fax: 530-753-4125 • e-mail: springer@davisenergy.com • deg@davisenergy.com • **www.davisenergy.com/index.html**

IBACOS Consortium
Brad Oberg • IBACOS Consortium • 2214 Liberty Avenue • Pittsburgh, PA 15222 • 412-765-3664 • fax: 412-765-3738 • e-mail: boberg@ibacos.com • **www.ibacos.com**

Industrialized Housing Partnership (IHP)
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National Renewable Energy Laboratory
Ren Anderson • 1617 Cole Boulevard, MS-2722 • Golden, CO 80401 • 303-384-7433 • fax: 303-384-7540 • e-mail: ren_anderson@nrel.gov • **www.nrel.gov**

Tim Merrigan • 1617 Cole Boulevard, MS-2722 • Golden, CO 80401 • 303-384-7349 • fax: 303-384-7540 • e-mail: tim_merrigan@nrel.gov • **www.nrel.gov**

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Pacific Northwest National Laboratory
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Produced for the U.S. Department of Energy (DOE) by Florida Solar Energy Center and the National Renewable Energy Laboratory.
FSEC-BAIHP-10

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Will Your Green Building Fall Short of Your Client's Expectations?

A recent study finds about 25% of LEED Certified buildings use more energy than expected and about 12% use more energy than allowed by the minimum code!

In field testing of over 100 commercial buildings, we identified failures that cause unexpected performance problems and energy waste including:

- Air and thermal envelope defects
- Uncontrolled air flows
- Inefficient ventilation and humidity control methods

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Attend the training series:

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A five-course series taught by building science experts and research faculty of the University of Central Florida.

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- Would you like to bring this training series to your area?
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- If you wish to participate in sponsorship, contact Chuck Withers by e-mail **chuck@fsec.ucf.edu** or by phone (321) 638-1419.

SEEC Southern Energy Efficiency Center
Building Energy Solutions for the South

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www.southernbuildings.org

Designing and Maintaining The High Performance Green Building Course Series

Attend all five courses of this series and pass the exam in courses 1-3 to earn FSEC* Green Commercial Building Design and Maintenance Certificate.

Course 1: **Designing Building Envelopes to Control Air and Moisture in High Performance Green Buildings**

Course provides a balance of lecture, live model demonstrations and class exercises so students will understand building envelope characteristics that control heat and moisture transport. Participants will become familiar with the four types of water movement – bulk, capillary, vapor diffusion, and air transport in hot and humid climates. We'll learn the relevance of material properties to energy efficiency, moisture accumulation, and durability, within the envelope assemblies. *7 hours.*

Course 2: **Designing and Maintaining Building Air Flows in High Performance Green Buildings**

Air flow and pressure problems are silently undermining green goals of maintaining healthy, energy efficient and, durable buildings. This course uses several case studies and research by instructors with first-hand experience to help students understand how the four primary forms of uncontrolled air flow are likely to undermine LEED certified buildings. We recommend specific measures as part of commissioning or recommissioning. *7 hours.*

Course 3: **Designing and Maintaining HVAC Systems for High Performance Green Buildings**

This course examines cooling system characteristics, advanced dehumidification systems and ventilation control strategies. HVAC systems can be an important part of conserving energy, maintaining comfort, and controlling humidity in green buildings. Case studies will be used that highlight re-commissioning measures that result in signifi-cant energy savings. This course is designed to accommodate those not very familiar with HVAC who want to learn more, but has detailed information about advanced systems that will benefit those more experienced. *7 hours.*

Course 4: **Design Charrette-Practice Design of a High Performance Green Building**

This course applies knowledge gained from the first three segments of the five course series "Designing and Maintaining the High Performance Green Building Series." Students will benefit from the experience of other professionals. Participants will work in small groups to discuss ideas and describe construction and equipment details for achieving a high performance green school building. Each group will discuss their design ideas at the end of the day. *7 hours.*

Course 5: **Commercial Energy Code and Green Building Modeling using *EnergyGauge Summit***

This course will teach participants how to use software for energy code compliance for Florida and other states that use ASHRAE 90.1. Students will also learn how to generate ASHRAE 90.1 ratings, evaluate federal tax deductions for energy efficient buildings and calculate LEED credits, including easy on-line reporting feature. Designed for first time and experienced users, students can work alone or in teams to input data and generate output reports which illustrates energy impacts. Come and see how easy it is to model building energy use. *7 hours.*

You don't want your building to end up here!

Measured versus Proposed Savings Percentages

Source: Cathy Turner and Mark Frankel Final Report to USGBC "Energy Performance of LEED® for New Construction Buildings" New Buildings Institute March 4, 2008

*The Florida Solar Energy Center (FSEC) is a research institute of the University of Central Florida, conducting building energy research and training since 1980.

BLDG-30

Creating Buildings Which Are 15%, 30%, and 50% More Energy Efficient

DRAFT Outline

September 30, 2008

This is a two-part course. The two parts are differentiated by the baseline building against which energy savings is calculated. Part 1 works within the framework of the ASHRAE Standard 90.1 rules (defined in Appendix G). Energy savings opportunities are greatly restricted by those rules. Part 2 examines a much wider range of energy savings strategies that can be used in real buildings to reduce energy consumption, and are not limited by the Appendix G rules defining the baseline building.

Part 1

8:00 – 9:00 AM Understanding the rules by which Standard 90.1 authorizes creating buildings that are xx% better than ASHRAE Standard 90.1.

- *This lecture will address the issue of how Appendix G of Standard 90.1 permits a building design to show energy savings, with special emphasis on how the baseline building is defined.*

9:00 – 10:30 AM Achieving 15%, 30%, and 50% energy savings compared to Standard 90.1 (2004)

- *This lecture will examine specific design modifications to representative types of buildings (office, classroom, etc.) showing specific approaches and measures that can achieve the specified levels of energy savings, including on-site renewable energy generation. A building computer simulation model will be employed to illustrate to the course attendees the impacts of specific modifications to the building design.*

Part 2

10:45 – 12 PM Achieving energy savings in real building – beyond the limitations of Standard 90.1 Appendix G rules.

1:15 – 2:30 PM Achieving energy savings in real building – beyond the limitations of Standard 90.1 Appendix G rules (continued).

- *Real buildings do not use energy in the same way that computer models and standards assume. In real buildings, duct systems leak, air flows are unbalanced, building envelopes may have air boundary or thermal boundary failures, reheat may be used beyond expectations, VAV system fan speed controls may not work as planned, etc. This lecture will examine energy savings that can be achieved by implementing all available real-world measures. Specific case studies will be employed to illustrate the effects of specific measures.*

2:45 – 4:15 PM Achieving 15%, 30%, and 50% energy savings targets by implementing packages of measures that will impact the design, construction, and operation of buildings.

- *For various representative types of buildings, specific cases will be examined to work toward the objectives of 15% savings, 30% savings, and 50% savings. A building computer simulation model will be employed to illustrate the impacts of specific modifications to the building, including the avoidance of various failures of design, construction, and operation.*

Building Energy-Efficient Green Homes

Presented by

Florida Solar Energy Center
1679 Clearlake Rd., Cocoa, FL 32922
Ph: 321-638-1401 - Fx: 321-638-1439

Agenda

8:00	Registration
8:30	Building homes that work well without call backs and catastrophes
9:15	Site selection and home design
10:15	Break
10:30	Foundations and walls
11:30	Window and door selection
12:00	Lunch
1:00	Roof, attic, ceiling and duct construction
2:00	Heating, cooling, and mechanical ventilation choices
2:45	Break
3:00	Water heating, lighting and amenities
3:30	Home building programs and other marketing techniques: Florida utility programs, Energy Star, Energy ratings, Building America, Florida Green Home Designation
4:15	Question and answer
4:30	Evaluations
4:45	Adjourn

7 **HVAC Systems for Zero Energy Green Homes** – The heating, cooling and ventilation systems are large energy users, so achieving a zero energy home means learning how to select super high-efficiency equipment and ductwork. Learn the impact of correct sizing, duct layout and duct tightness. This course covers air circulation systems in conjunction with heat pumps, geothermal heat pumps, and gas furnaces. Radiant heating and evaporation cooling systems will also be discussed.

8 **Selecting Appliances and Plug Loads for a Zero Energy Green Home** – Learn how to reduce energy by selecting ENERGY STAR® appliances and electronics, efficient pumps (such as for pools and wells), ceiling fans, and minimizing lighting requirements. This course includes demonstrations on how to monitor the home for possible hidden plug-load problems.

9 **Sizing and Selecting Solar Electric Systems for a Zero Energy Green Home** – Learn how to size a solar photovoltaic system and why it is important to follow the efficiency steps provided in earlier webinars. Learn the pros and cons of selecting different system types such as efficiency, durability and price.

10 **Using Your Home Solar Electric System for Emergency Power** – This webinar will explore how you can install your grid-connected solar system within code regulations to supply emergency power when the grid is down. The course includes a video visit to a home with such an installation. Recommendations for managing and storing the power for the emergency system will also be provided.

11 **Installation Considerations for Solar Electric Systems** – This course will examine locations for the solar system based on shading considerations, roof mounting, electrical runs, inverters, meters and monitoring. Learn how to install a system right the first time!

12 **Monitoring and Operating the Zero Energy Green Home** – This course is designed as a guideline for an occupant in a zero energy green home. It will cover more than 30 considerations to maximize savings, comfort and occupant satisfaction.

For course schedule go to:
www.floridaenergycenter.org/go/zero

Sponsored by the
FLORIDA SOLAR ENERGY CENTER®
Co-sponsored by the
U.S. DEPARTMENT OF ENERGY

Achieving Zero Energy Green Homes

12 Course Webinar Series

Learn the key strategies to design, build and operate
a zero energy home
– a home that produces as much energy as it uses.

SEEC
Southern Energy Efficiency Center
Building Energy Solutions for the South

Achieving Zero Energy Green Homes

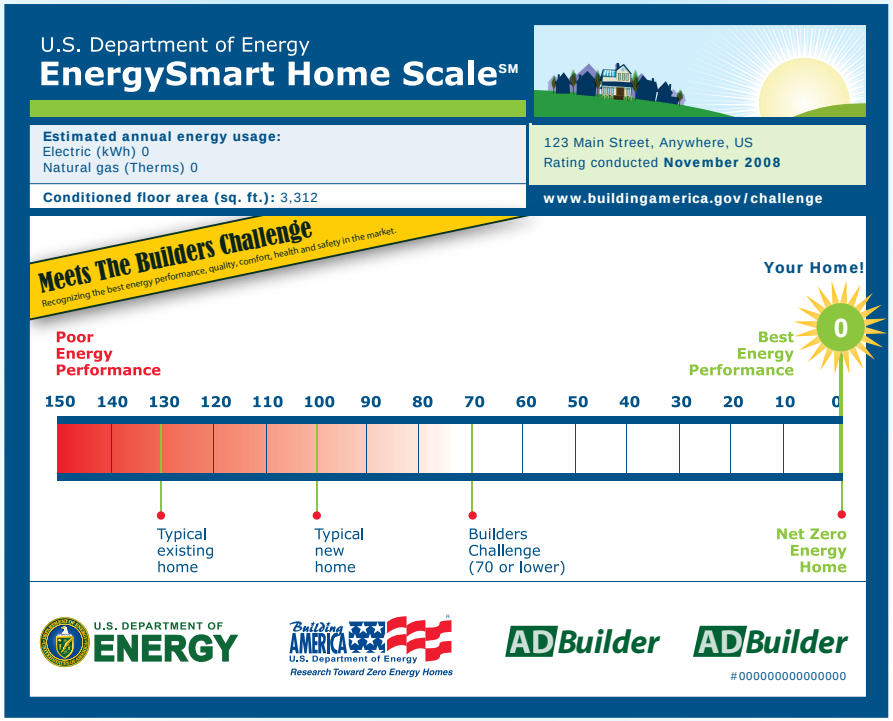
Practical Education from the Expert - Presentations are by the staff of the Florida Solar Energy Center who have been conducting research leading to zero energy homes for over thirty years.

Video Case Study - From design to occupancy, follow successful implementation of strategies to achieve zero energy use.

Earn our Certificate - Attend ten of our webinars and pass a brief quiz to receive our Certificate for Zero Energy Home Building.

Designed for You - This series is appropriate for builders, contractors, designers, educators, energy auditors, energy raters, engineers, perspective homebuyers and utility representatives.

For course schedule go to:
www.floridaenergycenter.org/go/zero



DOE's EnergySmart Home Scale will be used to measure the progress towards achieving a zero energy home.

Introducing the 12 Course Webinar Series

1 Defining a Zero Energy Green Home – Why attempt a zero energy home? What are some of the costs and concerns? Review case studies of near-zero and zero energy homes and some of the key findings from each one. See how ENERGY STAR® Builders Challenge, and green home program energy performance compares with zero energy homes.

2 Designing a Zero Energy Green Home – This course considers many design stage parameters, from solar orientation and shading to location of HVAC and renewable equipment, and material selection. Follow our case study through the design stage.

3 ENERGY STAR® Water Heating Choices – Achieve great savings from solar water heating systems, electric dedicated heat pump water heating and gas tankless systems. Learn how each of these systems works, including savings potential of combining solar with a heat pump or gas tankless. Instructors will show how to rate different systems and describe any maintenance considerations.

4 Selecting Solar Water Heating for Zero Energy Green Homes – Achieve renewable energy savings by providing solar water heating. Explore various types of solar water heating systems, typical savings and costs, and key features to specify based on climate and operation considerations.

5 Selecting Windows and Walls for a Zero Energy Green Home – Learn what matters when selecting windows and walls for your climate and your application. Our experts will tell you the energy savings you may expect and the important characteristics to look for when choosing windows and walls.

6 Constructing Roofs and Attics for a Zero Energy Green Home – Roof materials, attic insulation, duct location and radiant barrier systems are all covered in this webinar. Make the right roofing system choice to reduce energy use in your home.

SAVE THE DATE ★ NOVEMBER 17–19

AUSTIN, TEXAS

9th Annual International Conference for Enhanced Building Operations

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NOVEMBER 17 – 19

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- Improved building automation, controls and sensor accuracy
- Commissioning for Energy Star and LEED® (NC and EB) certifications
- CO_2 reduction through "Green Campus" and high performance building initiatives
- Achieving sustainability, saving energy, and improving occupant comfort
- Planning and designing intelligent buildings
- Successful utility programs for shaving peak demand from load-side HVAC management and thermal storage
- On-site renewable energy applications (wind, solar, fuel cell, etc.)
- Measuring and verifying performance of building improvements
- Success stories of combined heat and power (CHP) and distributed generation (DG)
- New Federal and State building energy efficiency initiatives
- International markets and collaboration for improving building performance

Workshops:

- Building Continuous Commissioning®
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International Conference
for Enhanced Building Operations
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3581 TAMU
College Station, Texas 77843-3581

Sixteenth Symposium on Improving Building Systems in Hot and Humid Climates

Marriott at Legacy Town Center, Plano, Texas
December 15-16, 2008

Focus: The purpose of the symposium is to accomplish knowledge and technology transfer for the building energy efficiency industry —from the laboratories of leading academic institutions, research organizations, U.S. Department of Energy's Building Technologies Program and from the best practices of operations professionals—to the building industry at large. Identification of new equipment, processes and methodologies is of major importance.

Where: The Symposium will be co-located with the Clean Air Through Energy Efficiency (CATEE) conference, Tuesday and Wednesday, December 16-17 in Dallas, Texas. You may also attend any of the CATEE sessions without paying additional registration fees. A variety of educational and informative workshops will be held on Wednesday, December 17th. You will also receive CEU credits for attending the Symposium and workshops.

Marriot Plano/Dallas at Legacy Town Center

7120 Dallas Parkway
Plano, Texas 75024 USA

Phone: 1-972-473-6444
Fax: 1-972-473-6440

Click here for map, directions and transportation from the hotel

Who: This is a benchmark year for the Symposium in that the Southern Energy Efficiency Center (SEEC) will be a primary supporter of the Symposium. The SEEC is comprised of the Florida Solar Energy Center, a research institute of the University of Central Florida, the Southface Energy Institute, a regional non-profit organization and the Energy Systems Laboratory at Texas A&M. The Symposium has traditionally been hosted by Texas A&M's Energy Systems Laboratory but with the recent creation of the SEEC, a DOE funded endeavor, the three member organizations will equally share the responsibility of hosting this and future Symposiums. The SEEC consortium will host the 17th Symposium in 2010 to be held in the Southeast United States.

Info: www.hothumidsymposium.org

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Info: www.hothumidsymposium.org

GREENPRINTS 2009

Sustainable Communities *by Design*

Conference and Tradeshow

Program of Events

March 25-26, 2009

Atlanta Hyatt Regency Hotel

Atlanta, Georgia

Hosted by

GEORGIA ENVIRONMENTAL FACILITIES AUTHORITY

Southface

www.greenprints.org

GREENPRINTS 2009
Sustainable Communities *by Design*

March 25, 2009

Dear Greenprints Participant,

Welcome to the 11th Annual Greenprints Conference and Tradeshow, hosted by the Georgia Environmental Facilities Authority (GEFA) and Southface Energy Institute.

This year, more than ever before, sustainability, energy efficiency and green buildings are foremost in our thoughts – from the country's large corporations to the local business community; from the federal government to the municipal governments of the cities we live and work in.

Once again, GEFA and Southface are proud to offer you the opportunity to learn the latest in sustainability trends and technologies from leaders in the green building industry. In addition, this year's Greenprints will provide a unique chance to discuss the federal stimulus plan and how it will impact us now and into the future.

We hope that Greenprints will also serve as a collective call-to-action. It is designed to provoke conversation, discussion and new ideas, so jump right in and fully participate in the presentations you attend. Conference sessions focused on residential and commercial buildings, rethinking suburban design, managing building waste and water use will inspire new ways of doing business. Discussions of policy issues from energy to water, plus an opportunity to view the sophisticated new products on display at the tradeshow, offer a roadmap to designing high-performance, sustainable buildings that benefit us all.

GEFA and Southface provide an array of green building services and energy efficiency programs. We hope you'll get to know us better and call on us for assistance.

Again, it is our pleasure to welcome you to Greenprints.

Sincerely,

Phil Foil
Executive Director
Georgia Environmental Facilities Authority

Dennis Creech
Executive Director
Southface

GEORGIA ENVIRONMENTAL FACILITIES AUTHORITY

The Georgia Environmental Facilities Authority (GEFA) Division of Energy Resources is proud to be involved in a number of energy programs that improve the quality of life for all Georgians. GEFA seeks to be creative in addressing energy issues through activities such as assessing statewide energy efficiency potential, advancing alternative fuels, promoting recycling initiatives and supporting one of the nation's most successful residential green building programs.

Southface

Southface promotes sustainable homes, workplaces and communities through education, research, advocacy and technical assistance. Each year, Southface reaches more than 50,000 design and building professionals, policy makers and consumers through efforts such as its commercial and residential green building services, EarthCraft House program and Sustainable Atlanta Roundtable.

Sponsorship

Southface and GEFA thank our sponsors, friends, benefactors and exhibitors for helping make Greenprints a successful, affordable, hands-on learning opportunity.

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The Conference and Tradeshow Overview

For the last 11 years, Greenprints has provided a forum for changing the way practitioners think about planning, architecture, construction and the use of natural resources. This year's highlight is our renowned keynote speaker Ed Mazria, who will discuss his work with the Architecture 2030 Challenge – the effort to make all new and renovated buildings carbon neutral by the year 2030.

A unique feature of Greenprints 2009 is the ULI "Conference within a Conference." Through collaboration with the Urban Land Institute-Atlanta, this embedded conference, which is held on the morning of March 26th, will include sessions on the real-world delivery of "green." In addition, Greenprints will host a half-day charrette and a half-day workshop on Thursday's menu of options. We hope you enjoy these and other aspects of this year's conference.

The Georgia Environmental Facilities Authority and Southface, together with our numerous other government and industry sponsors, thank you for attending Greenprints 2009.

Welcome Breakfast

Wednesday, March 25 8:15am
Welcoming remarks by Dennis Creech, executive director of Southface and Phil Foil, executive director of the Georgia Environmental Facilities Authority.
The breakfast buffet is included in your conference registration.

Luncheon and Keynote

Wednesday, March 25
11:30am-1:15pm

Ed Mazria, founder Architecture 2030.

Architecture 2030, a non-profit, non-partisan and independent organization, was established by architect Edward Mazria in 2002 in response to the global-warming crisis. 2030's mission is to rapidly transform the U.S. and global Building Sector from the major contributor of greenhouse gas emissions to a central part of the solution to the problem.

Edward Mazria is an internationally recognized architect with a long and distinguished career. His architecture and planning projects span a thirty-year period, and employ cutting-edge environmental approaches to design.

Conference Tracks

This Greenprints conference will feature tracks that focus on **Commercial and Residential Buildings, Community Design**, and **Green Cities.**

Commercial Track. Intended for design and building professionals, engineers and facility managers, this year's track will expand on lessons learned and focus on measuring and quantifying both the costs and benefits of green development.

Residential Track. Popular with builders, renovators, residential developers, architects, designers and realtors, this track shares experiences from leaders at the national policy level to those of cutting edge contractors working in single family and multifamily construction and renovation.

Communities Track. Developers, planners, policy makers and anyone interested in community development will enjoy the best of community design. A hands-on charrette will have participants exploring the real world challenges of designing innovative green communities.

Green Cities. Taking the cue that all sustainability is local, major American cities are making great strides toward sustainability. This track will strive to answer sustainability questions from the personal to the global perspective.

Urban Land Institute
Atlanta

Conference within a Conference

Conference within a Conference.
The Urban Land Institute (ULI) provides leadership in the responsible use of land to create thriving communities, both here in Atlanta and worldwide. ULI brings together leaders from across the fields of real estate and land use policy to exchange best practices and serve community needs. Learnings are distributed through a variety of channels including social media, publications, research and education.

Green Tradeshow

The Green Tradeshow features the latest products, services and emerging technologies in environmental design, development and construction, including:

- Exemplary green building products, materials and services
- Conveniently adjacent to conference workshops and sessions
- Special networking time during breaks

Celebrate the opening night of Greenprints with us on Wednesday evening at a reception in the Green Tradeshow Exhibit Hall. You will enjoy light appetizers and beverages as you visit the exhibits during these extended tradeshow hours. For a list of exhibitors, see page 6.

Closing Reception

The conference wind-down provides a chance to mix with other attendees and enjoy a toast to a greener world – to be located in the Exhibit Hall at the close of Greenprints.

WEDNESDAY
Schedule

Wednesday Morning

7:00am
Registration Open

7:30am
Breakfast

8:15am
Opening Remarks

9:00am
Exhibit Hall opens

9:00 - 9:45am
Morning Break
Exhibit Hall

9:45-11:15am
Morning Session

11:30am-1:15pm
Luncheon and Keynote address

Wednesday Afternoon

1:30-3:00pm
Early Afternoon Session

3:00-3:30pm
Afternoon Break
Exhibit Hall

3:30-5:00pm
Late Afternoon Session

5:00-6:30pm
Welcome Reception
Exhibit Hall

Residential Track
Wednesday

Sustainability and Modular Housing
9:45-11:15am

Subrato Chandra – *Florida Solar Energy Center*
Greg Alia - *Haven Custom Homes*
Laura Capps - *moderator, Southface*

Modular home technologies offer extensive opportunities for sustainable high performance residential construction. Case studies of high-performance modular homes will be presented and their performance compared to site-built homes.

Sustainability and Builder Operations
1:30-3:00pm

Duncan Prahl, *IBACOS*
David Ellis - *moderator, Greater Atlanta Home Builders Association*

Sustainability and high-performance building extend beyond technology and construction techniques. Learn how a company culture based on sustainability through strategic planning, design, sales, construction and customer care are essential for successful green building.

Home Performance with ENERGY STAR - Opportunities for Existing Homes
3:30-5:00pm

Chandler Von Schrader, *EPA*
Steve Herzlieb - *moderator, Southface*
Sandy Herrera, *Building Performance Diagnostics*
Bert Pierce, *Georgia Power*

A huge opportunity to green America lies with our existing building stock. Learn how *Home Performance with ENERGY STAR* improves the efficiency, comfort, and indoor air quality of existing homes.

The Residential Track is sponsored by the Pollution Prevention Assistance Division: P²AD

P²AD
POLLUTION PREVENTION ASSISTANCE DIVISION

Commercial Track
Wednesday

Prioritizing Green - It's The Energy, Stupid*
9:45-11:15am - **Master Speaker**

Joe Lstiburek, *Building Science Corporation*
Mike Barcik - *moderator, Southface*

Commercial failures are beginning to bubble to the surface and we are in danger of ruining the "green brand." Many green commercial buildings don't save energy.

Why? They have too much glass, are over-ventilated, leaky and fraught with thermal bridges. "Green" commercial buildings tend to rely on gimmicks and fads rather than physics, but "green" homes don't,... this is why they work. This is very scary if you are a "residential green" builder. We need to get "commercial green" right, to avoid screwing up "residential green".

**Credit to Architect Edward Mazria – I think he said this first – if he didn't say it first, he sure says it well!*

Solving IAQ Problems - Blame It on Star Trek
1:30-3:00pm - **Master Speaker**

Joe Lstiburek, *Building Science Corporation*
Mike Barcik - *moderator, Southface*

Whenever there is a complaint about air quality in a building, the first thing folks want to do is test the air. That is absolutely the worst thing to do. Do not start with air testing. Blame Star Trek! We grew up watching Spock go into a shuttle bay, do a tricorder scan and figure out that a tachyon field was causing the dilithium crystals to break down and that's why Uhura had a headache. In Star Trek you could measure everything and anything. That's not the way the real world works.

Civilians seem to think that we have the technology to go into a room, do a test, and determine what is in the air. As simple as that sounds, we can't do it. You cannot go into a space and ask a simple question such as "what is in the air?" There could be a million things in the air – literally. You have to ask a much more narrow question such as, is "this" in the air? Or is "that" in the air? The trick is to know what to ask. For that you need a hypothesis…

The Commercial Track is sponsored by Acuity Brands Lighting

AcuityBrands Lighting

Commercial Track continued...

Existing Buildings: Wasting Money Isn't as Much Fun as It Used to Be

3:30-5:00pm

Richard Heinisch, *Acuity Brands Lighting*
Kenneth B. Green, Jr., *Essex Engineering Corporation*
John Bracey, *Southface*

There is a huge opportunity to improve the energy performance of existing commercial building stock. Starting with realistic performance monitoring, poor performing buildings can be highlighted and quantified, allowing inexpensive operational improvements. Taking the next step to small or large scale renovations, there are numerous ways to greatly improve the performance of the building through envelope improvements, re-commissioning building systems, mechanical upgrades and lighting retrofits. Learn from the experts how to find and fix performance problems, and which upgrade strategies will result in substantial energy savings.

Thursday - workshop

Workshop: Using Wood Efficiently

9:00am-12:15pm

Peter Yost, *BuildingGreen LLC*
Sean Bleything - *moderator, Southface*

Optimizing design to minimizing the dumpster: This workshop will cover ALL aspects of how best to use this incredible building resource. You might be surprised at how many ways you can save money, time, labor, and the environment by making the highest and best use of wood during design – in specification, in construction, and even in landscaping and storm water management. It does not matter if you are a builder, an architect, a site supervisor or a lead carpenter - this session can help you build better homes using and disposing of less wood!

This session will run concurrently with the Thursday morning sessions.

Communities Track
Wednesday

Planning with Communities

9:45-11:15am

Mike Dobbins, *Georgia Tech*
Charles McMillan, *AEC, Inc.*

Blueprints for Successful Communities is a program of the Georgia Conservancy designed to facilitate community-based planning efforts. Atlanta regional communities are utilizing the program to achieve successful communities by creating sound conservation and growth strategies, and building consensus for action. Come and hear how it started and learn about Blueprints' accomplishments.

What Governments can Do to Spur Green Development

1:30-3:00pm

Tommy Linstroth, *Melaver Development*
Maia Davis, *Atlanta Regional Commission*

Noted green developer Tommy Linstroth will discuss the impacts local governments can have on sustainable development and greenhouse gas emissions. Case studies from Savannah to Portland will demonstrate how cities and counties across the country are not only decreasing emissions but keeping millions of dollars in their communities, and increasing the quality of life for their citizens. Features information from Linstroth's recent book, *Local Action: A New Paradigm in Climate Change Policy*. Maia Davis will discuss the ARC's Green Governments Program.

Agrarian Village - Developing Opportunities for Sustainability

3:30-5:00pm

Greg Ramsey, *Village Habitat Design*
Diane Burgoon, *Village Habitat Design*
Christina Corley - *moderator, Southface*

A fast way to sustainability? Grow your own food. Learn how this pioneering community planner is creating developments that reconnect residents to their food.

Green Cities Track
Wednesday

Governor's Energy Challenge

9:45-11:15am

Richard Ross, *GEFA*
PJ Newcomb, *GEFA*

ENERGY STAR, ARC Greening Governments, DCA Water First Program – Learn about these challenging programs for local governments to lead the way in energy and water conservation and government operations.

Energy Capacity through Conservation

1:30-3:00pm

Harold Crowder, *Dominion Power Representative*

Harold Crowder will discuss their program of energy conservation through efficiency improvements. Learn what forward-thinking utility providers see as the solution to increasing demand for power.

Green Roofs for Healthy Cities

3:30-5:00pm

Jennifer Sprout, *Green Roofs for Healthy Cities*
Bourke Reeve - *moderator, Southface*

Come hear about the latest professional accreditation designation, Green Roof Professional (GRP), and how this designation will differentiate you in the marketplace, particularly as more incentives are incorporated into municipal policies. Also, learn from the industry experts how their professional approach helps them win new green roof jobs.

Thursday - charrette

Communities Charrette *1:30-5:00pm*

Jeff Taylor, *Better Housing Coalition*
Matthew J. Fitzgerald, *Urban Design Associates*
Bob Newman, *Better Housing Coalition*

Facilitators:
Shannon Kettering, *ECOS Environmental*
Robert Reed, *Southface*
Christina Corley, *Southface*

Shannon Kettering of ECOS Environmental Design and Robert Reed and Christina Corley of Southface facilitate a charrette of an affordable housing development in Richmond, Virginia. The project represents all of the challenges of an intown site in a historic neighborhood. Participants will plan site layout, sustainability features and preliminary architectural design and will gain knowledge on sustainable development while applying their creativity and knowledge to an actual project in its planning process.

This session will run concurrently with the Thursday afternoon sessions.

THURSDAY
Schedule

Thursday Morning

7:00am
Registration opens

7:30am
Exhibit Hall opens

7:30-9:00am
Breakfast inside Exhibit Hall

9:00am - 12:15pm
Using Wood Efficiently - Workshop

Urban Land Institute
Atlanta

Conference within a Conference

9:00-10:30am
Early Morning Session

10:30-10:45am
Morning Break
Exhibit Hall

10:45am-12:15pm
Late Morning Session

12:15-1:30pm
Lunch
Exhibit Hall

Thursday Afternoon

1:30-5:00
Communities Charrette

1:30-3:00pm
Early Afternoon Session

3:00-3:30pm
Afternoon Break
Exhibit Hall

3:30-5:00pm
Late Afternoon Session

5:00-6:30pm
Closing Reception
Exhibit Hall

Residential Track
Thursday

The Green Market
9:00-10:30am

Sarah Kirsch, *RCLco*
Bill de St. Aubin - *moderator, Sizemore Group*

In today's economic climate, what's the demand for green homes? What features and benefits do buyers really care about? Kirsch shares market research to help developers find the ideal balance between environmental green and financial green.

Financing Sustainable Development
10:45am-12:15pm

Doug Lawrence, *JP Morgan*
Bill de St. Aubin - *moderator, Sizemore Group*

Sustainability is creating fundamental changes to how companies invest in real estate. Learn more about sustainability as a profitable strategy that preserves and grows capital and in turn ensures competitiveness in the ever-changing financial marketplace.

Green Jobs - Big Challenges/Big Opportunities
1:30-3:00pm - **Master Speaker**

Edward Pollock, *Residential Team Leader, Building Technologies Program – US Department of Energy*
Robin Vieira - *moderator, Florida Solar Energy Center*

National and global challenges present opportunities for the creation of jobs and the development of a new workforce dedicated to meeting the energy needs of the future.

Dovetailing Green Building and Building Science: How do green building, building science, quality and durabilty all fit together?
3:30-5:00pm

Peter Yost, *Building Green*
Duncal Prahl - *moderator, IBACOS*

The heart of high-performance/low environmental impact homes lies in the relationships among these often separated or even ignored connections. This session will convince you that all four of these need to fit together to increase value and decrease the cost of green homes. The session will also include coverage of the: LEED for Homes Innovative Design Process prerequisite, and credit for Quality Management for Durability.

P2AD
POLLUTION PREVENTION ASSISTANCE DIVISION

Residential Track Sponsor

Commercial Track
Thursday

"Building Design for the Market with LEED" and "What Does a LEED Building Cost?"
9:00-10:30am

Simon Tuohy, *Urban Realty Partners*
Rick Bizot, *Surber Barber Choate & Hertlein*
Tommy Linstroth, *Melaver, Inc.*
Dennis Hertlein - *moderator, Surber Barber Choate & Hertlein*

Oakland Park, an award winning mid-rise condominium project, will open its books and show you how to make your development truly green and comparably successful. Come hear how this project was transformed mid-design from a standard urban infill project into Atlanta's first LEED-certified condominiums. You'll learn which sustainability strategies were incorporated, what costs were incurred and where savings were found.

The Value of Green in Commercial Real Estate
10:45am-12:15pm

Greg O'Brien, *Sustainable Options, LLC*
Gary Ellis - *moderator, Winter Environmental*

While the 'value of green' may have different measurements based on differing perspectives, most of the real estate world calculates the value of green in dollars and cents. O'Brien will identify and discuss 'LEED for Existing Buildings,' some related green real estate initiatives and how these impact value while supporting the sustainability objectives that owners and tenants expect.

The Cost of Living Buildings: The Effect that Climate, Building Type and Incentives have on Creating the Buildings of Tomorrow
1:30-3:00pm

Lisa Petterson, *SERA Architecture*
Beth Heider, *Skanska USA Building Inc.*
Candice Groves - *moderator, Southface*

In the two years since the Living Building Challenge was announced, there has been growing interest from clients and design firms attracted by the simplicity of the concept and an appreciation for the new milestone it defines on the path to a restorative future. Often, the question that arises after clients begin to comprehend what's involved in building a Living Building is "what is the cost premium?"

This session will answer that question, presenting the findings of the study, "Cost of Living Buildings," currently being finalized. The study, led by SERA Architects joined by Skanska USA Building, Gerding/Edlen Development, New Buildings Institute and Interface Engineering, was commissioned by Cascadia to shed light

Commercial Track continued...

on what is perceived as a limiting factor for Living Buildings: Cost. For the study, the team conceptually transformed nine LEED Gold buildings into Living Buildings in four different climate zones.

Make Your Existing Building a Lean, Green Machine: Good for the Environment, Good for Business

3:30-5:00pm

Tom Boeck, *Sustainable Options*
Evan Tyroler, *Cassidy & Pinkard Colliers*
Annalisa Givens, *Cassidy & Pinkard Colliers*
Brandon Jones - *moderator, Southface*

How do you "green" an existing building? How do you capture the "value" of green? Tom Boeck will discuss different rating systems and programs involved in the greening of existing building operations and maintenance. His discussion will include how to measure and assess the value of green policies and practices, and will highlight low-hanging fruit that can be used now to help reduce energy consumption and incorporate sustainability into your building operations.

Evan Tyroler and Annalisa Givens will highlight a LEED-EB O&M case study in Washington, DC, including timeline, budget and actual costs incurred during the project. This presentation will focus on how the team coordinated with the different owners, tenants and vendors during the certification process. Additionally, they will touch upon how each of these entities interacted with one another, and how they all responded to the various sustainability efforts pursued.

Topics include:

- Costs associated with pursuing LEED-EB O&M
- Creation of organization-wide policies
  - Implementation at the property level
  - Best management practices
- Obstacles during the certification process
- Innovative tools - Excel calculators and templates
- Tenant involvement – hesitations/ reservations
- Owner interactions

AcuityBrands Lighting

Commercial Track Sponsor

Communities Track
Thursday

Brownfield Development 201

9:00-10:30am

Scott Condra, *Jacoby Development*
Jeff DuFresne - *moderator, ULI Atlanta District Council*

Delve into the current state of brownfield redevelopment in metro Atlanta and how the opportunities and challenges have evolved over the past 10 years. Condra shares insights and examples from Airport Station (the Hapeville Ford plant redevelopment) in contrast with brownfield development a decade ago when Atlantic Station was transforming from a steel mill to the mixed-use development it is today.

Re-building the Suburbs– Development Opportunities

10:45am-12:15pm **Master Speaker**

Ellen Dunham-Jones, *Georgia Tech*
Jeff DuFresne - *moderator, ULI Atlanta District Council*

Ellen Dunham-Jones, author of *Retrofitting Suburbia* and Director of the Architecture Program at Georgia Tech, will show examples of transformations of dead malls, office parks, and other "underperforming asphalt" into more sustainable, more marketable places. Participants will never look at a strip mall the same way again!

Telling your Sustainability Story in a Cluttered Market

1:30-3:00pm

Dana Hartline, *Edelman*
Tony Wilbert, *Edelman*
Jim Hackler, *The Urbane Environmentalist*

So many products and services are claiming to be environmentally-friendly that the public is suffering from "green fatigue." How do you avoid adding to the eco-confusion? Two top communication experts share their tips on how to effectively tell your sustainability story.

Making Walkable Urbanism Legal

3:30-5:00pm

Dan Slone, *McGuire Woods*

The development form of walkable mixed-use communities, now in great demand, is currently illegal in most places. Learn what to look for as your community changes its laws to meet this demand and move us closer to sustainability at the same time.

Green Cities Track
Thursday

Green Liabilities — From Brownfield Remediation to LEED Commitments

9:00-10:30am

Scott Hitch, *Balch & Bingham, LLP*
Dana Hartline - *moderator, Edelman*

As developers look at green projects, potential liabilities abound. Hitch discusses potential pitfalls, corresponding safeguards and best practices to ensure proper protection is in place, whether you're pursuing brownfield redevelopment, making commitments to be LEED certified, or taking on other green projects.

Sustainability: Mandates, Incentives & Workable Solutions

10:45am-12:15pm

Panelists:
JocCole Burton, *Woodline Solutions*
Katharine Kelley, *Greenstreet Properties*
Leah Knowlton, *Epstein, Becker Green, P.C.*
Nick Masino, *Gwinnett County Chamber of Commerce*
Daniel H. Sherman,IV - *moderator, Epstein, Becker Green, P.C.*

What exists, what's coming and what might the future hold? This diverse panel will examine economic and other incentives available within a variety of local jurisdictions as well as mandates/ordinances and real-life solutions aimed at encouraging and facilitating sustainable planning, development, design, and vertical construction.

City of the Future

1:30-3:00pm

Eric Bishop, *EDAW*
Todd Hill, *EDAW*

Come meet the design team that won a History Channel competition for designing a city of the future. See their vision for how Atlanta should grow and how it can bring natural systems back into the inner city.

Food: Urban Agriculture

3:30-5:00pm

Alice Rolls, *Georgia Organics*

Organics and CSA (Community Supported Agriculture) demand outstrips supply. Development projects can help. More and more people are demanding to know where their food comes from. Learn how pioneering citizens are fulfilling this demand - sometimes from their own backyard.

Green Tradeshow

Please make a point to introduce yourself to the exhibitors to gather information about the latest green building products and services.

2RW Consultants, Inc.
Booth #75
Green Engineering Consultants
100 10th Street NE
Charlottesville, VA 22902
Phone: (434) 296-2116
Email:laurie@2rw.com
Website: www.2rw.com

Alterna Corp
Booths # 36 & 37
Resource Conservation
2045 Attic Parkway
Kennesaw, GA 30152
Phone: (404) 316-7718
Email:vstewart@alternacorp.com
Website: www.alternacorp.com

Apogee Interactive
Booth # 31
Online technology solutions for the energy industry
100 Crescent Centre Parkway Suite 450
Tucker, GA 30084
Phone: (678) 684-6800
Email:kperkins@apogee.net
Website: www.apogee.net

Benjamin Moore Paint & Coatings
Booth #39
Paint
1977 Fairway Circle
Atlanta, GA 30319
Phone: (678) 794-8176
Email:randall.smith@benjaminmoore.com
Website: www.benjaminmoore.com

Blue Ridge Atlantic Enterprises
Booth #38
Rainwater Harvesting Systems
307 North Main Street
Oakboro, NC 28129
Phone: (704) 307-4317
Email:sgoldsmith@braewater.com
Website: www.braewater.com

Building Green, LLC
Booth #46
Green Building Advisor
122 Birge Street Suite 30
Brattleboro, VT 5301
Phone: (802) 257-7300
Email:julia@buildinggreen.com
Website: www.buildinggreen.com

Centria Architectural Systems
Booth #32
Metal wall panels & roofing
2325 Gladstone Place
Cumming, GA 30041
Phone: (678) 947-4407
Email:bcheeley@centria.com
Website: www.centria.com

Cosella Dorken Products Inc
Booth # 59
DELTA DRAIN & DELTA DRY
4655 Delta Way
Beamsville, ON LORIB4
Phone: (905) 563-3255
Email:jranalli@cosella-dorken.com
Website: www.cosella-dorken.com

EFI - Booth #28
Air sealing ventilation / energy efficient lighting
40 Washington Street
Westborough, MA 1501
Phone: (508) 870-2277
Email:joconnell@efi.org
Website: www.efi.org/wholesale

Ernst & Morris Energy Tax Savers
Booth # 68
Cost Segregation and §179D Energy Efficiency studies
2190 Dallas Highway
Marietta, GA 30064
Phone: (770) 427-4000
Email:marnold@costseg.com
Website: www.costsegandenergy.com

Forbo Flooring Systems
Booth #72
Linoleum flooring
8 Maplewood Drive
Hazelton, PA 18202
Phone: 1-800-842-7839
Email:tiffany.wysocki@forbo.com
Website: www.forboflooring.com

Georgia Environmental Facilities Authority (GEFA)
Booth # 69
GEFA is a state agency that administers a wide variety of programs that provide financial assistance and other support services to improve Georgia's environment
233 Peachtree Street NE Harris Tower
Suite 900
Atlanta, GA 30303
Phone: (404) 584-1077
Email:jwilson@gefa.ga.gov
Website: www.gefa.org

Georgia Concrete and Products Association
Booth # 64
Pervious pavement and retaining walls
100 Crescent Center Parkway #665
Tucker, GA 30084
Phone: (770) 621-9324
Email:gkenna@mail.gcpa.org
Website: www.gcpa.org

Georgia Pacific Gypsum
Booth # 58
Paperless Drywall
65 Dove Court
McDonough, GA 30252
Phone: (678) 525-9763
Email:mswolf@gapac.com
Website: www.gp.com

Georgia Tech Building Construction Program
Booth # 33
Professional Master's program with emphasis on green building
280 Ferst Drive, 1st Floor
Atlanta, GA 30332
Phone: (404) 385-7479
Email:brenda.morris@coa.gatech.edu
Website: www.beprogram.com

Greater Atlanta Home Builders Association, HomeAid Atlanta and Certified Professional Home Builders
Booth #45
Home Builders Association
P.O. Box 450749
Atlanta, GA 31145
Phone: (678) 775-1403
Email:ameadows@atlantahomebuilders.com
Website: www.hbag.com

GreenGrid
Booth #49
Green Roofs
5430 Metric Place
Norcross, GA 30092
Phone: (770) 325-7972
Email:Greg.Harper@Westonsolutions.com
Website: www.greengridroofs.com

Green-Way Industries
Booth #52
Foam insulation
956 Cordova Drive NE
Atlanta, GA 30324
Phone: (336) 462-4012
Email: donsmith10@comcast.net

Gro-Eco, LLC
Booth #24
Eco Friendly Landscaping
P.O. Box 262
Madison, FL 32341
Phone: (770) 639-2778
Email:kristi.turner@gro-eco.com
Website: www.gro-eco.com

Hannah Solar, LLC
Booth # 44
Solar energy developers, PV, Solar Thermal & Wind systems
1901 Walthall Drive
Atlanta, GA 30318
Phone: (404) 790-6911
Email:pete.marte@hannahsolar.com
Website: www.hannahsolar.com

Icynene
Booth #60
Open cell spray foam insulation
3347 Duluth Highway 120
Duluth, GA 30096
Phone: (678) 232-7597
Email:pbrown@comptonsales.com
Website: www.icynene.com

John Q Bullard Associates, Inc.
Booth # 35
Commercial / Residential HVAC equipment
1448 Tullie Road, NE
Atlanta, GA 30329
Phone: (404) 633-2507
Email:ryand@jqbullard.com
Website: www.jqbullard.com

Kohler
Booth #s 62 & 63
Water conserving fixtures
406 Acorn Chase
Canton, GA 30114
Phone: (678) 447-8612
Email:kenneth.shear@kohler.com
Website: www.kohler.com

KONE, Inc.
Booth # 71
Elevators, escalators and autowalks
1800 Sandy Plains Parkway Suite 200
Marietta, GA 30066
Phone: (770) 427-3373
Email:Danielle.Torrence@kone.com
Website: www.kone.com

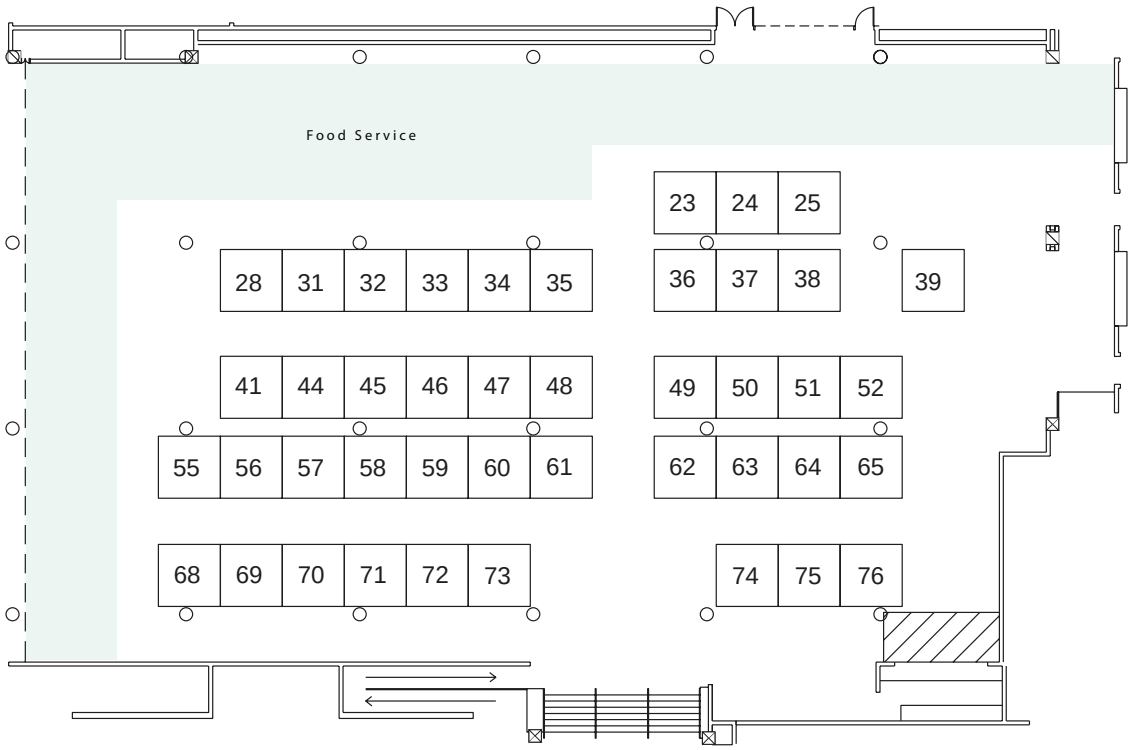
Nichiha USA
Booth # 50
Interior/exterior green cladding materials
6659 Peachtree Industrial Blvd. Suite AA
Norcross, GA 30092
Phone: (770) 805-9466
Email:kbodily@nichiha.com
Website: www.nichiha.com

Panasonic Home & Environment Company
Booth # 55
Ventilation Fans
One Panasonic Way
Seacaucus, NJ 7094
Phone: (201) 392-4580
Email:costelloa@us.panasonic.com
Website: www.panasonic.com/building

Pella Southeast Windows & Doors
Booth 73
Windows and Doors
2605 North Berkeley Lake Road
Duluth, GA 30096
Phone: (678) 638-1411
Email:dziadie@pellasoutheast.com
Website: www.pella.com

PolySteel Southeast
Booth # 41
ICFs
2545 Highway 17
Toccoa, GA 30577
Phone: (706) 886-5914
Email:twoody@polysteelsoutheast.com
Website: www.Polysteelsoutheast.com

Exhibit Hall



Power Partners Solar
Booth #48
Solar thermal collector manufacturer
700 Mitchell Bridge Road #22
Athens, GA 30606
Phone: (706) 548-3121 x 416
Email:deborah.purcell@powerpartners-usa.com
Website: www.PowerPartnersSolar.com

SouthEast Solar Co.
Booth 61
Solar thermal products
2670 N.Berkeley Lake Rd, Suite 5
Duluth, GA 30096
Phone: (678) 957-8454
Email:southeastsolar@gmail.com
Website: www.southeastsolar.net

Southface
Booth # 56 & 57
241 Pine Street
Atlanta, GA 30308
Phone: (404) 604-3596
Email:sconnell@southface.org
Website: www.southface.org

Southface Book Signing
Booth # 65
Conference speaker book signings

Square Foot Design & Build
Booth # 23
Building / Remodeling
509 Millwood Court
Canton, GA 30114
Phone: (770) 345-5932
Email:squarefoot@windstream.net
Website: www.livegreenga.com

Surber Barber Choate & Hertlein Architects, P.C.
Booth # 51
Architectural Firm specializing in Sustainable design
1776 Peachtree Street NW Suite 700 South
Atlanta, GA 30309
Phone: (404) 872-8400
Email:msnider@sbcharch.com
Website: www.sbcharch.com

Sustainable Forestry Initiative
Booth #25
Sustainable Forestry
1600 Wilson Blvd. Suite 810
Arlington, VA 22209
Phone: (703) 875-9500
Email:lisa.fox@sfiprogram.org
Website: www.sfiprogram.org

US Department of Energy - Builders Challenge
Booth #70
How to build a zero energy home
ORNL-1 Bethel Valley Road
Oakridge, TN 37831
Phone: (865) 574-4346
Email:Lovepm@ornl.gov
Website: www.buildingamerica.gov/challenge

USGBC
Booth # 76
Georgia chapter of the USGBC
2 Martin Luther King, Jr. Drive, SE Suite 1253
Atlanta, GA 30334
Phone: (404) 656-6531
Email:davidf@dnr.state.ga.us
Website: www.usgbc.org

Vinyl Siding Institute
Booth #34
Certified vinyl siding products and programs
1201 15th Street NW
Washington, D.C. 20005
Phone: (202) 587-5106
Email:kriddick@vinylsiding.org
Website: www.vinylsiding.org

WaterFurnace International, Inc.
Booth # 74
Georthermal heating, cooling, and hot water systems
9000 Conservation Way
Fort Wayne, IN 46809
Phone: (770) 487-4139
Email:manny.cromartie@waterfurnace.com
Website: www.waterfurnace.com

Wood Works
Booth #47
Wood promotions through educational programs
8549 Spring Breeze Terrace
Suwanee, GA 30024
Phone: (404) 502-6183
Email:pat@woodworks.org
Website: www.woodworks.org

Speakers and Moderators

Greg Alia
Haven Custom Homes
Residential Track
Sustainability and Modular Housing
Wednesday, 9:45am

Mike Barcik
Commercial Track
Solving IAQ Problems
Wednesday, 9:45am
Prioritizing Green - It's The Energy Stupid
Wednesday, 1:30pm

Eric Bishop
EDAW, Inc.
Green Cities Track
City of the Future
Thursday, 1:30pm

Rick Bizot
Surber Barber Choate & Hertlein Architects
Commercial Track
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Make Your Existing Building a Lean, Green Machine
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Diane Burgoon
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Communities Track
Agrarian Village - Develop Opportunities for Sustainability
Wednesday, 3:30pm

JocCole Burton
Woodline Solutions
Green Cities Track
Sustainability:Mandates, Incentives & Workable Solutions
Thursday, 10:45am

Laura Capps
Southface
Residential Track
Sustainability and Modular Housing
Wednesday, 9:45am

Subrato Chandra
Florida Solar Energy Center
Residential Track
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Scott W. Condra
Jacoby Development, Inc.
Communities Track
Brownfield Development 201
Thursday, 9:00am

Christina Corley
Southface
Communities Track
Agrarian Village
Wednesday, 3:30pm
Communities Charrette
Thursday, 1:30pm

Harold Crowder
Dominion Power
Green Cities Track
Energy Capacity through Conservation
Wednesday, 1:30pm

Maia Davis
Atlanta Regional Commission
Communities Track
What Governments can do to spur Green Development
Wednesday, 1:30pm

Bill de St. Aubin
Sizemore Group
Residential Track
The Green Market
Thursday, 9:00am
Financing Sustainable Development
Thursday, 10:45am

Mike Dobbins
College of Architecture, Georgia Tech
Communities Track
Planning with Communities Track
Wednesday, 9:45am

Jeff DuFresne
ULI Atlanta District Council
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Re-building the Suburbs–Development Opportunities
Thursday, 10:45am

Ellen Dunham-Jones
Georgia Tech
Communities Track
Re-building the Suburbs Development Opportunities
Thursday, 10:45am

David Ellis
Greater Atlanta Home Builders Assoc.
Residential Track
Sustainability and Builder Operations
Wednesday, 1:30pm

Gary Ellis
Winter Environmental
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The Value of Green in Commercial Real Estate
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Jim Hackler
The Urbane Environmentalist, LLC
Communities Track
Telling your Sustainability Story in a Cluttered Market
Thursday, 1:30pm

Dana Hartline
Edelman
Green Cities Track
Green Liabilities
Thursday, 9:00am
Communities Track
Telling your Sustainability Story in a Cluttered Market
Thursday, 1:30pm

Elizabeth J. Heider
Skanska USA
Commercial Track
The Cost of Living Buildings
Thursday, 1:30pm

Richard Heinisch
Acuity Brands Lighting, Inc.
Commercial Track
Existing Buildings
Wednesday, 3:30pm

Sandy Herrera
Building Performance Diagnostics, Inc.
Residential Track
Home Performance with ENERGY STAR
Wednesday, 3:30pm

Dennis Hertlein
Surber Barber Choate & Hertlein Architects
Commercial Track
Building Design for the Market with LEED
Thursday, 9:00am

Steve Herzlieb
Southface
Residential Track
Home Performance with ENERGY STAR
Wednesday, 3:30pm

Todd Hill
EDAW / AECOM
Green Cities Track
City of the Future
Thursday, 1:30pm

Scott Hitch
Balch & Bingham, LLP
Green Cities Track
Green Liabilities
Thursday, 9:00am

Brandon Jones
Southface
Commercial Track
Make Your Existing Building a Lean, Green Machine
Thursday, 3:30pm

Katharine Kelley
Greenstreet Properties
Green Cities Track
Sustainability:Mandates, Incentives & Workable Solutions
Thursday, 10:45am

Shannon Kettering
Ecos Environmental Design, Inc.
Communities Track
Communities Charrette
Thursday, 1:30pm

Sarah Kirsch
RCLco
Residential Track
The Green Market
Thursday, 9:00am

Leah J. Knowlton
Epstein, Becker Green, P.C.
Green Cities Track
Sustainability:Mandates, Incentives & Workable Solutions
Thursday, 10:45am

Doug Lawrence
JP Morgan Chase Urban Renaissance Fund
Residential Track
Financing Sustainable Development
Thursday, 10:45am

Tommy Linstroth
Melaver Inc.
Commercial Track
Building Design for the Market with LEED
Thursday, 9:00am
Communities Track
What Governments can do to spur Green Development
Wednesday, 1:30pm

Joe Lstiburek
Building Science Corporation
Commercial Track
Solving IAQ Problems
Wednesday, 9:45am
Prioritizing Green - It's The Energy Stupid
Wednesday, 1:30pm

Nick Masino
Gwinnett County Chamber of Commerce
Green Cities Track
Sustainability: Mandates, Incentives & Workable Solutions
Thursday, 10:45am

Ed Mazria
Architecture 2030
Conference Keynote
Conference Keynote
Wednesday, 11:30am

Charles McMillan
AEC, Inc.
Communities Track
Planning with Communities
Wednesday, 9:45am

PJ Newcomb
Georgia Environmental Facilities Authority
Green Cities Track
Governors Energy Challenge
Wednesday, 9:45am

Bob Newman
Better Housing Coalition
Communities Track
Communities Charrette
Thursday, 1:30pm

Greg O'Brien
Sustainable Options, LLC
Commercial Track
The Value of Green in Commercial Real Estate
Thursday, 10:45am

Lisa Petterson
Sera Architecture
Commercial Track
The Cost of Living Buildings
Thursday, 1:30pm

Bert Pierce
Georgia Power
Residential Track
Home Performance with ENERGY STAR
Wednesday, 3:30pm

Edward Pollock
US DOE
Residential Track
Green Jobs - Big Challenges/Big Opportunities
Thursday, 1:30pm

Duncan Prahl
IBACOS
Residential Track
Sustainability and Builder Operations
Wednesday, 1:30pm

Greg Ramsey
Village Habitat Design
Communities Track
Agrarian Village - Develop Opportunities for Sustainability
Wednesday, 3:30pm

Robert Reed
Southface
Communities Track
Communities Charrette
Thursday, 1:30pm

Bourke Reeve
Southface
Green Cities Track
Green Roofs for Healthy Cities
Wednesday, 3:30pm

Alice Rolls
Georgia Organics
Green Cities Track
Food: Urban Agriculture
Thursday, 3:30pm

Richard Ross
Georgia Environmental Facilities Authority
Green Cities Track
Governors Energy Challenge
Wednesday, 9:45am

Daniel H. Sherman, IV
Epstein, Becker Green, P.C.
Green Cities Track
Sustainability:Mandates, Incentives & Workable Solutions
Thursday, 10:45am

Daniel K. Slone
McGuire Woods
Communities Track
Making Walkable Urbanism Legal
Thursday, 3:30pm

Jennifer Sprout
Green Roofs for Healthy Cities
Green Cities Track
Green Roofs for Healthy Cities
Wednesday, 3:30pm

Jeff Taylor
Better Housing Coalition
Communities Track
Communities Charrette
Thursday, 1:30pm

Simon J. Tuohy
Urban Realty Partners
Commercial Track
Building Design for the Market with LEED
Thursday, 9:00am

Evan K. Tyroler
Cassidy & Pinkard Colliers
Commercial Track
Make Your Existing Building a Lean, Green Machine
Thursday, 3:30pm

Robin Vieira
Florida Solar Energy Center
Residential Track
Green Jobs - Big Challenges/Big Opportunities
Thursday, 1:30pm

Chandler von Schrader
EPA
Residential Track
Home Performance with ENERGY STAR
Wednesday, 3:30pm

Tony Wilbert
Edelman
Communities Track
Telling your Sustainability Story in a Cluttered Market
Thursday, 1:30pm

Peter A. Yost
BuildingGreen, LLC
Residential Track
Using Wood Efficiently - Workshop
Thursday, 9:00am
Residential Track
Dovetailing Green Building/Building Science
Thursday, 3:30pm

Greenprints 2009 Advisory Committee

Thanks to our Greenprints 2008 Advisory Committee for your guidance on this year's curriculum!

Cyrus Bhedwar, Southeast Regional Manager, ICLEI: Local Governments for Sustainability

Tim Block, The Home Depot Foundation

Susan Garrett, The Home Depot Foundation

Tom Gehl, Deputy Director, Government Relations, Georgia Municipal Association

Mandy Schmidt, Director of Sustainability, City of Atlanta

Henry Slack, U.S. Environmental Protection Agency

Tracy Williams, Outreach Program Manager, Georgia Environmental Facilities Authority

About the Hyatt Hotel

Globally, the Hyatt Corporation is dedicated to providing safe and comfortable accommodations and workspaces for guests and associates, minimizing the environmental impact of its hotels, and caring for the environment and communities in which it operates.

Some of the conservation measures in place are:

Water Conservation

- Low-flow bathroom fixtures installed in all areas, and automatic faucets in public area restrooms.
- Guestroom linens are replaced every third day as opposed to daily.

Energy Conservation

- All major pumping systems are controlled by variable-speed drives for improved efficiency.
- Public area lighting has been extensively retrofitted to fluorescent, compact fluorescent and HID.
- Utilization of state-of-the-art energy management systems for air handling and lighting systems.

Pollution Prevention and Reduction

- Recycling of used bulbs, batteries and ballasts.
- Use of electronic reporting to reduce paper.
- Check-in kiosks reduce paper usage.
- Consolidation of rooms on low occupancy days to reduce energy consumption.
- Extensive use sustainably manufactured and recycled carpet.
- Composting of kitchen waste.

Continuing Education Credits

Southface's Affiliation with Continuing Education Programs

American Institute of Architects (AIA)
www.aia.org

Residential Energy Services Network (RESNET)
www.natresnet.org

Building Performance Institute
www.bpi.org

Southface is a Registered Provider with the American Institute of Architects Continuing Education Systems. Therefore, we will be responsible for reporting to the AIA/CES the names of all AIA members. At the end of each of our workshops, a certificate will be given to the participant. This certificate should be used to self-report to all other Continuing Education Programs. It is the participant's responsibility to keep a copy of the certificate received for documentation of CEUs earned. AIA requires each attendee to sign in at each educational session. All CEUs and certificates for self-reporting must be requested at the conference.

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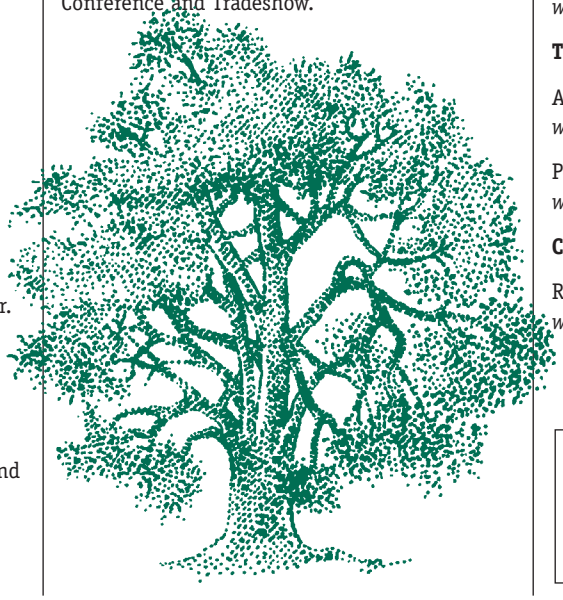

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For media inquiries, please contact:
Judy Knight
phone 404-604-3591
email jknight@southface.org

GREENPRINTS 2009
Sustainable Communities *by Design*

Conference Schedule at a glance

Wednesday	Residential	Commercial	Communities	Green Cities
7:00 am	Registration Opens			
7:30 am	Breakfast			
8:15 - 9:00 am	Opening Remarks			
9:15 - 9:45 am	Break in Exhibit Hall			
9:45 - 11:15 am	Sustainability and Modular Housing	Prioritizing Green - It's The Energy, Stupid! Master Speaker: Joe Lstiburek	Planning with Communities	Governor's Energy Challenge
11:30 am - 1:15 pm	Lunch and Keynote - Edward Mazria			
1:30 - 3:00 pm	Sustainability and Builder Operations	Solving IAQ Problems - Blame It on Star Trek	What Governments Can Do to Spur Green Development	Energy Capacity through Conservation
3:00 pm - 3:30 pm	Break in Exhibit Hall			
3:30 - 5:00 pm	Home Performance with ENERGY STAR - Opportunities for Existing Homes	Existing Buildings: Wasting Money Isn't as Much Fun as It Used to Be	Agrarian Village - Developing Opportunities for Sustainability	Green Roofs for Healthy Cities
5:00 - 6:30 pm	Welcome Reception in Exhibit Hall			
Thursday	**Residential**	**Commercial**	**Communities**	**Green Cities**
7:00 am	Registration			
7:30 am	Exhibit Hall Opens			
7:30 - 9:00 am	Breakfast Inside Exhibit Hall			
Concurrent Thursday session - morning - 9:00 - 12:15, Workshop: Using Wood Efficiently				
ULI 'Conference within a Conference'				
9:00 - 10:30 am	The Green Market	"Building Design for the Market with LEED" and "What Does a LEED Building Cost?"	Brownfield Development 201	Green Liabilities — From Brownfield Remediation to LEED Commitments
10:30 - 10:45 am	Break in Exhibit Hall			
10:45 am - 12:15 pm	Financing Sustainable Development	The Value of Green in Commercial Real Estate	Re-building the Suburbs - Development Opportunities Master Speaker - Ellen Dunham-Jones	Sustainability: Mandates, Incentives & Workable Solutions
12:15 - 1:30 pm	Lunch in Exhibit Hall			
Concurrent Thursday session - afternoon - 1:30 - 5:00pm, Communities charrette				
1:30 - 3:00 pm	Green Jobs - Big Challenges/Big Opportunities Master Speaker: Edward Pollock	The Cost of Living Buildings: The Effect that Climate, Building Type and Incentives have on Creating the Buildings of Tomorrow	Telling your Sustainability Story in a Cluttered Market	City of the Future
3:00 - 3:30 pm	Break in Exhibit Hall			
3:30 - 5:00 pm	Dovetailing Green Building and Building Science: How do green building, building science, quality and durabilty all fit together?	Make Your Existing Building a Lean, Green Machine: Good for the Environment, Good for Business	Making Walkable Urbanism Legal	Food: Urban Agriculture
5:00 - 6:30 pm	Closing Reception In Exhibit Hall			

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