

Buildings and Renewable Energy

Wednesday, November 5th, 2014, 7:00 – 9:00 PM – The ArtsCenter

- **Climate Protection Planning in Carrboro** *Randy Dodd, Town of Carrboro Environmental Planner*
 - **Passive and Active Solar Energy Opportunities for Your Home, featuring an Interactive 3-D Model,** *David Clinton, Architect, Principal at Szostak Design Inc. and Planning Board Member*
 - **Energy Conservation,** *John Hines, Marketing Representative of Piedmont Electric Membership Corporation*
 - **Base Hits, Strike Outs, and Home Runs: Twenty Renewable Energy Businesses I Have Loved,** *Lyle Estill, V.P. of Staff for Piedmont Biofuels and Serial Entrepreneur*
 - **Interactive Discussion**
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Buildings and Renewable Energy Carrboro Forum on Climate Change Protection:

Summary and Recommendations for Action

Executive Summary

The purpose of this forum was to engage the Carrboro community with town officials and industry experts in an effort to learn about and discuss the likely prospect of climate change, its contributing factors, and what individuals and the Town may do to adapt to ensuing change while also mitigating further negative consequences through responsible, sustainable building and energy usage practices today and in the future.

Expert speakers included Randy Dodd, Town of Carrboro Environmental Planner, who discussed town-wide issues related to planning for climate change and protection; followed by Rob Pinder of Solarize Orange County, a non-profit that works to promote solar energy solutions in the region. John Hines, Marketing Representative for Piedmont Electric Membership Corporation, discussed smart energy use within the individual's home, a topic which was further enriched by David Clinton's presentation and model featuring active and passive solar energy options. Finally, entrepreneur Lyle Estill shared his many and varied experiences in renewable energy and related business start-ups.

Attendees then engaged in an open discussion forum with the speakers to further address questions relating to climate change as it affects Carrboro citizens, and steps which can be taken to prepare for and mitigate this change with regard to building and energy, both at the individual and community level. Recommendations that arose from this forum focused on individual awareness

and vigilance in everyday practices linked to energy consumption and smart choices when constructing or remodeling one's home to maximize passive solar capability and energy efficiency in addition to any steps one may take to employ renewable energy practices.

Presentations & Discussion

- **Climate Protection Planning in Carrboro**, *Randy Dodd, Town of Carrboro Environmental Planner*

Randy Dodd opened the event with a presentation providing background on the Planning Board's forum series, information regarding the Town's effort toward climate protection during the last several years, data on energy usage for municipal operations, particularly buildings, and an explanation of the theme of this series relating to the Town's Strategic Energy and Climate Protection Plan. He highlighted the fact that residential carbon dioxide emissions are more than double the amount emitted by commercial sources in Carrboro, and electricity was by far the leading source of emissions (ahead of gasoline, natural gas, diesel, and water). While Town of Carrboro facilities and activities are not responsible for a large share of emissions, of the emissions they do produce, 24% can be attributed to street lights. The goal of the Town is to reduce municipal energy use and emissions by 5-10% over the next 1-2 years. Dodd provided links to the various reports on the Town's website and encouraged everyone to check the links and complete the survey, asking for input on ways that the Town can more proactively encourage or facilitate a community-wide effort to reduce the Town's climate footprint.

- **Solarize Orange County**, *Rob Pinder, Executive Director for NextClimate, and Program Lead for Solarize Carrboro and Solarize Orange County*

Rob Pinder spoke about the goals and activities of Solarize programs in North Carolina with a particular focus on Carrboro and Orange County. Solarize Orange County helps individuals and businesses to assess their solar options and helps them to seek organizational support and financial incentives to make the transition feasible and sustainable. This work is being led by his nonprofit NextClimate, whose mission statement is "to enable people to take action on climate change." With this combined experience, Pinder explained how the Solarize model works, and provided information relating to the tax credit opportunities which in combination with economies of scale and decreases in costs make the investment more manageable for homeowners.

Inquiries from the audience included the question of balancing solar arrays and tree cover for maximum benefit, and whether restrictions imposed by Home Owners Associations prevented solar from being used. Damon Seils and Sammy Slade provided background information on a recent Land Use Ordinance amendment preventing future development projects from having restrictions on solar and other green features such as

laundry lines, but noted that the ordinance did not impact existing developments. Finally, local builder Mark Marcoplos and Pinder discussed the pros and cons of solar hot water versus photovoltaics.

- **Energy Conservation**, John Hines, *Marketing Representative of Piedmont Electric Membership Corporation*

John Hines spoke about energy conservation opportunities with Piedmont Electric. Hines reviewed common sense information about saving energy in individual homes, many of which were low-cost items, with a focus on attic insulation, HVAC maintenance, and programmable thermostats. He encouraged folks to look at Piedmont Energy's website and use some of their online tools such as <https://www.myusage.com/> to get a sense of energy usage throughout the month rather than just at bill the end of the month. Energy saving programs offered by EMC include rebates for the installation of energy efficient electric heat pumps, or low-interest loan programs which specifically finance the installation of such heat pumps, replacement of doors and windows, or other strategies for improving home insulation.

- **Passive and Active Solar Energy Opportunities for Your Home, featuring an Interactive 3-D Model**, David Clinton, *Architect, Principal at Szostak Design Inc. and Planning Board Member*



David Clinton presented an interactive model as part of his talk, Passive and Active Solar Energy Opportunities for Your Home. While Clinton touched on elements of the previous speakers with regard to solar opportunities and insulation, he focused in detail on passive solar opportunities through building site planning and landscaping features. Clinton also explained R-values and U-values, the positioning of insulation, the use of vapor barriers and current scholarship on enclosed crawlspaces and changing standards with Low-E windows.

Clinton also feels strongly about involving young people in discussions of energy, and has offered to share his talk with any school science classes that would be amenable.

Passive and Active Solar Energy Opportunities for Your Home

Presented by David Clinton, AIA

Adding Solar-based energy control to a house should begin by taking advantage of the “low hanging fruit”; changing the way the house controls daylight and maintains interior temperature control.

Home improvements should focus on improving its sides that have optimal orientation for solar control. These are the south and north sides. The east and west facing elements (windows, materials that absorb heat, etc.) should be diminished so that the positive elements are not adversely affected by screening out direct sunlight with blinds, shades, trellises, or plant materials.

Solar-based energy control on optimal (south-facing) orientations can take the form of active and passive “add-ons”, including horizontal shading devices, plantings, solar electric panels, solar water heating panels, gravity ventilation systems, and enthalpy (evaporation from water features). For active systems, photovoltaics are, currently, the least efficient means of using solar energy, having an efficiency of only 15%-21%, while solar water heating has an efficiency of 80% - 85%.

Building materials can also provide solar-based energy control through absorption, reflection, shading, or insulation. Materials include High-Albedo (reflectance) roofing, batt/rigid/cellulose insulations, low-E glazing, heat sinks (trombe walls and mass floors) and trees (for placement around the site).

Summary: Invest, first, in the items that are least expensive (or most efficient) to improve the solar performance of your home. Wait for the technologies to improve before committing to large investments with questionable financial returns, unless you think of that investment as a charitable contribution to support the manufacturers of those technologies.

- **Base Hits, Strike Outs, and Home Runs: Twenty Renewable Energy Businesses I Have Loved**, *Lyle Estill, V.P. of Stuff for Piedmont Biofuels and Serial Entrepreneur*

Lyle Estill is Vice President of the Pittsboro-based Piedmont Biofuels, which makes, markets, and sells biodiesel as well as providing consulting, education, and advocacy regarding biodiesel and other renewable energy. With his extensive and varied experience in renewable energy, Estill offered a different point of view toward efficiency; rather than just focusing on doing the right thing toward reducing one’s carbon footprint, Estill spoke more to the economics of which system provided a solid return. He emphasized the importance of engaging the community of citizens interested in local food, solar energy, and other sustainable practices. Along these lines, the most important question may be how to create solutions which meet every day needs that suit the lifestyle of the consumer. For example, Estill offered common sense information such as making sure that a rain water

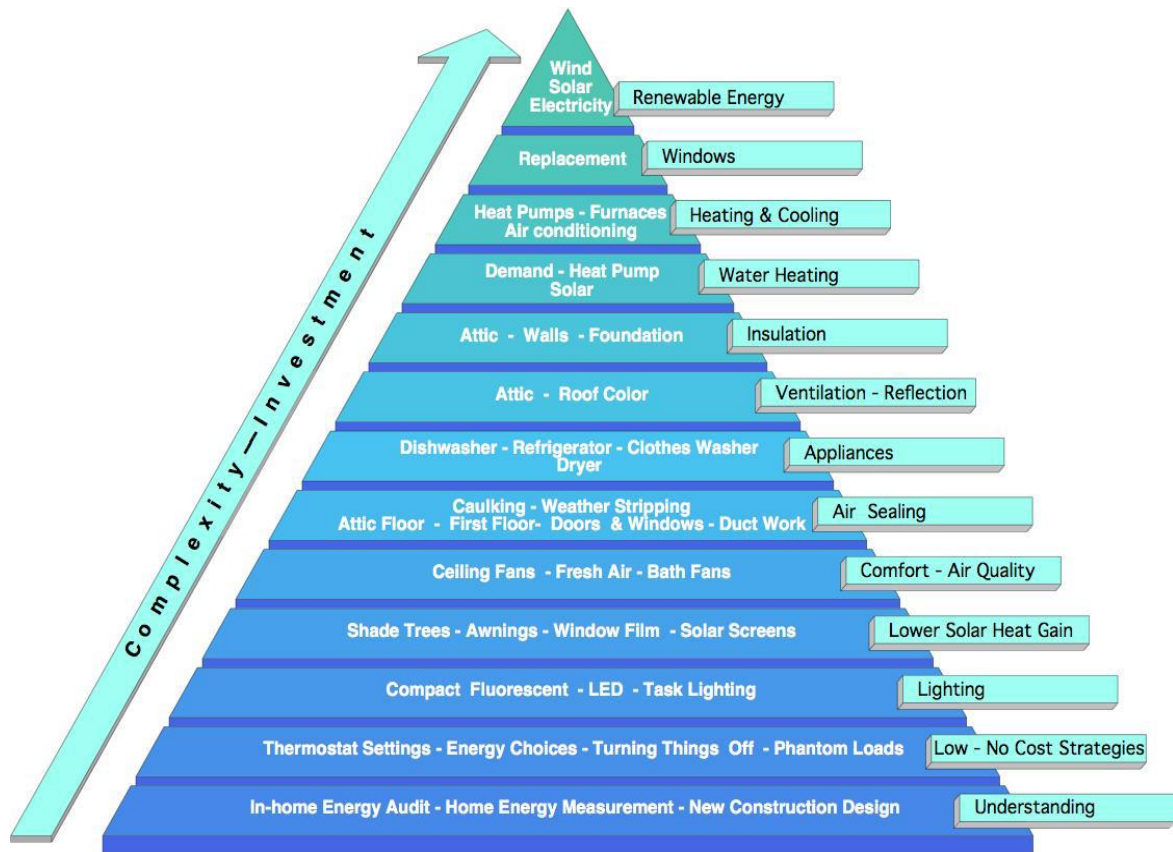
collection system is set up so that you can not only collect the water but more easily utilize it, and creating biofuel that can be used in diesel-consuming vehicles without modification.

Opportunities, Constraints, and Recommendations:

The following diagrams provide great suggestions for actions individuals may take with regard to their own home, from everyday practices to installation of renewable energy resources:



Energy Pyramid (source: <http://www.greenbuildingadvisor.com/blogs/dept/musings/energy-efficiency-pyramid>)



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The Town of Carrboro released its Energy and Climate Protection Plan on May 28, 2014 that, details the Town's plans for municipal action and also speaks to some of the aforementioned items in the diagrams. That report is available at:

<http://nc-carrboro.civicplus.com/DocumentCenter/Home/View/553>

Challenges to changes folks may make in Carrboro include cost prohibitive solutions, a lack of financial incentives and subsidies available, unsuitable location for renewable energy, a lack of home ownership, lack of awareness, a need for new policy addressing evolving concerns, and a municipal infrastructure that is becoming increasingly outdated. Town officials may increase awareness through dissemination of succinct and useful information to the community with an information table and representative at various public forums such as the local farmer's market and open street events, for example. However, speaking to the many obstacles to change, it will take some trial and error moving forward. While these challenges are real, they are not insurmountable, and, in fact, provide an opportunity for the Energy and Climate Task Force to work in conjunction with Town officials and the community to address these obstacles in seeking solutions that are far reaching, accessible, and meaningful in their impact.