DRAFT

Building Efficiency: Opportunities in Florida

Building efficiency offers methods to reduce the required energy and there are many highly cost-effective efficiency improvement methods that should be employed prior to any attempt to provide solar or switch fuels. The path to creating zero energy buildings begins with energy efficiency.

There are generally three distinct methods to reducing the energy use. One is through better design, another is via greater efficiency, and the third is through conservation, which is defined here as a method to reduce the use of energy through behavior changes.

Design strategies often rest with design teams prior to construction or remodeling. Many educated designers can incorporate lower energy use into buildings through techniques such as orientation and structural shading. However, it is still the norm in Florida that the architects create a building based on the building program and some aesthetic and often rely on the engineer to reduce the energy problem they have designed. Although LEED buildings are sometimes required by Universities and other clients, many architects remain ignorant or uninterested in designing low energy buildings so although the buildings may achieve their LEED status, they do so at great expense and potential discomfort to occupants.

Efficiency usually involves taking a current technology and tweaking it or replacing it with a better technology. For instance, residences have typically used incandescent light bulbs. Some "energy saver" bulbs reduce the energy use by 10 to 15%. However, compact fluorescents reduce that energy use by 75%, and LEDs offer similar or better potential while not using mercury. From a research standpoint there is always some aspect of building energy use that can be improved. Historically the largest energy uses, such as heating, cooling and commercial building lighting have been addressed. Home appliances have also been addressed thanks to government standards and above-code programs like Energy Star. However, there still remain opportunities within and outside these components. Figure 1 provides an overview of where building energy is used. Figure 2 demonstrates that the non heating, cooling and water heating energy use in residences tend to increase over time. Greater computer and television energy use, as well as more rechargeable appliances are believed to be the reason.

Jobs and Energy Efficiency in Buildings

Politicians like to point to a single location where 100 people are employed and say they helped get that employer located there. However, small changes in policy for building efficiency can create jobs for thousands of Floridians, albeit in scattered locations. Increased insulation, improved HVAC systems including tighter ducts, as well as key appliance upgrades are all smart residential efficiency upgrades. These upgrades result in employing many contractors.

Federal Research Program

The Department of Energy's research program has typically fluctuated from one of emphasizing high risk - high reward research, to one that wants to make a measureable difference in a short period. During the last five years, with limited funding, EERE ran energy code programs that resulted in much stricter energy codes, appliance programs that increased efficiency (albeit at a pace not pleasing to all advocates), a weatherization program to upgrade

low income housing, and new residential research that set goals and time-driven milestones setting the path to zero energy homes. In 2009, DOE announced a multi-lab zero energy commercial building research program.

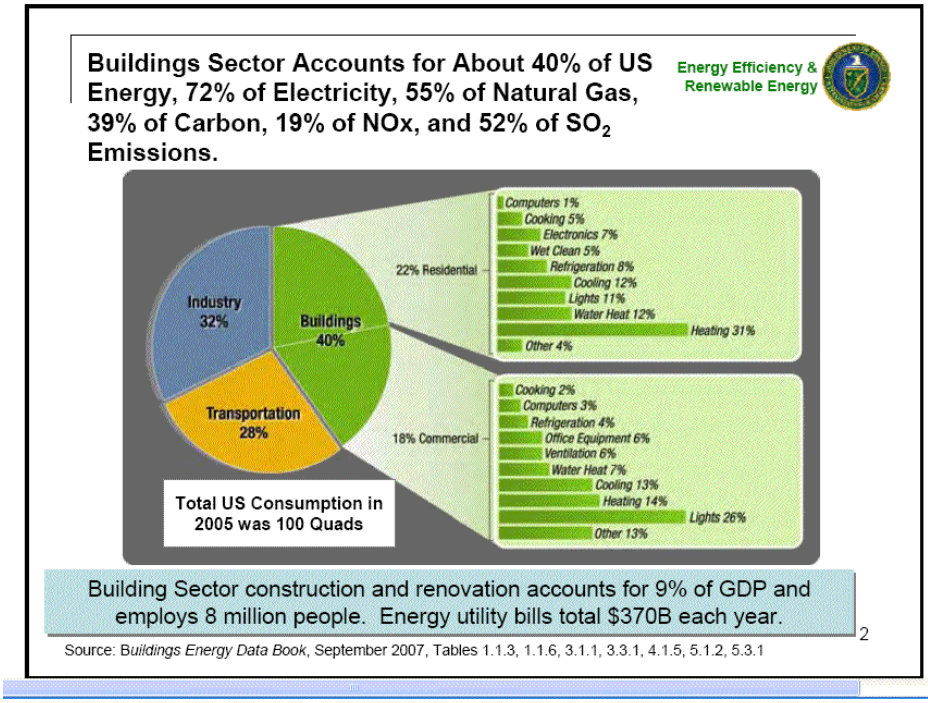
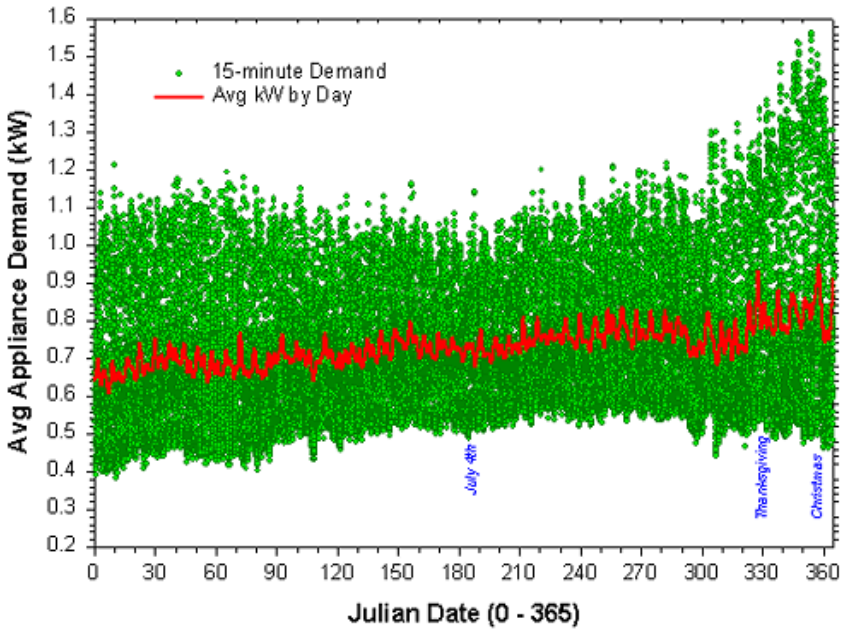


Figure 1. Building energy use in the U.S. From Jerry Dion, USDOE, as presented at the ASERTTI winter meeting, 2009.

Figure 2. Utility study results showing lighting, refrigerator and plug loads use increased by an average of 8.2 Wh/day or about 17% over the 1999 monitoring period.



A combination of factors has led to changes in the funding level and emphasis:

- The downturn in housing has led DOE residential emphasis to switch to retrofits
- With the switch to retrofits, DOE is removing the zero energy term from their marketing materials

- Emphasis is more on applying programs than in research of retrofit strategies and the stimulus package created significant funding through the Energy Efficient Block Grant Program and state funding to roll out programs
- DOE seeks financing solutions to overcome first cost barriers to energy upgrades in existing buildings
- Research has tended to provide money more to national labs and hubs than among many Universities and the private sector.

Florida

Florida has relied on its energy code for new building energy efficiency. The code, which deals with heating, cooling and water heating energy use on the residential side, does not address the many other end uses. Some utility new home programs have been approved by the Public Service Commission. For example, FPL's BuildSmart program requires exceeding the minimum code by 10% and the ductwork must pass a leak test. Gulf Power requests quality or efficiency measures in six areas plus passing the EnergyStar thermal bypass checklist as part of their EarthCents home program. Some natural gas utilities offer rebates for upgrading to efficient tankless gas water heaters.

Outside of the weatherization program and the current EECBG and state stimulus funding, there has been little done on a statewide basis for efficiency in Florida, as utilities have been the typical mechanism for creating an incentive for upgrades. Utility incentives typically have been for cool roofs, insulation, windows, commercial lighting and HVAC improvements.

Strategy Implications

Florida should continue to strengthen its building code as directed by the Governor and implemented by the Florida Building Commission. The code should seek to address more than the traditional end uses in order to minimize energy use.

Research should be conducted across end-uses and in whole building performance as buildings do not operate the way they were intended.

Policy

The state should work to help support the federal desire to create enduring financial mechanisms to overcome first-cost barriers to those efficiency measures that represent good economic returns. The state should also consider creating its own funding mechanism via an energy benefit fund. The funds could be used for specific research, first-cost financing, and public announcements that encourage behavior changes that lead to conservation.

Any state program incentive should be based on energy saved and not on the cost of the upgrade. Product costs tend to increase with cost-based incentives, while competition keeps cost low on energy performance based incentives. Appliance rebate programs should assure that the appliances replaced be recycled to prevent their continued use (e.g., residential refrigerator and air conditioner programs should mandate the old unit be recycled).

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