

Florida Building Code and the Energy Efficiency Code

Setting the law for building efficiency

The Florida Department of Community Affairs



- The state's land planning and community development agency.
- Ensures that new growth complies with the state's vital growth management laws, while also helping established communities revitalize their older or traditional neighborhoods
- Staff for the Building Commission
 - Maintain code documents

Florida Solar Energy Center



- Created in 1975 by the Florida Legislature
- The energy research institute of the state of Florida
- Mission is research, testing and education
- \$8 - 10 million annually in external contracts and grants
- The experience (staff >140) and capabilities to help solve our energy problems and help meet our energy needs
- Housed in one of the world's most energy-efficient buildings.





FSEC Program Areas

- High-Performance Buildings (energy efficiency)
- Solar Thermal Systems (today's cost-effective solution)
- Photovoltaics (solar electricity)
- Testing & Certification (protecting Florida's citizens)
- Hydrogen and Fuel Cells (the future's fuels and engines)
- Education and Training (Florida's workforce for today and the future)
- Alternative Fuels & Transportation (an agricultural opportunity for Florida)

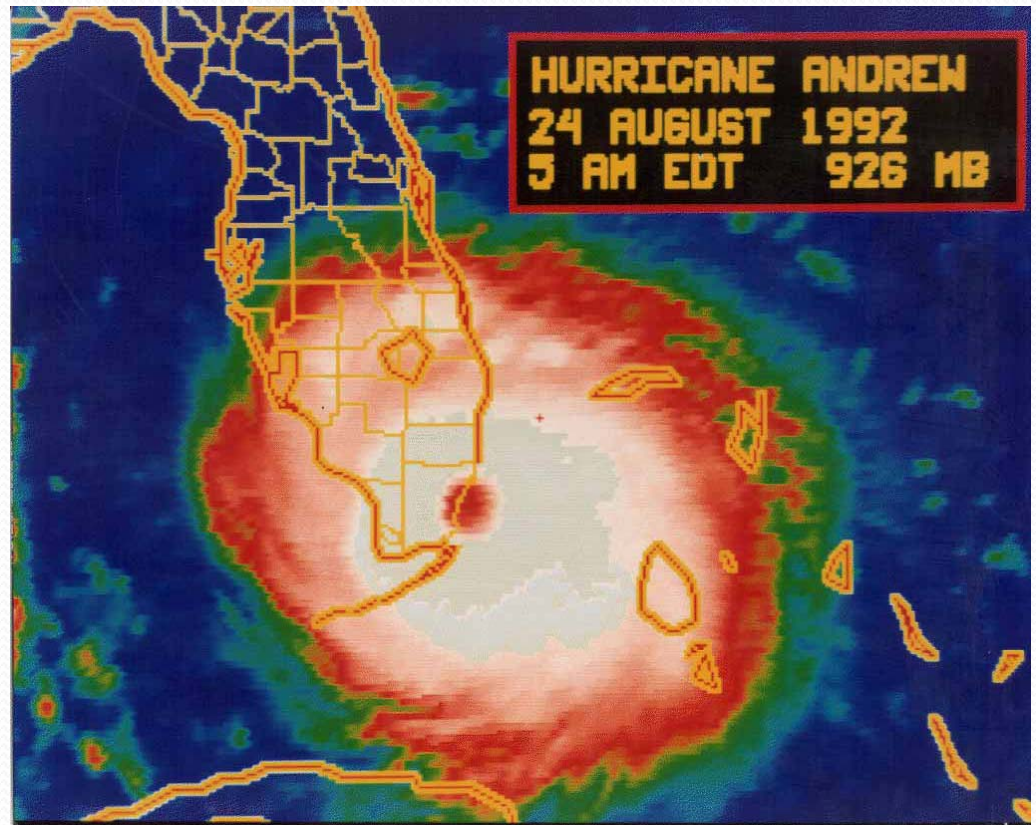


Some FSEC Highlights

- Our buildings research and Florida code changes have helped save state residents more than \$2.2 billion in energy costs.
- Our solar research has led to more than 250,000 solar water heating systems installed in the state – saving homeowners \$30 million annually.
- We have trained more than 15,000 industry professionals, government officials and others.
- Our PV research has helped accelerate a market now growing at more than 30% annually.

Building Code History

- Administered by the Department of Community Affairs
- 1992 – Hurricane Andrew
- Huge insurance losses, and was the direct cause of Florida's worst insurance crisis in history.



History of Building Code continued

- Building codes and their administration and enforcement was a statewide issue, with statewide implications.
- Poor compliance or enforcement in a single county could wreak havoc in every corner of the state.



After Hurricane Andrew, Picture facing N.W.



History continued

- The Legislature Mandated the Development of a New Building Code System with HB 4181 – 1998
- The law established the Florida Building Commission as the body which is responsible for the development of the Code





Florida Building Commission

- The Commission has 23 members representing Engineers, Architect, Contractors, Building Owners and Insurers, State and Local Government and Persons with Disabilities. The Chairman is Appointed by and serves at the pleasure of the Governor.
- Current chair is Raul Rodriguez of Rodriguez & Quiroga Architects, Coral Gables



Florida Building Commission

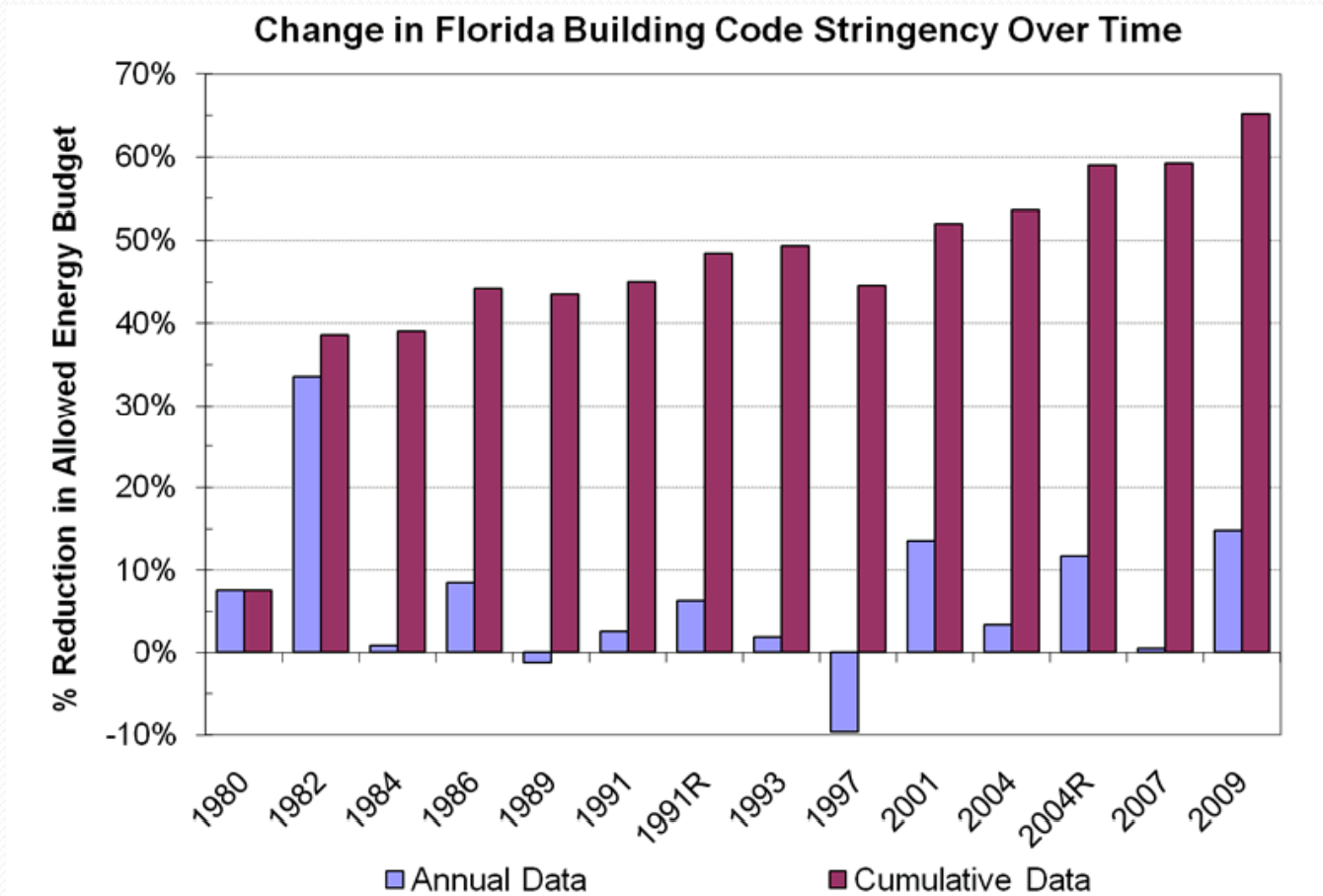
- Meets typically every other month
- Has technical subcommittees
- Public input usually includes industry and code officials
- Product approval
- Waivers
- Interpretations



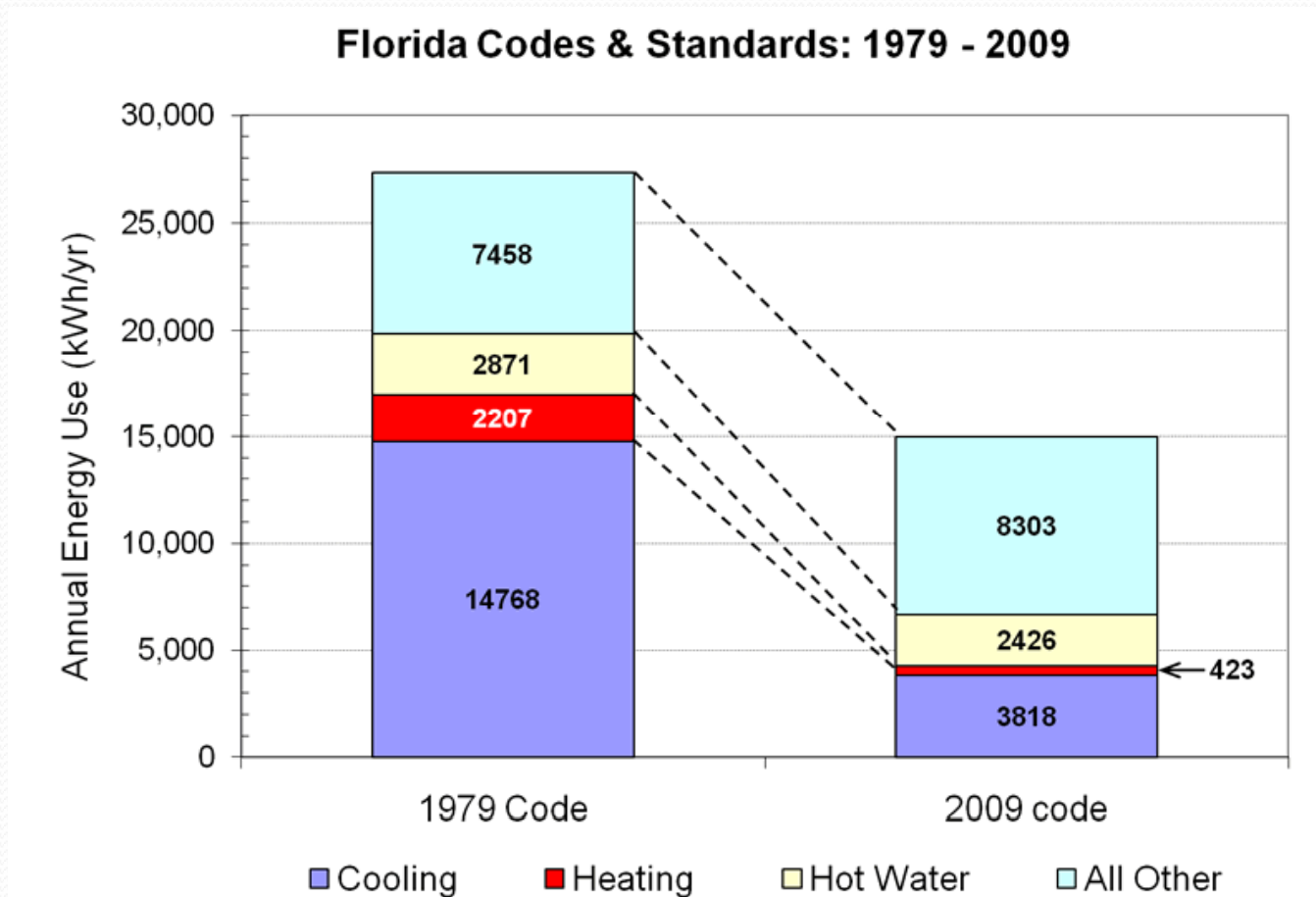
Florida Energy Efficiency Code

- Started following energy crisis of 1970s
- Updated every three years
- Gradual increase in efficiency
- Includes updates to national appliance standards

Changes in Florida's Code



How the Savings Stack Up

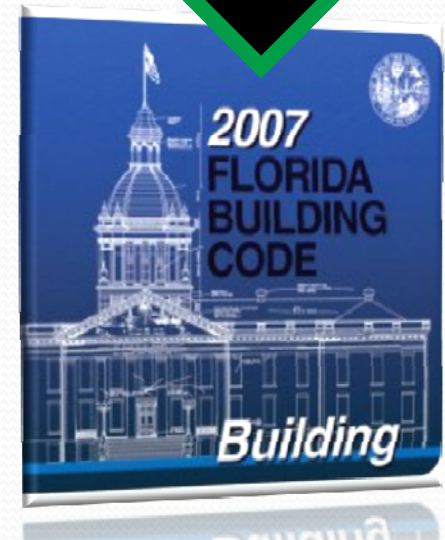
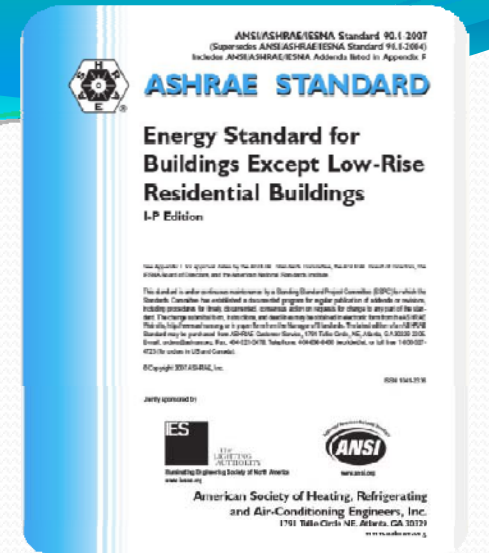


Recent Changes to the Florida Energy Efficiency Code

- 2004 glitch cycle (effective date late 2006)
 - Residential split air conditioning systems must meet new federal standard of SEER 13
- 2007
 - Commercial code updated to ASHRAE 2004
- 2009 glitch cycle (effective date March 1, 2009)
 - Implement 15% more stringent code per Governor Crist's executive order

Florida's Energy Code

- Applicable to all conditioned buildings
- Originally based on ASHRAE STD 90-75
- Geared to Florida's climate with strong ties to ASHRAE 90.1 and the IECC.
- Addresses:
 1. building envelope
 2. mechanical systems
 3. heating, cooling and hot water.
 4. Lighting (commercial)
 5. electrical systems
- Won National Awards for energy innovation

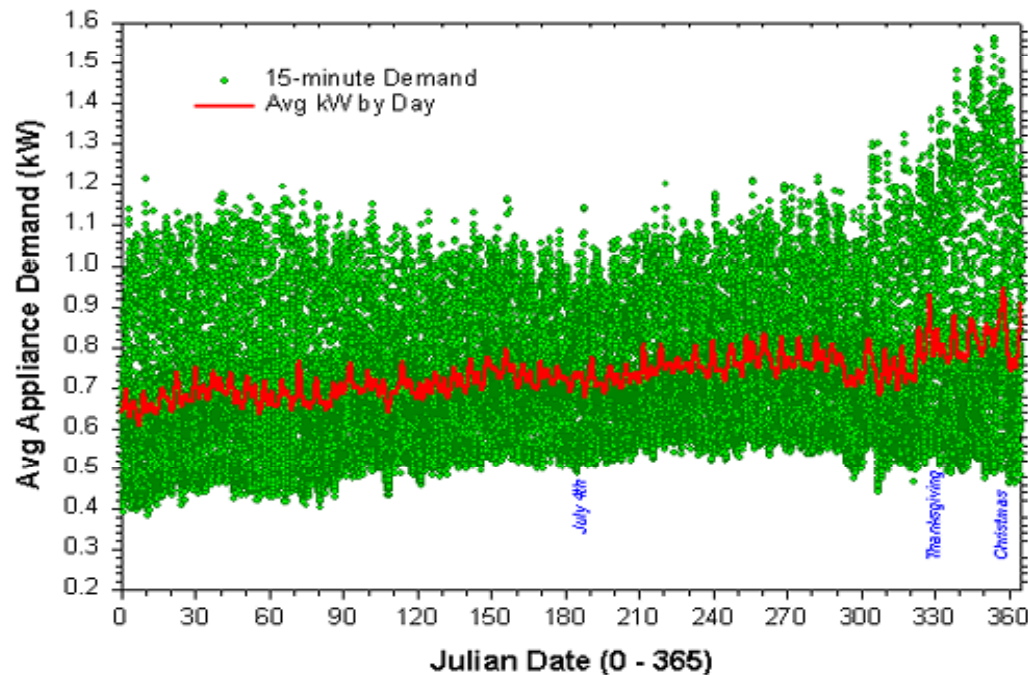




Limits of Current Energy Code

- Heating, cooling and water heating are typical only residential measures considered for code
- Plug loads, many that happen post-occupancy, are becoming larger portions of the energy use
- Commercial buildings are largely internal load dominated and operations greatly affect the energy bill
- Existing home retrofits sometimes do not get permits and are missed by the code

Home “Other” Use Increasing

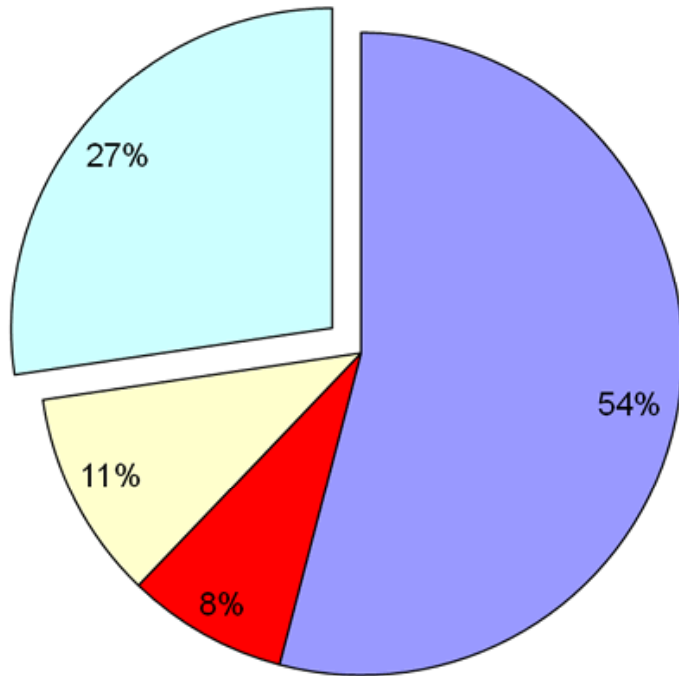


Utility study results showing lighting, refrigerator and plug loads use increased by an average of 8.2 Wh/day or about 17% over the 1999 monitoring period.

Parker, D., "Research Highlights from a Large Scale Residential Monitoring Study in a Hot Climate " Florida Solar Energy Center, FSEC-pf-369-02, Jan. 01, 2002

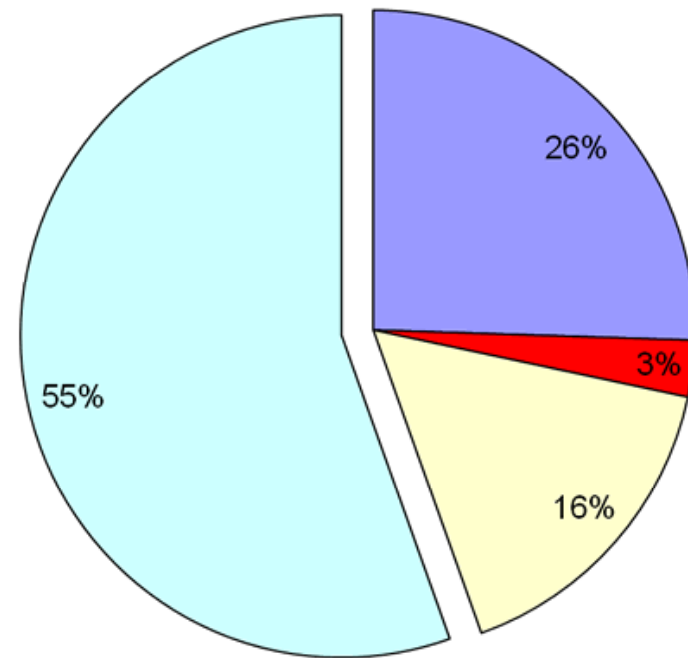
The “Other” Energy Uses

1979 Code Home: Totals by Energy End Use
(27,305 kWh/yr)



■ Cooling ■ Heating ■ Hot water ■ All Other

2009 Code Home: Totals by Energy End Use
(14,971 kWh/yr)



■ Cooling ■ Heating ■ Hot water ■ All Other



Meeting Future Energy Goals

- There are still cost effective measures at current code levels.
- Will take a combination of push and pull methods.
- Codes can **push** the floor upward on appliance and envelope efficiency.
- National programs like Energy Star and the Department of Energy's Builders Challenge can **pull** builders to demonstrate beyond-code performance.
- Utilities can create programs and implement control technologies to reduce energy use and demand.

U.S. Department of Energy EnergySmart Home ScaleSM



Estimated annual energy usage:

Electric (kWh) 8019
Natural Gas (therms) 100

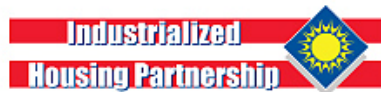
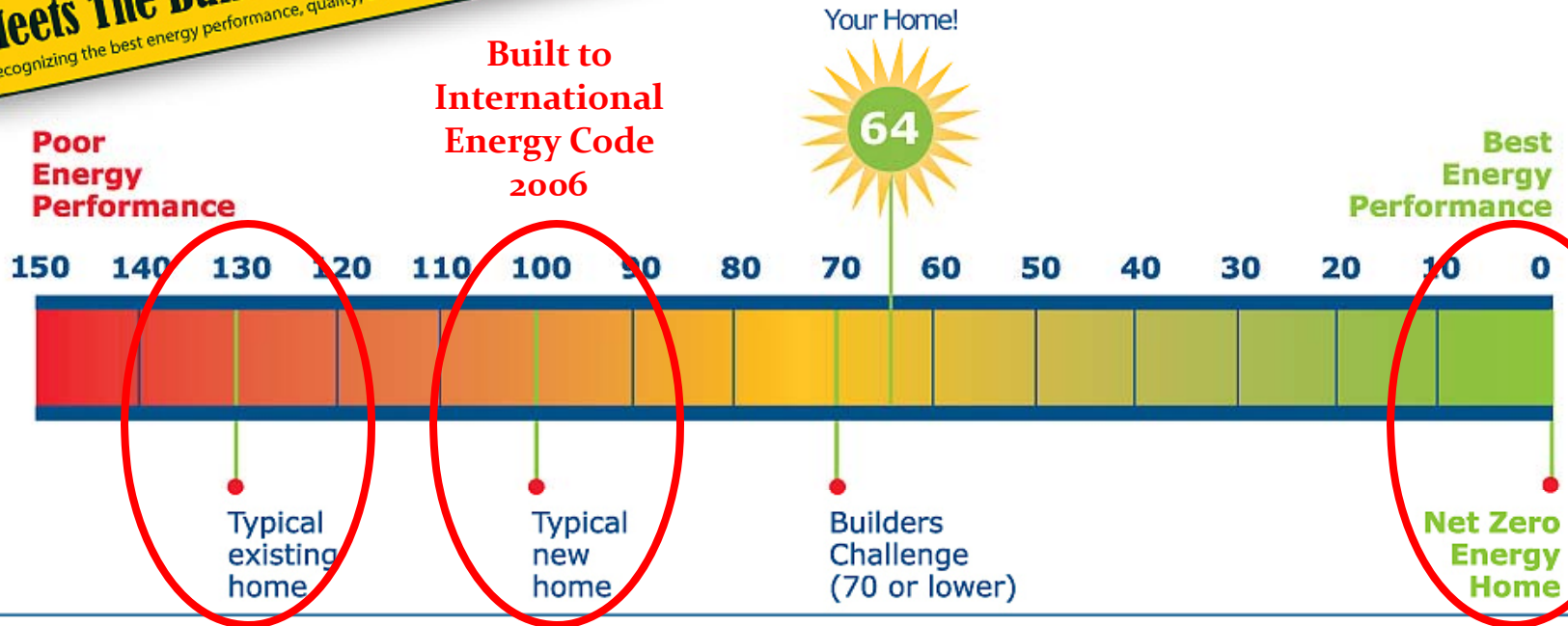
Estimated average monthly energy bill:
\$95

14479 NW 25th Street, Newberry, FL
Rated by Florida H.E.R.O., Inc.
Rating conducted **April 14, 2008**

Conditioned floor area (sq. ft.): 1508

www.buildingamerica.gov/challenge

Meets The Builders Challenge
Recognizing the best energy performance, quality, comfort, health and safety in the market.



www.baihp.org Florida Solar Energy Center*



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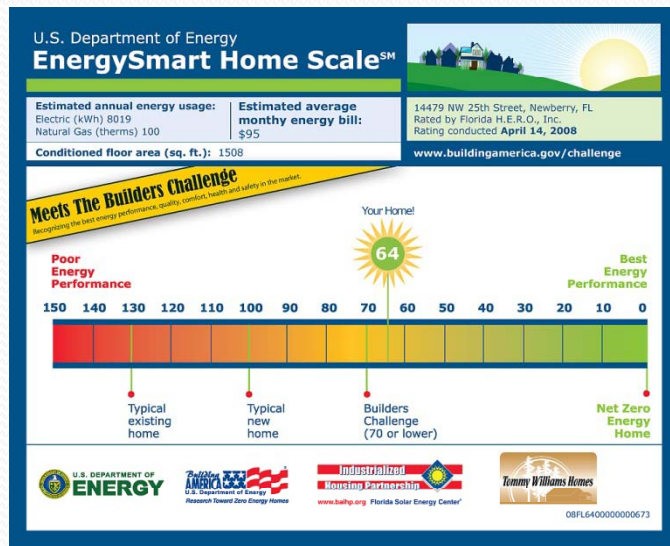
New Home Energy Programs

- Florida Energy Code about 90
- Energy Star = 80-85 in most states
 - Now 77 in Florida



New Home Energy Programs

- IECC Code
- Energy Star
- Builders Challenge = 70



New Home Energy Programs

- IECC Code
- Energy Star
- Builders Challenge
- Zero Energy = 0

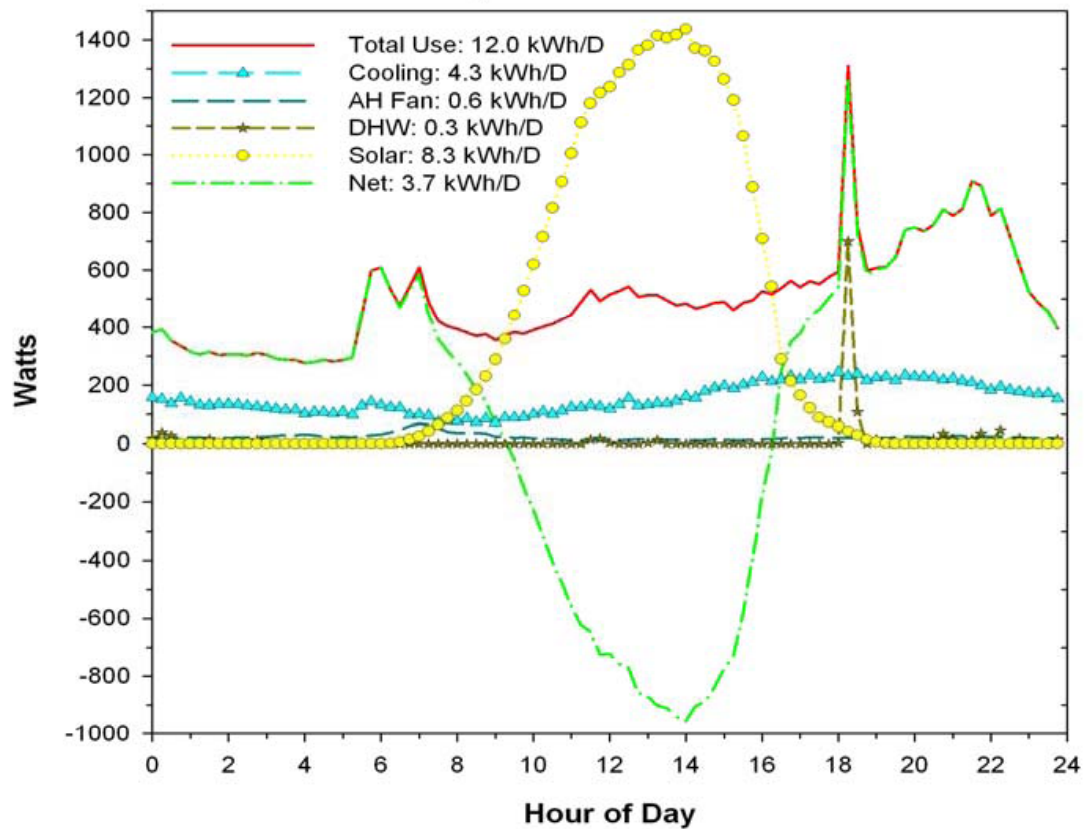


Panama City, Gainesville, FL NZEH



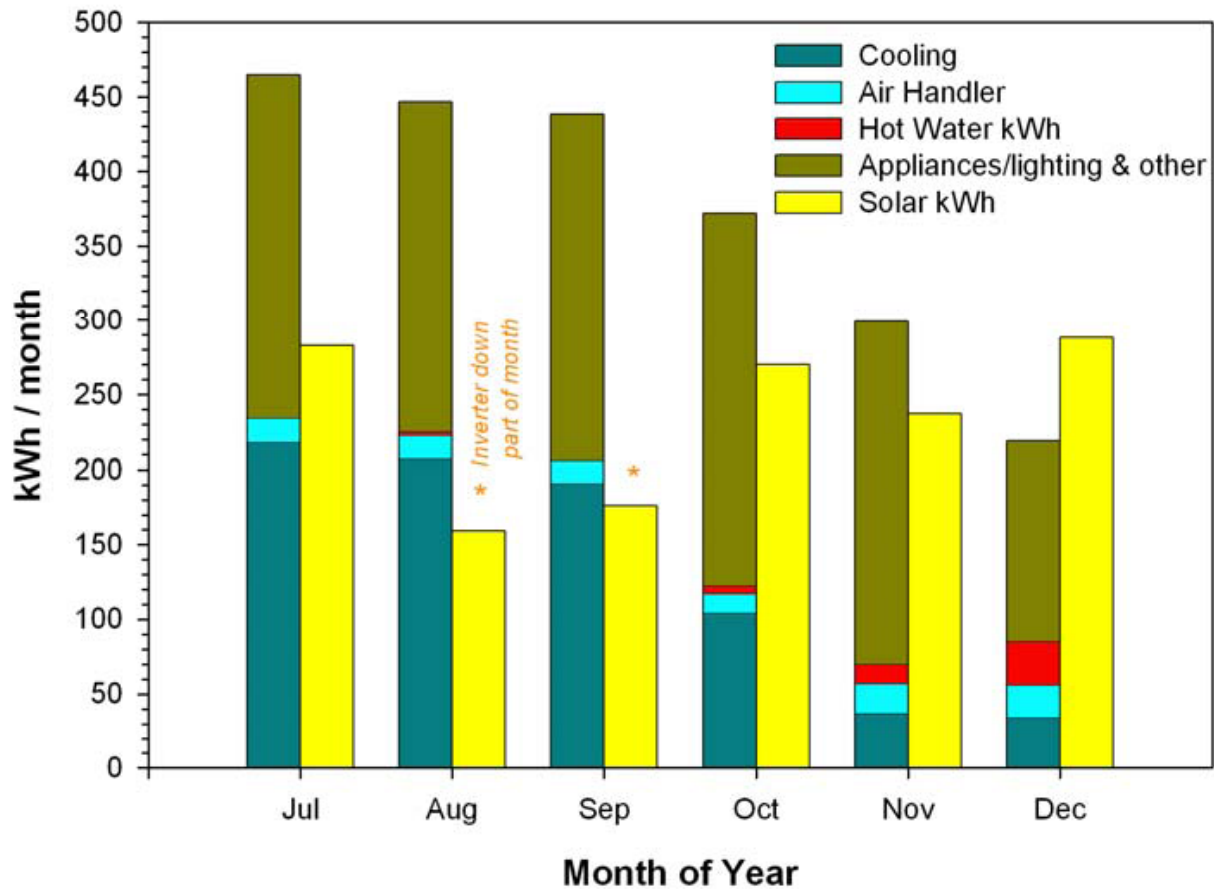
Hourly Performance

- Average use July – December 2008



Gainesville, FL NZEH

- Energy Use and on-site Generation



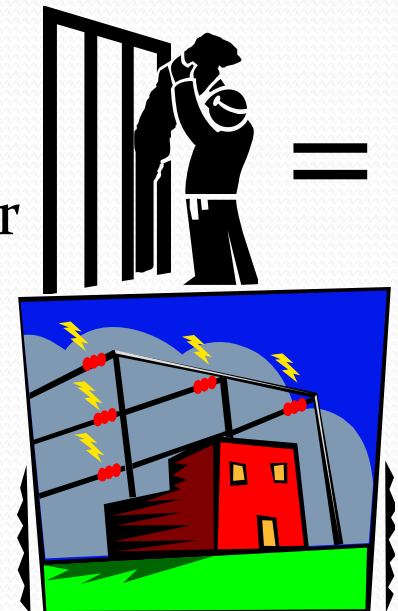
Green Home Program Overview



Potential for Building Energy Savings: The 25 TWh Example

- 160,000 new Florida homes per year
 - 24,000 tax credit homes per year
 - 24,000 solar water heaters per year
- 6.2 million existing Florida homes
 - 62,000 home improvements (15%) per year
 - 62,000 solar water heaters per year
- Photovoltaic Systems
 - 9,000 PV systems per year (2 kW peak)

15% of new home starts



Residential Tax Credits – Sample Tampa Qualifying Home

- Windows SHGC 0.28
- White barrel tile roof, R30 ceiling insulation
- Block with R7.6 wall insulation
- Sealed and Tested Duct System
- SEER 16 HSPF 9 Heat Pump
- Programmable Thermostat
- Energy Star Ceiling Fans, Refrigerator
- 72% Fluorescent lighting



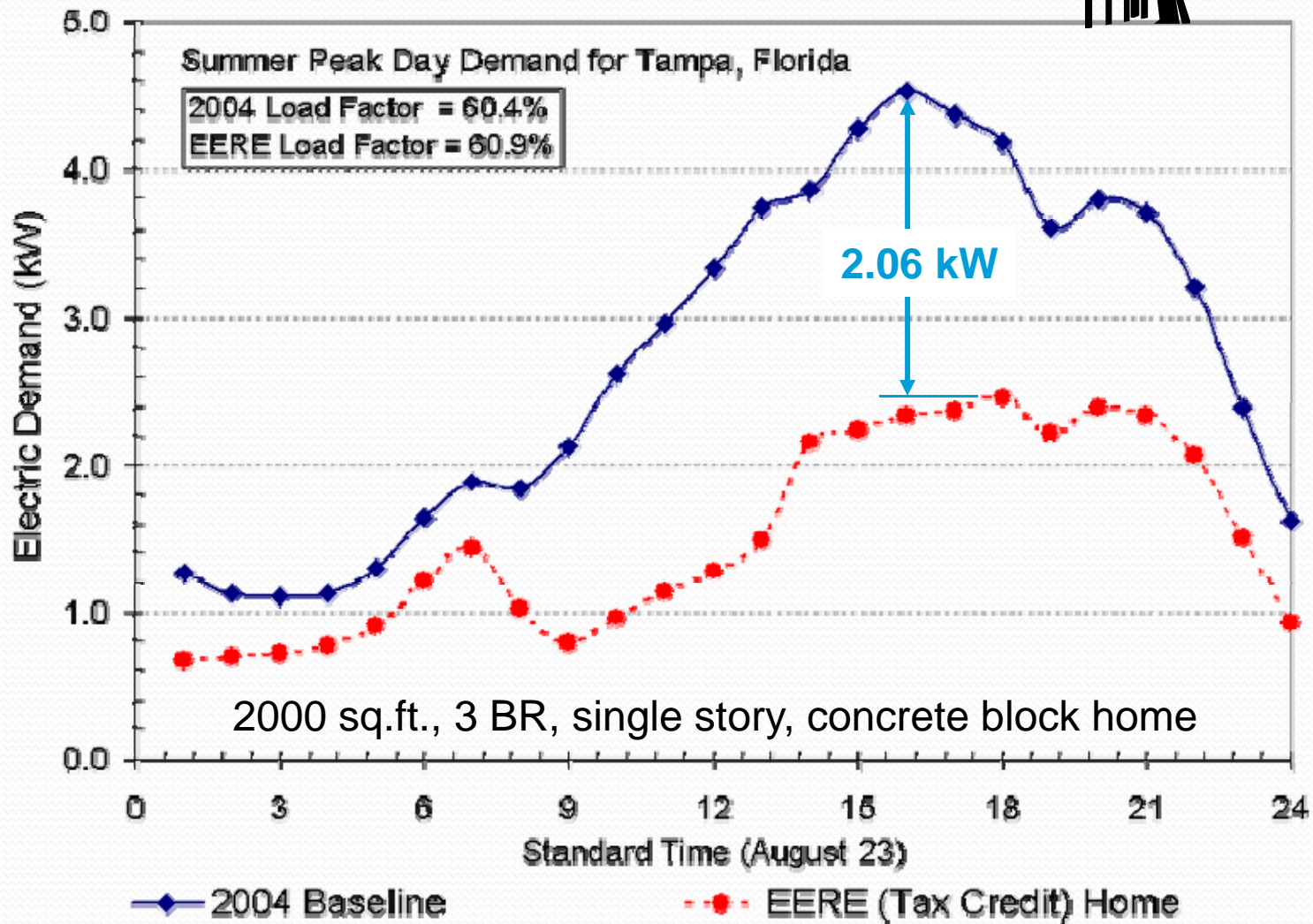
Residential Tax Credits – Sample Jacksonville Qualifying Home

- Windows SHGC 0.40, U-value 0.47
- Medium Colored Shingle, R38 ceiling insulation
- Wood Frame with R11 wall insulation
- Sealed Airtight Tested Duct System → $Q_n < 0.03$
- SEER 15, HSPF 8 Heat Pump
- Programmable Thermostat
- Energy Star Ceiling Fans, Refrigerator
- 60% Fluorescent lighting



Off-the-Shelf Technology

40% annual energy savings (~\$630)



Florida Benefits

Cumulative Ten Year Totals



Total energy savings	24.7 TWh
Total consumer cost savings	\$2.47 billion
Total fuel not purchased	\$1.24 billion
Avoided capacity	1,669 MW
Avoided generation costs	\$1.67 billion
New jobs	126,000
Tradable renewable energy credits (TRECs)	\$420 million
CO ₂ savings	26.4 million tons



Summary

- The Energy Code has saved Floridians 100s of \$millions in energy.
- Our energy code continues to be considered one of the best in the United States.
- Our code is determined by Building Commissioners who are advised by technical committees, including the energy technical advisory committee.
- Our commission reviews other codes but ultimately determine what is best for Florida
- Utility, state and national programs and incentives can help pull the building industry forward.
- We can achieve great savings!



Summary

- Leadership Matters
 - Governor's Executive Orders Caused Building Commission to Act
- Allow the market to work with performance methods
 - Maintain baseline and ramp comparison home
- Challenges
 - Heating, cooling, lighting, water heating only part of energy picture
- Learn more at www.floridabuilding.org