


# FLORIDA ENERGY CODE WORKGROUP



## 2010 Florida Energy Code Workgroup

### REPORT TO THE FLORIDA BUILDING COMMISSION

APRIL 7, 2010—MEETING XI

GAINESVILLE, FLORIDA

FACILITATION, MEETING AND PROCESS DESIGN BY



CONSENSUS CENTER

REPORT BY JEFF A. BLAIR  
FCRC CONSENSUS CENTER  
FLORIDA STATE UNIVERSITY



[jblair@fsu.edu](mailto:jblair@fsu.edu)

<http://consensus.fsu.edu>

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Codes & Standards, 2555 Shumard Oak Blvd., Tallahassee, FL 32399, (850) 487.1824.*

# **FLORIDA BUILDING COMMISSION**

## **FLORIDA ENERGY CODE WORKGROUP**

### **OVERVIEW**

Governor Crist directed the Commission to increase building energy efficiency requirements by 15% in his July 2007 Executive Order 127. In addition, the 2008 Legislature through passage of The Energy Act of 2008 created a suite of energy related assignments for the Building Commission. The Energy Code provisions were a major focus of the Commission during 2008, and the Commission increased the thermal efficiency requirements for the Florida Energy Code by 15% and integrated the enhanced requirements into the 2007 Florida Building Code. The Commission reviewed energy related code amendments adopted in the 2007 Florida Building Code Update to determine their cumulative level of increased efficiency, and adopted additional amendments required to achieve Governor Crist's directive of 15% increased efficiency. During 2008 the Energy Code was amended by administrative rule and then the revised Energy Code was adopted into the 2007 Florida Building Code during the 2008 "glitch" cycle concurrently with the March 1, 2009 effective date for the 2007 Florida Building Code. Working with stakeholders using consensus-building workgroups, the Commission was able to achieve the 15% increase in efficiency in buildings and implement code amendments that are efficient, consistent, understandable and enforceable for the full spectrum of Energy Code users. The Commission's Energy Code Workgroup will develop recommendations regarding energy conservation measures for increasing efficiency requirements in the 2010 FBC by 20% as required by law.

### **MEMBERS AND REPRESENTATION**

Raul L. Rodriguez, AIA, Chair of the Florida Building Commission, made the following appointments to the Florida Energy Code Workgroup (below). Members are charged with representing their stakeholder group's interests, and working with other interest groups to develop a consensus package of recommendations for submittal to the Commission.

#### **2010 Florida Energy Code Workgroup**

Steve Bassett, Rusty Carroll, Bob Cochell, Phillip Fairey, Dale Greiner, Jeff Gross, Jeff Householder, Bill Kent, Tom Larson, Larry Maxwell, Rafael Palacios, Donny Pittman, Paul Savage, Drew Smith, Jeff Stone, and Rob Vickers.

#### **Meeting Schedule**

February 3, 2009: Melbourne, March 5, 2009: Cape Canaveral, March 27, 2009: Tampa, April 30, 2009: Tallahassee, May 28, 2009: Tallahassee, September 3, 2009: Gainesville, October 14, 2009: Tampa; November 12, 2009: Gainesville; December 9, 2009: Orlando; February 3, 2010: Tampa; and, April 7, 2010 Gainesville.

## REPORT OF THE APRIL 7, 2010 MEETING

### Opening and Meeting Attendance

Bob Cochell, (Jim Bertie, alternate) Phillip Fairey, Dale Greiner, Jeff Gross, Jeff Householder, Bill Kent (Dino Muggeo, alternate), Larry Maxwell, Rafael Palacios, Donny Pittman, Paul Savage (Jack Glenn, alternate), Drew Smith, and Jeff Stone.

### *Members Absent:*

Steve Bassett, Rusty Carroll, Tom Larson, and Rob Vickers.

### DCA Staff Present

Rick Dixon, Mo Madani, and Ann Stanton.

### FSEC Staff Present

Mangesh Basarkar.

### Meeting Facilitation

The meeting was facilitated by Jeff Blair from the FCRC Consensus Center at Florida State University. Information at: <http://consensus.fsu.edu/>



### Project Webpage

Information on the project, including agenda packets, meeting reports, and related documents may be found in downloadable formats at the project webpage below:

<http://consensus.fsu.edu/FBC/2010-Florida-Energy-Code.html>

### Agenda Review and Approval

The Workgroup voted unanimously, 12 - 0 in favor, to approve the agenda as presented including the following objectives:

- ✓ To Approve Regular Procedural Topics (Agenda and Summary Report)
- ✓ To Hear Relevant Presentations Regarding April's Agenda Items
- ✓ To Review and Discuss 2010 FEC Commercial Chapter Prescriptive Packages for Shell Buildings and Renovations
- ✓ To Review and Discuss Issues Regarding 2010 FEC Residential Volume Overall UA Alternative to Prescriptive Compliance Method
- ✓ To Consider Any Additional FEC Development Issues
- ✓ To Consider Any Additional Green and Energy Efficient Roofs Subcommittee Recommendations
- ✓ To Discuss and Evaluate Level of Acceptability of Proposed Options
- ✓ To Adopt Any Additional Recommendations for Submittal to the Energy TAC and Commission
- ✓ To Consider Public Comment
- ✓ To Identify Needed Next Steps and Agenda Items for Next Meeting

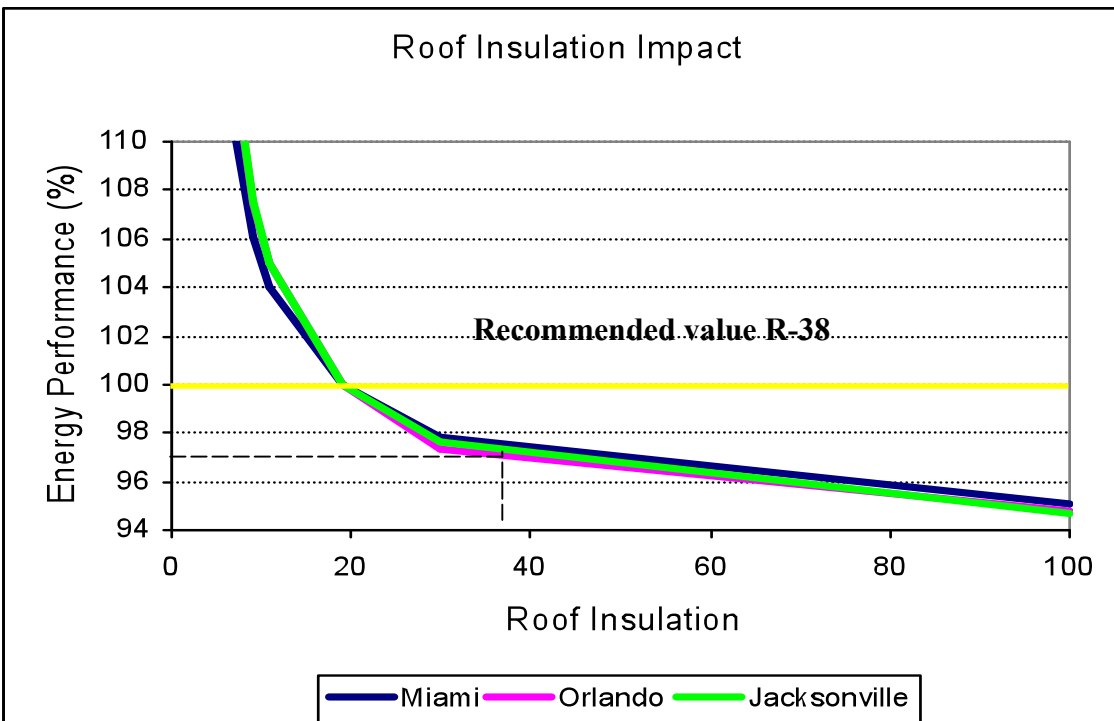
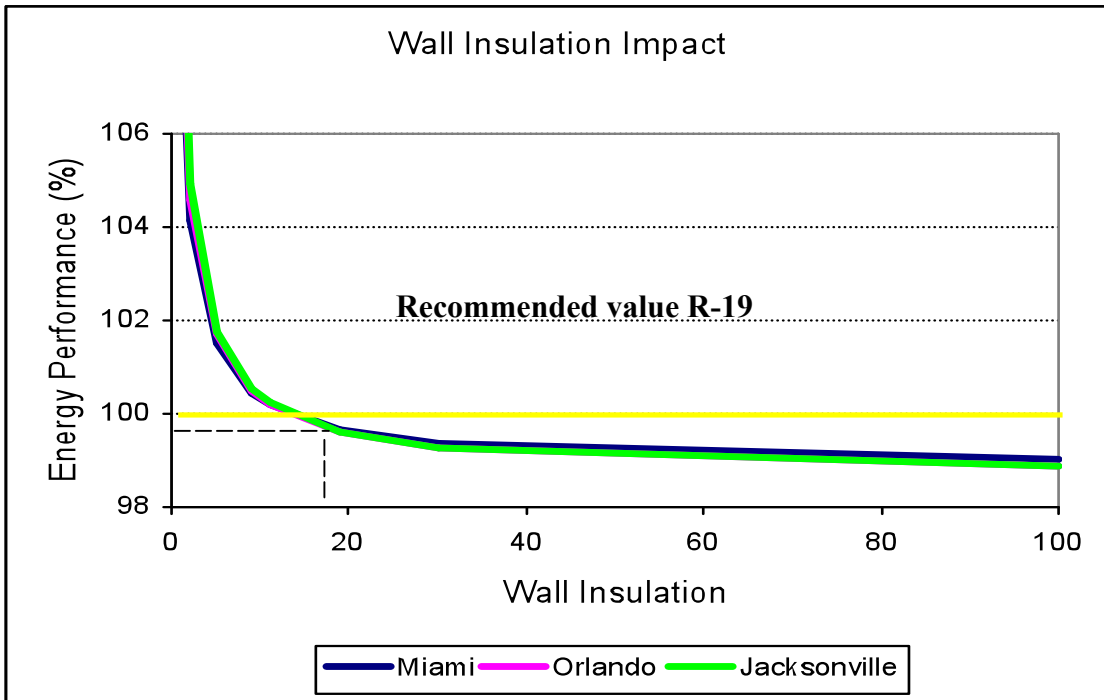
### February 3, 2010 Facilitator's Summary Report Approval

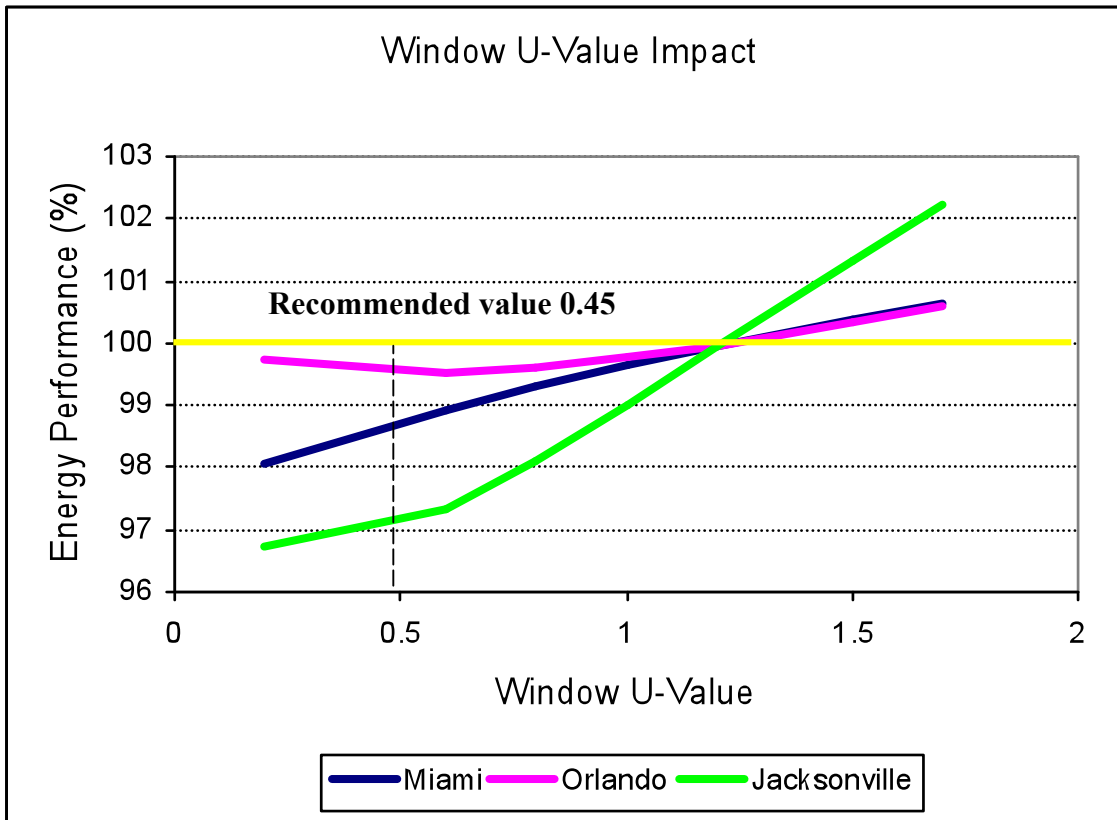
Jeff Blair, Commission Facilitator, asked if any members had corrections or additions to the February 3, 2010 Report, and none were offered. The Workgroup voted unanimously, 12 - 0 in favor, to approve the February 3, 2010 Facilitator's Summary Report as presented/posted.

### FEC Commercial Chapter Prescriptive Packages for Shell Buildings and Renovations Discussion and Decision

Mangesh Basarkar, FSEC, provided the Workgroup with recommendations for shell buildings and renovations prescriptive compliance method and answered member's questions.

Following are the prescriptive recommendations for renovations/alteration for a small office:





*Overview:*

At the February 2010 meeting the Workgroup heard and discussed a presentation on recommendations for prescriptive code compliance in commercial buildings and members agreed they would like to see recommendations for small office renovations and alterations at the April 2010 meeting. At the April 2010 meeting the Workgroup reviewed the proposed prescriptive recommendations for small office renovations and alterations and agreed on balance that the package of recommendations should be submitted as proposed code amendments to the 2010 Florida Building Code, Energy Volume.

**FEC Residential Volume Overall UA Alternative to Prescriptive Compliance Method Outstanding Issues Discussion and Decision**

Phillip Fairey, FSEC, provided the Workgroup with a PowerPoint presentation on the Overall UA Alternative to prescriptive compliance method for the FEC Residential Volume and answered member's questions.

*Overview:*

Phillip Fairey explained that UA alternative is U factor times surface area. U is reciprocal of R-value of entire assembly. Take UA of ceiling, walls, floors, etc and add together to get total UA of building. Have 2 UAs, one for code minimum prescriptive requirements, and one as-built. Total UA for proposed building has to be less than UA for baseline building. Have constructed XL spreadsheet which will do total UA calculations. It is a working spread sheet that can be used to calculate. Yellow areas can be edited by providing your own data. Example, took 2000 S.F. home with 3 bedrooms, added in all Florida minimum values. Slab on grade floor. No required R-value, no baseline or proposed UA. Walls: frame walls or mass

walls, add R-value of insulation to wall type, UA calculated is 86.04. If change R-13 to 10, UA is higher. Windows: U-0.65, SHGC 0.3, 40 s.f. doors, 286 s.f. windows; baseline & as-built identical. Ceilings: R-30 plus variables in back tab. Section on systems needs to be in conditioned space, leak free ducts, hot water minimums. Total UA calculation Baseline & As-built same.

Windows: it is becoming common to use lower U-factors (to meet energy programs). If use 0.3, proposed UA goes way down. Currently it would pass by a substantial amount. Allows ceiling to be installed at R-6. Use R-19 ceiling, change wall to R-4, still passes. Allows you to trade off U-factors among components. Let's look at how it compares to Method A (performance, Section 405). E ratio with 0.3 window gets .95 (different by Florida regions: North, Central, South Florida). Doesn't come anywhere near meeting 0.8 compliance. If use 0.65 U for windows, gets back to compliance. Significant difference in equivalence between compliance by either prescriptive or performance compliance. Jeff Sonne is proposing that Florida not incorporate total UA in the next Florida Energy Code.

#### *Conclusion:*

There is a significant difference in equivalence between Method A (performance option) and the IECC Total UA Alternative option. The IECC Total UA Alternative option does not result in equivalent compliance requirements (building energy performance) in Florida.

*(Attachment 5—Total UA Alternative Presentation)*

#### *Workgroup and Public Discussion on FEC Residential Volume Overall UA Alternative:*

- Stewart: Don't see why not meeting the 0.8 eRatio is a problem.
- Fairey: Prescriptive requirements do meet 0.8 eRatio. If you start trading them off then you don't meet equivalence. Only part of the UA equation. If assume DeltaT is same across all components; however, not the same. Temperature of attic and ambient air are different. Crawl space temp is different from attic, wall temperature difference. Significantly more heat flux. Can't offset ceiling heat flow by adding insulation to floor. Example UA ceiling & floor 100, crawl space is 16 times greater in attic. More complex. Propose do not use UA.
- Dixon: the method was designed to use for heating calculations. Chapter 5 not used for cooling historically. In southern climates, it doesn't work. Workgroup chose position that different compliance methods should be equivalent energy wise.
- Palacios: this method is only good for heating.
- Fairey: Florida software engine is DOE 2.3, does better job for residential air conditioners. Difference between DOE 2 and EnergyPlus is how it handles time steps better for mechanical system modeling. Can do load calculations on shorter time spans. EnergyPlus uses a variable interior air film surface conductance model; DOE 2 does this different.
- Basarkar: Energy Plus. Once system meets load, will have to meet design conditions.
- Fairey: Heating loads somewhat smaller for EnergyPlus.
- Lippy: is there a timeline for moving to EnergyPlus?
- Fairey: Yes, expect to use EnergyPlus during 2012 time frame. Will take longer to run. Annual energy use basis. Best Test program compares program results. 99% of difference is due to interior film coefficient.
- Dixon: Funding was not available in time to do this for the 2010 Code though we tried to get it in place. We are now moving into the 2010 Code development phase. The Workgroup will go dormant for a while, and be convened for next phase when there is funding.
- Palacios: ASHRAE 189.1 was developed using consensus with AIA and BOMA, achieving 20% savings. A little more than 30% more efficient than 2007. Expect to be adopted into ICC codes. If takes renewable part out, and is 24% more stringent.
- Dixon: Good place to start looking for Florida's goal of 30% for the next code.
- Stone: ASHRAE and ICC have come to an agreement on a green code.

- Stanton: There is a link to 189. Will provide to Jeff Blair to distribute to the Workgroup.
- Glenn: have you looked at all other components or just insulation?
- Fairey: the tab in the back of the spreadsheet has variables, skin, air space etc.

### **Additional Florida Energy Code Development Issues Discussion (If Any)**

There were none discussed.

### **Review and Decide on Additional Green & Energy Efficient Roofs Subcommittee Recommendations (If Any)**

Jeff Blair reported on the Green & Energy Efficient Roofs Subcommittee to the Energy Code Workgroup's meeting and answered member's questions. The Subcommittee had no additional recommendations for the Workgroup to consider.

### **General Public Comment**

Members of the public were invited to provide the Workgroup with comments. In addition, members of the public spoke on each of the substantive discussion issues before the Workgroup throughout the meeting.

*None were provided.*

### **Member's Comments and Issues**

Workgroup members were invited to provide comments, or identify any issues or agenda items for the next meeting.

*None were provided.*

### **Review of Workgroup Delivery and Meeting Schedule**

The Workgroup will be meeting as follows:

February 3, 2009: Melbourne, March 5, 2009: Cape Canaveral, March 27, 2009: Tampa, April 30, 2009: Tallahassee, May 28, 2009: Tallahassee, September 3, 2009: Gainesville, October 14, 2009: Tampa; November 12, 2009: Gainesville; December 9, 2009: Orlando; February 3, 2010: Tampa; April 7, 2010 Gainesville.

*(Attachment 3—Workgroup's Adopted Recommendations)*

*(Attachment 4—Statutory Charge)*

### **Next Steps**

The Workgroup has completed their tasks for the 2010 Code Update process. Additional tasks will be assigned as required and as funding allows.

### **Adjournment**

The Workgroup voted unanimously, 12 – 0 in favor, to adjourn at 3:00 PM.

# ATTACHMENT 1

## MEETING EVALUATION RESULTS

**April 7, 2010—Gainesville, Florida**

*Average rank using a 0 to 10 scale, where 0 means totally disagree and 10 means totally agree.*

**1. Please assess the overall meeting.**

- 9.00 The background information was very useful.
- 9.33 The agenda packet was very useful.
- 9.11 The objectives for the meeting were stated at the outset.
- 9.22 Overall, the objectives of the meeting were fully achieved.

**2. Do you agree that each of the following meeting objectives was achieved?**

- 9.00 Discussion/Ranking of 2010 FEC Commercial Chapter Prescriptive Packages (Shell/Renovations).
- 9.00 Discussion/Ranking of 2010 FEC Residential Volume Overall UA Alternative to Prescriptive Compliance Method.
- 9.13 To Decide on Any Additional FEC Development Issues.
- 9.38 To Decide on Additional Green/Energy Efficient Roofs Subcommittee's Report/Rec's.
- 9.13 Adoption of Any Additional Recommendations for Submittal to the Energy TAC/FBC.
- 9.44 Identification of Next Steps.

**3. Please tell us how well the Facilitator helped the participants engage in the meeting.**

- 9.56 The members followed the direction of the Facilitator.
- 9.44 The Facilitator made sure the concerns of all members were heard.
- 9.56 The Facilitator helped us arrange our time well.
- 9.33 Participant input was documented accurately.

**4. Please tell us your level of satisfaction with the meeting?**

- 9.22 Overall, I am very satisfied with the meeting.
- 9.44 I was very satisfied with the services provided by the Facilitator.
- 9.33 I am satisfied with the outcome of the meeting.

**5. Please tell us how well the next steps were communicated?**

- 9.88 I know what the next steps following this meeting will be.
- 9.75 I know who is responsible for the next steps.



**6. What did you like best about the meeting?**

- It's organization.
- Interaction.
- Stayed focused on agenda and time.
- Short.

**7. How could the meeting have been improved?**

- No.
- None.
- Need to improve sound system for clearer hearing.

**8. Member Evaluation Comments.**

*None were provided.*

**Public Written Comments**

*None were provided.*

**ATTACHMENT 2**  
**PUBLIC MEETING ATTENDANCE**

Public Meeting Attendance	
NAME	REPRESENTATION
Lorraine Ross	Intech Consulting
Mike Nau	PGT Industries
Chuck Anderson	AAMA
Michael LaFeure	CWS
Amanda Hickman	Intercode Inc.
Patricia Robinson	Simonton Windows
Arlene Stewart	AZS Consulting
Larry Nelson	FPL
Jack Glenn	FHBA
Dino Muggeo	FPSA
Jim Bertie	FVACCA

## ATTACHMENT 3

### WORKGROUP'S CONSENSUS RECOMMENDATIONS

#### 1.A. ENERGY EFFICIENCY COST-EFFECTIVENESS TESTS FOR RESIDENTIAL CODE CONSENSUS RECOMMENDATIONS

The Florida Legislature directed the Commission to develop a rule for determining cost effectiveness of energy conservation measures to be considered for inclusion in the Florida Energy Code. The rule must be completed and applied to the update of the energy provisions of the for the 2010 Florida Building Code.

*“(3) The Florida Building Commission shall, prior to implementing the goals established in subsection (1), adopt by rule and implement a cost-effectiveness test for proposed increases in energy efficiency. The cost-effectiveness test shall measure cost-effectiveness and shall ensure that energy efficiency increases result in a positive net financial impact.”*

#### Energy Analysis Calculations Methodology

*Energy analysis necessary to determine energy savings for Energy Conservation Measures (ECMs) be accomplished using Florida’s code compliance software, EnergyGauge®.*

*Energy simulation analysis will be conducted for both single ECMs and packages of ECMs.*

#### Economic Analysis Assumptions

*Energy Conservation Measure (ECM) costs will be the full, installed incremental cost of improvements, where the incremental cost is equal to the difference between the baseline measure cost and the improved measure cost unencumbered by any federal tax credits, utility incentives or state rebates.*

*Energy Conservation Measure (ECM) costs will be the full, installed incremental cost of improvements, where the incremental cost is equal to the difference between the baseline measure cost and the improved measure cost unencumbered by any federal tax credits, utility incentives or state rebates, with option to consider encumbering utility incentives, etc. later, if possible.*

#### Study Life Period

*The analysis for residential buildings shall be conducted over a 30 year study period.*

#### ECM Service Life

*The evaluation shall be conducted using the appropriate service lives of the measures.*

#### Home Mortgage Parameter Values

*Mortgage interest rate: the greater of the most recent 5-year average and 10-year average simple interest rate for fixed-rate, 30-year mortgages computed from the Primary Mortgage Market Survey (PMMS) as reported by Freddie Mac.*

*Mortgage down payment: 10%.*

### Annual Rate Parameter Values

*General inflation rate: the greater of the most recent 5-year and 10-year Annual Compound Interest Rate (ACIR) computed from the annual average Consumer Price Index (CPI) as reported by the U.S. Bureau of Labor Statistics.*

*Discount rate: General inflation rate plus 2%.*

*Fuel escalation rate: the greater of 5-year and 10-year ACIR computed from revenue-based prices as reported by Florida Public Service Commission minus the general inflation rate.*

*The baseline electricity and natural gas prices used in the analysis shall be the statewide, revenue-based average residential price for the most recent available 12 months as provided by the Florida Public Service Commission.*

### Cost Effectiveness Criteria

*For present value cost-to-benefit ratio (PV/CB) a value of 1.0 or greater.*

*For the internal rate of return (IRR) on investments, a value equal to 8%. {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). {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)].}*

### Evaluation Methodology for Measures and Packages of Measures

*Create multiple packages of ECMs that result in the target % efficiency increase for each code cycle update (20, 30, 40 and 50%), based on comparison to the 2007 FBC as adopted October 31, 2007 (without the 2009 supplement).*

*Evaluate each ECM using adopted cost effectiveness indicators (PV/BC, IRR, LCCE), within their specific package of ECMs. PV/BC will be considered the primary measure with IRR and LCCE used as measures for illustration and communication of individual ECMs and packages of ECMs comparative economic viability.*

*Validation of the cost effectiveness of Florida Energy Efficiency Code for Building Construction changes shall mean that a number of ECM packages evaluated to comply with the statutory percent energy efficiency increase requirements have a greater benefit than cost as measured in present value dollars.*

## 1.B. ENERGY EFFICIENCY COST-EFFECTIVENESS TESTS FOR COMMERCIAL CODE CONSENSUS RECOMMENDATIONS

### Energy Analysis Calculations Methodology

*Energy analysis necessary to determine energy savings for Energy Conservation Measures (ECMs) will be accomplished using Florida's code compliance software, EnergyGauge®.*

*Energy simulation analysis will be conducted for both single ECMs and packages of ECMs.*

## Economic Analysis Assumptions

*Energy Conservation Measure (ECM) costs will be the full, installed incremental cost of improvements, where the incremental cost is equal to the difference between the baseline measure cost and the improved measure cost unencumbered by any federal tax credits, utility incentives or state rebates.*

*Energy Conservation Measure (ECM) costs will be the full, installed incremental cost of improvements, where the incremental cost is equal to the difference between the baseline measure cost and the improved measure cost unencumbered by any federal tax credits, utility incentives or state rebates, with option to consider encumbering utility incentives, etc. later, if possible.*

## Study Life Period

*The analysis for commercial buildings shall be conducted over a 30 year study period with appropriate service lives included in the analysis.*

## ECM Service Life

*The evaluation shall be conducted using the appropriate service lives of the measures.*

## Mortgage Parameter Values

*Mortgage interest rate: the greater of the most recent 5-year average and 10-year average simple interest rate for fixed-rate, 30-year mortgages computed from the Primary Mortgage Market Survey (PMMS) as reported by Freddie Mac, rate plus 2%.*

*Mortgage down payment: 20%.*

## Annual Rate Parameter Values

*General inflation rate: the greater of the most recent 5-year and 10-year Annual Compound Interest Rate (ACIR) computed from the annual average Consumer Price Index (CPI) as reported by the U.S. Bureau of Labor Statistics.*

*Discount rate: General inflation rate plus 2%.*

*Fuel escalation rate: the greater of 5-year and 10-year ACIR computed from revenue-based prices as reported by Florida Public Service Commission minus the general inflation rate.*

*The baseline electricity and natural gas prices used in the analysis be the statewide, revenue-based average commercial price for the most recent available 12 months as provided by the Florida Public Service Commission.*

## Cost Effectiveness Criteria

*For present value cost-to-benefit ratio (PV/CB) a value of 1.0 or greater.*

*For the internal rate of return (IRR) on investments, a value equal to 7%.*

*For the levelized cost of conserved energy (LCCE), a value equal to the statewide commercial 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). {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)].}*

## Evaluation Methodology for Measures and Packages of Measures

Create multiple packages of ECMs that result in the target % efficiency increase for each code cycle update (20, 30, 40 and 50%), based on comparison to the 2007 FBC as adopted October 31, 2007 (without the 2009 supplement).

Evaluate each ECM using adopted cost effectiveness indicators (PVBC, IRR, LCCE), within their specific package of ECMs. PVBC will be considered the primary measure with IRR and LCEE used as measures for illustration and communication of individual ECMs and packages of ECMs comparative economic viability.

Validation of the cost effectiveness of Florida Energy Efficiency Code for Building Construction changes shall mean that a number of ECM packages evaluated to comply with the statutory percent energy efficiency increase requirements have a greater benefit than cost as measured in present value dollars.

### 1.C. DEFINITION OF “CONSUMER” (APPLIES TO BOTH RESIDENTIAL AND COMMERCIAL)

*Consumer: A class of economic system participant that makes no distinction between the owner of the building and the utility rate payer.*

*All of the above recommendations have been adopted by the Commission.*

### 3. ENERGY CONSERVATION MEASURES FOR REPLACEMENT OF AIR CONDITIONING EQUIPMENT RECOMMENDATIONS

#### Consensus Recommendations:

#### Sizing of Replacement Air Conditioning Systems:

*The A/C contractor or licensed Florida PE shall submit a nationally recognized method based sizing calculation at time of permit application for total replacement of the condensing / evaporator components of HVAC systems 65,000 Btu/h and less.*

*Exception: Buildings designed in accordance with Section 105.3.1.2 of the Florida Building Code, Building.*

#### Testing of air distribution systems when air conditioning systems are replaced:

*At the time of the total replacement of HVAC evaporators & condensing units, under 65,000 Btu/h, all accessible (a minimum of 30 inches clearance) joints and seams in the air distribution system shall be sealed using reinforced mastic or code approved equivalent and shall include a signed certification by the contractor that is attached to the air handler unit stipulating that this work had been accomplished.*

*Exception:*

- 1. Ducts in conditioned space.*
- 2. Joints or seams that are already sealed with fabric and mastic.*
- 3. If system is tested and repaired as necessary.*

## 2. DEVELOP A STRATEGIC PLAN FOR INCREASED EFFICIENCY REQUIREMENTS REQUIRED BY LAW FOR FUTURE FBC EDITIONS

### Consensus Recommendations:

#### Strategic Plan Criteria

1. The Strategic Plan must implement s.553.9061(1), F.S., scheduled increases in the Code's energy performance standard.
2. The Strategic plan must consider cost effectiveness of the incremental changes in efficiency required by the Code.
3. The Strategic Plan must implement s.553.73(6)(a), F.S., selection of the IECC as a foundation code and its modification to maintain the efficiencies of the Florida Energy Efficiency Code for Building Construction, s.553.901, F.S..
4. The Strategic Plan must implement s.553.9061(2), F.S., requiring the Code to recognize including energy efficiency performance options and elements including but not limited to:  
Solar water heating; Energy efficient appliances; Energy efficient windows, doors and skylights; Low solar absorption roofs/cool roofs; Enhanced ceiling and wall insulation; Reduced leak duct systems; Programmable thermostats; and Energy efficient lighting systems.
5. The Strategic Plan should identify compliance methods with the best potential for complying with the schedule for increasing efficiency standards.
6. The Strategic Plan should be adaptable for all potential mandated efficiency performance standard increase schedule.
7. The Strategic Plan should allow flexibility for builders to choose different ways to adapt their construction.
8. The Strategic Plan should provide flexibility appropriate to product innovation.
9. The Strategic Plan should provide for easy measurement and demonstration of compliance with the energy efficiency increases required by s.553.9061, F.S..
10. The Strategic Plan should require that compliance meets an equivalent energy standard regardless of the compliance method.

## **Strategic Plan Consensus Recommendation**

Commission Select The IECC As Foundation Code For Florida Building Code, Energy Pursuant To S.553.73(6)(A), F.S.

Commission Adopt The Florida Energy Efficiency Code For Building Construction (FEC) Within The Florida Building Code Pursuant To S.553.901, F.S. By --

Modifying The IECC To Maintain The Efficiencies Of The FEC Adopted And Amended Pursuant To S.553.901, F.S. As Directed By S.553.73(6)(A), F.S.

### **Modifications To Include:**

- Adding A Maximum Glass Percent Criteria To The Prescriptive Compliance Method To Maintain A Consistent Standard Of Energy Efficiency For All Compliance Methods. (Criteria 10, S.553.73(6)(A)), And S.553.901, F.S.)
- Modifying The Prescriptive Compliance Method's Component Efficiency Requirements To Meet The 20% Overall Efficiency Requirement Improvement Pursuant To S.553.9061(1), F.S., As Determined By Simulations Of Annual Energy Use By Energy Gauge USA Fla/Res. (Criteria 10 And S.553.73(6)(A))
- Modifying The UA Compliance Method's Compliance Criteria To Meet The 20% Overall Efficiency Requirement Improvement Pursuant To S.553.9061(1), F.S., As Determined By Simulations Of Annual Energy Use By Energy Gauge USA Fla/Res. (Criteria 10 And S.553.73(6)(A))
- Using The Energy Gauge USA Fla/Res Implementation Of The FEC Energy Budget Compliance Method For The Performance Compliance Method And Using 80 Points As The Compliance Criteria (S.553.73(6)(A), F.S., S.553.901, F.S., Criteria 4, 5, 6, 7, 8, 9, 10, 11 And 12)
- Modifying The IECC To Include All Other Energy Efficiency Requirements Adopted Pursuant To S.553.901, F.S. The "Thermal Efficiency Code".

*The above recommendation has been adopted by the Commission.*



#### 4. SPECIFIC BUILDING OPTIONS TO ACHIEVE ENERGY EFFICIENCY IMPROVEMENTS

Section 553.9061 (2) The Florida Building Commission shall identify within code support and compliance documentation the specific building options and elements available to meet the energy performance goals established in subsection (1). Energy-efficiency performance options and elements include, but are not limited to: (a) Solar water heating. (b) Energy-efficient appliances. (c) Energy-efficient windows, doors, and skylights. (d) Low solar-absorption roofs, also known as "cool roofs." (e) Enhanced ceiling and wall insulation. (f) Reduced-leak duct systems. (g) Programmable thermostats. (h) Energy-efficient lighting systems.

*Following are the Workgroup's adopted recommendations regarding including specific building technologies/options in the Florida Building Code, Energy Conservation:*

Key:

Green: the software is capable of simulating the performance of the technology, and energy allowances for the technology should be included in the Code.

Yellow: this technology is already accounted for in the Code.

Blue: the technology and/or software is not ready for use in the Code.

- Solar water heating
- Energy-efficient appliances
- Energy-efficient windows, doors, and skylights
- Low solar-absorption roofs, also known as "cool roofs"
- Enhanced ceiling and wall insulation
- Reduced-leak duct systems
- Programmable thermostats
- Energy-efficient lighting systems
- Water source, geo-thermal HVAC systems
- Solar photovoltaic systems
- Variable refrigerant flow mechanical systems
- Data center efficiencies
- Under-floor duct systems
- Induction lighting and new lighting technologies
- Passive energy efficient design and day-lighting
- Building envelop efficiencies
- HVAC System Zoning

## 6. OPTIONS FOR DESIGN CRITERIA FOR ENERGY EFFICIENT POOLS

*The Energy Act of 2008 (HB 7135) directs adoption of pool pump efficiencies in the 2010 FBC. During discussions with the Florida Spa and Pool Association regarding energy efficiency requirements for pool pumps members suggested improved efficiency could be achieved through criteria for pool hydronic system design.*

*This task will be evaluated by: Pool Efficiency Subcommittee to the Energy Code Workgroup.*

### **Issues for Evaluation:**

*Pool pump standards; Pool plumbing system design; Performance and prescriptive compliance paths for pools; Credits for alternative energy sources for pool heating, lighting and pumping.*

The Florida Energy Code Workgroup voted to adopt the Pool Efficiency Subcommittee to the Energy Code Workgroup's recommendation that APSP-15 (Standard for Energy Efficiency for Residential In-ground Swimming Pools) as revised by the Subcommittee should serve as the draft Code language for inclusion in the Florida Building Code, Energy Volume.

The Florida Energy Code Workgroup voted to adopt the Pool Efficiency Subcommittee to the Energy Code Workgroup's recommendation that the Florida Building Code, Energy, shall provide energy code credits (points) for PV and alternative/renewable technologies that reduce energy consumption for pool pump motors.

The Florida Energy Code Workgroup voted to adopt the Pool Efficiency Subcommittee to the Energy Code Workgroup's recommendation that APSP-14 (Portable Spa Energy Efficiency Standard) is an appliance standard and therefore not within the scope of the Florida Building Code.

## 7. EVALUATE REQUIREMENTS FOR GREEN ROOFS RECOGNITION IN FLORIDA BUILDING CODE

*This task will be evaluated by: Green and Energy Efficient Roofs Subcommittee to the Florida Energy Code Workgroup.*

### **Issues for Evaluation:**

*Green roof energy performance, structural and water protection characteristics in Florida environment; Cool roof options and energy performance in Florida environment; Alternative roof systems and components effect on roof/ceiling heating cooling loads and calculations for Florida environment (solar pool heater and DHW thermal arrays, pv arrays, pv roof tiles, mass and metal roof covering, evaporatively cooled, radiant barrier systems).*

The Florida Energy Code Workgroup voted to adopt the Green and Energy Efficient Roofs Subcommittee to the Florida Energy Code Workgroup's recommendation that the Florida Building Code, Energy, shall be amended to provide minimum energy code credits (points) for the use of vegetative roofs. Additional energy credits may be achieved if documentation is provided to support the additional energy efficiency credits.

**ATTACHMENT 4**  
**STATUTORY CHARGE**

**553.9061 Scheduled Increases In Thermal Efficiency Standards.--**

(1) The purpose of this section is to establish a schedule of increases in the energy performance of buildings subject to the Florida Energy Efficiency Code for Building Construction. The Florida Building Commission shall:

(a) Include the necessary provisions by the 2010 edition of the Florida Energy Efficiency Code for Building Construction to increase the energy performance of new buildings by at least 20 percent as compared to the energy efficiency provisions of the 2007 Florida Building Code adopted October 31, 2007.

(b) Increase energy efficiency requirements by the 2013 edition of the Florida Energy Efficiency Code for Building Construction by at least 30 percent as compared to the energy efficiency provisions of the 2007 Florida Building Code adopted October 31, 2007.

(c) Increase energy efficiency requirements by the 2016 edition of the Florida Energy Efficiency Code for Building Construction by at least 40 percent as compared to the energy efficiency provisions of the 2007 Florida Building Code adopted October 31, 2007.

(d) Increase energy efficiency requirements by the 2019 edition of the Florida Energy Efficiency Code for Building Construction by at least 50 percent as compared to the energy efficiency provisions of the 2007 Florida Building Code adopted October 31, 2007.

(2) The Florida Building Commission shall identify within code support and compliance documentation the specific building options and elements available to meet the energy performance goals established in subsection (1). Energy efficiency performance options and elements include, but are not limited to:

(a) Solar water heating.

(b) Energy-efficient appliances.

(c) Energy-efficient windows, doors, and skylights.

(d) Low solar-absorption roofs, also known as "cool roofs."

(e) Enhanced ceiling and wall insulation.

(f) Reduced-leak duct systems.

(g) Programmable thermostats.

(h) Energy-efficient lighting systems.

(3) The Florida Building Commission shall, prior to implementing the goals established in subsection (1), adopt by rule and implement a cost-effectiveness test for proposed increases in energy efficiency. The cost-effectiveness test shall measure cost-effectiveness and shall ensure that energy efficiency increases result in a positive net financial impact.

## ATTACHMENT 5

### TOTAL UA ALTERNATIVE—IS IT EQUIVALENT TO METHOD A? PRESENTATION



## *Total UA Alternative*

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- ❖  $UA = (\text{Component U-Factor}) \times (\text{Component Surface Area})$
- ❖ 
$$\text{Total UA} = UA_{\text{ceilings}} + UA_{\text{walls}} + UA_{\text{windows}} + UA_{\text{doors}} + UA_{\text{floors}}$$
- ❖ *Baseline* U-Factors for each component are as defined by code minimum prescriptive requirements
- ❖ *Baseline* Component Areas = *Proposed* Component Areas
- ❖ To achieve code compliance:  
$$\text{Total UA}_{\text{proposed}} \leq \text{Total UA}_{\text{baseline}}$$



## *Ex: Ceiling vs. Windows*

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- ❖ 2,000 sq. ft. single-story, frame home configured as per proposed 2010 FEC Method B
- ❖ Change to high-performance windows (U-0.30 / SHGC-0.30)
- ❖ Reduce ceiling insulation maintaining Total UA Alternative compliance
- ❖ Results in R-6 ceiling insulation
- ❖ How does this compare with Method A performance requirement (e-Ratio  $\leq 0.80$ )?



## Total UA Results

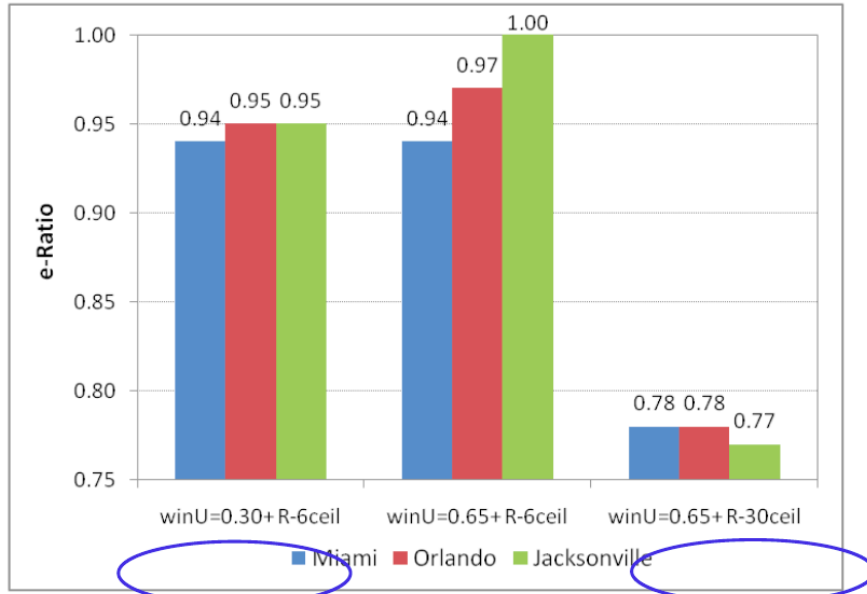
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**PASSES:** Total Proposed UA < Total Baseline UA

UA Calculation Summary		
Component:	Proposed UA	Baseline UA
Walls	86	86
Window & Doors	138	286
Ceilings	203	64
Floors	0	0
<b>Total UA:</b>	<b>428</b>	<b>436</b>



# Method A Calculations





## *Conclusions*

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- ❖ There is a significant difference in equivalence between Method A (performance option) and the IECC Total UA Alternative option
- ❖ The IECC Total UA Alternative option does not result in equivalent compliance in Florida.