FLORIDA SOLAR ENERGY CENTER®
Creating Energy Independence

Task 1: COMMERCIAL CODE REVIEW
FOR THE 2017 FLORIDA BUILDING ENERGY CODE

FSEC-CR-2019-16

DRAFT Final Report
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Executive Summary

This project was initiated because of the state of Florida desire to review provisions of its proposed 2017 commercial buildings energy code in order to make a determination if it meets or exceeds the IECC-2015 and ASHRAE 90.1-2013 standards. The first step of code review was to make a qualitative assessment of the proposed code modifications on energy efficiency of commercial buildings in the state of Florida. In the qualitative assessment, the proposed code changes that has impact on energy efficiency and can be modeled were identified. The following code modifications were identified to have impact on the energy efficiency:

- Vertical Fenestration SHGC Value (Mod # 6925)
- Fenestration Framing Area (Mode # 6563)
- Insulation R-value of Metal Framed Walls (Mod # 6538)

The second step was a quantitative analysis of the code modifications impact using simulations. In the qualitative analysis the proposed code modifications were investigated by incorporating them into commercial buildings energy models and simulating them using EnergyPlus version 8.5, trade mark of Department of Energy (DOE) whole building simulation program (DOE, 2016). The 2017 Florida code performance was investigated using sixteen prototype commercial buildings energy models. The DOE has energy models of IECC-2015 and ASHRAE 90.1-2013 codes for sixteen prototype buildings type. The 2017 Florida code prototype building models were created by modifying the IECC-2015 code building energy models using the proposed code changes. The energy models of the sixteen prototype buildings for the 2017 Florida, IECC-2015 and ASHRAE 90.1-2013 codes were simulated for Miami and Orlando, Florida site locations. The energy use intensity (EUI) of the prototype buildings energy models were determined and evaluated.

Nine of the sixteen prototype buildings energy models designed with the 2017 Florida code exceeded that of ASHRAE 90.1-2013 code. These nine prototype buildings represent 51.0% of the total floor area stock of commercial buildings in the state of Florida. The remaining seven prototype buildings energy models failed to meet ASHRAE 90.1-2013 code. The primary reason why the seven 2017 Florida code prototype buildings failed to meet ASHRAE 90.1-2013 code is that the later code has advanced control features that are not required or allowed in the 2017 Florida code or IECC-2015 code. However, based on the state's average EUI of commercial buildings, the 2017 Florida code performance meets ASHRAE 90.1-2013 code. Table-2 provides summary of the EUIs of the 2017 Florida code and ASHRAE 90.1-2013 code for the sixteen prototype buildings determined using EnergyPlus program and averaged over Florida climate zones. This report summarizes whether commercial buildings constructed in accordance with the 2017 Florida code meets energy efficiency requirements of ASHRAE 90.1-2013 code.

Table-2 2017 Florida Code Estimated Buildings Energy Use Intensity

Building Type	Weighting Factors, %	ASHRAE 90.1-2013 EUI, kBtu/ft^2-yr	FLORIDA-2017 EUI, kBtu/ft^2-yr	ΔEUI, %
Large Office	2.30	71.94	73.77	-2.54
Medium Office	5.94	34.59	35.07	-1.38
Small Office	5.27	29.86	29.81	0.18
Standalone Retail	11.60	46.43	44.78	3.54
Strip Mall	6.21	49.48	48.16	2.67
Primary School	4.28	48.93	51.23	-4.70
Secondary School	7.33	44.90	46.26	-3.02
Hospital	2.25	125.48	125.88	-0.31
Outpatient Health Care	2.83	112.74	112.40	0.30
Restaurant	0.56	312.63	311.52	0.35
Fast Food Restaurant	0.46	469.88	467.32	0.55
Large Hotel	3.81	94.41	93.62	0.83
Small hotel/motel	0.65	58.18	58.69	-0.87
Warehouse	14.50	11.72	11.27	3.84
High-rise apartment	26.26	45.38	45.83	-1.00
Mid-rise apartment	5.75	40.99	40.91	0.21
Florida Average	100.00	48.98	48.98	0.01

The overall result of the analysis shows that when all building types are considered, the Florida 2017 code beats ASHRAE 90.1-2013 by a minute percentage of 0.01%. As a result, one may justifiably conclude that the Florida 2017 Energy code for commercial buildings meets ASHRAE 90.1-2013 considering Florida as a whole.

Acronyms and Abbreviations

ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
DOE	U.S. Department of Energy
FLORIDA-2017	2017 Florida Proposed Code
EUI	Annual Energy use intensity, kBtu/(ft^2-yr)
HVAC	Heating, ventilation, and air-conditioning
IES	Illuminating Engineering Society of North America
IECC	International Energy Conservation Code
PNNL	Pacific Northwest National Laboratory

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1. Introduction

The state of Florida desires to review provisions of its proposed 2017 commercial buildings energy code in order to make a determination if it meets or exceeds the IECC 2015 and ASHRAE 90.1-2013 standards. This report summarizes the analysis performed and the evaluation carried out to make determination whether the 2017 Florida Code meets or exceeds ASHRAE 90.1-2013 code. The tasks performed include:

- Determined reference energy uses intensity (EUI) by building type and an average EUI for the state of Florida for buildings designed with IECC-2015 and ASHRAE 90.1-2013 codes. The reference EUIs for the prototype buildings were determined by simulating the reference prototype buildings in Miami and Orlando representing climate zones 1A and 2A, respectively.

- A weighting factors by Florida climate zones for each of the prototype buildings type and another set of average weighting factors by building types for the state of Florida were determined using commercial building stock and national average building stocks weighting factors by climate zones data obtained from PNNL report by Jarnagin and Bandyopadhyay (2010). The weighting factors were used to determine EUIs by building type and an average EUI across commercial buildings for the state of Florida.

- Identified all proposed modifications to Florida base energy code and evaluated the modified code against provisions of Standard ASHRAE 90.1-2013 to make qualitative assessment on impacts of the modification.

- Identified the difference between the 2017 Florida code and ASHRAE 90.1-2013 that has significant impacts on EUI. And reviewed input assumptions of the sixteen commercial prototype buildings models of IECC-2015 code, and created the 2017 Florida code equivalent prototype buildings energy models.

- Climate zone 2A reference buildings site location was altered to Orlando, Florida instead of Houston, TX, which is the reference site location for climate zone 2A for the DOE reference commercial prototype building models. The IECC-2015, ASHRAE 90.1-2013 and 2017 Florida codes prototype buildings energy models were updated to EnergyPlus version 8.5 and simulated.

- The EUIs were averaged by Florida climate zones weighing factors for each of prototype buildings and aggregated across the sixteen commercial buildings to determine an average EUI for the state of Florida. Whether the performance of the 2017 Florida code meets or exceeds ASHRAE 90.1-2013 code was determined by comparing EUIs of the prototype buildings designed with the 2017 Florida code and ASHRAE 90.1-2013 code. Where there are significant disparities between the 2017 Florida and ASHRAE 90.1-2013 codes buildings the EUIs explanations was provided.

- Summarized the findings whether commercial buildings constructed in accordance with the 2017 Florida code meets the energy efficiency requirements of ASHRAE 90.1-2013 code.

2. Florida Climate Zones

Based on DOE's climate zones classification the state of Florida is categorized into climate zones 1A and 2A, for very hot and humid, and hot and humid climate zones, respectively. The representative cities selected for climate zones 1A and 2A were:

- Miami, Florida (1A, very hot, humid)
- Orlando, Florida (2A, hot, humid)

A representative site location should have been selected based on buildings floor area stock distribution in the state but such information is not available. Orlando was selected as a representative site location for climate zone 2A mainly because it is the geographic center for major cities in climate zone 2A region in the state. Miami is the largest city in climate zone 1A, so it was selected as a representative site location. Representative weighting factors by climate zones and building types were determined in the next section.

3. Florida Weighting Factors Determination

The weighting factors used in this study were generated by processing building stock information obtained from a PNNL report by Jarnagin and Bandyopadhyay (2010). The information obtained include: total floor areas by building type for the state of Florida and national average building weighting factors by climate zones. The national average weighting factors by building type and climate zones 1A and 2A obtained from the PNNL report were used to split the Florida building stock total floor area into climate zones 1A and 2A for each of the prototype buildings type. Two sets of weighting factors were generated for this investigation: weighting factors for the two Florida climate zones for each prototype buildings type, and the state's average weighting factors by buildings type and climate zones. The former weighting factors for climate zones 1A and 2A were used to estimate the EUI for each of the sixteen prototype buildings. And the later weighting factors were used to determine an aggregate EUI across the sixteen prototype commercial buildings for the state of Florida.

3.1 Florida Climate Zones Weighting Factors

Figure 1 shows the weighting factors by climate zones for the state of Florida by prototype buildings type. The weighting factors for each prototype building type sum to 1.0. These weighting factors split the total floor areas stock of each of the prototype buildings in the state into climate zone 1A and 2A fractions. For instance, for High Rise Apartment 95.0% of the total floor area in the state of Florida is in climate zone 1A and the remaining 5.0% is in climate zone 2A.

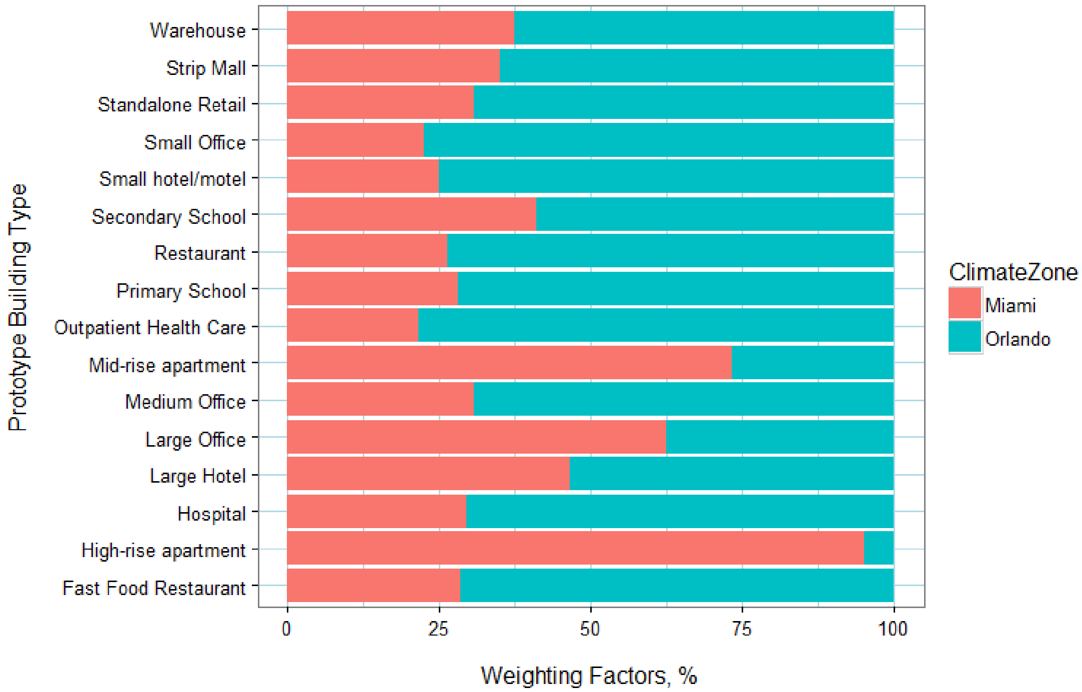

Figure 1 Florida Climate Zone Weighting Factors

3.2 Florida Average Weighting Factors

The average weighting factors were used to determine an aggregate EUI across the sixteen prototype buildings type for the state of Florida. The weighting factors across the sixteen prototype buildings and the two climate zones sum to 1. Figure 2 shows the average weighting factors by building type (sum of climate zones 1A and 2A) for the state of Florida. The High Rise Apartment building type represents the highest fraction of total floor area stock in the state of Florida and it is 26.26% of Florida commercial buildings total floor area stock. Warehouse and Standalone Retail commercial buildings type are the second and third largest buildings type by floor area in the state, respectively.

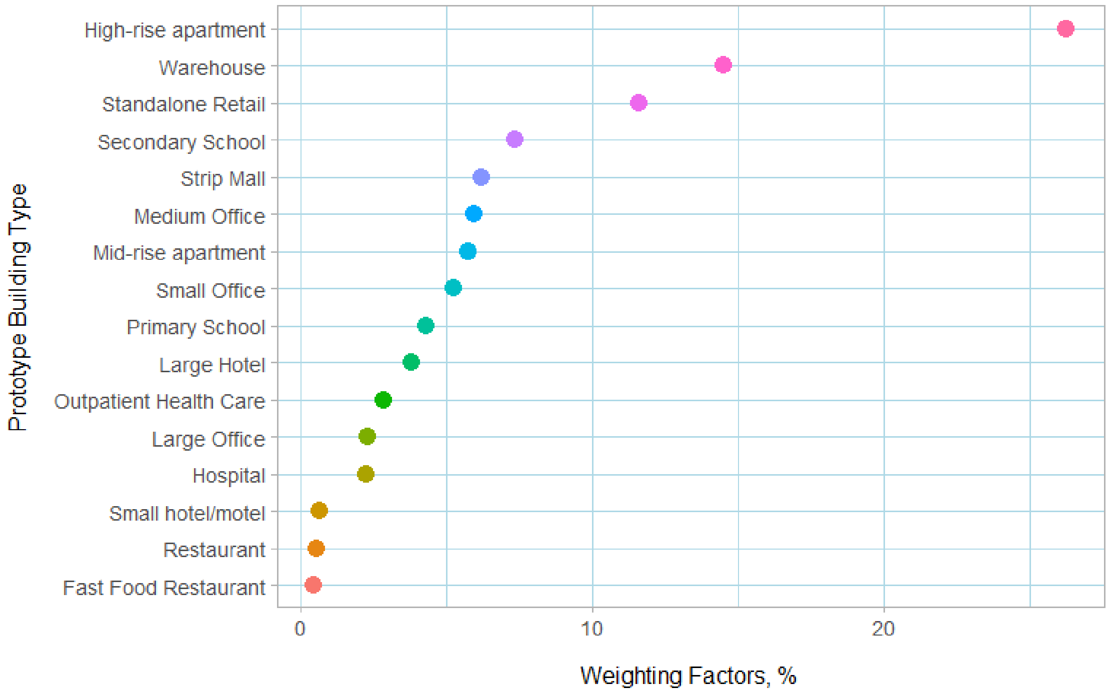

Figure 2 Florida Average Building Weighting Factors

4. Reference Building Energy Code Performance

Figure 3 shows reference EUI (kBtu/ft^2-yr) by prototype buildings type in the state of Florida. The EUI for each of prototype buildings type were aggregated using the weighting factors by climate zones. It was found that only seven out of the sixteen commercial reference prototype buildings energy models designed with IECC-2015 code exceeded energy efficiency of buildings designed with ASHRAE 90.1-2013 code. The remaining nine reference prototype buildings energy models designed with IECC-2015 code failed to meet energy efficiency of buildings designed with ASHRAE 90.1-2013 code. The nine reference prototype buildings failed to meet ASHRAE 90.1-2013 code energy efficiency amount to 68.08% of the total floor area stock of commercial buildings in Florida. The EUI percent differences between ASHRAE 90.1-2013 and IECC-2015 codes shown in Table-1 were calculated as follows:

$$\Delta EUI = 100 \cdot \frac{EUI_{\mathrm{ASHRAE\,90.1-2013}} - EUI_{\mathrm{IECC-2015}}}{EUI_{\mathrm{ASHRAE\,90.1-2013}}}$$

Table 1 summarizes the IECC-2015 and ASHRAE 90.1-2013 codes prototype buildings EUI by building type along with pecent difference and weighting factors by building type.

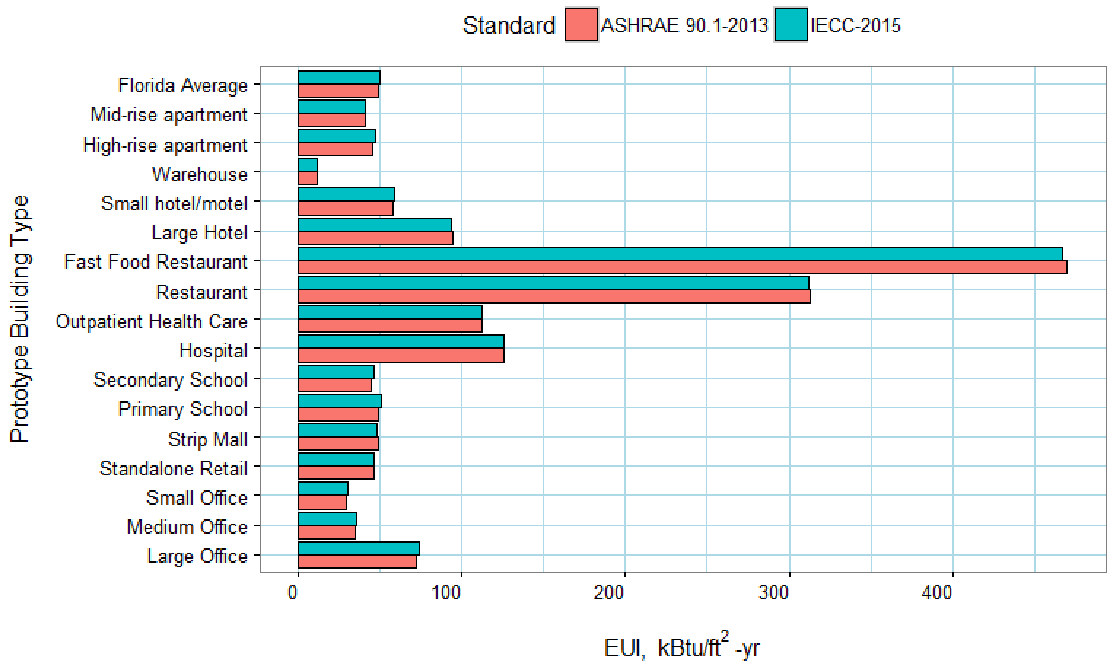

Figure 3 Reference Code Estimated Buildings Energy Use Intensity

Table 1 Reference Code Estimated Buildings Energy Use Intensity

Building Type	Weighting Factors, %	ASHRAE 90.1-2013 EUI, $kBtu/ft^2$-yr	IECC-2015 EUI, $kBtu/ft^2$-yr	ΔEUI, %
Large Office	2.30	71.94	73.77	-2.54
Medium Office	5.94	34.59	35.53	-2.70
Small Office	5.27	29.86	30.11	-0.82
Standalone Retail	11.60	46.43	46.18	0.53
Strip Mall	6.21	49.48	48.12	2.75
Primary School	4.28	48.93	51.27	-4.78
Secondary School	7.33	44.90	46.61	-3.82
Hospital	2.25	125.48	125.68	-0.16
Outpatient Health Care	2.83	112.74	112.41	0.29
Restaurant	0.56	312.63	311.64	0.31
Fast Food Restaurant	0.46	469.88	467.42	0.52
Large Hotel	3.81	94.41	93.64	0.82
Small hotel/motel	0.65	58.18	58.88	-1.21
Warehouse	14.50	11.72	11.47	2.13
High-rise apartment	26.26	45.38	46.93	-3.43
Mid-rise apartment	5.75	40.99	41.32	-0.80
Florida Average	100.00	48.98	49.55	-1.16

Figure 4 shows the Florida climate weighted average percent difference of the EUI by building type. The EUI of each of the sixteen prototype buildings were aggregated using the Florida climate zones weighting factors by building type. The state's average EUI labeled "Florida Average" was determined by aggregating across the sixteen prototype buildings EUIs using the Florida average weighting factors.

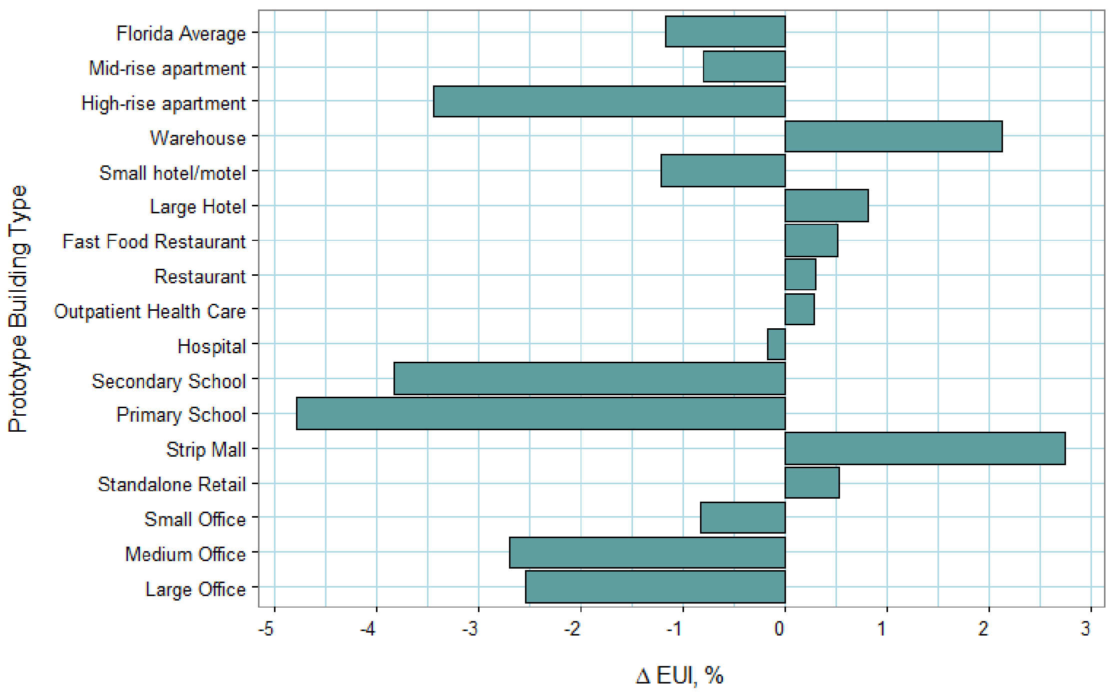

Figure 4 Reference Code Estimated Buildings Energy Use Intensity Difference

Out of the sixteen prototype commercial buildings only nine of the buildings designed with the IECC-2015 code have EUI's higher than that of ASHRAE 90.1-2013 code. The state's average EUI aggregated across the sixteen prototype buildings type for the IECC-2015 code reference buildings energy models was higher by about 1.16% compared to an average EUI obtained for reference buildings deigned with ASHRAE 90.1-2013 code. The state’s average EUIs difference between ASHRAE 90.1-2013 and IECC-2015 codes is close to the national average EUIs difference of 0.7% reported by Zhang et al. (2015). This implies on average a commercial building designed with the IECC-2015 code in Florida will consume about 1.16% more energy compared to ASHRAE 90.1-2013 code building.

5. Proposed Florida Code Modifications

The 2017 Florida building energy code introduced modifications to the base code, which is the IECC-2015 code. The list of code modifications proposed to the 2017 Florida code are in Table-1A in the Appendix. The 2017 proposed commercial code modifications that impact energy efficiency of commercial buildings and are included in the building energy models for this investigation were:

- Vertical Fenestration SHGC Value (Mod # 6925)
- Fenestration Framing Area (Mode # 6563)
- Insulation R-value of Metal Framed Walls (Mod # 6538)

The first two code modifications were applied as needed to the IECC-2015 code reference building energy models to get the 2017 Florida code equivalent models. The third code modification was not applied since the reference building energy models were created using U-values of opaque envelope assemblies as compliance criterion and the U-values of the assemblies did not change in the proposed modification. In addition to code modification, the prototype building models site location was altered from Houston, Texas to Orlando, Florida. Then the 2017 Florida code models were simulated for Miami and Orlando site locations. Finally, EUIs of the prototype buildings model designed with 2017 Florida Energy and ASHRAE 90.1-2013 codes were determined and evaluated. The following section summarizes the EUIs of commercial buildings for the 2017 Florida and ASHRAE 90.1-2013 codes.

6. Proposed Building Energy Code Performance

The EUI's of each prototype buildings type were aggregated by Florida climate zones weighing factors to determine the EUI for Florida climate by building type. Figure 5 shows the EUI for commercial prototype buildings designed with the 2017 Florida and ASHRAE 90.1-2013 codes in the state of Florida.

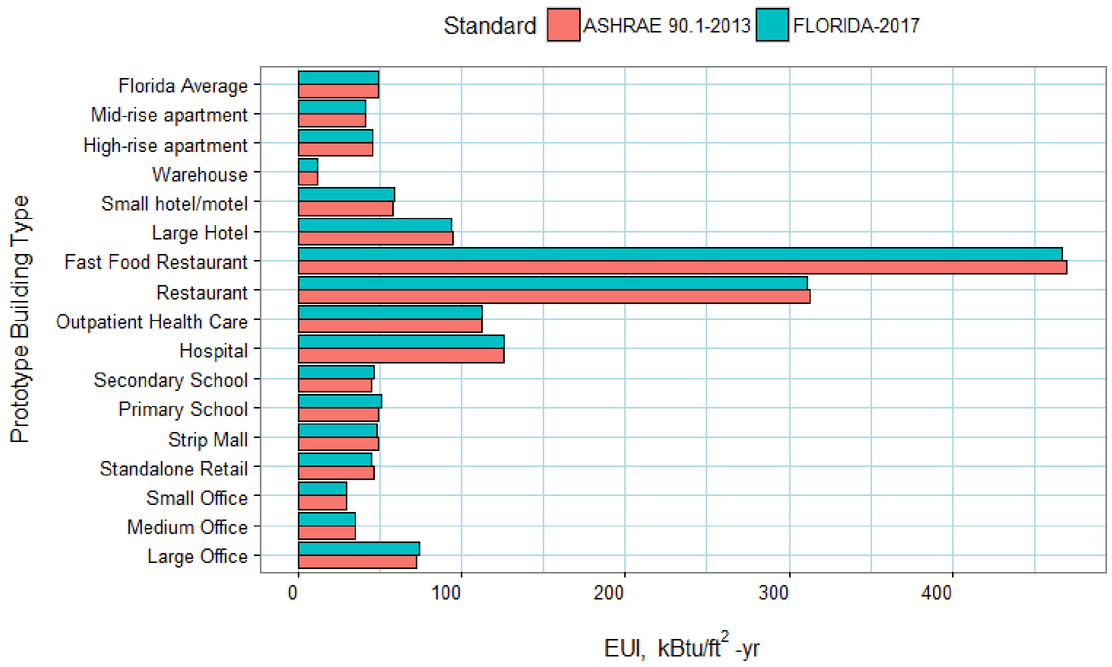

Figure 5 2017 Florida Code Estimated Buildings Energy Use Intensity

Figure 6 shows the EUI difference between building energy models designed with the 2017 Florida code and ASHRAE 90.1-2013 codes by building type. The EUIs percent difference were calculated from climate zones weighted EUIs of each of the sixteen prototype buildings designed with the 2017 Florida and ASHRAE 90.1-2013 codes. The Florida average EUI difference was determined from the 2017 Florida and ASHRAE 90.1-2013 codes commercial buildings weighted average EUIs. The EUI percent differences between the 2017 Florida and ASHRAE 90.1-2013 codes were calculated as follows:

$$\Delta EUI = 100 \cdot \frac{EUI_{ASHRAE90.1-2013} - EUI_{FLORIDA-2017}}{EUI_{ASHRAE90.1-2013}}$$

Most of the prototype buildings energy models designed with the 2017 Florida code have EUIs below that of ASHRAE 90.1-2013 code primarily due to code modification proposed to reduce SHGC values of vertical fenestrations. Some of the IECC-2015 prototype buildings energy models had their skylight SHGC higher than the maximum allowed for IECC-2015 code. Adjusting the skylight's SHGC values assumption for some of the 2017 Florida code building energy models also contributed to lowering the EUI values. The 2017 Florida code average EUI aggregated across sixteen commercial buildings is lower than that of ASHRAE 90.1-2013 code by about 0.01%. This confirms that on average across the commercial buildings sector the 2017 Florida energy code meets ASHRAE 90.1-2013 energy code.

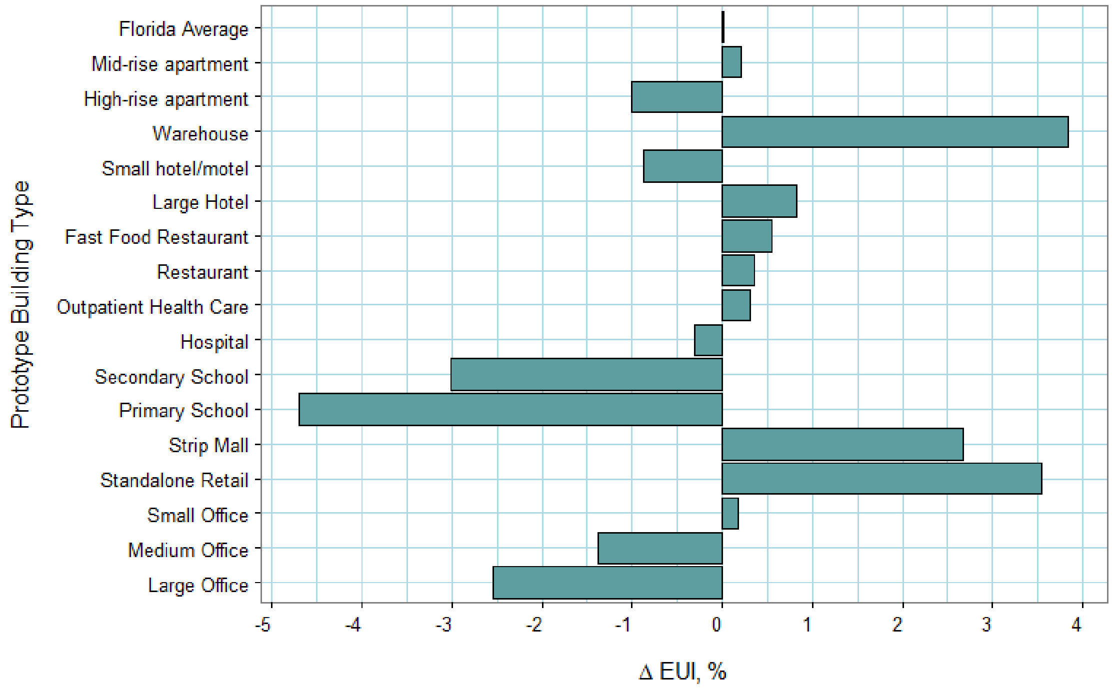

Figure 6 2017 Florida Code Estimated Building Energy Use Intensity Difference

Table 2 2017 Florida Code Estimated Building Energy Use Intensity Difference

Building Type	Weighting Factors, %	ASHRAE 90.1-2013 EUI, kBtu/ft^2-yr	FLORIDA-2017 EUI, kBtu/ft^2-yr	ΔEUI, %
Large Office	2.30	71.94	73.77	-2.54
Medium Office	5.94	34.59	35.07	-1.38
Small Office	5.27	29.86	29.81	0.18
Standalone Retail	11.60	46.43	44.78	3.54
Strip Mall	6.21	49.48	48.16	2.67
Primary School	4.28	48.93	51.23	-4.70
Secondary School	7.33	44.90	46.26	-3.02
Hospital	2.25	125.48	125.88	-0.31
Outpatient Health Care	2.83	112.74	112.40	0.30
Restaurant	0.56	312.63	311.52	0.35
Fast Food Restaurant	0.46	469.88	467.32	0.55
Large Hotel	3.81	94.41	93.62	0.83
Small hotel/motel	0.65	58.18	58.69	-0.87
Warehouse	14.50	11.72	11.27	3.84
High-rise apartment	26.26	45.38	45.83	-1.00
Mid-rise apartment	5.75	40.99	40.91	0.21
Florida Average	100.00	48.98	48.98	0.01

Out of the sixteen prototype commercial buildings only seven buildings failed to meet the energy efficiency of ASHRAE 90.1-2013 code. The next section explains why those buildings failed.

7. Impacts of ASHRAE's Advanced Control Requirement

Table-3 sumarizes the seven 2017 Florida code prototype buildings energy models failed to meet ASHRAE 90.1-2013 code. These seven buildings designed with the 2017 Florida code failed to meet ASHRAE 90.1-2013 code primarily due to absence of advanced control functions in the 2017 Florida building energy code. The three advanced control functions that are required in ASHRAE 90.1-2013 code but not in the 2017 Florida and IECC-2015 codes are:

a. Automatic Receptacle Control (ASHRAE 90.1-2013, Section 8.4.2)
b. HVAC System Optimum Start Control (ASHRAE 90.1-2013, Section 6.4.3.3.3)
c. Door Switches (ASHRAE 90.1-2013, Section 6.5.10)

Table 3 contains advanced control function applied to ASHRAE 90.1-2013 code prototype buildings energy models. One or more of the advanced control functions were applied to the seven ASHRAE 90.1-2013 prototype buildings energy models that are not in the 2017 Florida code equivalent prototype building energy models.

Table 3 2017 Florida Code Prototype Buildings Failed to Meet ASHRAE 90.1-2013 Code

Building Type	Advanced Control Functions	ASHRAE 90.1-2013 EUI, kBtu/ft^2-yr	FLORIDA-2017 EUI, kBtu/ft^2-yr	ΔEUI, %
Large Office	a, b	71.94	73.77	-2.54
Medium Office	a, b	34.59	35.07	-1.38
Primary School	a, b	48.93	51.23	-4.70
Secondary School	a, b	44.90	46.26	-3.02
Hospital	a	125.48	125.88	-0.31
Small hotel/motel	a, c	58.18	58.69	-0.87
High-rise apartment	a, b, c	45.38	45.83	-1.00

Automatic receptacles control is required in private offices, conference rooms, printing and copying rooms, classrooms, break rooms, and private work stations spaces per ASHRAE 90.1-2013 code. Office, Schools, and High Rise Apartment prototype buildings energy models designed for ASHRAE 90.1-2013 code have automatic receptacles control. Automatic receptacles control in ASHRAE 90.1-2013 code buildings energy models were accounted for using reduced fraction in the internal equipment energy use schedules. In addition to the automatic receptacle control, ASHRAE 90.1-2013 Section 6.4.3.3.3 allows system Optimum Start Control but not in IECC-2015 and the 2017 Florida codes. Furthermore, ASHRAE 90.1-2013 Section 6.5.10 allows automatic Door Switches control that disables the HVAC system or triggers thermostat setbacks control when conditioned space exterior doors are opened. This control function has been included in Apartment and Hotel prototype buildings energy models of ASHRAE 90.1-2013 code. The Large Office, Medium Office, Primary School, Secondary School, Hospital, Apartment and Hotel prototype buildings in Table-3 designed with ASHRAE 90.1-2013 have lower EUI because of one or more of these advanced control functions that are missing in the 2017 Florida code.

8. Summary

The DOE/PNNL reference commercial prototype buildings energy models were modified and investigated using EnergyPlus program, version 8.5. The IECC-2015 and ASHRAE 90.1-2013 codes reference buildings energy models were updated and investigated for Florida climate zones 1A and 2A. The 2017 Florida code prototype buildings energy models were created by modifying the IECC-2015 code energy models. Buildings weighting factors by climate zones and buildings type for the state of Florida were also determined. The weighting factors account for buildings floor area distributions by climate zones and building type in Florida.

It was found that only seven out of the sixteen commercial reference prototype buildings energy models designed with IECC-2015 code exceeded the energy efficiency of buildings designed with ASHRAE 90.1-2013 code. The remaining nine reference prototype buildings energy models designed with IECC-2015 code failed to meet energy efficiency of ASHRAE 90.1-2013 code building. The nine reference prototype buildings failed to meet ASHRAE 90.1-2013 code efficiency amount to 68.08% of the total floor area stock of commercial buildings in Florida. And the state's averaged EUI aggregated across the sixteen reference prototype buildings type for the IECC-2015 code was higher by about 1.16% compared to an average EUI obtained for reference buildings designed with ASHRAE 90.1-2013 code. This implies a commercial building designed with the IECC-2015 code in Florida will consume about 1.16% more energy compared to a building designed with ASHRAE 90.1-2013 code.

However, the 2017 Florida code, which is a modified version of the IECC-2015 code, on average meets or barely exceeded that of ASHRAE 90.1-2013 code in Florida climate. Nine out of the sixteen prototype buildings energy models designed with the 2017 Florida code exceeded that of ASHRAE 90.1-2013 code performance, i.e., the EUI's of the 2017 Florida code prototype buildings energy models were less than that of ASHRAE 90.1-2013 code buildings. These nine prototype buildings represent 51.0% of total floor area of commercial buildings in Florida. The remaining seven commercial prototype buildings energy models designed with the 2017 Florida code failed to meet energy efficiency of buildings designed with ASHRAE 90.1-2013 code. Since the seven prototype buildings energy models designed with ASHRAE 90.1-2013 code had automatic receptacles control, HVAC system smart start control, and Door Switches control functions, their energy use was lower than buildings designed with the 2017 Florida code.

Impacts of the advanced control functions on the state's commercial buildings energy use could not be investigated quantitatively because neither they were part of the proposed code modification nor they were within the scope of this task. But qualitatively it can be inferred that these advanced control functions could have reduce energy use or improved energy efficiency of the buildings had they been incorporated into the proposed Florida code.

9. Conclusion

The overall result of the analysis shows that when all building types are considered, the Florida 2017 code beats ASHRAE 90.1-2013 by a minute percentage of 0.01%. Some building types show Florida 2017 uses more energy than ASHRAE 90.1-2013 while others show less energy use than ASHRAE 90.1-2013. But in all cases the differences are in the noise level and within possible margins of errors in assumptions and data.

As a result, one may justifiably conclude that the Florida 2017 Energy code for commercial buildings meets ASHRAE 90.1-2013

10. Reference

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11. Appendix

Table-1A 2017 Florida Code Proposed Modifications

Mod.	Section.	Summary	Remark
6930	C101.4.1	This proposal modifies the categories of exempt buildings to be consistent with Florida Statutes	No impact on energy use to be considered here.
6561	C202	This code change is also being proposed for the 2018 IECC. This revision clarifies the types of products that are included in the category of "skylights" and brings the Florida Building Code: Energy Conservation (Commercial) in closer alignment with the Florida Building Code: Building.	No impact on energy efficiency to be considered here. This is clarification on the definition of skylights and types.
6580	C202	Improve correlation with the Building Code regarding Fenestration definitions	No impact on energy use to be considered here. This is clarification on the definition of skylights and types. The same as Mod # 6561.
6929	C202	This proposal updates and clarifies the definition of "Replacement"	Clarifies the definition of Replacement. No impact on energy use to be considered here.
6538	C402.1.3	Creates cost effective prescriptive R-values for buildings.	Reduced prescriptive R-values for metal framed and Wood framed walls from R-13 + R-5.0ci to R-13, and from R-13+R-3.8ci or R-20 to R-13, respectively. This modification makes IECC-2015 code for R-values of wood framed walls equivalent to ASHRAE 90.1-2013 but for metal framed walls only for climate zone 1. For climate zone 2 metal framed walls R-value requirement is reduced below ASHRAE 90.1-2013 minimum R-value.

Table-1A 2017 Florida Code Proposed Modifications (continued)

Mod.	Section.	Summary	Remark
6925	C402.4	This proposal maintains the commercial fenestration SHGC requirement that currently applies under the 5th Edition Code.	Modifies the maximum SHGC values allowed for vertical fenestration for all orientation to be 0.25 regardless of the projection factor. This modification makes the 2017 Florida code the same SHGC as that of ASHRAE 90.1-2013 in climate zones 1 and 2.
7003	C403.2.12.3	Revises label requirement for Fan efficiency grade (FEG) requirements.	No impact on the efficiency of the fan due to removal of the FEG label. Hence no impact on the energy use of the building. Note that certification of fan efficiency by independent testing agency is still required.
7021	C403.2.3	Make sure code is consistent with federal heating and cooling equipment efficiency minimums.	The 2017 Florida Code modification requires minimum efficacy of IECC-2015 or higher than the federal minimum efficiency requirements.
6782	C405.6.3	Change C405.6.3 to read the same as ASHRAE 90.1-2013. Addendum c 8.4.1 Voltage Drop. The conductors for feeders and branch circuits combined shall be sized for maximum of 5% voltage drop total.	The maximum combined Voltage Drop allowed changed to 5% to make it equivalent to with ASHRAE 90.1-2013 statement.
6563	C407.5.1	Correct an inconsistency in the 2015 IECC related to skylights. This code change is also being proposed for the 2018 IECC.	The proposed 2017 Florida code modification does not degrade the performance of the vertical fenestrations and skylights. In fact by changing the “glazing area” by “fenestration area” it may reduce the effective glazing area, as the fenestration includes the framing area as well.
6411	701.2	Prevent Reduction of Energy Efficiency when a building is entirely exempt from the FBC, Energy Efficiency volume.	This modification ensures that exempt building energy efficiency is maintained to existing level during alterations. The proposed modification will be more stringent compared to IECC-2015 requirement.