Energy

Proposed Code Modifications

Including Comments

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TAC: Energy

Sub Code: Energy Conservation

Total Mods for Energy: 57

Date Submitted	12/31/2015	**Section**	1	**Proponent**	Jeff Sonne / FSEC
Chapter	10	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6764 and 6765

Summary of Modification

New ANSI duct testing Standard for Table R402B.

Rationale

This change provides the new American National Standard that did not exist for reference during the last Florida Code cycle or for reference during the 2015 IECC cycle.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Impact to building and property owners relative to cost of compliance with code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Impact to industry relative to the cost of compliance with code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No; replaces existing Standard with a new American National Standard, but does not change duct testing requirements.

Does not degrade the effectiveness of the code

Does not degrade the code; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Is the proposed code modification part of a prior code version? No

TABLE R402B MANDATORY REQUIREMENTS		
Component	**Section**	**Summary of Requirement(s)**
Air leakage	R402.4	To be caulked, gasketed, weatherstripped or otherwise sealed per Table R402.4.1.1. Recess lighting: IC-rated as having =2.0 cfm tested to ASTM E 283. Windows and doors: 0.3 cfm/sq.ft (swinging doors: 0.5 cfm/sf) when tested to NFRC 400 c AAMA/WDMA/CSA 101/I.S. 2/A440. Fireplaces: Tight-fitting flue dampers & outdoor combustion air.
Programmable thermostat	R403.1.2	Where forced-air furnace is primary system, a programmable thermostat is required.
Air distribution system	R403.2.2 R403.2.4	Ducts shall be tested ~~to Section 803 of the RESNET standards~~ in accordance with ANSI/RESNET/ICC 380-2016 by an energy rater certified in accordance with Section 553.99, *Florida Statutes*, or as authorized by *Florida Statutes.* Air handling units are not allowed in attics.
Water heaters	R403.4	Comply with efficiencies in Table C404.2. Hot water pipes insulated to = R-3 to kitchen outlets, other cases. Circulating systems to have an automatic or accessible manual OFF switch. Heat trap required for vertical pipe risers.
Swimming pools & spas	R403.9	Spas and heated pools must have vapor-retardant covers or a liquid cover or other means proven to reduce heat loss except if 70% of heat from site-recovered energy. Off/timer swit required. Gas heaters minimum thermal efficiency is 82%. Heat pump pool heaters minimu COP is 4.0.
Cooling/heating equipment	R403.6	Sizing calculation performed & attached. Special occasion cooling or heating capacity requires separate system or variable capacity system.
Lighting equipment	R404.1	At least 75% of permanently installed lighting fixtures shall be high-efficacy lamps.

EN6930

Date Submitted	12/30/2015	**Section**	101.4.2	**Proponent**	Eric Lacey
Chapter	1	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal modifies the categories of exempt buildings to be consistent with Florida Statutes.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposal will help clarify the applicability of the code, improving enforcement.

Impact to building and property owners relative to cost of compliance with code

This proposal will clarify the applicability of the code, benefitting building and property owners.

Impact to industry relative to the cost of compliance with code

This proposal should not increase industry costs relative to compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal clarifies the energy code, which is part of a comprehensive set of building standards dedicated to the health, safety, and welfare of the general public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the code by clarifying the categories of exempt buildings.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any materials, products, methods, or systems of construction.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

C101.4.2 Exempt buildings. Buildings exempt from the provisions of the *Florida Building Code, Energy Conservation,* ~~include existing buildings except those considered renovated buildings, changes of occupancy type, or previously unconditioned buildings to which comfort conditioning is added. Exempt buildings include~~ are those specified in Sections C101.4.2.1 through C101.4.2.4.

C101.4.2.1 Federal standards. Any building for which federal mandatory standards preempt state energy codes

C101.4.2.2 Historic buildings. Any building meeting the criteria for historic buildings as defined in Chapter 2 of this Code.

C101.4.2.3 Low energy buildings as described in Section C402.1.1. Such buildings shall not contain electrical, plumbing or mechanical systems which have been designed to accommodate the future installation of heating or cooling equipment.

C101.4.2.4 Buildings designed for purposes other than general space comfort conditioning. Any building where heating or cooling systems are provided which are designed for purposes other than general space comfort conditioning. Buildings included in this exemption include:

1. Commercial service areas where only ceiling radiant heaters or spot coolers are to be installed which will provide heat or cool only to a single work area and do not provide general heating or cooling for the space.

2. Buildings heated with a system designed to provide sufficient heat only to prevent freezing of products or systems. Such systems shall not provide heating above 50°F (10°C).

3. Pre-manufactured freezer or refrigerated storage buildings and areas where the temperature is set below 40°F (4°C) and in which no operators work on a regular basis.

4. Electrical equipment switching buildings which provide space conditioning for equipment only and in which no operators work on a regular basis except that the provisions of Section C405 shall apply.

5. Buildings containing a system(s) designed and sold for dehumidification purposes only and controlled only by a humidistat. No thermostat shall be installed on systems thus exempted from this code.

Reason Statement for Proposal to Clarify Categories of Exempt Buildings

This proposal makes Section C101.4.2 more consistent with the specific categories of exempt buildings outlined in Florida Statutes, Section 553.902(2). While the Florida Building Commission is permitted to recommend to the Legislature additional types of buildings that should be exempt from the energy code, the statute provides the following specific list of exempt buildings:

> "553.902(2) Exempted building means:
>
> (a) A building or portion thereof whose peak design rate of energy usage for all purposes is less than 1 watt/sq. foot of floor area for all purposes.
>
> (b) A building that is neither heated nor cooled by a mechanical system designed to control or modify the indoor temperature and powered by electricity or fossil fuels.
>
> (c) A building for which federal mandatory standards preempt state energy codes.
>
> (d) A historical building as described in s. 267.021(3).
>
> The Florida Building Commission may recommend to the Legislature additional types of buildings which should be exempted from compliance with the Florida Building Code-Energy Conservation."

Fl. Stat. § 553.902(2). Section C101.4.8 of the 5th Edition Florida Building Code, Energy Conservation includes other categories that are not included in the statute. For example, the code applies the exemption to "existing buildings except those considered renovated buildings." We note that the Florida Statute does not exempt existing buildings from the Florida Building Code. To the contrary, Section 553.903 Applicability clarifies that the energy code applies to all new and renovated buildings and the components and systems installed in new and existing buildings:

> "553.903 – Applicability – This part applies to all **new** and **renovated buildings** in the state, except **exempted buildings**, for which building permits are obtained after March 15, 1979, **and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by the Florida Building Code-Energy Conservation**. The provisions of this part shall constitute a statewide uniform code."

Fl. Stat. § 553.903 (emphasis added). The term "exempted buildings" as defined in Section 553.902 (as detailed above) does not cover all existing buildings. This is an interpretation that was apparently added in previous editions of the Florida Building Code, and it is inconsistent with the statute. This single clause – "existing buildings except those considered renovated buildings" – has been the cause of significant debate and confusion among code officials, and some have suggested that it prohibits the Florida Building Commission from regulating any part of existing buildings. That interpretation was clearly not intended by the Florida Legislature, and we see no reason why the Commission's authority should be constrained in that way.

We also note that the language regarding changes of occupancy type and "previously unconditioned buildings to which comfort conditioning is added" also conflicts with Sections C503.2 and C505.1 and should be eliminated. Section C503.2 Change in space conditioning clarifies that where unconditioned (or low-energy) space is altered to become conditioned space, the space must be brought into compliance with the code. Similarly, Section C505.1 requires that spaces undergoing a change in occupancy that would increase energy use must comply with the code. The elimination of the Florida-specific language in C101.4.2 of the 6th Edition code would remove that conflict.

We believe that the Florida Building Code must be consistent with the statute. These changes will bring greater clarity to code officials and will clarify the scope of the Commission's authority consistent with the intent of the Florida Legislature.

Date Submitted	12/30/2015	**Section**	101.4.2	**Proponent**	Eric Lacey
Chapter	1	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal modifies the categories of exempt buildings to be consistent with Florida Statutes.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposal will help clarify the applicability of the code, improving enforcement.

Impact to building and property owners relative to cost of compliance with code

This proposal will clarify the applicability of the code, benefitting building and property owners.

Impact to industry relative to the cost of compliance with code

This proposal should not increase industry costs relative to compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal clarifies the energy code, which is part of a comprehensive set of building standards dedicated to the health, safety, and welfare of the general public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the code by clarifying the categories of exempt buildings.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any materials, products, methods, or systems of construction.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

R101.4.2 Exempt buildings. Buildings exempt from the provisions of the *Florida Building Code, Energy Conservation,* ~~include existing buildings except those considered renovated buildings, changes of occupancy type, or previously unconditioned buildings to which comfort conditioning is added. Exempt buildings include~~ are those specified in Sections R101.4.2.1 through R101.4.2.4.

R101.4.2.1 Federal standards. Any building for which federal mandatory standards preempt state energy codes

R101.4.2.2 Hunting or recreational buildings < 1,000 square feet. Any building of less than 1,000 square feet (93 $m^{2)}$
whose primary use is not as a principal residence and which is constructed and owned by a natural person for hunting or similar recreational purposes is exempt from this code; however, no such person may build more than one exempt building in any 12-month period.

R101.4.2.3 Historic buildings. Any building meeting the criteria for historic buildings as defined in Chapter 2 of this Code.

R101.4.2.4 Low energy buildings as described in Section R402.1. Such buildings shall not contain electrical, plumbing or mechanical systems which have been designed to accommodate the future installation of heating or cooling equipment.

Reason Statement for Proposal to Clarify Categories of Exempt Residential Buildings

This proposal makes Section R101.4.2 more consistent with the specific categories of exempt buildings outlined in Florida Statutes, Section 553.902(2). While the Florida Building Commission is permitted to recommend to the Legislature additional types of buildings that should be exempt from the energy code, the statute provides the following specific list of exempt buildings:

> "553.902(2) Exempted building means:
>
> (a) A building or portion thereof whose peak design rate of energy usage for all purposes is less than 1 watt/sq. foot of floor area for all purposes.
>
> (b) A building that is neither heated nor cooled by a mechanical system designed to control or modify the indoor temperature and powered by electricity or fossil fuels.
>
> (c) A building for which federal mandatory standards preempt state energy codes.
>
> (d) A historical building as described in s. 267.021(3).
>
> The Florida Building Commission may recommend to the Legislature additional types of buildings which should be exempted from compliance with the Florida Building Code-Energy Conservation."

Fl. Stat. § 553.902(2). Section R101.4.8 of the 5th Edition Florida Building Code, Energy Conservation includes other categories that are not included in the statute. For example, the code applies the exemption to "existing buildings except those considered renovated buildings." We note that Florida Statute does not exempt existing buildings from the Florida Building Code. To the contrary, Section 553.903 Applicability clarifies that the energy code applies to all new and renovated buildings and the components and systems installed in new and existing buildings:

> "553.903 – Applicability – This part applies to all **new** and **renovated buildings** in the state, except **exempted buildings**, for which building permits are obtained after March 15, 1979, **and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by the Florida Building Code-Energy Conservation**. The provisions of this part shall constitute a statewide uniform code."

Fl. Stat. § 553.903 (emphasis added). The term "exempted buildings" as defined in Section 553.902 (as detailed above), does not cover all existing buildings. This is an interpretation that was apparently added in previous editions of the Florida Building Code, and it is inconsistent with the statute. This single clause – "existing buildings except those considered renovated buildings" – has been the cause of significant debate and confusion among code officials, and some have suggested that it prohibits the Florida Building Commission from regulating any part of existing buildings. That interpretation was clearly not intended by the Florida Legislature, and we see no reason why the Commission's authority should be constrained in that way.

We also note that the language regarding changes of occupancy type and "previously unconditioned buildings to which comfort conditioning is added" also conflict with Sections C503.2 and C505.1, and should be eliminated. Section R503.2 Change in space conditioning clarifies that where unconditioned (or low-energy) space is altered to become conditioned space, the space must be brought into compliance with the code. Similarly, Section C505.1 requires that spaces undergoing a change in occupancy that would increase energy use must comply with the code. The elimination of the Florida-specific language in R101.4.2 of the 6th Edition Code would remove that conflict.

We believe that the Florida Building Code must be consistent with the statute. These changes will bring greater clarity to code officials and will clarify the scope of the Commission's authority consistent with the intent of the Florida Legislature.

EN6561

Date Submitted	12/15/2015	**Section**	202	**Proponent**	Dwight Wilkes
Chapter	2	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6558

Summary of Modification

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.

Rationale

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 theFlorida Building Code: Building.
This code change is also being proposed for the 2018 IECC.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No Impact

Impact to building and property owners relative to cost of compliance with code
No Impact

Impact to industry relative to the cost of compliance with code
No Impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Yes

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Yes, improves correlation with the Building Code

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
Does Not

Does not degrade the effectiveness of the code
Does Not

Is the proposed code modification part of a prior code version? No

Revise Section C202 as follows:

Products classified as either vertical fenestration or skylights.

Skylight. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

EN6580

Date Submitted	12/17/2015	**Section**	202	**Proponent**	Roger LeBrun
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Improve correlation with the Building Code regarding Fenestration definitions

Rationale

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.

This code change is also being proposed for the 2018 IECC.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

More thorough definition for "skylight" should improve consistency of enforcement

Impact to building and property owners relative to cost of compliance with code

No impact

Impact to industry relative to the cost of compliance with code

No impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Completes the range of products classified as skylights

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Removes discriminatory omission of other roof-mounted product types

Does not degrade the effectiveness of the code

No effect

Is the proposed code modification part of a prior code version? No

Revise Section C202 as follows:

FENESTRATION. Products classified as either vertical fenestration or skylights

Skylight. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

Date Submitted	12/30/2015	**Section**	202	**Proponent**	Eric Lacey
Chapter	2	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal updates and clarifies the definition of "Replacement."

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There should be no impact on local enforcement of the code.

Impact to building and property owners relative to cost of compliance with code

There should be no impact on building or property owners.

Impact to industry relative to the cost of compliance with code

There should be no impact to industry relative to cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal updates and clarifies a definition in the energy code, which is part of a comprehensive set of codes dedicated to the health, safety, and welfare of the general public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal strengthens the code by improving and clarifying a definition.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposal does not discriminate against any products.

Does not degrade the effectiveness of the code

The proposal improves the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Revise the definition of "Replacement" as follows:

REPLACEMENT. The installation of part or all of an existing mechanical or electrical system or thermal envelope component in an existing building.

Reason Statement for Proposal to Update Definition of "Replacement"

This proposal does not change any requirements in the code, but simply clarifies that the term "replacement" applies to mechanical systems and to thermal envelope components. We believe this definition is more consistent with Florida Statutes and with the Commission's regulation of replacement systems and components in recent editions of the Florida Building Code. The Florida Legislature provided the outline for the Commission's authority to regulate new and existing buildings as follows:

> "553.903 – Applicability – This part applies to all new and renovated buildings in the state, except exempted buildings, for which building permits are obtained after March 15, 1979, **and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by the Florida Building Code-Energy Conservation**. The provisions of this part shall constitute a statewide uniform code."

Fl. Stat. § 553.903 (emphasis added). The Commission has already set thermal efficiency standards for not only replacement systems (such as HVAC systems), but also thermal envelope components such as replacement fenestration and lighting. The proposed modification to this definition will simply acknowledge the range of products currently regulated by the Commission.

EN6558

Date Submitted	12/15/2015	**Section**	202	**Proponent**	Dwight Wilkes
Chapter	2	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This revision clarifies the types of products that are included in the category of “skylights” and brings the Florida Building Code: Energy Conservation (Residential) in closer alignment with the Florida Building Code: Residential.

Rationale

This revision clarifies the types of products that are included in the category of “skylights” and brings the Florida Building Code: Energy Conservation (Residential) in closer alignment with the Florida Building Code: Residential.
Proposal has been submitted to IECC 2018 Edition.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No Impact Improves correlation with the residential code

Impact to building and property owners relative to cost of compliance with code

No Impact

Impact to industry relative to the cost of compliance with code

No Impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not

Does not degrade the effectiveness of the code

Does not

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

Proponent Jeff Sonne / FSEC **Submitted** 2/24/2016 **Attachments** No

EN6558-G1

Comment:

This mod is informative, not normative, so doesn't belong in the code.

Revise Section R202 as follows:

SKYLIGHT. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

EN6582

Date Submitted	12/17/2015	**Section**	202	**Proponent**	Roger LeBrun
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6580

Summary of Modification

Improve correlation with the Residential Code regarding Fenestration definitions

Rationale

This revision clarifies the types of products that are included in the category of “skylights” and brings the Florida Building Code: Energy Conservation (Residnetial) in closer alignment with the Florida Building Code: Residential.

This code change is also being proposed for the 2018 IECC.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

More thorough definition for "skylight" should improve consistency of enforcement

Impact to building and property owners relative to cost of compliance with code

No impact

Impact to industry relative to the cost of compliance with code

No impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Completes the range of products classified as skylights

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Removes discriminatory omission of other roof-mounted product types

Does not degrade the effectiveness of the code

No effect

Is the proposed code modification part of a prior code version? No

Revise Section R202 as follows:

SKYLIGHT. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

Date Submitted	1/1/2016	**Section**	103.1.1.2.1	**Proponent**	Joseph Belcher
Chapter	3	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Reinstate requirement to send in energy forms.

Rationale

Up until the 5th Edition of the code submittal of the information was a requirement. The forms were sent to the University of Florida and data was extracted from the forms. An annual report was produced and the university was free to enter agreements with other parties to provide custom reports. The Masonry Association of Florida entered such an agreement with UF and found the information very valuable in a number of programs. The requirement was removed from the Florida Building Code, 5th Edition (2014). Subsequently, the university approached the Commission indicating the program could continue at no cost to the State and Florida Building Commission voted to initiate rulemaking reinstating the requirement. (October 2014) Apparently, there were issues with calendaring the rule and it has not been adopted. It is hoped the rule will be adopted in the near future and this code change is being submitted to provide relief in the event it is not adopted.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There will be a cost to copy, package, and mail the sheets.

Impact to building and property owners relative to cost of compliance with code

No impact.

Impact to industry relative to the cost of compliance with code

No impact.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The information was used in the past to provide reports on the energy use and other useful information statewide.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The submittal of the forms will allow extraction of data on energy use statewide.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN7079-G1

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

Suggest possibly deleting the second sentence of section R103.1.1.2.1 of this mod as the pertinent page(s) may not always be the front page, and we believe this may be covered with the proponents language of "proper form" as specified in section R103.1.1.2.1.1 of the mod.

R103.1.1.2.1 Reporting to entity representing the Florida Building Commission. A reporting form shall be submitted to the local building department by the owner or owner's agent with the submittal certifying compliance with this code. Reporting forms shall be a copy of the front page of the form applicable for the code chapter under which compliance is demonstrated.

R103.1.1.2.1.1 Reporting schedule. It shall be the responsibility of the local building official to forward the reporting section of the proper form to the entity representing the Florida Building Commission on a quarterly basis.

FLORIDA BUILDING COMMISSION
Plaza Beach Resort and Spa
600 North Atlantic Boulevard
Daytona Beach, Florida 32118
Plenary Session
October 14, 2014
8:30 AM

COMMISSIONERS PRESENT:

Dick Browdy, Chairman	Jeff Gross
Hamid Bahadori	Brian Langille
Steve Bassett	Beth Meyer
James Batts	Darrell Phillips
Donald Brown	Bradley W. Schiffer
Bob Boyer	Frederick Schilling
Oscar Calleja	Jim Schock
David Compton	Drew Smith
Nan Dean	Brian Swope
Charles Frank	Jeff Stone
David Gilson	Tim Tolbert

COMMISSIONERS NOT PRESENT:

Jay Carlson	Kevin Flanagan
Robert Hamberger	

OTHERS PRESENT:

Jim Richmond	Chris Burgwald
Mo Madani	April Hammonds
Norman Bellamy	Jim Hammers

MEETING FACILITATION:

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

Welcome:

Time: 8:30 am

Chairman Browdy welcomed Commissioners, staff, and members of the public to Daytona Beach and the October 14, 2014 plenary session of the Florida Building Commission. He stated that in addition to considering regular procedural issues including product and entity approvals, applications for accreditor and course approvals, petitions for declaratory statements, accessibility waivers, and recommendations from our various committees, the primary focus of the October meeting is to review an Energy Code compliance software accreditation application, and to discuss the effective date for the 5th Edition of the Florida Building Code.

Chairman Browdy advised members of the public to sign the attendance sheet on the speaker's table in the center of the room. In addition, we have a sign-up sheet for general public comment. He stated as always, we will provide an opportunity for public comment on each of the Commission's substantive discussion topics (actions that are not procedural or ministerial in content). Chairman Browdy sated if a member of the public would like to comment on a specific substantive Commission agenda item, please come to the speaker's table when the issue is up for consideration so we know you want to speak. He advised that public input is welcome, but should be offered before there is a formal motion on the floor. Chairman Browdy asked that all participants and members of the audience keep all electronic devices turned off or in a silent mode. Thank you for your cooperation.

Chairman Browdy stated that there are also buff colored "*Public Comment Forms"* on the speakers' table that can be used to provide written comments. All written comments will be included in the Facilitator's Summary Report. Please give your completed "*Public Comment Forms*" to Jeff Blair. He advised some of the licensing boards located within the Department of Business and Professional Regulation have adopted rules regarding continuing education credits for attending Florida Building Commission meetings and/or Technical Advisory Committee meetings. If your board participates you may sign-in on the kiosk laptop provided in the meeting room.

Roll Call:

Chairman Browdy performed roll call, a quorum was met with twenty two members present.

Chairman Browdy requested that Jeff Blair cover the agenda items for the meeting today.

Jeff Blair welcomed participants to the August Plenary Session and introduced the agenda as follows:

- To Consider Regular Procedural Issues: Agenda Approval and Approval of the August 22, 2014 Facilitator's Summary Report and Meeting Minutes.
- To Consider/Decide on Chair's Discussion Issues/Recommendations.
- To Consider/Decide on Accessibility Waiver Applications.
- To Consider/Decide on Approvals and Revocations of Products and Product Approval Entities.
- To Consider Applications for Accreditor and Course Approval.
- To Consider/Decide on Legal Issues: Petitions for Declaratory Statements.
- To Consider Energy Code Compliance Software Accreditation Application.
- To Receive and Consider an Update on the Adoption of the 5th Edition of the Florida Building Code.
- To Consider/Decide on Technical Advisory Committees (TACs): Electrical; Energy; Special Occupancy; and Structural TAC Report/Recommendations.
- To Consider/Decide on Program Oversight Committees (POCs): Education and Product Approval POC Reports/Recommendations.
- To Receive Public Comment.
- To Discuss Commissioner Comments and Issues.
- To Review Committee Assignments and Issues for the Next Meeting—December 12, 2014 in Daytona Beach, Florida.

Chairman Browdy requested a motion to approve the October 14, 2014 agenda as presented. A motion was entered by Commissioner Schiffer and seconded by Commissioner Schilling, the motion passed unanimously.

Approval of the August 22, 2014 Facilitator's Summary Report and Meeting Minutes:

Chairman Browdy requested a motion to approve the August 22, 2014 Facilitator's Summary Report and Meeting Minutes.

Commissioner Brown entered a Motion to approve the August 22, 2014 Facilitator's Summary Report and Meeting Minutes. Commissioner Calleja seconded the Motion. The Motion passed unanimously.

Chairman's Discussion Issues and Recommendations:

Appointments:

Chairman Browdy said that currently there is only one vacancy on the Florida Building Commission and is for the Residential Construction position. He stated there is also a vacancy too for the newly created position created by Secretary Putman for the Energy Office. Chairman Browdy advised that he spoke with the Governor's Secretary yesterday and she assured him that to the extent she can assure, they hoped to have some recommendations to the Governor prior to the next Plenary Meeting in December and hopefully we can move to have all vacancies filled.

Energy Code Forms:

Chairman Browdy stated in addition to the public comment submitted by Joe Belcher at the August meeting the Commission has received a letter from Dr. Ray Issa from the University of Florida College of Design, Construction and Planning. He said UF is requesting that the Commission reinstate Section R110 and the associated Appendix A requiring building officials to submit forms submitted to certify compliance with the Energy Code. Chairman Browdy advised that the Shimberg Center for Housing Science at UF has been collecting and conducting statistical sampling of the data, and there is no cost to the Commission for this service at this time. He further stated UF maintains that the data can be used in the future to reduce energy use in the residential sector. Chairman Browdy stated the Energy TAC met last week (October 9, 2014) at his request and Commissioner Smith will provide the TAC's recommendations to the Commission action during the Energy TAC Report later in the meeting. He said that he want the Commission to know that he had met with Dr. Issa and Mr. Belcher and other members of the masonry group to discuss the issue as such asking for the TAC meeting which did occur and will be a part of the report to the Commission during the Energy TAC Report.

Chairman's Discussion Issues and Recommendations (cont.):

New Work Group:

Chairman Browdy stated he would like to propose that the Commission create a new Code Coordination and Implementation Work Group. He stated when the process started the first code was birthed off of the 1997 Edition of the Standard Building Code by the Southern Building Code Congress, this is history. He said today this Commission, the citizens and the Construction Industry of the State of Florida are burdened with many regulations that came at the time of the creation of our first Florida Building Code. Chairman Browdy said what he is proposing is that the Commission form a work group a Code Coordination and Implementation Work Group with the purpose to review and evaluate all of the regulatory prerequisites currently affecting the code and the code review update implementation process. He further stated that this group would have in its goal to propose a legislative path to a more effective time table for the implementation and updating of the Florida Building Code in the future. Chairman Browdy advised pending the Commission's approval of that concept and creation of the work group; he would make appointments by the next meeting in December 12th here in Daytona Beach.

Chairman Browdy asked for any discussion from the Commissioners.

Commissioner Bassett asked if the group was not in place previously as he remembers serving during his past term with the Commission.

Chairman Browdy stated no that was the Uniformed Code Implementation Work Group. He said that it did not have anything to do with the timing and review process or the coordination of all of the codes that are integrated in the Florida Building code. He said this is more of a timing issue, and it doesn't really involve the implementation or the uniform implementation of the code but rather the timing of the implementation, perhaps the words are synonymous but the concepts and scopes are different.

Commissioner Calleja asked if the idea is to streamline the process from exception starting the process to where it is implemented and where it could be shortened to half or a quarter.

Chairman Browdy stated he did not know, but he does know it is important for us to re-evaluate the process. He stated it has been discussed that maybe the Florida Building Code should not be done by rule. Chairman Browdy further stated there will not be anything off of the table with respect to this but to discuss the process and a better way to work effectively with time on the updates.

Commissioner Calleja asked about legal involvement in the work group.

Chairman's Discussion Issues and Recommendations (cont.):

Chairman Browdy stated legal must be involved fully to tell us how many different ways we are burdened, our timing issues, the rule process issues and he feels the Commission is at the best place to discuss this and would rather the recommendations come from us or other special interest group or other interested parties. He further said he did not feel there was a better composed group to make the suggestion for a legislative path to correct some of the problems that we currently have. Chairman Browdy stated he hoped that if they were asked to serve you will so that we have a good representation of people who think positively about a better way to do what the Commission has been doing, and to have the ability to move the process forward more effectively.

Commissioner Schock stated he applauds the Chairman for this step due to processing issues from the past and he is in total support and would volunteer to be a member.

Commissioner Swope asked if there is any way to eliminate some of the red tape and legal chains we have to follow.

Chairman Browdy stated he felt the attorney will stay with what is in the law.

April Hammonds, Esq. stated to change laws a legislation change would need to be made.

Commissioner Schiffer asked if the Fire Code could be invited to be a part of the group.

Chairman Browdy stated absolutely they should be included. He further stated it is very important to engage everyone in this process.

Commissioner Gross entered a motion to support the creation of the committee. Commissioner Schiffer seconded the motion.

Chairman Browdy asked for any public comment.

Mark Zehnal, FRSA, stated he applauded the Chairman and would ask that FRSA be involved if possible.

Joe Belcher, Masonry Industry also applauded the move as well and would request working with the Fire Code to avoid issues that we are currently seeing. He also requested to be a part of the group.

Chairman Browdy asked for a vote on the motion. The Commission voted unanimously.

Accessibility Waiver Applications:

Chairman Browdy stated the Commission will now consider this month's requests for accessibility waivers. April Hammonds will serve as legal counsel and present the Accessibility Advisory Council's recommendations. He then asked April please present the Councils' recommendations regarding waiver requests in turn.

April Hammonds, Esq. advised that there was not a quorum during the Accessibility Council Meeting the recommendations being presented are from the individuals that were present.

Alpha Gamma Delta Porch Enclosure, 517 West Park Avenue, Tallahassee – Council recommended deferral to the December 2014 as they were not notified by staff that they needed to appear to allow their participation.

Commissioner Bassett entered a motion to accept the recommendation to defer. Commissioner Batts seconded the motion. The motion passed unanimously.

Venezia Hotel, 3865 Indian Creek Drive, Miami Beach – Council recommended approval. The Hotel will be installing an accessible ramp at the north side entrance of the building.

Commissioner Schock entered a motion to accept the recommendation to approve with installation of an accessible ramp at the north side entrance. Commissioner Meyer seconded the motion. The motion passed unanimously.

Life Group Office/Warehouse Remodeling, 9565 N. W. 40th Street Road, Doral – Council recommended approval.

Larry Schneider was present representing Life Group Office/Warehouse for any questions from the Commission.

Commissioner Schiffer entered a motion to accept the recommendation to approve. Commissioner Schilling seconded the motion. The motion passed unanimously.

Through the Years Vintage Market, 102 East Alfred, Tavares – Council recommended conditional approval pending applicant submits pictures verifying the presence of an accessible ramp at the back entrance and installs signage indicating the presence of an accessible entrance.

Commissioner Schock asked legal if all documents will be required, she stated yes. Commissioner Schock entered a motion to accept recommendation for conditional approval. Commissioner Meyer seconded the motion. The Motion passed unanimously.

Accessibility Waiver Applications (cont.):

William F. Schlitt, 1605 19th Place, Vero Beach – Council recommended approval.

Frank Schlitt was present representing William F. Schlitt for any questions from the Commission.

Commissioner Schiffer entered a motion to accept the recommendation to approve. Commissioner Schilling seconded the motion. The motion passed unanimously.

Watermark Clubhouse, 924 Seider Road, Winter Garden – Council recommended denial as this is new construction.

Commissioner Schilling entered a motion to accept the recommendation to deny. Commissioner Schiffer seconded the motion. The motion passed unanimously.

Palm Beach County Convention Center Hotel & Garage, 901 Florida Avenue, West Palm Beach – Council recommended denial. Leased from County this is a Title II entity.

Commissioner Schock entered a motion to accept the recommendation to deny. Commissioner Meyer seconded the motion. The motion passed unanimously.

Samantha Hotel, 235 39th Street and 240 31st Street, Miami Beach – Council recommended deferral to the December 2014 meeting at the request of Applicant's representative.

Robert Fine, Esq. was present advising there had been a change in the project that would need to considered and there was not sufficient time to present to the Council.

Commissioner Schilling entered a motion to accept recommendation of deferral. Commissioner Schiffer seconded the motion. The motion passed unanimously.

Commissioner Gross stated during this cycle there was a change created online applications for waivers. He stated he had received calls on the issues with the online system. He also said that he spoken with staff to resolve the problems. Commissioner Gross stated there were user issues and system issues.

Chairman Browdy asked if there were technical issues.

Commissioner Gross stated he felt that there are some issues with completing the application and the staff has acknowledged those issues.

Accessibility Waiver Applications (cont.):

April Hammonds, Esq. stated that there is going to be an Accessibility TAC meeting scheduled prior to the December Plenary Meeting. She stated we are going into the workshop phase and the proposed form, she said it was not mandated this month as there were some questions of usability from some so there will be a TAC meeting and the Rule. She stated this will be the only format for the December Meeting, she advised refunds were given back to those from this month's waivers. April advised we are mandated to charge for the waiver and we will work on the rules issues.

Larry Schneider stated the cells are limited on text which does not allow them to provide all language in the space. He also stated the payment process crashed and did not work. He said it is a very large issue for the Council members in reviewing. Mr. Schneider stated there are a lot of bugs to be worked out. He said he begged to differ with Counsel, that the rule currently written mandates that this has to be done online.

Ms. Hammonds stated that the rule mandates charging a fee.

Mr. Schneider stated that Ms. Hammonds had advised in the Council Meeting that it was mandated.

Ms. Hammonds clarified by stating that she said they were currently in Rule Making process that will mandate the use of the online application.

Mr. Schneider stated maybe there should be a beta test. He said that he and Mr. Fine were working together to complete their applications. He said they appreciate the TAC's meeting to resolve some of these issues.

Robert Fine said he experienced difficulty with the application. He also said that he is concerned about the December mandate of using online application, the current rule does not mandate online and the fact that rule making is going to be engaged to require it does not rule making need to be completed to require it. He further stated there are number of ways to take payment. He said when he got through the process; he found the only way to pay is by credit card with a convenience fee. Mr. Fine stated this is a fee added on. He said there should be options to pay.

Chairman Browdy stated that is why there is going to be a TAC meeting to discuss these issues.

Mr. Fine asked for an additional month before mandating the online application.

Ms. Hammonds advised our technical person is working on the issues. She said we will be possibly modeling after the product approval application.

Applications for Product and Entity Approval:

Chairman Browdy advised that Commissioner Stone will present the POC's recommendations for entity approvals and the consent agenda for products recommended for approval, and Jeff Blair will present the POC's recommendations for product approvals with discussion and/or comments. He said we will start with the consent agenda followed by entity approval applications, and conclude with discussion items. Commissioner Stone will now present the applications on the consent agenda and entity approval applications

Commissioner Stone stated there were 72 applications for approval on the consent agenda. Commissioner Stone entered a motion to approve the 72 applications. Commissioner Compton seconded the motion. The motion passed unanimously.

Commissioner Stone stated there were 7 entity applications on the consent agenda for approval. Commissioner Stone entered a motion to approve the 7 entities. Commissioner Compton seconded the motion. The motion passed unanimously.

Jeff Blair presented the following POC's recommendations for product approvals with discussion and/or submitted with public comment.

10342-R4 – Commissioner Stone entered a motion to approve as recommended by the POC, Commissioner Compton seconded the motion passed unanimously.

13509-R2 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

13624-R4 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

14285-R4 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

14320-R2 - Commissioner Stone entered motion to approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

15533-R1 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

17168 - Commissioner Stone entered motion to approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

Applications for Product and Entity Approval (cont.):

17177 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

Commissioner Schock stated there seemed to be a lot of conditions on this product and he felt they should limit the amount of conditions.

Mo Madani stated there are many products that have had numerous conditions in the past, it is a process.

17205 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

17209 - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

17106 - - Commissioner Stone entered motion to conditionally approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

Leslie Davidson, representing Quick Tie Products stated that the condition should be removed as they had revised the application and removed the language as requested. She said this information had been provided as stated by Commissioner Compton. She wanted to know if the forms needed to be resent.

Mo Madani stated that to have the condition removed they will need to complete process after the conditional approval, they will need to re-apply and it will be re-evaluated and then approved. He advised that they will not have to go back before the Commission.

Jamie Gascon, Miami Dade County stated there was one product omitted.

April Hammonds confirmed with the minute taker that there was one product omitted.

17184 – Commissioner Stone entered motion to approve as recommended by the POC; Commissioner Compton seconded the motion passed unanimously.

Applications for Accreditor and Course Approval:

Chairman Browdy advised that the Education POC did have a quorum. Commissioner Nan Dean will present the course applications will provide recommendations as needed.

Commissioner Dean provided the following Advanced Accredited Courses for consideration.

Applications for Accreditor and Course Approval (cont.):

648.0 - Commissioner Dean entered a motion to approve; Commissioner Phillips seconded the motion, the motion passed unanimously.

636.0 – Commissioner Dean entered a motion to approve; Commissioner Phillips seconded the motion, the motion passed unanimously.

Commissioner Dean provided the following Self Affirmed Courses for consideration.

549.0 - Commissioner Dean entered a motion to approve; Commissioner Phillips seconded the motion, the motion passed unanimously.

534.0 - Commissioner Dean entered a motion to conditional approval; Commissioner Phillips seconded the motion, the motion passed unanimously.

Petitions for Declaratory Statement: Legal Report

Chairman Browdy asked April Hammonds, Legal Counsel for the Commission if there were any other legal issues or legislative issues in addition to the declaratory statement requests.

Ms. Hammonds stated there is an update on the Education Rule and it should be final by within the next few weeks. She stated she thinks that we are at the final stage with the Rule.

Chairman Browdy requested that Ms. Hammonds present the declaratory statements.

DS2014-097 by David G. Karins, Karins Engineering Group, Inc.

Ms. Hammonds read the petition from Mr. David Karins with response.

Commissioner Schock entered a motion to accept the staff, Product Approval POC and Structural TAC recommendation to dismiss. Commissioner Phillips seconded the motion, the motion passed unanimously.

DS2014-115 by Carolina Drake Albano of Nichiha USA, Inc.

Ms. Hammonds read the petition from Carolina Drake.

Commissioner Stone entered a motion to accept staff and the Product Approval POC and Structural TAC recommendation to dismiss. Commissioner Schock seconded the motion, the motion passed unanimously.

Petitions for Declaratory Statement: Legal Report

DS2014-116 by Robert S. Fine, Esq. representing HFZ Capital Group d/b/a The Shore Club

Ms. Hammonds read the petition from Mr. Robert Fine with response.

Mr. Fine was present and concurred with the decision presented.

Commissioner Flanagan entered a motion to accept the staff recommendation, Electrical TAC with modifications, Energy TAC with modifications and legal recommendation. Commissioner Calleja seconded the motion, the motion passed unanimously.

NORESCO'S Florida Building Commission Software Tool Accreditation on Application for REM/Rate ™ v15.0:

Chairman Browdy advised that at the December 2012 meeting the Commission adopted the Energy Simulation Tool Approval Technical Assistance Manual. He stated the Manual serves as a "Technical Assistance Manual" for computer tool vendors to use in a self-certification process for demonstrating compliance with the Florida Energy Code performance compliance options for residential and commercial buildings. He further stated subsequent to that the Commission has considered applications for accreditation by vendors seeking approval of their software by providing self-certification that the software submitted meets the requirements to demonstrate compliance with the 2010 Florida Building Code, Energy Conservation for residential or commercial buildings and the procedures of the "Energy Simulation Tool Approval Technical Assistance Manual, TAM-2010-1.0".

Chairman Browdy said that today the Commission will consider the approval of an energy simulation calculation tool application submitted by NORESCO to demonstrate compliance with the Florida Building Code 2010, Energy Conservation for residential buildings pursuant to Section 405 Residential Energy Conservation. He stated the Energy TAC reviewed the application and has recommended deferral of the application to allow the vender an opportunity to revise the software to address each of the points identified by the TAC, and Commissioner Smith will provide the Energy TAC's recommendation.

Commissioner Smith stated the Energy TAC met and reviewed each of the points that were a part of the version of the software being presented. He said they reviewed staff recommendations as well as FSEC recommendations and each point is going to be addressed by the software vendor. He further stated the TAC voted to recommend deferral to the December meeting at which time they hope to see a revised version of the software.

NORESCO'S Florida Building Commission Software Tool Accreditation on Application for REM/Rate ™ v15.0 (cont.):

Chairman Browdy asked if he was making a motion to defer approval of the REM/Rate v15.0 software by NORESCO for demonstration of Code compliance for single-family and multifamily residential buildings until the December 2014 meeting to provide the vendor with an opportunity to address the Energy TAC's comments.

Commissioner Smith entered the motion to defer approval of the REM/Rate v15.0 software by NORESCO for demonstration of Code compliance for single-family and multifamily residential buildings until the December 2014 meeting to provide the vendor with an opportunity to address the Energy TAC's comments. Commissioner Calleja seconded the motion. The motion passed unanimously.

Update on 5th Edition of the Florida Building Code:

Chairman Browdy advised as he has been reporting on a meeting basis and the Commission voted at the August 2013 meeting to make the effective date of the Florida Building Code Fifth Edition (2014) midnight December 31, 2014. He said the selection of this date was to meet the statutory requirement to coordinate with the adoption of the updated version of the Florida Fire Prevention Code, which was being developed with an effective date of midnight December 31, 2014. Chairman Browdy further stated the Commission is also statutorily required to have the Florida Building Code published for 6 months after before it becomes effective. He advised as a result the effective date of the Florida Building Code Fifth Edition is dependent on when the Florida Fire Prevention Code 2013 is adopted. Chairman Browdy stated that at the August 2014 meeting Commissioner Frank reported on the status of adoption of the Florida Fire Prevention Code 2013 and indicated he thought the adoption process was on schedule for completion this summer. Chairman Browdy asked that Commissioner Frank provide an update on the Florida Fire Prevention Code.

Commissioner Frank advised the 5th of the 2013 Fire Code has been completed with all of the Florida specific amendments and is sitting with JAPC for their review, and it has been there a little over a week. He further said JAPC is requesting the electronic editions of the NFPA all of the reference documents and those will be forwarded this week to them. He said Legal still stands they are on track for adoption of the Florida Fire Code on 12/31 this year.

Chairman Browdy stated that the Commission can defer until the next meeting to see what is going on or take a step and assume adoption prior to or on or about December 31 and set the date for June 30th. He said we can set up Rule Adoption Hearing and if it does not happen we can cancel the hearing.

Update on 5th Edition of the Florida Building Code (cont.):

Chairman Browdy said he felt the public wanted a general idea as to when the code is going to come out and that the Commission should put one out there rather than every thirty days or forty five days saying we are going to wait until we know more about the Fire Prevention Code and its journey through the JAPC process. He further said he welcomed the Commissions comments and would like to take some action on this matter. He said it can be deferred until December or set a date today and tell the public right now the Florida Building Code should come out June 30, 2015.

Commissioner Smith stated his concerns if we keep pushing it will cause issues with the education programs. He said funding will start running out for the grants if they don't start teaching. He entered a motion to set a date.

Chairman Browdy asked if he had a specific date or was he choosing June 30. He said March is not realistic, as there is a six month cooling period.

Mo Madani stated they should be careful in setting a date. He said the reason for that is we had a date before, we set January 1 and the designers and everyone else were shooting for that date and then we changed the date and angered a lot of people as they were gearing toward that date. He further said establishing a date we do not have control, even if we say June 1 or July 1 it is still have to deal with the six month waiting period that has to be added. Mo said it is best to leave it until we are sure.

Chairman Browdy asked for any questions or feedback from the Commissioners.

Commissioner Schiffer stated the biggest problem from the design professionals; is that they are designing thinking the new code is coming out when it is not. He asked for the exact reason the Code isn't in effect on the 31st, he said the Fire Code guys are stating they are ready, so what is the technical timing problem.

April Hammonds stated that Commissioner Frank stated the Legal had advised that they are still on target. She further stated until we get the document, publish a proposed rule and it has been adopted and we get it, and as you heard him say they still need to file documents, until we get the document, we cannot submit anything.

Commissioner Schiffer stated that is because the Building Code references the Fire Code.

Ms. Hammonds it is because the statute states they shall and when you adopt by rule making under Chapter 120, Administrative Rule making procedures, anything contained within the code, anything referenced, as Commissioner Frank stated your have to submit. She said until we have the Fire Code which is referenced in the Building Code, we cannot submit, JAPC will kick it

Update on 5th Edition of the Florida Building Code (cont.):

back. She further stated as soon as we have their document we can give you a date we can go for the hearing, but until then we cannot set a date.

Commissioner Schiffer stated the Fire Code references the Building Code.

April Hammonds stated they are working off of an old code. She stated she does not know what their legal group is doing. April said she spoke with the Bureau Chief who stated they are still working on hearings so we are receiving conflicting information. She said until we get the document we cannot submit it, we have submitted everything else, all the standards that are referenced in the Building Code have been provided to the Rules Attorney, she has the correlated version that Mo has put together, she has everything except the Fire Code.

Commissioner Swope stated he is in agreement in setting an arbitrary date. He said if there is no deadline, it will be out of site out of mind.

Commissioner Tolbert questioned Ms. Hammonds if JAPC had gotten any better in the process? Will setting a date make JAPC react negatively?

April Hammonds, Esq. stated with our Education Rule we finally got that one through and we are working now on the Accessibility Rule and as far as the Code, we have to abide by Chapter 120 Rule Making, you have to provide all documentation. She advised beyond that a date can be set, but as Mo said, and she asked that they remember this conversation, if the date is set and the Fire Code is not there, we can't publish our rule so please do not be upset when it has to be pushed back.

Commissioner Calleja referenced education and not having a date, will the rule that we tried to change fix this or do we need a date or how does the rule read.

April Hammonds, Esq. stated the rule is crafted well, I cannot give you an exact date as JAPC still has a few days to respond and we are looking at the beginning of November for the Education Rule to go into effect. She said the way it was worded once a version of the code was approved for adoption by the Commission, which has already been done, they can begin teaching courses. April further stated if we can get the Education Rule finished that should rectify the education portion.

Commissioner Calleja stated we do not need to set a date for the code to be able to teach the courses.

Update on 5th Edition of the Florida Building Code (cont.):

April stated the Commission approved the language for adoption and that is how the Education Rules was worded due to the trouble with the code going through. She said they were careful with the language used. April advised there many interested parties and stake holders involved that have grants to teach the course, since the Commission had completed their due diligence.

Commissioner Calleja stated the second point is can we use the current version the Fire Code, can it be switched and then when approved go through Glitch to change to the new version.

Mo Madani stated the answer is no due to the fact the coalition completed for the 5th Edition is based on the new Fire Prevention Code.

Commissioner Compton stated from a design standpoint we need to be careful in setting a tentative date for implementation of the Code. Architects and Engineers are sometimes working on large projects six, twelve, eighteen months out, if we are gearing the design to permit towards the tentative date and it gets pushed out, this can cause a lot of stress from the design standpoint having to revert to the old code to get the permit. He further stated from an Engineering standpoint he said he would prefer not to have a date to allow us to work under the code now and allow for the cooling off period.

Commissioner Brown said for historical perspective not having been on the Commission during the last code cycle. He asked if this process and delay was the same as before, or is there new processes that have caused this delay.

Jim Richmond stated this cycle has been complicated by the fact that for the first time we were trying to take back disconnection from the model code. He said since the first version of the Florida Building Code in 2001 did not take effect until 2002 and since then we have backslidden in relation to the model code on which the building code was based. Jim further stated the work plan was very ambitious work plan put together for this code basically got us back a year closer to the model code which updates every three years like the building code does. He said however, that would have created its own set of problems with JAPC because we are charged with a triennial update and in that case we would have had a biennial update. Jim said that did not actually happen due to the changes. He further said it is a unique set of problems with just the one attempt we made.

Commissioner Brown asked if the procedural requirements, the legal requirements to adopt the code are the same as the last time or are they different.

Update on 5th Edition of the Florida Building Code (cont.):

Jim said for the 5th Edition it was a new process, we have not adopted any two codes under the same process, there have been tweaks. He said in this case we went back to the base code and Florida specific amendments automatically rolled forward those relating to hurricane integrity and State Agency Rules on high velocity hurricane zone. Jim said in the past all of the Florida specifics were rolled forward, but the law seems to change to address issues raised during the preceding code cycle, and we have not been able to follow the same process twice.

Commissioner Brown stated as a new comer to the Commission and observing the painful process procedurally that we have to go through to adopt this code, it reinforces the incredible proposal that you offered in the very beginning. He said something needs to be done to make this a more streamlined process and your suggestion to form a work group to make recommendations to the Legislature needs to be not as complicated. He further stated he congratulates the Chairman on his proposal.

Commissioner Bassett stated that there has been a time when he was not on the Commission, so he is not sure if things have changed, but it used to be if a designer wanted to take something like the electric code in the latest Edition he could as long as he did it for the whole project he could then use the later Edition of the reference codes. He further stated we have delayed the implementation of the new code six months to give people a chance to become educated. Commissioner Bassett asked if there was a problem with someone wanting to use the code before that date as long as they use if for the whole project. He said that would solve the problem for engineers and architects for designs that would be a simple way to do it and to let the people know that they can use the new code when passed even though it is not mandatory implementation date and that would solve a lot of problems.

Jim Richmond stated the circumstances described must be authorized under the building departments and building official's authority to approve alternates and equivalents. He stated there has never been any legal provision that would allow some type of voluntary implementation to the building code in advance of the effective date. Jim said that the building officials are free to accept anything that is a demonstrated alternate or equivalent has been recognized since day one in the Florida Building Code and years before that, they always have that flexibility.

Chairman Browdy added that Chapter One of the Building Code sets the date for acceptance of the plans not the date of the approval of the plans in the appropriate code moment. He said the actual submittal and acceptance of the documents by the building department is that time when the applicable code is utilized.

Update on 5th Edition of the Florida Building Code (cont.):

Commissioner Calleja stated it is hard to make the point that one of the things that has changed is the six month waiting period.

Chairman Browdy stated the six month waiting period is a vestige of the past and has been around a while. He said we are talking about the model code the 97 edition of the Building Code, if you were on the Commission in 2000 you would not be able to see each other as there were stacks of binders in front of each of us. He further said he is hopeful that the group we are putting together can come up with some recommendations that will allow a legislative path so that we do not have to deal with these issues, so there can be updates and reconcile differences.

Robert Fine, Esq. stated that he and a number of his colleagues represent big builders and developers and the changing of the code causes much a lot of consternation and planning and trying to figure out what they are doing due to big projects and extended times. He said going from one code to another can cause hardship, time and money. Mr. Fine said in that regard trying to get some certainty on the date is very important and helpful. He further addressed Jim Richmond stating once or twice there was a period and it was approved that during the six month period you could go with either code if it was for the whole project, he added it may have been a legislative issue when this occurred and if it was then, maybe it could be included in the process. He said once printed one could use the code as mentioned by several of the Commissioners and the hard date becomes less concerning. Robert said as an Architect also, the continuing education cycles are coming up and he would like to do his hours for the new code as he would be getting hours on obsolete information, so if the education can be moved up it would be nice to get the hours on the new code.

April Hammonds, Esq. stated with the Education Rule that should be the case.

Mark Zehnal, FRSA, said that he agrees that there is going to be a big issue for roofing that has to deal not only with the roofing code but the energy code that is going to change dramatically in the next code cycle. He said that a white paper was sent for the 2010 code that had tables that were used and made it easy to determine the R values needed to be on a roof, but this cycle is different, so they need to know when that is going happen to be able to put out estimates for re-roofing not just new construction. Mark stated that when you permit is going to make a huge difference which version you can put on the permit application and what they are going to accept at the building department. He said he understands wanting to be able to design, but the architects and engineers are not the only ones affected for permitting at the building department. Mark said even though he would like to see a date, he said he feels that may give a false sense of security and unfortunate for all of the trades involved in this program.

Update on 5th Edition of the Florida Building Code (cont.):

Chairman Browdy asked for any further comments, there being none, he entertained a motion to delay the discussion to set a rule hearing on the implementation for the Florida Building Code or we can set a date we would have to authorize a rule hearing for the December Meeting.

Commissioner Schiffer said just a thought from the design professionals perceptive can we establish a no sooner than date that way if the design can estimate where the project will go for permit will not be ambushed by the new code.

April Hammonds, Esq. stated if all processes are completed the soonest would be July 1. She stated one item, if we get the Fire Code, depending on either way you vote, if we are able to get the Fire Code prior to the December Meeting, at the Chairman's discretion, we can agenda hearing at that time as long as we have the 21 days sufficient to notice a rule hearing, if we get it at the Commission we are not setting a date today, we can still have it in December.

Commissioner Schiffer said if we complete in December would it be live in February.

Chairman Browdy stated no there is still the six month waiting period.

Commissioner Schiffer said then it could be June, when you design a project you have to have time frames.

Commissioner Compton entered a motion to defer any action on setting an implementation of the Florida Building code until the December Meeting.

Commissioner Bassett seconded the motion.

The motion failed with 12 members voting in favor and 10 members opposing.

Commissioner Calleja entered a motion to set a tentative implementation date of June 30, 2015 as the effective date of the code and conduct a rule hearing at the December 2014 meeting.

Commissioner Schiffer seconded the motion.

Chairman Browdy stated he felt this is a fair judgment and fair to assume that we should have an implementation date of June 30, 2015. He stated he felt the time has come that people are looking for guidance rather than saying we are going to meet again next month and talk about it.

Commissioner Swope stated as we are waiting for the Fire Code and it is waiting on legal. He asked if it is near and will be ready for us.

Update on 5th Edition of the Florida Building Code (cont.):

Chairman Browdy advised that Commissioner Frank had stated it is in JAPC. He then asked Commissioner Frank if all documents are in JAPC.

Commissioner Frank advised all the documents except the reference publications, the base code with the Florida specifics have been submitted. He said the reference documents will be sent this week. He further advised that the actual code itself has been put together and is sitting at publication waiting for adoption.

Chairman Browdy asked legal to confirm that JAPC will not review until all of the documents are received.

April Hammonds, Esq. stated yes.

Commissioner Frank stated that was correct, they do not have all of the documents.

Commissioner Swope asked for the time frame with JAPC.

April Hammonds, Esq. stated the time frame varies; she wanted the Commission to know that with an effective date that will be the hearing in December and then JAPC will then receive our material. She stated we can complete and submit but there is no guarantee that this will be completed for this date. April stated without the reference documents in, it is hard to tell.

Commissioner Swope stated this is mid-October and JAPC does not have the documents, so there is a good possibility that JAPC won't even have the code back by our December meeting.

Ms. Hammonds answered yes, adding because they then will have to publish for adoption, once they get it back from JAPC.

Commissioner Swope asked when they get the Fire Code back, and then we will have to submit the whole thing to JAPC before the six month cooling period.

Ms. Hammonds stated that was correct and we would need to hold a rule hearing because there are some people that want to make some modifications to what has already been done, there will be some hearings, pending action from the Commission. She stated hopefully there would be a hearing with no comments, JAPC made no comments.

Commissioner Schock stated he felt it would be impossible to have anything prior to June 30th, but he would like to take Commissioner Schiffer's comments that it would be no earlier than June 30 to allow some assurance to designers.

Update on 5th Edition of the Florida Building Code (cont.):

Chairman Browdy stated the motion "set the anticipated date for the implementation of the Florida Building Code to be June 30, 2015 and no sooner than and to conduct Rule adoption hearing at the December meeting.

Jim Richmond added that Commissioner Calleja used the word tentative and not anticipated.

The motion passed with 20 members voting in favor and 2 members opposing.

Committee Reports and Recommendations:

Chairman Browdy asked that the Committee Chairman, please confine their TAC/POC reports to a brief summary of key issues and recommendations, emphasizing any issues requiring an action from the Commission. He asked that they please frame any needed Commission action in the form of a motion. Chairman Browdy advised that there is no need to read the TAC/POC minutes since the complete minutes will be linked to the committees' subsequent meeting agendas for approval by the respective committees.

Education Program Oversight Committee

Commissioner Dean provided a brief summary of the POC meeting held via teleconference on October 6, 2014.

Commissioner Dean entered a motion to approve the POC report, Commissioner Bassett seconded the motion, the motion passed unanimously.

Electrical Technical Advisory Committee

Mo Madani provided a brief summary of the TAC meeting of October 10, 2014 held via teleconference.

Commissioner Bassett entered a motion to approve the TAC report, Commissioner Schock seconded the motion, the motion passed unanimously.

Committee Reports and Recommendations (cont.):

Energy Technical Advisory Committee

Commissioner Smith provided a brief summary of the Energy TAC meetings October 3rd and 9th 2014 held via teleconference.

Commissioner Smith entered a motion to approve the TAC reports. The motion was seconded by Commissioner Calleja, the motion passed unanimously.

Energy Code Compliance Reporting Forms:

Commissioner Smith provided the Energy stated there was a motion during the TAC to re-institute the report collection process certifying compliance of the Energy Code.

Chairman Browdy stated the Energy TAC recommends re-institution for submittal of the first page of the form that was previously deleted in the new edition of the code. He stated this came about due to a letter received from Dr. Issa, University of Florida. Chairman Browdy stated that at this time he would like to invite Dr. Issa to come and speak to the Commissioners regarding this subject.

Chairman Browdy stated there needs to be a motion to adopt the Energy TAC recommendation to preserve the requirement for local governments (building officials) to submit forms submitted to certify compliance with the Energy Code, and to accomplish this through the development of a separate rule and not by amending the Building Code.

Motion entered by Commissioner Smith and seconded by Commissioner Calleja.

Dr. Issa advised that he sent a letter to Chairman Browdy when he found out that the front page of the Energy forms were no longer going to be sent to the university. He said that he discovered about a year and a half ago from DBPR that there was no more funding was forthcoming to statistically collect forms and analyze the data. He stated he then contacted Masonry Association of Florida who was using the data to support the collection process, so there is no cost to the state and they are still accepting the forms as they have always been sent for over a decade and they are analyzing it and producing a report. Dr. Issa said since the hearings on the ninth two entities have gotten in touch with him, one of them willing to support the cost of statistically transcribing the data.

Committee Reports and Recommendations (cont.):

Chairman Browdy thanked Dr. Issa and asked if the Commissioners had any questions. He then advised the Commissioners that there is a motion on the floor with a second. Chairman Browdy asked if Jim Richmond would like to comment on the process we would need. He said in addition when we set the Rule Hearing for the new Code Edition Implementation we could also set a Rule Hearing for this and amend the motion.

Jim Richmond stated this would be a new Rule a revitalized Rule. He said when Rick Scott was elected this was a separate rule under the Department of Community Affairs it was repealed as it duplicative of what was in the building code and going through the development of the Fifth Edition it was removed from the building code thereby eliminating the requirement all together effective on the effective date of the building code. Jim said the recommendation of the TAC will create a new rule that will impose this requirement that local governments submit these forms. He further stated that we need to first notice for rule development, it could be initiated that and he believed that we can complete procedures and have ready for the December meeting and hold the workshop then. Jim said that when we get the rule to a hearing we could set the effective date of the separate rule consistent with the implementation date of the building code to ensure there is no lapse in coverage.

Chairman Browdy asked if there were any questions on this issue. He then stated there is a motion stating "to adopt the Energy TACs recommendation to maintain the requirement for local governments to submit forms to certify compliance with the Energy Code through adoption of a separate rule and to schedule a rule hearing given by Commissioner Smith and seconded by Commissioner Calleja.

Commissioner Calleja stated in the TAC meeting the cost is the reason it originally was taken out and now the Masonry Association is funding and the Commission should have record of the reporting on the system to be available for all to view.

Chairman Browdy stated that would be a question for Dr. Issa.

Dr. Issa stated he thought it was posted on the web, however when he checked with DBPR he found it was not posted and was able to provide to the requestor. He did state he would provide the report for the Commission to use and provide to the public.

Commissioner Schock asked Dr. Issa for the years that we have been sending these reports in, what specific code changes were developed because of these reports.

Dr. Issa stated he could not answer the question as he compiles the report; they were used by Ann Stanton and Ila Jones.

Committee Reports and Recommendations (cont.):

Mo Madani stated the reports were used for statistical information about certain energy measures but was not really used for the purpose of doing a code change, it was informational. He said it has been done for many years and we have not been approached by entities for the report, but it has always been available from our department for distribution.

Chairman Browdy then called for a vote. The vote passed with 21 in favor and 1 in opposition.

Commissioner Smith entered a motion to approve reports of TAC meetings on October 3 and October 9, 2014. Commissioner Calleja seconded the motion. The motion passed unanimously.

Product Approval Program Oversight Committee

Commissioner Stone provided a brief summary of the POC meeting held via teleconference on October 2, 2014.

Commissioner Stone entered a motion to approve the POC report, Commissioner Compton seconded the motion, the motion passed unanimously.

Special Occupancy Technical Advisory Committee

Commissioner Phillips provided a brief summary of the TAC meeting held via teleconference on October 2, 2014.

Commissioner Phillips entered a motion to approve the TAC report, Commissioner Schock seconded the motion, the motion passed unanimously.

Building Structural Technical Advisory Committee

Commissioner Schock provided a brief summary of the TAC meeting held via teleconference on October 3, 2014.

Commissioner Schock entered a motion to approve the TAC report, Commissioner Phillips seconded the motion, the motion passed unanimously.

General Public Comments:

Dwight Wilkes stated as a member of the Electrical TAC, at the meeting we had one of the worse connections and could not hear the other members. He stated he specifically requested another meeting when they found out what ever caused the problem on the audio. Mr. Wilkes advised that he had also made a motion that at the next meeting they continue the evolution for the investigation into possible adoption of the Electrical Code that it syncs a little more with the building code and even if it required Legislative action, they would want to include this. He said he feels the electrical contractors in the industry are moving to the 2014 NEC and it is out and is being adopted. Mr. Wilkes stated whatever it takes we want to explore it further, but the audio was so bad no one could hear.

Jim Richmond stated the call had a single caller that did not mute. He said there have been no further issues with the calls. This was an isolated incident. Jim said this really sounds like an issue that does need to be discussed with the workgroup that the Chairman has proposed. He said it is implementation and updating issue that has come up in connection with every edition of the Florida Building code because the NEC and the ICC are not working hand in glove. Jim said he feels that would be the best place for discussing that and come up with some systemic solution for it.

Dwight Wilkes stated anything that can be brought back to the Electrical Industry.

Mark Zehnal, FRSA, wanted to express appreciation to the FBC staff for their assistance with the Roof Tile Manual, and he handed copies out to the Commission. He said as of September 28th it is an approved equal standard to the Fourth Edition. Mark further stated it was ten months and most of it was through JAPC, he said what April Hammonds stated was consistent.

Jessica Ferris, Association of Milwork Distributors stated she had submitted a letter to the Chairman in relation to the draft Fifth Edition Code referencing section 17.10.5 which sets forth structural requirements for windows and doors. She stated their issue is with the removal of language in relation to requirements for side hinged exterior doors. Ms. Ferris said they are concerned with removal of this language; they understand and have no intention to re-open the code as they understand the implications of doing that. She said they do intend to move forward to try and resolve this with FBC staff and other avenues that are more feasible and practical at this time given the status with where the code is right now.

Chairman Browdy confirmed that she had spoken with Mr. Madani to resolve these questions.

Dick Wilhelm, Window and Door Manufacturers Association stated part of their members are working closely with Ms. Ferris to resolve the issues and concerns.

General Public Comments (cont.):

Tom Allen introduced himself as the new ICC Government Relations Manager for Florida. He stated he looked forward to working with the Commission in the future.

There was no other public comment.

Commissioner Comments:

Commissioner Gross stated he attended the ICC hearings in Broward County and tried to observe the way they complete their International Codes. He stated that they had about a thousand people in the Convention Center working on the International Green Code, they had three screens and the speaker faced the audience and the Commission was up high. Commissioner Gross stated one thing we do better giving the staff a compliment, they were going through code modes just like us, however, they did not have it on the screen, you had to have computer or IPod, and he said our staff having it portrayed on the screen to see the changes makes a difference. He further said one thing he would like to see a timeline graphics, this may be something the staff may look at and consider using something like this.

Commissioner Bassett stated he would like to volunteer for the task force and feel he would be a benefit.

Commissioner Calleja stated an issue has come up and the Mechanical TAC did not meet and he was approached by some mechanical building officials from Broward and Dade Counties regarding a problem they are having with smoke detector placement in the proposed Fifth Edition. He said we adopted the International Building Code and no-one picked up on the fact that it was totally different than what we had previously in our code. He further advised the International Mechanical Code requires that the smoke detectors be facing the return side of the equipment and we have always done this on the supply side and this poses a lot of problems. He said one of the issues is the NFPA 98 which is a standard requires it in the supply and in our code we took away the 90A standard out of the Mechanical Code, he said he understands looking at the proposed Fire Code there will be conflict between the Fire Code and the Mechanical Code. Commissioner Calleja asked procedurally how we are going to fix these types of things before we get further along before we have to wait until 2020.

Mo Madani advised the 2010 code was resolved by stating it would be on the supply side and this has been the case since 2001 code. He further stated at this point since this has not carried forward to the 2014 code you have two options; one is to define which one gives you the highest level of safety. When there is a conflict between two codes you can address through a declaratory statement to show which code gives highest level of safety. Mo said the law also allows the Commission and the Florida Fire Prevention Code to establish equal levels, he said there is opportunity to correct or clarify.

Commissioner Comments (cont.):

Chairman Browdy asked if we have to wait for a formal request for a declaratory statement.

Mo Madani stated yes there needs to be a formal request from an interested party.

Commissioner Calleja stated the issue is for like designers who project the designs and will have to have confirmation to know where it can be reviewed. He asked that this be brought to the Mechanical TAC.

Chairman Browdy stated this needs to be addressed and we need to go ahead and set a meeting and plan a path.

Mo Madani said as soon as we hold a hearing on the code and the Commission adopts the code, and then we are free to receive the issues and address them.

Chairman Browdy asked if the TAC could address.

Mo Madani stated no it is too early; we need to wait until we have had a hearing and an approved code.

Commissioner Calleja asked if we wait until a glitch, it is going to create confusion.

Mo Madani stated at the December meeting we could start working on it.

Commissioner Stone stated he felt that all members should attend code hearings or represent us at ICC and that the State of Florida could fund the expenses. He said Commissioners should take part in this process.

Commissioner Schock stated he supported Commissioner Stone and that we should participate more in the process and attend those meeting. He said he had a conversation with Eric Stafford and he was disappointed that Florida does not participate as much as they used to.

Jim Richmond stated he wanted to weigh in on this subject. He said that Mo did attend the hearings and was approved by the department to represent staff and the Commission. He further stated travel out of state requires much more approval and has to go downtown and is approved outside of the agency. Jim said it can be considered with much in advance notice.

Commissioner Comments (cont.):

Commissioner Schilling stated there are concerns on water consumption and the also waste water discharge as well and he has been approached by utilities directors and waste water managers throughout the State of Florida voicing their concerns about the fact neither the State of Florida nor the Code use some of the technology that is out there today. He said he would like to request guidance and suggestions on a group to review code to see if they are in tune and up to bring it use to speed with the new technology. He said this is a very important issue and as a plumbing contractor and Commissioner he needs to try and address.

Chairman Browdy stated if they need to put the concerns in a letter to the Commission listing their concerns. He said he thinks we should address and see what they have to say and then we can move it to the Plumbing TAC.

Commissioner Schiffer stated he would like to volunteer for the new work group.

Commissioner Boyer stated he would like to follow Commissioner Schock with the participation from the Commission. He said in the northeastern sector all of the code officials are funded by statute to attend the code hearings and that is why there is such good participation. He said we need to look for staff and code officials to be able to travel to the code hearings.

Chairman Browdy stated he would write to the Secretary and ask for guidance. He said he would get with Mo and Jim if this is the will of the Commission.

April Hammonds stated only one Commissioner can travel to the code hearings more than one traveling to same meeting could be a Sunshine Law issue.

Mark Zehnal stated that he attended the ICC hearings and he does engage he stated you can follow online and vote online. He said there is something in place to be able to engage.

Adjournment:

There was a motion to adjourn with a second. The meeting was adjourned at 10:54 am.

Date Submitted	12/14/2015	**Section**	402.1.3	**Proponent**	Mark Nowak
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Creates cost effective prescriptive R-values for buildings.

Rationale

This proposal improves on the base IECC code by providing a cost-effective option for framed walls under the prescriptive R-value compliance method that takes into account the climate in Florida. The IECC process does not consider the unique climates of Florida in setting their prescriptive envelope requirements because the IECC climate zones are far broader than Florida. Further, there was no specific cost impact assessment conducted to support individual entries to this table in the IECC. This proposal introduces a cavity-only solution for all framed walls in Florida that is supported by simulations and cost analysis.

Using Energy Gauge Premier Summit, we ran multiple simulations on a prototype building using R-13, R-13+5, and R-13+7.5 wall insulation to assess the difference in energy use and cost savings. The cost for continuous insulation and installation was estimated at $16,864 for R7.5 and $14,313 for R-5. The simple payback is between 66 and 89 years in Orlando and Miami, respectively. In most cases, the building will outlive its useful economic life before the continuous insulation will pay for itself.

Additional details on the simulations, cost analysis and assumptions are provided in the attached support document.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact.

Impact to building and property owners relative to cost of compliance with code

This proposal would lower costs to owners.

Impact to industry relative to the cost of compliance with code

This proposal would lower costs to the construction industry.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposal provides cost effective solutions for delivery of an energy efficiency building taking into account the unique climate in Florida.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal provides cost effective solutions for delivery of an energy efficiency building taking into account the unique climate in Florida.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposal is material-neutral and applies to all framed types of construction.

Does not degrade the effectiveness of the code

The proposed changes have insignificant impact on overall building performance while providing a much more cost-effective prescriptive solution than the base code.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6538-G1

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

Comment:

Proposal EN6538 should be disapproved for a number of reasons. First, it significantly weakens the code. Second, it relies on an overly simplistic economic analysis that does not account for the realities of the time-value of money. Third, it fails to realize that alternative solutions are feasible through the performance path or use of U-factors. Finally, it creates an even greater inequity between buildings that are built with wood or steel frame construction – causing an identical steel frame building to perform much lower than its wood frame counterpart. This inequity will be "blind" to consumers resulting in building construction or purchasing decisions that will tend to reduce energy efficiency in the marketplace, with consumers unwittingly footing the bill. Reducing the energy efficiency of wall construction also has other "value" impacts not considered in this proposal. For example, building envelopes that are less efficient result in a less comfortable indoor environment for occupants which affects behaviors, such as increasing energy consumption for space conditioning to offset the loss of comfort. There currently is a cavity-insulation option represented in the code (e.g., R20 for wood frame); thus, this proposal is not needed to maintain the option for cavity only insulation. By extending a cavity insulation only option to steel framing (which has a much greater problem with thermal bridging through steel studs), the effective R-value of walls will be nearly cut in half (i.e., reduced by 40 to 50 percent) and the energy cost-benefit impacts are likely in many cases to be greater than represented by the one building configuration considered.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6538-G2

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

TABLE C402.1.3 OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE METHOD[a]

CLIMATE ZONE	1		2	
	All Other	Group R	All Other	Group R
Metal framed	R-13 ~~+ R-5ci~~	R-13 ~~+ R-5ci~~	R-13 ~~+ R-5ci~~	R-13 ~~+ R-7.5ci~~
Wood framed and other	R-13~~+3.8 or R 20~~	R-13~~+3.8 or R 20~~	R-13~~+3.8 or R 20~~	R-13~~+3.8 or R 20~~

All other table entries remain unchanged.

This proposal improves on the base IECC code by providing a cost-effective option for framed walls under the prescriptive R-value compliance method that takes into account the climate in Florida. The IECC process does not consider the unique climates of Florida in setting their prescriptive envelope requirements because the IECC climate zones are far broader than Florida. Further, there was no specific cost impact assessment conducted to support individual entries to this table in the IECC. This proposal introduces a cavity-only solution for all framed walls in Florida that is supported by simulations and cost analysis.

We evaluated a four story, 32-unit building that is representative of many hotels, offices, and multi-family buildings in today's market. The building is nearly identical to the DOE prototype multi-family residential building. Using Energy Gauge Premier Summit, we ran multiple simulations on the building using R-13, R-13+5, and R-13+7.5 wall insulation to assess the difference in energy use and cost savings. The U-factors used in the analysis were based on values in Table A3.3 of ASHRAE 90.1-2013 using 16 inch on center stud spacing. The simulation results show the energy savings gained by adding R-5 and R-7.5 continuous are small, with an extremely long simple payback.

On the building subject to the simulations, the cost for continuous insulation and installation was estimated at $16,864 for R7.5 and $14,313 for R-5. The simple payback as shown in the table below is between 66 and 89 years. We believe these are conservative estimates and that the payback will actually be longer if secondary costs associated with wider walls, specialty fasteners or attachment methods for the continuous insulation, and returns or extensions at doors, windows, and other openings are included in the analysis.

City	Insulation in cavity + continuous insulation (CI)	Annual Energy use (Mbtu)	Annual energy cost $	% change from baseline (energy use)	change from baseline in $	change per unit in $	initial installed cost of CI in $	payback in years versus R13+0
Climate Zone 2								
Orlando	R13+7.5	1144.8	40117	NA	NA	NA	$16,864	66
Orlando	R13+0	1152.2	40373	0.6%	$256.00	$8.00	0	
Climate Zone 1								
Miami	R13+5	1237.8	43375	NA	NA	NA	$14,313	89
Miami	R13+0	1242.4	43536	0.4%	$161.00	$5.03	0	

In the last code change cycle in Florida, we proposed to eliminate continuous insulation on steel framed walls and also provided simulation results to support our proposal. The Energy TAC initially encouraged us to expand the proposal to include wood framed walls. We subsequently modified the proposal as requested but it was ultimately disapproved. However, since the last code cycle, the current IECC requirements in Climate Zone 1 and 2 for continuous insulation are even less cost-effective due to the overall stringency increases in other parts of the code. These stringency increases tend to have a large impact on the cost-effectiveness of envelope provisions such as continuous insulation on walls that have low added energy savings in Florida but relatively high costs. Thus, the new code requirements exacerbate the problems raised in the last code change cycle in Florida. There is now an even stronger economic argument to permit a cavity-only prescriptive option in the code.

Last, note that this proposal asks for a practical concession that is supported by analysis. We are not opposed to higher standards as long as they are cost effective and provide flexibility to designers so the code does not pick winners or losers in the marketplace. Thus, we are not proposing a corresponding change to the U-factor tables. If using the performance option, the existing U-factors would still be required in the standard reference building. The simulated performance option allows for much more flexibility in meeting the code and our proposal recognizes that alternatives to the prescriptive requirements can be used without excessive burden on a given system or product.

Responsible Energy Codes Alliance Comment on Proposal EN6538

Proposal EN6538 weakens the current 5th Edition energy conservation requirements for walls in commercial buildings. This is simply an energy efficiency roll-back and should be rejected on that basis. Aside from a significant weakening of the code, the proposal is also technically unsound because it treats metal-framed and wood-framed walls as if they perform in an identical manner. We recommend that the Commission maintain the wall insulation requirements as published in the 5th Edition Code (which are also consistent with the 2015 IECC), and not weaken them as suggested here.

The proponent's reason statement claims that this proposal "improves on the base IECC code." To the contrary, from an energy efficiency perspective, this proposal is a significant weakening amendment. For metal-framed walls, it would reduce insulation requirements from R-13+15c.i. to just R-13 cavity. For wood-framed walls, it would reduce the current R-13+3.8 or R-20 requirement to just R-13 as well. We see no justification for reducing the efficiency of the current code.

- Walls are most cost-effectively improved at construction; wall insulation is likely to remain unchanged over the useful life of the building.
- Continuous insulation provides a good thermal break for metal-framed walls; this proposal would eliminate that thermal break, reducing the efficiency substantially.
- The insulation levels reflected in the 2012 and 2015 IECC (as well as ASHRAE 90.1-2013) are cost-effective and industry-neutral, based on objective measurement of energy efficiency.
- The insulation requirements for each climate zone are carefully considered and debated in a consensus-based process at ICC. The proponent's suggestion that the "IECC climate zones are far broader than Florida" does not justify a departure from these consensus-based requirements.
- The proposed revision would treat metal-framed and wood-framed walls as if they perform in an identical thermal manner. This is simply not the case, and the proposed changes would create an incentive to install less-efficient building components.

We recommend that the Commission not weaken the current energy code in any way. Because proposal EN6538 would significantly reduce efficiency, we recommend disapproval.

Date Submitted	12/30/2015	**Section**	402.4	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal maintains the commercial fenestration SHGC requirement that currently applies under the 5th Edition Code.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposal prevents an efficiency rollback and simplifies enforcement of the code.

Impact to building and property owners relative to cost of compliance with code

This proposal prevents an efficiency rollback and simplifies compliance with the code.

Impact to industry relative to the cost of compliance with code

This proposal prevents an efficiency rollback and simplifies compliance with the code.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal supports the health, safety, and welfare of the general public by maintaining reasonable energy efficiency standards and simplifying the code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the code by simplifying compliance and enforcement and maintains the current fenestration SHGC requirement.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any product.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6925-G1

Proponent	Roger LeBrun	**Submitted**	1/12/2016	**Attachments**	No

Comment:

Reassign this to the Energy TAC. Also, look for other mislocated energy code change proposals.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6925-G2

Proponent	Muthusamy Swami	**Submitted**	2/25/2016	**Attachments**	No

Comment:

Obviously, IECC and ASHRAE have seen reasons to slightly roll back these numbers.
The proposers have not presented any analytical justification challenging the reasons ASHRAE & IECC undertook these rollbacks.
TAC need to examine this closely to determine if deviation from the base code is warranted.

Revise Table C402.4 and section C402.4.3 as follows:

Table C402.4

BUILDING ENVELOPE FENESTRATION MAXIMUM U-FACTOR AND SHGC REQUIREMENTS

CLIMATE ZONE	1	2	3	4 EXCEPT MARINE	5 AND MARINE 4	6	7	8
Vertical fenestration								
***U*-factor**								
Fixed fenestration	0.50	0.50	0.46	0.38	0.38	0.36	0.29	0.29
Operable fenestration	0.65	0.65	0.60	0.45	0.45	0.43	0.37	0.37
Entrance doors	1.10	0.83	0.77	0.77	0.77	0.77	0.77	0.77
SHGC								
~~Orientation~~[a]	~~SEW~~	~~N~~	~~SEW~~	~~N~~	~~SEW~~	~~N~~	~~SEW~~	~~N~~	~~SEW~~	~~N~~	~~SEW~~	~~N~~	~~SEW~~	~~N~~	~~SEW~~	~~N~~
All Vertical Fenestration ~~PF~~	0.25	~~0.33~~	0.25	~~0.33~~	0.25	~~0.33~~	0.40	~~0.53~~	0.40	~~0.53~~	0.40	~~0.53~~	0.45	~~NR~~	0.45	~~NR~~
~~0.2 = PF~~	~~0.30~~	~~0.37~~	~~0.30~~	~~0.37~~	~~0.30~~	~~0.37~~	~~0.48~~	~~0.58~~	~~0.48~~	~~0.58~~	~~0.48~~	~~0.58~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
~~PF = 0.5~~	~~0.40~~	~~0.40~~	~~0.40~~	~~0.40~~	~~0.40~~	~~0.40~~	~~0.64~~	~~0.64~~	~~0.64~~	~~0.64~~	~~0.64~~	~~0.64~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
Skylights								
U-factor	0.75		0.65		0.55		0.50		0.50		0.50		0.50		0.50	
SHGC	0.35		0.35		0.35		0.40		0.40		0.40		NR		NR	

C402.4.3 Maximum U-factor and SHGC. The maximum *U*-factor and solar heat gain coefficient (SHGC) for fenestration shall be as specified in Table C402.4.

~~The window projection factor shall be determined in accordance with Equation 4-5.~~

~~*PF = A/B*~~	~~**(Equation 4-5)**~~

~~where:~~

~~*PF*~~	~~=~~	~~Projection factor (decimal).~~
~~*A*~~	~~=~~	~~Distance measured horizontally from the furthest continuous extremity of any overhang, eave or permanently attached shading device to the vertical surface of the glazing.~~
~~*B*~~	~~=~~	~~Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave or permanently attached shading device.~~

~~Where different windows or glass doors have different *PF* values, they shall each be evaluated separately.~~

Reason Statement for Proposal to Maintain Current Fenestration SHGC Requirement and Avoid Rollbacks

The 2015 IECC requirements for SHGC are less stringent than those in the 2012 IECC or in ASHRAE 90.1-2013. The purpose of this proposal is to restore the simpler and more stringent SHGC values from the 2012 IECC (and ASHRAE 90.1-2013 – see Tables 5.5-1 through 5.5-8). Allowing higher fenestration SHGC for commercial buildings would decrease efficiency (and raise energy costs) for building owners and occupants, contribute to peak electric demand problems in Florida, and reduce comfort for building occupants. We see no value in permitting higher fenestration SHGC in Florida's climate zones in the 6th Edition code than would be allowed under the 5th edition code. To the extent that builders or design professionals incorporate permanent projections into building designs, proper credit for these projections can be taken via the performance path (Section C407) or in ASHRAE 90.1-2013, where the projections and the impact on energy use can be more accurately and consistently calculated.

This proposal will maintain the efficiency of the 5th Edition code and remove the potential for confusion in the application of this trade-off.

Date Submitted	12/31/2015	**Section**	403.2.12.3	**Proponent**	Amanda Hickman
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Revises label requirement for Fan efficiency grade (FEG) requirements.

Rationale

see attached.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Only the label requirement is being revised so code officials will now just need to look on construction documents.

Impact to building and property owners relative to cost of compliance with code

None. Only the label requirement is being revised.

Impact to industry relative to the cost of compliance with code

None. Only the label requirement is being revised.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

None. Only the label requirement is being revised.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

None. Only the label requirement is being revised.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

None. Only the label requirement is being revised.

Does not degrade the effectiveness of the code

None. Only the label requirement is being revised.

Is the proposed code modification part of a prior code version? No

C403.2.12.3 Fan efficiency. Fans shall have a fan efficiency grade (FEG) of not less than 67 when determined in accordance with AMCA 205 by an *approved*, independent testing laboratory ~~and labeled by the manufacturer~~. The total efficiency of the fan at the design point of operation shall be within 15 percentage points of the maximum total efficiency of the fan.

Exception: The following fans are not required to have a fan efficiency grade:

1. Fans of 5 hp (307kW) or less as follows:

1.1. Single fan with a motor nameplate horsepower of 5 hp (3.7 kW) or less, unless Exception 1.2 applies.

1.2. Multiple fans in series or parallel that have a combined motor nameplate horsepower of 5 hp (3.7 kW) or less and are operated as the functional equivalent of a single fan.

2. Fans that are part of equipment covered under Section C403.2.3.

3. Fans included in an equipment package certified by an *approved agency* for air or energy performance.

4. Powered wall/roof ventilators.

5. Fans outside the scope of AMCA 205.

6. Fans that are intended to operate only during emergency conditions.

C403.2.12.3 Fan efficiency (FEG) Label Mod Reason:

The Fan Efficiency Grade metric is defined in AMCA Standard 205 and ISO Standard 12759. The first U.S. model energy code/standard to adopt it was the 2012 International Green Construction Code. ASHRAE 90.1 adopted it for the 2013 edition, ASHRAE189.1-2013, and the 2015 IECC.

Despite its rapid penetration into model U.S. codes and standards, the U.S. Department of Energy decided to take a path leading to the need for a different metric when initiating a rulemaking on commercial and industrial fans and blowers. The rulemaking initiative started in June 2011. In the publication of the first regulatory milestone in January 2013, i.e., the *Framework Document,* DOE stated that they intended to regulate fans alone and in fan/motor and fan/motor/drive combinations. In subsequent meetings and public negotiations that have taken place in the interim, AMCA, DOE and other stakeholders, decided that an altogether different metric for fan efficiency was needed. This new metric, is called Fan Efficiency Index (FEI), and has no connection to the Fan Efficiency Grade metric.

The first complete draft of the regulation is expected late 2015; it would be released as a Notice of Public Rulemaking (NOPR), subject to review by the public. The final regulation is expected sometime in 2016 or 2017; and effectiveness is expected in year 2021 or after. Between now and then, the FEG will be a legacy metric; it will necessarily be replaced by the FEI metric over time.

During this interim period, AMCA is advising codes/standards communities to minimize dependence on the FEG metric. One way to do so is to eliminate the labeling requirement because:

- As written, the FEG requirement has four compliance checks in the charging statement:

    1. FEG 67 or higher

2. FEG rating is certified by an independent testing lab
3. FEG labeled by the manufacturer
4. Peak total efficiency requirement.

Labeling is inconsistent with 90.1, which does not require certification nor labeling. AMCA advises retaining the certification requirement because it aides with compliance assurance and checking. AMCA has been certifying fans for FEG ratings since 2010.

- There is no label that shows the FEG rating (FEG-67, for example), and having industry create one would be onerous given that the metric is on the way out and new labeling will have to be designed for DOE requirements and to support incentive programs for fans. Having multiple metrics and labels in the market over a period of years will be confusing to the industry and prolong the legacy of FEG.
- An AMCA label signifying certification exists; however, compliance checkers would have to perform research to determine what the actual FEG rating is (Figure 1). It may or may not be on the nameplate. The label is NOT required to be placed on certified fans. The label would, however, to comply with the AMCA Certified Ratings Program, at the very least have to be included in the manufacturers' literature and the literature would have to be present on the AMCA Website (www.amca.org).

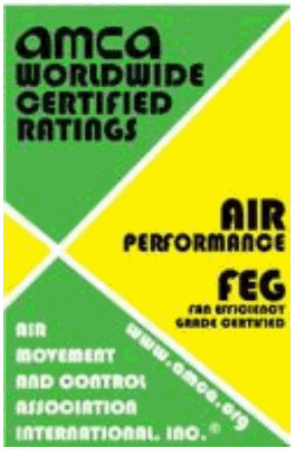


Figure 1: AMCA Certified Ratings Seal for FEG

- The peak total efficiency requirement is not required to be on the label. Therefore, some research is needed to check this parameter. The actions needed to check for the peak total efficiency requirement would satisfy the remaining three compliance-check requirements because all are traceable to the same source: AMCA's online "FEG Finder" procedure on the CRP web pages (for most cases). http://www.amca.org/feg/feg-finder.aspx (
- As a last resort, checking the manufacturer's literature or calling the manufacturer. The AMCA Certified Ratings program does NOT require participating companies to reveal the actual FEG rating nor the rated peak total efficiency on the AMCA database. However, many choose to do so. (
- AMCA will be making a proposal to IECC to eliminate the labeling clause for the 2018 edition. (

EN7021

Date Submitted	12/31/2015	**Section**	403.2.3	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6983

Summary of Modification

Make sure code is consistent with federal heating and cooling equipment efficiency minimums.

Rationale

At times there is a conflict between the written code and the federal standards. This clarifies that the federal law/standards take precedence.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Consistent with federal law.

Impact to building and property owners relative to cost of compliance with code

None.

Impact to industry relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, as the federal law limits have been vetted by government, manufacturers and energy advocates to be the best efficiency for any extra cost.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes; clarifies the code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Does not degrade the code; makes it clearer on what to do in case of conflict.

Is the proposed code modification part of a prior code version? No

C403.2.3 HVAC equipment performance requirements

Equipment shall meet the minimum efficiency requirements ~~of~~ specified in federal law or in their absence those specified in Tables C403.2.3(1), C403.2.3(2), C493.2.3(3), C493.2.3(4), C403.2.3(5), C403.2.3(6), C403.2.3(7), C403.2.3(8) and C403.2.3(9) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of Table C403.2.3(10). The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

[No other changes to section.]

Date Submitted	12/23/2015	**Section**	405.6.3	**Proponent**	Gary Beaumont
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

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.

Rationale

By not limiting the Feeder voltage drip to 2%, there is a major reduction in the first cost in certain projects (hi-rise, large commercial, etc.) and combining the voltage drop to a 5% total limit keeps the energy costs neutral. Lights, appliances, motors, etc. do not know whether the voltage drop occurred in the feeders or branch. This would save commercial projects in Florida millions of dollars a year with no additional energy costs.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

The impact would be approximately .5% of the construction costs

Impact to industry relative to the cost of compliance with code

Commercial projects would save approximately .5 of the construction costs.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Saves money with no negative energy effects.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Puts the energy code in compliance with NEC and ASHRAE addendum c

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No effect.

Does not degrade the effectiveness of the code

Meets and exceeds NEC

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6782-A2

Proponent Bryan Holland **Submitted** 2/22/2016 **Attachments** Yes

Rationale

While I agree that a reasonable efficiency of operation will be provided by limiting the maximum total voltage drop of all conductors from the service to the farthest outlet to 5 percent, the permitted voltage drop on any one circuit or conductor should not exceed 3 percent. As proposed, a calculated voltage drop of less than 2 percent on a feeder would allow a 4 percent or more voltage drop on the branch circuits. Overheating of the branch circuit conductors and conductor terminations could be the result. By limiting the maximum voltage drop on any single conductor to 3 percent, the total 5 percent voltage drop permitted will be evenly distributed across the entire premise wiring system.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None.

Impact to building and property owners relative to cost of compliance with code

None. This modified proposal will not have a significant impact on system design or cost of compliance.

Impact to industry relative to the cost of compliance with code

None. This modified proposal will not have a significant impact on system design or cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This has a minimal connection to health, safety, and welfare of the public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This modified proposal provides equivalent energy conservation to what is currently required by code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No.

Does not degrade the effectiveness of the code

No.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

1st Comment Period History 01/13/2016 - 02/25/2016

EN6782-G1

Proponent Thomas Lasprogato **Submitted** 2/3/2016 **Attachments** No

Comment:

I remain neutral

C405.6.3 Voltage drop.

~~**C405.6.3.1 Feeders and customer owned service conductors**. Feeder and customer owned service conductors shall be sized for a maximum voltage drop of 2 percent at design load.~~

~~**C405.6.3.2 Branch Circuits.** Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent at design load.~~

The conductors for feeders and branch circuits combined shall be sized for a maximum of 5% voltage drop total.

Revise the proposed modification as follows:

C405.6.3 Voltage drop. The maximum combined voltage drop on customer owned service conductors, feeders and branch circuits shall not exceed 5 percent. The maximum voltage drop on any single conductor shall not exceed 3 percent.

Date Submitted	12/15/2015	**Section**	407.5.1	**Proponent**	Dwight Wilkes
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6562

Summary of Modification

Correct an inconsistency in the 2015 IECC related to skylights. This code change is also being proposed for the 2018 IECC.

Rationale

This corrects an inconsistency in the treatment of skylights vs. vertical fenestration between the commercial text and the 2015 IECC commercial performance methodology.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact.

Impact to building and property owners relative to cost of compliance with code

No impact.

Impact to industry relative to the cost of compliance with code

No impact.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not.

Does not degrade the effectiveness of the code

Does not.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

OTHER

Explanation of Choice

This corrects an inconsistency in the treatment of skylights vs. vertical fenestration between the commercial text and the 2015 IECC commercial performance methodology. The code provides two sets of area limits for both vertical fenestration and skylights under prescriptive design. For vertical fenestration, both sets of limits are reflected in the criteria for performance design. For skylights, only one set of criteria is currently referenced.
It is not unusual for changes in prescriptive code to be adopted, with no appropriate attention paid to how the performance path might fall behind unless parallel changes are offered in the code change proposal. That appears to be the case in this instance.
This modification also replaces references to “glazing” with “vertical fenestration”, as appropriate per the previous modification.

This code change is also being proposed for the 2018 IECC.

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

NO

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6563-G1

Proponent	Eric Lacey	Submitted	2/25/2016	Attachments	Yes

Comment:

See attached comment.

Revise Table C407.5.1(1) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS as follows:

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Vertical fenestration other than opaque doors	Area 1. The proposed ~~glazing~~ vertical fenestration area; where the proposed ~~glazing~~ vertical fenestration area is less than 40 percent of the above-grade wall area. 2. 40 percent of above-grade wall area; where the proposed ~~glazing~~ vertical fenestration area is 40 percent or more of the above grade wall area.	As proposed
	U-factor: as specified in Table C402.4	As proposed
	SHGC: as specified in Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
	External shading and PF: None	As proposed
Skylights	Area: 1. The proposed skylight area; where the proposed skylight area is less than that permitted by Section C402.1 ~~3 percent of gross area of roof assembly.~~ 2. The area permitted by Section C402.1 ~~3 percent of gross roof assembly,~~ where the proposed skylight area exceeds that permitted by Section C402.1. ~~is 3 percent or more of gross area of the roof assembly~~	As proposed
	U-factor: as specified in Table C402.4	As proposed
	SHGC: as specified in Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed

Responsible Energy Codes Alliance Comment on Proposal EN6563

RECA is concerned with proposal EN6563 because it is inconsistent with the 2015 IECC and would likely result in less efficient commercial buildings in cases where skylights are installed. This proposal is complicated, and has not yet been vetted through the rigorous ICC Code Development Process. We acknowledge the proponent's attempt to set a reasonable assumption for skylight efficiency in the standard reference design of the performance path, but we are not convinced that this proposal reasonably accomplishes this objective. We are concerned with the specific approach proposed, the complexity of the approach and the potential impact on the standard reference design.

Date Submitted	12/30/2015	**Section**	202	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Revises the definition of Replacement to include thermal envelope components.

Rationale

See attached Reason Statement

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There should be no impact on enforcement of code.

Impact to building and property owners relative to cost of compliance with code

There should be no impact on building or property owners.

Impact to industry relative to the cost of compliance with code

There should be no impact on cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal clarifies a definition in the energy conservation code, which is part of a complete set of building codes dedicated to the health, safety, and welfare of the general public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal strengthens the code by improving and clarifying a definition.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any products.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Revise the definition of "Replacement" as follows:

REPLACEMENT. The installation of part or all of an existing mechanical or electrical system or thermal envelope component in an existing building.

Reason Statement for Proposal to Update Definition of "Replacement"

This proposal does not change any requirements in the code, but simply clarifies that the term "replacement" applies to mechanical systems and to thermal envelope components. We believe this definition is more consistent with Florida Statutes and with the Commission's regulation of replacement systems and components in recent editions of the Florida Building Code. The Florida Legislature provided the outline for the Commission's authority to regulate new and existing buildings as follows:

> "553.903 – Applicability – This part applies to all new and renovated buildings in the state, except exempted buildings, for which building permits are obtained after March 15, 1979, **and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by the Florida Building Code-Energy Conservation**. The provisions of this part shall constitute a statewide uniform code."

Fl. Stat. § 553.903 (emphasis added). The Commission has already set thermal efficiency standards for not only replacement systems (such as HVAC systems), but also thermal envelope components such as replacement fenestration and lighting. The proposed modification to this definition will simply acknowledge the range of products currently regulated by the Commission.

Date Submitted	12/30/2015	**Section**	402.1.1	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review

Commission Action Pending Review

Related Modifications

Summary of Modification

Amends the climate zone 1 fenestration U-factor requirement in Table R402.1.1 to "NR," consistent with the 2015 IECC.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposal will not impact enforcement of the code.

Impact to building and property owners relative to cost of compliance with code

This proposal will provide additional flexibility for compliance with the code.

Impact to industry relative to the cost of compliance with code

This proposal will provide additional flexibility for compliance with the code.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal makes the Florida Building Code climate zone 1 fenestration U-factor specification consistent with the 2015 IECC.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the code by making it more consistent with the 2015 IECC.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal will allow a wider range of materials to be used for compliance.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Revise Table R402.1.1 and footnotes as follows:

TABLE R402.1.1

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTORbj
1	~~.65~~ NR
2	0.40

[No change to footnotes a – i]

j. For impact rated fenestration complying with Section R301.2.1.2 of the *Florida Building Code, Residential* or Section 1609.1.2 of the *Florida Building Code*, *Building* the maximum *U*-factor shall be ~~0.75 in Climate Zone 1 and~~ 0.65 in Climate Zone 2.

Reason Statement for Proposal to Make Climate Zone 1 U-factor Consistent with 2015 IECC

This proposal would restore the fenestration U-factor requirement for climate zone 1 as set forth in the prescriptive table of the 2015 IECC. The prescriptive table of the IECC, which sets efficiency requirements for envelope components, applies "No Requirement" to fenestration U-factor in climate zone 1. Because climate zone 1 is cooling-dominated, the fenestration SHGC is far more important to energy conservation than the U-factor. Much of climate zone 1 is in a high wind zone, and impact-resistant fenestration is often required. The "No Requirement" specification provides maximum flexibility to builders in climate zone 1 to meet impact resistance requirements (which often raise the U-factors of the windows). Footnote j would also be amended to reflect the "NR" requirement in climate zone 1.

This change does not, however, affect the U-factor equivalent table (R402.1.4), which does contain a U-factor requirement for climate zone 1. Because the U-factor equivalent table is used for several trade-off compliance paths in the code (R402.1.5 total UA and R405 simulated performance alternative), there must be a U-factor baseline against which a proposed home can be compared. Of course, builders using the trade-off paths are not required to meet the specified U-factor requirement – they can trade efficiency among various building components in order to achieve the compliant total UA or annual energy cost levels specified in these sections.

This proposal would make the 6th Edition of the Florida Building Code, Energy Conservation more consistent with the 2015 IECC.

Date Submitted	12/31/2015	**Section**	402.1.2	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Limit prescriptive compliance glazed fenestration area as a fraction of total house conditioned area.

Rationale

Houses that have large glazed areas will have increased energy use relative to those with less glazed area. Historically most builders comply using the performance method where the actual home is compared against a home that has a limited amount of glazed area. This modification allows homes to continue to comply using the performance method and avoids having new homes that will have excessive air conditioning use due to large glazed areas relative to floor area. Some homes with very high glazed areas may also cause extra load at peak times on utilities. Florida homes main energy use is through air conditioning and windows allow our sun to pass through it and are one of the main loads for a house. Thus this change is more applicable to Florida than other locations. Furthermore, very high glazed fenestration area homes (upscale custom homes) have been built in Florida.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Very little as this only applies to a small portion of homes.

Impact to building and property owners relative to cost of compliance with code

Will force those homes with high glazing areas relative to floor area to maintain the same level of energy performance as homes with standard amounts of glazing to floor areas.

Impact to industry relative to the cost of compliance with code

For most homes this change would not have any impact. For those homes where it might cause a change a builder can comply in any number of ways, from better windows to better HVAC equipment using the performance method.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The purpose of the energy code is to avoid high energy use new homes. Without this requirement there is no assurance that a new home might not use as much energy as many 20-year old homes of the same size.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, this strengthens the code by limiting energy use in some cases.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Increases code effectiveness by limiting energy use in some cases.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

OTHER

Explanation of Choice

This has more bearing on Florida due to the homes we build and our high air conditioning load.

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6980-G1

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6980-G2

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

We disagree with the logic presented in general comment EN6980-G1 for rejecting this mod. The lack of window limits on the prescriptive path allow homes that would fail compliance under any performance path where the reference home has upper limits of glass. These houses could consume considerably more energy than homes built to earlier Florida codes (2010 and earlier) that included such limits. Many very large homes (some with more than 10,000 square feet) exceed the 20% threshold proposed and could end up costing Floridians considerable cost by increasing peak power demand. Our long summer weather and contemporary housing styles make Florida particularly sensitive to this loophole in IECC that the Commission had, up until 2014, correctly avoided. Homes with more glass will be able to comply by incorporating other efficiency measures using the performance method.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6980-G3

Proponent Jeff Inks **Submitted** 2/25/2016 **Attachments** No

Comment:

The Window & Door Manufacturers Association believes this proposed amendment should be rejected for several reasons. In particular the proposed 20% maximum glazed area is an arbitrary value and has not been substantiated by any sound data regarding energy efficiency gains that will result -- nor is there substation that this amendment is needed in the jurisdiction of Florida or elsewhere. Furthermore, while we don't dispute that houses with large glazed areas may have greater energy use than a similar home with less glazing, that can be for many reasons and is not true in all cases. Asserting otherwise ignores all of the other aspects of the building design, construction and operation that impact the efficiency of the building, as well as the other beneficial attributes provided by the glazed areas. A home with a large glazed area can also have lessened energy use relative to those with a less glazed area.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6980-G4

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

Concerning general comment 6980-G3, the commenter states the following:

"Furthermore, while we don't dispute that houses with large glazed areas may have greater energy use than a similar home with less glazing, that can be for many reasons and is not true in all cases. Asserting otherwise ignores all of the other aspects of the building design, construction and operation that impact the efficiency of the building, as well as the other beneficial attributes provided by the glazed areas. A home with a large glazed area can also have lessened energy use relative to those with a less glazed area."

FSEC agrees with this statement and believes that the performance method would indeed determine if the house uses too much energy or has incorporated the design parameters that would indeed allow it to use less energy. We believe this comment makes an argument for accepting FSEC's 6980 mod as originally submitted.

TABLE R402.1.1

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTORbj	SKYLIGHTb *U*-FACTOR	GLAZED FENESTRATION SHGCb, e	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUEi	FLOOR *R*-VALUE	BASEMEN WALL *R*-VALUE
1	.65	0.75	0.25	30	13	3/4	13	0
2	0.40	0.65	0.25	38	13	4/6	13	0
3	0.35	0.55	0.25	38	20 or 13+5h	8/13	19	5/13f
4 except Marine	0.35	0.55	0.40	49	20 or 13+5h	8/13	19	10 /13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5h	13/17	30g	15/19
6	0.32	0.55	NR	49	20+5 or 13+10h	15/20	30g	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10h	19/21	38g	15/19

[No change to table or footnotes a, and c – j]

b. The sum of all glazed fenestration areas must be <= 0.20 * conditioned floor area. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

Responsible Energy Codes Alliance Comment on Proposal EN6980

Proposals EN6980, 6981, and 6982 all attempt to apply a 20% glazing area limitation to the prescriptive-based compliance options in the IECC. This proposal is inconsistent with the IECC, and is an unnecessary complication of the prescriptive compliance options. The component-based prescriptive path, the assembly based U-factor alternative, and the Total UA approach are all designed to be simple, straightforward, efficient means of complying with the IECC. These simple options have served builders and code officials well, because the "rules of the game" are clearly spelled out for all parties. Applying glazing area limitations on these paths will not only complicate these straightforward options, but could also drive more builders toward the performance path, where compliance and enforcement are significantly more complicated. We recommend that the Commission reject these three proposals and maintain consistency with the IECC on this issue.

EN6981

Date Submitted	12/31/2015	**Section**	402.1.4	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6980

Summary of Modification

Limit prescriptive U-factor Alternative compliance glazed fenestration area as a fraction of total house conditioned area.

Rationale

Houses that have large glazed areas will have increased energy use relative to those with less glazed area. Historically most builders comply using the performance method where the actual home is compared against a home that has a limited amount of glazed area. This modification allows homes to continue to comply using the performance method and avoids having new homes that will have excessive air conditioning use due to large glazed areas relative to floor area. Some homes with very high glazed areas may also cause extra load at peak times on utilities. Florida homes main energy use is through air conditioning and windows allow our sun to pass through it and are one of the main loads for a house. Thus this change is more applicable to Florida than other locations. Furthermore, very high glazed fenestration area homes (upscale custom homes) have been built in Florida.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Very little as this only applies to a small portion of homes.

Impact to building and property owners relative to cost of compliance with code

Will force those homes with high glazing areas relative to floor area to maintain the same level of energy performance as homes with standard amounts of glazing to floor areas.

Impact to industry relative to the cost of compliance with code

For most homes this change would not have any impact. For those homes where it might cause a change a builder can comply in any number of ways, from better windows to better HVAC equipment using the performance method.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The purpose of the energy code is to avoid high energy use new homes. Without this requirement there is no assurance that a new home might not use as much energy as many 20-year old homes of the same size.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, this strengthens the code by limiting energy use in some cases.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Increases code effectiveness by limiting energy use in some cases.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

OTHER

Explanation of Choice

This has more bearing on Florida due to the homes we build and our high air conditioning load.

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6981-G1

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6981-G2

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

We disagree with the logic presented in general comment EN6981-G1 for rejecting this mod. The lack of window limits on the prescriptive path allow homes that would fail compliance under any performance path where the reference home has upper limits of glass. These houses could consume considerably more energy than homes built to earlier Florida codes (2010 and earlier) that included such limits. Many very large homes (some with more than 10,000 square feet) exceed the 20% threshold proposed and could end up costing Floridians considerable cost by increasing peak power demand. Our long summer weather and contemporary housing styles make Florida particularly sensitive to this loophole in IECC that the Commission had, up until 2014, correctly avoided. Homes with more glass will be able to comply by incorporating other efficiency measures using the performance method.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6981-G3

Proponent Jeff Inks **Submitted** 2/25/2016 **Attachments** No

Comment:

The Window & Door Manufacturers Association believes this proposed amendment should be rejected for several reasons. In particular the proposed 20% maximum glazed area is an arbitrary value and has not been substantiated by any sound data regarding energy efficiency gains that will result -- nor is there substation that this amendment is needed in the jurisdiction of Florida or elsewhere. There is also no substantiation for why this should be a condition for the use of the U-factor alternative provision or of the improvement in energy efficiency that results, and it undermines the intent of the provision to provide reasonable flexibility.

Furthermore, while we don't dispute that houses with large glazed areas may have greater energy use than a similar home with less glazing, that can be for many reasons and is not true in all cases. Asserting otherwise ignores all of the other aspects of the building design, construction and operation that impact the efficiency of the building, as well as the other beneficial attributes provided by the glazed areas. A home with a large glazed area can also have lessened energy use relative to those with a less glazed area.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6981-G4

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

Concerning general comment 6981-G3, the commenter states the following:

"Furthermore, while we don't dispute that houses with large glazed areas may have greater energy use than a similar home with less glazing, that can be for many reasons and is not true in all cases. Asserting otherwise ignores all of the other aspects of the building design, construction and operation that impact the efficiency of the building, as well as the other beneficial attributes provided by the glazed areas. A home with a large glazed area can also have lessened energy use relative to those with a less glazed area."

FSEC agrees with this statement and believes that the performance method would indeed determine if the house uses too much energy or has incorporated the design parameters that would indeed allow it to use less energy. We believe this comment makes an argument for accepting FSEC's 6981 mod as originally submitted.

R402.1.4 U-factor Alternative. An assembly with a U-factor equal to or less than that specified in Table R402.1.3 shall be permitted as an alternative to the R-value in Table R402.1.1. The U-factor Alternative method shall only apply to residences where the sum of all glazed fenestration areas is <= 20% of the conditioned floor area of the residence.

Responsible Energy Codes Alliance Comment on Proposal EN6981

Proposals EN6980, 6981, and 6982 all attempt to apply a 20% glazing area limitation to the prescriptive-based compliance options in the IECC. This proposal is inconsistent with the IECC, and is an unnecessary complication of the prescriptive compliance options. The component-based prescriptive path, the assembly based U-factor alternative, and the Total UA approach are all designed to be simple, straightforward, efficient means of complying with the IECC. These simple options have served builders and code officials well, because the "rules of the game" are clearly spelled out for all parties. Applying glazing area limitations on these paths will not only complicate these straightforward options, but could also drive more builders toward the performance path, where compliance and enforcement are significantly more complicated. We recommend that the Commission reject these three proposals and maintain consistency with the IECC on this issue.

Date Submitted	12/31/2015	**Section**	402.1.5	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6980 and 6981

Summary of Modification

Limit prescriptive Total UA Alternative compliance glazed fenestration area as a fraction of total house conditioned area.

Rationale

Houses that have large glazed areas will have increased energy use relative to those with less glazed area. Historically most builders comply using the performance method where the actual home is compared against a home that has a limited amount of glazed area. This modification allows homes to continue to comply using the performance method and avoids having new homes that will have excessive air conditioning use due to large glazed areas relative to floor area. Some homes with very high glazed areas may also cause extra load at peak times on utilities. Florida homes main energy use is through air conditioning and windows allow our sun to pass through it and are one of the main loads for a house. Thus this change is more applicable to Florida than other locations. Furthermore, very high glazed fenestration area homes (upscale custom homes) have been built in Florida.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Very little as this only applies to a small portion of homes.

Impact to building and property owners relative to cost of compliance with code

Will force those homes with high glazing areas relative to floor area to maintain the same level of energy performance as homes with standard amounts of glazing to floor areas.

Impact to industry relative to the cost of compliance with code

For most homes this change would not have any impact. For those homes where it might cause a change a builder can comply in any number of ways, from better windows to better HVAC equipment using the performance method.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The purpose of the energy code is to avoid high energy use new homes. Without this requirement there is no assurance that a new home might not use as much energy as many 20-year old homes of the same size.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, this strengthens the code by limiting energy use in some cases.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Increases code effectiveness by limiting energy use in some cases.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

OTHER

Explanation of Choice

This has more bearing on Florida due to the homes we build and our high air conditioning load.

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6982-G1

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6982-G2

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

We disagree with the logic presented in general comment EN6982-G1 for rejecting this mod. The lack of window limits on the prescriptive path allow homes that would fail compliance under any performance path where the reference home has upper limits of glass. These houses could consume considerably more energy than homes built to earlier Florida codes (2010 and earlier) that included such limits. Many very large homes (some with more than 10,000 square feet) exceed the 20% threshold proposed and could end up costing Floridians considerable cost by increasing peak power demand. Our long summer weather and contemporary housing styles make Florida particularly sensitive to this loophole in IECC that the Commission had, up until 2014, correctly avoided. Homes with more glass will be able to comply by incorporating other efficiency measures using the performance method.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6982-G3

Proponent Jeff Inks **Submitted** 2/25/2016 **Attachments** No

Comment:

The Window & Door Manufacturers Association believes this proposed amendment should be rejected for several reasons. In particular the proposed 20% maximum glazed area is an arbitrary value and has not been substantiated by any sound data regarding energy efficiency gains that will result -- nor is there substation that this amendment is needed in the jurisdiction of Florida or elsewhere. There is also no substantiation for why this should be a condition for the use of the Total UA Alternative provision or of the improvement in energy efficiency that results, and it undermines the intent of the provision to provide reasonable flexibility.

Furthermore, while we don't dispute that houses with large glazed areas may have greater energy use than a similar home with less glazing, that can be for many reasons and is not true in all cases. Asserting otherwise ignores all of the other aspects of the building design, construction and operation that impact the efficiency of the building, as well as the other beneficial attributes provided by the glazed areas. A home with a large glazed area can also have lessened energy use relative to those with a less glazed area.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6982-G4

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

Concerning general comment 6982-G3, the commenter states the following:

"Furthermore, while we don't dispute that houses with large glazed areas may have greater energy use than a similar home with less glazing, that can be for many reasons and is not true in all cases. Asserting otherwise ignores all of the other aspects of the building design, construction and operation that impact the efficiency of the building, as well as the other beneficial attributes provided by the glazed areas. A home with a large glazed area can also have lessened energy use relative to those with a less glazed area."

FSEC agrees with this statement and believes that the performance method would indeed determine if the house uses too much energy or has incorporated the design parameters that would indeed allow it to use less energy. We believe this comment makes an argument for accepting FSEC's 6982 mod as originally submitted.

R402.1.5 Total UA Alternative. If the total building thermal envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table R402.1.4 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table R402.1.~~2~~1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance. The Total UA Alternative method shall only apply to residences where the sum of all glazed fenestration areas is <= 20% of the conditioned floor area of the residence.

Responsible Energy Codes Alliance Comment on Proposal EN6982

Proposals EN6980, 6981, and 6982 all attempt to apply a 20% glazing area limitation to the prescriptive-based compliance options in the IECC. This proposal is inconsistent with the IECC, and is an unnecessary complication of the prescriptive compliance options. The component-based prescriptive path, the assembly based U-factor alternative, and the Total UA approach are all designed to be simple, straightforward, efficient means of complying with the IECC. These simple options have served builders and code officials well, because the "rules of the game" are clearly spelled out for all parties. Applying glazing area limitations on these paths will not only complicate these straightforward options, but could also drive more builders toward the performance path, where compliance and enforcement are significantly more complicated. We recommend that the Commission reject these three proposals and maintain consistency with the IECC on this issue.

Date Submitted	12/27/2015	**Section**	402.3.1	**Proponent**	Joseph Belcher
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

202 Definition Projection Factor

Summary of Modification

Adds definition for Projection Factor; Adds new section addressing projection factor for residential construction.

Rationale

This amendment allows for the use of overhangs to meet the solar heat gain coefficient requirements within the FBC-EC. See Uploaded Support File for Rationale.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to the local entity on the cost of code enforcement.

Impact to building and property owners relative to cost of compliance with code

May result in a cost savings by providing credit for viable element not recognized in residential portion of the code.

Impact to industry relative to the cost of compliance with code

May result in a cost savings by providing credit for viable element not recognized in residential portion of the code.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposal has a reasonable connection with the health, safety, and welfare of the general public by giving credit to an option to provide time honored creative design solutions to address solar heat gain issues.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal improves the code by giving credit to an option to provide time honored creative design solutions to address solar heat gain issues.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6805-G1

Proponent Jeff Sonne / FSEC **Submitted** 2/24/2016 **Attachments** No

Comment:

Although one could get more specific with projection factors by orientation, the factors provided do not provide sufficient shading. This method also may be more difficult for building inspectors to verify than the 4' average overhang depth.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6805-G2

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

Proponent Jeff Inks **Submitted** 2/25/2016 **Attachments** No

EN6805-G3

Comment:

The Window & Door Manufacturers Association believes this proposed amendment should be rejected for several reasons. Unlike the provisions noted for commercial construction where SHGC is based on the use or none-use of shading devices, it does not provide a complete exception for the SHGC requirements all together as this proposed amendment appears to do. We believe there is also no adequate substantiation for the PF values proposed in new Table R402.3.2.1, even if PF credit was warranted, and further that if approved, would be a significant degradation of the energy code. In addition we believe the proposed definition is not clear with respect to measuring the horizontal depth of the overhang.

PROJECTION FACTOR. The ratio of the horizontal depth of an overhang, eave, or permanently attached non-retractable shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

R402.3.2.1 Glazed fenestration SHGC exception. Permanently shaded vertical fenestration shall be permitted to satisfy the SHGC requirements. The projection factor of an overhang, eave, or permanently attached shading device shall be greater than or equal to the value listed in Table R402.3.2.1 for the appropriate orientation. The minimum projection shall extend beyond each side of the glazing a minimum of 12 inches (0.3 m). Each orientation shall be rounded to the nearest cardinal orientation (+/-45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

TABLE R402.3.2.1

MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

See Uploaded Support File

a. ***For the north orientation, a vertical projection located on the west-edge of the fenestration with equivalent PF >= 0.15 shall also satisfy the minimum projection factor requirement.***

TABLE R402.3.2.1
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

ORIENTATION	PROJECTION FACTOR
North	>=0.40[a]
South	>=0.20
East	>=0.50
West	>=0.50

a. *For the north orientation, a vertical projection located on the west-edge of the fenestration with equivalent PF >= 0.15 shall also satisfy the minimum projection factor requirement.*

Responsible Energy Codes Alliance Comment on EN6805

Proposal EN6805 is not technically justified and will result in reduced energy efficiency, greater air conditioning loads and higher first costs for builders as well as higher energy bills for homeowners. This proposal would simply be a roll-back of the current residential energy code. Given Florida's climate, low SHGC fenestration is simply a "no-brainer," one of the best and most cost-effective energy efficiency improvements available. Proposals like this one to trade-off SHGC have been soundly rejected at the ICC code change hearings and in every state where a trade-off for SHGC has been proposed. We urge the Commission to reject it in Florida too.

Florida's current energy code has required fenestration to meet a reasonable Solar Heat Gain Coefficient (SHGC), irrespective of the orientation or design of the home, for many years. SHGC is a measurement of the ability of a window, door, or skylight to block the sun's heat, and a low SHGC is crucial to saving energy, air conditioning load, peak demand and keeping occupants comfortable in the Florida climate. The 5th Edition Code, like the IECC, currently allows some amount of SHGC trade-off in the simulated performance path, but this trade-off is limited to the actual energy saved from the proposed overhang. A builder may already incorporate permanent shading or take advantage of good orientation to reduce solar gain only by properly and precisely matching the specific projections to each window in the home.

Unlike the current energy code and the IECC, however, this proposal would create a complete exemption from the SHGC requirement for fenestration with certain overhangs. We note that the IECC commercial chapter does allow some amount of trade-off between SHGC and overhangs, consistent with Table 5.5.4.4.1 of ASHRAE Standard 90.1-2013. However, the commercial chapter of the IECC and ASHRAE 90.1 only permit limited reductions to SHGC requirements – not a complete exemption from the requirement. Thus, this proposal is both technically flawed and is a clear reduction in energy efficiency as compared to the current code. The proposal would result in an increase in air conditioning load, higher peak electric demand, and a much less comfortable home.

The proposal would also require many additional complex calculations, as the dimensions of the overhang and window used in the calculation would need to be measured and a projection factor would need to be calculated for each opening in the building. This would obviously unnecessarily further complicate enforcement of the energy code under the otherwise relatively simple residential prescriptive compliance path. We believe that further complexity in the prescriptive path is only justified when it results in additional energy savings, not in situations like this where it will increase energy use and peak demand. There is simply no need for a prescriptive projection factor trade-off loophole like the one proposed here.

There are far too many ways to get this calculation wrong, and the results for occupant comfort and energy efficiency, equipment sizing, etc. are too severe to risk it. We urge the Commission to reject this proposal.

This amendment allows for the use of overhangs to meet the solar heat gain coefficient requirements within the FBC-EC. The concept of using shading to reduce heat gain is integral to the architecture of some of the oldest world cultures. Shading in modern construction offers many possibilities. This proposed code change allows for the use of overhangs and other permanently installed shading devices to meet the solar heat gain coefficient requirements within the FBC-EC. Permanent exterior shading features such as overhangs are allowed to be used in FBC-EC Chapter 5 as a prescriptive trade-off to meeting SHGC requirements within the code. The calculation for determining the projection factor for overhangs has been in the 2000, 2003, 2006, 2009 and 2015 Editions of the IECC for commercial buildings and has been proven to be very simple to calculate, fitting well into a prescriptive approach. Since shading devices are allowed as a trade-off under the commercial provisions of the FBC-EC there is no reason not to permit credit for permanent shading elements or devices for residential construction as well. Allowing flexibility in meeting the solar heat gain coefficient through the use of proven shading alternatives will increase the usability of the code for the building and design community while ensuring that the new fenestration is energy efficient. When credit for shading is permitted, it encourages an integrated approach to building designs, energy use, construction materials, renewable resources particularly as part of urban infrastructure, site and town planning and building design to be considered holistically. It also creates the opportunity for aesthetically pleasing and ingenious designs that might not otherwise be permitted.

Extended overhangs incorporating porches extending the length of one or more sides of a home are not uncommon in Florida. The feature was intended to provide shading to windows while providing an outside area for relaxation or other activities before energy codes were conceived. Currently the residential portion of the code does not provide credit for this functional and useful design feature. Home buyers pay for the extended shading of windows by overhangs or other permanent shading devices and are still required to pay additional costs added to windows to meet solar heat gain coefficients. This proposal would allow and option to the builder and consumer and is consistent with the intent of the code expressed in Florida Statute of providing requirements which will allow effective and reasonable protection for public safety, health, and general welfare for all the people of Florida at the most reasonable cost to the consumer.

Date Submitted	12/18/2015	**Section**	402.4.1.2	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6577

Summary of Modification

Raise residential building air leakage rate limit and provide air leakage testing standard.

Rationale

Temperature differences in Florida are small; the primary load from infiltration is humidity. However, it requires considerable energy use to remove excessive humidity that would be introduced through forced ventilation at the levels required below five ACH50. The seven ACH50 limit allows slightly leakier homes to not have the expense and energy use associated with mechanical ventilation while maintaining a level of air tightness consistent with historical practice, which has not shown to be problematic in Florida to date. More importantly, whole house mechanical ventilation systems have not been highly reliable and very tight houses with failed whole house mechanical ventilation systems could experience reduced indoor air quality and increased risk of occupant health issues. The proposed modification allows builders more leeway in creating houses that are still efficient while less subject to these risks.

EnergyGauge modeling shows energy use for a sample 2,400 square foot, 2-story Tampa Florida house to only increase 149 kWh per year going from an ACH50 of five to seven (without mechanical ventilation in both cases).

The ANSI/RESNET/ICC 380-2016 change provides the new American National Standard that did not exist for reference during the last Florida Code cycle or for reference during the 2015 IECC cycle.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Assists by allowing a small range of leakage rates which would not require mechanical ventilation systems and associated verifications, and by providing an air leakage testing standard.

Impact to building and property owners relative to cost of compliance with code

Reduces first cost by allowing a small range of leakage rates which would not require mechanical ventilation. May also lower ongoing costs by reducing humidity introduced by forced ventilation that would need to be removed. Testing standard reduces confusion and potential related costs.

Impact to industry relative to the cost of compliance with code

Reduces first cost by allowing a small range of leakage rates which would not require a mechanical ventilation system. May also lower operating costs by reducing humidity introduced by forced ventilation that would need to be removed. Also reduces confusion by providing a testing standard.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; reduces costs while maintaining a level of air tightness consistent with historical practice which has not been shown to be problematic in Florida to date; also provides a testing standard.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by reducing costs while maintaining a level of air tightness consistent with historical practice which has not been shown to be problematic in Florida to date; also provides a testing standard.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; provides a testing standard.

Does not degrade the effectiveness of the code

Improves code effectiveness by reducing costs while maintaining a level of air tightness consistent with historical practice which has not been shown to be problematic in Florida to date, and by providing a testing standard.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6573-A6

Proponent Mike Moore **Submitted** 2/22/2016 **Attachments** Yes

Rationale: Please see the attached document for the rationale supporting the proposed change to EN6573.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Reduces stringency of air tightness metrics, meaning that verification of compliance will be easier.

Impact to building and property owners relative to cost of compliance with code

By increasing the leakage rate, operational energy costs are expected to increase slightly.

Impact to industry relative to the cost of compliance with code

May reduce the cost of compliance by increasing the acceptable leakage rate.

Impact to small business

May reduce the cost of compliance by increasing the acceptable leakage rate.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposed changes to EN6573 are expected to improve occupant health and reduce associated health costs by achieving the recommended minimum ventilation rate and decreasing indoor pollutant concentrations, especially in the summer when formaldehyde concentrations are expected to peak.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by providing for a minimum acceptable level of indoor air quality aligned with national codes and standards.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Builders will continue to have multiple options for products and systems to meet the current and proposed code requirements.

Does not degrade the effectiveness of the code

As submitted by the proponent, EN6573 would degrade the effectiveness of the code to provide minimum acceptable indoor air quality. This amendment to the proposal seeks to restore the effectiveness of the code at providing minimum acceptable IAQ.

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6573-A7

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** Yes

Rationale

This alternate language comment keeps the original text of our originally submitted mod 6573 for section R402.4.1.2 (and rationale of mod 6573) but adds ASHRAE 62.2-2010 and 2013 as ventilation rate options to Section R403.6 which was brought up in alternate language comment 6573-A6. ASHRAE Standard 62.2-2010 and 62.2-2013 allow natural house air leakage to meet part of the outdoor air requirement (so the total outdoor air requirement is met by a combination of infiltration and mechanical ventilation). Although the current code tables for ventilation are the same as ASHRAE 62-2 2010 for the cases of no credit for infiltration, this modification allows designers to provide only that ventilation necessary according to the standards without creating potential unnecessary moisture or energy impacts. For consistency and to avoid code conflict, this modification should also be made in the residential code. The comparison table below shows that for a number of house size, bedroom, height and ach50 level combinations, the ASHRAE 62.2 options in most cases require less ventilation than the 2015 IRC and IMC requirements. Mechanical ventilation requirements of various codes and standards in the average Florida weather and shielding factor (62.2 wsf) climate Florida Home Characteristics Mechanical Vent Requirements (cfm) CFA Nbr Height 62.2 wsf

Mechanical ventilation requirements of various codes and standards in the average Florida weather and shielding factor (62.2 wsf) climate

Florida Home Characteristics					Mechanical Vent Requirements (cfm)			
CFA	Nbr	Height	62.2 wsf	ach50	IRC	IMC	62.2-2010	62.2-1013
3000	3	17	0.39	5	60	60	60	62
3000	3	17	0.39	7	60	60	50	39
2400	3	17	0.39	5	60	60	54	56
2400	3	17	0.39	7	60	60	46	37
2000	3	9	0.39	5	60	60	50	58
2000	3	9	0.39	7	60	60	48	46
1600	2	9	0.39	5	60	45	39	45
1600	2	9	0.39	7	60	45	37	35

ach50 IRC IMC 62.2-2010 62.2-1013 3000 3 17 0.39 5 60 60 60 62 3000 3 17 0.39 7 60 60 50 39 2400 3 17 0.39 5 60 60 54 56 2400 3 17 0.39 7 60 60 46 37 2000 3 9 0.39 5 60 60 50 58 2000 3 9 0.39 7 60 60 48 46 1600 2 9 0.39 5 60 45 39 45 1600 2 9 0.39 7 60 45 37 35

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Just being aware that the ASHRAE 62.2 ventilation options are in the code.

Impact to building and property owners relative to cost of compliance with code

Offers options that could reduce first cost and operating cost.

Impact to industry relative to the cost of compliance with code

Offers options that could reduce first cost and operating cost.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, provides ASHRAE Standard level ventilation options which may reduce moisture and/or energy impacts.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by providing ASHRAE Standard level ventilation options which may reduce moisture and/or energy impacts.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; provides additional options.

Does not degrade the effectiveness of the code

Does not degrade code effectiveness; improves the code by providing ASHRAE Standard level ventilation options which may reduce moisture and/or energy impacts.

Is the proposed code modification part of a prior code version? No

Rationale

This alternate language comment keeps the original text of our originally submitted mod 6573 for section R402.4.1.2 (and rationale of mod 6573) but adds ASHRAE 62.2-2010 and 2013 as ventilation rate options to Section R403.6 which was brought up in alternate language comment 6573-A6.

ASHRAE Standard 62.2-2010 and 62.2-2013 allow natural house air leakage to meet part of the outdoor air requirement (so the total outdoor air requirement is met by a combination of infiltration and mechanical ventilation). Although the current code tables for ventilation are the same as ASHRAE 62-2 2010 for the cases of no credit for infiltration, this modification allows designers to provide only that ventilation necessary according to the standards without creating potential unnecessary moisture or energy impacts. For consistency and to avoid code conflict, this modification should also be made in the residential code.

The comparison table below shows that for a number of house size, bedroom, height and ach50 level combinations, the ASHRAE 62.2 options in most cases require less ventilation than the 2015 IRC and IMC requirements.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6573-G1

Proponent Jeff Sonne / FSEC **Submitted** 2/24/2016 **Attachments** No

Comment:

Additional rationale for using ANSI/RESNET/ICC 380 for envelope leakage tests instead of referring to ASTM E779 (based on RESNET correspondence).

ASTM E779 has several parts that make the testing unduly complex and time consuming (and, therefore, costly) – one example is the requirement to perform extensive measurements in the home to show that pressures are relatively uniform, another is the requirement to both pressurize and depressurize a home.

ANSI/RESNET/ICC 380 is also much more specific about house preparation than E779. Examples of this include explicit instructions in 380 on what to do with attics, basements and crawlspaces that are not included in E779 and how to set dampered and non-dampered ventilation openings.

In terms of the test procedure itself, ANSI/RESNET/ICC 380 includes single-point testing (that is not in E779) because it is by far the most common mode of testing used by practitioners today. This single point testing had no specific approved test method so one was needed and was added to 380. For single point testing, 380 also includes correction factors to account for test bias and uncertainty that E779 does not include.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6573-G2

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6573-G3

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

R402.4.1.2 Testing.

The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding ~~five~~ seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ~~ASTM E 779 or ASTM E 1827~~ANSI/RESNET/ICC 380-2016 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official,* testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official.* Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope.*

[no change to remaining text in section]

R402.4.1.2 Testing.

The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding ~~five~~ seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ~~ASTM E 779 or ASTM E 1827~~ANSI/RESNET/ICC 380-2016 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official,* testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official.* Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope.*

[no change to remaining text in section]

Change the IECC as follows:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding ~~five~~ seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ~~ASTM E 779 or ASTM E 1827~~ ANSI/RESNET/ICC 380-2016 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

R403.6 Mechanical ventilation (Mandatory). The building shall be provided with mechanical ventilation that meets the requirements of Section M1507 of the *International Residential Code* or Section 403 of the *International Mechanical Code*, as applicable, or with other approved means of mechanical ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Change the IRC as follows:

R303.4 Mechanical ventilation. ~~Where the air infiltration rate of a *dwelling unit* is 5 air changes per hour or less where tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section N1102.4.1.2, the~~ *~~d~~Dwelling units* shall be provided with ~~whole-house~~ mechanical ventilation in accordance with Section M1507.3.

Change the IMC as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section R402.4.1.2 of the *International Energy Conservation Code*, the d~~Dwelling units shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

[Keep changes made to R402.4.1.2 in original 6573 mod, and add the following changes to R403.6.]

R403.6 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the *Florida Building Code, Residential* or *Florida Building Code, Mechanical*, or Section 4 of ASHRAE Standard 62.2-2010 or Section 4 of ASHRAE Standard 62.2-2013, as applicable, or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

[no change to remaining text in section]

EN6573: Reasons to disapprove

Submitted by: Jay H. Crandell, PE, ARES Consulting (representing FSC)

Proposal EN6573 should be disapproved for lack of compelling evidence that any problem or risk is created with use of a 5 ACH requirement or solved with a change to 7 ACH. In fact, the risk will likely be worsened by increasing to 7 ACH without mechanical ventilation still being required (see data provided by separate comment from Mike Moore). So, even with this proposal the risks, to the extent they actually exist, will still exist and not be solved and may be worsened by this proposal. As the referenced FSEC study indicates…people will still not maintain and operate ventilation systems properly, installers will not install them properly, inspectors not inspect them adequately, and many homes will still be built tighter than 5 ACH. Thus, this issue is not one of changing the ACH target (which comes with energy penalties and potential moisture control and IAQ problems with no guarantee of any improvement in indoor air quality or moisture control risks). The FSEC study indicates or admits a hope that moving from ACH 5 to ACH 7 "may reduce risk" but gives no risk-based evidence to support that recommendation. This subjective "hunch" does not provide adequate justification for the proposal.

Instead, the referenced FSEC study does give very actionable recommendations to improve functionality and reliability of ventilation systems including documentation, labeling, and instruction for proper operation and maintenance. Consumers receive these types of instructions and aids for TV remotes, watches, calculators, computers, cars, lawn mowers and many other things including things related to health, such as medicines and thermometers. In addition, it also is clear from the study that improved inspection and verification is needed. These are the fundamental needs recognized in the FSEC report that address the root of the problem and should be pursued, not a weakening of the energy code that will also result in the ability to use weakening trade-offs of reliable permanent energy efficiency features such as the building envelope. For example, see proposal EN 6821 which also should be disapproved and which links this proposal to a desire to weaken the energy code with very certain impacts associated with trading-off reliable energy conservation measures (such as the building envelope) for the random chance or hope that this proposal might have an unquantified and uncertain risk reduction benefit for an uncertain quantity of homes. Is the goal really to improve the code or allow it to be weakened? EN 6573 should be disapproved for all of the reasons stated above.

Responsible Energy Codes Alliance Comment on Proposal EN6573

Proposals EN6820 and EN6573 weaken the air leakage requirement in the current 5th Edition Code from 5 ACH50 to 7 ACH50 without justification. This would result in increased energy costs, additional problems with humidity, and less comfortable occupants. Both the 2012 and 2015 IECC specify that homes shall achieve a 5 ACH50 or better level of air tightness, and we see no reason why Florida should weaken its current requirement.

While we are cognizant of the ongoing debate about the air leakage test and acceptable levels at the Florida Legislature, we believe that the Commission must act consistently with the current direction given by the Florida Legislature to adopt the most recent edition of the IECC as the "foundation code," and to only modify it to the extent necessary to accommodate a state-specific need:

> "...The commission shall select the most current version of the International Energy Conservation Code (IECC) as a foundation code; however, the IECC shall be modified by the commission to maintain the efficiencies of the Florida Energy Efficiency Code for Building Construction adopted and amended pursuant to s. 553.901 ... The commission may modify any portion of the foundation codes only as needed to accommodate the specific needs of this state ..."

See Florida Statutes, Sections 553.73(7)(a) and (c). The proponents have not presented any Florida-specific justification for weakening the overall efficiency or humidity control that would be provided by a well-sealed home tested at an air leakage rate no higher than 5 ACH50. We recommend that the Commission reject this weakening amendment.

EN6573: Rationale to Amend
Submitted by: Mike Moore, P.E., Newport

To insure that occupants are able to receive the minimum combined infiltration and ventilation rate promulgated by model codes and standards (i.e., 0.35 natural air changes per hour), the air leakage target should not be increased without simultaneously requiring mechanical ventilation. This comment proposes to continue to require mechanical ventilation if Florida elects to increase the air tightness target to 7 ACH50.

Following is a chart created using DOE's EnergyPlus software that shows the average daily combined infiltration and ventilation rate for a typical 2,600 ft2 three-bedroom, single-family home located in Orlando. The chart examines daily, seasonal, and annual average combined infiltration and ventilation rates for the same typical home across two scenarios:

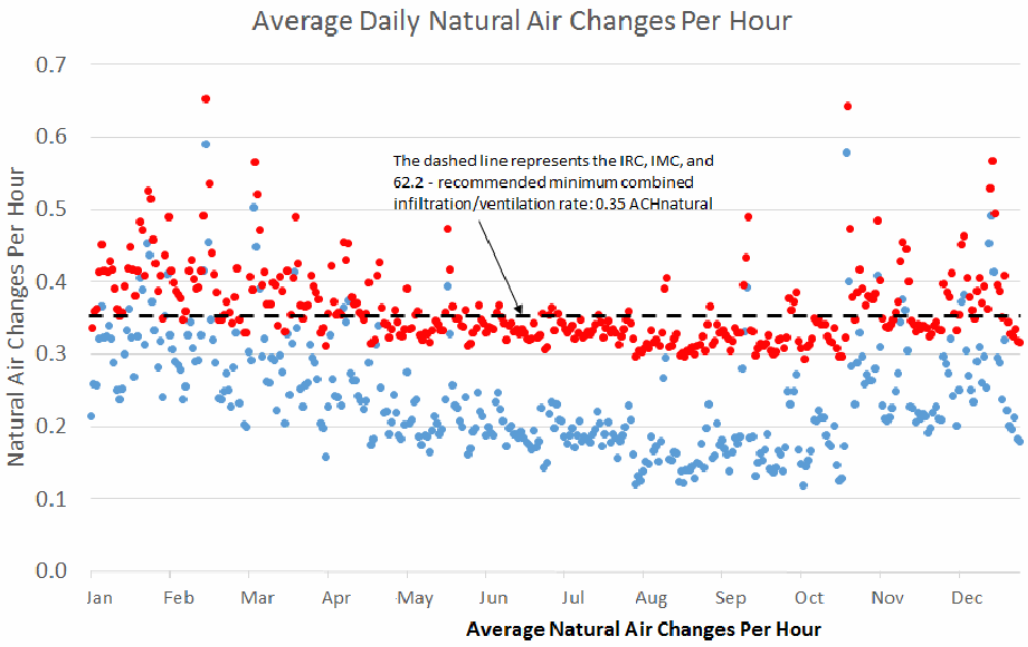
- Scenario A: 7 ACH50 tightness; no mechanical ventilation (as proposed by EN6573)
- Scenario B: 7 ACH50 tightness; mechanical ventilation in accordance with IRC M1507 (EN6573 amended to include mechanical ventilation)

Under Scenario A (7 ACH 50 with no mechanical ventilation), the average annual air change rate is 0.24 natural air changes per hour, frequently dipping below 0.15 in the summer months. Research has shown that formaldehyde emissions from building materials increase with increasing temperature and relative humidity, and formaldehyde concentrations increase with decreasing infiltration/ventilation rates. In other words, formaldehyde emissions and concentrations are likely to spike in the summer under Scenario A when natural infiltration is at its lowest. Resultant poor indoor air quality can significantly diminish occupants' health. In fact, research suggests that poor IAQ is responsible for around $500 annually in health related costs per person in the U.S., which translates to $10 billion annually in Florida.*

Under Scenario B, as proposed by this comment, tightening the building envelope to 7 ACH50 and providing mechanical ventilation would achieve the minimum annual average combined infiltration and ventilation rate of 0.35 natural air changes per hour. Scenario B would also provide more balanced ventilation across the year, registering 0.33 natural air changes per hour in the summer and providing more protection to occupants from higher levels of formaldehyde expected to be experienced during this season.

If no amendments are made to the current language of the 2015 IRC and IECC, then the home will operate at 5 ACH50 or less with mechanical ventilation in accordance with IRC M1507. Under this scenario, the home is expected to experience a maximum annual average combined infiltration and ventilation rate of 0.32 natural air changes per hour, with an average of 0.30 natural air changes per hour in the summer. While this annual level is slightly lower than the recommended 0.35 natural air changes per hour, it provides a much more acceptable rate than the 0.24 natural air changes per hour (0.15 in the summer) that would be provided if Scenario A were to be approved without this proposed amendment.

In the interest of health and reduction of costs associated with poor IAQ, the commission should either maintain the language as written or adopt the 7 ACH50 target with these proposed changes to require mechanical ventilation at or below 7 ACH50.



	Winter	Spring	Summer	Fall	Annual
7 ACH50 & NO Mech Vent	0.31	0.22	0.18	0.25	0.24
7 ACH50 & 60 CFM Mech Vent	0.41	0.35	0.33	0.37	0.36

*Assumes poor IAQ accounts for 0.01 disability adjusted life years (DALYs) per person, and that the value of a DALY is $50,000. This value is at the low end of epidemiological studies that estimate the value of a DALY between $50k - $200k.

References:

- Logue JM, Price PN, Sherman MH, & Singer BC. 2012. A Method to Estimate the Chronic Health Impact of Air Pollutants in U.S. Residences. Environmental Health Perspectives 120(2): 216-222.
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- Brown DW. 2008. Economic value of disability-adjusted life years lost to violence: estimates for WHO Member States. Rev. Panam Salud Publica, 24, 203-209.
- Lvovsky K, Huges G, Maddison D, Ostro B, and Pearce D. 2000. Environmental costs of fossil fuels: a rapid assessment method with application to six cities. Washington, D.C.: The World Bank Environment Department.

- Highfill T and Bernstein E. 2014. Using Disability Adjusted Life Years to Value the Treatment of Thirty Chronic Conditions in the U.S. from 1987-2010. U.S. Department of Commerce Bureau of Economic Analysis WP 2014-9.
- Hult EL, Willem H, Price PN, Hotchi T, Russell ML, and Singer BC. 2015. Formaldehyde and acetaldehyde exposure mitigation in US residences: in-home measurements of ventilation control and source control. Indoor Air 25:523-535.

Rationale

This alternate language comment keeps the original text of our originally submitted mod 6573 for section R402.4.1.2 (and rationale of mod 6573) but adds ASHRAE 62.2-2010 and 2013 as ventilation rate options to Section R403.6 which was brought up in alternate language comment 6573-A6.

ASHRAE Standard 62.2-2010 and 62.2-2013 allow natural house air leakage to meet part of the outdoor air requirement (so the total outdoor air requirement is met by a combination of infiltration and mechanical ventilation). Although the current code tables for ventilation are the same as ASHRAE 62-2 2010 for the cases of no credit for infiltration, this modification allows designers to provide only that ventilation necessary according to the standards without creating potential unnecessary moisture or energy impacts. For consistency and to avoid code conflict, this modification should also be made in the residential code.

The comparison table below shows that for a number of house size, bedroom, height and ach50 level combinations, the ASHRAE 62.2 options in most cases require less ventilation than the 2015 IRC and IMC requirements.

Mechanical ventilation requirements of various codes and standards in the average Florida weather and shielding factor (62.2 wsf) climate

Florida Home Characteristics					Mechanical Vent Requirements (cfm)			
CFA	Nbr	Height	62.2 wsf	ach50	IRC	IMC	62.2-2010	62.2-1013
3000	3	17	0.39	5	60	60	60	62
3000	3	17	0.39	7	60	60	50	39
2400	3	17	0.39	5	60	60	54	56
2400	3	17	0.39	7	60	60	46	37
2000	3	9	0.39	5	60	60	50	58
2000	3	9	0.39	7	60	60	48	46
1600	2	9	0.39	5	60	45	39	45
1600	2	9	0.39	7	60	45	37	35

Date Submitted	12/28/2015	**Section**	402.4.1.2	**Proponent**	Joseph Belcher
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Modify air leakage rate.

Rationale

The sole reason for the change given by the proponent to the change from 7 ACH to 5 ACH in the base code was to make buildings tighter.

“There are four key areas of improvement in this proposal: Reduced leakage in duct systems and building envelopes, verified by testing. The proposal requires that all ductwork be inside conditioned space, sets new leakage limits on the ductwork, and adds a new requirement for testing the air tightness of the building envelope. As an alternative, homes with high-efficiency HVAC equipment are exempted from the requirement for ducts inside the conditioned space and are subject to less stringent duct and whole-house testing requirements.” (Excerpt from Reason statement for ICC Code Change EC13-09/10, ICC Monograph for ICC Public Hearings October 2009)

The statement of the first "key area" is the only reference to tighter building envelopes and was the sole reason given. Florida has enacted other measures through Florida specific amendments to the foundation code that result in greater energy efficiency.

In a report on whole-house ventilation effectiveness and failure rates by FSEC, one recommendation was to not require houses to become tighter than already specified by code and to consider increasing allowed air leakage to 7 ACH50 throughout Florida. (Source: Investigation of the Effectiveness and Failure Rates of Whole-House Mechanical Ventilation Systems in Florida” FSEC-CR-2002-15, June 1, 2015.) According to a statement by a member of FSEC on an Energy TAC conference call the energy loss at a 7 ACH infiltration rate is not sufficient to be of concern in Florida’s climate. Running models on Energy Gauge for a typical Florida house using 5 ACH and using 7 ACH resulted in no change.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local entity for code enforcement. Proposal reverts to requirement of FBC-EC 2010.

Impact to building and property owners relative to cost of compliance with code

The proposal could result in a cost savings without a sacrifice of energy efficiency, Proposal reverts to requirement of FBC-EC 2010. Building and property owners would still have the option of requesting the builder to provide greater energy efficiency if desired.

Impact to industry relative to the cost of compliance with code

The proposal could result in a cost savings without a sacrifice of energy efficiency, Proposal reverts to requirement of FBC-EC 2010. Building and property owners would still have the option of requesting the builder to provide greater energy efficiency if desired.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposal has a reasonable connection with the health, safety, and welfare of the general public because it recognizes that Florida has different needs in some aspects that other states using the foundation code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal improves the code by removing an overly restrictive requirement and reverting to a reasonable provision with no loss in energy efficiency.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6820-A2

Proponent Mike Moore **Submitted** 2/22/2016 **Attachments** Yes

Rationale

Please see the attached document for the rationale supporting the proposed change to M6820.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Reduces stringency of air tightness metric, meaning that verification of compliance will be easier.

Impact to building and property owners relative to cost of compliance with code

By increasing the infiltration rate, operational energy costs are expected to increase slightly.

Impact to industry relative to the cost of compliance with code

May reduce the cost of compliance by increasing the acceptable leakage rate.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposed changes to M6820 are expected to improve occupant health and recuce associated health costs by achieving the recommended minimum ventilation rate and decreasing indoor pollutant concentrations, especially in the summer when formaldehyde concentrations are expected to peak.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Maintains the current standard of the model code by providing for a minimum acceptable level of indoor air quality aligned with national codes and standards.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Builders will continue to have multiple options for products and systems to meet the current and proposed code requirements.

Does not degrade the effectiveness of the code

As submitted by the proponent, M6820 would degrade the effectiveness fo the code to provide minimum acceptable indoor air quality. This amendment to the proposal seeks to restore the effectiveness of the code at providing minimum acceptable IAQ.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6820-G1

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6820-G2

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

R402.4.1.2 Testing.

The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding ~~five~~ 7.00 air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party in accordance with the provisions of Section 489 or 553.99, *Florida Statutes*, or as otherwise authorized by *Florida Statutes*. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

Remainder of Section unchanged.

Change the IECC as follows:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding ~~five~~ 7.00 air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party in accordance with the provisions of Section 489 or 553.99, *Florida Statutes*, or as otherwise authorized by *Florida Statues*. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

R403.6 Mechanical ventilation (Mandatory). The building shall be provided with mechanical ventilation that meets the requirements of Section M1507 of the *International Residential Code* or Section 403 of the *International Mechanical Code*, as applicable, or with other approved means of mechanical ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Change the IRC as follows:

R303.4 Mechanical ventilation. ~~Where the air infiltration rate of a *dwelling unit* is 5 air changes per hour or less where tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section N1102.4.1.2, the d~~*D*~~welling units~~ shall be provided with ~~whole-house~~ mechanical ventilation in accordance with Section M1507.3.

Change the IMC as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section R402.4.1.2 of the *International Energy Conservation Code*, the d~~D~~welling units~~ shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

M6820: Reasons to disapprove

Submitted by: Jay H. Crandell, PE, ARES Consulting (representing FSC)

Proposal EN6820 should be disapproved for lack of compelling evidence that any problem or risk is created with use of a 5 ACH requirement. In fact, the risk will likely be worsened by increasing to 7 ACH without mechanical ventilation still being required (see data provided by separate comment from Mike Moore). So, even with this proposal the risks, to the extent they actually exist, will still exist and not be solved and may be worsened by this proposal. As the referenced FSEC study indicates…people will still not maintain and operate ventilation systems properly, installers will not install them properly, inspectors not inspect them adequately, and many homes will still be built tighter than 5 ACH. Thus, this issue is not one of changing the ACH target (which comes with energy penalties and potential moisture control and IAQ problems with no guarantee of any improvement in indoor air quality or moisture control risks). The FSEC study indicates or admits a hope that moving from ACH 5 to ACH 7 "may reduce risk" but gives no risk-based evidence to support that recommendation. This subjective "hunch" does not provide adequate justification for the proposal.

Instead, the referenced FSEC study does give very actionable recommendations to improve functionality and reliability of ventilation systems including documentation, labeling, and instruction for proper operation and maintenance. Consumers receive these types of instructions and aids for TV remotes, watches, calculators, computers, cars, lawn mowers and many other things including things related to health, such as medicines and thermometers. In addition, it also is clear from the study that improved inspection and verification is needed. These are the fundamental needs recognized in the FSEC report that address the root of the problem and should be pursued, not a weakening of the energy code that will also result in the ability to use weakening trade-offs of reliable permanent energy efficiency features such as the building envelope. For example, see the proponent's proposal EN 6821 which also should be disapproved and which links this proposal to a desire to weaken the energy code with very certain impacts associated with trading-off reliable energy conservation measures (such as the building envelope) for the random chance or hope that this proposal might have an unquantified and uncertain risk reduction benefit for an uncertain quantity of homes. Is the goal of EN6820 really to improve the code or allow it to be weakened? EN 6820 should be disapproved for all of the reasons stated above.

Responsible Energy Codes Alliance Comment on Proposal EN6820

Proposals EN6820 and EN6573 weaken the air leakage requirement in the current 5th Edition Code from 5 ACH50 to 7 ACH50 without justification. This would result in increased energy costs, additional problems with humidity, and less comfortable occupants. Both the 2012 and 2015 IECC specify that homes shall achieve a 5 ACH50 or better level of air tightness, and we see no reason why Florida should weaken its current requirement.

While we are cognizant of the ongoing debate about the air leakage test and acceptable levels at the Florida Legislature, we believe that the Commission must act consistently with the current direction given by the Florida Legislature to adopt the most recent edition of the IECC as the "foundation code," and to only modify it to the extent necessary to accommodate a state-specific need:

> "...The commission shall select the most current version of the International Energy Conservation Code (IECC) as a foundation code; however, the IECC shall be modified by the commission to maintain the efficiencies of the Florida Energy Efficiency Code for Building Construction adopted and amended pursuant to s. 553.901 ... The commission may modify any portion of the foundation codes only as needed to accommodate the specific needs of this state ..."

See Florida Statutes, Sections 553.73(7)(a) and (c). The proponents have not presented any Florida-specific justification for weakening the overall efficiency or humidity control that would be provided by a well-sealed home tested at an air leakage rate no higher than 5 ACH50. We recommend that the Commission reject this weakening amendment.

M 6820: Rationale to Amend
Submitted by: Mike Moore, P.E., Newport

To insure that occupants are able to receive the *minimum* combined infiltration and ventilation rate promulgated by model codes and standards (i.e., 0.35 natural air changes per hour), the air leakage target should not be increased without simultaneously requiring mechanical ventilation. This comment proposes to continue to require mechanical ventilation if Florida elects to increase the air tightness target to 7 ACH50.

Following is a chart created using DOE's EnergyPlus software that shows the average daily combined infiltration and ventilation rate for a typical 2,600 ft2 three-bedroom, single-family home located in Orlando. The chart examines daily, seasonal, and annual average combined infiltration and ventilation rates for the same typical home across two scenarios:

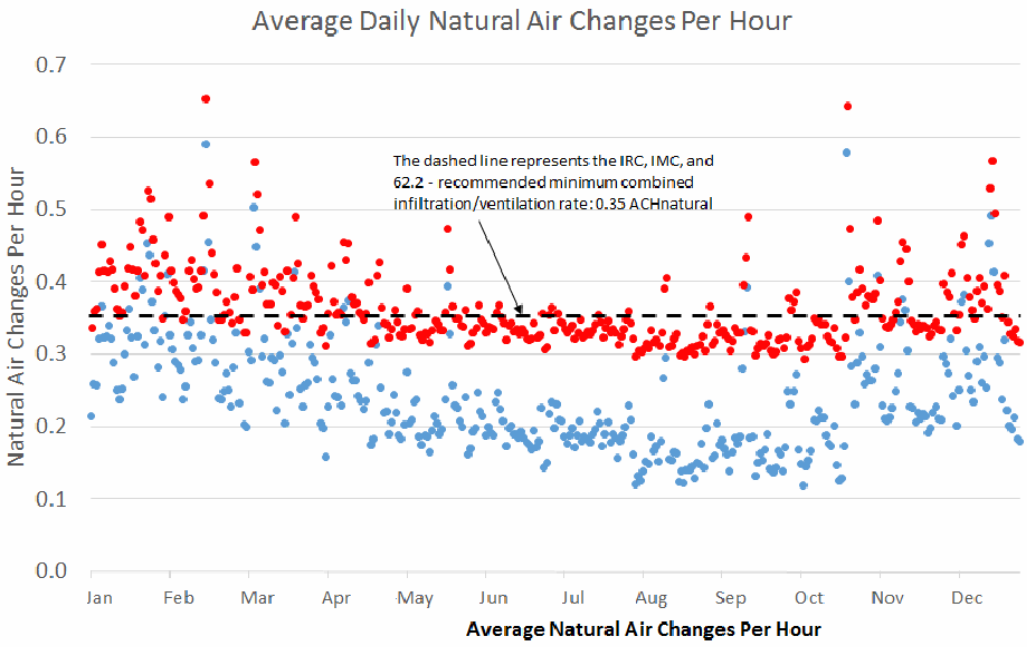
- Scenario A: 7 ACH50 tightness; no mechanical ventilation (as proposed by M 6820)
- Scenario B: 7 ACH50 tightness; mechanical ventilation in accordance with IRC M1507 (M 6820 amended to include mechanical ventilation)

Under Scenario A (7 ACH 50 with no mechanical ventilation), the average annual air change rate is 0.24 natural air changes per hour, frequently dipping below 0.15 in the summer months. Research has shown that formaldehyde emissions from building materials increase with increasing temperature and relative humidity, and formaldehyde concentrations increase with decreasing infiltration/ventilation rates. In other words, formaldehyde emissions and concentrations are likely to spike in the summer under Scenario A when natural infiltration is at its lowest. Resultant poor indoor air quality can significantly diminish occupants' health. In fact, research suggests that poor IAQ is responsible for around $500 annually in health related costs per person in the U.S., which translates to $10 billion annually in Florida.*

Under Scenario B, as proposed by this comment, tightening the building envelope to 7 ACH50 and providing mechanical ventilation would achieve the minimum annual average combined infiltration and ventilation rate of 0.35 natural air changes per hour. Scenario B would also provide more balanced ventilation across the year, registering 0.33 natural air changes per hour in the summer and providing more protection to occupants from higher levels of formaldehyde expected to be experienced during this season.

If no amendments are made to the current language of the 2015 IRC and IECC, then the home will operate at 5 ACH50 or less with mechanical ventilation in accordance with IRC M1507. Under this scenario, the home is expected to experience a maximum annual average combined infiltration and ventilation rate of 0.32 natural air changes per hour, with an average of 0.30 natural air changes per hour in the summer. While this annual level is slightly lower than the recommended 0.35 natural air changes per hour, it provides a much more acceptable rate than the 0.24 natural air changes per hour (0.15 in the summer) that would be provided if Scenario A were to be approved without this proposed amendment.

In the interest of health and reduction of costs associated with poor IAQ, the commission should either maintain the language as written or adopt the 7 ACH50 target with these proposed changes to require mechanical ventilation at or below 7 ACH50.



	Winter	Spring	Summer	Fall	Annual
7 ACH50 & NO Mech Vent	0.31	0.22	0.18	0.25	0.24
7 ACH50 & 60 CFM Mech Vent	0.41	0.35	0.33	0.37	0.36

*Assumes poor IAQ accounts for 0.01 disability adjusted life years (DALYs) per person, and that the value of a DALY is $50,000. This value is at the low end of epidemiological studies that estimate the value of a DALY between $50k - $200k.

References:

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- Lvovsky K, Huges G, Maddison D, Ostro B, and Pearce D. 2000. Environmental costs of fossil fuels: a rapid assessment method with application to six cities. Washington, D.C.: The World Bank Environment Department.

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Date Submitted	12/27/2015	**Section**	402.4	**Proponent**	Joseph Belcher
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Permit air leakage testing of low-rise R-2 as permitted for commercial.

Rationale

Current provisions for multi-family dwelling classified as low-rise residential require the testing of each unit separately. This amendment adds an exception to allow compliance to the air barrier requirements and testing as for commercial residential buildings allowing builders to test the entire building as a whole, as is permitted for commercial buildings.

Air tightness testing for single-family detached homes is very straightforward; however, it is much more difficult to accurately test attached dwelling units, including multi-family buildings. Currently the FBC-EC treats low-rise multi-family buildings of three stories or less like single-family homes and multi-family buildings of four stories or more like commercial buildings. Regardless of height, all multi-family buildings have the same air-tightness testing complications, such as: Does the entire building need to be tested at one time? What about multi-family buildings with open corridors? Does every dwelling need to be tested? Can the leakages be averaged between units? Is the leakage tested only to the “outside” or should it include leakage to adjacent units?

By approving this change, low-rise multi-family buildings and attached single-family dwellings will avoid these complications, but still held to the same level of performance as high-rise (R-2) residential as well as all commercial buildings.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local entity relative to code enforcement.

Impact to building and property owners relative to cost of compliance with code

No impact to building and property owners relative to code enforcement.

Impact to industry relative to the cost of compliance with code

The impact to industry relative to the cost of code compliance is most likely a reduction in costs as the builder could schedule testing of the entire building at once or test the units individually.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes because it offers an option for the testing of buildings containing multiple dwellings as a single building and retains the ability to test units individually. This provides an option to the builder that could result in decreased costs while ensuring compliance with the code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal strengthens and improves the code by providing a solution to a difficult problem.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6806-A1

Proponent Mike Moore **Submitted** 2/22/2016 **Attachments** Yes

Rationale

The objective of EN6806 is to provide more options for air tightness testing of multiple attached dwelling units. If approved, however, EN6806 would inadvertently remove the requirement for mechanical ventilation of tight dwelling units, which is currently contingent on the results of a blower door test at or below 5 air changes per hour at 50 pascals. This comment would insure that if Florida approves EN6806, mechanical ventilation would still be required for all dwelling units in compliance with the air tightness requirements of Florida’s IECC, regardless of the testing method that is used. Please refer to the rationale submitted for my proposed amendment to EN6573 for further information regarding combined ventilation/infiltration rates and health affects.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

As proposed, EN6806 may increase the local entity's burden by referencing a section of code that does not exist (i.e., C405.5.3.4 ??). Assuming this is corrected, increasing testing options can increase compliance, thereby reducing the local entity's costs of re-verification/inspection.

Impact to building and property owners relative to cost of compliance with code

By increasing compliance options, costs to industry may be reduced. These cost savings may be passed on to the building and property owners.

Impact to industry relative to the cost of compliance with code

Increases compliance options and likely promotes cost competitiveness.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposed changes to EN6806 are intended to safeguard public health, safety, and welfare by maintaining the requirement for mechanical ventilation currently in the model code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposed changes to EN6806 maintain the IAQ benefits of the model code while increasing options for compliance in verifying building air tightness.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposed changes to EN6806 maintain current options for ventilation systems that can be used to provide minimum acceptable indoor air quality.

Does not degrade the effectiveness of the code

The proposed changes to EN6806 maintain the IAQ benefits of the model code while increasing options for compliance in verifying building air tightness.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6806-G1

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

[This comment assumes the proposer intended to reference IECC 2015 / FL base energy code section C402.5 instead of what was actually in the mod's text: "FBC-EC Section C405.5.3.4".] Testing an entire multifamily residential building as a whole would not be able to address between unit pollution. For this reason, we are against this mod.

Note ASHRAE Standard 62.2 addresses "compartmentalization" as follows:

8.4.1 Transfer Air. Measures shall be taken to minimize air movement across envelope components separating dwelling units, including sealing penetrations in the common walls, ceilings, and floors of each unit and by sealing vertical chases adjacent to the units. All doors between dwelling units and common hallways shall be gasketed or made substantially airtight.

8.4.1.1 Compliance. One method of demonstrating compliance with Section 8.4.1 shall be to verify a leakage rate below a maximum of 0.2 cfm per ft2 (100 L/s per 100 m2) of the dwelling unit envelope area (i.e., the sum of the area of walls between dwelling units, exterior walls, ceiling, and floor) at a test pressure of 50 Pa by a blower door test conducted in accordance with either ANSI/ASTM-E779, Standard Test Method for Determining Air Leakage Rate By Fan Pressurization,1 or ANSI/ASTM-E1827, Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door. The test shall be conducted with the dwelling unit as if it were exposed to outdoor air on all sides, top, and bottom by opening doors and windows of adjacent dwelling units.

R402.4 Air leakage (Mandatory). The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Section R402.4.1 through R402.4.4.

Exception: Dwelling units of R-2 Occupancies and multiple attached single family dwellings shall be permitted to comply with FBC-EC Section C405.5.3.4

Change the IECC as follows:

R402.4 Air Leakage (Mandatory). The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Section R402.4.1 through R402.4.4.

Exception: Dwelling units of R-2 occupancies and multiple attached single family dwellings shall be permitted to comply with FBC-EC Section C405.5.3.4.

R403.6 Mechanical ventilation (Mandatory). The building shall be provided with mechanical ventilation that meets the requirements of Section M1507 of the *International Residential Code* or Section 403 of the *International Mechanical Code*, as applicable, or with other approved means of mechanical ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Change the IRC as follows:

R303.4 Mechanical ventilation. ~~Where the air infiltration rate of a *dwelling unit* is 5 seven air changes per hour or less where tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section N1102.4.1.2, the *d*~~*D*~~welling units~~ shall be provided with ~~whole-house~~ mechanical ventilation in accordance with Section M1507.3.

Change the IMC as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section R402.4.1.2 of the *International Energy Conservation Code*, the d~~D~~welling units~~ shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

Date Submitted	12/22/2015	**Section**	403.2.2	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6765

Summary of Modification

New ANSI duct testing Standard.

Rationale

This change provides the new American National Standard that did not exist for reference during the last Florida Code cycle or for reference during the 2015 IECC cycle.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Impact to building and property owners relative to cost of compliance with code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Impact to industry relative to the cost of compliance with code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No; replaces existing Standard with a new American National Standard, but does not change duct testing requirements.

Does not degrade the effectiveness of the code

Does not degrade the code; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Is the proposed code modification part of a prior code version? No

R403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes and building cavities that form the primary air containment passageways for air distribution systems shall be considered ducts or plenum chambers, shall be constructed and sealed in accordance with Section C403.2.7.2 of the Commercial Provisions of this code and shall be shown to meet duct tightness criteria below.

Duct tightness shall be verified by testing ~~to Section 803 of the RESNET Standards~~ in accordance with ANSI/RESNET/ICC 380-2015by either an energy rater certified in accordance with Section 553.99, *Florida Statutes*,or as authorized by *Florida Statutes,* to be "substantially leak free" in accordance with Section R403.3.3.

Date Submitted	1/1/2016	**Section**	403.3	**Proponent**	Cheryl Harris
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Changes insulation size from R8 to R6 for supply and return ducts in attics.

Rationale

R-8 duct insulation takes more physical space than may fit in typical construction spaces and does not provide a significant amount of energy reduction for the cost.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact.

Impact to building and property owners relative to cost of compliance with code

Impact would be to reduce cost not increase cost for both installation and materials.

Impact to industry relative to the cost of compliance with code

Impact would be to reduce cost not increase cost for both installation and materials.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Energy savings would not be impacted to any significant degree.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by allowing insulation in a thickness that facilitates installation without special equipment and insures the ductwork can fit into a typical allowed space.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

There is no requirement for proprietary equipment or products or method of installation.

Does not degrade the effectiveness of the code

There is no proven significant loss of energy efficiency between the R8 and R6 duct insulation in the Florida market.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6992-G1

Proponent	Jeff Sonne / FSEC	**Submitted**	2/24/2016	**Attachments**	No

Comment:

We oppose this change because it weakens the code.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6992-G2

Proponent	Charles Cottrell	**Submitted**	2/24/2016	**Attachments**	No

Comment:

Modification EN6922 – Reducing Duct Insulation Levels: NAIMA strongly opposes the proposal to reduce the requirements for duct insulation in unconditioned spaces. Because Florida's climate is predominantly a cooling climate and a ducts are often placed in unconditioned attics, proper levels of duct insulation are extremely cost effective.

Because attic temperatures in Florida can be as high as 140°F in the summertime and ducts located in those attics typically convey air that is approximately 55°F good insulation levels will save a great deal of energy. Even building walls which typically have much lower temperature differences across them (approximately 80°F outside and 68°F inside) have R-value requirements of R-13 and higher. The current levels of R-8 in for return and supply ducts in attics and R-6 in other unconditioned spaces like crawlspaces are well justified. These R-values have been in the International Energy Conservation Code (IECC) since the early 2000's and were originally proposed by the US Department of Energy and shown to be cost effective for all climate zones. And they are even more cost effective in Florida's hotter climate.

Finally, the reason provided by the proponent for reducing the R-values is, "Improves the code by allowing insulation in a thickness that facilitates installation without special equipment and insures the ductwork can fit into a typical allowed space." The additional thickness to go from R-6 to R-8 is approximately ¾ inch –because the duct has 2 sides the total added thickness for an R-8 duct as opposed to an R-6 duct is about 1-1/2 inches. This can be easily accommodated in typical attic and crawlspace construction. We strongly urge the State to retain the current duct R-value requirements.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6992-G3

Proponent	Eric Lacey	Submitted	2/25/2016	Attachments	Yes

Comment:

See attached comment.

R403.3 Ducts. Ducts and air handlers shall be in accordance with Sections R403.3.1 through R403.3.5.

R403.3.1 Insulation (Prescriptive). Supply and return ducts in attics shall be insulated to a minimum of ~~R-8~~**R-6** ~~where 3 inches (76 mm) in diameter and greater and R-6 where less than 3 inches (76 mm) in diameter~~. Supply and return ducts in other portions of the building shall be insulated to a minimum of ~~R-6 where 3 inches (76 mm) in diameter or greater and~~ R-4.2. ~~where less than 3 inches (76 mm) in diameter.~~

Exception: Ducts or portions thereof located completely inside the *building thermal envelope*

Responsible Energy Codes Alliance Comment on Proposal EN6992

Proposal EN6992 should be disapproved because it not only reduces the duct insulation requirements to levels below the 2015 IECC, but also below the current 5th Edition Code requirements. In short, this would be another efficiency rollback. The following table illustrates the differences among the 5th Edition Code, the 2015 IECC, and proposal EN6992:

	5th Edition FBC-EC	2015 IECC	Proposal EN6992
Supply ducts in attic	R-8		
"All other ducts"	R-6		
Supply & return ducts in attic ≥3 inches		R-8	R-6
Supply & return duct in attic < 3 inches		R-6	R-6
Supply & return duct in other portions of the building ≥3 inches		R-6	R-4.2
Supply & return duct in other portions of the building <3 inches		R-4.2	R-4.2
Ducts located completely inside thermal envelope	Exempt	Exempt	Exempt

If adopted, this proposal could significantly reduce the efficiency of the building and create problems for the operation of air conditioning systems. Air handlers and ducts are often installed in attics, where temperatures can be extremely high. At least one study by the Florida Solar Energy Center showed that attic temperatures in Florida can exceed 130 degrees Fahrenheit, depending on roof design and shingle type. *See* Parker, D., Sherwin, J., "Monitored Summer Peak Attic Air Temperatures in Florida Residences," Presented at the 1998 ASHRAE Annual Meeting, Toronto, Canada, June 20-24, 1998.

It would be far better to design the building with all ducts inside conditioned space, but for other designs, it is crucial that ducts be properly insulated. We recommend adopting the 2015 IECC requirements for duct insulation and rejecting proposal EN6992.

EN6985

Date Submitted	12/31/2015	**Section**	403.5.6.2	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6983 and 7021

Summary of Modification

Make sure code is consistent with federal water heating equipment efficiency minimums.

Rationale

At times there is a conflict with the written code and the federal standards code and federal standards. This clarifies that the federal law/standards take precedence.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Consistent with federal law.

Impact to building and property owners relative to cost of compliance with code

None.

Impact to industry relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, as the federal law limits have been vetted by government, manufacturers and energy advocates to be the best efficiency for any extra cost.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes; clarifies the code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; consistent with federal law.

Does not degrade the effectiveness of the code

Increases the effectiveness of the code by making it clearer.

Is the proposed code modification part of a prior code version? No

R403.5.6.2 Water heating equipment. Water heating equipment installed in residential units shall meet the minimum efficienc~~iesy of~~ requirements specified in federal law or in their absence those specified in Table C404.2 in Chapter 4 of the *Florida Building Code, Energy Conservation,* Commercial Provisions, for the type of equipment installed. Equipment used to provide heating functions as part of a combination system shall satisfy all stated requirements for the appropriate water heating category. Solar water heaters shall meet the criteria of Section R403.5.6.2.1.

Date Submitted	1/1/2016	**Section**	403.6	**Proponent**	Cheryl Harris
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarifies the wording "other approved means of ventilation" to ensure design is not restricted to only mechanical methods. Allows for ventilation by any means chosen by designer. Clarifies that Mechanical Ventilation is not mandatory.

Rationale

Clarifies that ventilation design may include methods other than mechanical thus allowing for ventilation by any means chosen by designer. Clarifies that Mechanical Ventilation is not mandatory.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to enforcement

Impact to building and property owners relative to cost of compliance with code

No impact to comply.

Impact to industry relative to the cost of compliance with code

No cost impact to comply.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Use of mechanical, natural, and infiltration methods for ventilation are all standard methods to provide ventilation for a residential dwelling.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by clarifying there are alternate methods of ventilation to mechanical.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Modification expands rather than restricts materials, products, methods or systems.

Does not degrade the effectiveness of the code

The modification does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

7006-A2

Proponent Arlene Stewart **Submitted** 2/25/2016 **Attachments** Yes

Rationale

The application of mechanical ventilation is a mechanical code issue, not an energy code one. A cross reference is not needed and certainly not any additional criteria that is not already covered in the mechanical or residential codes. Deleting this reference will clarify the questions that industry has faced since V5 went into effect and will assist in better implementation of the requirement. Note that while the comment deletes a mandatory provision, the requirements for mechanical ventilation remain cited appropriately in the residential and mechanical codes. The deletion removes unnecessary and confusion duplication.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Deletion should reduce confusion and lead to better enforcement.

Impact to building and property owners relative to cost of compliance with code

This proposal should reduce the cost of compliance because confusion can cause construction delays which costs additional dollars.

Impact to industry relative to the cost of compliance with code

This proposal should reduce the cost of compliance because confusion often causes construction delays which costs additional dollars

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, because codes are better enforced and their intents better met when conflicts do not exist between code volumes.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, because it reduces confusion, allowing the primary intent to be better met

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

no

Does not degrade the effectiveness of the code

no, it strengths it by reducing confusion

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN7006-G1

Proponent Mike Moore **Submitted** 2/22/2016 **Attachments** Yes

Comment:

Please see attached for the rationale recommending disapproval of this proposal.

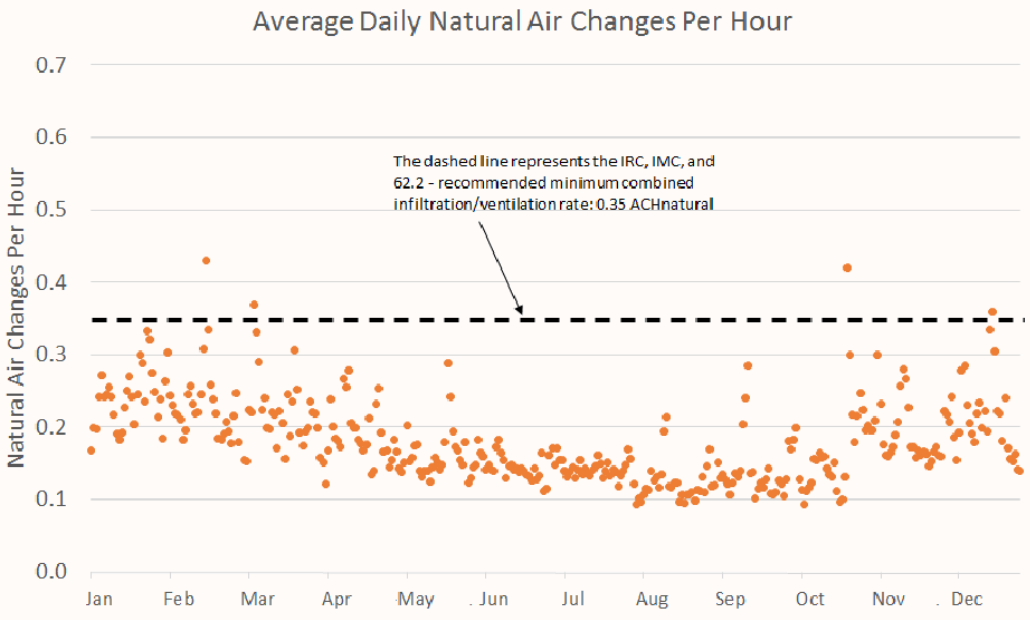
R403.6 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the International Residential Code or International
Mechanical Code, as applicable, or with other approved means of ventilation including: Natural, Infiltration or Mechanical means. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation
system is not operating.

~~R403.6 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the International Residential Code or International Mechanical Code, as applicable, or with other approved means of ventilation~~ including: Natural, Infiltration or Mechanical means. ~~Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the Ventilation system is not operating.~~

EN 7006: Rationale to Disapprove
Submitted by: Mike Moore, P.E., Newport

Recommend disapproval of this proposal. The proposal's rationale states that its intent is to clarify "that mechanical ventilation is not necessary." The proponent provides no technical basis to support this claim, which runs counter to engineering calculations and research showing that natural ventilation and infiltration are insufficient to achieve acceptable indoor air quality.

As an example, following is a chart created using DOE's EnergyPlus software that shows the average daily combined infiltration and ventilation rate for a typical 2,600 ft^2 three-bedroom, single-family home located in Orlando with a building air tightness of 5 ACH50 and *no* mechanical ventilation. The average annual natural air change rate for this typical home is 0.18 (just over half of the 0.35 air changes per hour promulgated by model codes and standards), with a seasonal low of 0.13 in the summer. Research has shown that formaldehyde emissions from building materials increase with increasing temperature and relative humidity, and formaldehyde concentrations increase with decreasing infiltration/ventilation rates. In other words, formaldehyde emissions and concentration are likely to spike in the summer when natural infiltration is at its lowest. Resultant poor indoor air quality can significantly diminish occupants' health. In fact, research suggests that poor IAQ is responsible for around $500 annually in health related costs per person in the U.S., which translates to $10 billion annually in Florida.*



	Winter	Spring	Summer	Fall	Annual
5 ACH50 & NO Mech Vent	0.23	0.17	0.13	0.19	0.18

*Assumes poor IAQ accounts for 0.01 disability adjusted life years (DALYs) per person, and that the value of a DALY is $50,000. This value is at the low end of epidemiological studies that estimate the value of a DALY between $50k - $200k.

References:

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- Lvovsky K, Huges G, Maddison D, Ostro B, and Pearce D. 2000. Environmental costs of fossil fuels: a rapid assessment method with application to six cities. Washington, D.C.: The World Bank Environment Department.
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Date Submitted	12/30/2015	**Section**	403.7.1.1	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Variable capacity equipment sizing exception.

Rationale

Allows for the opportunity of variable capacity equipment to operate at more efficient lower capacity stages more often, thereby consuming less energy while meeting load. Reference: http://fsec.ucf.edu/en/publications/pdf/FSEC-PF-459-14.pdf.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Code officials will need to be aware of this code exception; otherwise none.

Impact to building and property owners relative to cost of compliance with code

This is a voluntary option that enables owners and occupants to reap greater space conditioning energy savings than existing code.

Impact to industry relative to the cost of compliance with code

None; optional.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

There is no negative impact. Oversized variable capacity systems will operate at the lower stages more often at which they are quieter.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by allowing owners and occupants to reap greater space conditioning energy savings than existing code

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; provides another option.

Does not degrade the effectiveness of the code

Does not degrade effectiveness of the code; only provides an option.

Is the proposed code modification part of a prior code version? No

R403.7.1.1 Cooling equipment capacity. Cooling only equipment shall be selected so that its total capacity is not less than the calculated total load but not more than 1.15 times greater than the total load calculated according to the procedure selected in Section 403.7, or the closest available size provided by the manufacturer's product lines. The corresponding latent capacity of the equipment shall not be less than the calculated latent load.

The published value for AHRI total capacity is a nominal, rating-test value and shall not be used for equipment sizing. Manufacturer's expanded performance data shall be used to select cooling-only equipment. This selection shall be based on the outdoor design dry bulb temperature for the load calculation (or entering water temperature for water-source equipment), the blower CFM provided by the expanded performance data, the design value for entering wet bulb temperature and the design value for entering dry bulb temperature.

Design values for entering wet bulb and dry bulb temperature shall be for the indoor dry bulb and relative humidity used for the load calculation and shall be adjusted for return side gains if the return duct(s) is installed in an unconditioned space.

Exceptions:

1. Attached single- and multiple-family residential equipment sizing may be selected so that its cooling capacity is less than the calculated total sensible load but not less than 80 percent of that load.

2. When signed and sealed by a Florida-registered engineer, in attached single- and multiple-family units, the capacity of equipment may be sized in accordance with good design practice.

3. Variable capacity systems capable of delivering at least four different capacities may have a nominal rated size up to 1.5 times greater than the calculated total load.

Date Submitted	12/31/2015	**Section**	403.7	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Keep 2015 IECC heating and cooling equipment efficiency requirements.

Rationale

We recommend the 2015 IECC efficiency text be retained / included in the 2017 Florida Energy Conservation Code to provide clear efficiency rating requirements that do not need to be updated to keep up with changes to the federal law. While Section R303.1.2 addresses cooling and heating equipment efficiency, it does not stipulate “the minimum required by federal law….”

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Consistent with federal law.

Impact to building and property owners relative to cost of compliance with code

None.

Impact to industry relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, as the federal law limits have been vetted by government, manufacturers and energy advocates to be the best efficiency for any extra cost.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes; consistent with federal law.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; consistent with federal law.

Does not degrade the effectiveness of the code

Increases the effectiveness of the code by making it clearer.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

YES

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

OTHER

Explanation of Choice

Needs to be in the Florida code as it is federal law; not including it will cause confusion.

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

OTHER

Explanation of Choice

See above.

1st Comment Period History 01/13/2016 - 02/25/2016

Proponent	Eric Lacey	**Submitted**	2/25/2016	**Attachments**	Yes

EN6983-G1

Comment:

See attached comment.

[Starting from the Florida Supplement to 2015 IECC]

R403.7 Heating and Cooling Equipment (Mandatory).

R403.7.1 Equipment efficiency rating. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

R403.7.~~1~~2 Equipment sizing. [Renumber only; no text changes.]

R403.7.~~1~~2.1 Cooling equipment capacity. [Renumber only; no text changes.]

R403.7.~~1~~2.2 Heating equipment capacity. [Renumber only; no text changes.]

R403.7.~~1~~2.2.1 Heat Pumps. [Renumber only; no text changes.]

R403.7.~~1~~2.2.2 Electric resistance furnaces. [Renumber only; no text changes.]

R403.7.~~1~~2.2.3 Fossil fuel heating equipment. [Renumber only; no text changes.

R403.7.~~1~~2.3 Extra capacity required for special occasions. [Renumber only; no text changes.]

[No other changes to section.]

Responsible Energy Codes Alliance Comment on EN6983

RECA supports proposal EN6983 because it would adopt language contained in Section R403.7 of the 2015 IECC. The proposal does not actually establish any new requirements, but rather requires that equipment meet the federal efficiency standard that applies to Florida. The proposal improves the effectiveness of the code by reinforcing a practice that should already be taking place in plan review and inspection – verification of the efficiency rating of heating and cooling equipment. Although federal rules set the minimum efficiency levels for manufacturers, only code officials can determine whether equipment actually installed in buildings meets or exceeds the federal minimums. This will strengthen the role of the code official who must enforce these requirements.

This proposal is more important now than in the past because federal minimum efficiencies are shifting away from single nationwide efficiency levels to regionally-based efficiency levels that can vary from state to state. Air conditioners in Florida and several other southern states, for example, must meet a higher efficiency rating than air conditioners installed in the northern part of the country. It is possible, whether by accident or bad intent, to see equipment that would meet federal requirements in one jurisdiction used in other states or regions in which it does not meet the regional requirement. Although this verification may already be taking place during inspection or plan review, this proposal would make it a specific requirement in all buildings. We recommend approval of proposal EN6983.

Date Submitted	12/30/2015	**Section**	405.2	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal adds an important thermal envelope backstop to the simulated performance alternative.

Rationale

This proposal establishes a crucial trade-off "efficiency safety net" for Florida homeowners. It would require that the thermal envelope components at least meet the 2009 IECC prescriptive values as a backstop, just like Section R406 does for the new ERI compliance option. We recommend adopting this proposal in any event, but especially if the Commission decides to continue to permit equipment trade-offs in Section R405.

As we explain in a separate proposal to eliminate the equipment trade-offs from Section R405, trade-offs between equipment and envelope components allow an unnecessary weakening of the overall efficiency of the home, and can leave homeowners saddled with higher energy bills over the lifetime of the home. We believe that the most sensible solution is to follow the model of the IECC and eliminate these trade-offs, but if the Commission decides to allow equipment trade-offs in the 6th Edition code, we offer the above proposal in order to ensure at least a minimal efficiency level in the thermal envelope. This proposal would apply the same mandatory requirements, including envelope requirements at least as efficient as those specified in the 2009 IECC, in section R405 that are required in the Energy Rating Index compliance option (Section R406). We believe it is reasonable to require a sensible minimum efficiency level for the thermal envelope components, irrespective of other trade-offs.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposal should not have a significant impact on local enforcement of the code.

Impact to building and property owners relative to cost of compliance with code

This proposal should not negatively impact building and property owners.

Impact to industry relative to the cost of compliance with code

This proposal should not negatively impact building industry relative to compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal will help maintain building quality and efficiency by setting reasonable trade-off backstops on the thermal envelope efficiency.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the code by ensuring at least a minimum level of efficiency in the thermal envelope, regardless of the compliance path selected by the code user.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any materials or products.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code by helping ensure that even in the performance path, each building has a reasonably efficient thermal envelope.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6934-G1

Proponent	Charles Cottrell	**Submitted**	2/24/2016	**Attachments**	No

Comment:

Modification EN6934 – Applying the 2009 IECC Envelope Backstop of the ERI to the Performance Path: NAIMA strongly supports the proposal and reason statement filed by the Responsible Energy Code Alliance (RECA) adding a thermal envelope backstop from the ERI to the performance path.

While the 2015 IECC introduced the ERI performance path to give builders additional flexibility, it also recognized the importance of retaining minimum standards for the thermal envelope. As a consequence, the IECC requires that homes complying with the ERI path meet, at a minimum, the 2009 IECC prescriptive standards for thermal envelope components. We believe this is a reasonable requirement to place on all new home construction, irrespective of any trade-off that might be allowed within the Florida Building Code.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6934-G2

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

We feel that the additional performance compliance method stringency that this mod proposes is overly restrictive; the performance method is intended to allow "trade-offs" which account for less efficient components. It appears this mod would not allow any compliance method option for which glazed fenestration with an SHGC over 0.30 could be used.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6934-G3

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

Comment:

Proposal EN6934 should be approved only as a reasonable and secondary alternative to the preferred solution in proposal EN6935 by the same proponent to eliminate the equipment efficiency trade-off loophole. The reason for supporting this proposal are consistent with the reasons given by comment to proposal EN6935. Maintaining an adequate level of building envelope thermal efficiency is fundamentally important to long-term energy savings and performance because the envelope is present and must function for the life of the building. It is the foundation for energy efficiency and cannot easily be improved later in the life of a building.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6934-G4

Proponent Michael Fischer **Submitted** 2/25/2016 **Attachments** No

Comment:

Kellen supports this common sense backstop and urges adoption. If equipment tradeoffs are to be permitted, it is important that basic minimum requirements be met.

Revise Section R405.2 as follows:

R405.2 Mandatory requirements. Compliance with this section requires that: (i) the mandatory provisions identified in Section R401.2 shall be met; (ii) all building thermal envelope components (insulation and fenestration) shall comply with the building thermal envelope requirements specified under Section R406.2; and (iii) all. ~~All~~ supply and return ducts not completely inside the *building thermal envelope* shall be insulated to a minimum of R-6.

Date Submitted	12/17/2015	**Section**	405.3	**Proponent**	Roger LeBrun
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida Supplement - errata to correct superseded reference

Rationale

Rationale:
Appendix B was renumbered to RC in the Florida Supplement to the 2015 IECC

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
Correction of reference should assist local entity

Impact to building and property owners relative to cost of compliance with code
No impact

Impact to industry relative to the cost of compliance with code
No impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Not applicable

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Corrects improper reference

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
No effect

Does not degrade the effectiveness of the code
No effect

Is the proposed code modification part of a prior code version? No

Revise Florida Supplement - Section R405.3 as follows:

R405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design)* be shown to have annual total normalized Modified Loads that are less than or equal to the annual total loads of the *standard reference design* as calculated in accordance with Appendix ~~B~~ RC of this standard.

EN6923

Date Submitted	12/30/2015	**Section**	405.3	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Updates the baseline efficiency assumption for air conditioning units in the performance path, consistent with federal standards.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

N/A - This proposal applies the correct baseline assumption for air conditioners, consistent with federal standards.

Impact to building and property owners relative to cost of compliance with code

N/A - This proposal applies the correct baseline assumption for air conditioners, consistent with federal standards.

Impact to industry relative to the cost of compliance with code

N/A - This proposal applies the correct baseline assumption for air conditioners, consistent with federal standards.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal helps maintain consistency with federal standards as they relate to air conditioners.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal will make the performance path more accurate.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any products.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

EN6923-G1

Comment:

Proposal EN6923 should be approved as a necessary correction to the code only in the event that the commission should elect to not accept the preferred solution in proposal EN6935 by the same proponent to eliminate the equipment efficiency trade-off loophole. EN6935 is the preferred approach because it is more straight-forward and effective. Also, maintaining an adequately level of building envelope thermal efficiency is fundamentally important to long-term energy savings and performance because the envelope is present and must function for the life of the building. It is the foundation for energy efficiency and cannot easily be improved later in the life of a building.

Revise Section R405.3 as follows:

R405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence *(proposed design)* be shown to have annual total normalized Modified Loads that are less than or equal to the annual total loads of the *standard reference design* as calculated in accordance with Appendix B of this standard. Computer software used to comply with this section shall set *standard reference design* efficiency assumptions for cooling, heating, and water heating systems that reflect the current federal minimum efficiency requirements for Florida's climate zones.

Revise Appendix RC, Table B-1(1) as follows:

TABLE B-1(1) COEFFICIENTS 'a' AND 'b'

Fuel type and End Use	a	b
Electric space heating	2.2561	0
Fossil fuel* space heating	1.0943	0.4043
Biomass space heating	0.8850	0.4047
Electric air conditioning	**XXXX** ~~3.8090~~	0
Electric water heating	0.9200	0
Fossil fuel* water heating	1.1877	1.0130
* Such as natural gas, LP, fuel oil		

[XXXX = coefficient that corresponds with a SEER 14 split-system air conditioning unit.]

Reason Statement for Proposal to Update Section R405.3 and Appendix RC, Table B-1(1)

To be clear, we believe that Florida should eliminate equipment trade-offs from the Section R405 simulated performance alternative, just as these trade-offs were eliminated in the 2009, 2012, and 2015 IECC, and we have submitted a separate proposal to make this change. However, if the Commission decides to permit such trade-offs in Section R405, this scalar must be updated to reflect the appropriate federal minimum efficiency requirement for air conditioners.

This proposal does two things: First, it provides important instructions to compliance software developers to help ensure that software matches requirements set under federal law. Second, it updates the baseline assumption for air conditioning equipment in performance calculations, consistent with state-specific federal requirements. We have not calculated that scalar, but if this proposal is accepted, the appropriate number should be calculated and inserted.

The current scalar, 3.809, has been used in the 2010 and 2014 editions of the Florida Building Code, Energy Conservation, and appears to be based on a 13 SEER air conditioning unit. However, as of January 1, 2015, split system air conditioners installed in Florida must meet or exceed a SEER rating of 14. *See* 10 C.F.R. § 430.32(c)(4) (2015). Under the National Appliance Energy Conservation Act (NAECA), where a state incorporates the efficiency of a "covered product" for which the minimum efficiency is established by the federal government, such as an air conditioner, the code must specify the federal minimum efficiency level as the baseline for building designs. *See* 42 U.S.C. § 6297(f) (2012). Again, while we believe the most straightforward means of addressing equipment in the performance path is to specify the same level of efficiency in the standard reference design and the proposed design (essentially eliminating the impact of equipment efficiency in the performance calculation), consistent with the 2015 IECC. However, if Florida continues to allow equipment trade-offs in Section R405, the baseline must reflect, at a minimum, the federal efficiency levels for Florida's climate zones.

EN7007

Date Submitted	1/1/2016	**Section**	405.4.2.1	**Proponent**	Cheryl Harris
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarifies compliance by Performance method utilizing "Worst Case" building Orientation. Software calculation by rotation of building thru 8 cardinal orientations (N, S, E, W, NE, SE, SW, NW) to obtain worst case condition.

Rationale

Clarifies the "Worst Case" orientation calculation and allows for identical building models to be permitted by documenting that the "Worst Case" requirements have been met.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Energy calculation review time could be shortened.

Impact to building and property owners relative to cost of compliance with code

Cost to comply will be reduced by eliminating confusing or redundant calculations.

Impact to industry relative to the cost of compliance with code

Cost to comply will be reduced by eliminating confusing or redundant calculations.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

There would be no impact on energy conservation.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Modification improves the code by eliminating confusing or redundant calculation requirements.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

There are no proprietary materials, products, methods, or systems in the modification.

Does not degrade the effectiveness of the code

The modification does not eliminate energy calculations only the redundancy in the required calculations.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN7007-G1

Proponent	Jeff Sonne / FSEC	**Submitted**	2/25/2016	**Attachments**	No

Comment:

It appears that this mod isn't needed as Section R405.4.2 of the base code already covers "worst case" orientation.

R405.4.2.1 Compliance report for permit application. A compliance report submitted with the application for building permit shall include the following:

1. Building street address, or other building site identification.

2. A statement indicating that the *proposed design* complies with Section R405.3.

3. An inspection checklist documenting the building component characteristics of the *proposed design* as indicated in Table R405.5.2(1). The inspection checklist shall show results for ~~both the *standard reference design* and~~ the *proposed design* with user inputs to the compliance software to generate the results.

4. A site-specific energy analysis report that is in compliance with Section R405.3.

5. The name of the individual performing the analysis and generating the report.

6. The name and version of the compliance software tool.

Exception: Multiple orientations. When an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four cardinal (north, east, south and west) orientations, or the "Worst" orientation. Compliance software tools may calculate the "Worst Case" orientation by rotating the building through the 4 or 8 cardinal orientations.

Date Submitted	12/14/2015	**Section**	405.5.2	**Proponent**	Mark Nowak
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Allows equipment efficiency to be based on the proposed design in the simulated performance compliance path.

Rationale

This proposal will restore reasonable performance criteria to the energy code that existed in the base IECC code prior to 2009 and that were adopted as a Florida-specific amendment in the 2010 and 2013 Florida Energy Codes. Without these provisions that differentiate between mechanical equipment efficiency in the proposed design and the standard reference design, there is little incentive to use the simulated performance option that typically provides a better performing building over prescriptive designs in a more cost-effective manner. This is particularly important in hot climates such as Florida where there are more cost-effective options than the envelope for gaining high levels of performance. If the owner or builder will not receive compliance credit for such measures, the current base code will result in a disincentive to use higher-performing equipment that typically far exceeds the impact of envelope improvements on energy savings in hot climates such as Florida.

Although this proposal by definition will deliver an equivalent building in terms of energy use, in reality it will result in higher-performing buildings in many cases because of the higher savings at lower cost from equipment efficiency improvements compared to envelope or other improvements.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact.

Impact to building and property owners relative to cost of compliance with code

No impact.

Impact to industry relative to the cost of compliance with code

No impact.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Allows for flexibility in meeting equivalent levels of performance.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Allows for flexibility in meeting equivalent levels of performance.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Allows for flexibility in meeting equivalent levels of performance without specifying a particular solution or material.

Does not degrade the effectiveness of the code

Allows for flexibility in meeting equivalent levels of performance as the base code.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6426-G1

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

Comment:

Proposal EN6426 should be disapproved for a number of reasons. This proposal will, in fact, reduce efficiency when viewed from an actual construction market perspective. First, the market is able to and is currently making cost-beneficial equipment efficiency decisions. This is occurring in the market in a much more beneficial way and without the desired action of this proposal to allow commonly used equipment (equipment that is already being used) to become a means of reducing or trading-off the long-term performance of more permanent energy efficiency features of buildings, such as insulating the building envelope. This is not a fair or equal trade.

This proposal also carries unquantified value consequences. For example, less efficient envelopes will result in less comfortable indoor environments with a tendency for occupants to offset this by changing indoor set-points, increasing equipment power usage. Also, it creates a missed opportunity in that the most sensible time to ensure the structure itself is energy efficient is during its initial construction. It is very costly to do this later.

The issue of equipment trade-offs has been considered on numerous occasions with various interests and the conclusion has been to not sacrifice long-term building envelope energy efficiency by means of trading it off against federal minimums for relatively short-lived heating and cooling equipment. The energy-saving penalty of allowing equipment efficiency trade-offs has been studied and shown to be a non-energy-neutral means of energy code compliance (e.g., see report by ICF International at http://energyefficientcodes.com/wp-content/uploads/2013/10/2013-9-23-FIN-Review-Analysis-of-Equipment-Trade-offs-in-Residential-IECC-Exec-Summ-1-Pagers.pdf). Consequently, the proposal will not result in truly equivalent levels of performance and, therefore, is not an appropriate means to address a perceived need for flexibility beyond that already provided in the code.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6426-G2

Proponent Eric Lacey **Submitted** 2/25/2016 **Attachments** Yes

Comment:

See attached comment.

BUILDING COMPONENT DESIGN	STANDARD REFERENCE PROPOSED DESIGN	
Heating systems d,e	Efficiency: In accordance with prevailing Federal minimum standards ~~As proposed for other than electric heating without a heat pump. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the IECC – Commercial Provisions~~.	As proposed
	Capacity: sized in accordance with Section R403.7	As proposed
	Fuel type: same as proposed	As proposed
Cooling systems d,f	~~As proposed~~ Fuel Type: Electric	As proposed
	Capacity: sized in accordance with Section R403.7.	As proposed
	Efficiency: In accordance with prevailing Federal minimum standards	As proposed
Service water Heating d,e,f,g	~~As proposed~~ Fuel Type: As proposed	As proposed
	Use: same as proposed design	Gal/day= 30+(10 ×Nbr)
	Efficiency: In accordance with prevailing Federal minimum standards	As proposed

Responsible Energy Codes Alliance Comment on EN6426

RECA opposes the incorporation of trade-offs between thermal envelope components and mechanical equipment. These trade-offs have not been permitted in the IECC since the 2006 edition, and are not permitted in the 2015 edition. RECA's proposal **EN6935** would remove these trade-offs from the 6th Edition Florida Building Code, consistent with the approach of the 2015 IECC, along with the vast majority of states. Among the many reasons why these trade-offs should be eliminated:

- The net result of including equipment trade-offs in the performance path is a loophole that can be used to reduce energy efficiency in residential buildings. As we point out in our reason statement to EN6935, the efficiency losses could be a staggering 9-22%.
- The trade-off essentially trades away the long-term efficiency of thermal envelope components for short-term improvements in air conditioning, water heating, and heating equipment. Moreover, this equipment is often already going to be installed in the home anyway and is a classic free-rider. Homeowners will be stuck with higher energy bills over the lifetime of the home.
- While the Energy Rating Index of Section R406 provides some flexibility through trade-offs, R406 at least requires the thermal envelope to meet or exceed the 2009 IECC requirements and all mandatory requirements. Section R405 has no such requirements, and can be exploited to reduce thermal envelope efficiency to unacceptable levels.

For a more complete reason statement supporting the elimination of these trade-offs, see the reason statement for proposal EN6935. We urge the Commission to reject proposal EN6426.

Date Submitted	12/15/2015	**Section**	405.5.2	**Proponent**	Dwight Wilkes
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

The net result of these changes is to produce a more accurate Standard Reference Design energy determination, particularly when skylights are planned for the actual building.

Rationale

Correct an inconsistency in the 2015 IECC related to skylights.
The net result of these changes is to produce a more accurate Standard Reference Design energy determination, particularly when skylights are planned for the actual building. In addition, it will properly include a credit when highly efficient skylights are used in lieu of code minimum products, and further credit when those products are further enhanced with integral shading.

This code change is also being proposed for the 2018 IECC.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No Impact

Impact to building and property owners relative to cost of compliance with code
No Impact

Impact to industry relative to the cost of compliance with code
No Impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Yes

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
Does not.

Does not degrade the effectiveness of the code
Does not.

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
OTHER

Explanation of Choice

This discrepancy is due, at least in part, to approved RE173-13 which changed “glazing ” to “Vertical fenestration other than opaque doors” between the 2012 and 2015 IECC thereby omitting skylights from the provisions of this row of Table R405.5.2(1).

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
YES

1st Comment Period History 01/13/2016 - 02/25/2016

EN6562-G1

Proponent	Jeff Sonne / FSEC	Submitted	2/24/2016	Attachments	No

Comment:

We oppose changing the standard reference design skylight area from "none". Adding reference skylight area would increase the reference cooling load, decreasing the stringency of Florida's energy code. Furthermore, the performance method has always indicated a standard reference design of 0 skylight area.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6562-G2

Proponent	Eric Lacey	Submitted	2/25/2016	Attachments	Yes

Comment:

See attached comment.

Revise Table R405.5.2 (1) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS as follows:

Building Component	Standard Reference Design	Proposed Design
	~~Total~~ Vertical fenestration area[b] = (a) The proposed ~~glazing~~ vertical fenestration area, where the proposed ~~glazing~~ fenestration area is less than 15 percent of the conditioned floor area,. or (b) ~~15 percent of the conditioned floor area~~, The adjusted vertical fenestration area where the proposed~~glazing~~ fenestration area is 15 percent or more of the conditioned floor area, The adjusted vertical fenestration area shall be calculated as follows: AVF_{adj} = AVF x 0.15 x CFA/AF, Where AVF_{adj} = Adjusted Vertical Fenestration AVF = Proposed Vertical Fenestration Area CFA = Conditioned Floor Area AF= Proposed Total Fenestration area	As proposed
Vertical Fenestration other than opaque doors	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W)	As proposed
	U-factor: as specified in Table R402.1.4	As proposed
	SHGC: as specified in Table R402.1.2 except that for climates with no requirement (NR) SHGC=0.40 shall be used.	As proposed
	Interior shade fraction: 0.92-(0.21xSHGC for the standard reference design)	0.92-(0.21xSHGC as proposed)
	External shading: none	As proposed
	~~None~~ Skylight area= (a) The proposed skylight area, where the proposed fenestration area is less than 15 percent of the conditioned floor area, or; (b) The adjusted skylight area, where the proposed fenestration area is 15 percent or greater of the conditioned floor area. The adjusted skylight area shall be calculated as follows: $ASKY_{adj}$ = ASKY x 0.15 x CFA/AF	As proposed

Skylights	Where $ASKY_{-adj}$ = Adjusted skylight area ASKY = Proposed skylight area CFA = Conditioned Floor Area AF= Proposed total fenestration area	
	Orientation: as proposed	As proposed
	U-factor: as specified in Table R402.1.4	As proposed
	SHGC: as specified in Table R402.1.2 including footnote (b) of that table, except that for climates with no requirement (NR) SHGC=0.40 shall be used.	As proposed
	Interior shade fraction for the area of proposed skylights with SHGC ratings that include a pre-installed interior shade: 0.92-(0.21xSHGC for the standard reference design)	As proposed, with shades assumed closed 50% of the time
	External shading: none	As proposed

Responsible Energy Codes Alliance Comment on Proposal EN6562

RECA is concerned with proposal EN6562 because it is inconsistent with the 2015 IECC and would likely result in less efficient homes in cases where skylights are installed. This proposal is complicated, and has not yet been vetted through the rigorous ICC Code Development Process. We acknowledge the proponent's attempt to set a reasonable assumption for skylight efficiency in the standard reference design of the performance path, but we are not convinced that this proposal reasonably accomplishes this objective. We are concerned with the specific approach proposed, the complexity of the approach and the potential impact on the standard reference design. The proposal places no limits on skylight area in the standard reference design, other than the inherent limit of 15% on total fenestration area – in some instances, we fear that this may result in a substantial increase in target energy use under the standard reference design. We also believe this proposal is unnecessary – builders can already incorporate skylights into homes without any size restrictions in the prescriptive or Total UA compliance paths, as long as the reasonably efficient prescriptive requirements are achieved.

Rationale:

Skylights are treated inconsistently between the different compliance alternatives in the FBC 5th Edition Energy Conservation Residential Provisions. For example, the UA alternative does not limit the area of vertical fenestration or skylights. Likewise, there are no limits on area in the prescriptive provisions. However, the Simulated Performance Alternative specifically excludes any skylight area from the Standard Reference Design, while vertical fenestration area currently equals the Proposed Design up to 15% of the conditioned floor area.

This discrepancy is due, at least in part, to approved **RE173-13** which changed "glazing " to "Vertical fenestration other than opaque doors" between the 2012 and 2015 IECC thereby omitting skylights from the provisions of this row of Table R405.5.2(1).

Although Table R405.5.2(1) in the 2012 IECC did not include provisions directly for skylights, it did include provisions for "glazing". The definition of glazing given in that same table included skylights as well as vertical glazing, as implied by the first sentence of deleted footnote (a):

> " a. Glazing shall be defined as sunlight-transmitting fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Glazing includes the area of sunlight-transmitting fenestration assemblies in walls bounding conditioned basements. For doors.... "

Additionally, the 2015 IECC further separated the category into two domains, "Vertical Fenestration" and "Skylights", which were made separate definitions in R202.

These proposed changes to Table R405.5.2(1) correct this inconsistency by reinstating the inclusion of skylight area in the Total Fenestration Area of the Standard Reference Design. This proposal does this by adding the following:

a) Proposed provisions for skylight area, U-factor and shading that mirror the Vertical Fenestration provisions, wherever practical.

b) Proposed provisions for skylight SHGC that mirror those for Vertical Fenestration, and also include a needed reference to Footnote (b) of Table R402.1.2.

c) Proposed provisions for skylight orientation based upon "As Proposed". Typically skylight installation in residential construction is not equally distributed to all four cardinal compass orientations, as assumed for vertical fenestration under the Simulated Performance Alternative provisions.

d) Proposed suitable interior shading provisions that are used when any of the proposed skylights are rated products that include integral shading.

This proposal also includes the following changes to the provisions for Vertical Fenestration:

a) Reference to "glazing area" is replaced by "fenestration area". This is the only remaining use of the phrase "glazing area" in the residential provisions of this code, after the removal of "glazing" as defined in the deleted footnote (a).

b) Additional provisions were needed to reduce the vertical fenestration area (in proportion to skylight area reduction) for the Standard Reference Design, whenever total fenestration area equals or exceeds 15% of conditioned floor area and any skylight area is proposed.

Date Submitted	12/15/2015	**Section**	405.5.2	**Proponent**	Dwight Wilkes
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6562

Summary of Modification

Errata to reinsert and update text removed by mistake from the 2015 IECC

Rationale

ICC code change proposal RE173-13 partially changed “glazing area” to “vertical fenestration area” for the 2015 IECC.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact

Impact to building and property owners relative to cost of compliance with code

No impact

Impact to industry relative to the cost of compliance with code

No impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not.

Does not degrade the effectiveness of the code

Does not.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

OTHER

Explanation of Choice

Errata to reinsert and update text removed by mistake from the 2015 IECC.

This code change is also being proposed for the 2018 IECC.

Supporting RE173-13

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

YES

Revise Table R405.5.2 (1) as follows:

Step 1. Restore 2012 IECC footnote (b), in coordination with errata currently in process at ICC:

(Note: final footnote letter "#" is not yet available from ICC - must match

superscript reference in Table row dealing with Vertical Fenestration)

#. For residences with conditioned basements, R-2 and R-4 residences and townhouses,

the following formula shall be used to determine glazing area:

AF = A*s* × *FA* × *F*

where:

AF = Total glazing area.

As = Standard reference design total glazing area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area

+ 0.5 × below-grade boundary wall area).

F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area

+ common wall area) or 0.56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from

unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

Step 2. Modify the above restored footnote to coordinate with the rest of the code change that resulted in the removal of footnotes (a) and (b) for the 2015 IECC.

#. For residences with conditioned basements, R-2 and R-4 residences and townhouses,

the following formula shall be used to determine ~~glazing~~ fenestration area:

AF = A*s* × *FA* × *F*

where:

AF = Total ~~glazing~~ fenestration area.

As = Standard reference design total ~~glazing~~ fenestration area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area

+ 0.5 × below-grade boundary wall area).

F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area

+ common wall area) or 0.56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from

unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

RE173-13

Table R405.5.2(1) (IRC Table N1105.5.2(1))

Proponent: Dr. Thomas D. Culp, Birch Point Consulting LLC, representing the Glazing Industry Code Committee (culp@birchpointconsulting.com)

Revise as follows:

TABLE R405.5.2(1) (N1105.5.2(1))
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT
Opaque Doors
~~Glazing~~[a] Vertical Fenestration other than Opaque Doors
Skylights

(Portions of table not shown remain unchanged)

~~a. Glazing shall be defined as sunlight-transmitting fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Glazing includes the area of sunlight-transmitting fenestration assemblies in walls bounding conditioned basements. For doors where the sunlight-transmitting opening is less than 50 percent of the door area, the glazing area is the sunlight-transmitting opening area. For all other doors, the glazing area is the rough frame opening area for the door including the door and the frame.~~

Reason: This corrects the terminology in the performance path table to be consistent with the rest of the chapter. "Doors" can include both glazed and opaque doors, but the intent was clearly meant to be opaque doors, since it is referring to only the U-factor in Table R402.1.3. It is then unclear where to put glazed doors. This proposal clarifies the three fenestration rows as "opaque doors", "vertical fenestration other than opaque doors", and "skylights".

Cost Impact: This proposal will not increase the cost of construction.

Rationale:
ICC code change proposal RE173-13 partially changed “glazing area” to “vertical fenestration area” for the 2015 IECC. The 2012 IECC definition of glazing only appeared in footnote (a) of the table, which was shown as deleted in the proposal. Footnote (b) was not marked for deletion, but it was discovered to be missing in the published code. The language in that footnote is still needed, and is restored in Step 1. (An errata to the 2015 IECC is currently in process.)

The changes in Step 2 are needed because in the 2015 IECC, a new definition of “fenestration” was approved under a different code change that separated the category into vertical fenestration and skylights. "Glazing" has therefore been purged as a defined synonym of fenestration in the 2015 IECC.

This code change is also being proposed for the 2018 IECC.

Supporting RE173-13

Date Submitted	12/28/2015	**Section**	405.5.2	**Proponent**	Joseph Belcher
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Table R405.5.2(1)

Summary of Modification

Modify air leakage rate for Standard Reference Design.

Rationale

To correlate with change made to FBC-EC R402.4.1.2 (Mod 6820) The sole reason for the change given by the proponent to the change from 7 ACH to 5 ACH in the base code was to make buildings tighter.
“There are four key areas of improvement in this proposal: Reduced leakage in duct systems and building envelopes, verified by testing. The proposal requires that all ductwork be inside conditioned space, sets new leakage limits on the ductwork, and adds a new requirement for testing the air tightness of the building envelope. As an alternative, homes with high-efficiency HVAC equipment are exempted from the requirement for ducts inside the conditioned space and are subject to less stringent duct and whole-house testing requirements.” (Excerpt from Reason statement for ICC Code Change EC13-09/10, ICC Monograph for ICC Public Hearings October 2009)

The statement of the first "key are"
is the only reference to tighter building envelopes and was the sole reason given. Florida has enacted other measures through Florida specific amendments to the foundation code that results in greater energy efficiency.

In a report on whole-house ventilation effectiveness and failure rates by FSEC, one recommendation was to not require houses to become tighter than already specified by code and to consider increasing allowed air leakage to 7 ACH50 throughout Florida. (Source: Investigation of the Effectiveness and Failure Rates of Whole-House Mechanical Ventilation Systems in Florida” FSEC-CR-2002-15, June 1, 2015.) According to a statement by a member of FSEC on an Energy TAC conference call the energy loss at a 7 ACH infiltration rate is not sufficient to be of concern. Running models on Energy Gauge for a typical Florida house using 5 ACH and using 7 ACH resulted in no change.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local entity for code enforcement. Proposal reverts to requirement of FBC-EC 2010.

Impact to building and property owners relative to cost of compliance with code

The proposal could result in a cost savings without a sacrifice of energy efficiency, Proposal reverts to requirement of FBC-EC 2010. Building and property owners would still have the option of requesting the builder to provide greater energy efficiency if desired.

Impact to industry relative to the cost of compliance with code

Reduces cost by reverting to FBC-EC 2010. Option available to provide greater energy efficiency, if desired. Builders participating in programs such as Energy Star and LEED are required to provide the greater energy efficiency, but such programs are voluntary, not mandated by regulations.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposal has a reasonable connection with the health, safety, and welfare of the general public because it recognizes that Florida has different needs in some aspects that other states using the foundation code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal improves the code by removing an overly restrictive requirement and reverting to a reasonable provision with no appreciable loss in energy efficiency.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6821-A1

Proponent Joseph Belcher **Submitted** 2/24/2016 **Attachments** Yes

Rationale

Change is to provide specific range for requirement. Change will provide consistency with other Mods proposed to carry air change requirements to two decimal places.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None, clarification.

Impact to building and property owners relative to cost of compliance with code

None, clarification.

Impact to industry relative to the cost of compliance with code

None, clarification.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Provides clarity in determining the air change requirements when testing.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Provides clarity in determining the air change requirements when testing.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code. Provides clarity in determining the air change requirements when testing.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6821-G1

Proponent	Jay Crandell	Submitted	2/25/2016	Attachments	Yes

Comment:

See attached comment.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6821-G2

Proponent	Eric Lacey	Submitted	2/25/2016	Attachments	Yes

Comment:

See attached comment.

TABLE R405.5.2(1)

SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

In second column, STANDARD REFERENCE DESIGN, change first line to read:

Air leakage rate of ~~5~~ 7 air changes per hour ... REMAINDER OF TABLE UNCHANGED

Air leakage rate of ~~5~~ 7.00 air changes per hour ... REMAINDER OF TABLE UNCHANGED

TABLE R402.3.2.1
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

ORIENTATION	PROJECTION FACTOR
North	>=0.40[a]
South	>=0.20
East	>=0.50
West	>=0.50

a. *For the north orientation, a vertical projection located on the west-edge of the fenestration with equivalent PF >= 0.15 shall also satisfy the minimum projection factor requirement.*

EN6821: Reasons to disapprove

Submitted by: Jay H. Crandell, PE, ARES Consulting (representing FSC)

Proposals EN6821, M6820, and EN6573 should be disapproved for lack of compelling evidence that any problem or risk is created with use of a 5 ACH requirement. In fact, the risk will likely be worsened by increasing to 7 ACH without mechanical ventilation still being required (see data provided by separate comments from Mike Moore on M6820 and EN6573). So, even with this proposal the risks, to the extent they actually exist, will still exist and not be solved and may be worsened by this proposal. As the referenced FSEC study indicates…people will still not maintain and operate ventilation systems properly, installers will not install them properly, inspectors not inspect them adequately, and many homes will still be built tighter than 5 ACH. Thus, this issue is not one of changing the ACH target (which comes with energy penalties and potential moisture control and IAQ problems with no guarantee of any improvement in indoor air quality or moisture control risks). The FSEC study indicates or admits a hope that moving from ACH 5 to ACH 7 "may reduce risk" but gives no risk-based evidence to support that recommendation. This subjective "hunch" does not provide adequate justification for the proposal.

Instead, the referenced FSEC study does give very actionable recommendations to improve functionality and reliability of ventilation systems including documentation, labeling, and instruction for proper operation and maintenance. Consumers receive these types of instructions and aids for TV remotes, watches, calculators, computers, cars, lawn mowers and many other things including things related to health, such as medicines and thermometers. In addition, it also is clear from the study that improved inspection and verification is needed. These are the fundamental needs recognized in the FSEC report that address the root of the problem and should be pursued, not a weakening of the energy code that will also result in the ability to use weakening trade-offs of reliable permanent energy efficiency features such as the building envelope. For example, this proposal establishes a desire to weaken the energy code with very certain impacts associated with trading-off reliable energy conservation measures (such as the building envelope) for the random chance or hope that this proposal might have an unquantified and uncertain risk reduction benefit for an uncertain quantity of homes. Is the goal really to improve the code or allow it to be weakened? Proposal EN 6821 should be disapproved for all of the reasons stated above.

Responsible Energy Codes Alliance Comment on Proposal EN6821

Proposal EN6821 replaces the current air leakage level of 5 ACH50 in the standard reference design in the performance path of the 5th Edition Code (and the 2012 and 2015 IECC) with a much less efficient 7 ACH50. EN6821 would result in a clear reduction in energy efficiency from the current code, and it should be disapproved.

Because the standard reference design is used to set an efficiency baseline for the whole building, any modification to the baseline assumptions can impact the efficiency of any other component in the building. Thus, while the proponent questions whether a 5 ACH50 or 7 ACH50 air leakage rate is most appropriate for residential buildings in Florida, this weakening amendment would apply to all homes – regardless of the actual tested air leakage rate. If this proposal is adopted, and a home's tested air leakage rate is lower than 7 ACH50 at all, the difference can be used to trade off efficiency of other components – insulation, fenestration, etc. As a result, regardless whether there should be a mandatory or prescriptive air leakage rate of 5 ACH50 or some other number, the standard reference design in the simulated performance option should remain at 5 ACH50 to establish the target energy performance for residential buildings in Florida.

To support proposal EN6821, the proponent cites a Florida Solar Energy Center report on the effectiveness of whole-house ventilation approaches. *See* Florida Solar Energy Center, *Investigation of the Effectiveness and Failure Rates of Whole-House Mechanical Ventilation Systems in Florida, Final Report* (June 1, 2015). The report, which measured the air leakage rates of 21 houses in Florida, illustrates the key problem with this proposal: Of these 21 homes, ranging from 1 year old to 28 years old, **only 1 home tested higher than 7 ACH50** (1987 home at 8.8 ACH50). *Id*. at 11. For all other homes, some of which tested below 2 ACH50, proposal EN6821 would produce additional trade-off "credit" under the performance path that could be used to reduce the efficiency of other building components. Obviously, it is impossible to tell whether this is a representative sample of buildings in Florida, but it is clear that for 20 of the 21 homes in the study cited by the proponent, this proposal is an unnecessary giveaway of energy efficiency.

Date Submitted	12/30/2015	**Section**	405.5.2	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal removes excess language in the performance path related to homes not tested for air leakage.

Rationale

The purpose of this proposal is to remove an inconsistency in the code. Under Section R402.4.1.2, air leakage testing is mandatory in all buildings. As a result, the language as to residences that are not tested in this table is inconsistent and confusing. This proposal removes this language.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There should be no impact on local enforcement.

Impact to building and property owners relative to cost of compliance with code

There should be no impact on building or property owners.

Impact to industry relative to the cost of compliance with code

There should be no impact on industry.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal cleans up language in the performance path.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the code by cleaning up excess language.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any products.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

Proponent Jeff Sonne / FSEC **Submitted** 2/24/2016 **Attachments** No

EN6927-G1

Comment:

We support this mod if not contradicted by pending Florida legislation.

Revise Table R405.5.2(1) as follows:

TABLE R405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Air exchange rate	Air leakage rate of 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8 at a pressure of 0.2 inches w.g (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	~~For residences that are not tested, the same air leakage rate as the standard reference design.~~ ~~For tested residences, t~~ The measured air exchange rate[a]. The mechanical ventilation rate[b] shall be in addition to the air leakage rate and shall be as proposed.

Date Submitted	12/30/2015	**Section**	405.5.2	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal removes a significant performance path efficiency loophole by removing trade-offs for cooling, heating, and water heating equipment, consistent with the 2015 IECC.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There should be no negative impact relative to local code enforcement.

Impact to building and property owners relative to cost of compliance with code

Over the useful lifetime of the building, a building with a strong thermal envelope will be a more solid investment than one with a weak envelope (and more efficient equipment).

Impact to industry relative to the cost of compliance with code

There should be no negative impact on the industry.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal would strengthen the energy code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal strengthens the energy code by ensuring a reasonably efficient thermal envelope in every home.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any products or materials.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code and will likely lead to more energy and cost savings for consumers.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6935-G1

Proponent Charles Cottrell **Submitted** 2/24/2016 **Attachments** No

Comment:

Modification EN6935 – Eliminating HVAC Trade-Offs: NAIMA strongly supports the proposal and reason statement filed by the Responsible Energy Code Alliance (RECA) eliminating HVAC trade-offs.

HVAC systems have an average life of 15 years, while envelope conservation measures deliver energy savings to the homeowner for the life of that building – 50 years or more. By continuing to allow trade-offs for cooling, heating and water hearing equipment, Florida homeowners suffer. We urge you to eliminate this trade-off or at least limit the size of the trade-off. Similar to the ERI path in the IECC, Florida could introduce minimum envelope prescriptive measures.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6935-G2

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

Comment:

Proposal EN6935 should be approved as a necessary means of ensuring long-term performance of buildings which would otherwise be severely weakened by an artificially low and non-representative baseline for equipment efficiencies. As thoroughly studied in an analysis by ICF International (available at http://energyefficientcodes.com/wp-content/uploads/2013/10/2013-9-23-FIN-Review-Analysis-of-Equipment-Trade-offs-in-Residential-IECC-Exec-Summ-1-Pagers.pdf), using an inappropriate baseline for equipment efficiency can result in substantial long-term and avoidable impacts to building energy efficiency (9% to 22% loss in actual energy efficiency). It is for this reason that the IECC and many states have avoided this problem in a manner consistent with proposal EN6935. Until an appropriate baseline for equipment efficiencies is established, trade-offs based on federal minimum equipment efficiencies should be avoided as counter-productive to the goals of the energy code. Higher efficiency equipment is already being commonly used in the market on its own merits and such commonly used equipment should not be promoted in the code as a means of weakening the code and reducing energy efficiency. Thus, approval of proposal EN6935 is requested and urged as a significant improvement to the FL code, consistent with the base code.

1st Comment Period History 01/13/2016 - 02/25/2016

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

EN6935-G3

Comment:

Historically the Florida Energy Code has had the reference design equipment efficiencies "non-floating" which offered builders the option to find the most cost effective means of meeting the code while still meeting all mandatory requirements. We are opposed to this mod and instead support the language in the Energy Florida Supplement.

Revise Table R405.5.2(1) as follows:

TABLE R405.5.2(1)

SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems[d, e]	~~Efficiency: In accordance with prevailing Federal minimum standards~~ As proposed for other than electric heating without a heat pump. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the Florida Building Code, Energy Conservation—Commercial Provisions. Capacity: sized in accordance with Section R403.7 ~~Fuel type: same as proposed~~	~~As proposed~~ As proposed ~~As proposed~~
Cooling systemsd, f	As proposed ~~Fuel Type: Electric~~ Capacity: sized in accordance with Section R403.7. ~~Efficiency: In accordance with prevailing Federal minimum standards~~	As proposed ~~As proposed~~ ~~As proposed~~
Service water Heatingd, e, f, g	As proposed ~~Fuel Type: As proposed~~ Use: same as proposed design ~~Efficiency: In accordance with prevailing Federal minimum standards~~	As proposed Gal/day = $30 + (10 \times N_{br})$ ~~As proposed~~

Reason Statement for Proposal to Eliminate Loophole Created by Equipment Trade-Offs

This proposal will save energy and reduce costs for Florida homeowners by closing a loophole in the Florida Building Code, Energy Conservation that was eliminated seven years ago in the 2009 IECC. Florida is one of only a handful of states that continues to allow trade-offs for cooling, heating, and water heating equipment in Section R405 trade-offs. In light of the new Energy Rating Index option adopted in the 2015 IECC, which includes sensible thermal envelope backstops and a reasonable target index number, the Section R405 trade-off is an outdated, enormous loophole that should be eliminated from the Florida Building Code.

To be clear, the equipment trade-off proposed in the Staff Supplement to the 2015 IECC is not energy-neutral, and in many cases will result in an overall decrease in energy efficiency (as compared to a home built to a code without equipment trade-offs). Federal law prohibits states from setting efficiency requirements for products covered under the National Appliance Energy Conservation Act (including heating, cooling, and water heating equipment). Thus, if a state includes the efficiency of these products in its performance calculations, it is required to specify the current federal minimum efficiencies in the baseline – no higher and no lower. However, because the federal minimum efficiencies tend to lag behind the efficiency of commonly-installed products, the baseline often reflects a level of efficiency far below the products being installed in homes across the nation.

If equipment trade-offs are incorporated into Florida's residential energy code – as has been proposed – builders can take an artificial "credit" for any difference between the equipment efficiency and the federal minimum efficiency, and *remove that efficiency from the thermal envelope*. While heating, cooling, and water heating equipment will be changed out several times over the life of a residential building, many components of the thermal envelope (such as insulation) will be part of the home for decades or even the life of the home. Homes built under such a trade-off scenario could have a far weaker thermal envelope for 50+ years – saddling homeowners permanently with higher utility bills and less comfortable homes.

In its Final Determination on the 2009 *IECC*, the U.S. Department of Energy found that, "Because building envelopes have substantially longer lives than HVAC and/or water heating equipment, energy savings from envelope improvements may persist for many more years than comparable equipment improvements. Also, because high-efficiency equipment is already the predominant choice in many markets, disallowing envelope/equipment trade-offs is likely to result in improved overall efficiency in many situations." *See* Updating State Residential Building Energy Efficiency Codes, 76 Fed. Reg. 42688, 42697 (July 19, 2011).

How much could a homeowner lose in energy efficiency and cost savings from equipment trade-offs? An analysis conducted by ICF International shows a potential **9-22% decrease in energy efficiency and cost savings** as compared to a home built without equipment trade-offs. *See* ICF International, *Review and Analysis of Equipment Trade-offs in Residential Energy Codes* (Sep. 2013). In other words, this one amendment could eliminate some or all of the efficiency gains made in recent code update cycles.

To the extent that builders seek additional flexibility in code compliance and credit for efficient equipment, the Section R406 Energy Rating Index provides a better option than the current approach to equipment trade-offs in Section R405. The ERI still contains equipment trade-offs, which, by their nature, are problematic for the reasons outlined above. However, the ERI attempts to reduce the negative impacts of these trade-offs by adding a few important details:

- The ERI target score is set at a level which makes it less likely that the home will be built with a weaker permanent thermal envelope than a home built to the prescriptive path.
- The ERI contains a minimum thermal envelope backstop to ensure that even in trade-off scenarios, at least a reasonable level of efficiency is maintained in the envelope.

While it is still far from a perfect compliance option, because of the features detailed above, the ERI is a less problematic means of incorporating equipment into code compliance than the Section R405 equipment trade-offs proposed by Staff. We urge the Commission to reject the equipment trade-offs (consistent with the 2009, 2012, and 2015 versions of the IECC), and close this loophole.

EN6765

Date Submitted	12/22/2015	**Section**	405.5	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6764

Summary of Modification

New ANSI duct testing Standard.

Rationale

This change provides the new American National Standard that did not exist for reference during the last Florida Code cycle or for reference during the 2015 IECC cycle.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Impact to building and property owners relative to cost of compliance with code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Impact to industry relative to the cost of compliance with code

None; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No; replaces existing Standard with a new American National Standard, but does not change duct testing requirements.

Does not degrade the effectiveness of the code

Does not degrade the code; this new American National Standard is appropriate for code use, but does not change duct testing requirements.

Is the proposed code modification part of a prior code version? No

TABLE R405.5.2(1)— SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS. [Starting from Florida Supplement document, modify as follows:]

TABLE R405.5.2(1)

SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	Distribution System Efficiency: 0.88	Thermal distribution system efficiency shall be as tested in accordance with ~~Section 803 of RESNET Standards~~ ANSI/RESNET/ICC 380-2015 or as specified in Table R405.5.2(2) if not tested.
	Duct location: entirely within the building thermal envelope	As proposed …….
		As proposed… …..
	Air Handler location: entirely within the building thermal envelope	
		As proposed
	Duct insulation: R-6	

[No other changes to table.]

Date Submitted	12/30/2015	**Section**	405.5	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Modify Table R405.5.2(1) proposed design, non-tested air exchange rate.

Rationale

This change is designed to cover the possibility that the legislature or FBC will allow homes to not be tested for air leakage. In that event a default air leakage needs to be applied. This mod suggests 7 ach50 to cover this hole in the performance code for untested residences.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None; makes code clearer.

Impact to building and property owners relative to cost of compliance with code

None; makes code clearer.

Impact to industry relative to the cost of compliance with code

None; makes code clearer.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; by clarifying the code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by clarifying it.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Does not degrade the code; makes code clearer.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

OTHER

Explanation of Choice

[No] as the international code requires testing of all homes.

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

OTHER

Explanation of Choice

This is needed if the Florida legislature enacts bills that limit the ability of the FBC to call for testing. If no legislature or other code changes relative to testing residences is enacted, this proposed change will not affect anything.

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

[See support file for mod text.]

Code Mod Proposal 6920 Text

TABLE R405.5.2(1)— SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS. [modify as follows:]

Air exchange rate	Air leakage rate of 5 air changes per hour in climate zones 1 and 2, and 3 air changes per hour in climate zones 3 through 8 at a pressure of 0.2 inches w.g. (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 x *CFA* + 7.5 x *(Nbr* + 1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, ~~the same air leakage rate as the standard reference design~~ air leakage rate of 7 air changes per hour at a pressure of 0.2 inches w.g. (50 Pa). For tested residences, the measured air exchange rate[a]. The mechanical ventilation rate[b] shall be in addition to the air leakage rate and shall be as proposed.

[No other changes to table.]

Date Submitted	12/31/2015	**Section**	405.5	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Proposed design non-tested duct leakage Qn for performance compliance calculations.

Rationale

This change will allow performance computer programs to model the default leakage in the same manner they model tested leakage. The location of the ducts, the roof material, the attic or conditioned space conditions all affect the distribution system performance. Having an air distribution leakage resulted in illogical results at times. This change will provide a default duct tightness such that the proposed home is modeled in the same manner whether tested (with the tested Qn to outside) or not (using this default Qn). It also solves having to select a default distribution factor for the first box in Table 405.5.2(2) (distribution system components located in unconditioned spaces for forced air systems) which was left out of the 2014 Florida code.

This is more applicable to Florida than some northern states as northern states have fewer ducted systems and far fewer attic locations for ducts where the energy effects become most pronounced.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None.

Impact to building and property owners relative to cost of compliance with code

On average this does not change the strictness of the code, however for some homes and climates it may be stricter or looser depending on what default distribution factor would otherwise be determined.

Impact to industry relative to the cost of compliance with code

On average this does not change the strictness of the code, however for some homes and climates it may be stricter or looser depending on what default distribution factor would otherwise be determined.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; it improves consistency of applying the code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The code is improved by having more consistent results.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; provides more consistent results.

Does not degrade the effectiveness of the code

Does not degrade the code; helps clarify how to model untested ducts.

Is the proposed code modification part of a prior code version? No

TABLE R405.5.2(1)— SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS. [Starting from Florida Supplement document, modify as follows:]

TABLE R405.5.2(1)

SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	Distribution System Efficiency: 0.88 Duct location: entirely within the building thermal envelope Air Handler location: entirely within the building thermal envelope Duct insulation: R-6	Thermal distribution system efficiency shall be as tested in accordance with Section 803 of RESNET Standards or if not tested shall be modeled as a Qn to outside of 0.080 for ducted systems. Hydronic and ductless systems shall be as specified in Table R405.5.2(2) if not tested. As proposed ……. As proposed… …... As proposed

[No other changes to table.]

Table R405.5.2(2)
Default Distribution System Efficiencies For Proposed Designs*

DISTRIBUTION SYSTEM CONFIGURATION AND	FORCED AIR	HYDRONIC

CONDITION	SYSTEMS	SYSTEMS
Distribution system components located in unconditioned spaces	---	0.95
Untested distribution systems entirely located in conditioned space	~~0.88~~ ---	1
"Ductless" systems	1	---

[No changes to footnotes]

Date Submitted	12/17/2015	**Section**	405.7.4	**Proponent**	Roger LeBrun
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Recognition of venting skylights in the cross ventilation option

Rationale

This option will be made more effective and flexible by the inclusion of operable skylights in addition to windows, by providing the stack effect benefit of having vertical distance between the inlet and outlet apertures. Studies show venting skylights to be more energy efficient draft inducers than whole house fans, when the energy to drive the fans is taken into account.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Adds flexibility for effective natural ventilation options

Impact to building and property owners relative to cost of compliance with code

May reduce total fenestration area when venting skylights are used

Impact to industry relative to the cost of compliance with code

No impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

More effective natural ventilation improves indoor air quality at less operating cost

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Adds flexibility, provides better draft with the same opening area

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Removes an inherent discriminatory omission related to venting skylights

Does not degrade the effectiveness of the code

Improves options and effectiveness

Is the proposed code modification part of a prior code version? No

Revise Florida Supplement - Section R405.7.4 as follows:

R405.7.4 Installation criteria for homes using the cross ventilation option. The cross ventilation option may be used if the following criteria have been met.

1. Operable aperture areas totaling a minimum of 12 percent of the floor area of the room shall be provided for all primary living areas and main bedrooms.

2. Insect screens shall be provided for all operable windows, skylights and doors to be considered operable aperture area. All screened entry doors and interior doors in the ventilated areas shall be provided with either (1) mechanically attached door stops (or similar devices) to hold the door in an open position or (2) operable louvers.

3. The total aperture area shall be provided by a minimum of two distinct windows or one window and one skylight. Each ~~window~~ operable unit shall provide not more than 70 percent of the total aperture area. The windows (or sliding glass doors) shall be placed in walls adjacent or opposite to each other. The windows may be placed on a single outside wall if a skylight or wing walls are used.

4. Where wing walls are included in the building design for ventilation purposes, they shall be placed between windows to create a high-pressure and a low-pressure zone on each window. Wing walls shall extend from the ground to ~~eve~~ eave height, be located on the windward side of the building, and extend outward from the building a distance at least equal to one-half the width of the window. NOTE: This technique is effective only for areas which experience significant and continuous winds during the cooling months.

Date Submitted	12/30/2015	**Section**	405.7.6	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Eliminates the inaccurate performance path credit for ceiling fans.

Rationale

See attached Reason Statement

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

N/A. This proposal will have no impact on enforcement.

Impact to building and property owners relative to cost of compliance with code

N/A. This proposal will have no impact on property owners relative to cost of compliance.

Impact to industry relative to the cost of compliance with code

N/A. This proposal does not impact industry relative to cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal makes the performance path more accurate.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal strengthens the code by making the performance path more accurate.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against products.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6924-A1

Proponent Jeff Sonne / FSEC **Submitted** 2/24/2016 **Attachments** Yes

Rationale

ENERGY STAR certified ceiling fans are readily available today and insure efficient fans will be used for this credit.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Verify ENERGY STAR fan certification for applicable projects.

Impact to building and property owners relative to cost of compliance with code

Optional credit, so no additional cost unless ceiling fan credit is taken, and lower cost ENERGY STAR ceiling fans are readily available.

Impact to industry relative to the cost of compliance with code

Optional credit, so no additional cost.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; insures efficient fans are used for the ceiling fan credit.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by specifying efficient products for this credit.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Requires that efficient products be used for this credit.

Does not degrade the effectiveness of the code

Improves the effectiveness of the code by insuring that efficient fans are used when this credit is taken.

Is the proposed code modification part of a prior code version? No

Revise section R405.7.6 as follows:

R405.7.6 Installation criteria for homes using the ceiling fan option. The ceiling fan option shall apply a 2% reduction in cooling energy use for the proposed design if one or more ceiling fans are installed in each of the bedrooms and a minimum of one ceiling fan is installed in all primary living areas (living rooms, family rooms, or great rooms). This shall not include spaces designed to be dining rooms or dining areas. Areas separated by permanently fixed archways, walls, or dividers shall be considered separate rooms. The following criteria shall be met:

1. Ceiling fans shall be installed with minimum fan blade diameters of no less than those listed in Table R405.7.5 for the size and shape of the room.

2. Where a primary living area is an "L-shaped" room and the smaller portion of this area is 8 feet by 10 feet (2438 mm by 3048 mm) or larger, a fan shall be installed in both the larger and smaller portions of the primary living area.

Exception: Credit shall not be taken for both ceiling fans and cross ventilation.

TABLE R405.7.6

FAN SIZING TABLE

LONGEST WALL LENGTH (feet)	MINIMUM FAN SIZE (inches)
= 12	36
> 12 – 16	48
> 16 – 17.5	52
> 17.5 – 25	56
> 25	2 fans (minimum of 48 inches each)

For SI: 1 inch = 25.4mm, 1 foot = 304.8 mm.

R405.7.6 Installation criteria for homes using the ceiling fan option. The ceiling fan option shall apply a 2% reduction in cooling energy use for the proposed design if one or more ceiling fans are installed in each of the bedrooms and a minimum of one ceiling fan is installed in all primary living areas (living rooms, family rooms, or great rooms). This shall not include spaces designed to be dining rooms or dining areas. Areas separated by permanently fixed archways, walls, or dividers shall be considered separate rooms. The following criteria shall be met:

1. Ceiling fans shall be installed with minimum fan blade diameters of no less than those listed in Table R405.7.5 for the size and shape of the room.

2. Where a primary living area is an “L-shaped” room and the smaller portion of this area is 8 feet by 10 feet (2438 mm by 3048 mm) or larger, a fan shall be installed in both the larger and smaller portions of the primary living area.

3. Ceiling fans shall be ENERGY STAR certified.

Exception: Credit shall not be taken for both ceiling fans and cross ventilation.

[No other changes to section.]

Reason Statement for Proposal to Eliminate Ceiling Fan Credit

This proposal will improve efficiency and reduce confusion by eliminating the ceiling fan credit in Section R405.7.6. This credit has not been included in any edition of the IECC, and is not contained in any other state code. This credit suffers from several problems that make it unworkable for a building energy code:

- While ceiling fans can have a positive impact on occupant comfort, they do not actually cool the air. Thus, a ceiling fan running in a room with no occupants constitutes an energy use *increase*.
- The presence of a ceiling fan does not guarantee proper or efficient operation. There is no requirement, for example, that the fan only be used when occupants are present. Nothing would stop a homeowner from running ceiling fans all day (while nobody is home), or leaving the fans off when the home is occupied, leading occupants to adjust the thermostat. Either of these scenarios could completely negate the purported benefits of ceiling fans.
- The table for minimum fan size does not include the most important efficiency rating: the Airflow Efficiency (CFM/Watt). This is the metric used by Energy Star to determine qualification for its programs. Ceiling fan efficiency can vary significantly, and while the table above may be appropriate for sizing purposes, it does not provide any direction as to the quality or efficiency of the fan. An inexpensive, *inefficient* fan could do more harm than good, from an energy conservation standpoint.
- The 2% credit against cooling energy use is completely arbitrary. We are aware of no analysis that would justify a blanket 2% credit against cooling energy use simply because ceiling fans are installed in certain rooms. That 2% credit could be applied against other efficiency measures, such as low-SHGC fenestration, which actually does reduce energy use in the home by reducing the amount of solar heat passing through the thermal envelope. It does not make sense to trade away certain efficiency benefits for ceiling fans which may or may not be operated in a beneficial manner.

For these reasons, Section R405.7.6 should be deleted.

EN7004

Date Submitted	12/31/2015	**Section**	405	**Proponent**	David Yarbrough
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Modification to require use of area averaged emittance when evaluating the performance of approved attic radiant barrier systems or assemblies. The area averaged emittance is used in the calculation of radiant heat transfer.

Rationale

The proposed addition to R405.7.1 represents an important clarification concerning performance calculations for attic radiant barrier configurations that have been approved. A detailed discussion of the radiation calculations and the correct use of emittance values is contained in the attached file MOD 7004 Text 141 Stovall.pdf. The attached document contains a detailed discussion of the appropriate emittance to use for radiant barrier performance calculations. The paper shows that the simple area weighed average for emittance is a good approximation for the installation methods that have been approved with installation diagrams provided. The proposed addition to the code will improve performance evaluations and result is distinguishing differences in the performance of the approved methods of installation. The area average emittance is easily calculated and input to manual or computer based performance evaluations.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No known impact

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Not related

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Provides a way to use an important input property for performance evaluations.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate

Does not degrade the effectiveness of the code

Does not degrade effectiveness

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN7004-G1

Proponent David Yarbrough **Submitted** 2/25/2016 **Attachments** No

Comment:

Add sentence to EN7004
Existing sentence. Table R405.7.1(1) contains e ave for selected attic radiant barrier systems with 16 in. or 24 in. OC framing.

Add the following: When a coating is applied to the roof deck and attached rafters or truss elements, then e ave shall be the emittance of the coating.

R405.7.1 Installation criteria for homes claiming the radiant barrier option.
The sheet radiant barrier or interior radiation control coating (IRCC) options may be claimed where the radiant barrier system is to be installed in one of the configurations depicted in Figure R405.7.1, and the following conditions are met:

1. It shall be fabricated over a ceiling insulated to a minimum of R-19 with conventional insulation and shall not be used as a means to achieve partial or whole compliance with a minimum attic insulation level of R-19. Either a sheet type or spray applied IRCC may be used.

2. If the radiant barrier material has only one surface with high reflectivity or low emissivity it shall be facing downward toward the ceiling insulation.

3. The attic airspace shall be vented in accordance with Section R806 of the *Florida Building Code, Residential.*

4. The radiant barrier system shall conform to ASTM C 1313, *Standard Specification for Sheet Radiant Barriers for Building Construction Applications,* or ASTM C 1321, *Standard Practice for Installation and Use of Interior Radiation Control Coating Systems (IRCCS) in Building Construction* as appropriate for the type of radiant barrier to be installed. The operative surface shall have an emissivity not greater than 0.06 for sheet radiant barriers or 0.25 for interior radiation control coatings, as demonstrated by independent laboratory testing according to ASTM C 1371.

5. The radiant barrier system (RBS) shall conform with ASTM C 1158, *Use and Installation of Radiant Barrier Systems (RBS) in Building Constructions for Sheet Radiant Barriers,* or ASTM C 1321, *Standard Practice for Installation and Use of Interior Radiation Control Coating Systems (IRCCS) in Building Construction* for IRCC systems.

6. The radiant barrier shall be installed so as to cover gable ends without closing off any soffit, gable or roof ventilation.

7. When installed in accordance with this section, the area average emittance, e_{ave}, obtained with emittance for wood surfaces of 0.9 shall be used in performance evaluations. Table R405.7.1(1) contains e_{ave} for selected attic radiant barrier systems with 16 in. or 24 in. OC framing.

Table R405.7.1(1) Area Averaged Emittances for Methods 1, 2, and 3

Installation Method	Operative Surface Emittance	Area Averaged Emittance	
		16 in.	24 in.
1	0.03	0.03	0.03
	0.06	0.06	0.06
2 and 3	0.03	0.11	0.08
	0.06	0.14	0.11
	0.15	0.22	0.20

	0.25	0.31	0.29

Analysis in Support of the Radiant Barrier Fact Sheet 2010 Update

Therese Stovall, PE
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Student Member ASHRAE

ABSTRACT

Quantifying the benefits of radiant barriers is complex because the benefits depend upon the climate, attic geometry, duct arrangements, and other building parameters. Homeowners, however, require simplified guidance regarding building envelope options, even those options that seem to have no simple answers. An extensive parametric evaluation of radiant barrier installation alternatives was made using a newly expanded and benchmarked version of an attic simulation program. To complement this analysis, a detailed numerical analysis of radiation heat transfer within the attic and within the small space bounded by the rafters and the sheathing was completed. The results provide guidance for homeowners and builders.

INTRODUCTION

Extensive experimental work has identified the energy savings and peak-load reduction benefits of radiant barriers in attics in the southern climates of the U.S. Eight homes, all with air-handling equipment located in the attic, were retrofit with radiant barrier systems in 2000 in central Florida. Subsequent monitoring and data analysis showed cooling energy savings of 9%, peak load reduction of 16%, and an improvement in indoor comfort (Parker et al. 2001). Previous experimental work in Tennessee on uninhabited homes with no ductwork in the attic also showed significant cooling energy savings (Levins and Karnitz 1986a). Significant savings due to radiant barriers were also measured in controlled laboratory experiments, with and without duct systems in the attic (Petrie et al. 1998). Numerous other studies have established the energy conservation characteristics of a radiant barrier system, with and without the impact of ducts (Parker and Sherwin 1998; Levins and Karnitz 1986b; Parker et al. 1993; Wilkes 1991a). As expected, these studies point out the importance of multiple factors in determining the potential energy savings, most importantly: the climate, the amount of insulation on the floor of the attic, and the presence or absence of ductwork in the attic.

Builders are more likely to place ductwork in the attic in southern climates than in other parts of the country. In addition to providing a satisfactory cool-air distribution to ceiling registers, this location is often selected because it is economically expedient for the builder. About 80% of single family housing units (not including mobile homes) located in cooling climates (2,000 cooling degree days or more and less than 4,000 heating degree days) are built on a slab, ruling out the possibility of using basements or crawlspaces for the ductwork (Energy Information Administration 2005).

Energy-conscious consumers are faced with the decision of whether or not to include a radiant barrier in their home, and if so, what type of radiant barrier to install. A number of products are marketed as attic radiant barriers for use in residential applications. These include aluminum foil or metalized film-faced materials stapled to the bottom surface of rafters, placed on top of the attic floor insulation, roof sheathing materials with a foil-covered interior surface, and liquid-applied low-emittance coatings. The Department of Energy has long provided information fact sheets to inform consumers and to help them determine their likely energy savings. The current fact sheet, posted in the mid-1990s, provides a series of IRS-type forms for the calculation of savings.

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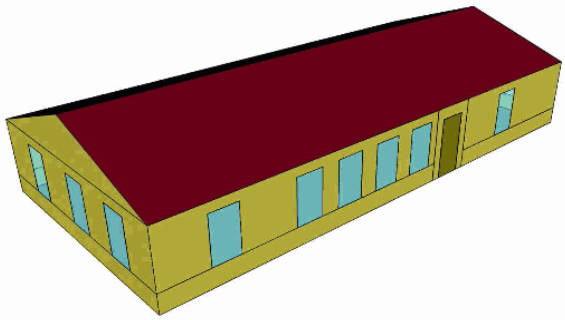

Figure 1 *Schematic of house used in EnergyPlus and AtticSim.*

The form was based on a large number of heat transfer calculations.

ANALYSIS APPROACH

The attic simulator, AtticSim, was developed to calculate the radiative, convective, and conductive energy exchanges in a specific attic geometry, with or without ducts (Wilkes 1991b; ASTM C1340 2009). This model has been benchmarked against experimental data from the controlled laboratory experiments, showing excellent accuracy for attics without ducts and moderate accuracy for attics with ducts. The attic model requires that the air temperature below the attic floor and the temperature and timing of air entering the ductwork be specified. To provide these values, a whole-building energy model, EnergyPlus, was used. This whole-building model includes leaking attic ducts and radiant energy exchange within the attic, but does not yet include radiant exchange between the attic surfaces and the duct surface (EnergyPlus 2009). These programs were coupled by using the same physical geometry and materials, the same weather data, and the same rate of duct leakage.

Both the attic and whole building calculations use a single emittance to represent the roof surface facing downward into the attic in order to maintain reasonable computation times, even though that surface can be a mixture of materials, such as reflective sheathing mounted upon a wooden rafter or truss system. This simplification was investigated during the course of this project by using different emittance values and realistic geometry in a multiple domain numerical analysis of the attic region.

COUPLED ENERGYPLUS-ATTICSIM ANALYSIS

The energy savings attributable to radiant barriers was calculated using a coupled AtticSim-EnergyPlus model. The current version of EnergyPlus (Version 4.0) ignores duct radiation heat exchange as well as duct heat transfer during conditioning equipment off-time. AtticSim is limited to simulating only the attic environment. Hence, input parameters for AtticSim, such as the temperature of the air provided by the conditioning equipment, the mean air temperature in the conditioned zone, supply air mass flow rate, duct air leakage rate, and conditioning equipment on-time were calculated using the building energy simulation program EnergyPlus. AtticSim results were used to estimate ceiling and duct heat transfers.

The Home Energy Rating System Building Energy Simulation Test (HERS BESTEST) Case L100A building model, shown in Figure 1, was used as a base building for this study (NREL/TP-472-7332a 1995). The building is a 57 ft × 27 ft single-story house with one conditioned zone, an unconditioned attic, and a vented crawl space. Although many of the homes in the southern climates are built on slabs, the crawl space foundation was retained in all zones for consistency. Because the temperature within the conditioned zone is considered to be well-mixed (i.e., no stratification), and is controlled to a setpoint, the air temperature below the attic floor (produced by EnergyPlus and used by AtticSim) should be unaffected by the foundation type. The foundation type would have a slight impact on the total house load, which would in turn impact the timing of the air entering the ductwork (the other EnergyPlus output used by the AtticSim model), but this should be a secondary effect, at worst. For example, if the total house load is changed by 10%, the total duct energy involved in the worst assumed leakage rate will change by 1.4%.

An hourly internal load schedule for the conditioned zone was also used as per the HERS BESTEST Case L100A building. The analysis was performed for eight cities, representing the eight ASHRAE climate zones, shown in Figure 2. For all climate zones, an interior 21.1°C (70°F) heating set point temperature and 23.9°C (75°F) cooling set point temperature were used.

Two levels of building quality were evaluated, one with adequate ceiling insulation (new), and one with minimal insulation (old). The new homes were taken to have code-level insulation, corresponding to R-30 for climate zones 1–3, R-38 for climate zones 4 and 5, and R-50 for climate zones 6–8. An

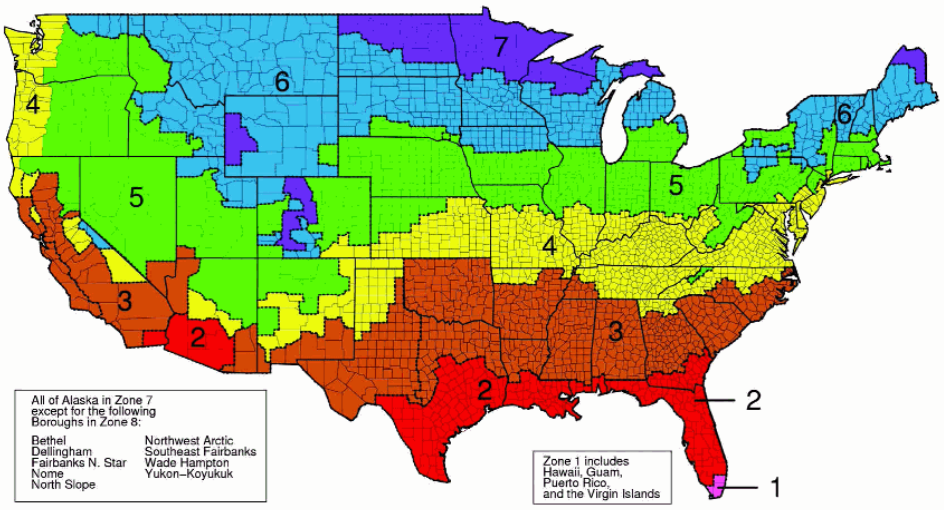

Figure 2 *Climatic zones used by ASHRAE and the IECC.*

attic insulation level of R-19 was used for the older home in all zones. Building air infiltration rates of one and two air changes per hour were used for the new and old homes, respectively. These leakage rates are consistent with those measured in a survey of 34 homes of various ages between 2004 and 2006, after adjusting the reported air change values at 50 Pa to 4 Pa, closer to the pressure difference that actually induces air exchange in homes (Antretter et al. 2007).

The study considered three cases for attic ducts, representing situations with no ducts (and therefore no duct losses), insulated and relatively tight ducts, and uninsulated leaky ducts. The leaky ducts were modeled with no insulation and 14±2% duct air leak. The better ducts were modeled with R-6 insulation and 4±1% duct air leakage. The EnergyPlus Airflow Network module was used to model the supply and return duct systems in an attic. In the Airflow Network module, the duct air leak for each moment in time is a function of four characteristic parameters ("Effective Leakage Ratio", "Maximum Flow Rate", "Reference Pressure Difference", and "Air Mass Flow Exponent") and two weather parameters (wind velocity and direction). The "Effective Leakage Ratio" was adjusted to get approximately the same duct air leakage rate, as a fraction of the total duct flow rate, for all climate zones.

To estimate the energy savings attributable to radiant barriers, four values of emittance (ε) for the downward-facing side of the interior attic space and the gable ends were considered; 0.05, 0.1, 0.2, and 0.9. The attic (that is, the top surface of the attic floor insulation) was given an emittance of 0.9. The building thermal load with no radiant barrier (ε = 0.9) was compared with the thermal loads with ε = 0.05, 0.1, and 0.2 to calculate the radiant barrier energy savings.

A DETAILED RADIATION MODEL OF THE RAFTER CAVITY SPACE WITHIN THE ATTIC ENVIRONMENT

The coupled AtticSim-EnergyPlus model requires the effective emittance of the downward-facing surfaces. In the simplest case, that of a radiant barrier stapled to the ends of the rafters, that value is well defined. However, if the radiant barrier is an integral part of the roof sheathing, supported over uncoated wood rafters, the radiation "view" facing down is a combination of both the barrier material and the wood. Previously, a projected area-weighted average was used. For example, if foil-faced sheathing was supported on 4 cm (1.5 in.) wide rafters spaced on 41 cm (16 in.) centers, the effective emittance was set equal to $(4\varepsilon_{rafter} + 37\varepsilon_{foil})/41$.

An analysis was performed to examine this simplification. The analysis divided the attic region into two sub-enclosures and a full three-dimensional surface-to-surface radiant interaction model was developed for each domain. The first region spans between the underside of the roof deck and the edges of the rafters. This region is further divided into a number of identical rafter enclosure models between two adjacent rafters, with a cross-section shown in Figure 3. The length of the unit cell in the direction perpendicular to this cross section is the length of the rafters. The temperatures of surfaces 7 to 13 were specified and a condition of symmetry with no heat flow was assumed on a plane through the center of each rafter. The second sub-enclosure, with a triangular cross-section shown in Figure 4, represents a simple attic region bounded by the top of the attic floor insulation, the two gable ends of the attic, and the plane stretched across the ends of the rafters.

For the two three-dimensional enclosures, the configurations were calculated based on three-dimensional expressions available in the literature and radiation is the only mode of heat

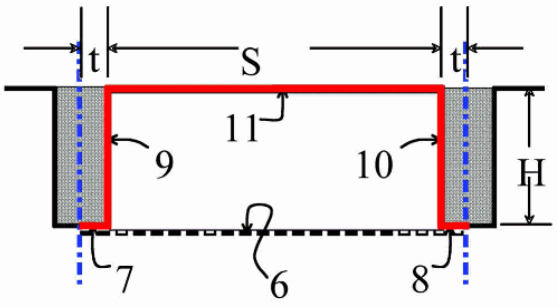

Figure 3 *Rafter Enclosure Model configuration. Surfaces 12 and 13 are at the ends of the channel.*

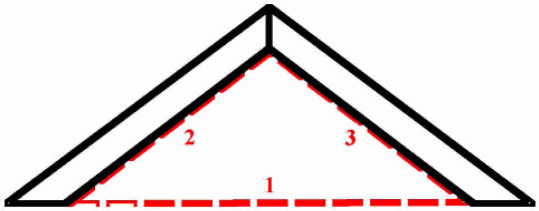

Figure 4 *Sketch of five-surface enclosure model of attic. Surfaces 4 and 5 are at the gable ends of the attic.*

transfer considered (Incropera and DeWitt 2002; Feingold 1966). Each of the surfaces in the enclosures is assumed to be diffuse gray with uniform radiosity and temperature. The temperature and emittance of surfaces 1, 4, and 5 in Figure 4 were specified for each case. These two solutions are coupled by the heat transfer, temperature, and effective emittance at the imaginary plane, identified as surface 6 in Figure 3 and surface 2 in Figure 4. The value for the effective emittance of that plane was varied parametrically to calculate the corresponding temperature and heat flux at the plane.

An integrated model combines the rafter enclosure and five-sided enclosure models into one and determines the temperature of the common plane, T_c, as a function of the emittance of the common surface, ε_c. Both enclosure models require that the emittances and temperatures of each surface be specified to calculate the radiant heat transfer for each of the surfaces. For a given emittance for surface 6 in Figure 3 (surface 2 in Figure 4), ε_c, its temperature, T_c, and heat flux can be determined by finding the temperature at which the heat transfer at that common surface is balanced between the two models. That is, for any emittance for the common surface, the surface temperature that satisfies both models corresponds to the condition where:

$$\left.\frac{q_6}{A_6}\right|_{\text{rafter enclosure model}} + \left.\frac{q_2}{A_2}\right|_{\text{five-sided enclosure model}} = 0 \qquad (1)$$

where

q_6/A_6 = heat flux across surface 6 in the rafter enclosure model (Figure 3)

q_2/A_2 = heat flux across surface 2 in the five-sided enclosure model (Figure 4)

These parametric results for q_c and T_c as a function of ε_c from the numerical analysis were then combined with an analytical model of the radiation heat transfer within the rafter domain. Looking at the general case for the rectangular region, shown in Figure 5, the heat flux across the common plane (note that in this convention, q_c will be negative when $T_h > T_c$) can be expressed as

$$q_c = \frac{\sigma(T_c^4 - T_h^4)}{\frac{1}{A_c}\left[\frac{1}{\varepsilon_c} + \frac{A_c}{A_h}\left(\frac{1-\varepsilon_h}{\varepsilon_h}\right)\right]} \qquad (2)$$

where

c and h surfaces are defined in Figure 5

q = heat flux, W/m^2

σ = Stefan-Boltzmann constant W/(m^2·K^4),

T = temperature (K),

A = area (m^2), and

ε = emittance.

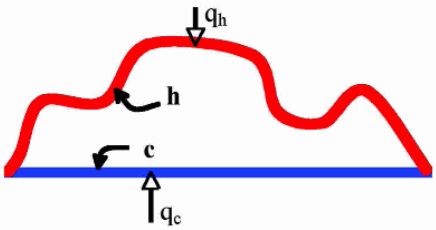

Figure 5 *General case for the rafter enclosure model.*

Table 1. Calculated Effective Emittance for Use with Whole House-Attic Model

Case Name	Roof Pitch	Rafter Spacing [cm (in.)]	Rafter Width[A] [cm(in.)]	Season[B]	Effective Values for Surface 6 in Figure 3 (which is also Surface 2 in Figure 3)			Simple Area, Averaged ε
					T (C)	Q (kW/m^2)	ε	
Foil radiant barrier stapled to the bottom of rafters[C]	Any	Any	Any	Any	–	–	0.05	0.05
All wood (Rafter and sheathing surface emittance of 0.9)	3	41 (16)	14 (5.5)	Summer	52	3.6	0.73	0.90
	3	41 (16)	14 (5.5)	Winter	–5.2	1.7	0.73	0.90
Foil-faced oriented strand board sheathing (Rafter emittance of 0.9 sheathing emittance of 0.1)	3	41 (16)	14 (5.5)	Summer	50	1.0	0.25	0.18
	3	41 (16)	14 (5.5)	Winter	–3.2	–0.50	0.26	0.18
	6	61 (24)	14 (5.5)	Summer	50	0.82	0.19	0.15
	6	61 (24)	28 (11.5)	Summer	50	0.51	0.21	0.15
	3	41 (16)	14 (5.5)[D]	Summer	50	0.77	0.19	0.18
	3	41 (16)	14 (5.5)[D]	Winter	–3.0	–0.36	0.19	0.18
Liquid-applied radiation coating (Rafter and sheathing surface emittance of 0.2)	3	41 (16)	14 (5.5)	Summer	50	0.85	0.21	0.20
	3	41 (16)	14 (5.5)	Winter	–3.1	–0.40	0.21	0.20
	6	61 (24)	14 (5.5)	Summer	50	0.86	0.20	0.20
	6	61 (24)	28 (11.5)	Summer	50	0.86	0.20	0.20
	3	41 (16)	14 (5.5)[D]	Summer	50	0.80	0.19	0.20
	3	41 (16)	14 (5.5)[D]	Winter	–3.0	–0.37	0.20	0.20

[A] All rafters 4 cm (1.5 in.) thick
[B] The temperatures used for the summer condition were 38°C (100°F), 66°C (150°F), and 66°C (150°F) at the top of the attic floor insulation, at the bottom of the attic sheathing, and at the gable ends of the attic, respectively. The temperatures used for the winter condition were 4.4, –18, and –18°C (40, 0, and 0°F) at the top of the attic floor insulation, at the bottom of the attic sheathing, and at the gable ends of the attic, respectively. During the summer the rafter temperature was 5.6°C (10°F) less than the sheathing temperature and during the winter the rafter temperature was 5.6°C (10°F) greater than the sheathing temperature.
[C] Not modeled because the emittance of the plane across the bottom of the rafters is known
[D] Temperature profile applied along width of rafter (fin effect)

Solving for the emittance of the hot surface for the case where the hot and cold areas are equal, that is, as the hot surface approaches the imaginary flat cold surface, the effective emittance of that surface can be expressed as

$$\varepsilon_{\text{effective, analytical}} = \left[\left(\frac{\sigma\left(T_c^4 - T_h^4\right)}{\left(q_c / A_c\right)} - \frac{1}{\varepsilon_c} \right) + 1 \right]^{-1} \quad (3)$$

The opposing surface temperature, T_h, was taken to be the area-weighted average of the surface temperatures 7 to 11 in the rafter enclosure model (Figure 3). The temperatures and heat fluxes from the full three-dimensional radiation models were used to calculate this effective emittance and compared to the assumed ε_c to find that point where the two values were equal.

$$\varepsilon_{\text{effective}} = \varepsilon_c \text{ that corresponds to}$$
$$\varepsilon_{\text{effective, analytical}}(\varepsilon_c, T_c, q_c) = \varepsilon_{c,\text{ numerical}}(T_c, q_c) \quad (4)$$

Table 1 summarizes the effective emittance for 14 combinations of materials and surface temperatures. For the summer conditions, the sheathing, gable ends, attic floor insulation, and rafter temperatures, respectively, were set equal to 339, 339, 311, and 333 K (150, 150, 100, and 140°F). For the winter conditions, the sheathing, attic floor insulation, and rafter temperatures, respectively, were 255, 255, 261, and 277 K (0, 0, 10, and 40°F). These temperatures are consistent with those measured at an experimental attic facility (Miller et al. 2007). The attic modeled here was 8.5 m × 12.8 m (28 ft × 42 ft) with a roof pitch (rise units for every 12 units of run) of either 3 or 6 (corresponding to roof angles of 14° and 27°).

In the equation for effective emittance of the imaginary slant surfaces of attic, the T_c and q_c are a part of the solution obtained in the numerical analysis. In other words, effective emittance is just what the name implies, but is not a property of any real surface unless one actually places a surface in there. Effective emittance depends on all input parameters. Other than the geometry, the significant parameters are the temperatures and the emittance of all other surfaces. So the values for the summer and winter seasons need not be the same.

For the cases where the foil-faced sheathing is placed upon wooden rafters, the overall effective emittance is greater than that of the foil because the foil is recessed within the rafter space and surrounded by materials with a greater emittance. The impact of this recessed effect is most marked in the case where the larger rafters, 4 cm × 28 cm (nominal 2 in. × 12 in.), are used.

RESULTS

To evaluate the potential economic savings due to radiant barriers, state average fuel prices and representative HVAC system efficiencies were applied to the calculated energy savings. For heat pumps and air conditioners, the seasonal efficiencies required in the 2006 Department of Energy standards were used, a Seasonal Energy Efficiency Ratio of 13 and a Heating Season Performance Factor of 7.7, to translate energy savings to electricity savings. For gas furnaces, an efficiency of 0.85 was assumed. Table 2 shows the energy prices used for each analysis location. For all locations, the lesser of the gas heat cost or the electric heat cost was used along with the electric air conditioning.

The results of the parametric evaluation showed that the savings estimates are most sensitive to the climate, then the presence and condition of the ductwork, and finally the effective emittance of the downward facing surface of the roof sheathing (in the range evaluated, from 0.05 to 0.20). Figure 6 shows the annual savings for a 143 m^3 (1540 ft^2) house for cases with no ducts, insulated ducts with a low leakage rate, and uninsulated ducts with a high leakage rate. Values are shown for attics with code-level insulation and houses with only R-19 attic floor insulation.

The influence of climate is immediately obvious, with the savings in zones 4 and 5 about half those in zones 1 and 2. The savings for houses with well-insulated low-leakage attic ducts (labeled "good" in Figure 6) versus houses with no ducts is

Table 2. Energy Prices Taken from EIA 2008 State Average Residential Retail Prices

Zone	City	Electricity (¢ per kWh)	Natural gas ($/1000 ft^3)
1	Miami, FL	11.17	21.29
2	Austin, TX	10.32	13.79
3	Atlanta, GA	9.12	18.5
4	Baltimore, MD	12.36	16.05
5	Chicago, IL	8.52	12.09
6	Minneapolis, MN	7.57	11.3
7	Fargo, ND	6.35	10.34
8	Fairbanks, AK	14.16	8.72

about a factor of two, although the savings for both are small. The savings for houses with poorly-insulated leaking ducts (labeled "poor" in Figure 6) are much greater in Zones 1 and 2, but the impact of duct condition is much less in colder climates, as shown in both Figure 6 and Figure 7. The influence of attic surface emittance on annual savings is relatively small in the range from 0.05 to 0.3, as shown in Figure 8 and by the closeness of the two points shown for each zone/duct condition in Figure 6. The two values shown for each case in this figure correspond to radiant barrier effective emittance of 0.05 (typical for a foil-faced barrier stapled to the bottom of the rafters) and 0.2 (representing a liquid-applied radiation coating covering both the sheathing underside and all exposed rafters). The savings for these two cases are very similar.

DISCUSSION

Our more recent whole-house models are able to provide detailed duct leakage and system run time information

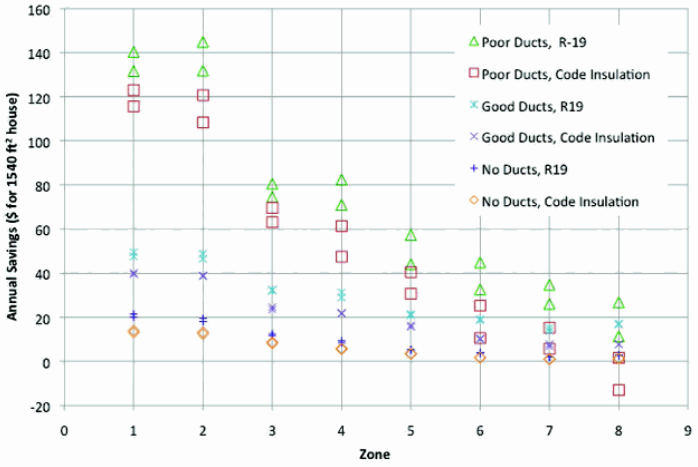

Figure 6 *Individual values shown for radiant barrier emittances of 0.05 and 0.20.*

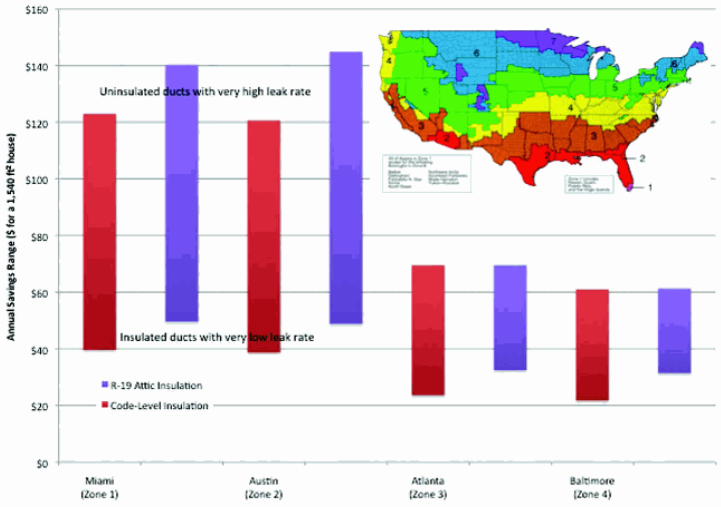

Figure 7 *Range of savings for attics with ducts in poor to good conditions for radiant barrier emittances up to 0.2.*

unavailable with previous hourly models. This more detailed information from the whole house model has in turn enabled us to better apply the attic model to examine the impact of duct leakage. These analyses revealed that the spread in radiant barrier savings estimates is extremely sensitive to this value, especially in the southern climates where radiant barrier savings are positive (see Figure 6 and Figure 7). Moreover, the results were less sensitive to the attic surface emittance for values between 0.05 and 0.3, as shown in Figure 8 for Zone 1.

Previous tools provided to consumers accommodated a large number of inputs, for heating and cooling system efficiency, local utility costs, local installed insulation costs, four levels of attic floor insulation, three different radiant barrier locations, and afforded a selection from 27 locations to match their climate. Fuel cost escalation factors were provided to help the consumer make a life-cycle cost calculation. Savings values were provided for two conditions, with or without ducts in the attic.

However, duct conditions can vary widely and are seldom well-characterized. Most customers will have no idea whether their ducts are leaking 5 or 20% of their conditioned air, or how much insulation is on the ductwork. Moreover, the savings calculations, both for the existing guidance and this new version, are based on a single attic geometry with a single whole-house model. Given these two factors, a detailed consumer tool asking for a host of specific values is likely to create an artificial perception of accuracy. At this point, it is likely that a range of values will be used to provide the information to the consumer, perhaps a graphic similar to Figure 7.

The detailed radiation analysis of the rafter cavity space within the attic environment was initiated because both the AtticSim and EnergyPlus models use a single surface to represent the downward facing side of the attic sheathing. The geometry in most real attics is much more complex; and the radiation heat transfer between this complex surface and the rest of the attic environment is of great interest when comparing the different types of radiant barrier products. Specifically, what is the performance difference between one product that covers every surface with a moderately low emittance coating versus another product that places a very-low emittance on a portion of the downward-facing surface?

The results for this numerical model showed a greater difference from the simple area-average model than was initially expected for the case of the foil-faced sheathing placed upon wood rafters. This difference was less when a temperature gradient was placed on the rafters to better reflect their thermal performance as fins. There were also small differences between the summer and winter effective emittance for the same geometry. This seasonal difference exemplifies one of the model limitations. The use of an artificial surface concept carries the drawback that the 'properties' of this artificial surface depend on the boundary temperatures as well as the geometry and radiation properties of the surrounding real surfaces. This numerical analysis is currently being extended to the point of a complete coupling of the two radiation domains without the use of the artificial surface concept. The expanded analysis will help us to make a more informed choice of an "effective" emittance for use in the simpler attic models.

CONCLUSIONS

Detailed consumer savings calculations are likely to provide a false sense of accuracy considering that the results are extremely sensitive to a factor, duct leakage, that most consumers will be unable to quantify. The update to the Radiant Barrier Factsheet will therefore likely delete the existing

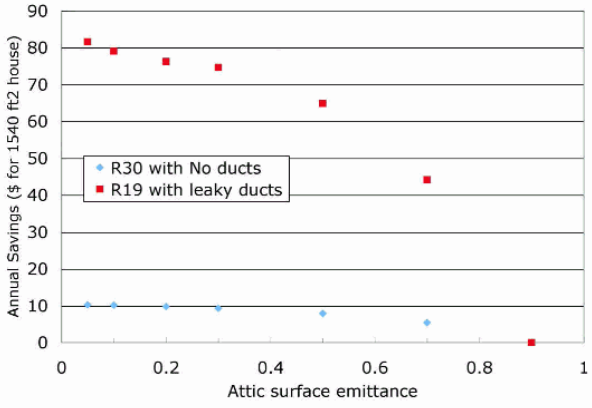

Figure 8 *Annual savings for a house in Zone 1 for various values of radiant barrier surface emittance applied to the underside of the roof only (not on the gable ends).*

calculator model and provide a more generalized guidance with regard to savings magnitudes.

The Fact Sheet guidance will likely include a statement to the effect that: "If you have poorly insulated and leaking ducts in the attic in climate zones 1 and 2 (e.g., Florida, southern parts of Texas), radiant barriers will save $50 to $150 per year. For other conditions and locations, savings will be much smaller or negative."

The numerical analysis shows that the effective emittance of the downward-facing roof surface is very similar for roof sheathing materials with a foil-covered interior surface, and liquid-applied low-emittance coatings. Furthermore, the savings for an emittance ranging from 0.05 to 0.2 were very similar, so consumers will be advised that these two approaches, as well as the use of aluminum foil or metalized film-faced materials stapled to the bottom surface of rafters, should provide similar savings.

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Date Submitted	12/30/2015	**Section**	406.3	**Proponent**	Eric Lacey
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarifies that on-site power production does not factor into the calculation of the Energy Rating Index.

Rationale

See attached Reason Statement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This will improve enforcement by clarifying the scope of the Energy Rating Index.

Impact to building and property owners relative to cost of compliance with code

This proposal will not impact building and property owners relative to cost of compliance.

Impact to industry relative to the cost of compliance with code

This proposal will not impact industry relative to cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

This proposal will add clarity to the energy code, which is part of a comprehensive set of building codes dedicated to the health, safety, and welfare of the general public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal improves the energy code by clarifying the calculation of the Energy Rating Index.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate against any products.

Does not degrade the effectiveness of the code

This proposal improves the effectiveness of the code by adding clarity to the ERI calculation.

Is the proposed code modification part of a prior code version? No

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6933-A1

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** Yes

Rationale

Requires the ERI to be met primarily through energy efficiency and conservation measures, not through on-site power generation with renewables. This assures an efficient house. The mod only allows on site renewable power generation to meet a small portion of the target. Clarifies how to handle ERI method that includes on-site renewable power generation.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Would require the local official to verify that the code submittal shows the ERI achieved without on-site renewable generation for those homes that have on-site renewable power generation.

Impact to building and property owners relative to cost of compliance with code

Clarifies code and allows options for building owners to use some renewables.

Impact to industry relative to the cost of compliance with code

Optional, so no impact unless on-site renewables are used.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; encourages renewables in Florida and provides options while maintaining code effectiveness.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by providing options while maintaining code effectiveness.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; provides additional options.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code; encourages renewables in Florida and provides options while maintaining code effectiveness.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G1

Proponent	Amanda Hickman	Submitted	2/22/2016	Attachments	Yes

Comment:

Please see attached file.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G2

Proponent	Justin Baca	Submitted	2/23/2016	Attachments	Yes

Comment:

See uploaded comment file.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G3

Proponent	Antheil Mike	Submitted	2/24/2016	Attachments	Yes

Comment:

FlaSEIA firmly believes that the Florida Building Commission should reaffirm its commitment to using on-site renewable energy as an energy efficiency and conservation tool for code compliance under the 2015 IECC. Solar energy integrated in to new construction is essential to the perpetuation of efficient building practices. FlaSEIA supports all efforts to keep solar affordable and a desirable option for every homeowner. Resale values of homes with solar have proven the cost-effectiveness of this option. On-site renewable generation is a cost-effective conservation tool under the IECC and is also embraced by the Florida Energy & Efficiency Conservation Act (FEECA) –a utility regulation administered at the Florida Public Service Commission. Continuing the use of renewable on-site generation under the 2015 IECC promotes consistent conservation principles that are deeply rooted in Florida law, and compliments both the legislature's intent and black letter law.
Pursuant to FEECA related statutes in 366.81 and 366.82(3), in addition to the fact that continuing the use of on-site renewable generation under the IECC 2015 is also consistent and complimentary of federal law, FlaSEIA respectfully requests that the Florida Building Commission should reaffirm its commitment to using on-site renewable energy as an energy efficiency and conservation for code compliance under the 2015 IECC. On-site renewable generation is a cost-effective conservation compliance tool since the 1980s under the Florida Energy & Efficiency Conservation Act (FEECA) –a utility regulation administered at the Florida Public Service Commission since the 1980s. Continuing the use of renewable on-site generation under the 2015 IECC promotes consistent conservation principles deeply rooted in Florida law, and compliments both Florida's legislature's intent and Federal Housing Authority's energy efficient loans.

Thank you,

Mike Antheil
Executive Director, FlaSEIA

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G4

Proponent Charles Cottrell **Submitted** 2/24/2016 **Attachments** No

Comment:

Modification EN6933 – Clarifying that No On-Site Power Production Should be Included in ERI Calculation: NAIMA strongly supports the proposal and reason statement filed by the Responsible Energy Code Alliance (RECA) clarifying that the Energy Rating Index does not include on-site power production.

The 2015 International Energy Conservation Code (IECC) under consideration by the Florida Building Commission contains several options for compliance, including the new Energy Rating Index (ERI) option. While NAIMA does not oppose the adoption of the ERI compliance option as published in the 2015 IECC, we are concerned that the methods and computer software used to calculate the ERI will be misapplied, creating substantial credit for the installation of on-site renewable energy generation, including rooftop solar systems. If applied this way, the software could enable homes using on-site renewable generation to be much less energy efficient and still comply with the energy conservation code. The use of on-site generation for compliance is not considered in any way in the 2015 IECC residential requirements.

Trading away energy efficiency improvements for more on-site electricity production actually raises the cost of home ownership by substantially increasing utility bills. It can also create home comfort and moisture problems and require larger HVAC systems. Using on-site energy production instead of building a home with up-to-date energy efficiency measures could result in homes that under-perform for the life of the home – 75 years or longer.

The energy conservation requirements of the Florida' Building Code are intended to promote energy conservation in buildings, and should not relax the efficiency requirements for buildings with systems that simply produce more energy. Allowing on-site power production as a trade off against cost effective energy efficiency measures would have the practical effect of relaxing Florida's Building Energy Code.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G5

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

Comment:

Proposal EN6933 should be approved as an appropriate means to allow use of on-site power generation and avoid the consequence of having it be used to reduce the fundamentally important role of energy efficiency of the building envelope which is the foundation of the energy code. Without efficient envelopes, the value and potential impact of on-site power generation is limited. Thus, maintaining adequate thermal envelopes will encourage the effective use of on-site power generation as is already being experienced in the market. The energy code should encourage the use of on-site renewable power, but not at the expense of long-term, reliable energy efficiency. This proposal will serve the purpose of ensuring an adequate energy code and will not erode or prohibit the use of on-site power generation. In fact, it will increase its value to the overall design of a building.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G6

Proponent Joseph Belcher **Submitted** 2/25/2016 **Attachments** Yes

Comment:

The Florida Home Builders Association supports the flexibility provided to builders and designers in the new Energy Rating Index Method of Section 406 of the base code unmodified. FHBA opposes the modifications suggested by Mod EN6933 for the reasons detailed in the uploaded comment file.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6933-G7

Proponent Michael Fischer **Submitted** 2/25/2016 **Attachments** Yes

Comment:

In support of EN6933; see attached file.

It's a bad idea to waste energy simply because it happens to be generated onsite.

For additional information on the role of renewables, visit: http://www.ase.org/buildingenergycodes

Revise Sections R406.3 and R406.4 as follows:

R406.3 Energy Rating Index. The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the total energy use of the rated design relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the *residential building*, and shall not include the effect of any on-site power production.

R406.4 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value listed in Table R406.4 when compared to the *ERI reference design.* No credit shall be allowed for on-site power production. The ERI report shall demonstrate that no on-site power production has been incorporated into the ERI calculation.

[No changes to section R406.3 of base code.]

R406.4 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value listed in Table R406.4 when compared to the *ERI reference design*. If on-site renewable electric generation is included on a design to meet the required ERI in Table R406.4, then the proposed design must also be simulated without any on-site renewable electric generation and achieve an ERI of 61 or less.

For your consideration, Amanda Hickman, InterCode Incorporated on behalf of The Leading Builders of America (LBA) respectfully submits the following Comment on RECA's Modification Proposal (EN6933).

RECA asserts that the purpose of their modification is to "clarify" that renewables are not permitted in determining the total energy use using Energy Rating Index (ERI) Compliance Alternative under section R406. However, characterizing a significant technical revision as a "clarification" is disingenuous.

RECA sites the 2015 International Energy Conservation Code (IECC) Section R405 (the IECC performance path) as basis for their argument to exclude renewables from the ERI in the 2015 IECC Section R406 (the ERI path). This is because the scoping language of R405 specifically states that the criteria for performance analysis shall include "heating, cooling, and service water heating energy **ONLY**". We agree that performance path (R405) clearly disallows the energy from renewables to be considered as it uses the word "only" after the above-mentioned list of allowed criteria. However, it is a far reach to then make the argument that the scoping section of one path (R405 the performance path) somehow applies to a totally separate compliance path, i.e., R406 (ERI path). This simply is not how the code works.

The International Code Council publishes a "Code Commentary" to provide code users and enforcers with direction and clarification on code language. The "2015 IECC Code Commentary" states what Section R406 Energy Rating Index Compliance Alternative does. It *"provides an ERI with established rating numbers to allow alternative programs using an ERI to be designed to meet these criteria. The section provides guidelines for the development of the index, requirements for documentation to be provided to ensure compliance and a requirement that an approved third party verify that the building complies with the applicable ERI."*
Section R405 and Section R406 have nothing to do with each other.

RECA states in its own rationale that *"popular home energy rating systems and software include the impact of on-site power production in the calculation of energy ratings, that the ERI can also include on-site power production."*

We agree. One such home energy rating systems is HERS, the widely accepted system developed by RESNET. It bases its program's software calculation on ANSI/ICC/RESNET 301-2014. Clearly, on-site power production is included in the calculation criteria of Standard 301. See item 24 from the table below.

ANSI/ICC/RESNET 301-2014, Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
1. Floor/Foundation Assembly	Construction type (slab-on-grade, crawl space; basement), insulation value (edge, under slab, cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), vented or unvented (crawl space), capacitance (if slab or basement receives appreciable solar gain).
2. Walls Assembly	Construction type, insulation value (cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), capacitance, color (light, medium, or dark).
3. Roof/Ceiling Assembly	Construction type, insulation value (cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), framing covered by insulation or exposed, roof color (light, medium, or dark).
4. Rim Joist	Insulation value (cavity, sheathing).
5. Doors	Construction type, insulation value.
6. Windows	Construction type, orientation, U-value (of complete assembly), solar heat gain coefficient (of complete assembly), shading.
7. Skylights	Construction type, orientation, tilt, U-value (of complete assembly), solar heat gain coefficient (of complete assembly), shading.
8. Passive Solar System (Direct Gain system)	Solar type, collector type and area, orientation, tilt efficiency, storage tank size, and pipe insulation value.
9. Solar Domestic Hot Water Equipment	System type, collector type and area, orientation, tilt, efficiency, storage tank size, pipe insulation value.
10. Air Leakage	Air leakage measurement type (default estimate, blower door test, tracer gas test), volume of conditioned space.
11. Distribution System	System type, location, insulation value (duct and pipe), air leakage measurement type (default estimate, duct

ANSI/ICC/RESNET 301-2014, Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
	pressurization).
12. Heating Equipment	Equipment type, location, efficiency (AFUE, HSPF), Auxiliary Electric Energy (Eae); power rating of ground fluid circulating pump(s) for ground-loop and ground-water heat pumps.
13. Cooling Equipment	Equipment type, location, efficiency (SEER, COP).
14. Domestic Hot Water Equipment	Equipment type, location, energy factor or seasonal efficiency, extra tank insulation value, pipe insulation value.
15. Control Systems	Thermostat type.
16. Light Fixtures	Number of Qualifying and non-qualifying Light Fixtures in Qualifying Locations, including (i.e. kitchens, dining rooms, living rooms, family rooms/dens, bathrooms, hallways, stairways, entrances, bedrooms, garages, utility rooms, home offices, and all outdoor fixtures mounted on a building or pole, (excluding landscape lighting).
17. Refrigerator(s)	Total annual energy consumption (kWh) for all units as determined from either the refrigerator Energy Guide label or from age-based defaults as defined in Section 4.2.2.5.2.5.
18. Dishwasher(s)	Labeled energy factor (cycles/kWh) or labeled energy consumption (kWh/y) for all units as defined in Section 4.2.2.5.2.9.
19. Range/Oven	Burner Energy Factor (BEF) and Oven Energy Factor (OEF) as defined in Section 4.2.2.5.2.7.
20. Clothes Washer	Energy Rating (kWh/y), electric rate ($/kWh), annual gas cost (AGC), and gas rate ($/therm) from Energy Guide label; and washer capacity (cubic feet) from manufacturer's data or the CEC database or the EPA ENERGY STAR website as defined in Section 4.2.2.5.2.10.

ANSI/ICC/RESNET 301-2014, Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
21. Clothes Dryer	Clothes washer Modified Energy Factor (MEF) and clothes washer Labeled Energy Rating (kWh/y) from Energy Guide label; clothes washer capacity from manufacturer's data or CEC database or EPA ENERGY STAR website; and clothes dryer Efficiency Factor from CEC database as defined in Section 4.2.2.5.2.8.
22. Ceiling Fans	Labeled cfm, Watts and cfm/Watt at medium fan speed from EPA ENERGY STAR ceiling fan label.
23. Whole-House Mechanical Ventilation System(s)	Equipment type, daily run hours, and wattage (may be listed in a source is the Certified Home Ventilating Products Directory available from the Heating and Ventilation Institute (HVI)).
24. On-site Power Production	Total annual kWh generation and total site fuel used in the On-Site Power Production as derived from manufacturer's performance ratings.

Furthermore, the attempt to constrain the ERI compliance path in this manor violates the spirit of the code. Under the scope of the 2015 IECC there is a section (R102) that deals with Alternative Materials, Design, and Methods of Construction and Equipment. This section states, *"The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction* ***not specifically prescribed by this code****, provided that any such alternative has been approved. The code official shall be permitted to approve an alternative material, design or method of construction where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code."*

The IECC Commentary on this section further clarifies the point by stating the following: *"This section reinforces Section R101.3, which states that the code is meant to be flexible, as long as the intent of the proposed alternative is to promote the effective use of energy.* ***The code is not intended to inhibit innovative ideas or technological advances****.* ***A comprehensive regulatory document such as an energy code cannot envision and then address all future innovations in the***

industry. As a result, a performance code must be applicable to and provide a basis for the approval of an increasing number of newly developed, innovative materials, systems and methods for which no code text or referenced standards yet exist. The fact that a material, product or method of construction is not addressed in the code is not an indication that the material, product or method is prohibited."

Moreover, Florida statute (553.73(9)(a)3,F.S.) requires that code modification proposals *"not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities."* We would argue that this modification aggressively violates the statute eliminating credit for renewables, particularly the use of photovoltaics in an approved code compliance path.

For all of these reasons we strongly recommend that the Florida Building Commission reject RECA's proposed modification.

For your consideration, Amanda Hickman, InterCode Incorporated on behalf of The Leading Builders of America (LBA) respectfully submits the following Comment on RECA's Modification Proposal (EN6933).

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We agree. One such home energy rating systems is HERS, the widely accepted system developed by RESNET. It bases its program's software calculation on ANSI/ICC/RESNET 301-2014. Clearly, on-site power production is included in the calculation criteria of Standard 301. See item 24 from the table below.

ANSI/ICC/RESNET 301-2014, Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
1. Floor/Foundation Assembly	Construction type (slab-on-grade, crawl space; basement), insulation value (edge, under slab, cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), vented or unvented (crawl space), capacitance (if slab or basement receives appreciable solar gain).
2. Walls Assembly	Construction type, insulation value (cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), capacitance, color (light, medium, or dark).
3. Roof/Ceiling Assembly	Construction type, insulation value (cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), framing covered by insulation or exposed, roof color (light, medium, or dark).
4. Rim Joist	Insulation value (cavity, sheathing).
5. Doors	Construction type, insulation value.
6. Windows	Construction type, orientation, U-value (of complete assembly), solar heat gain coefficient (of complete assembly), shading.
7. Skylights	Construction type, orientation, tilt, U-value (of complete assembly), solar heat gain coefficient (of complete assembly), shading.
8. Passive Solar System (Direct Gain system)	Solar type, collector type and area, orientation, tilt efficiency, storage tank size, and pipe insulation value.
9. Solar Domestic Hot Water Equipment	System type, collector type and area, orientation, tilt, efficiency, storage tank size, pipe insulation value.
10. Air Leakage	Air leakage measurement type (default estimate, blower door test, tracer gas test), volume of conditioned space.
11. Distribution System	System type, location, insulation value (duct and pipe), air leakage measurement type (default estimate, duct

ANSI/ICC/RESNET 301-2014, Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
	pressurization).
12. Heating Equipment	Equipment type, location, efficiency (AFUE, HSPF), Auxiliary Electric Energy (Eae); power rating of ground fluid circulating pump(s) for ground-loop and ground-water heat pumps.
13. Cooling Equipment	Equipment type, location, efficiency (SEER, COP).
14. Domestic Hot Water Equipment	Equipment type, location, energy factor or seasonal efficiency, extra tank insulation value, pipe insulation value.
15. Control Systems	Thermostat type.
16. Light Fixtures	Number of Qualifying and non-qualifying Light Fixtures in Qualifying Locations, including (i.e. kitchens, dining rooms, living rooms, family rooms/dens, bathrooms, hallways, stairways, entrances, bedrooms, garages, utility rooms, home offices, and all outdoor fixtures mounted on a building or pole, (excluding landscape lighting).
17. Refrigerator(s)	Total annual energy consumption (kWh) for all units as determined from either the refrigerator Energy Guide label or from age-based defaults as defined in Section 4.2.2.5.2.5.
18. Dishwasher(s)	Labeled energy factor (cycles/kWh) or labeled energy consumption (kWh/y) for all units as defined in Section 4.2.2.5.2.9.
19. Range/Oven	Burner Energy Factor (BEF) and Oven Energy Factor (OEF) as defined in Section 4.2.2.5.2.7.
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ANSI/ICC/RESNET 301-2014, Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
21. Clothes Dryer	Clothes washer Modified Energy Factor (MEF) and clothes washer Labeled Energy Rating (kWh/y) from Energy Guide label; clothes washer capacity from manufacturer's data or CEC database or EPA ENERGY STAR website; and clothes dryer Efficiency Factor from CEC database as defined in Section 4.2.2.5.2.8.
22. Ceiling Fans	Labeled cfm, Watts and cfm/Watt at medium fan speed from EPA ENERGY STAR ceiling fan label.
23. Whole-House Mechanical Ventilation System(s)	Equipment type, daily run hours, and wattage (may be listed in a source is the Certified Home Ventilating Products Directory available from the Heating and Ventilation Institute (HVI)).
24. On-site Power Production	Total annual kWh generation and total site fuel used in the On-Site Power Production as derived from manufacturer's performance ratings.

Furthermore, the attempt to constrain the ERI compliance path in this manor violates the spirit of the code. Under the scope of the 2015 IECC there is a section (R102) that deals with Alternative Materials, Design, and Methods of Construction and Equipment. This section states, *"The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction* ***not specifically prescribed by this code****, provided that any such alternative has been approved. The code official shall be permitted to approve an alternative material, design or method of construction where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code."*

The IECC Commentary on this section further clarifies the point by stating the following: *"This section reinforces Section R101.3, which states that the code is meant to be flexible, as long as the intent of the proposed alternative is to promote the effective use of energy.* ***The code is not intended to inhibit innovative ideas or technological advances****.* ***A comprehensive regulatory document such as an energy code cannot envision and then address all future innovations in the***

industry. As a result, a performance code must be applicable to and provide a basis for the approval of an increasing number of newly developed, innovative materials, systems and methods for which no code text or referenced standards yet exist. The fact that a material, product or method of construction is not addressed in the code is not an indication that the material, product or method is prohibited."

Moreover, Florida statute (553.73(9)(a)3,F.S.) requires that code modification proposals *"not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities."* We would argue that this modification aggressively violates the statute eliminating credit for renewables, particularly the use of photovoltaics in an approved code compliance path.

For all of these reasons we strongly recommend that the Florida Building Commission reject RECA's proposed modification.

FlaSEIA firmly believes that the Florida Building Commission should reaffirm its commitment to using on-site renewable energy as an energy efficiency and conservation tool for code compliance under the 2015 IECC. Solar energy integrated in to new construction is essential to the perpetuation of efficient building practices. FlaSEIA supports all efforts to keep solar affordable and a desirable option for every homeowner. Resale values of homes with solar have proven the cost-effectiveness of this option. On-site renewable generation is a cost-effective conservation tool under the IECC and is also embraced by the Florida Energy & Efficiency Conservation Act (FEECA) –a utility regulation administered at the Florida Public Service Commission. Continuing the use of renewable on-site generation under the 2015 IECC promotes consistent conservation principles that are deeply rooted in Florida law, and compliments both the legislature's intent and black letter law.

Under FEECA, and pursuant to Section 366.81, Florida Statutes,

> "The Legislature finds and declares that it is critical to utilize the most efficient and cost-effective energy conservation systems in order to protect the health, prosperity, and general welfare of the state and its citizens. Reduction in, and control of, the growth rates of electric consumption and of weather-sensitive peak demand are of particular importance. The Legislature further finds that the Florida Public Service Commission is the appropriate agency to adopt goals and approve plans related to the conservation of electric energy and natural gas usage. The Legislature directs the commission to develop and adopt overall goals and authorizes the commission to require each utility to develop plans and implement programs for increasing energy efficiency and conservation within its service area, subject to the approval of the commission. Since solutions to our energy problems are complex, the Legislature intends that the use of solar energy, renewable energy sources, highly efficient systems, cogeneration, and load-control systems be encouraged. [. . .]"

FEECA can be found in Sections 366.80-83, Florida Statutes.

http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0366/Sections/0366.80.html

See also, Section 366.82(3), Florida Statutes where solar PV up to 2MWs is statutorily characterized and treated as a conservation measure: "(3) In developing the goals, the commission shall evaluate the full technical potential of all available demand-side and supply-side conservation and efficiency measures, including demand-side renewable energy systems [. . .]"

http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0366/Sections/0366.82.html

FEDERAL ENERGY EFFICIENT LOANS

In addition, continuing the use of on-site renewable generation under the IECC 2015 is also consistent and complimentary of federal law. Under the Federal Housing Authority's energy efficient mortgages, on-site use of solar as an energy conservation measure is specifically enumerated as a qualifying measure to obtain the loan: http://programs.dsireusa.org/system/program/detail/742

These FHA loans allow lenders to add up to 100% of energy efficiency improvements to an existing mortgage loan with certain restrictions. FHA mortgage limits vary by county, state and the number of units in a dwelling.

See FHA link, http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/eem/energy-r

CONCLUSION

In conclusion, FlaSEIA respectfully requests that the Florida Building Commission should reaffirm its commitment to using on-site renewable energy as an energy efficiency and conservation for code compliance under the 2015 IECC. On-site renewable generation is a cost-effective conservation compliance tool since the 1980s under the Florida Energy & Efficiency Conservation Act (FEECA) –a utility regulation administered at the Florida Public Service Commission since the 1980s. Continuing the use of renewable on-site generation under the 2015 IECC promotes consistent conservation principles deeply rooted in Florida law, and compliments both Florida's legislature's intent and Federal Housing Authority's energy efficient loans.

Thank you,

Mike Antheil
Executive Director, FlaSEIA
2555 Porter Lake Dr. Suite 106
Sarasota FL 34240
321.220.0371

CC: FlaSEIA Board of Directors

The Florida Home Builders Association opposes Modification EN6933 and strongly supports the Public Comment submitted by the Leading Builders of America (LBA). The rationale for Mod 6933 begins by stating the modification is a clarification. The modification is not a clarification, but is most definitely an attempt to change the code. There is nothing in the IECC 2015 Section 406 or elsewhere that precludes including On-Site Power Production or Renewable Energy Systems in the energy efficient design of a home. The intent of the proponent is to change the code for the benefit of certain proprietary materials and manufacturers; not to clarify the code. **The Florida Home Builders Association supports the flexibility provided to builders and designers in the new Energy Rating Index Method of Section 406 of the base code unmodified.**

It is not possible for any code to address all the permutations and variations involved with buildings and building systems. An item, a system, or an aspect of a building that is not addressed by the code does not automatically become disallowed by omission. If such were the case the codes would be lengthy lists of items to make sure they were permitted. While the IECC does not specifically address On-Site Power Production or Renewable Energy Systems, such systems are recognized in nationally recognized standards in use today, one of which is proposed for adoption in the FBC-EC, 6th Edition (EN6728). The widely accepted rating system HERS developed by RESNET now uses ANSI/ICC/RESNET 301 for the base of its software calculation. These rating systems are often used to determine compliance with the code and to demonstrate above-code features of a structure. ANSI/ICC/RESNET 301 contains definitions for these systems:

> ***"On-Site Power Production (OPP)*** – Electric power produced at the site of a Rated Home. OPP shall be the net electrical power production, such that it equals the gross electrical power production minus any purchased fossil fuel energy used to produce the on-site power, converted to equivalent electric energy use at a 40% conversion efficiency in accordance with Equation 4.1-3."
>
> ***"Renewable Energy System*** – Means of producing thermal energy or producing electric power that rely on naturally-occurring, on-site resources that are not depleted as a result of their use. Renewable Energy Systems shall include, but are not limited to, solar energy systems, wind energy systems and biomass energy systems."[1]

In addition to the recognition of On-Site Power Production at Table 4.4.2(1) Item 24, as documented by the LBA Public Comment in opposition to Mod EN6933, various types of solar systems are also included in the calculation criteria of ANSI/ICC/RESNET 301 at Table 4.4.2(1) Minimum Rated Features. The proposed modification is a blatant attempt to preclude the use of On-Site Power Production and Renewable Energy Systems to the benefit of other proprietary systems and manufacturers; not to clarify the code. **The Florida Home Builders Association supports the flexibility provided to builders and designers in the new Energy Rating Index Method of Section 406 of the base code unmodified.**

ANSI/ICC/RESNET 301-2014 Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
1.Floor/Foundation Assembly	Construction type (slab-on-grade, crawl space; basement), insulation value (edge, under slab, cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), vented or unvented (crawl space), capacitance (if slab or basement receives appreciable solar gain).

[1] ANSI/ RESNET/ICC 301-2014; First Published March 7, 2014, Republished January 15, 2016; Residential Energy Services Network, Inc. P.O. Box 4561 Oceanside, CA 92052-4561 http://resnet.us/; International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, D.C. 20001 www.iccsafe.org

ANSI/ICC/RESNET 301-2014 Table 4.4.2(1) Minimum Rated Features

Building element	Minimum Rated Feature
2.Walls Assembly	Construction type, insulation value (cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), capacitance, color (light, medium, or dark).
3.Roof/Ceiling Assembly	Construction type, insulation value (cavity, sheathing), framing material and on-center spacing, insulation installation (Grade I, II, or III), framing covered by insulation or exposed, roof color (light, medium, or dark).
4.Rim Joist	Insulation value (cavity, sheathing).
5.Doors	Construction type, insulation value.
6.Windows	Construction type, orientation, U-value (of complete assembly), solar heat gain coefficient (of complete assembly), shading.
7. Skylights	Construction type, orientation, tilt, U-value (of complete assembly), solar heat gain coefficient (of complete assembly), shading.
8. Passive Solar System (Direct Gain system)	Solar type, collector type and area, orientation, tilt efficiency, storage tank size, and pipe insulation value.
9. Solar Domestic Hot Water Equipment	System type, collector type and area, orientation, tilt, efficiency, storage tank size, pipe insulation value.
24.On-site Power Production	Total annual kWh generation and total site fuel used in the On-Site Power Production as derived from manufacturer's performance ratings.

The following brief responses are offered in response to the Reason Statement submitted by the proponent of Mod EN6933.

Proponent's Reason Statement	Response
The purpose of this proposal is to clarify that the Energy Rating Index calculation does not include on-site power production such as solar photovoltaics. It also provides more specific guidance to software providers in order to help maintain consistency between software and code compliance. Our understanding is that the current Florida Building Code, Energy Conservation does not award credit for on-site power production in Section R405 simulated performance alternative, and this proposal would maintain a consistent approach to on-site power production across all compliance paths (including the new ERI path, if adopted).	1. The change is not a clarification but a code change. 2. The adoption of ANSI/RESNET/ICC 301-2014 will specifically recognize On-Site Power Production and Renewal Energy Systems. (See Item above.) 3. It is true that R405 does not award credit; however, R406 is a new Section presenting another method which recognizes all systems. The two methods are independent and separate. There should not be

	consistency because the ERI includes all building energy uses and Section 405 includes only heating, cooling, hot water and lighting energy. Further, the overall efficiency for homes complying through Section R406 is approximately 20% greater than required by Section R405. These two paths are not equivalent, or intended to be so, in any way.
The plain language of Section R406 does not permit the inclusion of electricity production in ERI calculations. Consistent with the scope outlined in Section R101.3 of the 2014 Florida Building Code, Energy Conservation, to "regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building," the language establishing the ERI in Section R406 focuses on energy *use* and *loads*, not the *production* of energy. The methodology prescribed by the ERI provisions does not mention the use of renewable energy or other on-site energy production, and these issues were not adequately analyzed or addressed during the 2015 IECC code development process.	If the intent was to prohibit the inclusion of electricity production in ERI calculations, the code would so state. The fact that On-Site Power Production and Renewable Energy Systems are not specifically included in the code does not mean they are precluded or prohibited. The code is designed to allow innovation where performance can be demonstrated.
However, some have suggested that because popular home energy rating systems and software do include the impact of on-site power production in the calculation of energy ratings, that the ERI can also include on-site power production. We are concerned that allowing on-site energy production could open up Pandora's Box, broadening the scope of the 6th Edition Code well beyond the intended scope. This code change proposal will clarify that regardless of the energy rating software used, the ERI calculation shall not include renewable or other on-site energy production. It should be noted that current software can still be used to calculate the ERI under this proposal, so long as no on-site power production is input into the calculation.	Again, the proposal is not a clarification, but a code change vastly exceeding the intent of the base code. There is no intent or provision in the base code prohibiting or precluding the use of renewable energy systems or on-site power production. Nationally recognized rating systems give credit for such systems.
To allow unrestricted trade-offs for on-site power production would bring about several unintended consequences. The most significant problem would be a reduction in thermal	1. This report fairly clearly shows that if a home meets the prescriptive requirements of the

envelope efficiency in favor of more on-site power production. For example, a recent report analyzed the potential impact of solar photovoltaics on the HERS Index. *See* Residential Energy Services Network, Inc., *The Impact of Photovoltaic Arrays on the HERS Index* (2015), http://www.academia.edu/15036659/The_Impact_of_Photovoltaic_Arrays_on_the_HERS_Index. This report found that in most parts of the country, a 4 kW photovoltaic array could reduce a HERS Index Score by 20-40 points. In Miami, for example, the analysis found that a 4kW system could reduce a HERS score by 26-32 points. *Id*. at 3.	2015 IECC and is equipped with 4 kWp PV, then it will obtain HERS Index scores that will allow it to comply through Section R406 of the code. The home would not come anywhere close to complying with R406 by just meeting the prescriptive requirements of 2015 IECC. 2. Yes, from about 80 to about 50, which is the required ERI compliance score in these areas. And this is for a home that complies with the 2015 IECC prescriptive requirements. This appears to make the case that the Sunshine State should take advantage of the abundant sunshine.
If the 6th Edition Code were amended to allow direct, unlimited trade-offs between electricity generation and the efficiency of the thermal envelope, it would virtually eliminate the need to incorporate efficiency measures into the home to meet the code, wiping out many years of progress in improving the energy efficiency of homes. This is fundamentally inconsistent with the scope and intent of the Florida Building Code, Energy Conservation, and it should not be permitted.	The purpose of energy efficiency provisions in the code is not to sell or promote products, materials, or systems. The overall goal of energy efficiency should be to allow the use of energy without negative impact on the environment or the planet. Converting natural sources freely available into useable energy with no effect on the planet is possible and should be pursued.
To be clear, this proposal does not take any position on the value of solar photovoltaics or other types of generation in themselves. Nor does this proposal affect the use of these systems in Florida homes. We note that sustainability-oriented and green codes such as the IgCC and ICC- 700 have addressed on-site power production, along with other sustainability-oriented measures that are beyond the scope of an energy conservation code. However, to begin allowing electric generation to replace critical energy efficiency measures in the 6th Edition Code, such as a good thermal envelope, will result in higher peak demands, less occupant comfort and substantial additional energy use given the much longer typical life of envelope measures. And given the uncertain future of net-metering or incentive programs, or the possibility that panels could be removed, a homeowner could be stuck with huge energy bills and higher costs over the long run. For all these reasons, we recommend that the Florida Building Code, Energy Conservation be clarified to	There is no evidence to support this assertion. In fact, there is some new evidence from field studies of code compliance that new homes are actually exceeding code

specifically exclude on-site power production from the ERI calculation.	requirements for building efficiency.

FBC Mod EN6933.

In support of this mod.

Note that this Mod is intended to clarify the intent of the energy code to ensure that buildings are designed and constructed in accordance with the minimum provisions of the code. The inclusion of the ERI path is a positive step in code development, but as Florida determines whether or not to include this ERI option in the 2017 Florida Energy Code, it is critical to avoid any potential rollbacks of the current code.

The use of on-site renewables as a trade-off for other building features, including opaque walls and roofs, ceiling insulation, roof reflectance, HVAC equipment efficiency, and fenestration performance is not appropriate. Some commenters have pointed out that the ANSI/ICC/RESNET 301-2014 Standard includes the option to use onsite renewables to determine a HERS Score. That standard, however, is not referenced in the 2015 IECC. It will likely be the subject of discussion for the 2018 IECC but the standard has not been yet reviewed by the IECC code committee or the ICC governmental members. Those arguments are not valid.

The Florida Code development process requires that modifications to the base codes have a Florida-specific need. In the case of the ERI option, it is critical that the Florida Building Commission affirm the obvious need to maintain an energy efficient building design, so that the benefits of on-site renewables such as rooftop mounted photovoltaics are used to improve the energy footprint of the building and not to replace other efficiency measures.

Some may declare that using renewables to determine the ERI will simply increase options and flexibility of the code, but make no mistake; such an approach would be a step backwards. The current text of the section proposed for inclusion in the Florida Energy Code includes:

“The ERI shall consider all energy used in the residential building”.

Onsite power production is not “energy used”.

Renewable energy, including onsite power generation, is an important tool towards zero-net energy goals. It would be a shame to allow the technology to undo decades of progress to improve Florida’s buildings.

Respectfully submitted,

Mike Fischer
Director of Codes and Regulatory Compliance
Kellen

Reason Statement for Proposal to Clarify that No On-Site Power Production Should Be Included in ERI Calculation

The purpose of this proposal is to clarify that the Energy Rating Index calculation does not include on-site power production such as solar photovoltaics. It also provides more specific guidance to software providers in order to help maintain consistency between software and code compliance. Our understanding is that the current Florida Building Code, Energy Conservation does not award credit for on-site power production in Section R405 simulated performance alternative, and this proposal would maintain a consistent approach to on-site power production across all compliance paths (including the new ERI path, if adopted).

The plain language of Section R406 does not permit the inclusion of electricity production in ERI calculations. Consistent with the scope outlined in Section R101.3 of the 2014 Florida Building Code, Energy Conservation, to "regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building," the language establishing the ERI in Section R406 focuses on energy *use* and *loads*, not the *production* of energy. The methodology prescribed by the ERI provisions does not mention the use of renewable energy or other on-site energy production, and these issues were not adequately analyzed or addressed during the 2015 IECC code development process.

However, some have suggested that because popular home energy rating systems and software do include the impact of on-site power production in the calculation of energy ratings, that the ERI can also include on-site power production. We are concerned that allowing on-site energy production could open up Pandora's Box, broadening the scope of the 6th Edition Code well beyond the intended scope. This code change proposal will clarify that regardless of the energy rating software used, the ERI calculation shall not include renewable or other on-site energy production. It should be noted that current software can still be used to calculate the ERI under this proposal, so long as no on-site power production is input into the calculation.

To allow unrestricted trade-offs for on-site power production would bring about several unintended consequences. The most significant problem would be a reduction in thermal envelope efficiency in favor of more on-site power production. For example, a recent report analyzed the potential impact of solar photovoltaics on the HERS Index. *See* Residential Energy Services Network, Inc., *The Impact of Photovoltaic Arrays on the HERS Index* (2015), http://www.academia.edu/15036659/The_Impact_of_Photovoltaic_Arrays_on_the_HERS_Index . This report found that in most parts of the country, a 4 kW photovoltaic array could reduce a HERS Index Score by 20-40 points. In Miami, for example, the analysis found that a 4kW system could reduce a HERS score by 26-32 points. *Id*. at 3.

If the 6th Edition Code were amended to allow direct, unlimited trade-offs between electricity generation and the efficiency of the thermal envelope, it would virtually eliminate the need to incorporate efficiency measures into the home to meet the code, wiping out many years of progress in improving the energy efficiency of homes. This is fundamentally inconsistent with the scope and intent of the Florida Building Code, Energy Conservation, and it should not be permitted.

To be clear, this proposal does not take any position on the value of solar photovoltaics or other types of generation in themselves. Nor does this proposal affect the use of these systems in

Florida homes. We note that sustainability-oriented and green codes such as the IgCC and ICC-700 have addressed on-site power production, along with other sustainability-oriented measures that are beyond the scope of an energy conservation code. However, to begin allowing electric generation to replace critical energy efficiency measures in the 6th Edition Code, such as a good thermal envelope, will result in higher peak demands, less occupant comfort and substantial additional energy use given the much longer typical life of envelope measures. And given the uncertain future of net-metering or incentive programs, or the possibility that panels could be removed, a homeowner could be stuck with huge energy bills and higher costs over the long run. For all these reasons, we recommend that the Florida Building Code, Energy Conservation be clarified to specifically exclude on-site power production from the ERI calculation.

Date Submitted	12/18/2015	**Section**	406.6.1	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Energy Rating Index software tool specification

Rationale

Specifies the same compliance software tool requirement that the Florida Supplement to the 2015 IECC requires for Section R405 (performance) compliance; needed to insure calculation integrity and consistency.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Facilitates code enforcement by providing clarity and consistency with performance compliance method.

Impact to building and property owners relative to cost of compliance with code

None or reduces code compliance cost as separate software tool documentation is not required (once software is approved by FBC) and requiring FBC approval provides an equal playing field for all software tools, facilitating cost consistency.

Impact to industry relative to the cost of compliance with code

None or reduces code compliance cost as separate software tool documentation is not required, and requiring FBC approval provides an equal playing field for all software tools, facilitating cost consistency.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Public is served by providing clear specifications on how to ensure software tool accuracy and consistency.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Code is improved by providing clear specifications on how to ensure software tool accuracy and consistency.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; requiring FBC approval provides an equal playing field for all software tools.

Does not degrade the effectiveness of the code

Enhances the effectiveness of the code by providing a means of ensuring software tool accuracy and consistency.

Is the proposed code modification part of a prior code version? No

R406.6.1 Compliance software tools.

Computer software utilized for demonstration of code compliance shall have been approved by the Florida Building Commission in accordance with requirements of this code. ~~Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.~~

Date Submitted	12/21/2015	**Section**	406	**Proponent**	Jeff Sonne / FSEC
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6728

Summary of Modification

Energy Rating Index inconsistency correction and Standard

Rationale

There is an inconsistency in the base code. Section R406.3.1 of the base code requires that the proposed residential building be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design. This section in effect makes the ERI required to pass the code 100 or less, while Table R406.4 requires an ERI of 52 or less in Florida (Climate Zones 1 and 2). This proposed modification removes the confusing language such that the index level required is that given in Table R406.4.

Rationale for including the new ANSI/RESNET/ICC Standard is that it provides a consistent, uniform methodology for evaluating residential energy performance.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Helpful to local entity as it resolves a code inconsistency and provides a uniform energy rating methodology.

Impact to building and property owners relative to cost of compliance with code

No impact or lowers cost; resolves a code inconsistency and provides a uniform energy rating methodology.

Impact to industry relative to the cost of compliance with code

No impact or lowers cost; resolves a code inconsistency and provides a uniform energy rating methodology.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Benefits the general public as it removes a code inconsistency and provides a uniform energy rating methodology.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by removing a code inconsistency and providing a uniform energy rating methodology.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; removes a code inconsistency and provides a uniform energy rating methodology.

Does not degrade the effectiveness of the code

Improves code effectiveness by removing a code inconsistency and providing a uniform energy rating methodology.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6727-G1

Proponent Jay Crandell **Submitted** 2/25/2016 **Attachments** No

Comment:

Proposal EN6727 should be disapproved because it references a standard (RESNET 301) which is conflicted in a significant way with the goals and intent of the existing ERI provisions, the performance path of the code, and also the equivalency mandate for alternative means and methods. For example, it will allow on-site electricity generation to be used to weaken long-term (permanent) energy conservation provided by the building envelope. On-site electricity generation should be (and is) used, but should not be promoted in the code at the expense of important and permanent energy conservation measures intended to work in concert with on-site electricity generation. And, it should be done in a way that does not create conflicts and inequities among the compliance paths within the code. For these reasons, EN6727 should be disapproved.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6727-G2

Proponent Jeff Sonne / FSEC **Submitted** 2/25/2016 **Attachments** No

Comment:

In response to comment EN6727-G1, please see FSEC's alternate language comment 6933-A1 which limits on-site renewable power generation to meet the ERI (R406) code compliance option. We agree with the general goal of comment EN6727-G1. We don't want to reduce energy conservation measures; we believe FSEC's comment 6933-A1 will achieve the same level of conservation as the performance (R405) method while still allowing the option of on-site renewable power generation to go beyond the performance code compliance level to meet the stricter level of performance required for ERI.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6727-G3

Proponent	Eric Lacey	Submitted	2/25/2016	Attachments	Yes

Comment:

See attached comment.

R406.3 Energy Rating Index.

The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the ~~total energy use~~ annual total normalized modified loads of the ~~rated design~~ *rated design* relative to the annual total ~~energy use~~ loads of the *ERI reference design.* The ERI shall consider all energy used in the *residential building.*

R406.3.1 ERI reference design.

The *ERI reference design* shall be configured such that it meets the minimum requirements of the 2006 *International Energy Conservation Code* prescriptive requirements.

~~The proposed *residential building* shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the *ERI reference design.*~~

R406.4 ERI-based compliance.

The ERI for the *rated design* shall be determined in accordance with ANSI/RESNET/ICC 301-2014, including Addendum A-2015, and ~~Compliance based on an ERI analysis requires that the *rated design* be shown to have an~~ ERI less than or equal to the appropriate value listed in Table R406.4 ~~when compared to the *ERI reference design*~~.

[No other changes to Section R406.]

Responsible Energy Codes Alliance Comment on Proposal EN6727

Proposal EN6727 should not be approved because it could fundamentally alter the nature of the 2015 IECC Energy Rating Index, and the potential impacts are not yet fully known. RESNET 301 is not referenced in the 2015 IECC, nor has it yet been fully vetted through the ICC process. Before adopting this code change and designating a single standard as the exclusive approach to calculate compliance under the ERI, a careful and detailed review and assessment of all of the provisions of the standard would need to be conducted. Without such a review by either the Commission or through the ICC process, it would be impossible to conclude that the standard is a reasonable substitute for the ERI. Our understanding is that RESNET 301 will be fully considered this year at ICC as part of the 2018 IECC/IRC update process, and we strongly recommend that the Commission not approve EN6727, but instead wait until the ICC process plays out before considering a proposal like this. This would avoid a premature adoption of the standard and an unnecessary waste of resources to evaluate it.

Further, by replacing the established ERI calculation process as reflected in the language of the code with a reference to an external standard (which is maintained and controlled by a body outside of the Florida Building Commission's control), this proposal would transfer an unnecessary and/or undesirable amount of authority over an entire code compliance path to a single outside non-governmental entity. As the RESNET standard is amended or updated in the future, there is a real risk that new issues outside the current scope of the IECC and/or the Florida Building Code could be incorporated into that standard.

In fact, there is already considerable concern that referencing RESNET 301 could incorporate provisions of the standard that are not allowed under the IECC's ERI. A good example is the fact that unlimited on-site electricity generation is permitted under RESNET 301, but such generation is not currently incorporated at all into the ERI rating. In order to address this concern, if RESNET 301 were adopted, we believe that this issue should be addressed explicitly by the Commission and that the Commission should specifically clarify that on-site generation is not allowed to be considered in the ERI.

Date Submitted	1/1/2016	**Section**	502	**Proponent**	Jeff Sonne / FSEC
Chapter	5	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarify simulated performance compliance for additions and add Energy Rating Index compliance alternative for additions.

Rationale

Removes the IECC's energy cost language for residential additions and provides that performance compliance for additions is calculated as for whole house projects. Also provides an Energy Rating Index compliance alternative for additions.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None for performance compliance; consistent with current Florida code. Local entity would need to be aware of the Energy Rating Index alternative option.

Impact to building and property owners relative to cost of compliance with code

None for performance compliance; consistent with current Florida code. Energy Rating Index alternative is optional / provides another compliance path for additions.

Impact to industry relative to the cost of compliance with code

None for performance compliance; consistent with current Florida code. Energy Rating Index alternative is optional / provides another compliance path for additions.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes; clarifies the performance compliance method for additions. Energy Rating Index alternative provides another compliance path option for additions.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by clarifying the performance compliance method for additions. Energy Rating Index alternative improves the code by providing another compliance path option for additions.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate; clarifies the code and provides another compliance path option for additions.

Does not degrade the effectiveness of the code

Improves code effectiveness by clarifying it and providing another compliance path option for additions.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

OTHER

Explanation of Choice

Needed for Florida to provide consistency with the state's whole-house performance compliance method.

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

R502.1 General.
Additions to an existing building, building system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this code. Additions shall not create an unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code where the addition alone complies, where the existing building and addition comply with this code as a single building, or where the building with the addition uses no more energy than the existing building. Additions shall be in accordance with Section R502.1.1, ~~or~~ R502.1.2 or R502.1.3.

R502.1.2 ~~Existing plus addition compliance (~~Simulated Performance Alternative~~).~~
~~Where nonconditioned space is changed to conditioned space, the addition shall comply where the annual energy cost or energy use of the addition and the existing building, and any alterations that are part of the project, is less than or equal to the annual energy cost of the existing building when modeled in accordance with Section R405.~~ The addition ~~and any alterations that are part of the project~~ or existing building and addition together shall comply with Section R405 in its entirety.

R502.1.3 Energy Rating Index Compliance Alternative.
The addition or existing building and addition together shall comply with Section R406 in its entirety.

Date Submitted	1/1/2016	**Section**	6	**Proponent**	Jennifer Hatfield
Chapter	2717	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Submitting same for residential reference standards.

Summary of Modification

Corrects Association information, updates APSP-14 Standard to latest edition, and corrects code section number.

Rationale

Corrects Association information because currently lists the wrong Association related to the standard listed. Updates the APSP-14 Standard to the latest edition and corrects code section number.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Makes two corrections to assist in the enforcement of the code and updates existing standard to latest edition.

Impact to building and property owners relative to cost of compliance with code

None. Updates existing standard to latest edition.

Impact to industry relative to the cost of compliance with code

None. Updates existing standard to latest edition.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, keeps up with the latest edition of a national consensus standard.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, keeps up with the latest edition of a national consensus standard.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No, does not discriminate, simply updates standard to latest edition.

Does not degrade the effectiveness of the code

No, does not degrade the effectiveness of the code. Change updates standard to latest edition.

Is the proposed code modification part of a prior code version? No

APSP ~~**American Architectural Manufacturers Association**~~

~~1827 Walden Office Square~~

~~Suite 550~~

~~Schaumburg, IL 60173-4268~~

Association of Pool and Spa Professionals

2111 Eisenhower Avenue, Suite 500

Alexandria, VA 22314

Standard reference number	Title	Referenced in code section number
ANSI/APSP/ICC 14-1~~1~~4	American National Standard for Portable Electric Spa Energy Efficiency	C4 04.8~~1~~0

Date Submitted	12/21/2015	**Section**	6	**Proponent**	Jeff Sonne / FSEC
Chapter	2717	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6573, 6764 and 6765

Summary of Modification

Add ANSI/RESNET/ICC 380-2016 Standard as residential building air leakage testing reference and delete the existing reference.

Rationale

Provides reference for ANSI/RESNET/ICC Standard included in residential energy code modification proposals 6573, 6764 and 6765.
It is appropriate to use this standard as it is the new American National Standard promulgated for air leakage testing purposes.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None; reference only.

Impact to building and property owners relative to cost of compliance with code

None; reference only.

Impact to industry relative to the cost of compliance with code

None; reference only.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Serves the public by providing a new residential building and duct system air leakage testing ANSI reference.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Helps clarify the code by providing a new residential building air leakage and duct system testing ANSI reference.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No; reference only.

Does not degrade the effectiveness of the code

No; reference only.

Is the proposed code modification part of a prior code version? No

ANSI	American National Standards Institute 25 West 43rd Street Fourth Floor New York, NY 10036	
Standard reference number	Title	Referenced in code section number
ANSI/RESNET/ICC 380-2016	Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems and Airflow of Mechanical Ventilation Systems	R402.4.1.2, R403.3.2, Table R405.5.2(1) and Appendix D

~~RESNET~~	~~Residential Energy Services Network, Inc.~~ ~~2170 E. El Camino Real~~ ~~Oceanside, CA 92054~~	
Standard reference number	Title	Referenced in code section number
	~~2006 Mortgage Industry National Home Energy Rating Systems Standards (March 2, 2012 edition).~~	~~R403.2.2, Table R405.5.2(1)~~

EN6728

Date Submitted	12/21/2015	**Section**	6	**Proponent**	Jeff Sonne / FSEC
Chapter	2717	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

6727

Summary of Modification

Add ANSI/RESNET/ICC 301-2014 and Addendum A-2015 Standards references.

Rationale

Provides standard references for calculation of the residential Energy Rating Index (ERI) as specified in code mod 6727.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None; reference only.

Impact to building and property owners relative to cost of compliance with code

None; reference only.

Impact to industry relative to the cost of compliance with code

None; reference only.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Serves the public by providing references for the residential Energy Rating Index (ERI) calculation.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Helps clarify the code by providing references for the residential Energy Rating Index (ERI) calculation.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No; reference only.

Does not degrade the effectiveness of the code

No; reference only.

Is the proposed code modification part of a prior code version? No

ANSI	American National Standards Institute 25 West 43rd Street Fourth Floor New York, NY 10036	
Standard reference number	Title	Referenced in code section number
ANSI/RESNET/ICC 301-2014	Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index	R406.4
ANSI/RESNET/ICC 301-2014, Addendum A-2015	Amendment on Domestic Hot Water Systems	R406.4

EN7064

Date Submitted	1/1/2016	**Section**	6	**Proponent**	Jennifer Hatfield
Chapter	2717	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

7063

Summary of Modification

Updates the APSP-14 Standard to latest edition and corrects title and edition of the APSP-15 Standard.

Rationale

Updates the APSP-14 Standard to latest edition and corrects title and edition of the APSP-15 Standard. Corrects section number references.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Updates existing standards to latest editions.

Impact to building and property owners relative to cost of compliance with code

None. Updates existing standards to latest editions.

Impact to industry relative to the cost of compliance with code

None. Updates existing standards to latest editions.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, keeps up with the latest edition of national consensus standards.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, keeps up with the latest edition of national consensus standards and corrects code section references.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No, does not discriminate, simply updates standards to latest edition.

Does not degrade the effectiveness of the code

No, does not degrade the effectiveness of the code. Change updates standards to latest edition.

Is the proposed code modification part of a prior code version? No

APSP **~~The~~ Association of Pool and Spa Professionals**

2111 Eisenhower Avenue, Suite 500

Alexandria, VA 22314

Standard reference number	Title	Referenced in code section number
ANSI/APSP/ICC 14-1~~1~~4	American National Standard for Portable Electric Spa Energy Efficiency	R~~403.10.1,~~ 403.11
ANSI/APSP/ICC 15~~a 2013~~11	American National Standard for Residential Swimming Pool and Spa Energy Efficiency with Addenda A approved January 9, 2013	R403.10.1, R403.12

Sub Code: Existing Building

Date Submitted	9/23/2015	**Section**	701.2	**Proponent**	Michael Goolsby
Chapter	7	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

None

Summary of Modification

Prevent Reduction of Energy Efficiency when a building is entirely exempt from the FBC, Energy Efficiency volume.

Rationale

This modification will ensure current levels of energy efficiency may not be reduced or completely eliminated in the event a building is exempt from compliance with the levels of energy efficiency for new construction established in the Florida Building Code, Energy Efficiency volume.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Simplifies enforcement by clarifying current levels of energy efficiency may not be reduced or eliminated when removing and replacing building components, systems or materials.

Impact to building and property owners relative to cost of compliance with code

Clarifies current levels of energy efficiency may not be reduced or eliminated.

Impact to industry relative to the cost of compliance with code

Removes confusion related to energy compliance by clarifying current levels of energy efficiency may not be reduced or eliminated when removing and replacing building components, systems or materials.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

It does so by ensuring current levels of energy efficiency may not be lessened or eliminated.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

It does so by ensuring current levels of energy efficiency may not be lessened or eliminated.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This modification provides guidance for maintaining existing levels of energy efficiency and does not limit the use or compliance of materials.

Does not degrade the effectiveness of the code

This modification improves the effectiveness of the code by ensuring current levels of energy efficiency may not be lessened or eliminated.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

701.2 Conformance.

An *existing building* or portion thereof shall not be altered such that the building becomes less safe or energy efficient than its existing condition.

Maintaining existing levels of energy efficiency in the hot humid climate of Florida is critical in maintaining the health and welfare of residents.

Sub Code: Residential

EN6819

Date Submitted	12/28/2015	**Section**	303.4	**Proponent**	Joseph Belcher
Chapter	3	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Modify air changes triggering whole house mechanical ventilation.

Rationale

See uploaded Support File for Rationale

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to cost of code enforcement for local entity.

Impact to building and property owners relative to cost of compliance with code

Possible reduction in costs to building and property owners not required to install whole-house mechanical ventilation system.

Impact to industry relative to the cost of compliance with code

Possible reduction in costs to industry where not required to install whole-house mechanical ventilation system.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, the proposal will improve the health, safety, and welfare of the general public by instituting a reasonable level for requiring whole house mechanical ventilation systems.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposal improves the code by instituting a reasonable level for requiring whole house mechanical ventilation systems.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No, does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

No, the provision approves the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

1st Comment Period History 01/13/2016 - 02/25/2016

EN6819-G1

Proponent	Mike Moore	**Submitted**	2/22/2016	**Attachments**	Yes

Comment:

Please see attached rationale for disapproval of this proposal.

1st Comment Period History 01/13/2016 - 02/25/2016

EN6819-G2

Proponent	Jeff Sonne / FSEC	**Submitted**	2/25/2016	**Attachments**	No

Comment:

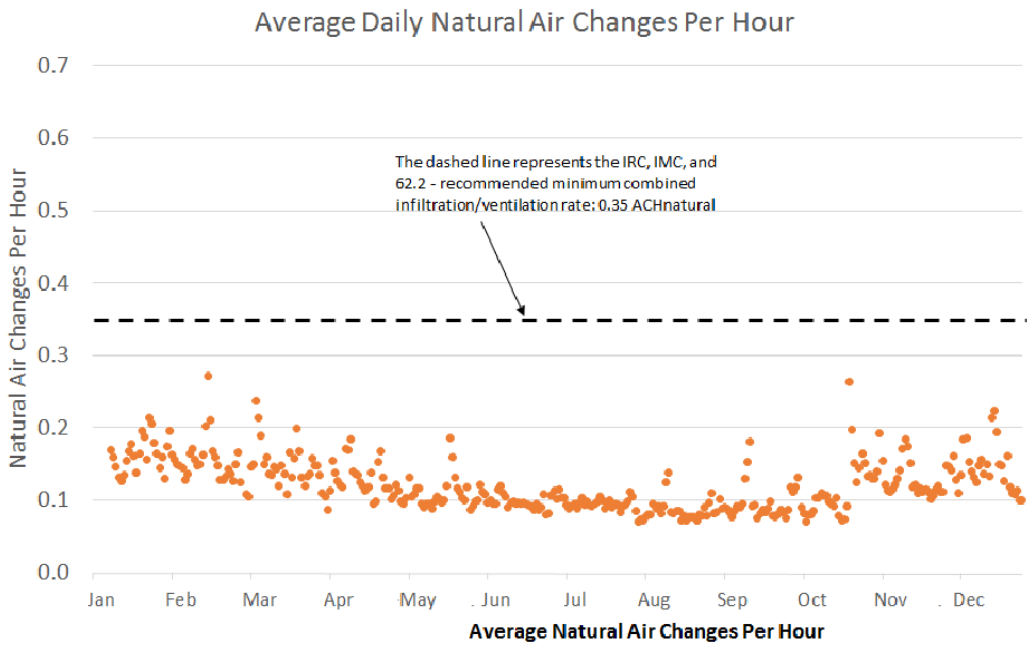
The proponent correctly conveys that an FSEC PPT document included a slide indicating that "8,296 or 9.9% of buyers are 'priced out' of the market for every $1,000.00 increase in a house's price based on 2014 data"; however the slide in the FSEC PPT document that shows this increase is incorrect (the impact is less severe). Note that while this slide was included in the PPT document forwarded to DBPR, it was not included in the actual presentations made to the Mechanical and Energy TACs. We're sorry for any confusion this slide may have caused.

R303.4 Mechanical ventilation. Where the air infiltration rate of a dwelling unit is ~~5 air changes per hour or~~ less than 3.00 air changes per hour where tested with a blower door at a pressure of 0.2-inch w.c (50 Pa) in accordance with ~~Section N1102.4.1.2,~~ Section R402.4.1.2 of the *Florida Building Code, Energy Conservation* the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.

M 6819: Rationale to Disapprove
Submitted by: Mike Moore, P.E., Newport

Recommend disapproval of this proposal. The proponent makes the unsubstantiated claim that the proposal "will improve the health, safety, and welfare of the general public by instituting a reasonable level for requiring whole house mechanical ventilation systems". There is no technical basis to support this claim, which runs counter to engineering calculations and research showing that natural ventilation and infiltration are insufficient to achieve acceptable indoor air quality.

As an example, following is a chart created using DOE's EnergyPlus software that shows the average daily combined infiltration and ventilation rate for a typical 2,600 ft^2 three-bedroom, single-family home located in Orlando with a building air tightness of 3 ACH50 and *no* mechanical ventilation, as proposed by the proponent. The average annual natural air change rate for this typical home is 0.12 (roughly a third of the 0.35 air changes per hour promulgated by model codes and standards), with a seasonal low of 0.09 in the summer. Research has shown that formaldehyde emissions from building materials increase with increasing temperature and relative humidity, and formaldehyde concentrations increase with decreasing infiltration/ventilation rates. In other words, formaldehyde emissions and concentration are likely to spike in the summer when natural infiltration is at its lowest. Resultant poor indoor air quality can significantly diminish occupants' health. In fact, research suggests that poor IAQ is responsible for around $500 annually in health related costs per person in the U.S., which translates to $10 billion annually in Florida.*



	Winter	Spring	Summer	Fall	Annual
3 ACH50 & No Mech Vent	0.15	0.11	0.09	0.13	0.12

*Assumes poor IAQ accounts for 0.01 disability adjusted life years (DALYs) per person, and that the value of a DALY is $50,000. This value is at the low end of epidemiological studies that estimate the value of a DALY between $50k - $200k.

References:

- Logue JM, Price PN, Sherman MH, & Singer BC. 2012. A Method to Estimate the Chronic Health Impact of Air Pollutants in U.S. Residences. Environmental Health Perspectives 120(2): 216-222.
- Turner WJN, Logue JM, and Wray CP. 2012. Commissioning Residential Ventilation Systems: A Combined Assessment of Energy and Air Quality Potential Values. LBNL-5969E.
- Brown DW. 2008. Economic value of disability-adjusted life years lost to violence: estimates for WHO Member States. Rev. Panam Salud Publica, 24, 203-209.
- Lvovsky K, Huges G, Maddison D, Ostro B, and Pearce D. 2000. Environmental costs of fossil fuels: a rapid assessment method with application to six cities. Washington, D.C.: The World Bank Environment Department.
- Highfill T and Bernstein E. 2014. Using Disability Adjusted Life Years to Value the Treatment of Thirty Chronic Conditions in the U.S. from 1987-2010. U.S. Department of Commerce Bureau of Economic Analysis WP 2014-9.
- Hult EL, Willem H, Price PN, Hotchi T, Russell ML, and Singer BC. 2015. Formaldehyde and acetaldehyde exposure mitigation in US residences: in-home measurements of ventilation control and source control. Indoor Air 25:523-535.

This proposal reduces the trigger for whole-house mechanical ventilation from 5 ACH or less to less than 3 ACH. There is no argument that as houses get tighter to meet or exceed energy conservation measures, there is a potential for indoor air quality issues. However, the reasons given by the proponent of the change to the foundation code for requiring whole-house mechanical ventilation did not provide substantiation for the trigger air change level mandated. The proponent, a representative of a manufacturer of mechanical ventilation systems, did state the cost of construction would increase, but provided no estimate of the amount of the increase. (M156-09/10; ICC 2009/2010 Code Development Cycle) The increased costs associated with the trigger level of 5 ACH are not justified in the State of Florida.

Before discussing costs, a serious problem with requiring whole-house mechanical ventilation in moderately tight houses in Florida should be noted. Whole-house mechanical ventilation brings outside air into the house. The hot humid climate of Florida will result in the introduction of moisture to the interior. Once introduced, the health problems associated with excess moisture such as mold, mildew, and rotting, must be addressed which may require the installation of a dehumidification system. The overall effect could very well be an increase in energy use.

Regarding the costs, an interim progress report of a study by FSEC was presented to various Commission TACs. As part of the project a survey was developed and widely distributed to stakeholders. The survey specified an example house and asked respondents to estimate the cost of providing a whole-house mechanical ventilation system. The costs of the interim report are based on the results of the survey and range from $800.00 to $1000.00. (Interim Progress Report for Evaluating the Economic Impacts of the Legislatively Delayed Provisions of the 5th Edition (2014) Florida Solar Energy Center, FSEC-CR-2009-15, Interim Report, Nov. 13, 2015) In addition, cost estimates from other sources were provided. Other estimates of the costs from builders outside the report have ranged from $3200.00 to $3,500.00.

In addition to the estimated costs, the FSEC presentation indicates for Florida: "8,296 or 9.9% of buyers are 'priced out' of the market for every $1,000.00 increase in a house's price based on 2014 data" This "priced out" data is based on a study by NAHB "State and Metro Area House Prices: the "Priced Out" Effect Special Studies", August 1, 2014. Finally, in cases where a dehumidification system is needed, cost estimate provided by a builder for the typical sized house is $2700.00 to $3000.00. Using the low side of the estimated cost ranges above, yields a total potential cost increase for the whole-house ventilation system in a one story 2,000 ft^2 three bedroom two bath home of $3,500.00; on the high side we have a potential increase of $4,500.00. This equates to potentially denying more than 25,000 Florida citizens the opportunity to purchase a home.

Further, in another report of whole-house ventilation the operation of such system in existing buildings is shown to be woefully short of expectations. The

Florida Building Commission engaged FSEC to conduct an investigation of the effectiveness and failure rates of existing whole-house mechanical ventilation systems. The investigation included a survey and testing of twenty-one homes built in the last fifteen years in Florida. The testing results showed only three of the homes were capable of providing a ventilation flow close to the design level and two of the three systems were turned off by the homeowner. Therefore, only one of the twenty-one systems investigated was found to be delivering the expected ventilation. The remainder of the findings are similar indicating even where whole-house mechanical ventilation systems are installed and operational they are not functioning or not functioning at near the expected level. (Report: Investigation of the Effectiveness and Failure Rates of Whole-House Mechanical Ventilation Systems in Florida" FSEC-CR-2002-15, June 1, 2015.)

While there are a number of recommendations made by the June 1, 2015, report, the following recommendation addressing allowable leakage levels, taken with the testing results reported, may be seen to support a reduction in the trigger for the requirement for mechanical ventilation:

> **"Do not require houses to become tighter than already specified by code. Consider increasing allowed leakage to 7 ACH50 in climate zones 1 and 2 (all of Florida)"**

(*Source:* Investigation of the Effectiveness and Failure Rates of Whole-House Mechanical Ventilation Systems in Florida" FSEC-CR-2002-15, June 1, 2015.)

It is understood that whole-house mechanical ventilation may well be needed in very tightly constructed homes. The proposal recognizes this need by retaining the requirement for whole-house mechanical ventilation in homes where the air changes per hour are less than 3. The potential of the unmodified provision to deny thousands of Florida residents the ability of to buy a home seems unquestionably counter to the statutorily stated intent of the code '… of providing requirements which will allow effective and reasonable protection for public safety, health, and general welfare for all the people of Florida at the most reasonable cost to the consumer." [Ch. 553.72(1)]

Date Submitted	12/27/2015	**Section**	1401.1	**Proponent**	Joseph Belcher
Chapter	14	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Pending Review
Commission Action Pending Review

Related Modifications

Summary of Modification

Adds reference to AHU in attics in FBC-EC.

Rationale

The proposal is intended to draw attention to requirements of another volume of the code addressing the installation of heating and cooling equipment to make certain it is not overlooked.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Proposed language adds a reference to an existing section of the Florida Building Code which is part of a rule challenge settlement.

Impact to building and property owners relative to cost of compliance with code

None. Proposed language adds a reference to an existing section of the Florida Building Code which is part of a rule challenge settlement.

Impact to industry relative to the cost of compliance with code

None. Proposed language adds a reference to an existing section of the Florida Building Code which is part of a rule challenge settlement.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, the proposed language adds a reference to an existing section of the Florida Building Code which is part of a rule challenge settlement.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, the proposed language adds a reference to an existing section of the Florida Building Code which is part of a rule challenge settlement.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No, the proposal does not discriminate.

Does not degrade the effectiveness of the code

No, the proposal does not degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? No

M1401.1 Installation. Heating and cooling *equipment* and *appliances* shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. Air-handling units installed in attics shall comply with the Florida Building Code-Energy Conservation Section R403.3.6.