RESNET
RESIDENTIAL ENERGY SERVICES NETWORK

Setting the Standards for Home Energy Efficiency

Results of RESNET Board Electronic Ballot on RESNET Staff Proposed Amendments to the 2021 International Energy Conservation Code

January 10, 2019

The results of the ballots of the RESNET Board are:

Ballot 1

Shall the RESNET Board endorse RESNET staff submitting the proposed Update to Standard 301 to reference 2019 version amendment to the 2021 IECC (Attachment A)?

Yes – 17	**No – 0**	**Abstain – 2**	**Not Voting - 1**
Jim Amorin		Jacob Atalla*	Bob Eipert
David Beam		Mark Johnson**	
Dave Bell			
Emelie Cuppernell			
Philip Fairey			
Matt Gingrich			
David Goldstein			
Andrew Harris			
John Hensley			
Roy Honican			
Cy Kilbourn			
Abe Kruger			
Paulette McGhie			
Chris McTaggart			
Clayton Morris			
Curt Rich			
Clayton Traylor			

*Jacob Atalla abstained because “I haven’t been able to engage in this matter earlier”
**Mark Johnson abstained because as staff of the International Code Council he cannot take positions on IECC amendments

The RESNET Board voted to endorse the proposal.

Ballot 2

Shall the RESNET Board endorse RESNET staff submitting the proposed Update to Standard 380 to reference 2019 version amendment to the 2021 IECC (Attachment B)?

Yes – 15	No – 1	Abstain – 2	Not Voting - 1
Jim Amorin	Clayton Morris*	Jacob Atalla**	Bob Eipert
David Beam		Mark Johnson***	
Dave Bell			
Emelie Cuppernell			
Philip Fairey			
Matt Gingrich			
David Goldstein			
Andrew Harris			
John Hensley			
Roy Honican			
Cy Kilbourn			
Abe Kruger			
Paulette McGhie			
Chris McTaggart			
Curt Rich			
Clayton Traylor			

*Clayton Morris voted no for the following reason:
Some of the calculating methodologies in the Standard 380 are contradictory to code testing and provide an unlevel playing field, though this could be a product of a lack of clarification. I believe the testing needs to be clarified for the whole code, and not just the ERI path. For example: Single Point BD Testing Penalty. Also, the ventilation testing still needs more work and I do not want to endorse this standard until it better addresses those issues.
**Jacob Atalla abstained because "I haven't been able to engage in this matter earlier"
***Mark Johnson abstained because as staff of the International Code Council he cannot take positions on IECC amendments

Because of the negative vote this ballot will be submitted for reconsideration.

Ballot 3

Shall the RESNET Board endorse RESNET staff submitting the proposed Reference Standard 380 for duct leakage testing amendment to the 2021 IECC (Attachment C)?

Yes – 16	No – 0	Abstain – 3	Not Voting - 1
Jim Amorin		Jacob Atalla*	Bob Eipert
David Beam		Andres Harris	
Dave Bell		Mark Johnson**	
Emelie Cuppernell			
Philip Fairey			
Matt Gingrich			
David Goldstein			
John Hensley			
Roy Honican			
Cy Kilbourn			

Abe Kruger			
Paulette McGhie			
Chris McTaggart			
Clayton Morris			
Curt Rich			
Clayton Traylor			

*Jacob Atalla abstained because “I haven’t been able to engage in this matter earlier”
**Mark Johnson abstained because as staff of the International Code Council he cannot take positions on IECC amendments

The RESNET Board voted to endorse the proposal.

Ballot 4

Shall the RESNET Board endorse RESNET staff submitting the proposed Revision of the 2018 IECC amended ERI on ventilation amendment to the 2021 IECC (Attachment D)?

Yes - 14	**No – 2**	**Abstain – 3**	**Not Voting - 1**
Jim Amorin	Clayton Morris*	Jacob Atalla**	Bob Eipert
David Beam	Curt Rich***	Mark Johnson****	
Dave Bell		Clayton Traylor	
Emelie Cuppernell			
Philip Fairey			
Matt Gingrich			
David Goldstein			
Andrew Harris			
John Hensley			
Roy Honican			
Cy Kilbourn			
Abe Kruger			
Paulette McGhie			
Chris McTaggart			

*Clayton Morris voted no because:
As we have experienced in rating homes throughout diverse building climates, the ventilation rate is contingent upon many factors, including but not limited to humidity levels. We have seen a spike in homes with air quality issues due to over ventilation and have guided builders on repair plans. With this in mind, I do not believe aligning the RESNET HERS Index with that standard, and no longer crediting the home for reduced levels, even ones that meet the state adopted codes, is our best plan of action in the marketplace. I believe the best course of action, since ventilation is such a complex, and often contentious conversation, is to be completely neutral. I state this because, over time, I think the ventilation equipment manufacturers are going to produce smarter systems that actually measures indoor VOC levels and the ventilation will be variable based upon conditions. Also, I suspect that

ventilation could be altered per locality if the building department recognizes the need for change. The coastal regions of many markets have had issues with ventilation increases in the home.
**Jacob Atalla abstained because "I haven't been able to engage in this matter earlier"
***Curt Rich voted no because:
Rationale: The ERI path, when adopted by states, is in many instances amended so that it becomes a watered down, lenient path for code compliance. Target numbers are relaxed, mandatory backstop provisions removed and attempts are made to replace efficiency with rooftop solar. This severely damages the RESNET/HERS brand as a gold standard for efficient homes. The current ventilation standard actually increases the stringency of the ERI path in the model code. Though such a result may have been inadvertent, perhaps it will help ameliorate the damage that is otherwise being done to the ERI path through state code adoption. My vote leads to a larger question of whether the ERI path for code compliance is supportable in the 2021 code and beyond. Efforts by some to use the ERI path to erase the substantial efficiency gains realized in the 2009-2012 model code updates leads me to the conclusion that the ERI path may have been a well intentioned, but failed experiment.
***Mark Johnson abstained because as staff of the International Code Council he cannot take positions on IECC amendments

Because of the negative votes this ballot will be submitted for reconsideration.

Ballot 5

Shall the RESNET Board endorse RESNET staff submitting the proposed ERI Quality Assurance and Implementation to the 2021 IECC (Attachment E)?

Yes – 16	**No – 0**	**Abstain – 3**	**Not Voting - 1**
Jim Amorin		Jacob Atalla*	Bob Eipert
David Beam		Andres Harris	
Dave Bell		Mark Johnson**	
Emelie Cuppernell			
Philip Fairey			
Matt Gingrich			
David Goldstein			
John Hensley			
Roy Honican			
Cy Kilbourn			
Abe Kruger			
Paulette McGhie			
Chris McTaggart			
Clayton Morris			
Curt Rich			
Clayton Traylor			

*Jacob Atalla abstained because "I haven't been able to engage in this matter earlier"
**Mark Johnson abstained because as staff of the International Code Council he cannot take positions on IECC amendments

The RESNET Board voted to endorse the proposal.

Because there was negative votes on two of the ballots there will be a reconsideration ballot sent out to the Board members who voted on these questions.

Attachment A

Update the ANSI/RESNET/ICC 301 Referenced Standard in the 2018 IECC as follows:

RESNET

ANSI/RESNET/ICC 301-~~2014~~2019: Standard for the Calculation and Labeling of the Energy Performance of ~~Low-rise Residential Buildings~~ Dwelling and Sleeping Units using an Energy Rating Index.

Reason Statement:

This is the second edition of the Standard and is the first update in its five-year revision cycle. The designation is updated to indicate year 2019 and the title and scope are modified to reflect its expansion to cover dwelling and sleeping units. The entire standard has been revised for improved consistency with the International Code Council model building codes. This Standard provides a consistent, uniform methodology for evaluating and labeling the energy performance of Dwelling Units and Sleeping Units, including all detached and attached housing types.

The update to this standard includes the following improvements:

- More robust calculations to estimate the energy consumption of domestic hot water systems,
- A house size adjustment factor treats all home sizes fairly,
- Recognizes technology advancements in solid state lighting,
- Improved and expanded consideration of multifamily dwelling units,
- Better recognition of dwellings with air distribution systems located within conditioned space

Attachment B

Update the ANSI/RESNET/ICC 380 Referenced Standard in the 2018 IECC as follows:

RESNET

ANSI/RESNET/ICC 380-~~2014~~2019: Standard for Testing Airtightness ~~for~~ of Building, Dwelling Unit, and Sleeping Unit Enclosures~~,~~; Airtightness of Heating and Cooling Air Distribution Systems~~,~~; and Airflow of Mechanical Ventilation Systems ~~Republished January 2016~~

Reason Statement:

Standard 380 has been developed to provide a consensus national standard for consistent measurement of several air-flow related building metrics. It builds on existing American National Standards to provide standard procedures essential to the evaluation of the energy performance of Residential Buildings, as well as Dwelling Units and Sleeping Units within Residential or Commercial Buildings. This Standard provides a consistent, uniform methodology for evaluating the airtightness of building, Dwelling Unit, and Sleeping Unit enclosures and heating and cooling air distribution systems, and the air flows of mechanical ventilation systems. These test procedures can be used as diagnostics, in quality assurance and control, for determining compliance with codes and standards, and to determine inputs to energy simulations and ratings. The Standard recognizes that some test procedures are easier to perform depending on building and HVAC system characteristics and that different codes and standards have specific testing requirements. Therefore, the Standard presents several alternative approaches for each measurement to allow flexibility in application of the standard.

Requirements for recording, documenting and reporting how the tests established by this standard are conducted and the test results shall be established by the adopting entities.

Attachment C

Revise Section R403.3.3 of the 2018 IECC as follows:

R403.3.3 Duct testing (Mandatory). Ducts shall be pressure tested in accordance with ANSI/RESNET/ICC 380 or ASTM E1554 to determine air leakage by one of the following methods: (Remainder of section left unchanged)

Reason Statement:

Section R403.3.3, Duct testing, currently provides no guidance for testing duct systems to determine if they meet the maximum duct leakage rate. The current code language sets a duct leakage metric and essentially leaves it up to those that are testing the system to determine how to arrive at the results. The lack of guidance can lead to inconsistent test results from house to house. This code change proposal solves this problem by requiring testing to conform to ANSI/RESNET/ICC Standard 380 - *Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems* OR ASTM E1554. Standard 380 provides a standardized methodology that is currently in use throughout the industry. The methodology will provide consistent results that can be replicated by testing organizations and enforcement personnel.

RESNET/ICC Standard 380 has been developed to provide a consensus national standard for consistent measurement of several air-flow related residential building metrics. It builds off of existing American National Standards to provide standard procedures essential to the evaluation of the energy performance of residential buildings energy.

ASTM Standard E1554-13, was most recently re-approved in 2018 and describes 4 different test methods (A, B, C, and D) for performing a duct leakage test. Method A requires multi-point testing of both the enclosure and the distribution system at a range of 5 to 50 Pa in 5 Pa increments using both pressurization AND depressurization of the building enclosure AND distribution system. Method B requires a physical separation of the supply and return distribution systems and that each are tested separately at a 25 Pa pressure difference, while measuring the pressure difference between any buffer zones and the outside. This procedure requires several iterations of each test (supply, return, buffer zone). Method C measures distribution system leakage to the outside using a 25 Pa pressure difference across the building enclosure with reference to the outside using a location sheltered from wind and sunshine. The distribution system is tested at a 25 Pa pressure difference with reference to the outside and the recording of inside temperature, outside temperature, and barometric pressure at the start and end of each test. This method requires testing under pressurization, while Standard 380 allows pressurization or depressurization (field conditions may require depressurization in order to maintain seals on the supply outlets and return inlets). Method D measures total distribution system leakage at a 25 Pa pressure difference with reference to the outside without using a fan (blower door) to create a 25 Pa pressure difference across the building enclosure to isolate leakage to the outside.

Although Standard 380 is a more industry-recognized standard, either Standard 308 or ASTM E1554 provide a consistent methodology for testing the air leakage of duct systems.

Cost Impact: Will not increase the cost of construction

Attachment D

Revise Section R406.3 of the 2018 IECC as follows:

R406.3 Energy Rating Index. The Energy Rating Index (ERI) shall be determined in accordance with RESNET/ICC 301. ~~except for buildings covered by the *International Residential Code*, the ERI Reference Design Ventilation rate shall be in accordance with Equation 4-1.Ventilation rate, CFM = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1)] **(Equation 4-1)**~~

Reason Statement:
The language being proposed for deletion was approved during the 2018 IECC development cycle. Here is the proponent's reason statement from the proposal:
"As written the ERI ventilation rate specification is in conflict with the ventilation rate specified by the IRC. The current language references ANSI/RESNET/ICC Standard 301 which references the ASHRAE 62.2-2013. The ventilation rate in the ASHRAE Standard 62.2 is significantly higher than the ventilation rate in the IRC. The IRC rate was reaffirmed in Group A changes this code cycle. Without this ventilation rate correction, the higher ventilation rate would use more energy unnecessarily and thereby increase ERI scores for no good reason. Interestingly the ASHRAE 62.2-2010 used the same rate as is in the current IRC.

Third party organizations should not set ventilation rates for the IRC and the IECC. Ventilation rates in the IRC and IECC should be set by the ICC code development process. This proposal brings the IECC/IRC ERI calculation into compliance with the IRC ventilation rate by using the same ventilation equation as will be in Section 1507.3.3 of the 2018 IRC. The published committee reason expected this update, stating: "The difference in ventilation rate might need to be resolved but the experts can solve that through public comments." This is the public comment they were referring to."

The proponent makes this statement: "Without this ventilation rate correction, the higher ventilation rate would use more energy unnecessarily and thereby increase ERI scores for no good reason." In a study conducted by the Florida Solar Energy Center (FSEC), it was found that this change, as included in the 2018 IECC, actually increases ERI scores from 2-10 points, depending on climate zone. The reason for this is that the rated home under Standard 301 is not allowed to use a ventilation rate less than ASHRAE 62.2-2013. Since the 2018 IECC changed the reference home to require less ventilation than the rated home, the home will be shown to use more energy and increase the ERI score.

In a second statement the proponent says: "Third party organizations should not set ventilation rates for the IRC and IECC." This statement is also false. ANSI/RESNET/ICC Standard 301 does not require any specific ventilation rate, nor does RESNET take a position as to proper ventilation rates. RESNET's Standard Development Committee 300 chose to reference the most recent ANSI-approved standard for ventilation rates which is ASHRAE 62.2-2013. The standard does not require homes to meet those ventilation rates, instead, the standard simply doesn't give any "credit" (in the form of lower index scores) for ventilation rates that are less than required by ASHRAE 62.2.

When the proponent of this change in the 2018 cycle, submitted a proposal to change Standard 301, SDC 300 rejected the change with the following reason statement:

"ASHRAE Standard 62.2 is the sole American National Standard on ventilation for indoor air quality in low-rise residential buildings. RESNET has chosen to not conflict with this indoor air quality standard. ANSI/RESNET/ICC Standard 301 does not require any specific level of outdoor air ventilation. However, in order to not encourage outdoor air ventilation levels that do not meet the indoor air quality requirements of ASHRAE Standard 62.2, RESNET has chosen to provide no Energy Rating Index credit for ventilation air flow rates that are less than those required by ASHRAE Standard 62.2. There is no other American National Standard on ventilation for indoor air quality and RESNET has chosen to not provide credits for outdoor air ventilation rates that do not achieve this level of indoor air quality. ANSI/RESNET/ICC Standard 301 does not "require" any level of outdoor air ventilation. Rather it simply stops giving outdoor air exchange energy reduction credit at the 62.2 ventilation specification. The commenter would better seek resolution of the issue raised by this comment by working with the ASHRAE to amend ASHRAE Standard 62.2."

This change did not achieve the proponent's stated objectives during the 2018 code development cycle. By NOT approving this change to delete the ventilation requirement for the reference home, the committee would be allowing Section R406 to be out of alignment with Standard 301.

RESNET acknowledges that the scientific and political discussions regarding the "correct" ventilation rate for residential homes is contentious. Neither RESNET nor standard ANSI/RESNET/ICC 301-2014 seek to determine the correct ventilation rate for homes.

At the time ANSI/RESNET/ICC 301-2014 was published, the published American National Standard for *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings* was ASHRAE 62.2-2013. To align with published American National Standards for indoor air quality, RESNET chose to adopt the ventilation rates prescribed by ASHRAE 62.2-2013. RESNET considers this decision to be procedural. RESNET as an organization acknowledges ventilation is important for homes that are built to modern building energy code standards, which require fairly tight envelopes. However, RESNET is neutral regarding the "correct" ventilation rate. To facilitate this neutrality, RESNET Standards do not penalize homes with ventilation rates that are less than ASHRAE 62.2-2013 Standard minimum ventilation rates but RESNET also does not provide energy credit for such homes.

Regardless of which rate may be best, the ERI calculation procedure does not establish requirements for home ventilation rates. Rather such requirements are established by building code authorities and model codes such as set forth in Section R403.6 of the 2018 IECC. The ventilation rates used in the ANSI/RESNET/ICC 301-2014 procedure do not change or modify any requirements of building codes or standards.

Attachment E

Revise Section R406.5 as follows:

R406.5 Verification by approved agency. Verification of compliance with Section R406 shall be completed by an *approved* third party working under the auspices of an approved rating provider as defined in ANSI/RESNET/ICC 301.

Reason Statement:
In the 2018 IECC, Standard 301 is only referenced for the calculation of the ERI. However, there are many other aspects of Standard 301 that address implementation items, like: inspection of minimum rated features, certified raters, approved rating providers and labeling. Without any reference to some of these items in the code, there are no requirements other than an "approved" third party to verify compliance. Unfortunately, that provides little guidance to the local code official. In addition, there is currently no quality assurance requirements under the ERI path. Homes complying with the ERI path will only be subject to quality assurance if they are using the HERS index and submit a "Confirmed" rating to RESNET.

In Standard 301 an "Approved Rating Provider" is defined as: *An approved entity responsible for the certification of home energy raters working under its auspices and who is responsible for the quality assurance of such Certified Raters and for the quality assurance of home energy ratings produced by such home energy raters.*

In Standard 301 a "Certified Rater" is defined as: *An individual who has become qualified to conduct home energy ratings through certification by an Approved Rating Provider.*

In Standard 301 "Approved" is defined as: *shall mean approved by an entity adopting and requiring the use of this Standard as a result of investigation and tests conducted by the entity or by reason of accepted principles or tests by nationally recognized organizations.*

After having the ERI path in the code for two cycles now, it has become clear that there is confusion about the nuances of its implementation in the field. This change will help to clarify any confusion about who should be approved as a third party to verify compliance with the ERI path.

Add new Section R406.5.1 as follows:

R406.5.1 Quality Assurance. *Approved* third party verifiers and all *residential buildings* demonstrating compliance with Section R406 shall comply with the quality assurance requirements in accordance with ANSI/RESNET/ICC 301.

Reason Statement:
There has been confusion about the differences between ERI and HERS, especially when it comes to quality assurance requirements. Currently, under the 2018 IECC, a permit applicant could submit an ERI Compliance Report to demonstrate compliance with the energy code without any requirement subjecting that rating to quality assurance. The only way a home complying with the ERI path will be subject to

quality assurance is if that home uses a HERS rating and a "confirmed" rating is submitted to RESNET. Sections 5.1.4.1.3 and 5.1.4.2.3 of ANSI/RESNET/ICC 301 require that "Confirmed" and "Sampled" ratings be subject to Quality Assurance requirements "equivalent to Section 900 of the *Mortgage Industry National Home Energy Rating Systems Standard."*

One of the most important benefits of the ERI compliance path is the requirement for third party verification of compliance. Many local code officials are under the misconception that all homes using the ERI for compliance are subject to quality assurance. Unfortunately, this is not true.

This proposal would require that the approved third party verifiers are working under a program that has quality assurance requirements; and the homes they're responsible for verifying are subject to those quality assurance standards.

Cost Impact: Will not increase the cost of construction

Add new Section R406.5.2 'Compliance documentation for certificate of occupancy' as follows:

R406.5.2 Compliance documentation for certificate of occupancy. Third parties that have been *approved* to verify compliance with R406 shall provide the following documentation to the *code official*, prior to issuance of a certificate of occupancy:

1. Documentation that the *approved* third party is certified by an approved rating provider in accordance with ANSI/RESNET/ICC 301;
2. Documentation demonstrating that the mandatory requirements in R406.2 have been met;
3. A compliance report in accordance with R406.6.2 that is clearly indicated as a "Confirmed Rating" or "Sampled Rating" as defined by ANSI/RESNET/ICC 301;
4. Documentation of air leakage testing results in accordance with R402.4.1.2;
5. Documentation of duct leakage testing results in accordance with R403.3.3.

Reason Statement:
Despite education efforts, there is confusion among code officials and third party verifiers about the documentation that should be required, prior to the issuance of a certificate of occupancy, for compliance with the ERI path. Since this is still a relatively new compliance path for the IECC, the proponents of this proposal feel that it is necessary to provide guidance to local code officials and third party verifiers.
This proposal seeks to add each of the proposed documentation items for the following reasons:

1. This provision ensures that third party verifiers are subject to quality assurance procedures
2. This item ensures that third party verifiers are verifying the mandatory requirements of the IECC and not just what's required to conduct the rating
3. ANSI/RESNET/ICC 301 only requires "Confirmed" and "Sampled" ratings to be subject to quality assurance, so this item ensures that third parties are not submitting a "projected" rating to the code officials that is not subject to quality assurance
4. Documenting the envelope air leakage results ensures that those numbers are in alignment with the figures used in obtaining the ERI score
5. Documenting the duct leakage results ensures that those numbers are in alignment with the figures used in obtaining the ERI score.

Overall, this proposal will improve consistency among third parties and code officials in documenting compliance with the ERI path.