

Florida Building Commission

ERI Workgroup

August 3, 2016

Joe Cain, representing Solar Energy Industries Association
(SEIA)

I respectfully submit the following two options for consideration of the ERI Workgroup. Both options are drawn from the ICC Group B Development process for the 2018 IECC. The technical requirements of these two proposals are very similar.

The first option is proposal RE175-16, submitted by Vickie Lovell, InterCode Incorporated, representing Leading Builders of America.

The second option is proposal RE176-16, submitted by Eric Makela of Cadmus, representing RESNET.

Joe Cain

RE175-16

R406.4.1 (New) [IRC N1106.4.1 (New)], Table R406.4.1 (New) [IRC Table N1106.4.1 (New)], R406.6.2 (IRC N1106.6.2)

Proponent : Vickie Lovell, InterCode Incorporated, representing Leading Builders of America (vickie@intercodeinc.com)

2015 International Energy Conservation Code

Add new text as follows:

R406.4.1 (N1106.4.1) On-site power production. Where on-site power is provided, the contribution of power produced on-site to the ERI shall not exceed the percentages specified in Table R406.4.1

TABLE R406.4.1 (N1106.4.1)
Credit for On-site Power Production

ENERGY RATING INDEX (ERI) of the Rated Design	% CREDIT FOR ON-SITE POWER PRODUCTION^a
65 and above	0
64	5
63	10
62	15
61	20
60	25
59	30
58	35
57	40
56	45
55	50
54	55
53	60
52	65
51	70
50	75
49	80
48	85
47	90

46	95
45 and below	100

a. Percentage of power produced on-site applied per ERI value.

Revise as follows:

R406.6.2 (N1106.6.2) Compliance report. Compliance software tools shall generate a report that documents that the ERI of the *rated design* complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information:

1. Address or other identification of the residential building.
2. An inspection checklist documenting the building component characteristics of the *rated design*. The inspection checklist shall show results for both the *ERI reference design* and the *rated design*, and shall document all inputs, including the percentage of power produced on-site credited to the ERI, entered by the user necessary to reproduce the results.
3. Name of individual completing the compliance report.
4. Name and version of the compliance software tool.
 - **Exception:** Multiple orientations. Where 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 (north, east, south and west) cardinal orientations.

Reason: This proposal creates an easy to enforce method that recognizes on-site power production, but LIMITS THE CREDIT FOR POWER PRODUCED ON-SITE THAT MAY BE APPLIED TO THE CALCULATION OF THE ERI.

The CONCEPT –

The International Code Conservation Code should not be inconsistent with the federal policy (and many state statutes) that encourage national energy independence through conservation, and incentivizes the use of on-site power generation in residential buildings. This proposal creates a compliance method that is easy to enforce and a design tool that is easy to use and understand.

A method for calculating for on-site power in the ERI is not currently required anywhere in Section 406. This proposal does NOT require on-site power production to be calculated in the ERI. It only limits how much on-site power is allowed to be considered in calculating the ERI if and when the designer chooses to incorporate on-site power in the total energy use of the rated design.

The new Table 406.6.1 promotes both energy conservation and energy production. It accomplishes this by driving improvements in the building enclosure and installed mechanical systems in order to earn greater contributions from the production of on-site power while maintaining the protections of meeting the code envelope requirements and mandatory measures in the 2009 IECC.

Homes currently have to meet the mandatory building requirements of the 2009 IECC. That does not change with the implementation of the new Table 406.4.1. Compliance with the 2009 "backstop" provisions ensure that the building itself is efficient.

The METHOD –

The proposed new Table 406.4.1 starts crediting on-site power at an ERI of 64 and moves in 5% increments per integer until 100% of on-site power produced may be applied to the ERI. The percentages in Table 406.4.1 represent those 5% increments.

The value of 65 for was selected for the Table 406.4.1 because it is the AVERAGE HERS RATING of over 610,000 new homes built since 2012 as reported by RESNET.

The designer can adjust the rated design by calculating exactly what percentage of the on site power may be utilized in the rated design to achieve a code compliant ERI scores found in Table 406.4

The new Table 406.4.1 is also designed to account for ERI scores that states and local jurisdiction may adopt that are both above and below the ERI values currently listed on Table R406.4. Table 406.4 is adaptable to states and local jurisdictions that are adopting different ERI scores different from what is contained in the 2015 IECC, such as Texas that adopted an ERI score of 65. The values in Table R406.4.1 can be applied to these higher ERI scores which would limit on-site power production consistently from state to state regardless of the ERI adopted by the states. The lower values (more stringent) than the current Table R406.4 values also "future proof" the table to account for more stringent ERI scores in later versions of the IECC.

The ENFORCEMENT –

Compliance with Table 406.4.1 is easy. The code official or plan reviewer only has to review the compliance report for the ERI score that is required for the climate zone in Table 406.4. The code official or plan reviewer then needs to verify that that the percentage of on-site power cited in the compliance report is consistent with percentage listed in Table 406.4.1. There is a companion proposal to this change to require that the percentage of onsite power used in the ERI in found in the compliance report.

The CONCLUSION

Enabling new paths to achieve energy efficiency creates new opportunities for even greater innovation is part of the stated purpose of the IECC. This is yet another option, the most stringent yet flexible of all the compliance options within the IECC, for consumers and builders. Power produced on-site is gaining steadily in popularity with homeowners and can help reduce the compliance costs for builders, making homes more affordable to build and to live in.

Cost Impact: Will not increase the cost of construction

Because on-site power production is not required to achieve code compliant Energy Rating Index values and this proposal only limits the amount of on-site power produced that can be applied to reduce the ERI to achieve code compliance, there is no direct cost impact.

Cost-effectiveness: This change is cost-effective because it is expected to provide neutral or positive energy impact and builders are not required to use on-site power production to reach code compliant Energy Rating Index values.

RE175-16 : R406.4.1 (NEW)-LOVELL12664

RE176-16

R406.4.1 (New) [IRC N1106.4.1 (New)], Table R406.4.1 (New) [IRC Table N1106.4.1 (New)], R406.6.2 (New) [IRC N1106.6.2 (New)]

Proponent : Eric Makela, Cadmus, representing RESNET

2015 International Energy Conservation Code

Add new text as follows:

R406.4.1 (N1106.4.1) On-site power production. The power produced on-site shall be included in the calculation for determining the ERI value in accordance with ANSI ICC/RESNET 301. The contribution to the ERI calculation shall be 5% of the on-site power produced for each ERI point less than 65 as specified in Table R406.4.1.

TABLE R406.4.1 (N1106.4.1)
Credit for On-site Power Production

<u>ENERGY RATING INDEX</u>	<u>PERCENT CREDIT FOR ON-SITE POWER PRODUCTION^a</u>
<u>65 and above</u>	<u>0</u>
<u>64</u>	<u>5</u>
<u>63</u>	<u>10</u>
<u>62</u>	<u>15</u>
<u>61</u>	<u>20</u>
<u>60</u>	<u>25</u>
<u>59</u>	<u>30</u>
<u>58</u>	<u>35</u>
<u>57</u>	<u>40</u>
<u>56</u>	<u>45</u>
<u>55</u>	<u>50</u>
<u>54</u>	<u>55</u>
<u>53</u>	<u>60</u>
<u>52</u>	<u>65</u>
<u>51</u>	<u>70</u>
<u>50</u>	<u>75</u>
<u>49</u>	<u>80</u>
<u>48</u>	<u>85</u>
<u>47</u>	<u>90</u>
<u>46</u>	<u>95</u>
<u>45 and below</u>	<u>100</u>

a. Percentage of power produced on-site applied per ERI value.

R406.6.2 (N1106.4.2) Compliance report. Compliance software tools shall generate a report that documents that the ERI of the *rated design* complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information:

1. Address or other identification of the residential building.
2. An inspection checklist documenting the building component characteristics of the *rated design*. The inspection checklist shall show results for both the *ERI reference design* and the *rated design*, and shall document all inputs, including the percentage of power produced on-site credited to the ERI, entered by the user necessary to reproduce the results.
3. Name of individual completing the compliance report.
4. Name and version of the compliance software tool.
 - **Exception:** Multiple orientations. Where 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 (north, east, south and west) cardinal orientations.

Reason: RESNET supports limiting the credit that on-site power production provides when determining an ERI score for demonstrating compliance with the energy code. The limitation ensures that the efficiencies of the building envelope, heating and cooling system, and lighting are not traded away by the use of on-site power production.

Table 406.4.1 only allows a percentage of the total amount of on-site power produced to be considered based on the Target ERI score included in Table R406.4. The look-up table will inform both the builder and the code official on the percentage of onsite power that can be credited when generating the ERI score.

For example, a home proposed to be built in Climate Zone 2 would have a target ERI score from Table R406.4 of 52. Table R406.4.1 shows that 65% of the proposed on-site power produced could be credited toward the building to generate the ERI score. If a 5 kW photovoltaic system is proposed for the house for on-site power production, credit can only be taken for 3.25 kW (0.65 X 5kW).

The code change proposal then requires that the percentage of on-site power assumed for the project is printed on the report that is submitted as part of the energy code documentation.

When on-site power production is utilized in the residential building design, such power may be permitted to reduce the Energy Rating Index (ERI) for the residential building with an ERI of less than 65. The proposed new table starts crediting such power at an ERI of 64 and moves in 5% increments per integer until 100% of on-site power produced may be applied to the ERI. The value of 65 was selected because it is the AVERAGE HERS RATING of over 610,000 new homes built since 2012 as reported by RESNET.

The Table is also designed to account for Target ERI scores that states and local jurisdiction may adopt that are both above and below the ERI values listed on Table R406.4. The table recognizes that not all states and local jurisdictions are adopting the ERI scores as contained in the 2015 IECC, such as Texas that adopted an ERI score of 65. The values in Table R406.4.1 can be applied to these higher ERI scores which would limit on-site power production. The values lower (more stringent) than the Table R406.4 values also "future proof" the table to account for more stringent ERI scores in later versions of the IECC.

Cost Impact: Will not increase the cost of construction

None. The ERI approach is an alternative compliance approach other compliance approaches can be used if the additional first cost due to the cap on on-site energy production impacts the first cost of the project.

Analysis: A review of the standard proposed for inclusion in the code, BRS/RESNET/ICC 301-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2016)

RE176-16 : R406.4.1 (NEW)-MAKELA13307