May 6, 2021
Amanda Reeder
Commission Counsel
Office of Administrative Hearings

RE: Residential Code N1101.13 (R401.2) Substantial Impact Determination

Ms. Reeder:

The Rules Review Commission asked the Office of State Budget and Management (OSBM) on February 18 for a substantial impact determination per G.S. 150B-21.9 regarding the Residential Code N1101.13 (R401.2). This proposed rule change resulted from the Building Code Council (BCC) granting a petition from the Home Builders Association that provides builders with more flexibility to meet energy efficiency requirements for residential buildings. OSBM worked with DOI staff to assess the proposal's likely impacts on builders, homeowners, and society.

Builders in North Carolina have the option of complying with the NC Residential Code through the Energy Rating Index (ERI) pathway, which is based on the modeled energy efficiency performance of the home at construction. New homes must meet or exceed certain energy efficiency scores, or ERI values, that account for the dwelling's thermal envelope as well as the installed equipment, appliances, and any on-site renewable energy features. The petition creates an *additional* ERI-based compliance pathway to provide builders with more flexibility.

The proposed new ERI pathway is expected to reduce construction costs and save time for builders compared to the existing pathway. These savings could be passed on to buyers in whole or in part. Homeowners and society are likely to incur higher long-term energy costs due to the lack of thermal envelope backstops and mandatory minimum requirements. As written, the proposal lacks necessary implementation and enforcement components.

Although the total magnitude of the proposed new ERI pathway impact is uncertain, it has the potential to create a substantial economic impact of $1M or more in aggregate costs and benefits in a year and impacts will compound over time as the housing stock grows. Therefore, the agency must produce a regulatory impact analysis (fiscal note) as required by G.S. 150B 21.4(b1) and ensure the proposal satisfies the rulemaking principles in G.S. 150B 19.1. OSBM's determination reflects the analysis of DOI staff experts based on information provided by the proponent, interested parties, BCC records, and professional experience.

The enclosed Appendix includes additional details about the proposed changes, expected impacts, and considerations for the BCC regarding next steps.

Sincerely,

Carrie Hollis
Principal Economist
NC Office of State Budget and Management

cc: Carl Martin, Rulemaking Coordinator
Dan Dittman, PE, Chief Energy Code Consultant

APPENDIX: Summary Analysis and Next Steps

Overview of Proposed Changes

The proposal as written differs from the existing ERI pathway in the following ways:

1. **Does not require certain mandatory measures or the 2012 thermal envelope backstops,**
2. **Requires using the 2019 ANSI/RESNET/ICC 301-2019 standards ("2019 standards") for calculating energy ratings, compared to 2014 standards using the current pathway,**
3. **Does not require certified or registered professionals to conduct the ratings,**
4. **Does not require Code Officials to verify the ratings,**
5. **Does not explicitly define the ERI Index or the reference home, which form the basis for the ERI rating calculation,**
6. **Does not explicitly define software standards and capabilities, although the approved software is referenced in the 2019 standards,**
7. **Lowers minimum ERI value for zone 3 structures with onsite renewable energy starting in 2023 (42 compared to 47), and**
8. **Mis-states the full title of the 2019 standards, which should be "ANSI/RESNET/ICC 301-2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index."**

Regarding the changes in **3 through 6**, the proposed code language does not reference N1106, which contains general requirements for an ERI analysis and references requirements for certain mandatory features and thermal envelope backstops. Although the proposed amendment does not specifically exclude these requirements, DOI cannot enforce them without a direct reference. Since BCC meeting records indicate the proponent intended the new pathway to be implemented without backstops, the proposal would most likely not require any of the elements of the current ERI method listed in **3 through 6**.

Expected Impacts

The two sections below discuss the potential impact of the proposed new compliance pathway compared to the existing ERI method. This discussion reflects the analysis of DOI staff based on information provided by the proponent, interested parties, BCC records, and professional experience.

Effect of Change 1: ERI Pathway without Backstops

Compared to the existing ERI pathway, this new proposed option is expected to reduce construction costs and save time for builders. These savings could be passed on to buyers in whole or in part. While home energy efficiency is expected to be largely equivalent at construction, dwellings would likely have higher energy costs over their lifetime due to the lack of thermal envelope backstops and mandatory minimum requirements referenced in NC Residential Code N1106.

A dwelling's ERI value does not consider the useful life of each feature that contributes to the energy rating. Greater reliance on non-permanent features increases the likelihood of long-term energy efficiency losses. Under the new pathway, a larger portion of the ERI value could be achieved through appliances, equipment, and on-site renewable energy features, rather than the building envelope, likely

resulting in higher energy use over the long term compared to the baseline. Energy efficiency would be lost if homeowners do not maintain these shorter-lived features properly and replace them with others of similar efficiency. This is a reasonable outcome due to the higher replacement costs of these above-standard features. The additional energy-related costs to homeowners and society would compound as more dwellings built using this pathway are added to the housing stock each year.

As written, the proposed path would allow a builder to make largely unlimited tradeoffs against the thermal envelope and use high efficiency equipment, appliances, or on-site renewable power generation (such as solar panels) to achieve a larger portion of the required ERI value with no minimum thermal envelope requirements. Practically, such tradeoffs are limited to a certain extent by homebuyer knowledge and preferences, although housing demand is increasing and buyer knowledge is incomplete.

Examples of the most common thermal envelope design tradeoffs, according to DOI staff experience, would include less wall insulation (R13 vs R15) or (R15 or R13 vs R19), lower R-value requirements for spray foam insulation, and removal of slab edge insulation in zones 4 or 5. Approximate construction savings could range from $100-$1,000 *per design feature* and energy cost differences could range from roughly $30-$50 per feature per year.[1] These examples are for illustration; they are not exhaustive of the design options or their whole-dwelling combinations. They are common elements sought for tradeoffs per phone calls and observations of e-mails submitted for review by DOI staff. The risk of higher long-term energy costs increases with the extent of the design tradeoffs against the thermal envelope, as the equipment and on-site renewable power generation is subject to shorter lifespans than the building thermal envelope.

One can deduce the direction of the proposal's effect but the total magnitude of expected builder savings and costs to the homeowner and society (heating and cooling expenses, effect to the electric grid,[2] comfort, economic and health impacts from increased fossil energy production) are unknown. The impacts depend upon builders' specific design tradeoffs, homeowner replacement and repair decisions, and the popularity of this pathway.

It is reasonable to assume that, at minimum, builders using the existing ERI method (about 3% of homes annually are built using the existing pathway)[3] would switch to the proposed ERI method. Due to the added flexibility, more builders who are currently using other methods could adopt the proposed pathway. North Carolina is expected to add 50-65 thousand single-family homes annually.[4]

The proponent provided an analysis, conducted by Home Innovation Research Labs (HIRL), of model homes built using the ERI method with 2019 standards. However, the HIRL analysis does not reflect the most likely impact of the proposed new pathway because the modeled example homes would comply with the existing ERI pathway. It is reasonable to assume that builders will use the flexibility to construct homes with features below the current minimums, otherwise the proposed pathway would not be necessary. HIRL did not directly evaluate such homes.

[1] Estimates are based on previous analyses, where available:
2016 Appalachian State analysis of 2018 Energy Conservation Code and 2018 Residential Code adoption
Fiscal Note for 2018 NC Energy Conservation code provisions of 2018 NC Residential Code
REMRate analysis, 2012 Code/ No Slab, 2012 Code/R-10 Slab, Zone 4
DOI 2020 analysis of proposed code change B-15, R406.2

[2] When solar is unavailable, buildings with reduced thermal envelopes may pull more from the grid.

[3] According to NC Building Performance Association.

[4] Source: IHS Markit projections for North Carolina, referenced April 2021.

Effect of Change 2: 2019 vs 2014 Standards

Differences between the 2014 and 2019 versions of Standard 301 could result in additional construction and operation costs or savings compared to the existing ERI pathway. While DOI has not performed detailed modeling at this stage, staff are unaware of any major differences.

Effect of Changes 3 Through 7

The existing ERI pathway requires certified HERS raters or licensed design professionals to conduct the modeling in compliance with the specifications in N1106 and the 2014 standards and provide outputs to Code Officials, who then verify compliance. The proposed new pathway does not require certified or licensed professional raters, define the ERI index calculations and reference home definitions used to compute the score, or establish minimum software capabilities and restrictions. The absence of these specifications increases the risk of inaccurate or inconsistent implementation of this pathway. Code Officials will not be able to detect such issues or verify compliance.

Dwellings in zone 3 with onsite renewable energy would have to score as 5% more efficient than the existing pathway starting in 2023 due to the proposed ERI value of 42 (currently 47). This change would likely increase costs to builders with an unknown net effect on buyers.

Discrepancy between HERS and ERI Rating

Interested parties raised the issue of discrepancies between HERS and ERI ratings. HERS ratings and ERI ratings are often conducted by the same professionals and HERS ratings have been used for ERI pathway compliance. Although deserving of further consideration, the implications of the divergence between HERS and ERI values are not explored further here. This issue is out of the scope of a regulatory impact analysis, which assesses changes from the business-as-usual baseline.

Next Steps

If the Rules Review Commission disapproves the proposal for failure to comply with the Administrative Procedure Act, the BCC must decide whether to begin the rulemaking process anew or to drop the proposal.

OSBM cannot approve the proposal as written because it does not satisfy the rulemaking principles in G.S. 150B 19.1, specifically (a)(6). The basis for an ERI analysis is undefined and the proposal lacks necessary implementation and enforcement elements. As written, the proposal does not achieve the regulatory objective in a cost-effective manner such that it seeks to maximize benefits and minimize costs to all affected entities. Although OSBM's review is limited to the principles in (a)(2), (a)(5), and (a)(6), the agency must also ensure the rules satisfy the remaining principles; the Rules Review Commission will review for clarity, necessity, and authority.

If the BCC chooses to move forward with a revised proposal, the agency must take the following steps before adoption:

1. Ensure the proposal satisfies the rulemaking principles in G.S. 150B 19.1,
2. Produce a regulatory impact analysis and obtain OSBM certification per G.S. 150B 21.4,
3. Publish the proposal and the analysis in the North Carolina Register, and
4. Hold a second public comment period.

STATE OF NORTH CAROLINA
OFFICE OF ADMINISTRATIVE HEARINGS

February 18, 2021

Carrie Hollis
Office of State Budget and Management
Sent via email to Carrie.Hollis@osbm.nc.gov

Re: Residential Code, N1101.13(R401.2)

Ms. Hollis:

At its meeting this morning, the Rules Review Commission voted pursuant to G.S. 150B-21.9 to ask the Office of State Budget and Management to determine if the above-referenced Rule has a substantial economic impact and therefore require a fiscal note. A response to this request pursuant to G.S. 150B-21.9 will assist the Commission in determining whether the agency adopted the Rule in accordance with the Administrative Procedure Act.

This Rule will remain under the Commission's review until after review by OSBM and subsequent action by the agency pursuant to G.S. 150B-21.12. The Commission is aware that there are multiple demands on your time, and respectfully requests a response as soon as you are able to do so.

Thank you for your assistance in this matter. Please let me know if I can be of any assistance or if you desire further information regarding the Commission's decision.

Sincerely,

Amanda J. Reeder
Commission Counsel

cc: Carl Martin, Rulemaking Coordinator

Enclosure Residential Code, N1101.13(R401.2)

Julian Mann, III, Director
Chief Administrative Law Judge

Fred G. Morrison, Jr.
Senior Administrative Law Judge

Linda T. Worth
Deputy Director

An Equal Employment Opportunity Employer

1711 New Hope Church Road, Raleigh, NC 27609
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www.oah.nc.gov

SUBMISSION FOR PERMANENT RULE

1. Rule-Making Agency: NC Building Code Council

2. Rule citation & name (name not required for repeal):
2018 NC Residential Code N1101.13 (R401.2) Compliance (200714 Item B-23)

3. Action:
☐ ADOPTION ☒ AMENDMENT ☐ REPEAL ☐ READOPTION ☐ REPEAL through READOPTION

4. Rule exempt from RRC review?
☐ Yes. Cite authority:
☒ No

5. Rule automatically subject to legislative review?
☐ Yes. Cite authority:
☒ No

6. Notice for Proposed Rule:
☒ Notice Required
Notice of Text published on: August 17, 2020
Link to Agency notice: https://www.ncosfm.gov/codes/building-code-council-bcc/bcc-hearing-notices
Hearing on: September 1, 2020
Adoption by Agency on: December 8, 2020
☐ Notice not required under G.S.:
Adoption by Agency on:

7. Rule establishes or increases a fee? (See G.S. 12-3.1)
☐ Yes
Agency submitted request for consultation on:
Consultation not required. Cite authority:
☒ No

8. Fiscal impact. Check all that apply.
☐ This Rule was part of a combined analysis.
☐ State funds affected
☐ Local funds affected
☐ Substantial economic impact (≥$1,000,000)
☐ Approved by OSBM
☒ No fiscal note required

9. REASON FOR ACTION

9A. What prompted this action? Check all that apply:
☒ Agency
☐ Court order / cite:
☐ Federal statute / cite:
☐ Federal regulation / cite:
☐ Legislation enacted by the General Assembly
Cite Session Law:
☒ Petition for rule-making
☐ Other:

9B. Explain:
The purpose of this amendment is to expand the options for compliance by allowing the use of the ANSI/RESNET/ICC 301 -2019 Standard for Calculation and Labeling of Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index as a stand-alone compliance path.
The delayed effective date of this Rule is January 1, 2022.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

10. Rulemaking Coordinator: Carl Martin
Carl Martin
Phone: 1(919)647-0009
E-Mail: carl.martin@ncdoi.gov

Additional agency contact, if any:
Phone:
E-Mail:

11. Signature of Agency Head* or Rule-making Coordinator:
Carl Martin

*If this function has been delegated (reassigned) pursuant to G.S. 143B-10(a), submit a copy of the delegation with this form.

Typed Name: Carl Martin
Title: Chief Code Consultant

RRC AND OAH USE ONLY

Action taken:

☐ RRC extended period of review:
☐ RRC determined substantial changes:
☐ Withdrawn by agency
☐ Subject to Legislative Review
☒ Other: Submitted to OSBM per 150B-21.9(a) on 2/18/21

SUBMISSION FOR PERMANENT RULE

2018 NC Residential Code
N1101.13 (R401.2) Compliance. (200714 Item B-23)

IRC Chapter 11

N1101.13 (R401.2) Compliance. Projects shall comply with one of the following:

1. Sections N1101.14 through N1104.

2. Section N1105 and the provisions of Sections N1101.14 through N1104 labeled "Mandatory."

3. An energy rating index (ERI) approach in Section N1106.

4. North Carolina specific REScheck™ shall be permitted to demonstrate compliance with this code. Envelope requirements may not be traded off against the use of high efficiency heating or cooling equipment. No trade-off calculations are needed for required termite inspection and treatment gaps.

5. Rated in accordance with ANSI/RESNET/ICC 301-2019 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index with a maximum energy rating index (ERI) less than or equal to the appropriate value indicated in one of the following tables as applicable, when compared to the ERI reference design:

MAXIMUM ENERGY RATING INDEX
(without calculation of on-site renewable energy)

CLIMATE ZONE	JAN. 1, 2019 – Dec. 31, 2022	JAN. 1,2023 AND FORWARD
3	65	61
4	67	63
5	67	63

MAXIMUM ENERGY RATING INDEX
(including calculation of on-site renewable energy)

CLIMATE ZONE	JAN. 1, 2019 – Dec. 31, 2022	JAN. 1,2023 AND FORWARD
3	51	42
4	54	50
5	55	51

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Residential Code, N1101.13(R401.2)

DEADLINE FOR RECEIPT: Friday, February 12, 2021

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

On the Submission for Permanent Rule form, Box 9B, this is not the reason for amendment that you published in the Register. Please update it here.

In Item (5), you refer to the "Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units" but you published "Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings." Was this change made in response to public comment?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: January 29, 2021

SUBMISSION FOR PERMANENT RULE

2018 NC Residential Code
N1101.13 (R401.2) Compliance. (200714 Item B-23)

IRC Chapter 11

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