



NORTH CAROLINA HOME BUILDERS ASSOCIATION

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October 17, 2023

Mr. David Rittlinger, PE
Interim Secretary, NCBCC
North Carolina Department of Insurance
Office of State Fire Marshal
Engineering & Codes
1202 Mail Service Center
Raleigh, NC 27699-1202

Dear Mr. Rittlinger:

I am writing to comment on the fiscal note and cost benefit analysis that accompanies the proposed 2024 NC Energy Code.

In the past, the residential portion (IECC with NC amendments) of the NC Energy Code has been mirrored into Chapter 11 of the NC Residential Code. The Energy Ad-Hoc Committee introduced a proposal on June 12, 2023 (Item B-5) to adopt and incorporate [the residential sections of the proposed 2024 NC Energy Code into the 2024 NC Residential Code – Chapter 11]; however, Session Law 2023-108 now prohibits any adoption or modification until January 1, 2026. Since the desire of the Energy Ad-Hoc Committee was to mirror the residential portion of the proposed 2024 NC Energy Code into the proposed 2024 NC Residential Code - Chapter 11, it is appropriate to make public comments relative to the adoption of the proposed NC Energy Code.

The proposed adoption of the 2024 NC Energy Code and the manner it was created along with the fiscal note and cost-benefit analysis is filled with incorrect information, omissions, incorrect estimates, and has apparent conflict of interest issues. Below will point of these facts.

Incorrect information:

In the proposed code application¹ dated November 1, 2022, the proponent marked all four relevant categories “No”.

Will this proposal change the cost of construction?	Decrease []	Increase []	No [X]
Will this proposal increase to the cost of a dwelling by \$80 or more?	Yes []	No [X]	
Will this proposal affect the Local or State funds?	Local []	State []	No [X]
Will this proposal cause a substantial economic impact ($\geq \$1,000,000$)?	Yes []	No [X]	

Using the numbers from the cost benefit analysis², Table 8 (for single-family construction cost increase) and Table 9 (for multi-family construction cost increase), the minimum stated cost is \$4,763 and \$1,803, respectively per unit. Even using these incorrect estimates compared to the real construction costs, this shows that this proposal will increase the cost of construction. Further, since a dwelling can be built under the commercial code, it shows the costs well above \$80 per unit. Finally, the proposal would cause a substantial impact well over \$1M. It takes only 210 single-family dwellings at the stated \$4,763 cost per unit to reach \$1M. The facts are that the economic impact will be hundreds of millions using the fiscal note estimates. The truth is that the cost increase is much greater, and will cause a substantial economic impact.



Table 8. Total Single-Family Construction Cost Increase for the 2024 NCECC Compared to the 2018 NCECC

Single-family Prototype House			
Climate Zone	Crawlspac	Slab	Unheated Basement
3A	\$4,763	\$5,194	\$4,763
3AWH	\$4,763	\$5,194	\$4,763
4A	\$4,755	\$5,186	\$4,755
5A	\$6,057	\$6,487	\$6,057

Table 9. Multifamily Construction Cost Increase for the 2024 NCECC Compared to the 2018 NCECC per Dwelling Unit¹¹

Multifamily Prototype Apartment/Condo			
Climate Zone	Crawlspac	Slab	Unheated Basement
3A	\$1,803	\$1,867	\$1,803
3AWH	\$1,803	\$1,867	\$1,803
4A	\$1,552	\$1,616	\$1,552
5A	\$2,029	\$2,092	\$2,029

On the proposed code application¹, 3 out of the 4 boxes marked “X” are incorrect.

Omissions:

The proposed 2024 NC Energy Code¹ has omitted General Statutes that exempts certain items (both commercial and residential) from being within the proposed 2024 Code.

Per N.C.G.S. 143-138(b18), "Exclusion from Energy Efficiency Code Requirements for Certain Use and Occupancy Classifications. - The Council shall provide for an exemption from any requirements in the energy efficiency standards pursuant to Chapter 13 of the 2012 North Carolina Building Code and the 2012 Energy Conservation Code, and any subsequent amendments to the Building Code and Energy Conservation Code, for the following use and occupancy classifications pursuant to Chapter 3 of the 2012 North Carolina Building Code: Section 306, Factory Group F; Section 311, Storage Group S; and Section 312, Utility and Miscellaneous Group U. This exclusion shall apply to the entire floor area of any structure for which the primary use or occupancy is listed herein."

Per N.C.G.S. 143-138(b18), "Exclusion from Energy Efficiency Code Requirements for Residential Garages. - The Council shall provide for an exemption for detached and attached garages located on the same lot as a dwelling from any requirements in the energy efficiency standards pursuant to Chapter 11 of the North Carolina Residential Code for One- and Two-Family Dwellings and Chapter 4 of the North Carolina Energy Conservation Code."

Both omissions are not shown in the proposed 2024 NC Energy Conservation Code due to the Ad-Hoc Committee's apparent desire to exclude these exemptions from the public as demonstrated in an email response³ below concerning N.C.G.S. 143-138(b19). Boards are authorized through the General Statutes to administer specific duties approved by the General Legislature; therefore, they are subject to the law.



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RE: [External] RE: F, S or U occupancies

KW

Kim Wooten <kwooten@fstrategies.com>
To Dittman, Daniel E; Isaac, Cliff; Martin, Carl
Cc Rittlinger, David B; Gloria Shealey

i You forwarded this message on 6/9/2023 3:10 PM.

↳ Reply ↳ Reply All ↗ Forward ...
Mon 5/15/2023 11:15 AM

No change. The committee voted to adopt the language as currently written.

There are many examples of building codes and state statutes not in agreement. The NCBCC adopts codes for the general welfare of the public per statute. The General Assembly may make laws that contradict codes and may affect the general welfare of NC citizens, but that effort is independent of the NCBCC.

Thank you,
Kim

Kim Wooten, PE, LEED AP
Senior Engineer, Energy and Sustainability
Facility Strategy Group, LLC
1012 Market Street, Suite 307, Fort Mill, SC 29708
kwooten@fstrategies.com
704-258-4150

From: Dittman, Daniel E <dan.dittman@ncdoi.gov>
Sent: Monday, May 15, 2023 10:53 AM
To: Isaac, Cliff <CIsaac@nchba.org>; Martin, Carl <Carl.Martin@ncdoi.gov>
Cc: Rittlinger, David B <david.rittlinger@ncdoi.gov>; Kim Wooten <kwooten@fstrategies.com>; Gloria Shealey <gcshealey@thedanieleco.com>
Subject: RE: [External] RE: F, S or U occupancies

Cliff,

I don't believe there was any intent to not comply with the General Statutes, however, if the wording or lack of wording in the proposed code does not meet the statute, I'll be happy to change it, but I am staff to the Building Code Council and will do as they direct on this issue.

Sincerely,
Dan Dittman
919-647-0012

Further, omission of N.C.G.S. 143-138(b18) – (Exemption for detached and attached residential garages) may have implications in the cost-benefit analysis and fiscal note as it concerns dwelling units.

Incorrect Statements and Estimates of Cost:

In the fiscal note and the cost analysis, there are multiple incorrect statements and estimates of cost. Below are four items that point out incorrect information:

1 – Statement from PNNL (Pacific Northwest National Laboratory) that they, “*found some errors in the cost summation and the costs in the report are too low*” from the original cost estimates given in July 2021 from the report located in the link as shown from an email⁵ shown here.

https://www.energycodes.gov/sites/default/files/2021-07/NorthCarolinaResidentialCostEffectiveness_2021_0.pdf



RE: PNNL External Website Staff Directory Inquiry

SV

Salcido, Victor R <victor.salcido@pnnl.gov>
To Isaac, Cliff



3/28/2023

i You forwarded this message on 4/14/2023 10:02 AM.

Hi Cliff,

Sorry for the delay in getting back to you. Tons going on with 2024 IECC and DOE initiatives.

I wanted to let you know that we found some errors in the cost summation and the costs in the report are too low. I want to alert DOE to the discrepancy and let them know of my intent to update those first cost values.

I will try and get something to you next week.

Thanks,

--
Rob
PNNL

On June 16, 2023 PNNL issued a MEMO⁴ to the NC Building Code Council and stated in part, “*Was there an error in the previous PNNL analysis? No.*” The MEMO speaks to the 2021 IECC (International Energy Conservation Code) comparison to the 2018 NCECC (North Carolina Energy Conservation Code) before the proposed 2024 NCECC was developed. While this is correct, the question that was asked in the email as well as PNNL’s response does not change that the cost estimates from the earlier comparison were found to have “*some errors and the costs in the report [July 16, 2023 PNNL – link above] are too low.*” The proposed code provisions on the specific question about continuous insulation cost that was asked in the email⁵ did not change between PNNL’s evaluations, nor is relevant.

The fact is that PNNL’s July 2021 evaluation comparison of the 2018 NCECC to the 2021 IECC does have cost errors, which were stated in the email⁵ (partly shown above).

2 – The analysis of the proposed 2024 NCECC contains inaccurate cost estimates that built upon the US Department of Energy’s methodology paper, 2021 IECC nationwide analysis performed which were cost adjusted to North Carolina as well as inflation, and modified from any changes made by the Energy Ad-Hoc committee in the proposed cost provisions for North Carolina.

Methodology for Evaluating Cost-Effectiveness of Residential Energy Code Changes
https://www.energycodes.gov/sites/default/files/2021-07/residential_methodology_2015.pdf

Cost-Effectiveness of the 2024 North Carolina Energy Conservation Code (pages 9-15)
<https://www.ncosfm.gov/b-6-2024-ncecc-cost-analysis/open>

Stated in the Cost-Effectiveness of the 2024 North Carolina Energy Conservation Code above on page 10-11 in part, “*Construction cost difference between the 2024 NCECC and the 2018 NCECC were taken directly from DOE/PNNL reports on the cost-effectiveness of new code editions. National cost estimates were adjusted by a North Carolina-specific construction cost multiplier and appropriate Consumer Price Index (CPI) multipliers to bring costs into 2022 dollars.*”



Cost-Effectiveness of the 2021 IECC for Residential Buildings in North Carolina

https://www.energycodes.gov/sites/default/files/2021-07/NorthCarolinaResidentialCostEffectiveness_2021_0.pdf

Stated in the Cost-Effectiveness of the 2021 North Carolina Energy Conservation Code above on page 18 shows the followings on how PNNL calculated cost.

3.0 Incremental Construction Costs

In order to evaluate the cost-effectiveness of the changes introduced by the 2021 IECC over the 2015 IECC, PNNL estimated the incremental construction costs associated with these changes. For this analysis, cost data sources consulted by PNNL include:

- Building Component Cost Community (BC3) data repository (DOE 2012)
- Construction cost data collected by Faithful+Gould under contract with PNNL (Faithful + Gould 2012)
- RS Means Residential Cost Data (RSMeans 2020)
- National Residential Efficiency Measures Database (NREL 2014)
- Price data from nationally recognized home supply stores

The consumer price index (CPI) is used to adjust cost data from earlier years to the study year (U.S. Inflation Calculator 2021).

The estimated costs of implementing the prescriptive provisions of the 2021 IECC over the 2015 IECC with amendments are taken from earlier PNNL studies that evaluated the cost-effectiveness (Lucas et al. 2012), (Mendon et.al. 2015) and (Taylor et al. 2019). The national scope costs from those studies are adjusted to reflect local construction costs in using location factors provided by RSMeans (2020). The incremental costs of implementing the provisions of the 2021 IECC over the 2018 IECC are described in National Cost Effectiveness of the Residential Provisions of the 2021 IECC (Salcido et al. 2021).

Stated above, “*The incremental cost of implementing the provisions of the 2021 IECC over the 2018 IECC are described in National Cost Effectiveness of the Residential Provisions of the 2021 IECC.*”

National Cost Effectiveness of the Residential Provisions of the 2021 IECC

https://www.energycodes.gov/sites/default/files/2021-07/2021IECC_CostEffectiveness_Final_Residential.pdf

Shown above is the base level report in which the cost analysis showing the increase between the 2018 IECC and 2021 IECC. It should be noted that North Carolina's current 2018 NCECC is a mix of several energy codes including 2009, 2012 and 2015; therefore, the base level cost analysis may not be comparable in specific code sections unless performed. In no place in the two North Carolina cost-effectiveness evaluations is such a difference shown that differs from the National based specific code provisions.

3 – The analysis in the National Cost Effectiveness of the Residential Provisions of the 2021 IECC showing incremental cost estimate for new provisions of the 2021 IECC compared to the 2018 IECC is incorrect and does not compare to the current 2018 NCECC for residential construction. Below is an example:

3.2.2 Increased Wall Insulation

RE29 increases wood frame wall insulation requirements by adding an additional R-5 continuous insulation for climate zones 4 and 5.

A review of RS Means 2020 shows that 1-inch of polyisocyanurate or expanded polystyrene (R-5 insulated sheathing) has an installed cost of \$0.98/ft² of wall area. This cost agrees with prices at major home improvement stores for 1-inch R-5 insulation board.



While adding an additional *R*-5 continuous insulation to the 2021 IECC for Climate Zone 4, North Carolina would increase an additional *R*-10, not *R*-5. The cost shown from a major home improvement store shows roughly \$1 per sf, without taxes, or installation cost. Further, the national analysis did not account for the cost increase in Climate Zone 3 to increase the insulation from *R*-15 to *R*-20. This would not only increase the insulation cost but further increase cost due to the walls would be built from 2x6s instead of 2x4s. To my knowledge in speaking with builders and inspection departments, 95% of all homes in North Carolina are built using 2x4 exterior walls. Therefore, the cost is far greater in reality than PNNL's evaluation in this code provision. The same can be said for all most of the additional energy efficiency requirements being proposed in the 2024 NCECC.

4 – The actual cost is also related to additional items that PNNL did not list. Items such as construction documents, certificate, vapor retarder, additional baffles, blower door test, programmable thermostat, supply/return duct requirements, hot water pumps, loss of square footage due to the increased wall width, increased time, etc. The estimated real cost on a statewide weighed average is approximately \$20,400 per dwelling, far greater than the stated cost in the PNNL reports.

Apparent Conflict of Interest issues:

ICC Code Making Process: The following points were discovered.

- From my understanding the International Code Council met through various groups, "Group B" for example that brought leaders, industry representatives, energy conservation advocates, material suppliers, governmental employees and others together to vote on various provisions of the 2021 IECC. To all accounts, these various groups did compromise and come together on the energy code provisions. The compromise on over 20 major items effecting the Code were then overturned by energy advocates using a voter guide, a YouTube video and pulling Governmental employees throughout various States to online register and vote. The compromise between the various stakeholder groups were then overturned. The National Home Builders Association appealed the vote. ICC ruled the online votes were acceptable. Since, ICC has made several changes for voting to happen more appropriately. Further to my knowledge, the new energy code would be made into a standard. <https://www.youtube.com/watch?v=2RQO83ut4YI>

NCBCC Code Making Process: The following points were discovered.

- The current Chair of the NC Building Code Council was/is Vice-Chair of the 2021 and 2024 Residential International Energy Conservation Code Development Committee.
<https://www.aspe.org/pipeline/international-code-council-appoints-committees-to-lead-energy-code-development/>
- The current Chair appointed various council members and/or public members on the various committees. The Energy Ad-Hoc committee had 14 members, the residential ad-hoc committee had 12 members.
- The Energy Ad-Hoc committee met October 1, 2021 and worked for one year, not two. That work was sent to NCDOI as seen through the 2024 NCECC proposal¹ to the Council on November 1, 2022.
- The mission statement of the Energy Ad-Hoc committee was to adopt the current 2021 IECC with as little changes as possible.
- It has been stated that costs were considered during the Energy Ad-Hoc committee meeting process.
- It has been stated in the news that the Home Builders worked well with the energy ad-hoc committee through the entire process and that compromises were made.
- According to the 2024 NCECC proposal¹ sent from the Standing Energy Committee to the NCBCC, not one of the 20 items that the NAHB Suggested Amendments were taken.



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- It has been stated that the NC Home Builders worked with the Energy Ad-Hoc committee to compromise and work through items in the proposed Code, yet the truth shows otherwise. It was found that there are no minutes from the Energy Ad-Hoc committee meetings showing how or what members voted, as stated in the first meeting on Oct. 1, 2021. Note – The first meeting explained that all votes would be written down and recorded showing information such as the person making the motion, who seconded the motion, the code provision, the vote count and any other information. It was found that this did not happen and no records were found in the minutes of all the Energy Ad-Hoc committee meetings. See below.

i You replied to this message on 3/3/2023 9:49 AM.

Cliff,

The Chair would have kept those records. I was just editing the document as being directed by the committee.

I certainly recall Mr. Privott proposing to keep the 2018 NC energy code provisions for Residential, as did David Smith, so he certainly did not go rogue on who he is representing, but I don't know the vote tally exactly.

Sincerely,

Dan Dittman
919-647-0012

KW

Kim Wooten <kwooten@devitainc.com>

Isaac, Cliff; Dittman, Daniel E ▾

3/3/2023

Re: 2024 NC Energy Ad-Hoc committee meetings

Cc Dittman, Daniel E

Hi Cliff,

Good morning! Good to hear from you.

The committee later voted to hold voice votes as we moved through the energy code. Energy code provisions which received a majority of positive votes by committee members are included in the final document. Provisions that did not receive a majority of positive votes are not included. When there was disagreement among the members, discussion was held to determine acceptable and reasonable solutions and compromise.

Thank you for your interest!

We are looking forward to your participation on the committee for the next code cycle.

Kim



Mission Statement:

The intent is to adopt the IECC 2021 as written with as few amendments as possible.

A. Meeting Discussion Items:

1. Assign responsibility and create groups to address the different sections of the IECC.
2. Who does not have the IECC: Tom Phoenix, Gloria, Rob Zapple,
3. Review membership roster and correct errata. (Roster sent via email).
4. Assign tasks for each section of the IECC where each group will have approximately 30 pages to review.
5. Ensure everyone has what they need from DOI to perform their review and analysis.
6. Review what we will need to finish and submit findings to the Chair and the group prior to the next meeting.
7. Review sections and flag any for further study and discussion at next meeting.
8. Review materials available to members. IECC 2021, Cost Effectiveness of ASHRAE Standard 90.1-2019 North Carolina, EED_1365_BROCH_State Energy Codes_States_North_Carolina, NAHB-Suggested-Amendments-2021-IECC, and North Carolina Residential Effectiveness_2021_0. (Materials sent via email).
9. Establish meeting schedule. (November 2021, January 2022, February 2022, March 2022).
10. Identify items to be discussed at next meeting and member assignments to same.
11. Establish milestones. Goal is to be complete by March 2022 for submittal at June 2022 meeting.
12. Establish procedure for voting on proposed amendments to the IECC 2021 and method to record voting by the committee members. Procedure distributed at meeting and was attached to agenda, see below.

Proposed Item: ((Description))

Motion Made By (Name): ((To approve or deny))	Second Made By (Name):
Item, Discussion, and Vote:>>>>>>	

House Bill 488: The following facts that have been discovered during the analysis.

- Several organizations such as ICC, NEMA, ASHRAE, and other climate related advocacy groups campaigned against HB 488. These same groups stand to benefit directly as they are listed as team building partners for grants from the federal government to implement the new 2021 IECC provisions.
- NC Building Code Council members may also stand to benefit through increased numbers of energy audits if the proposed 2024 NCECC is adopted.

These examples are apparent conflicts of interest.



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It is clear that the process in creating the latest energy codes is broken through the apparent overturning of the will of stakeholders during the process at the National level. This continued into the code adoption process in North Carolina when most of the Energy Ad-Hoc committee members adopted the 2021 IECC with little modifications and no apparent focus on affordability. The real costs of the proposed 2024 NCECC far exceeds what the government sponsored PNNL evaluations show, and the basic cost analysis contains errors. Incorrect information on the application for the code change in addition to the omissions of two general statutes that exempt various types of construction was ignored by the Energy Ad-Hoc committee should cause great concern to the general public and Rules Review Commission.

We urge the NC Building Code Council to not adopt the proposed 2024 NCECC, form a new equally weighted Energy Ad-Hoc committee membership, and adopt reasonable energy efficiency standards that are affordable for our citizens.

Sincerely,

Cliff Isaac, PE
Director of Codes and Construction

References:

- ¹ 2024 NCECC Proposed.pdf
- ² Cost-Benefit Analysis for 2024 N.C. Energy Conservation Code.pdf
- ³ Email Response on occupancies.msg
- ⁴ PNNL-180509-PNNL-North-Carolina-Residential-Energy-Code-Memo.pdf
- ⁵ RE_PNNL External Website Staff Directory Inquiry.msg
- ⁶ BCC_2023-08-21.pdf