



December 3, 2019

Theresa Newman
Office of the Secretary
Department of Natural Resources and Environmental Control
89 Kings Highway
Dover, DE 19901

Re: Docket #2019-R-CCE 0220

Dear Ms. Newman:

We are writing as the Delaware Community of Green Building United to support the adoption of the 2018 International Energy Conservation Code (IECC) and the latest American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2016 **without amendment** in Delaware.

The issue of modernizing building energy codes is of particular interest to Green Building United, as our community is instrumental in how buildings and communities are designed, built, and operated in our region.

Building energy codes codify minimum construction standards to protect the health, safety, and welfare of those constructing, occupying, and managing buildings. Codes ensure that design and construction standards are rigorous, keep pace with emerging technologies and practices, and promote continuity across city and state lines.

Delaware's Energy Conservation Code Act¹ (16 Del.C. §7602) compels the Delaware Energy Office to adopt the "highest available energy conservation code" as its referenced energy code. In addition, the Act stipulates that, "[a]s of December 31, 2025, all new residential building construction in the State of Delaware shall be zero net energy capable. As of December 31, 2030, all new commercial building construction must also be zero net energy capable."

The impacts and benefits of updating to the latest energy code edition are significant and exciting for all Delawareans. By raising Delaware's minimum building energy codes to incorporate vetted and cost-effective technologies and practices, we can save consumers money, improve safety and resiliency, and reduce environmental impact. All the while, Delaware can demonstrate progress

¹ Delaware Code. Title 16, Chapter 76. County of Municipal Building, Plumbing, Electrical and Other Codes.
<https://delcode.delaware.gov/title16/c076/index.shtml>

toward its ambitious zero net energy capable goals to positively impact every person that lives, works, or visits a building.

It is critical that Delaware adopt 2018 IECC/ASHRAE 90.1-2016 **without amendment** to ensure that the numerous impacts and benefits are full realized.

Consumer Energy Cost Savings

For commercial buildings, the transition from Delaware's current commercial energy codes (ASHRAE 90.1-2010) to those that are currently being reviewed for adoption (ASHRAE 90.1-2016) yields an energy cost savings of about 17%, per U.S. Department of Energy reports².

That means that with the changes to building design practices and materials, we can expect modern code-compliant non-residential buildings to perform more efficiently and cheaply than those in compliance with our current minimum requirements.

In residential buildings, the transition from Delaware's current residential energy codes (2012 IECC) to the 2018 IECC yields an energy cost savings of just under 3%, per U.S. Department of Energy reports³.

The incremental improvement is so modest that any modification to provisions could jeopardize the opportunity to deliver energy cost savings to the consumer.

In particular, we strongly discourage the following amendments to the residential energy code that were proposed during the Delaware Energy Code Coalition stakeholder process, of which Green Building United was a part:

- (1) R403.3.5 Building cavities (Mandatory)** *Building framing cavities shall not be used as ducts or plenums.*
Exception: Returns run exclusively through conditioned space and not located on exterior walls, floors or ceiling assemblies

Using building cavities for air returns increases duct leakage. Green Building United's concern with this proposed exception is not as strong as other proposed amendments but discourages any practice that has the strong potential to increase utility costs and lower occupant comfort.

- (2) R 403.5.3 Hot Water Pipe Insulation (Prescriptive)**

1. Piping *larger than* $\frac{3}{4}$ inch (19.1 mm) ~~and larger~~ in nominal diameter.
- ~~#4 Piping from the water heater to a distribution manifold.~~

² ANSI/ASHRAE/IES Standard 90.1-2013 Determination of Energy Savings: Quantitative Analysis. Pacific Northwest National Laboratory on behalf of the U.S. Department of Energy. https://www.energycodes.gov/sites/default/files/documents/901-2013_finalCommercialDeterminationQuantitativeAnalysis_TSD.pdf

Energy Savings Analysis: ANSI/ASHRAE/IES Standard 90.1-2016. U.S. Department of Energy. https://www.energycodes.gov/sites/default/files/documents/02202018_Standard_90.1-2016_Determination_TSD.pdf

³ 2015 IECC: Energy Savings Analysis. Pacific Northwest National Laboratory on behalf of the U.S. Department of Energy. https://www.energycodes.gov/sites/default/files/documents/2015_IECC_FinalDeterminationAnalysis.pdf. Residential Determinations. U.S. Department of Energy. <https://www.energycodes.gov/development/determinations>

Hot water pipe insulation is an inexpensive practice. Green Building United does not support its removal, as its cost is quickly recovered by the avoided heat loss.

(3) R402.4.1.2 Testing (Mandatory). *The building or dwelling unit shall be tested for air leakage and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. The maximum air leakage rate for any building or dwelling unit under any compliance path shall not exceed 5.0 air changes per hour. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E779 or ASTM E1827 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.*

An amendment of this nature is of most concern to Green Building United. Requiring that a project only meet five air changes per hour is a step backward from what is required by the current 2012 IECC and runs counter to Delaware's zero net energy capable homes by 2025 goal. The proposed changes can also be costly to consumers whose homes can have more envelope air leakage and thus require more energy use to maintain comfort levels.

While the 2012 IECC in Delaware currently allows homes under 1,500 square feet to meet a 5 air changes per hour requirement, we do not agree with extending this allowance to all homes when the intent is to improve performance over current code. If, ultimately, there is a desire to maintain tiered requirements for homes above and below 1,500 square feet, using the requirements of the 2018 IECC as a guide, those requirements should shift to 4 air changes for homes below 1,500 square feet and 3 air changes per hours for homes 1,500 square feet or more.

For any proposed modifications to the 2018 IECC that would decrease residential energy efficiency, those proposing the amendments need to provide significant justification for these changes, as they will be passed along to homebuyers in the form of higher utility bills and diminished comfort.

Cost-Efficiency

The increased efficiency and improved safety of built projects will bring Delaware in line with neighboring states and will deliver utility cost savings to end users all at a marginal cost difference from the previous code edition.

For building owners, the increased quality and energy efficiency of new construction and retrofit projects can be marketed to residential and commercial tenants as cheaper to operate and more comfortable than buildings built to our current base code.

Resiliency and Safety

The 2018 IECC and ASHRAE 90.1-2016 represent the best-available guidance for design and construction to mitigate risks from natural hazards ensuring that new construction is safer and more

resilient to the effects of climate change. This is a critical planning step for Delaware, which is vulnerable to climate change-related coastal storms, sea level rise, and flooding.

Energy efficient buildings are better able to weather power outages and increases in utility costs⁴ than the average building. Given that people also spend on average 90% of their time indoors⁵, buildings must provide appropriate protection from the outside world.

First State Leadership and Regional Competitiveness

Peer states⁶ including New Jersey and Maryland are currently on 2018 Codes and Pennsylvania is on 2015 Codes. The jump to the 2018 IECC/ASHRAE 90.1-2016 will position Delaware as one of the region's leaders in modern code adoption.

As a leader, Delaware will need resources to ensure smooth compliance and enforcement. Training for and communication between the architecture, engineering, and construction industry and the code enforcement community is essential for the full energy and energy cost savings to be realized. Green Building United has supported the energy code transition in Philadelphia and has ready-to-deploy training resources for non-residential buildings including in-person seminars and webinars. Having the trainings, expertise, and materials need to comply with an updated code standard already available in the region will help facilitate a seamless transition to the 2018 code.

In addition, training Delaware designers and builders on modern energy codes will give our workforce a competitive edge in the region, as they will be up-to-date on the latest skills and practices.

Environmental Impact

Operational energy use from buildings accounts for nearly half of carbon emissions in the United States⁷. To address this concern, the State of Delaware has a commitment to reduce carbon emissions by 30 percent by the year 2030 from a 2008 baseline.

In the life cycle of a building, the most cost-effective time to ensure efficient energy usage and avoid unnecessary cost is in the initial design and construction phase. More energy efficient buildings save consumers money on utility bills and reduce the environmental impact from energy use in the built environment.

Conclusion

Delaware has the opportunity to lead while also benefitting the health, safety, and pocketbooks of its residents by adopting 2018 IECC and ASHRAE 90.1-2016 without amendments.

We appreciate your consideration of our comments and welcome any additional questions.

⁴ "How Energy Efficiency Can Boost Resilience." ACEEE, Apr 2018. <https://aceee.org/blog/2018/04/how-energy-efficiency-can-boost>

⁵ The Inside Story: A Guide to Indoor Air Quality: <https://www.epa.gov/indoor-air-quality-iaq/inside-story-guide-indoor-air-quality>

⁶ Commercial Code Status: <http://bcapcodes.org/code-status/commercial/>

⁷ "Why the Building Sector?" Architecture 2030. https://architecture2030.org/buildings_problem_why/

Signed,

The Delaware Community of Green Building United Steering Committee

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Green Building United is an independent 501(c)(3) nonprofit organization. Our mission is to foster transformative impact in our communities through green building education and advocacy, and our vision is a sustainable, healthy, and resilient built environment for all. Our region includes the greater Philadelphia area, Lehigh Valley, and the State of Delaware. Our community is made up of architects, engineers, policy makers and advocates, landscape architects, marketing and communications professionals, developers, contractors, building managers, building operators, government workers, and more. Green Building United's stakeholders share a common interest in green building and sustainability, and knowledge levels range from novice to expert.