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Committee on Energy and Commerce
Subcommittee on Energy
2125 Rayburn House Office Building
Washington, DC 20515

Via email

Re: Testimony of the International Code Council on the U.S. House Energy and Commerce Energy Subcommittee’s Hearing on: “Building a 100 Percent Clean Economy: Solutions for the U.S. Building Sector”

The International Code Council (ICC) is a member-focused association dedicated to helping the building community and the construction industry provide safe, resilient, and sustainable construction through the development and use of model codes (the I-Codes) and standards used in the design, construction, and compliance processes. Most U.S. states and communities, federal agencies, and many global markets choose the I-Codes to set the standards for regulating construction, plumbing and sanitation, fire prevention, and energy conservation in the built environment.

The design and construction of new buildings and major renovations are governed by building codes. ICC’s model building codes are “voluntary consensus standards” under Office of Management and Budget (OMB) Circular A-119 and the National Technology Transfer Advancement Act (NTTAA), meaning they are developed in an open forum—with a balance of interests represented and due process—that, ultimately, ensures a consensus outcome. State and local governments adopt, amend, and enforce model building codes to advance policy goals and to ensure the health, safety, and welfare of their residents.

ICC develops the International Energy Conservation Code (IECC), which provides for the energy efficient construction of residential and commercial buildings. The IECC is updated every three years and, like other building codes, has advanced with each subsequent code cycle. The 2018 IECC represents a [more than 30% improvement](#) in efficiency over the 2006 IECC edition.

The code captures policies and practices that lead to reduced energy use and greenhouse gas emissions. It addresses the design of energy-efficient building envelopes and the installation of energy-efficient mechanical, lighting, and power systems through requirements emphasizing performance. Between 2010 and 2040, the U.S. Department of Energy expects that model building energy codes will save up to [12.82 quads](#) of primary energy associated with building energy use. The IECC is in use in 49 states.

The Department of Energy’s Building Technologies Office (BTO) supports the development and implementation of building energy codes, like the IECC, by providing technical assistance for code development, adoption, and compliance. BTO coordinates with stakeholders to improve model energy codes and provides technical assistance to states implementing updated energy codes. The purpose of BTO’s dedicated [Building Energy Codes Program \(BCEP\)](#) is to “improve building energy efficiency, and to help states achieve maximum savings” by “advancing building codes.”



ICC also develops the International Green Construction Code (IgCC), a collaboration between the Code Council, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the U.S. Green Building Council (USGBC), and the Illuminating Engineering Society (IES), which provides a code-based approach to achieving sustainability objectives. The IgCC is in use in 16 states and DC. [GSA requires the IgCC](#) for the construction and renovations it supervises. The IgCC contains criteria aimed at reducing the impact of buildings on the community and surrounding environment. Covered topics include:

- Site selection to limit heat islands and support transportation efficiency;
- Water use efficiency measures;
- Enhanced energy efficiency measures;
- Material use, including limiting construction waste, encouraging use of recycled or salvaged materials, and conducting life-cycle assessments; and
- Construction and operations actions to limit construction impacts and support ongoing achievement of sustainability objectives.

Beyond the development of an energy efficiency code and a green code, the Code Council has undertaken several additional activities that support advancement of energy efficiency and clean energy solutions. We have begun convening members and other interested stakeholders to identify potential guidance that builds off the existing code infrastructure to deliver zero energy buildings and reduce the embodied carbon in buildings.

The ICC Evaluation Service (ICC-ES) provides product certifications for clean energy technologies through the Solar Rating & Certification Corporation (SRCC). These certifications provide manufacturers with a mechanism to test and rate the performance of their equipment while providing consumers with assurance of the safety and durability of the products. As interest in deploying these technologies grows to meet energy and GHG reduction goals, the testing and certification of these products becomes increasingly important. Product certification is a valuable tool to assure safety, durability, and performance that Congress and the federal government should consider in developing technology deployment efforts. The ENERGY STAR and ITC programs currently cite to SRCC certifications to ensure the quality of incentivized products.

I. Building Codes as Tool to Promote Energy Efficiency and Emissions Reduction

Energy codes and green codes by their very nature provide a scalable solution to address new construction and major renovations. They are designed to apply nationwide and provide a common basis for designers, manufacturers, and contractors who support construction activity across the country.

When applied effectively, the model energy and green construction codes provide a sound foundation for energy efficient and low carbon intensity buildings. The private sector driven, consensus-based development process assures that all stakeholders are given the opportunity to participate in the process and therefore buy into the results. This process allows the code to be updated every three years, providing certainty for the building industry and the communities that rely on the code while also

allowing for the incorporation of the latest technologies and practices that improve buildings. The existing code development process along with supplementary guidance and tools provides the building industry with a path forward to achieving significant energy and greenhouse gas emission reductions—including achievement of zero energy buildings.

[Analyses show](#) buildings generally need to be 50 to 80 percent more efficient than the 2006 IECC, depending on occupancy and climate zone, to potentially be considered net zero. Given that the 2018 IECC is, depending on occupancy and climate zone, 33 percent more efficient than the 2006 IECC, cost-effective net zero construction would require a further reduction of approximately 20 to 50 percent. Last year, the U.S. Conference of Mayors passed a [resolution](#) urging the use of the IECC to achieve net zero building construction by 2050. An average 2 to 4.5 percent decrease in energy use over each of the 11 code cycles from the 2018 IECC to the 2051 IECC would accomplish the mayor’s resolution.

Many of the communities that rely on the I-Codes have adopted greenhouse gas reduction goals and are leveraging the I-Codes to achieve them (the U.S. Conference of Mayors being one example). ICC is committed to assisting these communities in developing the tools and guidance that will help them achieve these goals.

II. Federal Policies that Leverage Codes to Promote Efficiency and Emissions Reduction

The efficiency and emissions reduction benefits modern codes provide can be leveraged through several policy pathways, all which utilize existing law or build off prior successes.

A. Offer significant incentives to encourage the adoption and enforcement of current green construction and model energy codes, including the IECC and IgCC

The IgCC is typically used for state owned buildings or provided as a voluntary or stretch option in the 16 states in which it has been adopted. In 12 of these states, the IgCC is in use by a limited number of local governments. Given its usage, a significant opportunity exists to expand its adoption both for government owned buildings and community-wide.

Sixteen states currently employ commercial or residential energy codes that are 9 or more years out of date. Current codes are more than 25% more efficient. Six states do not require local energy code adoption. In these states, adoption (if any) is determined at the local level. Were these 22 states and the communities within them to track current energy codes, our nation’s energy efficiency would increase significantly.

Improved energy code enforcement is also critical. To achieve the projected [\\$126 billion energy cost savings](#) DOE has estimated codes can provide through 2040, codes must be fully implemented. DOE [residential field studies](#) have demonstrated that adequate training is one of the keys to effective implementation – with training shown to increase energy code savings by about 39%.

Strong federal incentives could meaningfully increase green construction and energy code adoption and enforcement. This strategy has worked before. Under the American Recovery and Reinvestment Act

(ARRA), \$3.1 billion in State Energy Program (SEP) grants were tied to the adoption and enforcement of the latest edition of model energy codes—the then 2009 IECC and ASHRAE 90.1-2007 (applicable to commercial buildings). Governors provided letters committing to adoption of the latest edition and to developing and implementing a plan to achieve 90 percent compliance by 2017.

This approach was impactful. As of September 2009, [only two states met or exceeded the 2009 IECC or ASHRAE's 90.1-2007](#) efficiency standard. By January of 2011 approximately 30% of states had adopted codes that met or exceeded ARRA's energy code requirement. To date more than [half of states](#) have continued to adopt more current codes and only two states that adopt statewide codes are on code editions prior to the ARRA targets. Notably, because of ARRA, 6 states that leave aspects of code adoption to local governments, adopted energy codes that are applicable statewide. Nearly half of states have taken advantage of federal funding to evaluate code compliance and offer targeted training based on field study findings.

With significant enough incentives attached to tighter compliance structures, states and communities across the country could be encouraged to (1) update to the latest green construction and energy codes, (2) ensure proper enforcement, and (3) stay up to date with later, and more efficient, green construction and energy code editions.

B. Tie federal grant awards to applicant code adoption and require federal funded projects adhere to the latest model codes

A state/local federal funding applicant's adoption and enforcement of up to date green construction and model energy codes should be a condition for receipt of funds or make the applicant more competitive for funding. Such an approach is consistent with legislation that passed twice last year—the [Bipartisan Budget Act](#) and [Disaster Recovery Reform Act](#)—which increase funding or increase applicant competitiveness for funding based on the applicant's adoption and application of modern model building codes that mitigate against natural hazards. Both SEP and Energy Efficiency and Conservation Block Grants (EECBG) could be avenues through which jurisdictional adoption of updated energy and green construction codes is promoted.

Congress should also insist on adherence to the energy code standards it has previously instituted. Section 413 of the Energy Independence and Security Act of 2007 (EISA) required DOE to promulgate regulations establishing standards for energy efficiency in manufactured housing based on the most recent edition of the IECC by no later than December 19, 2011 "except in cases in which the Secretary finds that the code is not cost-effective, or a more stringent standard would be more cost-effective." DOE has yet to finalize regulations requiring these efficiency improvements. In the more than seven years since that deadline has passed, more than [542,000 manufactured homes](#) have been produced. Several proposals in DOE's 2018 RFI on these efficiency requirements indicate that the Department may be considering exempting most manufactured homes from EISA's efficiency requirements. ICC urges Congress to explore means to ensure these requirements are followed.

Federally funded projects should also require adherence to the latest model energy codes (where these codes exceed local requirements). Green construction codes should also be leveraged. The federal government expends billions annually through grant and loan programs to rehab, construct, or provide

for the purchase of buildings. Locking efficiency design and green construction features into these investments is particularly important considering many will have 50-75 year lifetimes.

EISA took a step toward this outcome for HUD and USDA by requiring energy codes in their grant and loan programs.¹ Within a year after updates to model energy codes, USDA and HUD are required to adopt them, “unless the Secretaries determine that compliance with such revised code or standard would not result in a significant increase in energy efficiency or would not be technologically feasible or economically justified.” After a year, the new codes apply if the Secretaries “make a determination that the revised codes do not negatively affect the availability or affordability . . .” HUD has adopted through rulemaking the 2009 IECC in its Public Housing Capital Fund and Housing Trust Fund programs.² FHA and USDA backed loans for new construction require adherence to the 2009 IECC.³ HUD/USDA minimum standards should be updated to the latest energy codes which would achieve efficiency savings of at least 25%.

Broader application of current green construction and energy codes throughout the federal government would provide greater efficiency benefits. For example, Community Development Block Grants (CDBG) do not include a minimum building code standard. Since 2017, Congress has awarded roughly \$40 billion in disaster recovery funds through CDBG in addition to the program’s annual \$3 billion outlay.

Requiring adherence to current building codes through federal programs tracks the just released [National Mitigation Investment Strategy \(NMIS\)](#). The NMIS, released by the FEMA-chaired Mitigation Framework Leadership Group (MitFLG), presents a unified national strategy on mitigation investment that reduces risks posed by natural hazards and increases the nation’s resilience to disasters. The MitFLG is composed of 14 federal agencies and departments as well as state, tribal and local officials and is charged with coordinating the strategy’s implementation. One of the most critical recommendations in the strategy is “[u]p-to-date building codes and standard criteria should be required in federal and state grants and programs.”

C. Increase and maintain training, education, and workforce funding

BECP is the development, adoption, and deployment arm of energy codes within DOE. The program provides technical resources to support state and local code adoptions and enforcement, including software tools, training and education, and other technical assistance. The BECP budget (currently \$7 million) is about a third of what it was post ARRA, curtailing technical assistance, training, and education. Consistent and expanded funding, and coordination with SEP, EECBG and other incentive programs would provide greater resources to communities to undertake code adoption and enforcement (including training and certifications for code officials and training for local architects, engineers, and contractors) and provide a more consistent focus on keeping energy codes up-to-date and fully implemented.

¹ 42 U.S.C § 12709.

² [24 CFR § 905.312](#); 80 Fed. Reg. 5200 (Jan. 30, 2015).

³ https://www.hud.gov/program_offices/economic_development/eegb/standards.

D. Support beyond code programs

ICC is actively convening members and other interested stakeholders to identify potential guidance that builds off the existing code infrastructure to deliver zero energy buildings and reduce the embodied carbon in buildings. While this effort is in its early stages, DOE and other federal agencies could help accelerate advancement by providing both technical and financial resources.

The IgCC offers an opportunity to capture energy savings, greenhouse gas emissions reductions, and achieve other sustainability goals through the variety of measures it covers. While the IgCC inherently contributes to reduced energy use and greenhouse gas emissions based on its enhanced requirements beyond the current baseline, the exact levels of improvement have not yet been quantified. As states and localities consider the adoption of the IgCC, data on the magnitude of energy savings and greenhouse gas emission reductions will illustrate how adoption and enforcement of the IgCC will contribute to their energy, climate, and other sustainability goals. Ongoing evaluation of potential changes during development and after publication of each edition would allow for continual improvement and potential alignment with sustainability goals. The technical expertise of agencies like DOE and EPA to help the IgCC developers to quantify the level of savings would improve the underlying code and help advance its adoption.

A cooperative grant program for existing codes and standards developers would allow DOE and EPA to provide technical and financial resources to support enhanced or accelerated methods for achieving zero energy buildings and reduced GHG emissions and embodied carbon.

E. Strengthen model energy code incentivization through state certifications under the Energy Policy Act of 1992

BECP, supported by Pacific Northwest National Laboratory, evaluates each new edition of model energy codes to determine energy savings compared to prior versions. This determination triggers a requirement for states to evaluate their current energy code and provide a certification to the DOE Secretary that for commercial buildings they have updated their codes to meet or exceed the updated edition and for residential buildings that they have made a determination as to whether it is appropriate to revise their code to meet or exceed the updated edition.⁴ Current determinations are given based on energy cost, site energy, and source energy. To encourage greater focus on greenhouse gas emissions improvements associated with each edition of the code, future determinations could also include a determination of greenhouse gas emissions improvements across editions.

Additionally, while states are required to make a certification on their response to the new code edition, there is no penalty or incentive based on the certification and the statute expects commercial code updates but not residential updates (“whether they have updated their codes” versus “whether it is appropriate to revise their code”). Tying these determinations to funding incentives and treating residential and commercial the same would strengthen existing state requirements.

⁴ 42 U.S.C. § 6833.



F. Establish consistent DOE participation in code development

The IECC development process is open to all interested parties and improvements in the code are driven by proposals offered by interested parties, including DOE. DOE participation in the code development process has varied. A policy governing DOE's participation would provide clarity to DOE leadership on the Department's participation and ensure a more consistent level of participation.

G. Coordinate federal research on buildings and increase funding for these activities

Multiple federal agencies support research activities within the buildings industry including NSF, DOE, NIST, FEMA, and EPA. Often, the research priorities of these agencies are not coordinated. U.S. investment in buildings research is also [relatively limited](#) and lacks the focus many other countries have shown.

A coordinated approach to buildings research with a greenhouse gas emissions focus including energy efficiency, embodied carbon, renewable energy, and energy grid integration would be beneficial. Increased funding and greater coordination would foster significant advancement in building technologies and greenhouse gas reduction. These advances ultimately may be captured by future building code editions, ensuring their widespread and lasting integration into the built environment.

The National Earthquake Hazards Reduction Program (NEHRP), where relevant agencies come together around a common goal and share their individual areas of strength, may be a model to support research and actions in this area. Such a program could be highly focused just on energy and greenhouse gas emissions or broader to focus on buildings in general, assuring that energy efficiency is considered alongside natural hazard mitigation and other important building attributes.

ICC recommends increased research funding (tied to pilot and deployment programs) to support the following activities: energy efficiency products (improvement to existing products and new technologies that provide the same or improved performance using less energy); building-grid interactions; systems efficiency; embodied carbon of building products/life-cycle based decision making; optimization of the design, construction, and operations processes to support efficiency; and social science research on building occupant behavior and motivating factors.

Thank you for the opportunity to provide testimony. If you have any questions concerning ICC's comments, please do not hesitate to contact me.

Sincerely,

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