



Shaping Tomorrow's Built Environment Today

Submitted Testimony of

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To the

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**Hearing on Strategic Petroleum Reserve Discussion Draft and Title IV Energy
Efficiency**

Chairman Whitfield, Ranking Member Rush, and members of the Subcommittee, thank you for the opportunity to submit testimony for what will be one of the most important hearings on energy legislation in recent memory.

My name is Tom Phoenix, and this year I am President of ASHRAE. Founded in 1894, ASHRAE is a global organization of over 53,000 members. The Society and its members focus on building systems, energy efficiency, indoor air quality and sustainability within the industry. Through research, standards writing, publishing and continuing education, ASHRAE shapes tomorrow's built environment today¹.

ASHRAE's Mission is to advance the arts and science of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world. In pursuit of this, ASHRAE has been engaged with many of the issues that are the focus of this hearing. While the Society is supportive of many of the ideas contained in Title IV of Chairman Upton's Discussion Draft, we also have some concerns and suggestions for improvement. Our thoughts on these matters are presented below, and we welcome continued dialogue on these matters, as we seek to build consensus on the best ways to solve our evolving energy, water, and indoor air quality challenges.

Support for Building Energy Codes

Many bills in Congress touch on building energy codes in one form or another, and it is easy to understand why. The nation's model residential and commercial building energy codes are developed by the International Code Council (ICC) and ASHRAE². These codes have the potential for substantial energy, economic, and environmental benefits. For instance, a study by the Pacific Northwest National Laboratory (PNNL) of the U.S. Department of Energy's (DOE) Building Energy Codes Program (BECP) found the cumulative greenhouse gas emissions reductions from the Programs' activities have been significant, totaling nearly 3.9 billion metric tons, or approximately three-fourths of all energy-related emissions in the U.S. in 2012³. The study also concluded that since the Program's inception 20 years ago,

"cumulative FFC [full-fuel-cycle] energy savings from 1992 – 2012 are estimated to be approximately 4.2 quads and cost savings to consumers have been more than \$44 billion. These savings have resulted primarily from the Program's activities which upgrade the model energy codes, accelerate their adoption by states and localities, and improve code compliance"⁴.

While these figures are impressive, realizing the full extent of these benefits requires the many disparate elements of the building industry to work together in harmony to facilitate the development, adoption, and compliance with the building energy codes. Certain elements of the Discussion Draft would bolster these efforts and facilitate greater understanding. For instance, ASHRAE supports the

¹ For additional information on ASHRAE, please visit www.ashrae.org.

² For additional information on the development of Standard 90.1, see the portion of this document entitled "Appendix: An In-depth Look at ASHRAE Standard 90.1".

³ Pacific Northwest National Laboratory. 2014. "Building Energy Codes Program: National Benefits Assessment, 1992-2040". Richland, Washington: Pacific Northwest National Laboratory. http://www.energycodes.gov/sites/default/files/documents/BenefitsReport_Final_March20142.pdf

⁴ Ibid.

Government Accountability Office study on the energy and cost savings impacts of updating the model building energy codes that would be required under Chapter 3 – Building Energy Codes of the Discussion Draft.

There are several provisions in the Discussion Draft that ASHRAE is strongly opposed to. Drawn primarily from the Energy Savings and Building Efficiency Act of 2015 (H.R.1273, and commonly known as Blackburn-Schrader), ASHRAE is strongly opposed to any efforts to limit, in any way, DOE's participation in the development, adoption, and compliance of building energy codes. The provisions in the Discussion Draft that would limit the type of technical assistance DOE is allowed to provide to the model code development bodies, states, Indian tribes, and local governments threaten to reduce understanding of the potential full impacts of the consensus-based model building energy codes. More information is needed, not less. Similarly, ASHRAE believes that efforts to improve code compliance should be increased.

Elevating state building energy code compliance is an area likely rich with potential. While data on code compliance rates is often limited or incomplete, a comprehensive study⁵ conducted by the Institute for Market Transformation found that compliance rates of many states is between 25 and 80%, with some as low as 3%. Among the report's most interesting findings is that increasing compliance rates have significant returns on investment, with every \$1 used to improve compliance yielding \$6 in energy savings.

The provisions in the Discussion Draft would help increase state and local building energy code compliance through required certifications, training for state and local building code officials, and annual reporting requirements.

ASHRAE also supports the provisions of the Discussion Draft that would require DOE to provide assistance, as requested, in developing definitions of energy use intensity (EUI).

ASHRAE firmly believes that you can't manage what you don't measure. Because common, widely accepted and validated definitions and metrics of building EUI do not currently exist, building owners, operators, and policymakers can't effectively communicate goals, evaluate potential investments, and measure success since they effectively are not speaking the same language. The Discussion Draft helps solve this problem.

Stretch Codes and Standards

ASHRAE strongly supports the provisions of the Discussion Draft that would require DOE to provide technical and financial support for the development of stretch codes and advanced standards for commercial and residential buildings. ASHRAE is active in this area, and is currently making it easier for the building industry and policymakers to implement and adopt green building codes and voluntary

⁵ Stellberg, S. 2013. *Assessment of Energy Efficiency Achievable from Improved Compliance with U.S. Building Energy Codes: 2013 – 2030*. Washington, D.C.: Institute for Market Transformation.
http://www.imt.org/uploads/resources/files/IMT_Report_Code_Compliance_Savings_Potential_FINAL_2013-5-2.pdf

building rating programs by creating a first-of-its-kind comprehensive framework involving ANSI/ASHRAE/USGBC/IES 189.1 Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, the International Green Construction Code, and the Leadership in Energy & Environmental Design (LEED) program.

ASHRAE has also joined with ICC and the National Association of Home Builders to develop the 2015 edition of ICC 700 National Green Building Standard (NGBS). NGBS is an ANSI-approved standard, meaning that it adheres to rigorous consensus process requirements. NGBS addresses several green practices, including:

- Lot design, preparation and development
- Resource, energy, and water efficiency
- Indoor environmental quality
- Operation, maintenance, and building owner education

There are four achievable levels to NGBS: Bronze, Silver, Gold, and Emerald. Additional information on the NGBS can be found at www.homeinnovation.com/green.

Net Zero Energy Buildings

In a related area, **ASHRAE supports the provisions of the Discussion Draft related to net zero energy buildings**. As articulated in ASHRAE's *Vision 2020* report⁶, we support a goal for the building community to produce market-viable net zero energy buildings by 2030. The Discussion Draft can help the community come closer to reaching this goal through the bill's requirement for DOE to conduct a study on the feasibility, economics, and impacts of code improvements that would require that buildings be designed, sited, and constructed in a manner that enables buildings to become zero-net-energy after initial construction as advances are achieved in energy efficiency technologies.

Workforce Training and Certification

ASHRAE believes the Discussion Draft can be improved by incorporating the elements of Subtitle B – Worker Training and Capacity Building of S.720. The full benefits of energy efficiency cannot be realized if those that work in the building industry do not possess the skills research and experience have proven are needed. The proposed building training and assessment centers will help close this gap, however more needs to be done. **ASHRAE recommends expanding upon Subtitle B of S.720 to include a stronger emphasis on certification programs that benchmark with the ANSI/ISO accreditation standards for personnel certification programs for building professionals in energy efficiency legislation. This will help ensure quality in workforce training and certification.**

⁶ ASHRAE. *Vision 2020: Providing Tools by 2020 that Enable the Building Community to Produce Market-Viable NZEBs by 2030*. January 2008.

http://www.ashrae.org/File%20Library/docLib/Public/20080226_ashraevision2020.pdf

Research has shown that building professionals who participate in training and obtain certifications yield buildings that are designed and perform at higher levels. Certification programs also provide significant benefits to building owners, including⁷:

- Increased confidence in critical job knowledge, skills and abilities
- Compliance with applicable local, state and federal requirements
- Confidence in corporate commitment to the professional development of its employees and to providing the best possible resources for projects
- Disciplinary process to follow in case of complaints

ASHRAE is active in meeting the needs of the building industry for a highly-educated workforce, and has developed and maintains six professional certifications in the following areas⁸:

- Building Energy Assessment
- Building Energy Modeling
- Commissioning Process Management
- Healthcare Facility Design
- High-Performance Building Design
- Operations and Performance Management

Currently, ASHRAE has certified more than 2,000 professionals who have demonstrated their knowledge and expertise in the heating, ventilating, air conditioning and refrigeration industry. These certifications are recognized by the federal government and several states and cities who use ASHRAE Certifications for energy audits, energy modeling, commissioning, and other services. These states and cities include⁹:

- California
- Connecticut
- Florida
- Maryland
- Michigan
- New York
- Texas
- Virginia
- Austin, TX
- Boston, MA
- Chicago, IL
- Fort Collins, CO
- Los Angeles County
- Lowell, MA
- Miami/South Florida
- New York City
- Sacramento, CA
- San Francisco, CA

⁷ ASHRAE. "The Value of Certification". <https://www.ashrae.org/education--certification/certification/value-of-certification>

⁸ Additional information on ASHRAE's professional certifications can be found at <https://www.ashrae.org/education--certification/certification>

⁹ Additional information on government recognition of ASHRAE's certifications is available at <https://www.ashrae.org/education--certification/certification/government-recognition>

School Buildings

ASHRAE supports Chapter 5 – School Buildings of the Discussion Draft. This legislation would help meet the widespread need throughout the nation for extensive repair of school buildings that affects some 14 million students¹⁰. Many of these repairs involve the heating, ventilating, and air conditioning systems – the same systems responsible for both large amounts of energy consumption and the maintenance of healthy and comfortable indoor environments. By upgrading these systems, energy efficiency is increased, learning environments are improved, and scarce funds are conserved.

ASHRAE believes Chapter 5 can be improved by including language that more explicitly links energy efficiency with indoor air/environmental quality (IEQ), such as that contained in S.523.

Energy Efficiency and Indoor Environmental Quality

Research has confirmed that poor indoor air/environmental quality (IEQ) can result in serious health consequences, such as heart disease and lung cancer. As noted in the section above, the systems responsible for good or poor IEQ are the same systems that consume large amounts of energy in buildings. **In recognition of this link, ASHRAE opposes any efforts to increase energy efficiency at the expense of IEQ, and instead encourages Congress to support legislation that takes a more comprehensive approach to improving building performance.**

Data Center Energy Efficiency

Among the hottest trending topics in the building community is how to improve data center energy efficiency. ASHRAE is currently focused on this subject, and supports the provisions of the Discussion Draft concerning federal data center energy efficiency. **We believe this section can be improved by adding specific provisions that would promote the future use of consensus-based standards on data center energy efficiency. ASHRAE is currently working with public and private stakeholders to develop Standard 90.4 Energy Standard for Data Centers and Telecommunications Buildings; adding a provision on standards for energy efficient data centers would assist federal agencies who voluntarily choose to use Standard 90.4, or other standards when they become available.**

Valuing Energy Efficiency in Mortgage Underwriting

Residential energy efficiency improvements have long-term benefits, but the initial upfront costs can be a deterrent to homeowners. At the same time, average yearly energy costs for homeowners can exceed the amount paid in real estate taxes or homeowners insurance, yet monthly energy bills are often ignored when determining a homeowner's ability to afford monthly mortgage payments.

This situation can be changed by including energy efficiency improvements in mortgage underwriting. Doing so will provide a more complete picture of the full costs of homeownership, while clarifying the value of investing in energy efficiency.

¹⁰ U.S. General Accounting Office. "Condition of America's Schools". February 1995. <http://www.gao.gov/products/HEHS-95-61>.

ASHRAE strongly supports adding a section to the Discussion Draft that would allow federal mortgage loan agencies to include energy cost-savings when determining a borrower's ability to afford monthly mortgage payments. ASHRAE supports the sections from S.720 on this issue.

Next Steps for Energy Efficiency Legislation That Helps Solve Pressing Challenges

As the Sub- and full Committees moves forward in their consideration of energy efficiency legislation, allow me to offer ASHRAE up as a resource. Throughout its 121 year history, ASHRAE and its members have answered the call to develop solutions for the world's energy and indoor air quality problems. In-so-doing, we have amassed deep and broad technical expertise in the built environment. ASHRAE has been involved with the development and promotion of many of the issues being discussed by the Subcommittee today, and I encourage the Subcommittee to continue seeking our input as the Discussion Draft moves forward, with the goal of enacting historic legislation that truly helps meet the pressing energy and environmental needs of our day.

Sincerely,



Thomas H. Phoenix
ASHRAE Society President

Appendix: An In-depth Look at ASHRAE Standard 90.1

ANSI/ASHRAE/IES 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings has been the basis for federal, state, and local commercial building energy codes since the 1970s, and is required in numerous laws and Executive Orders, including the Energy Independence and Security Act, Energy Conservation and Production Act, Energy Policy Act of 2005, National Technology Transfer and Advancement Act of 1995, and OMB Circular A-119.

Standard 90.1 is an American National Standards Institute (ANSI) approved standard, which means that its development adheres to rigorous principles of consensus, openness, balance, transparency, and due process. In fact, ASHRAE is one of the very few ANSI Audited Designators which means we have established and maintain a consistent record of successful voluntary standards development.

The Standard is developed by a committee made up of technical experts representing diverse aspects of the building community, including product manufacturers, energy efficiency advocates, academics, government, building owners, utilities, and consulting (or design) engineers and architects. After the committee reaches consensus on a draft of the standard it is open for a period of public comment. There are no restrictions on who may offer comments, and no one commenter is given greater standing than another. Once comments are received, the committee must attempt to resolve all comments before presenting the standard to the ASHRAE Board of Directors for publication. Both within the ASHRAE and ANSI structures there are opportunities for appeal for anyone who feels that their comments regarding the standard are not adequately addressed.

During the development of the Standard, the 90.1 committee evaluates the cost-effectiveness of individual addenda, as applicable, using a type of life-cycle cost (LCC) analysis called the Scalar Ratio Method. This method is based on ASTM Standard E917—Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems. The Scalar Ratio Method simplifies the LCC model in ASTM Standard E917 into a single variable called the Scalar Ratio, which is simply a ratio of economic present worth factors. The Ratio is mathematically equivalent to a LCC analysis using the following parameters:

Parameter	Rate (percent)
Economic Life	Up to 40 years
Loan Interest Rate	6.25%
Heating Fuel Escalation Rate	3.76%
Cooling Fuel Escalation Rate	3.76%
Federal Tax Rate	34%
State Tax Rate	6.5%
Nominal Discount Rate	7%
Real Discount Rate	6.05%

For additional, in-depth information on Standard 90.1, please visit <http://sspc901.ashraeeps.org/>.