

RESPONSES FROM ASHRAE
September 13, 2019
To Questions from the U.S. House of Representatives,
Committee on Energy and Commerce
To Inform the Development of Comprehensive Climate Legislation

1. **What are the key policy, regulatory, and market considerations that should inform the development of comprehensive climate legislation? Please provide specifics.**

When developing policy to combat climate change, it's important to consider that buildings and their heating, ventilating, air conditioning and refrigeration (HVAC&R) systems directly and indirectly contribute to greenhouse gas (GHG) emissions. These emissions are associated with the energy needed to operate buildings and building systems (which account for approximately 38% of America's total energy consumption¹), and to a lesser extent indirectly through the release of refrigerants, if not properly managed. According to the United Nations Intergovernmental Panel on Climate Change (IPCC), "buildings offer immediately available, highly cost-effective opportunities to reduce energy demand, while contributing to meeting other key sustainable development goals including poverty alleviation, energy security and improved employment."² Improving the energy efficiency and the performance of building systems provide a significant opportunity for climate change mitigation and adaptation.

The Federal government itself is the nation's largest building owner, and ASHRAE encourages it to lead in these efforts and to encourage other building owners to follow suit.

2. **Please describe any innovative concepts for climate policy design, including both sector-specific and economywide measures, that you believe the Committee should consider.**
 - I. Congress should examine the best ways to assist states with the adoption, implementation and enforcement of the most recent building energy efficiency codes and standards. Code-adopted standards can save more energy than any other policy tool, and consensus standards (e.g., ASHRAE Standard 90.1 and 189.1/International Green Construction Code) help ensure technical and economic feasibility as well as market acceptance.
 - II. Congress should assure that Federal policies related to energy efficiency support market innovation and ensure that government leads by the example of outstanding design, construction and operation of its own buildings, whether owned or leased.

¹ U.S. Energy Information Administration, "Use of Energy in the United States - Energy Explained, Your Guide To Understanding Energy," Updated 29 May 2018, www.eia.gov/energyexplained/index.php?page=us_energy_use

² Lucon, Oswald, and Diana Ürge-Vorsatz. "AR5 Synthesis Report: Climate Change 2014." Chapter 9: Buildings, United Nations Intergovernmental Panel on Climate Change, 2014, https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter9.pdf.

- III. Congress should consider increasing funding for research, development, demonstration and deployment to advance energy efficiency and renewable energy technologies and practices. Federal funding for R&D is a critical tool for ensuring that the nation has affordable, clean and reliable energy, and helping stimulate innovation in the private sector.
 - a. Federally funded research and development is also critical to sound climate policy design, and this has been shown to help us meet national goals of economic growth while supporting technological innovation. For example, third party formal evaluation studies have concluded that for the \$12 billion invested in research and development by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE), the United States yielded more than \$230 billion in net economic benefit.³

3. **If you work in, advise, or are familiar with sectors that are particularly challenging to decarbonize, have you identified any effective (and scalable) solutions that should be included in comprehensive climate legislation?**

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4. **If your organization has adopted carbon pollution reduction goals, how have those goals – or your plans to meet those goals – evolved over the last decade?**

ASHRAE Commitments

ASHRAE published a [Climate Change](#) position document in 2018 that identifies opportunities that exist within the HVAC&R industry and also provides solutions to reduce GHG emissions. These include refrigerant selection and practices, demand load reductions, energy efficiency, and use of renewable energy. The position document states that ASHRAE is committed to the following:

- I. Developing and adopting designs, materials, components, systems, and processes that minimize environmental impacts, including climate change.
- II. Promoting the use of life-cycle, environmental, and economic impact assessments in HVAC&R design and operation.
- III. Developing and disseminating standards and guidelines supporting the minimization of GHG emissions by HVAC&R systems and the buildings sector.
- IV. Informing designers and decision makers about practices that lower the risk of environmental degradation and its damaging effects on health and the economy worldwide through activities such as the development of green building design guides.
- V. Educating building owners and operators on effective use of life-cycle cost techniques to empower them to make the best investment decisions.

³ U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, "2016–2020 STRATEGIC PLAN and Implementing Framework," 16 Dec. 2015, www.energy.gov/sites/prod/files/2015/12/f27/EERE_Strategic_Plan_12.16.15.pdf.

- VI. Recognizing and promoting case studies of high-performance buildings that achieve high levels of energy efficiency and significant reductions in environmental impact.
- VII. Working with educators to incorporate sustainability and energy conservation practices into the curricula of engineering and design schools.
- VIII. Participating in the research and testing required to implement transition to more climate friendly technologies.

ASHRAE’s Plan to Meet Goals

In 2008, ASHRAE’s produced a report that describes a vision and the tools necessary to produce market-viable net zero energy buildings (NZEBS) by 2030.⁴

Toward this end, in January 2019, a new Standard Project Committee was approved: [Standard Project Committee 228P, Standard Method of Evaluating Zero Energy Building Performance](#). This committee will produce a consensus document that is expected to provide a consistent method of establishing qualifications for zero energy buildings (both new and existing). This standard should also be useful for evaluating if a single building or a group of buildings meets the definition of zero energy.

In addition, ASHRAE is leading by example by its moving headquarters into a 1970s era building that will be renovated into a net-zero-energy-ready destination. The new headquarters is being designed to be resilient and exceed the provisions of the Society’s energy and indoor air quality standards. The new headquarters will fulfill ASHRAE’s mission to advance the arts and sciences of HVAC&R by showcasing the latest equipment and serving as a living lab. The building will eventually be zero energy as defined by the Department of Energy as well as achieve an ASHRAE Building EQ score of 0.

5. If applicable, what actions has your organization already taken, or do you plan to take, to reduce carbon pollution?

ASHRAE develops and publishes consensus based voluntary standards; many of which are adopted into building codes. This includes:

- [ANSI/ASHRAE/IES Standard 90.1-2016 -- Energy Standard for Buildings Except Low-Rise Residential Buildings](#) – which has been a benchmark for commercial building energy codes in the United States and a key basis for codes and standards around the world for more than 40 years. The most recent version of the standard, which was published in 2016, is about 34% more energy efficient than the 2004 version.
- [2018 International Green Construction Code® powered by ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1](#) – which provides total building sustainability guidance for designing, building, and operating high-performance green buildings. From site location to energy use to recycling, this standard sets the foundation for green buildings by addressing site

⁴ American Society of Heating, Refrigerating and Air-Conditioning Engineers, “ASHRAE Vision 2020: Producing Net Zero Energy Buildings,” January 2008.

sustainability, water use efficiency, energy efficiency, indoor environmental quality (IEQ), and the building's impact on the atmosphere, materials and resources.

- [Standard 15-2019 and Standard 34-2019 -- Safety Standard for Refrigeration Systems and Designation and Safety Classification of Refrigerants](#) – provide essential guidance to manufacturers, design engineers and operators who need to stay current with new air conditioning and refrigerating requirements.

Furthermore, ASHRAE funds and supervises a robust research program to develop timely technical and educational information that supports the development of standards and guidelines. ASHRAE also has a history of collaborating with government agencies to conduct important research. In June 2016, the U.S. Department of Energy (DOE) invited ASHRAE and the Air-Conditioning, Heating and Refrigeration Institute (AHRI) to work together on research to develop a more robust fact base about the properties and the use of mildly flammable refrigerants. This \$5.2 million research program, with financial contributions from DOE (\$3 million), ASHRAE (\$1.2 million) and AHRI (\$1 million), is part of an ongoing global effort to phase down the use of high-global warming potential (GWP) refrigerants and identify appropriate climate-friendly alternatives.

Additionally, ASHRAE also works on publishing, certifications, and continuing education programs. This includes the Building Commissioning Professional (BCxP) and Building Energy Assessment Professional (BEAP) certifications, which have been recognized by the U.S. Department of Energy (DOE) as meeting the Better Buildings Workforce Guidelines (BBWG).

6. What have been the challenges or barriers to making meaningful carbon pollution reductions, and how have you responded to those challenges or barriers?

ANSI/ASHRAE/IES 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings provides minimum requirements for the energy-efficient design of buildings except low-rise residential buildings in the United States. The Energy Conservation and Production Act (ECPA) requires the Department of Energy to make a determination each time a revised version of ASHRAE Standard 90.1 is published on whether the revision improves energy efficiency. If the determination is positive, States have two years to update their commercial energy code to meet or exceed that version of 90.1. While the DOE made a positive determination⁵ on the 2016 version of 90.1, most states have not adopted this latest version, nor have they adopted the second-latest version, 90.1-2013 or another code that provides equivalent energy efficiency. Development of codes must be coupled with their adoption and enforcement in order for them to be effective.

7. How can the Federal Government assist you in reducing carbon pollution?

Congress should examine the best ways to assist states with the adoption, implementation and enforcement of the most recent building energy efficiency codes and standards. Code-adopted standards can save more energy than any other policy tool, and consensus standards (e.g.,

⁵ U.S. DOE Notice of Order, "Final Determination Regarding Energy Efficiency Improvements in ANSI/ASHRAE/IES Standard 90.1-2016: Energy Standard for Buildings, Except Low-Rise Residential Buildings," February 27, 2018. <https://www.regulations.gov/document?D=EERE-2017-BT-DET-0046-0008>

ASHRAE Standard 90.1) help ensure technical and economic feasibility as well as market acceptance.

8. Are there any additional comments or feedback you would like to add?

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