



Shaping Tomorrow's
Built Environment Today

CLIMATE CHANGE AND BUILDING SYSTEMS

THE ISSUE

Worldwide concern for changes in the global climate has escalated as scientific evidence has become more definitive, linking increased concentrations of atmospheric greenhouse gases (GHGs) with global warming. As a result, the policy focus on global climate change has significantly increased, including through the mitigation of GHGs.

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 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.

ASHRAE's ROLE

ASHRAE is the leading source of information and research for HVAC&R systems and building performance making this issue a key area for our members. ASHRAE's members use their expertise to help policymakers promote the implementation of energy efficient design practices and sustainable technologies that can help reduce GHG emissions. This is done most notably through ASHRAE's Energy Conservation Standard 90.1, and the International Green Construction Code Powered by ASHRAE Standard 189.1, which addresses sustainability in buildings and building sites. ASHRAE and its partners have published several Advanced Energy Design Guides, which are available for free download and provide educational guidance to reduce energy consumption.³

ASHRAE also continuously advances the HVAC&R field by performing research and developing guides and standards for designing systems that minimize energy consumption and reduce emissions of high global warming potential (GWP) refrigerants. In addition, ASHRAE has developed Building EQ, a building energy rating program and performance tool, that helps building owners and operators

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

² Lucon, Oswaldo, 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.

³ For more information, see www.ashrae.org/technical-resources/aedgs.



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understand the energy use of their buildings and identifies opportunities for improvement. ASHRAE has also published Standard 105, which provides a method for determining, expressing and comparing building energy performance and greenhouse gas emissions. With respect to refrigerants, ASHRAE's Standard 15 provides criteria for the safe use and installation of a new generation of low GWP refrigerants.

ASHRAE's VIEW

ASHRAE is committed to a leadership role in reducing climate change contributed to by building systems and responding to climate change experienced in the built environment. ASHRAE encourages policymakers to implement integrated approaches including:

- Full evaluation of building climate impacts and energy performance.
- Funding for research that improves energy efficiency/utilization in HVAC&R technology to minimize GHG emissions.
- Funding for building science research leading to advanced equipment and systems and increased understanding of how building design affects long-term operations and responds to climate change.
- Policies encouraging building owners and operators to optimize energy efficiency.
- Promotion of life-cycle-cost analysis to building owners to encourage sustainable building construction, operation and renewal.
- Strategies that consider all phases of a building's life, including design, construction, commissioning and operation; recognizing that operational energy use is a dominant factor in total impact.