



Shaping Tomorrow's
Built Environment Today

RESEARCH AND DEVELOPMENT NEEDS TO MEET NATIONAL GOALS

THE ISSUE

Research and development (R&D) funding by the Federal government is a critical tool for ensuring that the nation has affordable, clean and reliable energy. While R&D programs by ASHRAE and other private sector organizations provide valuable insight and tools for the built environment, some necessary research and development can only be performed with the support and initiative of the government.

Federally funded research and development also provides cross-cutting results to meet national goals of economic growth while supporting technological innovation. For example, third party formal evaluation studies have concluded that for the \$12 billion in taxpayer investments that the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) received, the United States yielded more than \$230 billion in net economic benefit.¹

ASHRAE's ROLE

ASHRAE funds and supervises a robust research program to develop timely technical and educational information that supports the development of standards and guidelines addressing, among others, the interaction between people and the indoor and outdoor environment through the operation of heating, ventilating, air conditioning and refrigerating systems in buildings and other applications. ASHRAE supported research has advanced indoor air quality to increase occupant productivity and decrease the spread of airborne diseases; building design that supports a reduction in energy use and associated operating costs; and food preservation and storage that reduces the risk of contamination.

ASHRAE 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.

ASHRAE's VIEW

Integrative research that covers multiple industry sectors and high-risk basic research are unlikely to be supported in the private sector alone but will prove valuable to society. Specific research and development that should receive federal funding include:

¹ 2016–2020 STRATEGIC PLAN and Implementing Framework. U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, 16 Dec. 2015, www.energy.gov/sites/prod/files/2015/12/f27/EERE_Strategic_Plan_12.16.15.pdf.



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- Advanced energy efficiency and renewable energy R&D to reduce energy use.
- Understanding influences on Indoor Air Quality (IAQ) and tools to assure good IAQ.
- Increased understanding of the relationship between the design of buildings and actual energy use during occupancy to allow for better building design that supports more efficient and less costly operation and the development of more accurate energy use models.
- The need for a robust database of case studies of energy use in real buildings, for better benchmarking.
- Efficiency, design and energy research to support the development of increasingly energy efficient buildings and eventually net zero energy and carbon neutral buildings.
- Research focused to improve teaching and learning of science, technology, engineering and mathematics (STEM) concepts and critical thinking skills to ensure a competent technical workforce.
- Resilient building design, construction and operation.
- Grid-responsive and grid-integrated buildings.