



Shaping Tomorrow's Built Environment Today

RESEARCH AND DEVELOPMENT NEEDS TO MEET NATIONAL GOALS

THE ISSUE

Federally funded research and development provides cross-cutting results to meet national goals of economic growth, increased energy efficiency, a globally competitive workforce, and a clean environment. For example, the National Research Council report, *Energy Research at DOE: Was It Worth it?* (2001) found that the economic benefit to the nation of a few advanced technologies whose research and development (R&D) was supported by the Department of Energy's (DOE) energy efficiency programs was over four times greater than DOE's R&D investment in energy efficiency over its entire history. The results of just six case studies showed sufficient savings to justify the entire government R&D spending in energy efficiency. Significant environmental and energy security benefits also were realized. Other Federally supported research programs contribute to meeting other national goals.

ASHRAE's ROLE

ASHRAE funds and supervises a robust research program to develop timely technical and educational information, standards and guides on, 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's VIEW

R&D funding by the Federal government has historically been based on technological innovation as a critical tool for ensuring that the nation has affordable, clean, and reliable energy, as well as to help stimulate innovation in the private sector to produce more energy efficient equipment and systems. Adequate funding is necessary to assure that R&D to advance these goals continues. 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 government. Integrative research that covers multiple industry sectors and high risk basic research are unlikely to be supported in the private sector, but will prove extremely valuable to society.

Specific research and development needs include:

- 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 technological workforce
- How will the design, construction and operation of buildings and associated HVAC equipment need to change as the world adapts to a changing climate?