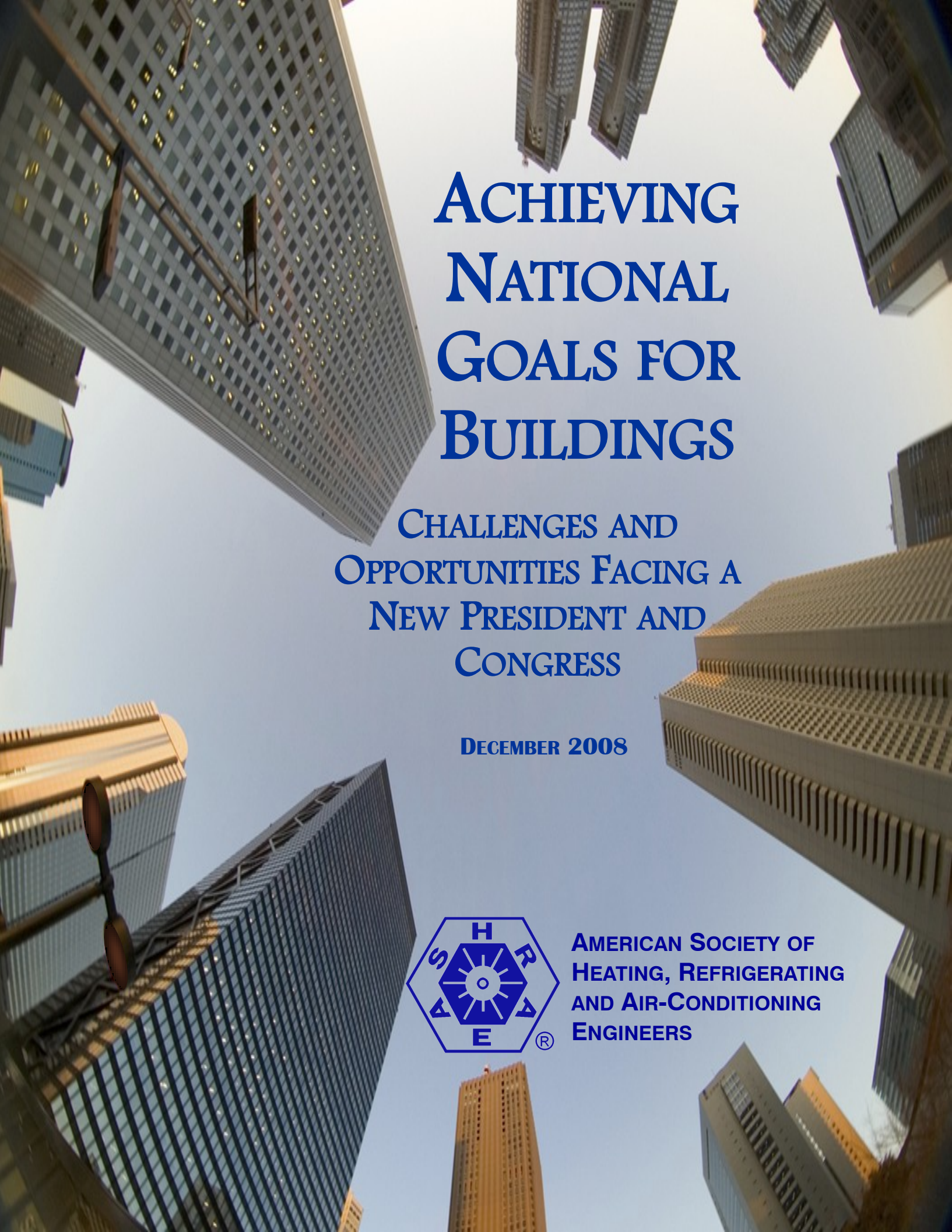


Achieving National Goals for Buildings

Challenges and Opportunities Facing a New President and Congress

December 2008

American Society of Heating, Refrigerating and Air-Conditioning Engineers

Summary of Recommendations for Achieving National Goals for Buildings

Energy Policy & Climate Change

- Convene a White House Summit on Energy Efficiency
- Require posting and annual updates of buildings' energy use
- Appoint a National Energy Efficiency Advisor
- Include energy efficiency as a renewable fuel source within renewable portfolio standards
- Encourage decoupling of utility rates from energy sales
- Encourage states to implement utility demand-side management programs
- Provide adequate funding and direction for data collection and analysis of energy use in buildings
- Support implementation of smart-grid and micro-grid systems
- Remove barriers to grid-connection for on-site power generation
- Require states to adopt commercial building energy codes with ANSI/ASHRAE/IESNA Standard 90.1-2004 as a minimum
- Support international implementation of technologies to increase energy efficiency and reduce greenhouse gas emissions
- Adequately fund and prioritize work of federal agencies that advance development and enforcement of energy standards and guidelines
- Implement climate change policies reflecting the opportunities and previous activities of the building sector

Incentives for Implementing Energy Efficiency

- Set realistic depreciation schedules for HVAC&R equipment to encourage high-efficiency replacements
- Ensure adequate planning time in extension or implementation of tax credits/deductions
- Incentivize widespread use of building commissioning, re-commissioning and retro-commissioning
- Support implementation of technologies utilizing energy previously deemed as waste heat
- Encourage ongoing education and training for operations and maintenance personnel, building designers and constructors

Research and Development to Achieve Energy Goals

- Make the Business R&D Tax Credit permanent
- Continue increased funding under the American Competitiveness Initiative
- Fund research on:
  - on-site and off-site renewable energy technologies
  - building technologies for improved indoor environmental quality and energy efficiency
  - building technologies and designs to achieve net-zero energy buildings
  - human factors of building operation, occupancy, and energy use
  - characteristics and control of indoor contaminants
  - improving teaching and learning of science, technology, engineering and mathematics (STEM) concepts

Federal Agencies as National Leaders

- Provide agencies with the financial resources necessary to achieve new requirements
- Provide agencies with technical resources to accomplish and maintain energy use reductions
- Support training for all employees involved in design, construction, procurement and operation of buildings
- Fund the Office of Federal High-Performance Green Buildings at the General Services Administration
- Allow flexibility within the capital and operating budgets to allow consideration of life-cycle costs
- Encourage use of Building Information Modeling (BIM) for all federal construction projects
- Continue to support cross-agency working groups
- Require use of an integrated design process for all federal construction projects
- Improve transparency and accessibility to agency data on building energy performance and technologies
- Allow realistic design budgets for federal building projects

Education as a Critical Tool

- Support establishment of a grant program to assist states and localities in enforcement of building energy codes
- Provide funding for "green collar" job training program
- Support the establishment of university research centers on energy efficient building technologies
- Develop programs to recruit, train and retain qualified STEM teachers
- Encourage the adoption of curriculum standards that cultivate high student performance
- Create opportunities and incentives for women and minorities to pursue STEM careers

Government-wide Activities to Further Science and Technology

- Immediately appoint a White House Science Advisor
- Support use of voluntary consensus standards in regulation as recognized by NTTAA and OMB Circular A-119
- Work with standards developers to address societal needs through use of voluntary consensus standards
- Encourage government experts to participate in the development of voluntary consensus standards
- Support domestic and international policies ensuring copyright and trademark protection for standards developers
- House of Representatives members should join the High-Performance Buildings Caucus

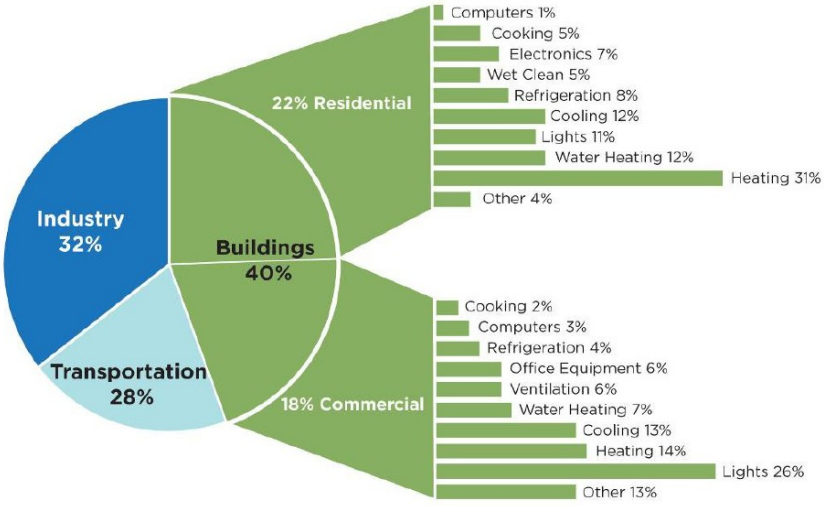
ACHIEVING NATIONAL GOALS FOR BUILDINGS

CHALLENGES AND OPPORTUNITIES FACING A NEW PRESIDENT AND CONGRESS

INTRODUCTION

As policymakers struggle with an increasingly complex array of issues, buildings often are overlooked as an opportunity to address many of these issues. Buildings are responsible for 40 percent of the United States' energy consumption—more than transportation and industry (see Figure 1).[i] Buildings also represent 38 percent of the U.S.'s greenhouse gas (GHG) emissions—U.S. buildings' CO_2 emissions approximately equal the combined carbon emissions of Japan, France, and the United Kingdom.[ii] Our citizens spend approximately 90 percent of their time indoors—many of them in schools and office buildings.[iii] The entire U.S. construction industry employs an estimated 10 million people including manufacturing, and with increased focus on improving energy efficiency within buildings, that number can be expected to rise.[iv]

Figure 1: Energy Consumption in the U.S. [v]



The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is in a unique position to assist decisionmakers in developing unbiased, technically sound policies to address many of the concerns facing our society—including energy and climate change, education, and the economy and jobs. Founded in 1894, ASHRAE is an international non-profit technical organization of 52,000 individual members. Our members represent the diversity of the building community including consulting engineers (33 percent), contractors (15 percent) manufacturers (16 percent), architects (5 percent), and facility managers (4 percent). ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

ASHRAE Mission:
To advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.

ASHRAE has long provided leadership on critical issues facing the nation. During the energy crisis of the 1970s, ASHRAE developed the first consensus based energy efficiency standards for commercial buildings which is the basis for the current national model energy code for commercial buildings.[vi] As the world struggled with depletion of the ozone layer, ASHRAE served as a resource for policymakers.

This leadership continues as ASHRAE provides standards and guidance to reduce the energy use of buildings, provide proper indoor environmental quality (IEQ), and produce high-performance buildings. For the model building energy code, ASHRAE has established a goal of achieving a 30 percent reduction in energy use by 2010 over the 2004 version. A new standard in development will provide criteria for the design of high-performance green buildings. Commercially viable net zero energy buildings (NZEBs)[vii] are the necessary future direction of the building industry and ASHRAE has committed to provide design guidance for NZEBs by 2015.

Addressing energy use in existing buildings also is critical—between 70 and 85 percent of the buildings present in 2030 already exist today. ASHRAE also has developed standards and guidance, educational programs, and other initiatives to address building operations and maintenance and retrofit and renovation opportunities.

As the new president and members of Congress examine critical issues facing the economy, ASHRAE is pleased to serve as a technical resource and offer the following policy recommendations for achieving national energy and sustainability goals through buildings.

Energy Policy & Climate Change

Concerns about energy and climate change should remain top priorities of the new president and Congress. Energy efficiency—particularly in buildings—offers a significant opportunity to address these concerns. Recognizing this, the President should convene a White House Summit on Energy Efficiency with participation of high-level representatives from relevant federal agencies (including the Departments of Energy, Transportation, Housing and Urban Development, and Labor, and the General Services Administration, and Environmental Protection Agency,) and leaders from the private sector. A National Energy Efficiency Advisor should be appointed to drive efficiency gains across all sectors of the economy.

Initiatives to increase energy efficiency and reduce greenhouse gas emissions globally should be supported through the use of appropriate technologies and products developed in the U.S. while providing adequate safeguards of intellectual property rights.

Focusing on the current energy transmission and procurement system reveals several barriers to greater implementation of energy efficiency measures. The nation must address current limitations in our power generation and utility grid distribution systems. A comprehensive building efficiency program can reduce demand and the need for new capacity. In many states, utility profits are directly tied to the amount of energy sold—resulting in a disincentive to promote efficient use of energy. Decoupling utility rates from energy sales is a successful means for promoting efficiency programs. States also should be encouraged to initiate demand side management programs through utilities—such programs can result in a more stable electricity grid and reduced need for development of new power plants. Implementing a smart grid system[ix] can assist in the development of demand side management programs[viii] and more efficient energy use—necessary incentives should be provided to utilities and building owners to support its implementation. Smart metering will assist utilities and building owners in taking advantage of real-time pricing which will reduce times of peak demand. Further utility investment in energy efficiency can be encour-

aged by including energy efficiency as an acceptable energy resource within renewable portfolio standards.

Existing barriers to grid connection for on-site power generation (mostly by renewable sources) are hindering the implementation of such technologies and are necessary for the implementation of net-zero energy buildings. Such barriers must be removed and provisions must be established to allow widespread implementation of net-metering.[x]

Programs such as the EPA/DOE EnergyStar and Federal Trade Commission's EnergyGuide provide consumers and building owners with important information for making informed decisions regarding their energy use. Other federal agencies are critical to the advancement of the development and enforcement of energy standards and guidelines and must be adequately funded including the Department of Energy (DOE), Department of Commerce's National Institute of Standards and Technology (NIST), Environmental Protection Agency (EPA), and General Services Administration (GSA).

Adequate funding and direction should be provided for data collection and analysis of energy use in commercial buildings—this is critical to understanding and reducing current energy use. Additionally, building owners should be required or encouraged to post and annually update a building's energy use. Building owners, perspective tenants and owners, and the public would be able to track the energy use of buildings—should the energy use increase, the owner likely would investigate to determine the cause of the increase. Proper operation and maintenance can help identify the cause or prevent any such occurrence. ASHRAE is in the process of developing a Building Energy Labeling Program which will assist building owners in determining their building's designed and actual energy use.

As the new Congress and administration consider action to reduce greenhouse gas emissions, such policies should reflect the opportunities and previous activities of the building sector.

Incentives for Implementing Energy Efficiency

While federal policies can help shape the nation's energy policy, engagement by the private sector is necessary. A comprehensive program of incentives will encourage businesses and individuals to invest in energy saving technologies and practices resulting in greater penetration in the marketplace.

However, any tax credits or deductions intended to transform the design or construction process or invigorate an industry must account for the necessary planning time desired by these sectors. The Commercial Building Tax Deduction, for example, has the potential to significantly reduce the energy use associated with commercial buildings, but its initial utilization was limited due to its short time frame relative to the design and construction process. The current five year extension through 2013 will allow for greater certainty. Credits for the renewable energy sector also should reflect our long-term goals. Short-term or uncertain-term incentives diminish the potential investment in the sector. Long-term investment is necessary to push technological advances and market penetration.

Technologies and practices that utilize energy previously thought of as waste heat—such as heat recovery and combined heat and power—are essential to reducing the energy use associated with buildings. Their widespread implementation should be supported through realistic depreciation schedules, tax credits and job training programs.

In order to encourage replacement of older, less efficient (and sometimes CFC-based) equipment, depreciation schedules for HVAC&R equipment should be set at a level that reflects the actual life-span of the

equipment rather than the current 39 years. Additional benefits also could be included to encourage selection of equipment that goes beyond the minimum requirements.

Commissioning, re-commissioning, and retro-commissioning[xi] of buildings can help assure that a building is operating at its maximum efficiency. Since many buildings currently are not operating according to their original design, re-commissioning and retro-commissioning frequently results in significant energy savings. Widespread utilization of commissioning, re-commissioning, and retro-commissioning should be encouraged through the tax code.

To assure that buildings continue to operate as designed, a well trained operations and maintenance staff is necessary. Building owners should be encouraged to provide ongoing education and training through tax credits or deductions. Similar incentives should be extended to architecture and engineering firms to promote the utilization of the best available tools, technologies and practices.

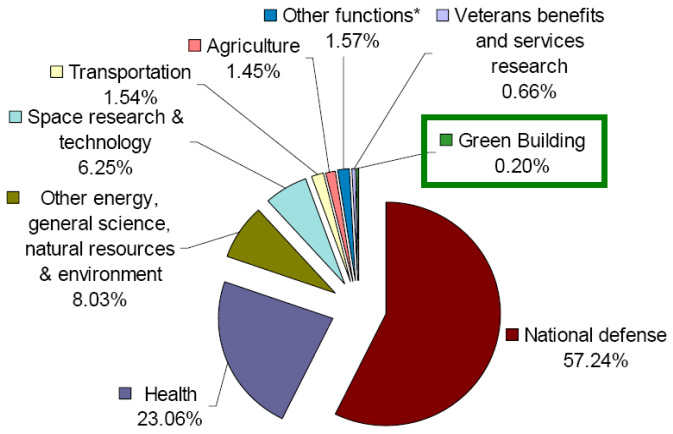
Future incentives for reducing energy use should examine use of an integrated approach rather than a component-by-component approach. Buildings operate as a system where the greatest levels of energy savings at the least cost can be achieved through examination of all components and optimization of the systems as a whole.

Research and Development to Achieve Energy Goals

As the nation looks to buildings to reduce our energy use and GHG emissions, research and development (R&D) into all aspects of the built environment is necessary—from both the public and private sector. Despite the significant value buildings contribute to the nation's GDP (all construction accounts for a 13.4 percent share of GDP in 2006[xii]) and their proportion of the nation's energy consumption, the resources dedicated to building R&D are woefully inadequate.

The U.S. Green Building Council has estimated that only 0.2 percent of federal R&D spending went toward green building related R&D (see Figure 2). Within the DOE, a small fraction of their R&D program is focused on buildings-related research despite 40 percent of the nation's energy use attributable to the sector.

Figure 2: Federal R&D Budget Authority, by Budget Function FY2003-2005[xiii]



** Other functions include education, training, employment, and social services; income security; and commerce. Green building data was compiled from agencies and the Office of Management and Budget (OMB); baseline federal R&D budget data comes from the National Science Foundation (NSF). The 0.2% funding toward green building does not include money from the Department of Defense.*

Private sector investment in R&D also is small compared to other sectors—in 2003 only 1.2 percent of sales across all construction is invested in R&D compared to 3.2 percent of sales across all sectors.[xiv] The Business R&D Tax Credit is a critical incentive for private sector investment in R&D and should be made permanent.

Expanded federal support for R&D across disciplines related to the built environment is required. The precedent established by the American Competitiveness Initiative to significantly increase funding for research at the DOE Office of Science, NIST, and the National Science Foundation (NSF) must be continued. Funding should specifically be designated for basic and applied research on building technologies that result in improved IEQ and energy efficiency and building technologies and designs to achieve net-zero energy buildings. Research and development in both on-site and off-site renewable energy technologies will be necessary to encourage rapid deployment in the marketplace and help realize the development of NZEBs. DOE's National Labs are an excellent resource for necessary buildings related R&D—they should be funded at levels commensurate with the importance of their research.

Social science research also will be critical to understand and respond to the human factors of building operations, occupancy characteristics, energy use and IEQ. A greater understanding of contaminants and the indoor environment also is necessary. Research is needed to identify indoor pollutants including biological and chemical contaminants relevant to disease transmission, sources of the pollutants, limits on acceptable concentration levels, and whole-building control measures for volatile organic compounds (VOCs), mold and other asthma triggers. Based on existing research and standards, regulations should be implemented to establish acceptable IEQ for all occupied areas practicable including schools, healthcare facilities, commercial buildings and commercial aircraft.

Research focused on improving the teaching and learning of science, technology, engineering and mathematics (STEM) concepts and critical thinking skills is essential to ensuring a competent technological workforce.

Federal Agencies as National Leaders

Federal agencies have long been looked to as an example of what can be done within the built environment. As the nation's largest holder of real estate, the federal government has the opportunity and resources to influence the development and implementation of building design, construction, operations and maintenance tools, technologies and practices. Federal buildings should serve as public showcases and leading examples of energy efficiency and indoor environmental quality (IEQ) through their design, construction, equipment, and operations and maintenance.

The Energy Independence and Security Act (EISA) (Pub.L. 110-140) included new stringent requirements regarding federal agency energy use for the entire building portfolio and fossil fuel based energy use in new buildings.[xv] While these requirements could result in significant energy savings, environmental benefits, and encourage development of new technologies, agencies must have the financial and technical resources necessary to implement them. Existing mechanisms such as energy savings performance contracts (ESPCs) can be effective in some circumstances, but access to additional resources will be necessary.

A government-wide revolving fund for energy improvements and energy efficient equipment purchases should be established. The fund can be financed by the energy savings an agency receives due to the improvements made by the agency. Both the Energy Policy Act of 2005 (EPAct) (Pub.L. 109-58) and EISA

already have mechanisms for federal agencies to retain the savings achieved through energy use reductions.

Previous funding patterns may need to change—more funds may be needed initially to implement energy savings, but over the long-term, associated energy costs will fall. Also, with consistent annual energy reduction requirements, agencies will be requesting funding for energy related projects on a regular basis. Design fees for new and existing federal projects must allow for the up-front costs necessary to achieve high-performing buildings through integrated design.

As recognized in EISA, existing barriers between capital budgets and operating budgets can serve as a disincentive to invest in assets with increased first cost but a decreased life-cycle cost—greater flexibility within agency budgets could encourage greater focus on life-cycle costs.

Agencies will require technical resources to accomplish and maintain energy use reductions. The General Services Administration's Office of Federal High-Performance Green Buildings can be the office responsible for coordinating the availability of these resources, but it must be adequately funded. Training for asset managers, facilities managers, procurement managers and others on energy saving technologies, finance mechanisms, and operations and maintenance also should be supported.

Existing cross-agency working groups such as the Interagency Sustainability Working Group (ISWG) and the Council on Indoor Air Quality (CIAQ) provide excellent forums to develop mutually applicable guidance and share best practices. Other government-wide requirements will help establish best practices that can be applied in both the public and private sectors. Agency data on building energy performance and technologies should be more transparent and accessible to other agencies and the building community.

Building Information Modeling (BIM) is currently being utilized for GSA projects but should be required across agencies to assist in asset management, employing integrated design practices, streamlining operations and maintenance, and advance uptake in the marketplace. An integrated procurement, design, and construction process should be required for all federal construction projects to assure all high-performance building requirements are achieved despite limited financial resources.

Education as a Critical Tool

As we are challenged to improve the performance of buildings, a skilled engineering and technical workforce is necessary to assure that buildings are properly designed, constructed and maintained. Assuring the existence of such a workforce will require a focus on education from elementary school through continuing education programs. Investment in a technical workforce to achieve increasingly more efficient buildings can provide significant economic benefit (see Table 1).

Table 1: Potential New Green Jobs - U.S. Total[xvi]

	2018	2028	2038
Renewable Power Generation	407,200	802,000	1,236,800
Residential & Commercial Retrofitting	81,000	81,000	81,000
Renewable Transportation Fuels	1,205,700	1,437,700	1,492,000
Engineering, Legal, Research & Consulting	846,900	1,160,300	1,404,900
Total	**2,540,800**	**3,481,000**	**4,214,700**

Recruiting, training, and retaining teachers qualified in science, technology, engineering and mathematics (STEM) is essential. Programs should be implemented to recognize educators who excel in STEM education and encourage the best and brightest scientists and engineers to teach. Curriculum standards should

cultivate high student performance and foster creativity, experiential problem solving and critical thinking. Grant programs can support a focus on hands-on learning and the necessary curriculum development. Minorities and women should have opportunities and incentives to pursue STEM coursework and careers.

To support the development of the next generation of building designers, constructors, and operators, research centers focused on energy efficient building technologies and practices should be established on university campuses. Funding for "green collar" job training programs such as the program established under EISA also will help assure a continuing workforce focused on reducing the fossil fuel based energy use of buildings.

In an effort to assist states and localities in the enforcement of existing building energy codes, a grant program should be established to help provide the necessary training for code officials. Within the finance and insurance industry, the importance of following building codes and proper operations and maintenance to protecting the continued value of assets should become more prominent and be incorporated into contracts and policies.

Government-wide Activities to Further Science and Technology

Recognizing the overall importance of science and technology to society, the new president and Congress should focus on actions across the government that respects the critical role of science and technology. In order to allow for the immediate coordination of critical science and technology issues, the new president should immediately appoint a White House Science Advisor.

Members of the House of Representatives should join the High-Performance Building Congressional Caucus, a bipartisan effort to bring policy-relevant expertise from across the buildings community to policymakers.[xvii]

As recognized by the National Technology Transfer and Advancement Act of 1995 (NTTAA) (P.L. 104-113) and OMB Circular A-119, voluntary consensus standards serve as a critical resource and should be utilized in regulation and codes whenever practical. Agencies should work with standards developers and industry to identify situations where societal interests could be addressed through the use of voluntary consensus standards and work together for common solutions. Government experts should be encouraged to participate in the development of voluntary consensus standards through allowing release time and reimbursement of expenses incurred.

While it is important to share the technology and practices for improving global society, government should support policies, both domestically and internationally, that ensure the continued ownership and control of the copyrights and trademarks of standards developers, or develop other mechanisms to cover the costs and value of these standards.

Conclusion

As the nation looks to reduce its dependence on foreign energy sources, decrease its greenhouse gas emissions, and grow its economy, buildings offer an excellent opportunity to achieve these goals. As the new president and the new Congress consider laws and regulations that impact the built environment, ASHRAE is pleased to provide a potential roadmap for addressing these issues. We are poised to offer the leadership and unbiased, technical knowledge necessary to transform the built environment in pursuit of a more sustainable world.

ENDNOTES

[i] Department of Energy 2008. *Buildings Energy Data Book*. http://buildingsdatabook.eere.energy.gov.

[ii] U.S. Energy Information Administration 2006. *Emissions of Greenhouse Gases in the U.S.*

[iii] Environmental Protection Agency 2004. *Buildings and the Environment: A Statistical Summary*.

[iv] See note i.

[v] National Science and Technology Council 2008. *Federal Research and Development Agenda for Net-Zero Energy, High-Performance Green Buildings*.

[vi] Now ANSI/ASHRAE/IESNA Standard 90.1-2007.

[vii] A net zero energy building (NZEB) is a building that produces at least as much energy as it consumes on an annual basis.

[viii] Demand Side Management entails actions that influence the quantity or patterns of use of energy consumed by end users, such as actions targeting reduction of peak demand during periods when energy-supply systems are constrained.

[ix] Smart Grid is an electricity transmission and distribution network or "grid" that uses two-way communications, advanced sensors, and distributed computers to improve the efficiency, reliability and safety of power delivery and use.

[x] Net metering is a service to an electric consumer where electricity generated by that consumer from an on-site generating facility and delivered to the local distribution facilities may be used to offset electricity provided by the electric utility to the consumer.

[xi] Commissioning is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria. Re-commissioning is an application of the commissioning process requirements to a project that has been delivered using the commissioning process. Retro-commissioning is the commissioning process applied to an existing facility that was not previously commissioned. See ASHRAE Guideline 0-2005: The Commissioning Process.

[xii] See note i.

[xiii] USGBC 2007. *Green Building Research Funding: An Assessment of Current Activity in the United States*.

[xiv] See note i.

[xv] See the report *High-Performance Federal Buildings: Meeting EISA Requirements through 2030* for results of a public/private sector workshop on implementing the requirements in EISA. http://www.ashrae.org/docLib/20081103_FedBldgReport.pdf.

[xvi] The U.S. Conference of Mayors 2008. *Current and Potential Green Jobs in the U.S. Economy*.

[xvii] For more information on the caucus see http://www.hpbccc.org.

ASHRAE Facts & Stats

Mission: Founded in 1894, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is an international nonprofit technical engineering society. ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration (HVAC&R) to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

Membership: ASHRAE's technical foundation is built by its 52,000 volunteer members and a professional staff of 107. In more than 130 countries, ASHRAE's membership in 170 chapters and 212 student branches includes consulting engineers (33%), contractors (15%) manufacturers (16%), architects (5%), and facility managers (4%).

Expertise: ASHRAE's areas of expertise include energy efficiency, indoor air quality, codes and standards, and guidance for a safe environment during extraordinary incidents.

Standards: ASHRAE – with 130 standard and guideline project committees that establish recommended design and operation practice – is one of only five standards-developing organizations in the U.S. that can self-certify that its standards have followed American National Standards Institute's (ANSI) standards development procedures.

Research: ASHRAE's research program, established in 1912, supports 81 research projects with a combined value of more than $8 million. Research focus includes energy and resource efficiency, indoor environmental quality, design and operation and management tools, alternative technologies and materials and equipment. Through scholarships and grants, the Society supports engineering education and research projects for graduate engineering students.

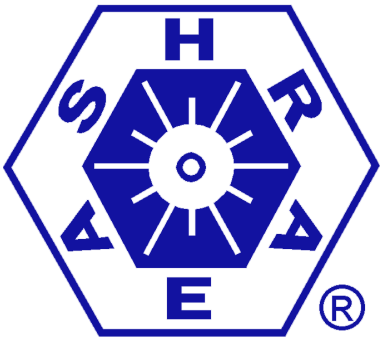
Public Policy: ASHRAE's government affairs program provides a critical link between ASHRAE members and government through contributing technical expertise and policy guidance to Congress and the Executive branch. Current priorities include energy efficiency; building codes; science, technology, engineering and mathematics education; indoor environmental quality; and building security.

Technical Oversight: ASHRAE has over 100 technical committees that drive ASHRAE's research program, develop standards, sponsor the technical program at ASHRAE meetings, develop technical articles, special publications and educational courses and write the *ASHRAE Handbook*.

Publications: ASHRAE produces more than 300 publications, including the *ASHRAE Handbook,* the bible of the HVAC&R industry. The Society also publishes the peer-reviewed *ASHRAE Journal*, and *HVAC&R Research*, the most prestigious reporting of archival research in the fields of environmental control for the built environment.

Continuing Education: Through the ASHRAE Learning Institute, ASHRAE offers courses in a variety of formats, including eLearning, professional development seminars, short courses and self-directed learning courses.

Meetings: The 2009 Winter Meeting is held in Chicago Jan. 24-29 in conjunction with the International Air-Conditioning, Heating, Refrigerating Exposition (AHR Expo). The 2009 Annual Meeting will be June 20-24 in Louisville, KY.



American Society of Heating, Refrigerating and Air-Conditioning Engineers
1828 L Street, NW
Suite 906
Washington, DC 20036
p: 202.833.1830 ● f: 202.833.0118
www.ashrae.org/advocacy
washdc@ashrae.org