



## **HIGH-PERFORMANCE BUILDING CONGRESSIONAL CAUCUS COALITION**

--www.HPBCCC.org--

### **Producing High-Performance Federal Buildings**

As Congress evaluates opportunities to impact the energy use of Federal buildings, the Executive Committee of the High Performance Building Congressional Caucus Coalition ([www.hpbccc.org](http://www.hpbccc.org)) developed the following recommendations which, if implemented through upcoming energy legislation, will provide an effective transition to reduced energy consumption, enhanced sustainability, improved building operation and maintenance, and more efficient use of national resources in the Federal building stock.

Achieving energy reduction, enhanced sustainability, improved operation and maintenance, and effective use of resources in the federal building stock requires addressing the diversity of goals associated with high performance buildings including: accessibility, cost-effectiveness, function and operation, historic preservation, productivity, safety and security, and sustainability.

Efforts to enhance the energy and sustainability of Federal buildings must proceed within the context of traditional design requirements for safeguarding life, health, property, and public welfare. In order to avoid unintended consequences to building user's health and life-safety, energy efficient/sustainable design guidelines and standards recommended for federal building projects should take into account existing building and fire code requirements, avoid creating conflicts with those requirements, and where necessary, include recommendations for coordinating modifications to such safety-related codes and standards.

#### ***Require True Life-Cycle Analysis and Decision-Making for the Acquisition of Federal Buildings.***

The American Institute of Architects (AIA) defines life-cycle cost analysis as, "any technique which allows assessment of a given solution, or choice among alternative solutions, on the basis of considering all relevant economic consequences over a given period of time." One of the major impediments to innovation and significant reductions in energy consumption in the Federal building stock is the separation of financial accounting for acquisition from operations. That is, there is a congressional approved budget for acquisition and a totally separate budget for yearly operations. Often the responsibilities for these budgets are in two separate organizational elements with different leadership and reporting responsibilities. This means that any investment in innovation that increases first (acquisition) cost while substantially reducing long-term cost (operations) is not considered. This fundamental dichotomy (caused by parallel separations in internal management and accounting procedures) creates a misalignment between setting the goals for a high-performance building and achieving those goals.

Making full life-cycle costs of a building project part of the life-cycle analysis and decision-making processes will provide a major step toward the acquisition of true high-performance Federal buildings.

#### ***Require Total Building Commissioning for the Federal Building Stock.***

All Federal buildings should be required to utilize total building commissioning, re-commissioning, retro-commissioning, and post-occupancy-evaluations to include the documentation of owner performance requirements, design intent and justification, verification and validation of actual building performance, including the comprehensive training of operations and maintenance staff through the adoption of ASHRAE *Guideline 0:2005 The Commissioning Process*. The requirement to include documentation of lessons learned from post-occupancy-evaluations would provide significant increases in quality control for "green" buildings, including the validation of design strategies and decisions to improve building performance, the verification of actual building performance, the documentation of design intent to be used by building operations staff, and the development and implementation of a comprehensive training program for operations and maintenance staff.

***Require Integrated Project Delivery including Whole Building Design, Procurement, and Construction for Federal Buildings.***

Integrated Project Delivery (IPD) is an approach that brings together the relevant parties (designer, builder, owner, contractors, operations and maintenance teams, etc.) as well as the necessary systems, business structures, and practices at the beginning of portfolio development and continues through the life of the building. This collaborative approach harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, construction, and occupancy. The requirement for a collaborative process will help owners meet the increasingly aggressive goals for energy and carbon reduction, facilitating the complex interaction of systems and context in order to achieve significant energy-use reductions in projects.

Integrated delivery will strengthen the project team's understanding of the owner's desired outcomes, thus improving the team's ability to control costs and manage the budget, all of which increase the likelihood that project goals, including schedule, life-cycle costs, quality, and sustainability, will be achieved. Integrated delivery allows constructors to contribute their expertise in construction techniques early in the design process resulting in improved project quality and financial performance during the construction phase. Utilizing an integrated delivery approach changes the typical fee structure to allow for participation of all parties throughout the design process. Provisions must be considered to allow implementation of this important practice.

***Require Building Information Modeling and Support Building Data Interoperability for Federal Buildings.***

A Building Information Model (Model) is a digital representation of the physical and functional characteristics of a facility. It serves as a shared knowledge resource for information about a building, forming a reliable basis for decision-making throughout the life-cycle of the building from inception through deconstruction. A basic premise of Building Information Modeling (BIM) is collaboration by different stakeholders at different phases of the life-cycle of a facility to insert, extract, update, or modify information in the Model to support and assist in the decision-making of each stakeholder. The Model is a shared digital representation founded on open standards for interoperability.

Non-value added effort, or waste, is a significant problem in Federal buildings. Much of the waste comes from the inaccuracy of transferred information, resulting in information having to be re-gathered multiple times throughout the life of the building. As much as 57% of time, effort and material investment in construction projects do not add value to the final product according to a study by the Construction Industry Institute (CII) and Lean Construction Institute (LCI). The private sector building industry is finding benefit in BIM implementation and is pushing forward at a rather rapid rate for this traditionally conservative industry.

The scope of BIM ranges from the smallest building component expanded to the world or portfolio view, from inception onward in the life-cycle of a facility, and includes all stakeholders who need facility information from the designers to the occupants.

Federal agencies should adopt and implement the National BIM Standard so that the collection, maintenance, and use of building information become an integral part of the entire life-cycle of Federal buildings.

***Require Comprehensive Education and Training and Higher Levels of Competence in the Federal Building Design, Property Management, Operations and Maintenance, and Procurement Communities.***

Surprisingly, a large number of high performance building systems do not work as designed, largely because they do not receive proper building management, operations, and/or maintenance. Education and training must be conducted for all Federal employees with a focus on their particular roles within the organization—whether as project managers, building occupants, facilities management personnel, or procurement officers. Cross-agency and cross-discipline training should be promoted to share experiences and more effectively utilize limited resources. All senior Federal real property managers must receive the requisite education and the proper training and tools to do their jobs effectively. Requiring relevant personnel certifications can assure employees have the up-to-date body of knowledge to fulfill their responsibilities.

## **Producing High-Performance Federal Buildings**

### *Recommendations from the High-Performance Building Congressional Caucus Coalition*

Ongoing training and education is essential to counter employee turnover and keep employees abreast of best practices. Procurement and portfolio managers in particular should receive a broad level of training with modules on life-cycle costing, specifying appropriate criteria in requests for proposals, available energy saving technologies, and a range of energy savings contracts and opportunities.

#### ***Require the Collection, Storage, Dissemination, and Utilization for Federal Building Performance Data.***

The Federal sector encompasses a vast array of building types. However, there is no national database containing information on the stock of U.S. Federal facilities, their energy-related building characteristics, and their energy consumption and expenditures. Such a program would require the Federal agencies to collect and monitor their resource consumption data, compile it together with other agencies, allow open analysis and comprehensive decision-making, and use it to provide a framework for progressing toward significant resource savings required in existing legislation. This Federal building performance database and clearinghouse would provide for the accurate and actual measurement of energy use in specific Federal buildings, verify the actual building performance of specific Federal buildings, serve as a more accurate and appropriate baseline for Federal building energy performance in future legislation, allow for an improved analysis of different types of Federal buildings in order to better evaluate actual sector building use, and document the energy and environmental impact of building products.

The database and clearing house would thus provide a cradle-to-grave accounting of the energy and material flows into and out of the environment that are associated with Federal buildings and their systems, assemblies, materials, and components, allowing informed decisions to be made to create truly high performance Federal buildings.

The Federal Energy Management Program (FEMP) was established to help federal agencies reduce building energy use and procure renewable energy. Because FEMP's budget has been cut over the years (when energy was not a priority), it now lacks the authority or resources to provide this critical mission. Legislation is needed to restore FEMP to its original stature within DOE and among the federal agencies and authorize appropriations commensurate with its responsibilities in assisting agencies with the implementation of Executive Orders 13123 and 13423, EPACK 05, EISA 07, and other tasks as needed. Such tasks include collecting, storing, and utilizing data on actual building energy consumption and related greenhouse gas emissions government-wide and providing training on a wide range of topics, from product procurement to integrated project delivery and the whole building design approach. FEMP should coordinate with GSA's Office of Federal High Performance Green Buildings.

As Congress considers legislation focused on implementing High-Performance Federal Buildings, the membership of the High-Performance Building Congressional Caucus Coalition stands ready to offer technical expertise and guidance on the steps necessary to reach the nation's goals.

#### **High-Performance Building Congressional Caucus Coalition Executive Committee**

American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE)

Air Conditioning Contractors of America (ACCA)

Air Conditioning, Heating and Refrigeration Institute (AHRI)

American Institute of Architects (AIA)

American National Standards Institute (ANSI)

Building Owners and Managers Association (BOMA)

The Green Building Initiative (GBI)

International Code Council (ICC)

International Facility Management Association (IFMA)

National Electrical Manufacturers Association (NEMA)

National Fire Protection Association (NFPA)

National Institute of Building Sciences (NIBS)

Spray Polyurethane Foam Alliance (SPFA)

U.S. Green Building Council (USGBC)