

Report on the Cost-Effectiveness of Sustainable Building Design Standards and Rating Systems Used by the Department of Defense



Office of the Under Secretary of Defense
for Acquisition, Technology, and Logistics

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Pursuant to Section 2830 of the National Defense Authorization Act of Fiscal Year 2012 (Public Law 112-81) the Department of Defense (DoD) asked the National Research Council (NRC) to conduct primary research and to produce a peer-reviewed report on the cost effectiveness of green building rating systems and standards used by the Department to design and construct its facilities.

The NRC convened a committee of experts in the fields of economics, construction, and sustainability to evaluate the economic efficiency of building projects designed and constructed using the following “green building” rating systems and standards:

Type	Common Name	Sponsoring Organization
Rating System	LEED – Leadership in Energy and Environmental Design (Silver, Gold, and Platinum certification levels)	USGBC – U.S. Green Building Council
Rating System	Green Globes (1, 2, 3, and 4 globes certification levels)	GBI – Green Building Initiative
Standard	90.1-2010: Energy Standard for Buildings	ASHRAE – American Society of Heating, Refrigeration, and Air Conditioning Engineers
Standard	189.1-2011: Standard for the Design of High-Performance, Green Buildings	ASHRAE

The NRC report recommended that DoD take the following actions:

1. Continue to require that new buildings or major renovations be designed to achieve a LEED-Silver or equivalent rating.
2. Retain flexibility to modify building standards and the application of green building certification systems in ways that are appropriate to the DoD operating environment and mission.
3. Put policies and resources in place to measure the actual performance of the Department’s high-performance, green, and conventional buildings.
4. Use investment approaches that analyze the total cost of ownership, a full range of benefits and costs, and uncertain future conditions as part of the decision-making process.
5. Specify and fund training appropriate for facilities managers to ensure the effective operation of high-performance buildings.

It is clear from these recommendations that the NRC shares the Department’s desire to reduce the total ownership cost of facilities. The Department recognizes that, in today’s austere budgetary climate, we must maximize the return we receive from every dollar invested in facilities.

In line with the Committee's recommendations, the Department published a new building standard, known as a Unified Facilities Criteria (UFC) for High Performance Green Buildings, which will raise the bar of performance for all new construction and major renovation undertaken within the Department. This new DoD standard was compiled by subject matter experts from around the Department, drawing on only the most cost-effective measures found in various building standards like ASHRAE's 189.1. This new standard will serve as the energy and sustainability exemplar that all new buildings and major renovations must achieve as a minimum. The committee noted in its research that rating systems like LEED and Green Globes can produce cost-effective results, but the results also tend to vary widely based on many factors, including the experience of the project team. The new DoD standard for high performance green buildings is intended to remove some of this variability in performance by using unambiguous language to describe a requirement that can be included in enforceable contract documents.

While the UFC will help remove variability in the performance of DoD buildings, if it were used by itself, it could also limit the flexibility project teams need to adapt to local conditions and mission requirements. Therefore, third-party rating system tools like LEED and Green Globes will continue to play an important role in the Department's green building strategy. These systems will serve as a means to verify performance and they will serve to guide projects where a clear mission requirement drives a need to go beyond the UFC standard. Examples of mission needs that may require a building to exceed the standard are water shortages in the Southwest that require greater water conservation measures or high energy prices in the Northeast that necessitate greater energy saving measures.

The Department also recognizes the need for more highly skilled facility managers to operate and maintain complex building systems now and in the future. That is why we have partnered closely with the General Services Administration in implementation of the Federal Buildings Personnel Training Act.

Going forward, the Department will continue to gather performance data for our new high performance buildings not only to help refine our own policies, but also to advance the state of knowledge in the building industry. We will also continue to explore means of incorporating factors such as life-cycle cost and uncertain future conditions into our investment decisions.

The Department appreciates the efforts of the NRC and its committee of experts, and we are committed to using their report recommendations to drive down the total ownership cost of our facilities.