Federal Participation in LEED in 2005

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INTRODUCTION

The federal government is an active participant in promoting sustainable design, construction and operations and in the use of USGBC's Leadership in Energy & Environmental Design (LEED) Green Building Rating System. This paper presents an overview of sustainable construction activities in the federal sector in 2005.

CERTIFIED FEDERAL BUILDINGS

As of September 2005, US federal agencies have certified 24 federal buildings under LEED: 3 buildings using the LEED-NC v1 certification system and 21 certified under LEED-NC v2. Papers at prior USGBC conferences have discussed federal buildings built before 2005. Table 1 lists federal buildings that were certified in 2005, the sponsoring agency, and the certification level achieved.

Table 1 Federal buildings certified under LEED-NC through May 2005

Federal Agency	Project	Certification Level
Department of Defense – Navy	Energy & Sustainable Design Demonstration Facility	Gold
Department of Interior - National Park Service	Carl T. Curtis Midwest Regional Headquarters	Gold
Environmental Protection Agency	EPA National Computer Center	Silver
General Services Administration & Department of Labor	Occupational Health & Safety Administration Salt Lake Technical Center	Silver
General Services Administration	Sweetgrass-Coutts Port of Entry	Certified

Federal projects continue to adopt LEED at a high rate – the percentage of LEED-certified federal new construction projects (24 of 285 total LEED-NC projects, or roughly 8%) is four times higher than the percentage of federal buildings in the US building stock (1%-2%). In addition, the buildings that were certified in 2005 achieved a high level of certification – an average of almost 35 points.

REGISTERED FEDERAL BUILDINGS

In addition to the federal building projects that have already been certified, a significant number of projects have committed to using LEED in the future by registering their projects in the LEED Registration database. Note that GSA is building a number of buildings in close consultation with the agency or agencies that will be the building's ultimate tenants. As a result, some agency registrations may be undercounted due to GSA's lead role in the building's construction process. For example, both the Department of Transportation and the Department of Interior have headquarters facilities under construction that are listed here as GSA buildings.

Table 2 shows federal projects listed in the USGBC LEED registration database, sorted by agency.

Table 2 Federal buildings registered for LEED participation, by agency

Agency	Number of Registered Buildings
Department of Agriculture	2
Department of Commerce	1
Department of Defense – Air Force	8
Department of Defense – Navy	17
Department of Energy	13
Department of Health and Human Services	2
Department of Homeland Security	1
Department of Interior	1
Department of State	3
Environmental Protection Agency	3
General Services Administration	40
Total	91

The registration data show a significant commitment by federal agencies to sustainable construction practices. Furthermore, the figures above may under-represent the total number of federal projects, as the data collected in the project registration database sometimes make it difficult to identify a federal agency as the ultimate building tenant. Given the numbers for which we can be sure of federal involvement, the percentage of federal registered buildings to the total number of registered projects (91 of 2161, or ~4%) is roughly double the prevalence of federal buildings in the US stock. This high registration rate demonstrates that the pace of sustainable construction in the federal sector will continue to remain high in the near future. As discussed in the next section, policies are now being put into place to continue that sustainable construction pace beyond those buildings currently built or under construction.

FEDERAL AGENCY ACTIVITIES

The number of LEED-certified and LEED-registered federal buildings is substantial, but how has this been achieved? Federal agencies have developed a wide range of sustainable construction policies to disseminate sustainable construction practices throughout their construction programs. These policies have ranged from direct agency mandates requiring the use of LEED in new construction to incorporation of LEED requirements into design guides, standard facility construction templates, solicitations for construction, and other mechanisms. To share these examples and reduce redundancy of effort, the US Department of Energy's Federal Energy Management Program (FEMP) created a database of policy and practice documents for federal facilities on the Whole Building Design Guide Web site. The Sustainable Federal Buildings database provides interested parties with a variety of sustainable construction documents. The URL for the database is:

http://www.wbdg.org/tools/sfbd.php

Additions to the Sustainable Federal Buildings database in 2005 include (or will soon include):

- a Department of Commerce memo requiring LEED in the construction of Commerce buildings,
- a memo specifying LEED requirements in USDA facilities,
- model language from the US Forest Service for procurement of LEED-qualified architects, and
- model lease language from GSA for specifying a LEED building in a build-to-lease situation.

The Department of Energy's Building Technologies program has funded research that seeks to improve building performance measuring methods by collecting data on various factors that affect a building's performance, such as energy, materials, and land use. Data about a number of facilities has been collected and made available through the High Performance Buildings Database. The URL for that database is:

http://www.eere.energy.gov/buildings/database/

The database includes information about a number of federal LEED-certified buildings, as well as both public and private buildings that are considered high performance.

In addition to these policy and data collection activities, agencies have also been working to coordinate their agency-specific activities with LEED rating systems. For example, EPA has been working with the LEED for Existing Buildings program to incorporate EPA's Energy Star performance criteria for existing buildings into the LEED-EB framework.

Similarly, the Army Corps of Engineers is working to transition the Army's metric of sustainable construction from the current Army-specific Sustainable Project Rating Tool (SPiRiT) system to USGBC's LEED metrics. This has become possible as the LEED rating tools have developed, as they can now capture some issues that originally made LEED a difficult match for the Army's needs. The experience of other defense agencies with LEED, including the use of LEED at the Pentagon and within the Navy's construction activities, has also demonstrated that LEED is flexible enough to work appropriately in a variety of federal contexts.

The Department of State is also working to coordinate its own unique construction requirements with the LEED framework. Under the construction program for US embassies overseas, the State Department has developed standard embassy construction practices to incorporate LEED-NC criteria. The State Department is hopeful that a "volume build" program can be developed in which certain components of all US embassy new construction could be pre-certified as meeting LEED requirements.

ENERGY POLICY ACT OF 2005

Agencies have continued to make strides in incorporating LEED into their sustainability policies and procedures. These efforts have been given a boost with the recent passage of the Energy Policy Act of 2005 (EPAct '05). Section 109 of the new law requires that

"sustainable design principles are applied to the siting, design, and construction of all [federal] new and replacement buildings." While previous Presidential Executive Orders have directed agencies to use sustainable design principles, this is the first time that a legislative mandate requires it. The enhanced emphasis on sustainability in the Energy Policy Act should help sustainable design further penetrate the federal construction market.

In addition to the requirement for sustainable design, Section 109 also creates a new mandatory energy-efficiency standard for federal construction. New federal buildings will be required to consume 30% less energy than that allowed under the ASHRAE 90.1-2004 standard for commercial buildings or the International Energy Conservation Code for residential buildings. New federal buildings would thus be required to earn at least 6 points under the draft guidelines for LEED-NC version 2.2.

Section 102 of EPAct '05 requires federal agencies to reduce the energy consumption per gross square foot in all existing buildings by 2% per year beginning in 2006, relative to a 2003 baseline. This leads to a 20% reduction required by 2015. Energy-efficient new construction will play a significant role in the ability of agencies to achieve these goals. Preliminary calculations indicate that one-quarter of the 20% reduction required for the total building stock in 2015 could be met by the requirement for energy efficiency in new construction. Using LEED as a metric for energy performance in sustainable design will allow agencies to specify these design targets in their new construction projects. Additional follow-through will be required for start-up commissioning and ongoing attention to energy efficient operations and maintenance to assure that the projected savings are actually achieved.

In addition to these aggressive energy performance goals, EPAct '05 also broadens the applicability of the goals to federal facilities. For the first time, industrial and laboratory facilities are explicitly included in these energy reduction mandates. Laboratory buildings are being built at a rapid rate in the federal sector, so there is a need for good policy guidance that can help reduce laboratory energy consumption. The development of the LEED Application Guideline for Laboratories is expected to be a significant benefit in this regard. Federal agencies have been active participants in the precursor to the Application Guideline – the Environmental Performance Criteria of the Laboratories for the 21st Century program.

PERFORMANCE ASSURANCE IN FEDERAL BUILDINGS

LEED-NC provides a mechanism for developing good sustainable design and construction practices, but how do these design and construction intentions translate into the ongoing operation of buildings? Several activities are taking place in the federal sector to answer this question. Three examples are the development and use of performance metrics, the use of LEED-EB to enhance operations and maintenance, and the collection of performance data from new federal LEED-certified buildings.

First, the Federal Energy Management Program, in partnership with GSA, DoD/NAVFAC, and EPA, developed a set of performance metrics for sustainable federal

buildings. The metrics were selected for ease of collection, usefulness or relevance of the information to sustainability, and the expected quality of the data to be collected. The metrics include measurements for the cost and performance impact of water, energy, maintenance and operations, waste generation, purchasing, occupant health and productivity, and transportation.

The metrics are being used by the U.S. Navy to measure the performance of seven buildings designed for sustainability as compared to seven typically designed buildings in the same location with similar use profiles. Other federal agencies and private organizations are considering using the metrics as well. These metrics will be used to track the ongoing performance of federal buildings to provide operational data about the impact of sustainable construction practices. The performance and cost data from the sustainably-designed buildings could be used to develop new case studies for the High Performance Buildings Database mentioned above.

Second, the LEED for Existing Buildings program requires a level of performance tracking, and federal actors are beginning to adopt LEED-EB to take advantage of this. For example, Oak Ridge National Laboratory's East Campus Modernization project (LEED-Certified in 2004) is now going through the LEED-EB process. In particular, ORNL's facility managers are interested in their project's Energy Star building benchmark score, a required element of LEED-EB based on 12 months or more of metered energy use.

Finally, EPA and DOE have both funded activities to collect and analyze performance data about new LEED-certified federal buildings. EPA has funded a research project with the U.S. Green Building Council to study the actual performance of LEED-NC certified buildings, to determine the success of early adopters in achieving their energy design goals, and to identify why gaps exists between design and occupied performance. DOE is working to collect metered energy data from as many of the federal buildings that have been LEED-certified as are available. Analysis of that data will be used to feed back into the design of new federal buildings, helping close the loop between design intent and operational results.

CONCLUSION

Beyond their direct impact on federal construction practices, federal agency policies and activities have also had an indirect impact on the broader market for sustainable construction. Federal, state, and local public agencies all look at each other's experience with sustainable construction practices and policies. Numerous public/institutional entities have adopted LEED as a sustainability metric. By increasing the number of architects, engineers, and construction firms familiar with LEED requirements and documentation procedures, these public sector projects have helped move sustainable construction practices closer to the mainstream throughout the economy.

USGBC's suite of LEED products continues to be extremely useful to federal agencies in helping develop, construct, and operate sustainable federal facilities. Sustainable construction policies and practices are becoming more and more integrated into federal

operations, a process likely to be accelerated by the passage of the Energy Policy Act of 2005.

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