

## **Cornell Green Building Oversight Committee FY 2006-07 Annual Report**

### **Purpose**

This annual report provides metrics and summary information on the green building activities across campus over the last fiscal year. The purpose of this report is to provide data and recommendations which can be used to guide the process in future years. Summary recommendations are attached at the end of this report.

### **Background**

The Cornell Green Building Oversight Committee (GBOC) was organized in 2005 to oversee the implementation of suitable “green building” standards into campus construction programs. The current active membership of the GBOC is as follows:

- John Kiefer, P.E., Director, PDC (Chairman)
- Steve Beyers, P.E., Technical Services Manager, ECO (Co-Chair)
- Jack Elliott, PhD, Design and Environmental Analysis faculty (Member)
- Lanny Joyce, P.E., Manager, Utilities Dept (Member)
- Randy Lacey, P.E., University Engineer (Member)
- Andrew Magre, Architect, PDC Architecture Section (Member)
- Bob Stundtner, Manager of PDC Project Management Section (Member)
- James Gibbs, Director of Maintenance Management
- Dean Koyanagi, University Sustainability Coordinator (Staff Support)
- Robert Bland, P.E., Director of ECO (Staff Support)

This report references two processes. The first is the Leadership in Environmental and Energy Design (LEED), the leading national green building rating system. The other, the Cornell Green Building Guidelines (CGBG), is a qualitative internal process developed by members of the GBOC for use on campus for projects not pursuing a LEED process.

In the summer of 2006, lacking funds thought necessary for a campus-wide LEED program, the Green Building Oversight Committee recommended a green building process (CGBG) be applied to all \$500K and larger facilities to be built on Cornell’s campus.

The CGBG is closely modeled after the strategies used by LEED but is less quantifiable and does not result in a “rating”. The CGBG utilizes a “workshop and checklist” approach to green building strategies. Specifically, the guidelines direct project teams to hold a workshop in which a broad range of sustainable actions are discussed by means of a 43-strategy checklist, with the project’s use of various strategies documented through a “fill in the blanks” on the checklist. Because there are no required outcomes, only a process that must be followed, accountability is limited.

The decision to use the CGBG on non-LEED projects has been in effect since the late summer of 2006 (most of FY 06/07).

### **Green Building Activities at Cornell University: Metrics**

Figure 1 provides some basic metrics from which to ascertain the commitment to green building at Cornell. This figure was created by tabulating data from all of the Project Authorization Requests (PARs) issued over a period of about 9 months, from roughly August 1, 2006 (soon after the announced decision to proceed with the Cornell Green Building Guidelines) through June 1, 2007.

As Figure 1 shows, there is a tremendous amount of construction activities documented through the PAR process, representing over \$1.2 billion dollars in projects in planning, design, or construction. Clearly, Cornell's construction projects have a significant impact both on the Cornell community and on the region. Without careful management, this construction impact could be a potential major impediment to our "sustainability" goals.

Some PAR-authorized projects are of limited scope and do not represent the type of construction or renovation work which can be appropriately reviewed by a broad green building program like LEED. However, "general building projects" (36% of all sampled projects) represent almost 85% of the total value of work proposed on campus, over \$1B. Thus, LEED or a similar system can be a useful tool in measuring the environmental performance of a large portion of Cornell's projects.

Additional data from this "survey" suggests the dichotomy of the green building efforts here on campus:

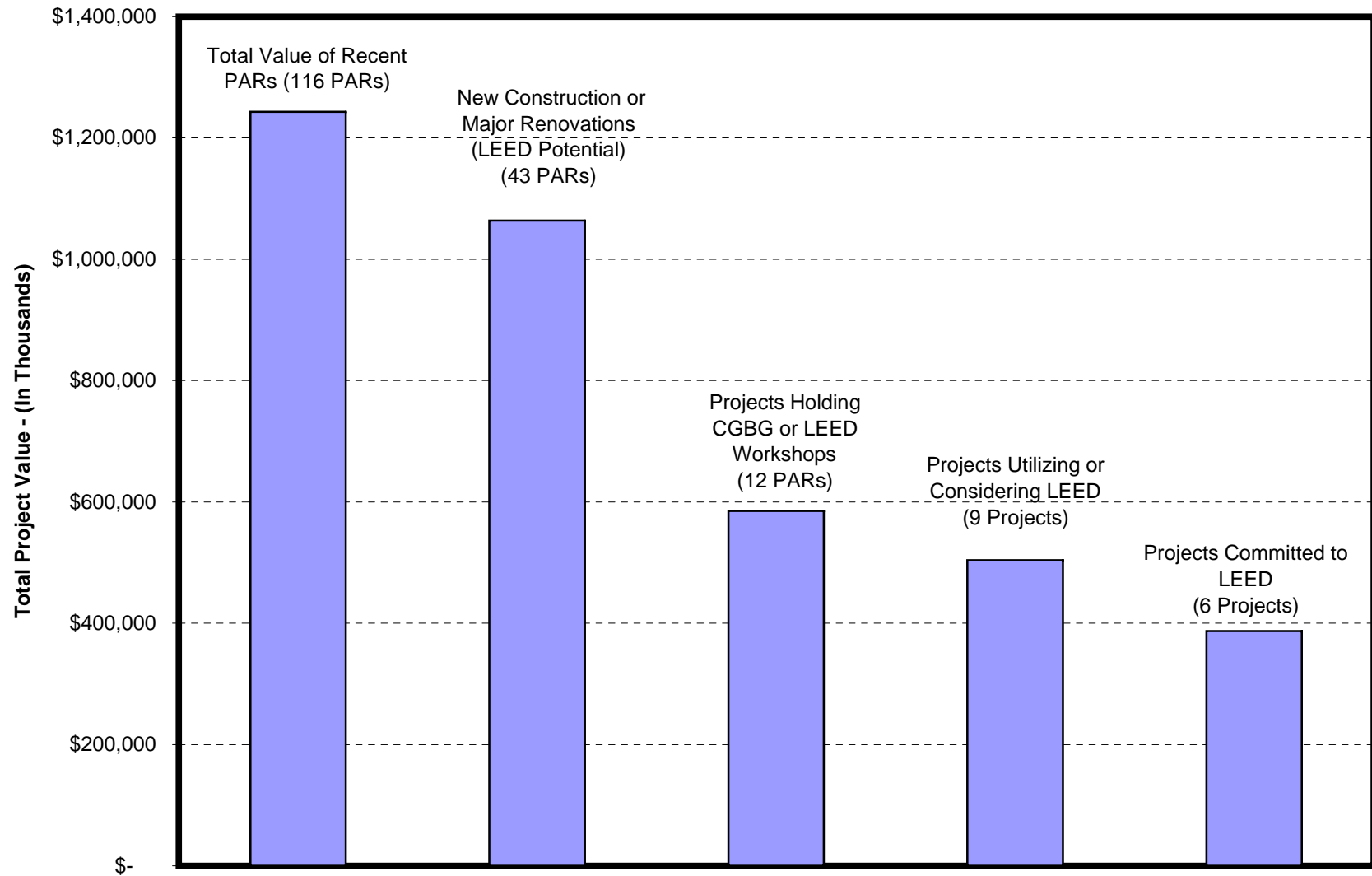
#### **Negative Data**

- Less than 30% of general building projects have had a formal green building workshop or similar exercise
- Less than 15% of all new construction projects have committed to a formal LEED green building certification.
- New and renovation projects continue to substantially increase campus energy use.

#### **Positive Data**

- Over 55% of the total VALUE of new construction projects have conducted a formal green building workshop
- Almost \$400M in campus projects have committed to a formal LEED building process. This rises to almost \$500M if Physical Sciences commits to LEED.
- Modeling of some recent projects revealed exceptional designs which result in 20-39% less energy use than more conventional designs without loss of functionality.

**Figure 1: Green Building Activity at Cornell (as of June 2007)**



## **Major Projects**

The data above suggests that Cornell's green building efforts have been (appropriately) focused on the larger projects on campus. There are many potential reasons for this, including the following:

- Many large projects consume large amounts of energy, which have compounding effects on campus utilities, environmental impacts, and long-term costs. Facilities Services staff focus particular attention on these projects.
- Many of our largest projects have sophisticated project management teams (in-house and consultant) who can successfully integrate the challenges of sustainability into the many other challenges facing successful projects. Smaller or less experienced project teams may not have the resources to take on this additional challenge.
- The highly public nature of large projects invites public (campus and beyond) concern or opposition. A green building program helps the project team evaluate impacts, reduce impacts where practical, and improve the potential for public support. Conversely, smaller projects may feel they can "ride under the radar".
- Cornell's green building (including energy) experts are already engaged on the larger, most impacting projects, offering an opportunity to integrate sustainability into the design process without much additional effort.

Nonetheless, there is not yet a clear mandate requiring specific environmental performance of all facilities. Table 1 (attached) demonstrates the current level of application of green building principals to the fourteen (14) largest projects on campus.

Cornell's fourteen (14) largest projects represent about \$1B in total construction project impact. Thus, a more consistent green building approach to just a few of these large projects can have a proportionally large impact on Cornell's overall environmental, social, and fiscal "footprint".

## **CGBG versus LEED**

In general, the impression of the GBOC has been that the CGBG have provided the following benefits:

- Served as a non-binding educational tool to help project teams understand environmental and social impacts of construction without mandating specific project approaches or changes.
- Provided an easy-to-understand and implement approach.
- Provided a very low-cost approach to sustainable project review.
- Facilitated discussions and design reviews focusing on sustainability.

**Table 1: Green Building Activity -- 14 Largest New Construction/Major Renovation Projects**

Project	Total Project Value*	Current Project Phase	Workshop Held?	Energy		LEED?	Notes
				Model?	30% Below Code?		
Life Sciences Tech Bldg	\$ 160,000,000	Construction					Seeking LEED Gold
Physical Sciences	\$ 100,000,000	Site Preparation					Considering LEED
Food Science	\$ 89,000,000	Planning					
West Campus Residential Initiative	\$ 88,300,000	Construction					Phase I was LEED Certified
Animal Health Diagnostic Center	\$ 80,050,000	Design					Targeting LEED Silver/Gold
MVR North Replacement	\$ 78,000,000	Design					Targeting LEED Silver/Gold
MVR '33 and East Wing Rehab	\$ 75,000,000	Construction					
Central Heating Plant CCHPP	\$ 60,000,000	Design					Bldg Addition to be LEED
University Health Services	\$ 60,000,000	Planning					
Computing and Information Science	\$ 50,000,000	Planning					
Millstein Hall	\$ 41,000,000	Design					LEED PAR Approved
Olin Library Renovations	\$ 40,000,000	Design					
Goldwin Smith Addition	\$ 40,000,000	Planning					
CIT Building	\$ 37,000,000	Planning					Real Estate Delivery
Combined PAR Values:		\$ 998,350,000					

\*Note: Project Values based on Latest PAR

**LEGEND:** "Project Complies"  
 "Project Does Not Comply"  
 Unknown at Current Stage

The CGBG also has the following limitations:

- The CGBG itself does not produce measurable changes in the way that projects on campus are designed or constructed.
- The CGBG process also does not provide a measurable sustainable rating or outcome that can be easily communicated either in-house or to the general public.
- The CGBG process is not familiar to outside consultants, who therefore must review this “parallel” system (although its alignment with LEED helps to minimize this issue).
- Many of our consultants and project leaders express confusion about the intention of these non-binding “guidelines”.

LEED has many of the opposing attributes. On the positive side, the following are the benefits of the LEED process:

- The numerical targets and the specific project requirements of LEED encourage project teams to optimize their design and/or material specifications to meet various “levels” of achievement.
- The LEED process produces results that can be readily quantified and generally communicated.
- The general architectural and engineering design community (as well as the general population) are familiar with LEED and do not need to be “trained” on a unique system.
- SUCF projects already are required to conduct LEED workshops.
- LEED requires good energy performance as a prerequisite and encourages higher levels of performance through a “point system”. Energy performance is a key component of Cornell’s commitment to carbon emissions reductions.

On the negative side, the LEED process has the following downside:

- LEED requires higher overhead cost (for registration of projects, documentation, and the third-party review process) as well as a great deal of formal documentation.
- Depending on the project and level of achievement sought, the capital cost of a project targeting LEED may also be higher (although for most projects on campus the additional capital cost has been less than 1% of project cost).
- LEED is fairly rigid; not all projects may be “rewarded” for certain design practices which may in fact be sustainable.

While no approach is perfect, the majority of the GBOC judge the LEED system to be superior overall.

## **Conclusions and Recommendations**

The GBOC makes the following three recommendations for Cornell University:

### **1. Maintain a visible green building program.**

- Continue to target large building projects, where impacts and opportunities are the highest.
- Continue to develop and mandate campus-wide standards that reflect the strategies of sustainability (low VOC materials, high energy performance, etc) for integration into all projects on campus.
- Mandate a common PAR item on sustainability and energy efficiency goals of the project to make the process more transparent to CF&PC and project team members. This will promote an early discussion of sustainability in the project's development, limiting negative cost impacts.
- Improve hiring of A/E teams with demonstrated commitment to sustainable design. GBOC members feel that proven interest and expertise in sustainable design is essential to a successful and efficient green building program.

### **2. Adopt LEED**

- Require LEED certification for all new construction or significant renovation projects valued at over \$5M, with the stated right of the CF&PC to make exceptions to this general policy when warranted. All entities on campus should be included in the general policy.
- Abandon the CGBG and conduct workshops using the LEED guidelines instead. LEED would introduce a level of accountability that is currently lacking on some of our projects, improving the ability to measure and communicate the University's efforts. Utilizing LEED will also facilitate a more uniform campus-wide approach, since the LEED process is already mandated on State-funded projects.
- Remain flexible about what "green" performance level is applicable to each project, encouraging high energy performance as a focus without mandating a specific LEED performance level. Encourage high performance, but allow individual projects to set applicable LEED goals.

### **3. Mandate High Energy Efficiency for Future Buildings**

- Require all project teams to target reduced energy use for the buildings they design, with a target of 30% below the "baseline" using the LEED

modeling protocol, while analyzing even higher energy savings (striving towards a 50% or greater reduction).

- Mandate that A/E agreements for projects involving new buildings or significant energy use include a formal energy model which is used to guide the design process towards the University's goals.
- Develop and implement a plan under which smaller renovation projects can seek funding for larger scale energy saving initiatives. For example, Cornell currently constructs projects using electric heat where a building lacks infrastructure for more appropriate alternatives. A strategy to encourage sustainable energy use practices on our smaller scale projects is important to the overall program.
- Review and integrate, as appropriate, the goals of the AIA 2030 carbon neutrality challenge and the President's Climate Commitment, both of which aim to significantly reduce carbon emissions, into future Cornell energy goals.