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# Taking Sustainability to the Streets

Georgia Tech helps building professionals get the right information at the right time.

by T.J. BECKER

**S**ustainable building isn't a technical problem – it's a people problem, says Annie R. Pearce, director of the Sustainable Facilities and Infrastructure (SFI) Branch at the Georgia Tech Research Institute.

"Everyone agrees that sustainability is a good thing," she explains. "But not everyone agrees on what it is, how to achieve it or when it's been achieved."

Launched in 1997, SFI provides tools, training and technical assistance to help building professionals apply sustainable materials and methods. Whether they're designing a new facility or a renovating an existing one, the goal is to create structures with enduring environmental, economic and social benefits.

## Getting Connected

One of the biggest challenges is overcoming the lack of communication among various groups involved in the building process. "There is a huge disconnect, especially between design and operations," Pearce says. "Architects conceive designs that may incorporate sustainable technology, but they don't always consider the facilities staff. This often results in sustainable buildings being built, but not used as intended."

**Above: The Sustainable Facilities and Infrastructure Branch at the Georgia Tech Research Institute recently hosted a "green" building seminar to help participants learn to apply sustainable materials and methods to construction and renovation projects.**

PHOTO COURTESY U.S. DEPT. OF ENERGY



**The Albany, N.Y., county airport's passenger terminal was designed to be energy efficient. It is an example of a sustainable building – one that has enduring environmental, economic and social benefits.**

**Right: Participants in the “green” building seminar learn how to apply sustainable materials and methods to construction and renovation projects.**



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*Case in point:* Pearce visited a park in Colorado where buildings had been outfitted with a solar water-heating system. The operations staff had received no training on the system and was concerned that water in the pipes might freeze. Consequently, they shut down the system during its first winter and installed a conventional heating system. When spring came, the solar system was never turned back on.

To combat such problems, SFI takes an integrated approach to its curriculum. SFI classes target a broad audience – planners, project managers, architects, engineers and maintenance personnel – with interactive exercises that teach people how to work together to identify strategies for implementing sustainability.

“The idea is to get everyone who is involved in a project in the same room,” Pearce explains.

Because the building process is so complex, early collaboration is critical to understand how different components work together and result in higher-quality buildings that cost less to operate and maintain. Take windows. Energy-efficient glass may cost more, but requires less of heating and cooling systems. Thus, ductwork can be more compact, which affects the structure’s overall size: If height can be reduced, there’s less strain on a building’s foundation.

“Sustainability trickles all the way down,” Pearce says. “But unless people are talking to each other, they don’t get the bigger picture. They often believe sustainability will be more expensive.”

To promote greater synergy among building participants, SFI offers customized training on organizational change and how to implement sustainability. To date, clients include the U.S. Army, Air Force, state Department of Defense partnerships, the Centers for Disease Control and Prevention and the USDA Forest Service.

Pearce has also recruited SFI staff members from unexpected disciplines, such as psychology and philosophy, to help address organizational behavior issues. “In fact, I’m the only person on my staff with a traditional engineering degree,” Pearce says.

### Online Knowledge Base

SFI is also striving to combat information overload. “There’s no lack on information out there on sustainability,” Pearce observes. “The problem is trying to find what you need for your particular project.”

In response, SFI has created the Sustainability Knowledge Base ([www.sustainablefacilities.org](http://www.sustainablefacilities.org)), a project that began in 2002 with Defense Department funding. This online tool targets military installation personnel in the Southeast, but can benefit anyone trying to practice sustainable building.

The database captures real-world knowledge in an easy-to-digest form, enabling users to skim more than 200 different technologies – from aerated autoclaved concrete to waterless urinals – and drill deeper when they want more details. “The idea is to deliver the right information to the right person at the right time,” Pearce explains.



PHOTO COURTESY U.S. DEPT. OF ENERGY

**Daylighting a building can reduce lighting energy use by up to 55 percent, according to a U.S. Department of Energy study.**



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“What impressed me was how the knowledge base delivers a checklist of requirements that need to be considered, such as lighting systems,” says Bruce Ramo, environmental coordinator at Dobbins Air Reserve Base, who was among users testing the knowledge base. With limited space and construction funding, Defense Department planners, architects and engineers need to build facilities that are multi-functional, energy efficient, economical to operate and maintain – and “last forever,” Ramo says. “If we’re going to succeed with championing sustainability, we need to identify those requirements early in the planning stage when key decisions are being made.”

Other hallmarks of the knowledge base include:

- *Personalization.* People can browse technologies depending on their role in the building process.
- *Pros and cons.* Besides cost analysis and benefits, the tool points out potential problems. For example, one school building had small holes in its windows for natural ventilation, but students kept sticking pencils in these holes, which played havoc with the HVAC system.
- *Case studies* on facilities where sustainable technologies have been applied successfully. Contact information is also included, so readers can call peers if they have questions.
- *Reader reviews.* Similar to Epinions.com, users can write reviews about different sustainable technologies, such as rainwater harvesting or recycled contact fabric.

“People typically are risk averse and don’t want to try something new,” Pearce observes. “The case studies and reviews expose users to technologies that have been used on projects similar to their own — as opposed to some trophy building they can’t relate to.”

SFI has completed a working prototype of the Sustainability Knowledge Base and is seeking additional funding to take it to the next level. Pearce envisions adding different levels of access. She also wants to improve the tool’s algorithm, which prioritizes sustainable technologies based on specific parameters of a project.

“There are so many things you could introduce to a building – from energy-efficient appliances to water-supply and treatment systems,” Pearce explains. “The algorithm helps point people to technologies that have the biggest payoffs for their particular projects.”

### Do-it-Yourself Sustainability

Limited resources can also discourage building professionals from embracing sustainability.

“It’s easier to build sustainability into some high-profile projects than small, everyday ones where you have neither the time nor money to bring in specialists,” Pearce says.

This is a particular problem for government agencies that may have shrinking staffs and budgets, but still face high expectations and scrutiny from constituents. With that in mind, SFI is developing a new tool for U.S. Air Force installation personnel — do-it-yourself charrettes.

Charrettes are intense sessions in which participants try to solve an architectural problem in a limited time period. Although these conferences are typically reserved for large projects and facilitated by specialists, SFI has created a tool that enables organizations to host in-house charrettes.

Featuring a series of checklists and worksheets, SFI’s charrette kit is intentionally low-tech. “It’s easy to get overwhelmed by the amount of detail in sustainability and start debating the life-cycle of some material to the nth degree,” Pearce says. “Yet rarely do you need that level of information to make decisions. This tool gives people a skeleton to capture precisely the information needed to make the best decisions for their situation.”

Building to serve the needs of future generations means that sustainability must be woven into all projects – not just the big ones, Pearce stresses: “By breaking down barriers like information overload and organizational disconnects, SFI isn’t just making people aware of sustainability, we’re helping them apply it.”

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**Left: The interior at the Solar Energy Research Facility in Golden, Colo., features a stair step design and windows that bring daylight inside.**

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