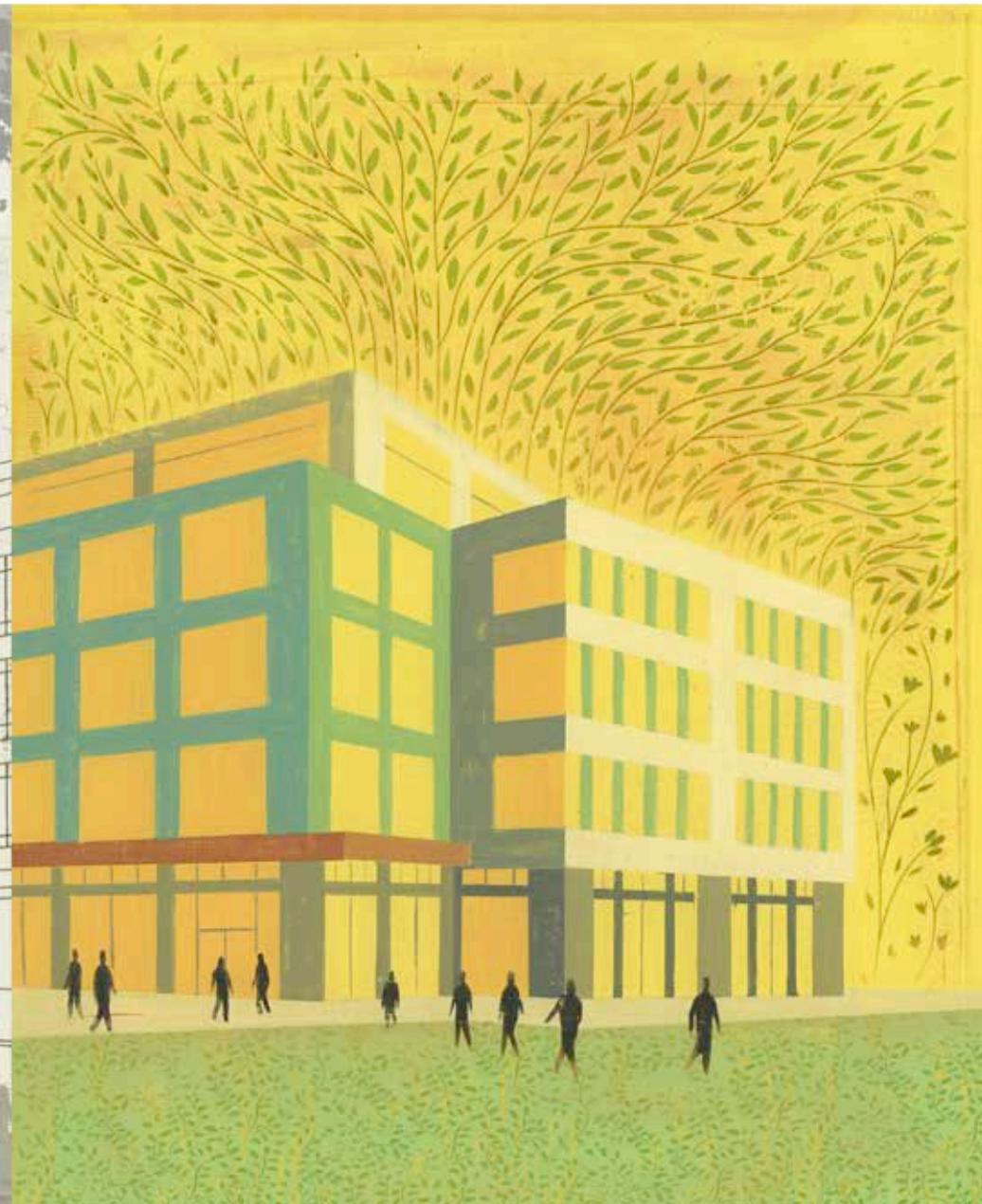


KNOWLEDGE FOR **BETTER** BUILDING

**FOR MORE THAN 25 YEARS,
THE CENTER FOR BUILDING
KNOWLEDGE (CBK) AT NJIT**

has carried out the mission of improving the built environment through research, technical assistance and training. Operating under the auspices of the College of Architecture and Design, the CBK's professional staff has focused on generating practical results that provide tangible benefits to individuals and the communities in which they live and work.





It's a mission guided for over a decade by Executive Director Deane Evans, who came to NJIT from the American Institute of Architects, where he was vice president for research. Funding for the CBK's projects has come from various sources in the public and private sectors, including utilities, corporations, and state and federal government agencies.

The CBK's scope of activities has evolved to encompass affordable housing design, supportive environments for special-needs populations, commercial and institutional buildings, high-performance educational environments, and even historic preservation. Today, there is increasing emphasis on meeting the pressing challenges of sustainable and resilient building.

THE SUPERMARKET CONNECTION

The expertise that the CBK brings to the sustainability arena focuses on developing practical approaches to improving building performance and then providing online tools for attaining the goals that are set. One example is the CBK's work with supermarkets.

Evans explains that supermarkets are prime candidates for improvement because they use substantial amounts of electricity and refrigerants at numerous sites owned by a relatively small number of parent corporations. "Appropriate upgrades endorsed at the top corporate level can make a major difference nationally," he says. Working first for local utility PSE&G and then for the U.S. Environmental Protection Agency (EPA), CBK staff created a suite of evidence-based online tools to help supermarkets reduce energy and water consumption, and improve the way they manage their use of refrigerants.

A similar approach led to the first national online training program for building commissioning, the process of fine-tuning a new building so that it operates at peak efficiency from day one. "We began working one-on-one with clients to meet their specific needs and then packaged the expertise needed in toolkits that interested groups could use on their own," Evans says. With support from the U.S. Department of Energy, use of the toolkits is being promoted by the Building Commissioning Association.

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“WE UNDERSTAND SUSTAINABILITY AND RESILIENCY, AND HOW BUILDINGS ARE SOLD AND TRADED. WE UNDERSTAND THE ECONOMICS, WHAT’S POSSIBLE AND WHAT’S NOT POSSIBLE IN THE MARKETPLACE.”

— Deane Evans, Executive Director, Center for Building Knowledge

BENCHMARKING TO CUT COSTS

Recently, the CBK and the Consortium for Building Energy Innovation (CBEI) launched an initiative that can cut costs for energy and water wasted due to building inefficiencies. It’s the Certificate of Proficiency in Benchmarking®, an interactive online training and certificate program for professionals who track the energy and water consumed by buildings.

On average, buildings waste 30 percent of the energy they consume, so there is substantial opportunity to be smarter in the use of energy and to save money for owners and tenants. An important first step in identifying inefficiencies is to benchmark a building to understand how its performance compares to other similar buildings.

The new program – described in greater detail at benchmarkingcertificate.org – educates users through a no-cost training component about how to collect accurate energy and water benchmarking data and use the U.S. EPA’s ENERGY STAR™ Portfolio Manager® tool in the benchmarking process. For a fee, the program also certifies participants who successfully complete the training and an exam.

Although benchmarking can lead to significant savings for property owners, Evans notes that it involves a significant change in business as usual for building owners, who require transparent and credible data to make decisions. Although benchmarking can provide such data, the people who run the calculations need to be proficient to guarantee actionable, economically meaningful results.

“It’s really essential to establish a baseline for proficiency, for the municipal employees or contractors responsible for evaluating buildings. Otherwise, you run the risk of generating incorrect results – as happened in New York with some 25 percent of initial ratings. This could set acceptance of the program back by several years,” Evans says. The CBK’s training and certificate program – developed in collaboration with the Natural Resources Defense Council, the U.S. EPA and the CBEI – guarantees the level of proficiency needed by anyone who intends to benchmark a building.

A COMMUNITY PERSPECTIVE

Superstorm Sandy and more recent extreme weather events have put resiliency “on the radar” for an increasing number of individuals and municipalities. “After Sandy, a lot of people realized that trees and water aren’t always our friends. There is a greater sense of vulnerability,” Evans says.

In response, the CBK and the NJIT Center for Resilient Design directed by Thomas Dallesio have taken the lead on a proposal to the National Institute of Standards and Technology to establish a national Community Resilience Center of Excellence at NJIT. In advocating for such a group, the CBK and Dallesio’s center drew on diverse expertise readily available at the university, in areas that include computer modeling, statistical analysis, city planning, transportation, and structural design and engineering.

The initiative promotes a comprehensive approach to resiliency which, in addition to individual structures, takes into account “lifeline systems” such as power transmission and distribution, water supplies and wastewater management, and transportation. The goal is to give communities inclusive strategies for improving the survivability of infrastructure threatened by natural disasters and recovering as quickly as possible from damage that does occur – recovery that incorporates improvements and does not just revert to the pre-disaster status quo.

Climate change is also figuring into the infrastructure equation. “There’s increasing data that more regions of the country will experience the same nuisance flooding that we already see in parts of Florida and elsewhere. It’s not catastrophic, but it is expensive. Also, when there’s a bigger event, the flooding will be that much worse,” Evans says.

Understandably, the economics of resiliency and sustainability will be a significant factor in determining the degree to which municipalities upgrade their infrastructure, as it is for building owners in the private sector. The challenge, then, will be for municipalities as well as private property owners to decide how much to spend in response, and how soon to make the investment.

INCREMENTAL BENEFITS

While the CBK is working to develop an essential bigger picture for resilient and sustainable design, a great deal can be done incrementally in the near future to implement positive change and demonstrate the value of that change. “We can help people use what they might already be doing to their homes and buildings in a way that increases resilience and sustainability at an acceptable cost,” Evans explains.

For example, as a recent CBK research study concluded, relatively minor changes in the way buildings are re-sided can have a significant effect on energy consumption. Each year, some 10,000 structures are re-sided in New Jersey alone. If each of these jobs were done with energy efficiency in mind, the impact on individual buildings as well as on the state’s energy consumption could be substantial.

Looking ahead, Evans advocates applying the same thinking to resilience, taking advantage of what home and commercial building owners typically do with respect to maintenance and upgrades to turn these activities into opportunities to improve resilience as well as energy efficiency. “People simply don’t have the money to radically upgrade the sustainability and resilience of their buildings all at once. But they may be able to improve performance over time if they undertake normal upkeep with a new understanding of how to get more resilience bang for their bucks.”

Evans and his colleagues at the CBK are prepared to contribute in every area where innovative, practical strategies can translate into better building. “We understand how buildings go together, and what they should do for people. We understand sustainability and resiliency, and how buildings are sold and traded. We understand the economics, what’s possible and what’s not possible in the marketplace.” ■

There will be more about work at NJIT to improve the built environment and promote economic development in future issues.

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