



Erdman Anthony's Rachel Stuckey meets with Chris Button, Associate Director for Planning and Construction at Hobart and William Smith Colleges. Top left is a music room at HWS's new performing arts center.

The Integrative Design Process: Making an Impact on Energy Efficiency

Erdman Anthony Forms SustainabiliTEAM™ to Promote This Effort

The facts are startling. The built environment is estimated to be responsible for more than 40% of global energy use and as much as one third of global greenhouse gas emissions. Building energy consumption, energy efficiency, and global climate change are 21st-century issues directly related to the building-design profession.

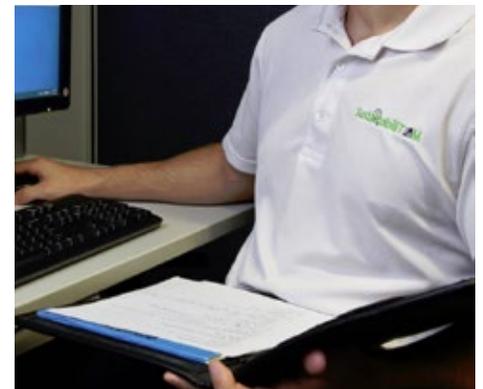
The federal government and New York state have set aggressive goals to reduce the energy used by buildings. By executive order, the federal government plans to reduce federal-agency facility energy use intensity (EUI) by 2.5% annually from 2015 to 2026. New York is following suit and plans to reduce state-building EUI 20% by April 2020, based on 2010/2011 building-energy use.

“Clearly, in order to make an impact on energy usage this significant, engineers and everyone involved in construction and renovation needed a change of approach,” said Michael St. John, PE, CEM, LEED AP, core business leader and principal associate at Erdman Anthony.

The questions were clear to Erdman Anthony. How can we help our clients be better stewards of energy? How do we ensure that their buildings will be energy-efficient, cost-effective, and easy to maintain? How can we accomplish all this and still give them the attractive and purposeful buildings they envisioned? The firm created a new approach.

A New Approach

Erdman Anthony created the SustainabiliTEAM™, which is comprised of engineers, energy analysts, and commissioning professionals, to provide customers with a unique and comprehensive approach to sustainable design and building operation. From improved new facility design to



improving operations through commissioning, energy studies, and audits, the SustainabiliTEAM uses a custom approach to achieve optimal solutions in quality and sustainability.



The SustainabiliTEAM at Erdman Anthony works collaboratively with clients to achieve energy-saving goals.

The SustainabiliTEAM's Evolution

The team saw barriers to achieving significant energy savings using the traditional design approach, which was developed in an era of much simpler buildings. In the conventional process, the various design disciplines operated largely independently, only coordinating with the entire team at key points during the design process. Each discipline worked to make its part as efficient as possible. However, opportunities for greater innovation were often missed. Significant changes involving the shape or size of the building, how it is used, where it is located, and even system types must be addressed very early in design – and often must have buy-in from users and maintenance personnel to be successful in the long term.

To address these concerns, Erdman Anthony's SustainabiliTEAM uses a collaborative design process, often called the "integrative design process," which seeks high-performance and cost-effective solutions by taking an early look at how the building systems might better work together. The SustainabiliTEAM is part of the integrative design process of each project. Architects, owners, users, maintenance personnel, engineers, and commissioning team members come together in the earliest phases of the design process to determine if each recommendation is efficient, easy to implement, and in accordance with the building's purpose.

"Bigger, more effective changes in energy usage require input from everyone involved in the process," St. John said. "The scale of energy-saving goals is beyond what can be done in the typical design process. Integrative design pushes that further."

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High-Performance Building Support

The integrative design process is at the forefront of Leadership in Energy and Environmental Design (LEED) projects, as well as projects supported through New York State Energy Research and Development Authority's (NYSERDA) New Construction Program. As a technical assistant for NYSERDA's New Construction Program, Erdman Anthony works with program applicants to analyze energy-efficiency opportunities in new or substantially renovated buildings. In this capacity, our firm plays a lead role in transforming the marketplace by encouraging building owners, architects, and engineers to choose more energy-efficient and sustainable solutions.

LEED has also recognized the importance of an integrative design process, which includes the use of building energy simulation beginning in the earliest phase of the design process. The current rating system, LEED v4, provides credit toward certification for utilizing and documenting this integrative design path.

Energy Savings at Hobart and William Smith Colleges, Geneva, NY

The integrative design process is proving to be successful. Hobart and William Smith Colleges expect to save more than \$105,000 annually in energy costs and also expect to receive nearly \$160,000 in NYSERDA awards for the new Gearan Center for the Performing Arts project. The facility is aiming for LEED® Silver, but anticipates achieving LEED Gold. The 62,500-square-foot, three-story building is comprised of three theater spaces, studio and rehearsal spaces, a scene shop, classrooms, and offices.



Gearan Center for the Performing Arts at Hobart and William Smith Colleges.



Erdman Anthony provided technical assistance to the project design team, offering feedback and guidance on several design options under consideration. This process provided essential information to the project team and contributed to the facility's final design. At the conclusion of the design, the energy analysis was used to gain financial incentives as noted above, as well as to pursue energy credits for the building's LEED certification. To ensure that the designed systems perform as intended, Erdman Anthony also provided USGBC Fundamental and Enhanced commissioning services for the new performing arts center during the design, construction, acceptance, and warranty phases.

"The new Gearan Center is a magnificent state-of-the-art building that not only meets the needs of the performing arts, but will save energy, tell a fantastic story, and put us one step closer to our climate neutrality goals. Erdman Anthony was a huge part of our success," said Chris Button, Associate Director for Planning and Construction at Hobart and William Smith Colleges.

Erdman Anthony Steps toward Sustainability

The concept of the **SustainabiliTEAM™** was formed when Erdman Anthony engineers studied their own workplace and began in small steps to make the firm's headquarters on Culver Road in Rochester more efficient.

Several employees took a look at the firm's energy performance and resource utilization and brainstormed ways to bring more sustainability into the workplace. Implementation started with simple actions, like making sure printers were at the most efficient settings and ensuring that the office kitchen was stocked with reusable supplies instead of nothing but paper products.



The group worked together to come up with an appropriate name that would encompass its efforts. Michael Gardner, PE, LC, LEED AP BD+C, an Electrical Engineer in Erdman Anthony's Facilities group, pointed out that "EA," the abbreviation for Erdman Anthony, is in the center of the word "team," and sustainability is part of the group's mission. So the group joined the two words to form **SustainabiliTEAM™** and trademarked the name.

Erdman Anthony continues to develop ways to be more energy-conscious internally. The firm holds a bike-to-work day each spring, which has had more participants every year. Staff members also care for a community garden near the office. "It's a great excuse to go

outside during the day," Gardner said. "Tending the garden has been a way for employees from all disciplines to come together and get to know each other."

The company made an impact on the entire complex on Culver Road, where Erdman Anthony is located, when it requested a recycling area for all the tenants. "We've developed substantial experience in optimizing our clients' energy and resource use," said Michael St. John, PE, CEM, LEED AP, core business leader and principal associate at Erdman Anthony. "It was a natural step to turn that expertise inward to benefit our own working environment."