



EDUCATE  
ACCELERATE  
INVESTIGATE  
DEMONSTRATE  
REGENERATE  
RENOVATE  
INNOVATE





**SyracuseCoE** is New York State's Center of Excellence for innovations in environmental and energy systems. We engage our partners and collaborators to address global challenges in clean and renewable energy, indoor environmental quality, and water resources.

Located on a revitalized brownfield site in downtown Syracuse, SyracuseCoE's state-of-the-art LEED® Platinum headquarters serves as a living laboratory for research, development, and demonstration projects. Through collaboration with government, industry, academia, and other research partners, we create relationships that speed green technology from the lab to the marketplace.

**The goal is simple: improve the air we breathe, the water we drink, the energy that powers our lives, and the buildings where we live, work, and play.**

## SYRACUSECoE MISSION AND VISION

**THE PURPOSE** of the Syracuse Center of Excellence in Environmental and Energy Systems is to create jobs and wealth in New York State through collaborations in research, development, and education.

**THE MISSION** of SyracuseCoE is to create innovations in environmental and energy technologies that promote sustainable well-being in built and urban environments.

**THE VISION** of SyracuseCoE is to earn international recognition for development of knowledge and products in environmental and energy systems for built and urban environments.



**TEN YEARS AGO, WE IMAGINED** a lab for collaboration, an organization that would create “intellectual collisions” among a diverse group of partners and yield fresh ideas for new products and services in environmental and energy systems. Targeted research would enable ideas to become reality. Innovations would create jobs at local companies, and revitalize the economy in Central New York and across the state. Today, our vision is being realized.

SyracuseCoE—New York’s Center of Excellence for innovations in environmental and energy systems—is a collaborative organization that engages more than 200 firms and institutions. We work on global challenges in clean energy, indoor environmental quality, water resources, and materials management—all pivotal issues for a sustainable future. Our members conduct research, development, demonstration, and commercialization projects. Our award-winning headquarters is a unique living laboratory and a hub for collaboration.

In these pages, seven feature stories illustrate the breadth of SyracuseCoE activities: we educate, accelerate, investigate, demonstrate, regenerate, renovate, and innovate. You will read about early intellectual collisions that developed into new products—NuClimate’s Q Air Terminal and e2e Material’s office furnishings—or created new approaches to addressing

regional environmental issues—such as combined sewer overflows in Onondaga County, disrupting the mercury cycle in Onondaga Lake, or revitalizing Syracuse’s historic Near Westside neighborhood. Two stories give a foretaste of the future—current research to understand the dynamics of complex fluid flows and to understand individual response to indoor environmental quality factors.

Also in these pages, you will read about many of our accomplishments in 2012. Our lab for collaboration produced a winning application to five federal agencies for awards that will accelerate the growth of Central New York’s emerging advanced manufacturing cluster in thermal and environmental control systems. We started construction on \$8.7 million in new facilities at our headquarters campus. Our 12th annual Symposium engaged local collaborators and noted authorities from across the county and around the world.

Our record of achievement positions us extremely well for the future. We envision healthy communities, built upon principles of environmental justice and the core values of sustainable well-being. Innovative products and services will help preserve and protect the health of residents and workers and of environmental resources while optimizing productivity and life-long learning. We invite you to partner with us to make these visions a reality!

# COLLABORATE



# EDUCATE



“We need locations like Onondaga County and Syracuse whose leaders are willing to be progressive and try new concepts... and SyracuseCoE is a conduit for making that happen.”



When SyracuseCoE Executive Director Ed Bogucz was trying to recruit Cliff Davidson from Carnegie Mellon University, he told the environmental transport expert it was the perfect time to come to Syracuse because of Onondaga County’s commitment to sustainability.

Today, Davidson is the Thomas and Colleen Wilmot Chair in Engineering at Syracuse University’s L.C. Smith College of Engineering and Computer Science. He conducts innovative research in stormwater management using green infrastructure in a public-private partnership with local government and SyracuseCoE.

Davidson and his research team—graduate and undergraduate SU engineering students—have installed equipment to monitor stormwater capture on the 60,000-square-foot green roof on Syracuse’s Oncenter, one of the largest green roofs in the Northeast and one of more than 100 green infrastructure projects that comprise Onondaga County’s nationally recognized “Save the Rain” program. The comprehensive stormwater management plan utilizes sustainable initiatives to decrease stormwater runoff from the county sewage system. While green roofs are increasingly popular, little research has been completed to understand their efficacy.

Davidson and his team have installed monitoring equipment on the convention center roof to measure how much rain is collected, how much water is stored at any given time, and how much evapotranspires through the plants and soil. “There are other research projects that have looked at pieces of this problem, but this is one of the few times there’s been an attempt to look at the complete mass balance of water on a roof,” he says.

The research intends to improve understanding of how green roofs retain precipitation and reduce stormwater runoff, as well as evaluate equipment used for monitoring green roof performance.

Davidson credits SyracuseCoE with forging the partnerships that make his research possible, research that could have significant commercial applications in the near future. “There are more than 700 cities in the United States that have problems with combined sewer overflow during storm events,” says Davidson, who is also studying stormwater runoff over and through permeable pavements that have been installed throughout Syracuse.

“When it rains, stormwater goes into the sewer, mixes with the sewage, and greatly increases the volume of flow. During heavy rain, the water treatment system can’t handle the capacity, ultimately overflowing untreated into Onondaga Lake,” he explains.

Davidson says he was attracted to Syracuse because of Onondaga County’s use of green infrastructure. “The county has made a big investment in environmental sustainability,” he says, efforts resulting in Syracuse and Onondaga County being named one U.S. Environmental Protection Agency’s 10 green infrastructure partners.

“We need locations like Onondaga County and Syracuse whose leaders are willing to be progressive and try new concepts,” says Davidson. “If we continue on the current trajectory, I expect this area will be a leader in the country on stormwater management, and SyracuseCoE is a conduit for making that happen.” ●



The 60,000-square-foot rooftop garden was planted with 2,400 pounds of sedums, which require little maintenance, and is expected to absorb up to a million gallons of water a year. Rain and snowfall are measured by the precipitation gauge (above); the surrounding alter shield blocks wind so that snow falls into the gauge.



AT GREENBUILD 2012 IN SAN FRANCISCO, JOHN DIMILLO DEMONSTRATES THE ENERGY EFFICIENCY OF NUCLIMATE'S CHILLED BEAM SYSTEM



“Every time we ask for assistance, they deliver. SyracuseCoE has been an essential partner in the development of this company.”

When a group of former Carrier executives was looking for help with the cost of independent testing to get a newly patented, energy-efficient commercial heating, ventilation, and air conditioning (HVAC) system to market, it turned to the SyracuseCoE for help.

“We were just a few guys with big ideas about how this invention could change the industry,” recalls John A. DiMillo, vice president of NuClimate. “But we were promoting a very energy-efficient product and SyracuseCoE believed in us.”

NuClimate was awarded a \$50,000 grant through the SyracuseCoE’s Commercialization Assistance Program, and in 2003, the small company manufactured 40 of its chilled beam units. By 2012, production was up to 10,000 annually, with sales in seven states. That number could soon expand dramatically.

NuClimate recently signed an exclusive agreement with Carrier Corp., which will now sell the NuClimate chilled beam through its worldwide distribution channels with the Carrier name on it.

According to DiMillo, SyracuseCoE has been an essential partner in that achievement. “When we were looking to vertically integrate our manufacturing, they put us in touch with the expertise that could help us do that. When we were looking for investment dollars, they brought us equity investors. Every time we ask for assistance, they deliver,” he says.

From the start, SyracuseCoE provided the support that allowed NuClimate to be viewed as an advantageous HVAC technology by engineers, architects, and contractors throughout New York State. Perhaps the most valuable connection was made when SyracuseCoE brought NuClimate to a NYE-RIC Bridges to Markets meeting, which resulted in an order from the New York City Schools for several thousand units over a five-year period for a series of major public school renovations.

NuClimate has also outfitted 55 school buildings in greater Boston, and will be supplying systems for renovated public school buildings in Syracuse, which began with the Fowler High School renovation.

The NuClimate chilled beam provides an alternative to a standard fan coil or variable air volume (VAV) system, which is found in about 80 percent of commercial buildings in the United States. A conventional system mixes fresh outside air with re-circulated building air, which then is heated or cooled and blown through air ducts into a building’s rooms.

The chilled beam works on the theory of energy induction and is incorporated with a building’s water system. The unit takes outside air, sends it through a series of nozzles that increases its velocity, and blows that air on one side of a coil hooked to the water system. Water temperature determines heating or cooling. The unit requires no electrical power, no compressor, and no fan motor, resulting in energy savings of up to 25 percent, better air quality, quieter operation, and lower maintenance costs.

“This is the right time for our product,” says DiMillo. “When we started, nobody was evaluating systems on payback. Today, return on investment is everything. Every building in America is analyzed for energy consumption 20 years in the future. It was not easy early on, but SyracuseCoE stuck with us.” ●



NuClimate’s commercial HVAC system is an energy-efficient alternative to a standard fan coil or variable air volume system that is particularly effective in high-population buildings such as schools. School districts in Boston, New York City and Syracuse, among others, have outfitted schools with NuClimate chilled beam units in recent renovation projects. The first installation in Syracuse was at George W. Fowler High School.





# INVESTIGATE





“The proximity to the other research groups and interactions with local industry will be an invaluable source of inspiration and collaboration.”



**M**elissa Green runs the Flow Visualization Laboratory at SyracuseCoE, where her research focuses on vortex dynamics and bio-inspired propulsion. The lab itself—a water tunnel that allows researchers to visualize the complex dynamics of fluid flows by using sheets of laser light to illuminate dyes injected in a water tunnel—is located in the lab wing at SyracuseCoE headquarters.

It's a natural fit, says Green, an SU assistant professor of mechanical and aerospace engineering, who anticipates collaborations with researchers from local industry and within Syracuse University. Currently, Green is using the lab to investigate the ways fish and aquatic mammals manage their locomotion to be extremely efficient. “The goal is to determine whether there are any simple physics that we can exploit for man-made applications,” she says.

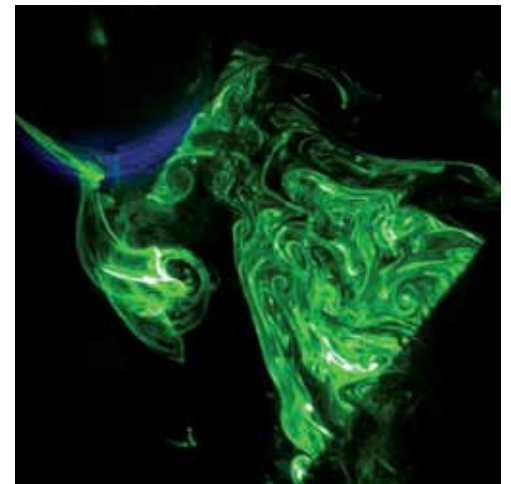
It's known as energy harvesting. Similar to a windmill that takes the kinetic energy of the wind already blowing and transforms it to work or store, fish swimming upstream will often “rest” behind pilings in a river, slaloming in its wake, says Green. “In this scenario, the fish is using the energy imparted to the wake by the shedding of vortices to minimize the energy it has to input,” she explains. Underwater vehicles might take advantage of the same types of opportunities to be more efficient.

Finding and exploiting sources of energy that occur more naturally has obvious connections to the mission of SyracuseCoE, but Green finds additional benefits in her lab location. “By locating the water channel facility in a LEED® Platinum building like SyracuseCoE headquarters, we can learn something about how to do even fundamental fluid dynamics research in a more sustainable way—by possibly sourcing the working fluid from rainwater and by reusing the water in the building after experiments,” she says. “That isn't always a consideration in laboratories at other universities.”

Although SyracuseCoE headquarters is itself a “living lab,” with test facilities located throughout, the building's lab wing is outfitted with state-of-the-art laboratories and testbeds that focus on combustion and thermal power systems, biofuel production, flow visualization, photovoltaic power, window power, and smart building technologies.

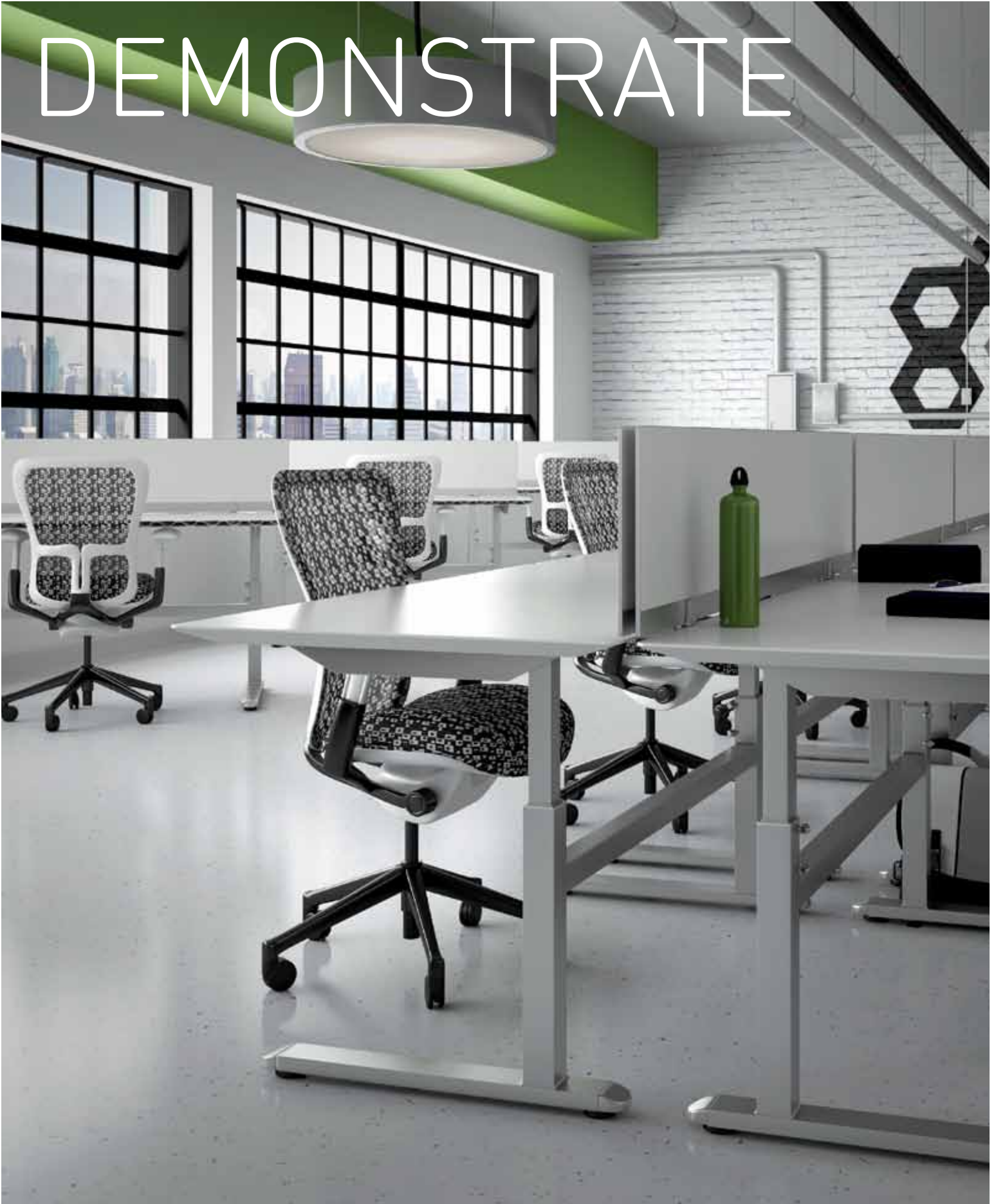
The facilities were outfitted through a \$3-million grant from New York State, awarded as part of a Regional Economic Development Council competition. University researchers and industry partners use these world-class facilities as a platform to discover and test the next generation of energy-efficient innovations for buildings and the environment.

Although each have specific focus areas, the juxtaposition of these labs and their researchers may spark new inquiry, or at least new ways of looking at old problems. “Interacting on a more regular basis with local industry and faculty from different labs at SyracuseCoE lets me see natural overlaps with the research being done in civil and environmental engineering, biomedical and chemical engineering, and by other faculty in mechanical and aerospace engineering,” says Green. “The proximity to the other research groups and interactions with local industry will be an invaluable source of inspiration and collaboration.” ●



Green uses the lab to visualize the complex dynamics of fluid flows by using sheets of laser light to illuminate dyes injected in a water channel. The device, designed and built by Engineering Laboratory Design Inc., helps Green and other researchers better understand force, weight, and vortex dynamics.

# DEMONSTRATE







**E**2e Materials is working to provide a new environmentally sustainable model for manufacturing and boost the Upstate New York agricultural economy in the process. The company uses an exclusive technology that converts agricultural waste and byproducts into a completely bio-based composite that can be used to manufacture products from skateboard decks and automobile trunk liners to kitchen cabinetry and office furniture. This innovative biocomposite is a sustainable and cost-effective alternative to wood, petroleum-based plastics, and composites such as mdf and particleboard. Unique engineering capabilities allow the material to be processed into complex shapes, with a higher strength-to-weight ratio approaching mid-weight steel. In addition, the material is 100 percent formaldehyde-free, biodegradable, and naturally fire resistant.

The company's proprietary biocomposites are made from soy flour and natural grass fibers such as jute and flax—crops grown everywhere in America—and require much less energy to manufacture than wood composites. The company is working with the USDA to source the grass fiber used in the biomass material regionally in Upstate New York. By using a “Regionally Integrated Manufacturing” model designed to create economic impact within a 500-mile radius, each new manufacturing job should result in five new agricultural jobs in the region. A new manufacturing facility in Geneva, New York, is expected to employ 200 workers over the next five years.

e2e Materials began its relationship with SyracuseCoE by conducting necessary third-party testing to prove performance of the material in various applications and confirm there was no toxic off-gassing. SyracuseCoE strengthened its partnership with e2e by using its innovative material in its LEED®-Platinum headquarters building, including cabinetry for three kitchens, benches that line the hallways, and the security guard desk in the first-floor atrium.

“They saw the potential for our technology to contribute to a healthy and innovative built environment and gave us our first major purchase order,” says Clayton Poppe, vice president of engineering at e2e. “This milestone propelled us forward and has become a meaningful part of our history.”

The company won a competitively awarded SyracuseCoE Commercialization Assistance Program (CAP) award in 2010 to support its purchase of unique manufacturing equipment. SyracuseCoE gave additional support by co-exhibiting at several Greenbuild tradeshow, providing the fledgling company with exposure to potential customers.

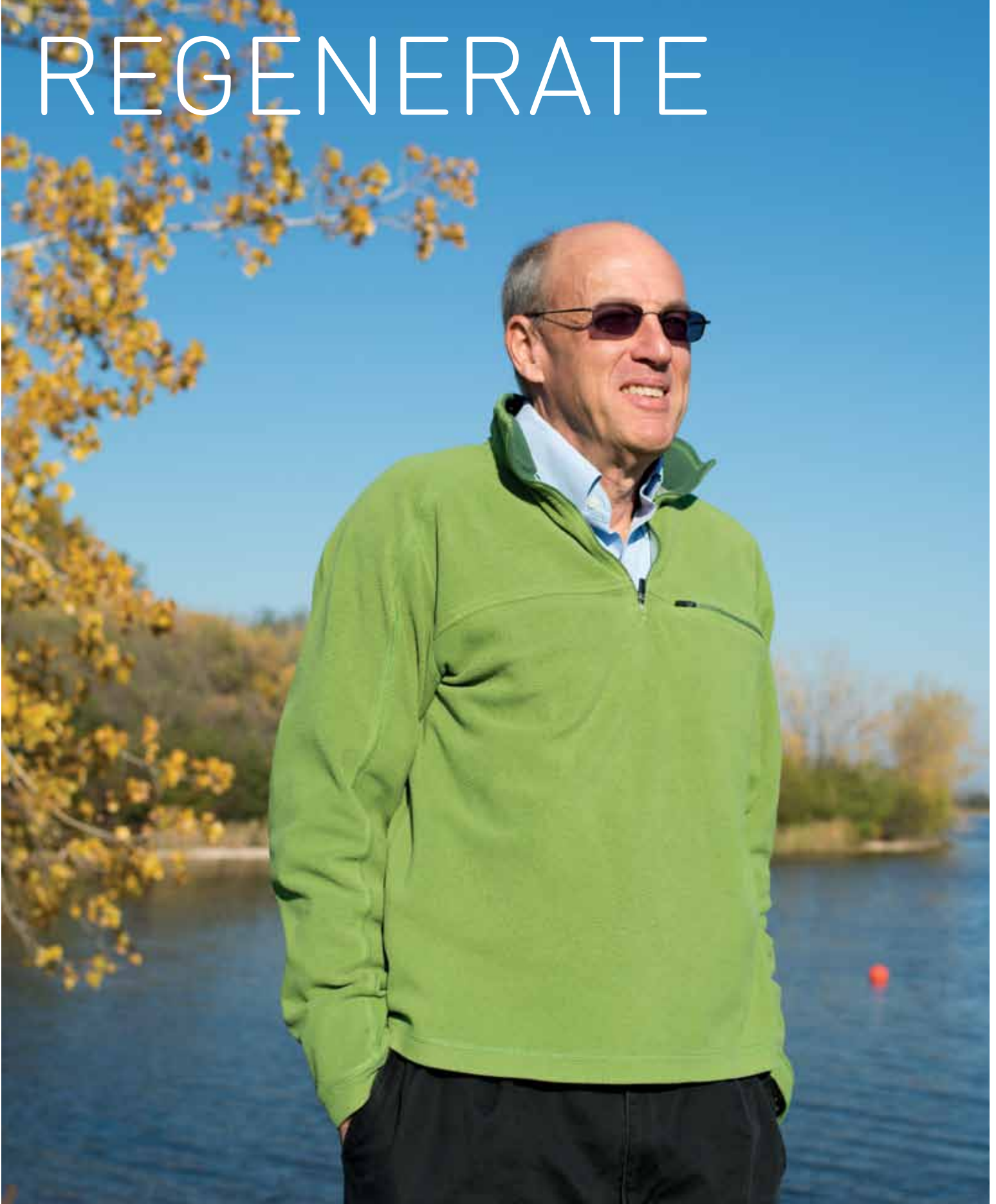
In 2012, e2e Materials won four prestigious awards: a 2012 Best of NeoCon Gold Award, a Best of NeoCon 2012 Product Innovation Award, a 2012 ACE Award for Composites Sustainability, and a 2012 Buildings Magazine Award for Product Innovation. The company also achieved Biopreferred® status, becoming certified by the USDA as a 98-percent bio-based product. The USDA certifies and awards labels to qualifying products to increase consumer recognition of bio-based products and designates categories of bio-based products that are afforded preference by federal agencies when making purchasing decisions.

The fast-growing Ithaca-based company was launched in 2007, a spin off from technology developed during 15 years in a research lab at Cornell University. The ongoing relationship with SyracuseCoE continues to be productive and successful by helping e2e Materials develop and market its innovative building material. ●

“Having SyracuseCoE see the potential in the technology and give us our first major purchase order was incredibly meaningful.”

e2e Material's patented biocomposite, is made from soy flour and natural grass fibers such as jute and flax. The innovative material is a sustainable and cost-effective alternative to wood, petroleum-based plastics, and composites such as mdf and particleboard. With strength approaching mid-weight steel and engineering capabilities allowing it to be processed into complex shapes, the biomaterial can be used for a wide range of products, including the Workstation at left.

# REGENERATE





# "It's been a team effort, really a model for the kind of collaboration SyracuseCoE promotes."

Collaboration to find innovative sustainable solutions is a hallmark of SyracuseCoE, perhaps best exemplified by the academic-industry cooperation to clean up Onondaga Lake. The lake that surrounds the northern part of Syracuse was long known as one of the most polluted inland lakes in America, contaminated both by industry and household pollutants coming from a regional wastewater treatment facility.

In 2004, the Onondaga County Metropolitan Wastewater Treatment plant (Metro) began advanced treatment of wastewater to address some of the negative effects caused by high nutrient inputs. The water quality improved. But Syracuse University Professor Charles Driscoll, who has studied the water quality of Onondaga Lake for more than 25 years, noticed something else: the mercury levels in the lake's fish were dropping too.

"It was an Aha! moment," says Driscoll, a Syracuse University faculty member with an international reputation for his work on water quality issues.

Inorganic mercury in sediments can be converted to methylmercury, which can bioaccumulate in high concentrations in organisms, specifically the fish that populate the lake. "That's why even low concentrations of mercury in water can result in very high concentrations of mercury in fish," explains Driscoll. "The discharges of nitrate from Metro limited methylmercury production, but didn't completely shut down the process."

A SyracuseCoE collaborative study between Syracuse University and the Upstate Freshwater Institute (UFI) was undertaken to address the seasonal and year-to-year variability in mercury in the lake resulting from the water quality improvements.

As a result, Driscoll, a UFI boardmember, began working with UFI, Honeywell and local engineering firms to devise a means to treat the lake's mercury contamination by adding additional nitrate. "We've gone from theory, to getting information on how to implement this, to building devices, to installing them and applying the technology, which has never been tried elsewhere in the world," says Driscoll.

Honeywell International is well underway in a \$451 million cleanup project to remove waste and chemical contamination from the lake. The cleanup includes dredging that will continue through at least 2016. Also in a three-year pilot test, Honeywell engineers are adding calcium nitrate to the water right above the sediment/water interface. "It settles to the deepest part of the lake and essentially shuts off the production of methylmercury," says Driscoll, who is monitoring the results with fellow researchers.

Driscoll's research on mercury pollution was previously supported by SyracuseCoE, with a \$100,000 grant in 2008 to analyze mercury pollution in Lake Ontario and surrounding watersheds. In addition, SyracuseCoE cosponsors annual scientific forums on Onondaga Lake with Syracuse University, SUNY-ESF, and the UFI.

At the end of the three-year study, the New York Department of Environmental Conservation and the Environmental Protection Agency will examine the data and determine whether the operation should continue. "So far, it's been an unbelievable success," says Driscoll.

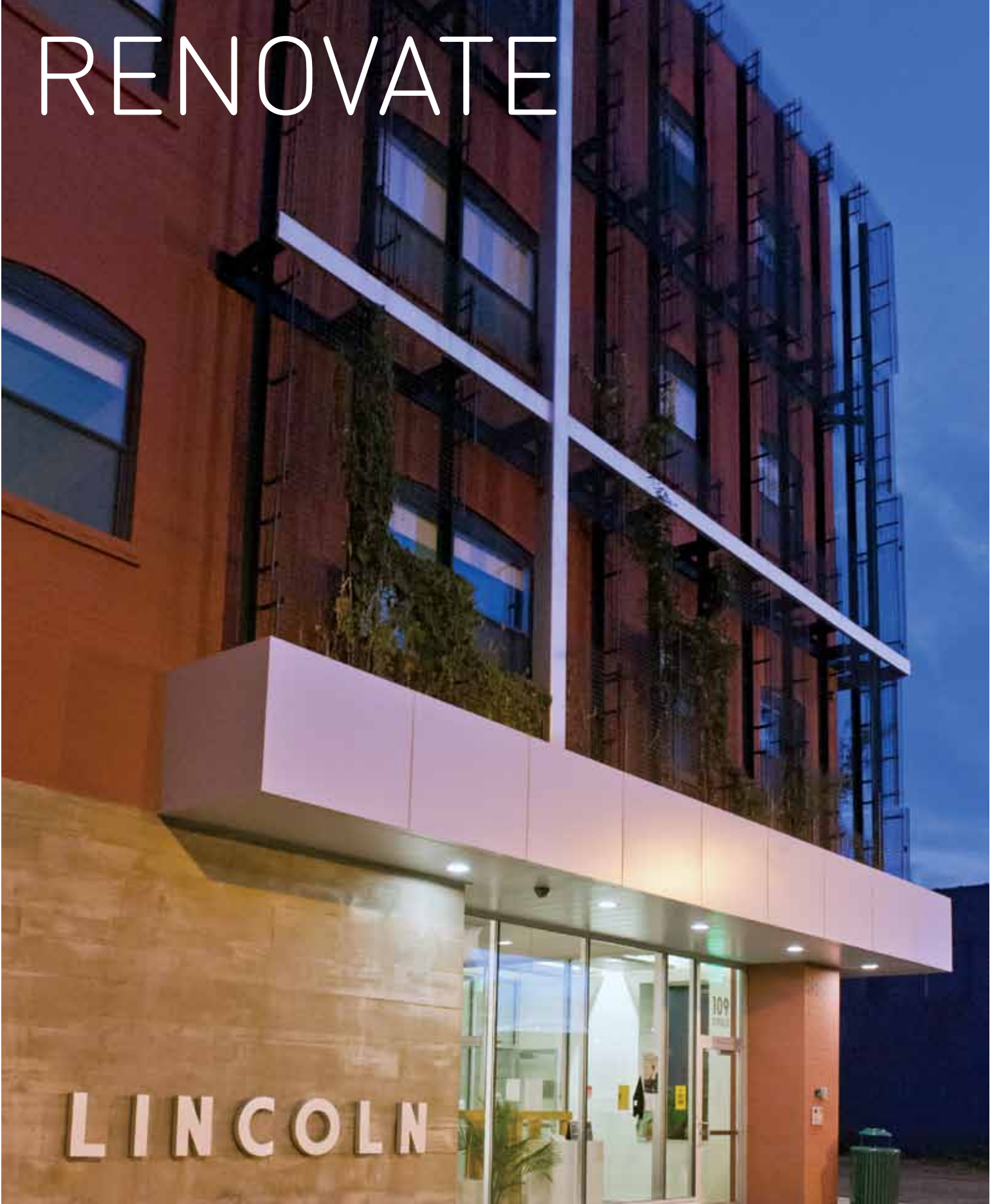
"It's been a team effort, really a model for the kind of collaboration SyracuseCoE promotes." ●



Driscoll developed a pilot test—currently being implemented—to reduce the mercury contamination of the lake's fish. SyracuseCoE co-sponsors an annual scientific forum on Onondaga Lake with Syracuse University, SUNY-ESF, and the Upstate Freshwater Institute.



# RENOVATE





“It’s a vision that couldn’t have become reality without SyracuseCoE. They make the key connections.”



Cities looking to renovate and sustainably adapt existing buildings for mixed use face unique construction challenges, says Josh Stack, a partner in Northeast Green Building Consulting. But sometimes a little challenge can lead to brilliant outcomes.

The sustainable renovation of a vacant, 100-year-old industrial building in downtown Syracuse’s Near Westside earned a Platinum rating from the U.S. Green Building Council’s LEED® program, one of the first in the country to earn the top rating in the mid-rise, multi-use category, and the very first in New York to earn the designation outside of metropolitan New York City. The project was conducted in partnership with the Near Westside Initiative and Syracuse University’s School of Architecture.

“The project married the vision of the Near Westside Initiative with SyracuseCoE’s leadership in sustainable design and construction,” says Stack, whose firm consulted on the infrastructure, systems, and materials used on the project as well as provided LEED® for Home rater services.

Two of the major players on the project have a long history with SyracuseCoE. C&S Companies, the project engineers, is a SyracuseCoE charter member and Northeast Green Building Consulting is a frequent SyracuseCoE collaborator. “It’s a vision that couldn’t have become reality without SyracuseCoE. They make the key connections,” Stack says.

The renovation, completed during 2009 and 2010, was designed to demonstrate innovations in green technologies for energy and environmental systems, with SyracuseCoE funding the design of the green systems for the project. The 30,000 square feet of mixed-use commercial and residential spaces boasts green building technologies that include energy-efficient geothermal heating and cooling, high-performance windows and insulation systems, heat recovery ventilators for residential spaces, solar panels, and stormwater retention strategies such as a green roof and permeable pavement. The first and second floors contain office space and are currently home to the La Casita Cultural Center and Say Yes to Education. The third and fourth floors feature 10 live-work artist lofts.

“The home and office are completely different and somewhat foreign environments from each other in terms of ventilation, air sealing, and energy efficiency,” Stack says.

Accordingly, he says the LEED® mid-rise rating system is designed to allow multi-family and mixed-use buildings a way to earn LEED® certification more affordably than by pursuing the commercially focused LEED® for New Construction rating system. “The mid-rise rating system takes into account the difference between new commercial construction versus home construction,” he says. “The finished project exemplifies ideal environments for living and working in a mixed-use space,” he says.

Stack says the project’s platinum rating reflects the creative and innovative uses of the most advanced sustainable building practices today. ●



The 100-year-old vacant industrial building was transformed into a state of the art mixed-use building, earning Leed® Platinum status in 2012. The former Lincoln Supply Building now houses two floors of office space and two floors of live/work artist lofts. The renovation was a collaborative effort between the Near Westside Initiative, Syracuse University’s School of Architecture, and several SyracuseCoE partners and collaborators.

# INNOVATE





“When people have the ability to control their own environment, they’re more comfortable and thus, more productive.”



Although indoor environmental quality experts have found ways to vastly improve the quality of individual closed office spaces, balancing indoor environmental interactions in open office space or semi-open cubicles remains an engineering challenge.

“It’s very easy to provide individualized environmental control when everyone is in a private office. It’s a big, huge engineering challenge to try to do the same thing when you’ve got a number of open work stations in the same room,” says H. Ezzat Khalifa, founding director of the multi-institutional STAR Center for Environmental Quality Systems led by Syracuse University, where he is also the NYSTAR Distinguished Professor of Mechanical & Aerospace Engineering.

Finding solutions to this challenge was the impetus behind the STAR Center’s funding and support of the Willis H. Carrier Total Indoor Environmental Control (TIEQ) Lab at SyracuseCoE headquarters. The Carrier TIEQ Lab consists of two identical office spaces, each outfitted with 12 open cubicle-style workstations. In one room, there are Personalized Environmental Control Systems (PECS) in each cubicle that allow occupants to control the conditions in their own cubicle—including temperature, percentage of fresh air circulated, humidity and lighting. In the other room those factors are regulated by a central control.

“Research demonstrates that when people have the ability to control their own environment, they’re more comfortable and thus, more productive,” says Khalifa. Most of those studies, however, examine only one factor at a time, such as temperature, ventilation, or lighting. The Carrier TIEQ Lab is a one-of-a-kind research facility that allows Khalifa and other researchers to study numerous indoor environmental control parameters—and their interactions—at once.

Most office buildings are controlled in a one-size-fits-all-fashion from a central control, Khalifa explains. However, individuals have varying sensitivities to temperature. Allowing individuals to control the temperature of their own environment may provide them with greater comfort, but typically results in higher energy costs, particularly when spaces with different environmental demands are adjacent.

Khalifa, along with Alan Hedge, professor of design and environmental analysis at Cornell University, is studying how to provide individual environmental control to improve worker productivity without increasing energy consumption, and preferably, while decreasing it. “We are looking to see if people change their selections if they know the cost associated with the adjustments they make,” he says.

While the Carrier TIEQ Lab provides a wonderful controlled environment for scientific research, Khalifa is also studying how PECS stimulate productivity in a real office environment, using King + King Architects in Syracuse as a “living lab.”

“Their employees work in a large, open space, so it is a perfect environment to study to understand energy consumption and individual comfort in a real-world setting,” Khalifa says.

The firm’s renovated offices transformed a 100-year-old industrial building into an energy-efficient workspace, earning a LEED® Platinum rating from the U.S. Green Building Council.

With funding from SyracuseCoE, Khalifa and visiting professor Arsen Melikov, a leading researcher from the International Centre for Indoor Environment and Energy in Denmark, installed PECS identical to those in the Carrier TIEQ Lab at 38 workstations at King + King and are monitoring worker satisfaction over an extended period of time. ●



Khalifa is studying the effects of indoor environmental control on employee comfort and productivity at both the Carrier Total Indoor Environmental Control (TIEQ) Lab at SyracuseCoE headquarters (left) and at King + King Architecture’s LEED® Platinum offices (above). He is pictured with Clyde, a \$170,000 research manikin that emulates the thermal characteristics of a typical human being—including skin temperature, sweating and breathing—used in the study of ventilation and environmental control system performance.



New York State Assemblyman William Magnarelli congratulates the team from Ephesus Technologies on its receipt of a CAP Award designed to encourage innovation, product development, and entrepreneurship.

## Five Upstate New York companies awarded Commercialization Assistance Program awards

**FIVE COMPANIES** received SyracuseCoE and CenterState CEO Commercialization Assistance Program (CAP) awards in 2012 to promote the commercialization of innovative green and clean technologies support totaling \$248,300.

The CAP awards are funded by a grant secured by New York State Assemblyman William Magnarelli and administered by CenterState CEO in collaboration with SyracuseCoE. CAP grants are awarded for projects that commercialize new products and services in the three SyracuseCoE focus areas: indoor environmental quality, water resources, and clean and renewable energy. Since 2001, 26 companies have received more than \$1.3 million in SyracuseCoE CAP awards.

“In 2001, when the Commercialization Assistance Program was first initiated to encourage innovation, product development and entrepreneurship in the field of indoor quality, we were confident that this matching fund program would fuel technology development, job creation and thereby strengthen our local economy,” Magnarelli said. “I am pleased that we are able to point to this program and see so many successes.”

The five 2012 award recipients and their projects are:

**Ephesus Technologies** of Syracuse, which designs and manufactures high-quality LED fixtures using LEDs and other core components from outside suppliers.

**GreenView Energy Management Systems** of Syracuse, New Hartford, which implements real-time, remotely monitored data acquisition services for commodities such as electricity, natural gas, steam, water, generators, and renewable systems, including photovoltaics, fuel cells, and wind.

**Rapid Cure Technologies** of Syracuse, developer of energy-curable resins, coatings, inks, and adhesives.

**Synairco** of Ithaca, an emerging company that is commercializing a patented ultra-efficient, environmentally responsible air conditioner.

**Synex** of Pulaski, an industry leader in developing controls technology for the steam, hydronic, and thermal fluid heat transfer system markets.

To date, the CAP program has created or retained more than 150 high-value jobs, leading to \$392.5 million in new revenue for Central Upstate New York firms. ●

## Syracuse leadership honored with Green Building Council Leadership Awards

“**THE GREEN BUILDING INDUSTRY** didn’t grow into a global movement by chance. We got here because of the hard work and innovation of sustainability pioneers and visionaries,” says Rick Fedrizzi, president and CEO of the USGBC. “We are thrilled to recognize many of those individuals in this year’s awards.”

Nancy Cantor, chancellor and president of Syracuse University; Joanie Mahoney, Onondaga County chief executive; and Stephanie A. Miner, mayor of Syracuse, each received the 2012 Global Community Leadership Award for their collective and collaborative efforts to foster substantive change across the Syracuse and Central New York landscape. Among their many initiatives: Cantor has elevated the mission of green building on Syracuse University’s campus through numerous LEED® building projects and a school-wide goal to achieve carbon neutrality by 2040; County Executive Mahoney led the charge on the Save the Rain program for stormwater management; and Mayor Miner has advocated for local green buildings and worked to create a vibrant, revitalized connective corridor in the city of Syracuse.

“This USGBC Leadership Award speaks to the power of innovation through collaboration,” says Cantor. “We can only tackle the profoundly complex challenges we face today such as achieving sustainability if we partner across sectors and roll up our sleeves together. That’s exactly what we’re trying to do in Syracuse and across Central New York.”

“Syracuse Mayor Stephanie Miner and Syracuse University Chancellor Nancy Cantor have been excellent partners and we appreciate our sustainability efforts being recognized in a global way,” adds Mahoney.

“We have worked very hard to become a leader in the green economy, working with start-up green tech firms, building LEED® buildings across our city, renovating our airport to LEED® standards, and creating a more sustainable community,” says Miner. “I am proud to lead a city with this level of commitment to our green future.” ●



U.S. Green Building Council President Rick Fedrizzi presents Leadership Awards to Onondaga County Executive Joanie Mahoney, Syracuse Mayor Stephanie Miner, and SU Vice President of Sustainability Shere Abbott (accepting for Chancellor Nancy Cantor)

# COOPERATE





New York Governor Andrew Cuomo is joined by CNY Regional Economic Development Council co-chairs Rob Simpson and Nancy Cantor at an announcement of REDC projects in the region.

## SyracuseCoE begins first stages of NYE-RIC project

**IN APRIL 2012**, SyracuseCoE begin the first stage of a statewide alliance to accelerate the development of energy-efficient innovations for buildings. The “New York Energy Regional Innovation Cluster (NYE-RIC),” was launched via a \$3-million award from New York State that was made as part of Governor Andrew M. Cuomo’s Regional Economic Development Council (REDC) initiative. The state funding leverages \$5.7 million in from federal and private sources that will be used for investments in facilities at SyracuseCoE including new laboratories and a smart transportation testbed.

“This award underlines the pivotal economic development role that NYE-RIC can play, not only for Central New York, but statewide,” says Nancy Cantor, Syracuse University Chancellor and co-chair of the CNY REDC. “New York State’s \$3-million investment is leveraging SyracuseCoE’s proven track record of successfully connecting cross-sector partners to generate world-class innovation, and spur job creation. Crucially, SyracuseCoE’s international renown will give NYE-RIC’s corporate partners a leg up in gaining access to global markets and restoring prosperity to New York State.”

The new labs are an essential step in the development of NYE-RIC, which was identified as a priority project by the CNY REDC. “More than just labs, NYE-RIC represents a transformational initiative that will capitalize on our region’s extensive R&D assets and leverage downstate partnerships to connect to global markets for innovations in clean technologies to produce long term outcomes for our region,” says Robert Simpson, president of CenterState CEO and co-chair of the CNY REDC.

The new labs will support research and development in collaboration with local manufacturing firm NuClimate Air Quality Systems, as well as two other local companies that were supported by state funding awarded through the REDC process—Fulton Companies and Ephesus Technologies.

“The Central New York region has a terrific cluster of firms and institutions that are developing innovations to improve energy efficiency and indoor environmental quality in buildings,” says Ed Bogucz, executive director of SyracuseCoE. “Our new facilities are focused on opportunities to create jobs by helping local companies develop new products for buildings across the state and around the world.”

## SyracuseCoE partners win \$1.9 million in federal awards to boost CNY manufacturing

A SYRACUSECoE-LED TEAM won five federal awards in October for a collaborative project that will accelerate growth of the emerging Central New York manufacturing cluster of systems that control temperature and environmental quality in a wide range of applications. Project partners include CenterState CEO, MACNY, NYSTAR, CNY Technology Development Organization, Syracuse University, SUNY College of Environmental Science and Forestry, and the Small Business Development Center at Onondaga Community College.

The Advanced Manufacturing for Thermal and Environmental Systems (AM-TECS) initiative was one of 10 projects selected nationally from 55 applications for the 2012 Advanced Manufacturing Jobs and Innovation Accelerator Challenge, supported by a coalition of federal agencies. Five federal awards totaling nearly \$1.9 million are supported by an additional \$1.3 million in matching funds provided by the New York State Energy Research and Development Authority (NYSERDA), Empire State Development, CenterState CEO, and the Manufacturers Association of Central New York (MACNY).

“This massive federal investment is great news for Central New York and will serve as a catalyst for job creation and further private investment,” says Sen. Charles E. Schumer.

“America was built by New York’s manufacturing,” adds Sen. Kirsten Gillibrand. “Our manufacturers powered our economy through the 20th century and will be the key to fueling our economy in the 21st century. It’s time to see ‘Made In America’ again starting right here in New York.”

The AM-TECS initiative originated from a new approach to economic development established by New York Gov. Andrew Cuomo in 2011. Ten Regional Economic Development Councils (REDCs) across the state each developed strategic plans based on local strengths and opportunities. The plan developed by the CNY REDC targeted strengthening of the region’s existing industry cluster in manufacturing and clean energy and environmental systems. Through a competitive review process, the CNY REDC plan was judged to be one of the four best plans in the state, and earned the state’s top award of more than \$103 million for projects, including \$3.3 million in investments that are leveraged in the AM-TECS project.



US Senator Kirsten Gillibrand visited SyracuseCoE to announce her America Innovates Act, which supports the development of product innovations and technology.



US Senator Charles Schumer toured the SyracuseCoE headquarters facility and met with local entrepreneurs Ed Campagna and Bob Button from NuClimate.



Stuart Jones, Vice President of Research at Interface, Inc., shares Interface’s commitment to bio-inspired innovation at the 1st annual Syracuse Biomimicry Challenge, held at the SyracuseCoE headquarters.

## SyracuseCoE issues Biomimicry Challenge

DON CARR, professor of Industrial and Interactive Design at Syracuse University, has long been fascinated by the application of the principles of biomimicry, which drives innovation by taking its inspiration from biology. In 2012, Carr and a team of collaborating faculty and staff from SU and SyracuseCoE took that interest one step further by hosting the first annual Syracuse Biomimicry Challenge in the spring of 2011.

The challenge—a hip, TED-style event—brought together science, design, and architecture students with local innovators to brainstorm nature-inspired solutions to product and engineering development, the transfer of ideas from biology to technology. Presenters challenged students and other attendees to use natural, evolutionally tested solutions to sustainable building practices, and to connect ideas across their respective disciplines.

For example, an office complex in Africa, influenced by biomimicry research of how termites stay cool in their mound structure, features buildings that stay cool without air conditioning, while using only 10 percent of the energy of a conventional building of its size.

The inaugural Biomimicry Challenge featured presenters including world-renowned architect Dr. Marcos Cruz, Interface Vice President Stuart Jones, and area attorney and Biomimicry Guild alumni Kevin and Josh Stack. The fast-moving pace of the weekend provided a unique opportunity for students, educators, and practitioners to foster new approaches to engineering and sustainable design that emulate how nature “constructs” its environments.

The second annual Syracuse Biomimicry Challenge is being planned for spring 2013.

A sampling of the talks from the 2012 Syracuse Biomimicry Challenge can be viewed on Vimeo: [vimeo.com/user13556338](http://vimeo.com/user13556338).

# STIMULATE





Bill McKibben, founder of 350.org, engaged students in a panel discussion moderated by SUNY ESF President Neil Murphy that was held at the SyracuseCoE headquarters.

## Environmentalism Bill McKibben visits Syracuse University

**SYRACUSECOE HELD** its 12th annual Symposium over three days in October. The event opened with a keynote lecture by Bill McKibben, author and internationally-recognized environmentalist, a full day of presentations at the Oncenter, and a day of workshops held at SyracuseCoE. Symposium sessions featured the latest results from collaborators across New York State developing innovations in clean technologies and processes, including indoor environmental quality, clean and renewable energy, and water resources.

McKibben's visit was arranged in collaboration with the University Lecture Series at Syracuse University. His evening lecture at Hendricks Chapel attracted more than 1,000 attendees. Earlier in the day, McKibben visited the SyracuseCoE headquarters to talk to students, faculty, and SyracuseCoE partners about the opportunities and challenges in reducing carbon emissions.



## PARTNERS

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Central New York Clean Communities  
Central New York Regional Planning and Development Board  
CH2M Hill  
Chemung County Stormwater Coalition  
Citizens Campaign for the Environment  
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Clean Islands International  
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CNY Technology Development Organization  
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Finger Lakes-Lake Ontario Watershed Protection Alliance  
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Galson Laboratories	Lower Hudson Long Island Resource-Conservation and Development Council	NYS Department of Environmental Conservation	Pyramid Management Group	TAG Mechanical	Vieques Conservation and Historical Trust
General Electric			Queens Botanical Garden	Tate Access Floors	Virgin Islands Conservation Society
GHD	M2B2, LLC	NYS Department of Health	Queens University	Technology Alliance of Central New York	Virgin Islands Recycling Partnership
Gifford Foundation	Madison County Soil and Water Conservation District	NYS Department of State	Queri Development	Tenrehte Technologies, Inc.	Virgin Islands Waste Management Authority
Giffitt Hill School	Manufacturers Association of Central New York	NYS Environmental Facilities Corporation	Rapid Cure Technologies	Thermo Fisher Scientific	
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Girls, Inc.	Masoma	NYS Tug Hill Commission	ReEnergy	Town of Hounsfield	Vivo Recycling
GrassRoots Recycling Network	McQuay International	NYSERDA	Rensselaer Polytechnic Institute	Toyota	Waterport
Greening USA	Mesa Reduction	NYSTAR	Reuse Alliance	Triad Technology	WavElectric
GreenView Energy Management Systems	Morrisville State College		RJ Lee Group	Trigo Agro Industrial Services	WCNY
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Haledyne	National Energy Management Institute	Office of the Governor, US Virgin Islands	Salt City Enterprises	United Solar Ovonic	Environmental Facilities
HAPcontrol, LLC	National Recycling Coalition	Omega Institute	Skidmore, Owings & Merrill, LLP	United Technologies Research Center	Woodbine Group
HeliOptix	National Renewable Energy Laboratory	OnCenter	Small Business Development Center at Onondaga Community College	Universidad Metropolitana	Workforce Development Institute
Henderson Johnson Company	Near Westside Initiative	Onondaga Citizens League	SourceSentinel	Universidad Politécnica	
Home HeadQuarters	New England Wood Pellet	Onondaga Community College	Southern Tier Central Regional Planning and Development Board	University at Albany-SUNY	
Honeywell International	New York Battery & Energy Storage Technology Consortium, Inc.	Onondaga County	Southern Tier East Regional Planning and Development Board	University at Buffalo-SUNY	
Hope for Us Housing	New York Biomass Energy Alliance	Onondaga County Resource Recovery Agency	Southern Tier West Regional Planning and Development Board	University of Puerto Rico (Arecibo, Mayaguez, Río Piedras and Utuado campuses)	
Hospitality Green, LLC		Onondaga Earth Corps	Southside Interfaith Community Development Corp	University of Rochester	
Hudson River Sloop Clearwater	New York City Building Construction and Trades Council	Onondaga Environmental Institute	St. Croix Environmental Association	University of the Virgin Islands	
Hudson Valley Regional Council	New York City Investment Fund	Onondaga Nation	Steelcase	University of Wisconsin	
Hudson Valley Solid Waste Management Committee	New York Farm Viability Institute	Orthogonal, Inc.	Stony Brook University	Upstate Freshwater Institute	
Hugu Neu Corporation		OrthoSystems, Inc.	Storm Water Coalition	US Department of Agriculture	
Huhtamaki Packaging	New York Power Authority	P.E.A.C.E., Inc.	Strategic Materials	US Department of Energy	
IBM	New World Capital Group, LLC	Pace University	Sunco	US Department of Housing & Urban Development	
IFCO Recycling Corporation	NIEQRI	Partners for Education and Business	SUNY Upstate Medical University	US Department of Labor	
Indoor Controls	Northeast Green Building Consulting	Partnership for New York City	SWANA Puerto Rico Chapter	US Environmental Finance Advisory Board	
Inficon	Northeast Organic Farming Association of New York	Pegasus Capital Advisors	Synairco	US Environmental Protection Agency	
Institute for Local Self Reliance	Northeast Recycling Council	Permasteelisa North America Corp	Synapse Partners	US EPA, Caribbean Environmental Protection Division	
Interface, Inc.	NuClimate Air Quality Systems	Peterson Guadagnolo Consulting Engineers	Synex	US General Services Administration	
International Society of Indoor Air Quality and Climate	NY Rural Water Association	Phytofilter	Syracuse Convention & Visitors Bureau	US Green Building Council	
Intertek ETL SEMKO	NY Water Environment Association	Product Stewardship Institute	Syracuse Academy of Sciences	US Green Building Council Caribbean Council	
Iowa State University	NYS Association for Reduction, Reuse, and Recycling	Propulsive Wing, LLC	Syracuse Habitat for Humanity, Inc.	US Green Building Council New York Upstate Chapter	
Island Green Building Association	NYS Association of Towns	Puerto Rico Association of General Contractors	Syracuse Housing Authority	US GreenFiber	
Iwastenot Systems	NYS Conference of Mayors and Elected Officials	Puerto Rico Environmental Quality Review Board	Syracuse Office Environments	USDA Puerto Rico State Office	
Lafayette Big Picture School		Puerto Rico Home Builders Association		Vento Tek, Inc.	
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