SYRACUSE CENTER OF EXCELLENCE MEMBERS

Partners

Platinum:
Alliance Energy
Carrier
Clarkson University
Corning
National Grid
O'Brien & Gere
SUNY College of Environmental Science and Forestry
Syracuse University

Gold:
Bitzer Scroll Technologies
C&S Companies
Constellation Energy
Destiny USA
King & King Architects
SRC

Silver:
Air Innovations
Boylan Marble & Terrazzo Restoration
Sensis
SUNY Oswego
SUNY Upstate Medical University
Syracuse City School District

Patron:
Brown & Brown Empire State
CabFab
CDH Energy
Firley, Moran, Freer & Eassa
GreenHomes America
Palmerton Group
Taitem Engineering

StartUp:
Aerfil
Bluepoint Environmental
Brenner Business Development
e2e Materials
Earthsense
Isolation Sciences
Munly Brown Studio
Natural Systems Engineering
Nectar Partners
The Open Atelier
Pyrus Energy
Summerhill Biomass Systems
Upstate Worm Farms
Widetronix Semiconductors

Collaborators

Adirondack North Country Association
Adirondack Park Agency
Air Iso
Alfred University
American Hazard Control Group
The Amos Project
Arup
Ashley McGraw Architects
Atlantic States Legal Foundation
Baker Engineering
BASF Corporation
Bernier Carr & Associates
Blasland, Bouck & Lee
Bond, Schoeneck & King
Business and Institutional Furniture Manufacturer's Association
Camroden Associates
Cayuga County Department of Planning and Economic Development
Cazenovia College
CDM
Centek Laboratories
Center for Clean Tech Entrepreneurship
Centria Corporation
Changing World Technologies
Clark Air Systems
Climate Energy
Clough, Harbour & Associates
CNY Regional Planning and Development Board
CNY Technology Development Organization
Colden Corporation
CollabWorx
Cook+Fox Architects
CoolBrands Dairy
Corbond Corporation
COR Development
Cornell Cooperative Extension
Cornell University
Cortland County Business Development Corporation/Industrial Development Agency
County of Franklin Industrial Development Agency
Cummins
Double A Vineyards
Earthergy
Eastern Lake Ontario Regional Innovation Network
ECR International
ELM Consulting
EMC2
Empire Biofuels
Empire State Development Corporation
Enable CNY
Energy Initiatives
Engineering
ENSR International
Environmental Design & Research
Environmental Finance Center Network
Environmental Laboratory Services
FailSafe Air Safety Systems
Fluent
FOCUS Greater Syracuse
Fortfiber Building Systems Group
FXFowle
Galson Laboratories
Gary Liss & Associates
General Electric
Genesee/Finger Lakes Regional Planning Council
The Gifford Foundation
GrassRoots Recycling Network
Greater Syracuse Chamber of Commerce
Greater Syracuse Economic Growth Council
Green Think
Guptill Farms
Hamilton Sundstrand
Hancock & Estabrook
HAPControl
Healthway Products
Henderson Johnson Company
HermanMiller
Hoffman
Holmes, King, Kallquist & Associates
Home HeadQuarters
Honeywell International
HSBC Bank USA
Huber Engineered Wood
Hueber-Breuer
Huntsman Corporation
IBM
Inficon
Ingersoll-Rand
Institute of Ecosystem Studies
Intertek ETL SEMKO
Isolation Systems
Jefferson Community College
Jeld-Wen Corporation
Johnson Controls
Keck Foundation
Keystone Associates
Kingston Economic Development Corporation
Knowlton Technologies
Kodak
KoningEizenberg Architecture
Lamont Engineering
LeChase Construction Services
Lowes of Camillus, NY
Malcolm Pirnie
Manufacturers Association of Central New York
McQuay International
Metropolitan Development Association of Syracuse and Central New York
Mohawk Tower
Molecular OptoElectronics Corp.
Morrisville State College-SUNY
MRB Group
Munistat Services
Naef Recycling
National Center for Energy Management and Building Technologies
National Energy Management Institute
National Recycling Coalition
National Renewable Energy Laboratory
Near Westside Initiative
New York Indoor Environmental Quality Center
New York Power Authority
New York Solar Energy Industries Association
New York University
NIEQRI
Northeast Biofuels
Northeast Green Building Consulting
Northern Biodiesel
NuClimate Air Quality Systems
Nussbaumer & Clarke Engineers
NY Rural Water Association
NY Water Environment Association
NYS Association for Reduction, Reuse, and Recycling
NYS Association of Towns
NYS Conference of Mayors and Elected Officials
NYS Department of Environmental Conservation
NYS Department of Health
NYS Department of Transportation
NYS Energy Research and Development Authority
NYS Environmental Facilities Corporation
NYS Office of Science, Technology, and Academic Research
NYS Office of the Comptroller
Oncenter Complex
Oneida Air Systems
Onondaga Community College
Onondaga County Industrial Development Agency
Onondaga County Resource Recovery Agency
Onondaga County Water Authority
Op-Tech Environmental Services
Operation Oswego County
OrthoSystems
PASCO
Paul Smith's College
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Pyramid Management Group
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Southern Tier West Regional Planning and Development Board
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The Tech Garden
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US Green Building Council
US Green Building Council New York Upstate Chapter
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The W!ld Center
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CHARTER MEMBERS

Industry
Air Innovations
Blasland, Bouck & Lee
Carrier
C&S Companies
CDH Energy Corp.
Colden Corporation
Firley, Moran, Freer & Eassa
Galson Laboratories
HSBC Bank USA
King & King Architects
Metropolitan Development Association of Syracuse and Central New York
National Grid
Northeast Natural Homes
O'Brien & Gere
Robson & Woese
Rosenthal Companies
Sensis
Syracuse Research Corporation
US Green Building Council

Academic
Alfred University
Cary Institute of Ecosystem Studies
Clarkson University
Cornell University
Rensselaer Polytechnic Institute
SUNY College of Environmental Science and Forestry
SUNY Upstate Medical University
Syracuse University
University at Albany-SUNY
University at Buffalo-SUNY
University of Rochester
Upstate Freshwater Institute

SYRACUSECoE
EXCELLENCE IN ENVIRONMENTAL & ENERGY INNOVATIONS

Annual Progress Report 2009

SYRACUSE CENTER OF EXCELLENCE—A HISTORY OF INNOVATION

Syracuse Center of Excellence accelerates the creation of environmental and energy innovations for a sustainable future. SyracuseCoE engages collaborators at 200+ companies and institutions to address global challenges in clean and renewable energy, indoor environmental quality, and water resources. Our members conduct targeted research, demonstrate new technologies, commercialize innovations, and educate the workforce. Learn more at syracusecoe.org.

1996

Metropolitan Development Agency of Syracuse & Central New York (MDA) launches "Vision 2010," a regional economic strategy.

2000

MDA creates the New York Indoor Environmental Quality Center, Inc. (NYIEQ), an independent, non-profit, 501(c)(3) corporation whose purpose is to foster academic/industry collaborations.

New York Assemblyman William Magnarelli (D-120) announces NYIEQ will receive a $2.33 million state grant to energize product R&D.

Rep. James Walsh (R-NY) secures $2 million from the US Environmental Protection Agency (US EPA) for a collaborative project to study the impact of indoor environmental quality on children at risk for asthma in Syracuse homes.

2001

NYIEQ receives 18 proposals for its first round of Commercialization Assistance Program (CAP) grants. A total of $250,000 is split by Cleanroom Systems and O'Brien & Gere.

The New York State Office of Science, Technology, and Academic Research (NYSTAR) awards $15.9 million to create the Environmental Quality Systems (EQS) Strategically Targeted Academic Research (STAR) center. Dr. H. Ezzat Khalifa of Syracuse University (SU) is appointed director.

2002

CAP II awards are announced at the Second Annual International Environmental Symposium held in Syracuse. Galson Laboratories, Taitem Engineering, and Failsafe Air Safety Systems Corporation share $250,000.

SyracuseCoE is created by New York State, which commits $22 million to the federation as part of the initiative to fund the Empire State High-Tech Corridor.

2003

Rep. James Walsh (R-NY) announces that NYIEQ will share an $850,000 grant to study childhood asthma from the US Department of Housing and Urban Development (HUD). The funding was part of a competitive process that funded only six projects in the US.

SyracuseCoE members begin a broad portfolio of research projects in indoor environmental quality and water resource management supported by $10.2 million in funding from the US EPA secured by Rep. James Walsh.

2004

Winners of the third round of CAP grants are announced: Air Innovations, NuClimate Air Quality Systems, OrthoSystems, and Rupprecht & Patashnick Co. Each is awarded $50,000.

NY Gov. George Pataki announces that the Syracuse CoE headquarters will be built on a brownfield in downtown Syracuse. The facility will be a 55,000 square-foot office and research building incorporating technologies developed by SyracuseCoE partners.

2005

NYIEQ begins to do business as the SyracuseCoE Office of Industry Collaboration, which continues its role identifying, developing, and coordinating academic/industry collaborations in Central New York.

SyracuseCoE launches a new program of competitively awarded Collaborative Activities for Research and Technology Innovation (CARTI) projects, supported by $11.7 million in funding from the US EPA secured by Rep. James Walsh.

2006

Five companies receive a total of $650,900 in merit-based Technology Application and Demonstration (TAD) awards, made possible through funding from the US EPA secured by Rep. James Walsh.

A record 13 students from academic partners intern with local firms through the Syracuse CoE Office of Industry Collaboration internship program.

The International Society of Indoor Air and Climate (ISIAQ) selects the SyracuseCoE federation to host its triennial "Healthy Buildings" conference in September 2009.

2007

Syracuse University announces it will invest $13.8 million in Syracuse's Near Westside neighborhood. SyracuseCoE leads the initiative's sustainability efforts.

TAD 2007 awards a total of $710,985 to five Central New York companies working on projects to improve air quality.

A total of $3.6 million in CARTI II awards is committed to 16 collaborative research projects focusing on air quality and water resources.

Fifty Central New York companies form the Central Upstate Regional Alliance, branded as New York's Creative Core, to market the region's green and clean tech assets.

2008

Link+, an interdisciplinary reasearch facility containing SyracuseCoE's ICUBE test bed, is opened on the SU campus.

In July the final iron beam is placed on top of the SyracuseCoE headquarters building.

CARTI III awards $600,000 to six collaborative research projects in air quality and water resources.

Four Central New York companies share $199,875 in CAP IV grants to assist the commercialization of green and clean tech innovations.

2009

SyracuseCoE hosts 1,700 delegates and attendees at the Ninth International Healthy Buildings Conference and Exhibition.

Three Central Upstate companies receive a total of $415,798 in the TAD 2009 awards to demonstrate innovations that improve air quality.

The BEST Lab, a unique facility to test building envelope systems, is opened on the SU campus.

Nine collaborative air and water quality research projects share $1.4 million in CARTI IV grants.

SYRACUSE CENTER OF EXCELLENCE

INNOVATION ECOSYSTEM

Central to SyracuseCoE's mission, vision, and purpose, the **Innovation Ecosystem** encourages and funds collaborative projects that develop new environmental and energy systems products and services. Focusing on **clean and renewable energy, indoor environmental quality,** and **water resources,** these projects improve built environments, the places in which we live, work, and learn.

Grants are offered for **targeted research, demonstration,** and **commercialization.** In addition, SyracuseCoE **outreach** activities educate the public and the workforce: a crucial aspect of the green and clean technology sector.

SyracuseCoE members leverage world-class R&D facilities, including the SyracuseCoE headquarters, the Building Energy and Environmental Systems Laboratory (BEES Lab) at Syracuse University, the Fuel Cell Institute at Cornell University, bio-fuels facilities at SUNY-ESF, full-scale wind turbine testing operations at Clarkson University, and more.

Indoor Environmental Quality

Clean & Renewable Energy

Water Resources

Research

When the blue arrow is bolded, a story is an example of a SyracuseCoE targeted, collaborative research project.

Demonstration

When the orange arrow is bolded, a story is an example of a SyracuseCoE green and clean technology testing and demonstration project.

Outreach

When the yellow arrow is bolded, a story is an example of a SyracuseCoE workforce development or public outreach project.

Commercialization

When the green arrow is bolded, a story is an example of a SyracuseCoE green and clean technology commercialization project.

Syracuse Center of Excellence in Environmental and Energy Systems | 621 Skytop Road, Syracuse, NY 13244 | 315-443-4445 | Fax 315-443-1329 | info@syracusecoe.org

2009

Annual Progress Report

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Hugh Henderson (Secretary)
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Executive Director, Syracuse CoE
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MESSAGE FROM THE CHAIRMAN

PETER G. KING

Duis vel mi ipsum. Integer scelerisque, turpis vitae auctor imperdiet, metus ipsum commodo diam, sit amet tristique est ante vel leo. Vivamus vel justo diam, in tincidunt mauris. Donec vestibulum, nisi a viverra aliquet, odio nisl convallis nunc, vel congue mi erat nec mi. Sed et nunc quis metus iaculis hendrerit id sed dui. Morbi congue tellus ac massa sodales cursus. Etiam nec libero elit. Nulla eu venenatis lectus. Aliquam porta faucibus eros eget fermentum. In sapien turpis, hendrerit eget feugiat quis, varius id diam. Morbi nec ligula volutpat libero lacinia egestas ac vitae tortor. Cras tempus volutpat libero, a blandit odio sodales vel. Nunc auctor urna et nulla ornare viverra interdum orci gravida.

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HEALTHY BUILDINGS

HEALTHY BUILDINGS 2009 POSITIONS SYRACUSE AS GLOBAL GREEN AND CLEAN TECH LEADER

From Sept. 13 through 17, 2009 SyracuseCoE hosted researchers, academics, and entrepreneurs from 43 different countries at the Ninth International Healthy Buildings Conference of the International Society for Indoor Air Quality and Climate (ISIAQ). Throughout the plenaries, technical sessions, and forums held at the Oncenter Complex, HB2009 delegates discussed built environments and how to make them healthier, more productive, and more sustainable places to live, work, and learn. The conference included an impressive 366 podium presentations, 154 technical posters, 49 technical sessions, and 11 technical forums.

Delegates gather at the Convention Center for the conference dinner dance.

In conjunction with the HB2009 Conference, SyracuseCoE hosted an "Opportunity Exchange" designed to maximize business opportunities for local companies by strategically connecting global industry leaders, top researchers, and local and regional businesses through a series of targeted networking events.

US Rep. Dan Maffei (center), SyracuseCoE board members, and HB2009 sponsors open the Opportunity Exchange.

Between these two concurrent events, HB2009 attracted more than 1,700 delegates and attendees, including more than 420 international visitors, 76 volunteers from the local community, and 90 local, national, and international exhibitors.

SyracuseCoE thanks all the sponsors and supporting organizations that collaborated diligently to make HB2009 a resounding success and a sustainable event. Special thanks goes to HB2009 Diamond Sponsors National Grid, Carrier, Corning, IBM, Syracuse University, Empire State Development Corporation, New York State Foundation for Science, Technology and Innovation (NYSTAR), US Department of Energy, and US Environmental Protection Agency. A complete list of sponsors and supporting organizations can be found at hb2009.org.

Plenary Speaker Dr. Eduardo de Oliveira Fernandes, former Portuguese Secretary of State for the Environment, speaks on EU Policies on Indoor Air Quality.

Julia Goodwin sings the National Anthem.

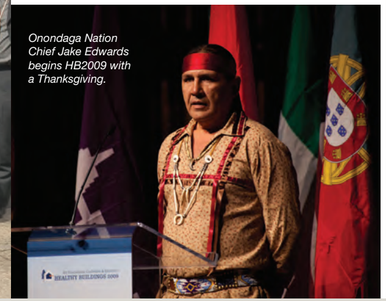
Grammy winner Joanne Shenandoah performs with her daughter and sister.

Opening Keynote Rick Fedrizzi, President, CEO, and Founding Chairman of the US Green Building Council.

Delegates from more than 44 nations attended HB2009.

Plenary Speaker Rick Cook of Cook+Fox Architects

Student delegates gather at The Tech Garden for a lunchtime networking event.



Onondaga Nation Chief Jake Edwards begins HB2009 with a Thanksgiving.

Delegates tour the BEES Lab at Syracuse University.

Community Welcome at the Everson Plaza.

Technical sessions at the Convention Center.

HEALTHY BUILDINGS 2009

SYRACUSE, NY USA

International delegates plan their week.

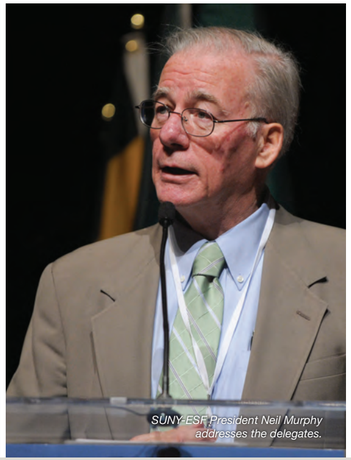
Jane Snowdon of HB2009 Diamond Sponsor National Grid speaks at OppEx.

State Assemblyman Al Stirpe, C&S Companies' Chairman and CEO Orrin MacMurray, and Rick Fedrizzi.

SyracuseCoE Executive Director Ed Bogucz describes a green home design to State Sen. Dave Valesky.

US Rep. Dan Maffei visits King & King Architects' OppEx booth.

Clarkson University President Tony Collins speaks at a Plenary Session.



SUNY-ESF President Neil Murphy addresses the delegates.

YEAR IN REVIEW

SYRACUSE CoE SYMPOSIUM DISCUSSES RESILIENCE IN SUSTAINABLE COMMUNITIES

Green collar jobs and sustainable urban communities pioneer Majora Carter was keynote speaker at the 8th Annual SyracuseCoE Symposium in Sept. 2008

SyracuseCoE introduced Central Upstate New York to the best "green and clean" practices of urban development, neighborhood revitalization, technological innovation, and environmental stewardship at its 8th Annual Syracuse Symposium on Environmental and Energy Systems at the Oncenter in September 2008.

This symposium's theme was "Creating Resilience in Sustainable Communities." The two-day event surveyed the latest ideas and advancements in the fields of resilient human and natural environments; sustainable design of homes, neighborhoods, and communities; and clean and green products and services that will benefit this generation and generations to come.

The keynote speaker was Majora Carter, one of the nation's pioneers in successful green-collar job training and placement systems. Carter founded Sustainable South Bronx in 2001 to achieve environmental justice through economically sustainable projects informed by community needs. As with other SyracuseCoE symposiums, a research, demonstration, and innovation poster viewing was held, with an overwhelming number of poster submissions addressing research and development in SyracuseCoE's focus areas, as well as in green jobs growth and green building.

SyracuseCoE, CNY Works Receive Grant for Green Jobs Project

In September 2008, SyracuseCoE and CNY Works were awarded an Initiative grant to provide green workforce development training. This project provides opportunities for students, contractors, business owners, and other professionals to obtain accreditation as green building professionals.

Specifically, the Initiative funds will offset training and exam costs for the US Green Building Council's Leadership in Environmental and Energy Design so that individuals can become LEED accredited professionals. Enitiative is SyracuseCoE Platinum Partner Syracuse University's Entrepreneurship Initiative. Its latest funded projects are part of a $3 million, five-year grant awarded to Syracuse University by the Ewing Marion Kauffman Foundation of Kansas City, MO, as part of its Kauffman Campuses initiative. SyracuseCoE Platinum Partner SUNY-ESF and Members SUNY-Morrisville and the Greater Syracuse Chamber of Commerce also received Enitiative grants.

Members of the 13N Workforce Development Taskforce met at SyracuseCoE in October 2009. Clockwaise from center: Hanah Ehrenreich, CNY Works; Steve Maloney, MACNY; Judy Davison, Cayuga-Cortland Workforce Investment Board; Robin Sandwick, Cortland Works!; Charles Spuches, SUNY-ESF; Evan Newell, Environmental Finance Center at Syracuse University; Ginny Williams, SUNY-ESF; Lisa Cleckner, SyracuseCoE; and Mike Novakowski, Metropolitan Development Association.

SyracuseCoE, Collaborators Continue Green Clean Workforce Development Initiatives

SyracuseCoE supports workforce development initiatives in green and clean technologies, collaborating with Empire State Development Corporation, the Manufacturers Association of Central New York, Onondaga Community College, SUNY Oswego, and various workforce investment and development boards.

- **13N Regional Workforce Development Project.** SyracuseCoE is part of a team that won a second $500,000 New York Department of Labor grant focused on workforce development in the energy and environmental systems cluster. For this project, SyracuseCoE mentored an intern with the Alliance of Communities Transforming Syracuse (ACTS) to support green jobs training and the organization of a Core Team Congress where green job training was a priority. Another intern is assisting the South Side green jobs training program to incorporate the USGBC LEED-Green Associate credential. Finally, SyracuseCoE is working with Platinum Partner SUNY-ESF to create outreach materials for a LEED building project.
- **Community College Collaborations.** Recognizing the need for vocational education, SyracuseCoE is engaged with Central Upstate community college initiatives, including the Onondaga Community College (OCC) Sustainability Task Force and Jefferson Community College green workforce development projects relating to the Fort Drum area.
- **SUNY Oswego.** SyracuseCoE continues to collaborate with SUNY Oswego on workforce development initiatives
- **Syracuse Alliance for a New Economy (SANE).** SyracuseCoE is helping SANE to develop training programs for building trade organizations.
- **Green Building Training for Building Trades.** In partnership with CNY Works, the SyracuseCoE presented a workshop in December 2008 introducing LEED and sustainability for the trades unions and non-traditional building professionals. A follow-up Green Building Workshop, developed by the USGBC and co-sponsored by the Workforce Development Institute and SyracuseCoE, was held in February 2009.

A researcher at Syracuse-based OrthoSystems, which received an SBIR grant to develop its novel biological sensors for medical applications.

OrthoSystems Receives Prestigious NIH Grant

In November 2008, OrthoSystems, a biotechnology company founded by SyracuseCoE Platinum Partner Syracuse University researchers and a recipient of SyracuseCoE CARTI, TAD, and CAP grants, was awarded a $977,000 Phase II grant from the Small Business Innovation Research (SBIR) program of the National Institutes of Health. The grant will help OrthoSystems further develop and commercialize the company's core technology—a novel technique to aid in the discovery of biological probes that can be used in the diagnosis and treatment of disease.

Previous SBIR funding enabled the company to purchase an instrument called a Geniom One (from Febit Inc.) that can synthesize up to a half million DNA strands on a glass slide. The instrument is one of only eight such instruments in the US.

OrthoSystems has received other phase I and phase II grants from the National Institutes of Health and the Department of Homeland Security. Grant support from SyracuseCoE has been awarded to both the company and SU to develop sensors to test for environmental contaminants in public water supplies.

NATURALLY CHILLED WATER PROJECT BEGINS FEASIBILITY STUDY

Introduced in October 2008 by SyracuseCoE Platinum Partner SUNY-ESF, the Central New York Naturally Chilled Water Project (CNYCWP) is in the process of conducting scientific and engineering investigations to determine the feasibility and suitability of bringing naturally chilled water from Lake Ontario to Onondaga and Oswego counties, using existing rights-of-way and new technology to effectively support a large-scale municipal cooling district and other opportunities. The $1.5 million funding for the study was secured through the US Environmental Protection Agency.

The lake water would provide a greenhouse gas-free cooling source that would reduce emissions and cut the amount of fossil fuels used to power mechanical chillers and coolers in regional private and public buildings. After being used, the oxygen-rich water would flow back through Onondaga Lake and then return to Lake Ontario, closing the loop on the system.

Not only does the project stand to provide natural cooling to buildings, but the water, when deposited in Onondaga Lake, can aid in the lake cleanup. The water entering Onondaga Lake would be approximately 52 degrees, which is cooler than Onondaga Lake in the summer. This cooler, oxygen-rich water will help reduce mercury and other toxins, add oxygen naturally and enhance aquatic fisheries.

Bi-National Air Quality Workshop Visits Syracuse

SyracuseCoE Platinum Partner Syracuse University's LC Smith College of Engineering and Computer Science and SyracuseCoE hosted a workshop in October 2009 on acid rain effects as part of the Canada-US Air Quality Committee. The workshop was led by SyracuseCoE Platinum Partner Syracuse University Professor Dr. Charles Driscoll. Acid rain and its effects have become an issue of recent concern for the Air Quality Committee.

Twenty-two US and Canadian scientists and managers met at Syracuse University to discuss the approaches and tools to assess the ecological response to emissions reductions proposed under the Canada-US Air Quality Agreement. These discussions included collaborations on atmospheric transport modeling and watershed effects modeling. The participants also discussed an initiative of pilot studies to determine the "critical loads" of acid rain to US and Canadian ecosystems.

SYRACUSECoE, PARTNERS EXHIBIT A STRONG PRESENCE AT GREENBUILD 2008

The SyracuseCoE booth at Greenbuild 2008, as seen from the skybridge at the Boston Convention Center.

More than 27,000 attended the conference and expo, held in November 2008 in Boston, MA. Once again, SyracuseCoE created a sustainable booth, this time by re-purposing an old exhibit frame, using recycled materials, and hanging banners on willow boughs donated by SyracuseCoE Platinum Partner SUNY-ESF, which harvests willow for bio-fuel. National Grid sponsored the SyracuseCoE booth with a grant intended to showcase both SyracuseCoE's capabilities and New York's Creative Core. Other sponsors were NYSTAR, NYSERDA, Empire State Development Corporation, US EPA, and the US Department of Energy.

Rick Fedrizzi, US Green Building Council President, CEO, and Founding Chair and a SyracuseCoE Board Member, visits the SyracuseCoE booth at Greenbuild 2008.

Metropolitan Development Association (MDA) President-Elect Rob Simpson addressed a Nov. 19 Greenbuild reception hosted by the MDA and SyracuseCoE. The reception honored Rick Fedrizzi, US Green Building Council President, CEO, and Founding Chair and a SyracuseCoE Board Member; introduced business leaders from around the country to the Creative Core; and helped SyracuseCoE Members make new connections in the field of clean and green technology, a process that continued throughout Greenbuild.

SUNY-ESF Studying Central Upstate Biomass Market

In order to determine the local availability of biomass for renewable energy generation, a research team at SyracuseCoE Platinum Partner SUNY-ESF, led by Dr. Tim Volk, in December 2008 began surveying landowners within a 25-mile radius of Syracuse to determine how many have biomass they are willing to sell to energy producers, as well as the price.

Funded by a $75,000 grant from NYSERDA, the study will help lay the groundwork for potential biomass energy plants developing in the region, building on prior studies that have already determined how much forest and farmland suitable for biomass production exists within the radius.

A willow whip planter at work on the Vernon-Verona-Sherrill School District campus in Central Upstate New York. SUNY-ESF is studying how much agricultural land in Central Upstate is being used for biomass production.

EFC launches NYFoodTrader.org

In December 2008, SyracuseCoE affiliated center the Environmental Finance Center (EFC) at Syracuse University announced the launch of NYFoodTrader.org, a virtual farmer's market that quickly and easily connects New York buyers and sellers with local food and other farmers market type items.

NYFoodtrader.org is modeled after the EFC at Maryland's successful website, Foodtrader.org. The site also functions as a online food bank, where donations can be made to those in need. Using the site to post listings or to buy produce is free of charge. From those with backyard fruit harvests and farmers with large operations, to winery owners and food charity volunteers, the site can be utilized for local food exchange for a range of audiences across the state.

GLSEC Meets to Discuss Regional Sustainable Energy System

In December 2008, 20 members of the Bi-National Great Lakes Sustainable Energy Consortium (GLSEC)—from Queens University in Kingston, Ontario; Cornell University; Clarkson University; SUNY-ESF; Syracuse University, and SyracuseCoE—met in Alexandria Bay, NY to plan research and programmatic activities and the integration of both technology and policy to create a sustainable energy system in the Lake Ontario region. It is hoped this renewable energy region will act as a template for other regions both across Canada and the US.

An annual gathering of the researchers from academia and industry was held in October 2009, under the auspices of Thousand Islands Energy Research Forum (TIERF). The forum provided an opportunity to share information on recent energy-related research with industry, with the aim to develop research into potential products and commercialization projects. The Alex Bay meeting was facilitated and partially supported by the Canadian Consulate in Buffalo.

EFC DIRECTOR NAMED TO ICLEI STAR COMMUNITY INDEX POST

Sara Pesek, Director of SyracuseCoE affiliated center the Environmental Finance Center at Syracuse University (EFC), was appointed, after a competitive process, to the STAR Community Index Technical Advisory Committee (TAC) of ICLEI-Local Governments for Sustainability.

The STAR Community Index represents ICLEI's "National Framework for Sustainable Communities." It is a national, consensus-based framework for gauging the sustainability and livability of US Communities and will be launched by 2010. It is being developed through a partnership with ICLEI, SyracuseCoE Charter Member the US Green Building Council, and the Center for American Progress.

According to ICLEI, "much as LEED transformed the building industry, STAR will transform the way local governments set priorities and implement policies and practices to improve their sustainability performance. It will become the definitive means by which local governments measure and 'certify' their achievements." TAC members—in all, there are eight committees in three categories—will collaborate to develop indicators and metrics that comprise the STAR Community Index and ensure technical rigor, scientific validity, and cost-effectiveness.

A groundbreaking for the From the Ground Up homes was held in October 2009. Breaking ground are, (L to R) Marilyn Higgins, Vice President, Community Engagement & Economic Development, Syracuse University; Alys Mann, Neighborhood Planning, Home HeadQuarters; Kerry Quaglia, Executive Director, Home Headquarters; Ed Bogucz, Executive Director, SyracuseCoE; Near Westside resident Carol Horan; Nancy Cantor, Chancellor & President, SU; Mark Robbins, Dean, School of Architecture, SU; Jared Della Valle, Partner, Della Valle Bernheimer; Rick Cook, Partner, Cook+Fox Architects; Pam Campbell, Cook+Fox Architects; and Adam Yarinsky, Principal, Architecture Research Office.

SU ARCHITECTURE CHOOSES FROM THE GROUND UP WINNERS

In January 2009, SyracuseCoE Platinum Partner Syracuse University's School of Architecture, in partnership SyracuseCoE and Home HeadQuarters Inc., announced three winners "From the Ground Up: Innovative Green Homes," fostering advanced thinking about design, sustainability and cost-effective building practices for the single-family house.

Developed for sites on Syracuse's Near Westside, the proposals and resulting built work will provide a new vision for one of the city's oldest neighborhoods and demonstrate the value of design within an disinvested and demographically diverse community. These small domestic projects wed high standards of living with advanced technology and design to encourage revitalization of the Near Westside and similar neighborhoods across the country. A groundbreaking for the projects was held in October 2009.

The three winning teams are:

- **ARO and Della Valle Bernheimer, New York**
- **Cook + Fox/Terrapin Bright Green, New York and Washington, D.C.**
- **Onion Flats (including Andropogon Associates, Rivera Structural Design, and MaGrann Associates), Philadelphia**

"The winning designs include many innovative strategies for energy efficiency and superior indoor environmental quality that fit perfectly with the capabilities of firms in Central New York," says SyracuseCoE Executive Director Edward Bogucz. "The construction of these homes will help strengthen our region's reputation as a leader in green building design, technology, and construction."

WSJ Features Green Home Designed for Syracuse

In April 2009, the Wall Street Journal approached four architects "to design an energy-efficient, environmentally sustainable house without regard to cost, technology, aesthetics, or the way we are used to living."

Richard Cook of Cook+Fox Architects was one of the architects featured in the subsequent WSJ story. The concept that Cook described is based on the Live/Work/Home, a single-family home that Cook+Fox Architects designed for Syracuse's Near Westside as part of the "From The Ground Up" competition, co-sponsored by SyracuseCoE, the winners of which were featured at the Van Alen Institute in New York City in May 2009.

Among the features of the "Live/Work/Home" is a "skin" that turns dark in bright sunlight to keep out light and heat and turns clear on cloudy days to let in light and heat. The house's walls and furniture are on rollers to allow rooms to be reconfigured.

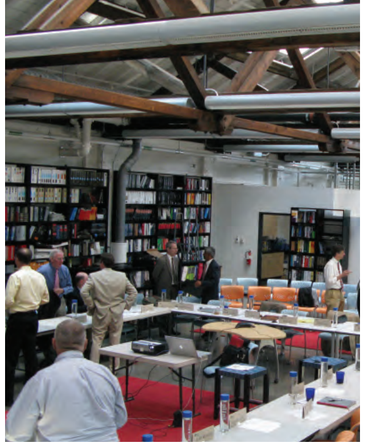
YEAR IN REVIEW

Dr. Andrea Ferro of Clarkson University won a National Science Foundation award for her research into air pollution.

Ferro Receives CAREER Award from NSF

Andrea R. Ferro, Assistant Professor of civil and environmental engineering at SyracuseCoE Platinum Partner Clarkson University, has received a CAREER Award from the National Science Foundation. Ferro will receive $410,000 over five years from the NSF for her research into the resuspension of pollutants into the air. The Faculty Early Career Development (CAREER) Program is an NSF-wide activity that offers the Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education, and the integration of education and research within the context of their organizations' missions.

Ferro's research could result in changes in the selection of materials used in buildings; guidance for emergency response to chemical and biological agents; and human behavior modification and policy changes to reduce exposure to resuspended pollutants. Ferro will conduct studies and evaluate the forces affecting particle resuspension. Her project will benefit from newly built facilities and equipment, including a temperature- and humidity controlled test chamber, a laminar flow resuspension wind tunnel, and advanced particle monitoring and visualization devices in the Clarkson University Center for Air Resources Engineering and Science (CARES).



King & King Architecture's new HQ building renovated a 1913 building that had been a factory and, later, a warehouse.

The inside of King & King Architecture's new HQ, expected to gain LEED-Platinum

King & King Architecture held a riboon-cutting for its new HQ in March 2009.

KING & KING MOVES HQ TO RENOVATED BUILDING

SyracuseCoE Gold Partner King & King Architects, previously located in the village of Manlius, moved to new offices in downtown Syracuse in January 2009. Renovations to the building—which was built in 1913 as a factory and expanded in 1924—began in late May 2008. The firm's 70 employees moved in mid January, and a ribbon-cutting was held in March 2009.

The building is being renovated under US Green Building Council's LEED standards and is expected to attain LEED-Platinum status. Among the energy-efficient features are skylights that will cut heating and lighting energy costs. Large windows on the corner meeting room will give employees a view of the Near Westside neighborhood and allow people driving by on West Street to look in.

FOX GIVES SU GIFT FOR SUSTAINABLE ENERGY STUDIES

John Fox, president and CEO of Innovation Fuels, has commited to give up to $3.5 million to hire a new professor of sustainable energy studies at Syracuse University.

John Fox, president and CEO of Innovation Fuels, has commited to give up to $3.5 million to hire a new professor of sustainable energy studies at SyracuseCoE Platinum Partner Syracuse University's LC Smith College of Engineering and Computer Science. The gift from the '92 alum of SU's College of Arts and Sciences will be one of three new endowed chairs to be added in sustainable studies at the school. Fox's gift will be matched SU under the Faculty Today program, which will allow the engineering school to hire the new professor immediately.

In 2005, Fox's company Homeland Energy Resources Development formed a biodiesel division, which was merged into the privately held Innovation Fuels in 2007. Innovation owns a biodiesel production facility in Newark, NJ, where the company can make up to 40 million gallons per year from vegetable oil, animal fats, or waste cooking oil. With a partner, the company recently bought a 13 million-gallon fuel terminal in Milwaukee for use as the nation's first renewable fuels distribution facility. Innovation is looking at other sites to develop biofuels distribution facilities, including Fulton, NY, and is working with Morrisville State College and others to cultivate pennycress as a possible source of biodiesel.

SyracuseCoE Co-Sponsors Biomimicry Lecture

Natural sciences writer and innovation consultant Janine Benyus envisions solar cells that mimic leaves, agriculture that models a prairie, and businesses that run like redwood forests. In March 2009 Benyus, president of the Biomimicry Institute, spoke at a University Lectures event at SyracuseCoE Platinum Partner Syracuse University, sponsored in cooperation with the L.C. Smith College of Engineering and SyracuseCoE.

Benyus is the author of six books, including her latest, Biomimicry: Innovation Inspired by Nature. In Biomimicry she names an emerging discipline that seeks sustainable solutions by emulating nature's designs and processes.

Biomimicry Institute President Janine Benyus spoke at Syracuse University's Hendricks Chapel in February 2009.

Center for CleanTech Entrepreneurship gets $1.5m

In April 2009, the New York State Energy Research and Development Authority (NYSERDA) awarded $1.5 million to the Center for CleanTech Entrepreneurship at the Syracuse Technology Garden to establish a clean energy business incubator program that will provide business support to accelerate the successful development of early-stage, clean energy technology companies in Central New York.

The Center for CleanTech Entrepreneurship offers support for entrepreneurs and early-stage companies through incubation, acceleration, and retention efforts. Partners in this NYSERDA initiative include SyracuseCoE, the Greater Syracuse Chamber of Commerce, and the Metropolitan Development Association. The initiative is supported by a coalition of academic research partners that include SyracuseCoE Partners Clarkson University, SUNY ESF, and Syracuse University; Charter Member Cornell University; and Members SUNY-Morrisville and SUNY-Binghamton.

Frank Murray, President and CEO of NYSERDA, speaks at a ceremony to announce a grant to the Center for CleanTech Entrepreneurship.

WIDETRONIX WINS EMERGING BUSINESS COMPETITION

In April 2009, SyracuseCoE Start-Up Partner Widetronix won the New York's Creative Core $100K Emerging Business Competition for its work with a new manufacturing process for next generation batteries with applications in sensors and microprocessors and in the medical implants, security, and logistics industries.Widetronix designs and builds low-power, long-life batteries for microelectronics. With grant funding from the US Navy, the Ithaca, NY-based company, in collaboration with Syracuse CoE Charter Member Cornell University, is commercializing a patent-pending, semiconductor materials solution for these self-charging batteries that have a lifetime greater than 25 years.

Taitem's Christa Shopis

TAITEM'S SHOPIS WINS ENGINEERING AWARD

In May 2009 Crista Shopis of SyracuseCoE Patron Partner Taitem Engineering received Consulting-Specifying Engineer Magazine's 2009 40 Under 40 award. This award is given to 40 building industry engineers under the age of 40 who stand out in their academic, professional, personal, and community achievements. Candidates were nominated by a professional colleague and were judged based on commitment to excellence in a variety of areas.

SYRACUSECoE OPENS ONE-OF-A-KIND BEST LAB

Two of Syracuse's signature strengths—robust, four-season weather and expertise in green building technologies—have attracted an international team to conduct a project that will help improve energy efficiency in buildings through weatherization technologies.

Project partners include the Air Barrier Association of America (ABAA), Oak Ridge National Laboratory (ORNL), the US Department of Energy (USDOE), the New York State Energy Research and Development Authority (NYSERDA), Syracuse University, and the Syracuse Center of Excellence (SyracuseCoE). The partners have committed more than $2 million to undertake the three-year project.

The project is being conducted at the new Building Envelope Systems Test (BEST) Laboratory—opened in April 2009—a unique SyracuseCoE research and development facility located on SyracuseCoE Platinum Partner Syracuse University's South Campus. The project focuses on the performance of air barriers—systems that control unintended air movement between outdoors and indoors, which can have major impacts on a building's energy use and indoor air quality. In heating climates, up to 40% of the energy use in a building can be attributed to air leakage.

The BEST Laboratory resembles a small, two-story house. In place of windows, the laboratory has 34 openings for test panels, each of which is four feet wide and nine feet high. ABAA has installed panels that represent various materials and air barriers, which are then subjected to identical outdoor and indoor conditions. Inside, ORNL will install instruments to measure temperature, moisture and air movement. ORNL will analyze the results.

The location of the BEST Laboratory in Syracuse recognizes the expertise and resources available through SyracuseCoE, such as Jainshun Zhang, professor of mechanical and aerospace engineering at SU, who is director of the world-renowned Building Energy and Environmental Systems (BEES) Laboratory in the L.C. Smith College of Engineering and Computer Science. Zhang, along with other SU faculty and students, will help manage the BEST Laboratory.

The Building Envelope Systems Test Laboratory on Syracuse University's South Campus is a one-of-a-kind facility for research and demonstration projects designed to improve building envelope systems

SU, IBM Break Ground on Green Data Center

In May 2009, officials from SyracuseCoE Platinum Partner Syracuse University, IBM, and New York State broke ground on what will be one of the most energy-efficient computer data centers in the world. With the use of green technologies, the new facility is expected to use about half the energy of a typical data center. US data centers consume more than 62 billion kilowatt hours of electricity annually at a total cost of about $4.5 billion, an amount equal to what 5.8 million US households use in a typical year.

The project, expected to be completed in late 2009 on SU's South Campus, will focus on the actual construction of the data center itself, not just the computer hardware and software. A key element of the $12.4 million, 6,000-square-foot facility will be an onsite electrical co-generation system. It will use natural gas-fueled micro-turbine engines to generate all electricity and provide cooling for the computer servers.

The data center also will feature a liquid cooling system will use double-effect absorption chillers to convert exhaust heat from the microturbines into chilled water to cool the data center's servers, with sufficient excess cooling to handle the needs of an adjacent building.

The facility will contain more than $5 million in IBM-donated equipment, design services, and support, which includes supplying the electrical cogeneration equipment and servers such as IBM BladeCenter, IBM Power 575, and an IBM z10 systems.

The Syracuse University/IBM Green Data Center will be one of the most energy efficient facilities of its kind in the world

Researchers and leaders at four SyracuseCoE member institutions were awarded collaborative research grants for air quality and water resources projects at a May 2009 ceremony held at SyracuseCoE Platinum Partner Syracuse University.

CARTI Air, Water Studies Win $1.4 million in Grants

Researchers at four member institutions of SyracuseCoE have begun innovative projects to help improve the air quality of buildings and communities and protect water resources, thanks to $1.4 million in US Environmental Protection Agency (US EPA) grants.

In May 2009, Collaborative Activities for Research and Technology Innovation (CARTI) grants were awarded to nine projects aimed at investigating the role static electricity plays in indoor air quality; particulate matter in the Syracuse airshed; an air filter that utilizes plant microbes; the impact of daylighting on decision-making; whether certain common air particles damage the lungs; innovative real-time water quality sensors; water sensors that utilize holographic and quantum properties of hydrogels; and the role a stream's subsurface plays in stream restoration.

This fourth round of CARTI awards was made possible through funding from the US EPA. Congressman Dan Maffei (NY-25), like local congressional representatives over the past decade, was instrumental in securing the funds that have made the CARTI research program a success.

The project investigators, their institutions, and the titles of the funded projects are as follows:

- **Dr. Andrea Ferro of Clarkson University:** $100,000 for the "Investigation of electrostatic forces caused by walking on the floor and its effect on particle resuspension in an indoor environment."
- **Dr. John Hassett of SUNY College of Environmental Science & Forestry:** $298,890 for the "Real-time sensing and time-resolved sampling of organic chemicals in Onondaga Lake."
- **Dr. Philip Hopke of Clarkson University:** $90,369 to study the "Characterization of coarse particles in Syracuse, NY."
- **Dr. Yan-Yeung Luk of Syracuse University:** $100,000 to study "Integrated sensing mechanisms based on holographic diffraction and quantum confinement in protein-laden hydrogel."
- **Dr. Kathleen McGrath of SUNY College of Environmental Science & Forestry:** $100,000 to study "Life Down Under: The forgotten hyporheic zone in stream restoration and development of a bioindicator of subsurface recovery."
- **Dr. Temitope Ojo of Clarkson University:** $215,589 to take "Water quality measurements using a novel buoyancy controlled drifting sensor platform."
- **Dr. Dacheng Ren of Syracuse University:** $100,000 for the "Analysis and optimization of a novel regenerative bio-filter system for enhanced volatile organic compound removal from indoor environments."
- **Dr. Usha Satish of SUNY-Upstate Medical University:** $299,011 to study the "Impacts of daylighting on human decision making and productivity."
- **Dr. Lawrence Tavlarides of Syracuse University:** $100,000 to study "Reactive oxygen species in particulate matter: formation, elimination, and in vitro assessment of relative toxic effects."

YEAR IN REVIEW

EFC Wins USDA Technical Assistance and Training Grant

Environmental Finance Center
Syracuse University

In May 2009, Congressman Dan Maffei (NY-25) announced that SyracuseCoE affiliated center the Environmental Finance Center at Syracuse University (EFC) was a recipient of a $190,000 USDA Rural Development Technical Assistance and Training grant. The grant allows the EFC to offer training, outreach, and technical assistance to rural and low-income New York State communities to promote sustainable land use practices that will lead to improved water quality. Key elements of the EFC program will be to provide training on targeted system management and land use best-management practices, as well as to create an on-line resource for farmers to manage waste supplies and implement best practices on their land.

This grant also will allow the EFC to launch a new website that will be based on nyfoodtrader.org but will focus on trading low-value agricultural waste products such as manure, hay, and farm equipment. On a national level, the website agtrader.org is based on the same model and has already proved successful. The grant also will allow EFC to focus on developing working collaborations among government officials, nonprofit, and private sector programs that provide technical assistance, as well as developing collaborations to support the agricultural market and infrastructure.

SYRACUSECoE FUNDS INTERNSHIPS AT CENTRAL NEW YORK COMPANIES

SyracuseCoE Industry Collaboration Intern Matthew Murray, a student at the Rochester Institute of Technology, interned in Summer 2009 with Huhtamaki Packaging, working with the company on cost-reduction-through-energy-conservation measures.

The SyracuseCoE Industry Collaboration Internship Program sponsors interns at Central New York companies. It provides support for qualified local college students hosted by companies working in the Environmental Quality and Indoor Air Quality fields, including high performance/green building design.

The goal of the program is to increase post-graduation student retention in Central Upstate by establishing valuable relationships between college students and area companies doing work in the environmental field. Starting in June 2009, SyracuseCoE funded the following internships:

- **Benjamin Barrington** (Cornell University) with Antek (Water Filtration)
- **Jessica Bohn** (SUNY-ESF) with Northeast Green Building Consulting (Ecological Engineering)
- **Anthony Cimpi** (SUNY-Morrisville) with C&S Companies (Water/Wastewater Management)
- **Eric Cody** (SUNY-Canton) with Tag Heating & Cooling (Building Auditing)
- **Brett Evans** (Rennselaer Polytechnic) with O'Brien & Gere (Water Treatment Research)
- **Richard Gianotti** (SUNY-IT, Utica, NY) with Air Innovations (Prototyping/Assessment)
- **Miriam Koesterich** (Clarkson University) with Colden Corporation (IEQ R&D)
- **Scott Long** (Syracuse University) with The Open Atelier (Building Envelope Design)
- **Rayna Mayo** (SUNY-ESF) with Atlantic States Legal Foundation (Green Infrastructure)
- **Alexander Mottern** (SUNY-ESF) with Antek (Water Filtration)
- **Matthew Murray** (Rochester Institute of Technology) with Huhtamaki Packagaing (Energy Conservation)
- **Clairanne Pesce** (Syracuse University) with King & King Architects (Interior Design)
- **Andrew Smith** (Clarkson University) with CDH Energy (Energy Use Analysis)
- **Shane Sullivan** (University of Richmond) with Cayuga County Department of Planning (Air Quality/Fuel Efficiency)
- **Kyle Thomas** (SUNY-ESF) with Salt City Enterprises (LEED Certification)
- **Anna Vanderhoof** (Syracuse University) with Natural Systems Engineering (Water Resources)

SYRACUSE ANNOUNCED AS HOST OF IAQVEC 2010

The 7th International Conference on Indoor Air Quality, Ventilation, and Energy Conservation in Buildings will be held at SyracuseCoE Platinum Partner Syracuse University, Aug. 8 to 15, 2010. The conference, hosted by SU, SyracuseCoE, and the National Research Council-Canada, and the US Environmental Protection Agency will provide a forum for presentations of original research work and findings, demonstrations of displays of innovative technologies, and discussions on future challenges and opportunities. The conference will cover a wide range of key research areas with the goal of simultaneously improving indoor environmental quality and energy efficiency and enhancing wellbeing and sustainability. Dedicated spaces will be provided for displays, exhibitions, and demonstrations of technology products by sponsors. Learn more at iaqvec2010.org.

Three stages of the decosntruction of a house in Syracuse's Near Westside neighborhood, a demonstration project to show the feasibility of the process and to train local workers in deconstruction techniques.

WORKERS DECONSTRUCT SYRACUSE HOUSE

In June 2009, workers from Hope for Us Housing deconstructed a house at 319 Marcellus St. in Syracuse's Near Westside neighborhood. Deconstruction, as opposed to demolition, is a way of taking down a house, piece by piece, so materials can be saved. Professionals from SyracuseCoE Charter Member Northeast Green Building Consulting and Fred Smith Roofing monitored and mentored trainees on the job. Housing materials in good condition—including doors, windows, flooring, lighting fixtures, and others—can be reused instead of being sent to a landfill.

Materials salvaged from this deconstruction project were donated to Habitat for Humanity's ReStore—located in the Near Westside—where they are available for purchase. Wood that was not in good shape was ground for use as mulch. Scrap metal was recycled and the money received for the metal offset the cost of deconstruction. Construction of a new home on this site will begin soon. The design for the new low-cost, energy-efficient home is one of the winning entries from the "From the Ground Up" competition sponsored by Home HeadQuarters, SyracuseCoE, and SyracuseCoE Platinum Partner Syracuse University's School of Architecture.

Congressman Dan Maffei (NY-25, fourth from left) stands with recipients of SyracuseCoE demonstration grants at the recent TAD 2009 awards, held at The Tech Garden in Syracuse.

Central Upstate Companies Share $400K Demonstration Grant

SyracuseCoE in June 2009 announced that three Central New York companies received a total of $415,798 in the third round of Technology Application and Demonstration (TAD 2009) awards. These demonstration projects are designed to improve air quality by testing for airborne contaminants and by creating the next generation of air conditioning and purification systems.

The awards are made possible through funding to SyracuseCoE from the US Environmental Protection Agency (US EPA). Congressman Dan Maffei (NY-25), like local congressional representatives over the past decade, has been instrumental in securing the funds that have made the TAD program a success.

The TAD 2009 awards push the total US EPA funding to date for SyracuseCoE technology demonstration projects to more than $1.7 million, a subset of a larger portfolio of demonstration projects funded by the SyracuseCoE in the past. TAD projects are a crucial part of SyracuseCoE's "innovation ecosystem," which seeks to fund product and service innovations in clean and renewable energy, indoor environmental quality, and water resources through research, demonstration, and commercialization phases.

The TAD 2009 companies were competitively selected based on their proposals for yearlong projects that demonstrate the "first proof of principle" or "reduction to practice" phase of a new product or service associated with air and/or water quality. Projects began in summer 2009 and most will run through May 2010.

The technology demonstration projects supported by the SyracuseCoE have a clear impact on the local community. For instance, Air Innovations of North Syracuse has created a system that circulates purified air throughout a home year round, dramatically helping asthmatic children breathe properly, especially in the winter months. This system has been deployed in Syracuse's Near Westside as part of the Near Westside Initiative. Another of the demonstration projects—by CollabWorx—will take place at the new SyracuseCoE headquarters in downtown Syracuse.

The TAD 2009 award recipients and their collaborators are:

- **Air Innovations of North Syracuse:** $150,000 for the "Demonstration and Commercialization of the HEPAiRx Integrated Energy Recovery Ventilation and Air Purification System." Collaborators: Clarkson University, University of Buffalo, and Applied Healthcare Resource Management.
- **CollabWorx of Syracuse:** $144,998 for "Open Web Services-Based Indoor Climate Control System, Phase III." Collaborator: SenSyr LLC.
- HAPcontrol of Syracuse: $120,800 for a "Remediation System for Paint Booth Applications." Collaborators: Cornell University and Triad Technologies, Inc.

YEAR IN REVIEW

SU Announces Collaboration with Brookhaven National Laboratory

In June 2009 SyracuseCoE Platinum Partner Syracuse University and Brookhaven National Laboratory announced a new agreement that will enable SU faculty and students to utilize BNL's state-of-the-art research facilities and explore opportunities for collaborative research with Brookhaven scientists in the fields of energy technology development, environmental sciences, biomaterials, forensic science, engineering and computer science, biological sciences, and policy. The agreement also calls for SU and BNL officials to explore the possibility of opening a BNL satellite location for research in alternative biofuels at SyracuseCoE's new headquarters building in downtown Syracuse.

The collaboration between Syracuse University and Brookhaven National Laboratory adds another world-class research asset to those SU already boasts.

SyracuseCoE Funding Helps Collaborative Photovoltaic Cell Research

Antek Tests Solar Cells

SyracuseCoE Platinum Partner Syracuse University Physics Prof. Eric Schiff has teamed up with Anthony Terrinoni of green and clean technology firm Antek to research methods for lowering the cost of production for photovoltaic cells. Instead of the traditional method of heating silicon and phosphorous wafers in large ovens and exposing them to boron gas, Schiff and Terrinoni are testing the effectiveness of treating the wafers with a proprietary mixture of chemicals, potentially reducing the cost of production of photovoltaic cells and solar panels by 10% to 20%. SyracuseCoE is helping to fund the research, taking place in the sub-basement of the SU Physics Building.

GREEN INFRASTRUCTURE DEMONSTRATED BY SYRACUSECoE COLLABORATORS IN SYRACUSE'S NEAR WESTSIDE

Guests at an August 2009 ceremony to celebrate the completion of a green infrastructure project at a private residence in Syracuse Near Westside neighborhood pour water collected from a rain barrel to demonstrate how the project's rain garden works.

The installation of a project to demonstrate multiple approaches to reduce stormwater runoff was celebrated in August 2009 by SyracuseCoE and its collaborators.

The project transformed a residential property at 515 Tully St., Syracuse. Previously, the property included about 3,400 square feet of asphalt pavement. As part of the project, the asphalt was removed and replaced with a rain garden and a permeable pavement driveway.

In addition, a green roof was installed on a shed and eight rain barrels were placed around the home.

Present at the event were Ed Bogucz, SyracuseCoE Executive Director; State Sen. David Valesky (D-Oneida); Matthew J. Driscoll, City of Syracuse Mayor; BJ Adigun, Director of Public Affairs, Onondaga County Department of Water Environment Protection; Marilyn Higgins, Vice President, Community Engagement and Economic Development, Syracuse University; Anastasia Urtz, Executive Director, Cornell Cooperative Extension of Onondaga County; Kerry Quaglia, Executive Director, Home HeadQuarters; and homeowners Don and Helen Walrath. In addition, Sid Hill, Tadodaho (Spiritual Leader) of the Haudenosaunee, and Oren Lyons, Faithkeeper, Turtle Clan, Seneca Nation, gave thanks and addressed the crowd.

Presidential Advisor Carol Browner Visits SyracuseCoE HQ

SyracuseCoE Executive Director Ed Bogucz shows White House Energy Czar Carol Browner around the roof of the SyracuseCoE headquarters. One aspect that makes the HQ attractive to air quality and other researchers is its urban setting—in the middle of a medium-sized city that experiences four-season weather and next to two busy highways.

In August 2009 White House "energy czar" Carol Browner toured the SyracuseCoE headquarters building in downtown Syracuse. After seeing the HQ, Browner said the sustainably built center, as well as the collaborations in research and demonstration that SyracuseCoE and its partners are already engaged in, have helped put Syracuse at the forefront of green innovation.

Said Browner to the crowd assembled at the press conference: "I see a community that is collaborating to create a different energy future—to create not only a clean energy building but also a healthy building."

Groundbreaking Held for Near Westside's Lincoln Supply Building

In September 2009, a ceremony was held to commemorate the start of a $3.2 million renovation project of the Lincoln Building, located on the 300 block of Wyoming Street, Syracuse.

The Lincoln Building, formerly known as the Lincoln Supply Warehouse, is a 100-year-old, four-story property that will be renovated to create 30,000 square feet of mixed-use commercial and residential space. The renovation will transform the first two floors into commercial space and the top two floors into live/work artist lofts.

The building is designed to demonstrate innovations in green technologies for energy and environmental systems, with SyracuseCoE funding the design of green systems for the project. The effort is led by SyracuseCoE Gold Partner C&S Companies, with contributions from SyracuseCoE Charter Member Northeast Green Building Consulting, Earth Sensitive Solutions, John Todd Ecological Design, Intelligent Converted Energy, Building Energy Solutions, and Steven Winter Associates.

The project is one of the first in the country that has been designed using a proposed new rating system that is being developed by SyracuseCoE Charter Member the US Green Building Council for mid-rise, multi-family residential buildings. The Lincoln Building is designed to achieve a Gold rating in the new LEED system, one step below the highest rating.

Although called a groundbreaking, Syracuse Near Westside residents, Near Westside Initiative staff, and others tossed salt over their shoulders for good luck at a September 2009 ceremony to initiate work on the Lincoln Building in Syracuse's Near Westside neighborhood.

US Energy Secretary Steven Chu is seen in the SyracuseCoE headquarters with SyracuseCoE Partners and Collaborators. Chu's visit highlighted the potential Central Upstate New York has to be a leader in the energy sector of the green and clean technology industry.

Energy Secretary Chu Tours SyracuseCoE Headquarters

In October 2009, US Energy Secretary Steven Chu visited Syracuse to learn more about renewable energy projects at SyracuseCoE Platinum Partner SUNY-ESF, as well take a first-hand look at the new SyracuseCoE headquarters building.

During Chu's tour of the headquarters, experts from SyracuseCoE Partners Syracuse University, Carrier Corp., CDH Energy, Northeast Green Building Consulting, and SUNY-ESF presented various features of the building and described SyracuseCoE projects.

Earlier, Chu and U.S. Rep. Dan Maffei announced that $63 million in federal stimulus money for energy projects has been released to New York State, for a total of $123 million. The city of Syracuse will get $1.44 million to make municipal buildings, parking garages, and parks more energy-efficient. "We have an incredible opportunity," Chu said. "We essentially need a new industrial revolution, to give us the energy we want but in a much cleaner way."

National Grid Creates $350K Sustainable Energy Endowment at Clarkson University

National Grid and Clarkson University announced a $350,000 sustainable energy research fund in October.

(L to R) Hayley H. Shen, CU Honors Program Associate Director; Susan Crossett, National Grid Vice President-Energy Solutions Services; Tony Collins, President, CU; Tom King, President, National Grid US; and Ken Visser, Associate Professor, Mechanical and Aeronautical Engineering, CU.

In October, SyracuseCoE Platinum Partners Clarkson University (CU) and National Grid announced the creation of a $350,000 endowment at CU. The National Grid Endowed Fund for Student Research Opportunities in Sustainable Energy will annually fund up to five summer research opportunities for Clarkson Honors Program students studying sustainable energy.

The students' research includes areas such as power systems, energy education, energy efficiency, energy harvesting and storage, bioenergy, fuel cells and hydrogen fuel, solar energy systems, and wind energy. Students will also benefit from a series of seminars and workshops on sustainability and participate in field trips and team-building activities.

GLSEC HOLDS THOUSAND ISLANDS ENERGY RESEARCH FORUM

In October, the Thousand Islands Energy Research Forum was held in Alexandria Bay, NY by the Great Lakes Sustainable Energy Consortium, a Canada-US collaboration of academic and industry partners serving to foster technical research, public policy options, and commercial developments in sustainable energy strategies on both sides of the border.

SyracuseCoE, along with other academic and industry partners including SyracuseCoE Platinum Partners Clarkson University, SUNY-ESF, and Syracuse University, have joined with Canadian colleagues in academia and industry to pursue collaborations along the I-81 Corridor through Central New York and Eastern Ontario.

HUD Secretary Visits Near Westside

In October, US Housing and Urban Development Secretary Shaun Donovan toured Syracuse's Near Westside along with US Sen. Charles Schumer and US Rep. Dan Maffei to see the efforts being made toward the sustainable revitalization of Syracuse's neighborhoods. While the Near Westside is characterized by vacant and abandoned properties, it is also a target for housing rehabilitation efforts and a testbed for innovative building technologies. (L to R) Mark Robbins, Dean, School of Architecture, Syracuse University; Ed Bogucz, Executive Director, SyracuseCoE; Shaun Donovan; Marilyn Higgins, Vice President, Community Engagement & Economic Development, SU; Maarten Jacobs, Director, Near Westside Initiative.

Spreading the Sustainable Word

From October 2009 to October 2010, SyracuseCoE hosted, co-sponsored, and/or exhibited and presented at the following green and clean technology and sustainability themed events:

- CNY Sustainable Speaker Series (in collaboration with USGBC New York Upstate Chapter)
- The Tech Garden's "Opportunities in Renewable Energy" Series
- The Sustainable Enterprise Partnership Seminar Series (in collaboration with SU's Whitman School and SUNY-ESF)
- SUNY-ESF's CNY's Response to Global Energy and Climate Change Challenges Seminar Series
- Bi-National Air Quality Workshop, Syracuse, NY (Oct. 2008)
- Go Green Summit Earth Summit, Syracuse, NY (Oct. 2008)
- Deconstruction Workshop (in collaboration with the Institute for Local Self Reliance), Syracuse, NY (Oct. 2008)
- Quebec-New York Economic Summit, Syracuse, NY (Oct. 2008)
- US EPA Acid Rain Workshop (in collaboration with SU's LC Smith College of Engineering and Computer Science), Syracuse, NY (Oct. 2008)
- Greenbuild 2008, Boston, MA (with The Amos Project, e2e Materials, Greater Syracuse Chamber of Commerce, King & King Architects, Metropolitan Development Association, National Grid, Northeast Natural Homes, Onondaga County Industrial Development Agency, Syracuse City School District, and Syracuse University) (Nov. 2008)
- The Wild Center Adirondack Climate Change Conference, Tupper Lake, NY (Nov. 2008)
- Institute for National Security and Counter Terrorism (INSCT) Planning Meeting, Syracuse University, (Nov. 2008)
- SyracuseCoE Scientific Advisory Council Meeting, Syracuse, NY (Dec. 2008)
- Waste Management and Sustainability Planning for Small Communities, USGBC Caribbean Chapter Annual Conference, San Juan, PR (Dec. 2008)
- CNY Business Journal Book of Lists Launch, Syracuse, NY (Feb. 2009)
- RETECH 2009, Las Vegas, NV (with other members of NY's Creative Core) (Feb. 2009)
- PowerGen Renewables Conference, Las Vegas, NV (Feb. 2009)
- Green Communities Workshop, National League of Cities Leadership Training Institute, Washington DC (March 2009)
- Fostering Sustainable Behaviour Conference, Toronto, Canada (March 2009)
- SUNY-ESF 7th Annual Green Building Conference, Syracuse, NY (March 2009)
- Energy in the 21st Century: Energy Saving Through Smart Growth & Transportation Options, Cazenovia College (April 2009)
- Syracuse Chamber of Commerce Business Show, Syracuse NY (April 2009)
- Buffalo Solar Show, Buffalo, NY (with other members of NY's Creative Core) (April 2009)
- AccelerateCNY: New Ideas in Technology, Manufacturing, Energy, and the Environment, Syracuse, NY (April 2009) (in collaboration with SU's CASE Center, CNY Technology Development Organization, Syracuse Chamber of Commerce, Manufacturers Association of CNY, Metropolitan Development Association, and National Grid)
- Corning Technology Fair, Corning, NY (May 2009)
- German-American Chamber of Commerce Bioenergy Conference, National Grid, Syracuse, NY (June 2009)
- Blue Rain EcoFest/ArtsWeek, Syracuse, NY (July 2009)
- SUNY-ESF Climate Change Panel, Syracuse, NY (Oct. 2009)

YEAR IN REVIEW

SyracuseCoE's mission is to create innovations to improve health, productivity, security, and sustainability in built and urban environments. To this end, SyracuseCoE supports projects across its "Innovation Ecosystem"—from basic and applied research to technology application and demonstration to commercialization—in air quality, water resource management, and clean and renewable energy systems.

SyracuseCoE's "Collaborative Activities for Research and Technology Innovation" (CARTI) projects—supported by the US Environmental Protection Agency (US EPA)—conduct basic and applied research in two thrust areas: air quality and water resource management. An independent Scientific Advisory Committee of nationally recognized researchers recommended projects for CARTI awards following a rigorous process used by the National Science Foundation and the US EPA for competitively awarded projects.

The following CARTI research projects began or were ongoing in 2008-2009.

2008-2009 SYRACUSECoE'S RESEARCH PORTFOLIO

US Rep. Dan Maffei brought Presidential Advisor Carol Browner to the Syracuse CoE headquarters in August 2009. Discussing research projects that will take place at the HQ are (L to R) Browner, Prof. Myron Mitchell of SUNY-ESF, Ed Bogucz of SyracuseCoE, and Prof. Charles Driscoll of Syracuse University.

Waiting for new photo

Two research assets at the SyracuseCoE headquarters are the green roof, seen freshly planted with sedum, and the meteorological tower, which has been fitted with instruments to test Syracuse air quality in real time.

CARTI IV (2009)

Investigation of electrostatic forces caused by walking on floor and its effect on particle re-suspension in an indoor environment.

Principal Investigators: Andrea Ferro and Goodarz Ahmadi (Clarkson University)

Award: $100,000

Investigation of how static electricity created by walking affects the movement of dust and particles—the "flooring effect."

Characterization of coarse particles in Syracuse, NY.

Principal Investigators: Philip Hopke (Clarkson University) and Gary S. Casuccio (RJ Lee Group)

Award: $90,369

Analysis of how weather and traffic patterns affect relatively large particles found in the air in Syracuse, NY.

Analysis and optimization of a novel regenerative bio-filter system for enhanced VOC removal from indoor environments.

Principal Investigators: Dacheng Ren and Jianshun (Jensen) Zhang (Syracuse University)

Award: $100,000

A study of whether interactions between microbes and plants have the ability to clean air.

Impacts of daylighting on human decision-making and productivity.

Principal Investigator: Usha Satish (SUNY Upstate Medical University)

Award: $299,091

Investigation into whether day-lit work environments produce better economic productivity and, in the case of schools, better academic performance.

Reactive oxygen species in particulate matter: formation, elimination, and in vitro assessment of relative toxic effects.

Principal Investigators: L.L. Tavlarides and J.H. Henderson (Syracuse University)

Award: $100,000

Research on volatile air particles that contain oxygen atoms and their effects on health.

Real-time sensing and time-resolved sampling of organic chemicals in Onondaga Lake, NY.

Principal Investigators: John Hassett (SUNY-ESF) and Steven Effler (Upstate Freshwater Institute)

Award: $298,890

Development and deployment of buoy systems to measure organic contaminants in Onondaga Lake, NY.

Water quality measurements using a novel Buoyancy Controlled Drifting Sensor Platform.

Principal Investigators: Temitope Ojo, James Bonner, and Kerop Janoyan (Clarkson University)

Award: $215,589

Development of an inexpensive floating sensor system to aid in the environmental protection of lakes, bays, and estuaries.

Integrated sensing mechanisms based on holographic diffraction and quantum confinement in protein-laden hydrogel.

Principal Investigators: Yan-Yueng Luk, Mathew M. Maye, Michael B. Sponsler, and Dacheng Ren (Syracuse University)

Award: $100,000

Further development of sensors to detect water-borne toxins (proteins and bacteria) based on their reaction with hydrogel (a water-based, highly absorbent gel).

Life Down Under—The forgotten hyporheic zone in stream restoration and development of a bioindicator of subsurface recovery.

Principal Investigators: Kathleen McGrath (SUNY-ESF) and Laura Lautz (Syracuse University)

Award: $100,000

Research on volatile air particles that contain oxygen atoms and their effects on health.

CARTI III (2007)

Spatial distribution of ultrafine aerosol population from local sources.

Principal Investigator: Suresh Dhaniyala (Clarkson University)

Award: $100,000

A study of the distribution of ultrafine particles that pollute urban neighborhoods and how this pollution is affected by local traffic patterns and urban terrain.

Mercury transport and contamination in the Lake Ontario Basin.

Principal Investigator: Charles T. Driscoll (Syracuse University)

Award: $100,000

Analysis of mercury pollution in Lake Ontario and how the amount and distribution of mercury is affected by surrounding watersheds.

Characterizing non-point salt contamination to streams and groundwaters.

Principal Investigators: Stuart Findlay (Cary Institute of Ecosystems Studies) and Don Siegel (Syracuse University)

Award: $100,000

Research into the causes of increased salt concentrations in surface and groundwater throughout New York State.

Laser holographic biosensing mechanism using porous protein-laden hydrogel.

Principal Investigators: Yan-Yeung Luk, Michael B. Sponsler, and Ren Dacheng (Syracuse University)

Award: $100,000

Development of a highly sensitive hydrogel material that can quickly detect the presence of water-borne toxins.

Bridging the temporal mismatch between remotely sensed land use changes and field-based water quality/quantity observations.

Principal Investigators: Giorgos Mountrakis, Karin Limburg, Myrna Hall, and Bonggi Hong (SUNY-ESF)

Award: $100,000

Creation of a more accurate and useful model of how runoff from sidewalks, parking lots, rooftops, and roads affects natural water sources.

Development and application of novel particle tracers for the measurement of flow fields affecting indoor air quality.

Principal Investigators: Igor Sokolov and Douglas Bohl (Clarkson University)

Award: $100,000

Development of a novel ultrafine material—photoluminescent silica—that will simulate dust, allowing researchers to better model airflow in indoor environments.

CARTI II (2006)

Biosensors with Low Cross-Reactivity for Waterborne Contaminants.

Principal Investigators: Philip Borer, Mark P. McPike, and Bruce Hudson (Syracuse University)

Award: $299,884

Development of an inexpensive and efficient way to detect water-borne toxins at the molecular level.

An intelligent urban environmental system for Central New York water resource management.

Principal Investigators: Charles Driscoll (Syracuse University) and Steven W. Effler (Upstate Freshwater Institute)

Award: $600,000

Deployment of remote, linked robotic water quality monitors for several waterways in CNY to better understand how contaminants move through an aquatic ecosystem.

Controlling the microclimate around the head with local ventilation.

Principal Investigators: Hiroshi Higuchi, Mark Glauser, and H. Ezzat Khalifa (Syracuse University) and Edward Arens, Zhang Hui, Charlie Huizenga, and Gail Brager (University of California, Berkeley)

Award: $300,000

A study to lay the groundwork for effective, comfortable, energy-efficient personal ventilation systems for work and other environments.

Characterization of the ambient air quality in Syracuse, NY and identification of its origins.

Principal Investigators: Philip Hopke and Thomas Holsen of Clarkson University; Myron Mitchell of SUNY-ESF; and K. Max Zhang of Cornell University

Award: $600,000

Description of the air quality in Syracuse, NY taking measurements at the SyracuseCoE headquarters site and Upper Onondaga Park.

Distributed demand-controlled ventilation for improving indoor air quality.

Principal Investigators: H. Ezzat Khalifa, Can Isik, and Jianshun Zhang (Syracuse University) and C.J. Li (Rensselaer Polytechnic Institute)

Award: $300,000

Creation of an intelligent ventilation system to improve the air quality in work and other environments.

Impact of carbon dioxide on human decision-making and productivity.

Principal Investigators: Usha Satish (SUNY Upstate Medical University) and William B. Fisk (Lawrence Berkeley National Laboratories)

Award: $299,411

Investigation to determine what levels of carbon dioxide are appropriate for healthy and productive human performance in offices and other indoor environments.

Development of a Living Test Bed for Built (Indoor) and Urban (Outdoor) Environmental Systems.

Principal Investigators: Jensen Zhang and H. Ezzat Khalifa (Syracuse University), Andrea R. Ferro (Clarkson University), Max Zhang (Cornell University). and Greg Dobbs (United Technologies Research Center)

Award: $300,000

Development—at the SyracuseCoE headquarters—of a full-scale, real-time test bed to investigate how outdoor air affects the quality of indoor air.

SYRACUSECoE'S
DEMONSTRATION PORTFOLIO 2008-2009

The second phase of SyracuseCoE's research, demonstration, and commercialization "Innovation Ecosystem," the Technology Application and Demonstration (TAD) awards—funded by the US Environmental Protection Agency—grow Central Upstate New York's economy by funding the thorough, collaborative testing of environmental quality product and service innovations. The following TAD demonstration projects began or were ongoing in 2008-2009.

TAD 2009

Demonstration and commercialization of the Air Innovations HEPAiRx integrated energy recovery ventilation and air purification system.

Collaborators: Air Innovations, Clarkson University, University of Buffalo, and Applied Healthcare Resource Management

Award: $150,000

Open web services-based indoor climate control system, phase III.

Collaborators: CollabWorx, SenSyr, and Syracuse University

Award: $144,998

Remediation system for paint booth applications.

Collaborators: HAPcontrol, Cornell University, and Triad Technologies,

Award: $120,800

TAD 2007

Application and demonstration of macroarray analytical techniques for the detection of fungal bioaerosols in buildings.

Collaborators: Environmental Laboratory Services and SUNY-ESF

Award: $149,141

Commercial development of a multi-use personal ventilation/filtration system.

Collaborators: Propulsive Wing, Allred & Associates, and Syracuse University LLC. PO Box 321, Elbridge, NY 13060 (propulsivewing.com)

Award: $150,000

Geothermal desiccant cooling: a new approach to air conditioning.

Collaborators: Taitem Engineering and Syracuse University 109 South Albany Street, Ithaca, NY 14850 (taitem.com)

AWARD: $111,944

Silicon carbide avalanche photodiode for photomultiplier tube replacement in airborne biological contaminant.

Collaborators: Widetronix and Cornell University

AWARD: $150,000

John DiMillo of NuClimate Air Quality Systems—a recipient of a SyracuseCoE commercialization grant—describes his company's energy-efficient Q Air Terminal to US Rep. Dan Maffei at the Healthy Buildings 2009 Opportunity Exchange.

SYRACUSECoE'S
COMMERCIALIZATION PORTFOLIO 2008-2009

The third phase of SyracuseCoE's research, demonstration, and commercialization "Innovation Ecosystem," the Commercialization Assistance Program (CAP) awards—established in partnership with the Metropolitan Development Association and the Empire State Development Corporation with grants received under the auspices of New York Assemblyman William Magnarelli—fund projects that commercialize products and services in the fields of indoor environmental quality, water resources, and clean and renewable energy. The following CAP commercialization projects were ongoing 2008.

CAP IV

Produce shrub willow as a source biomass fuel for renewable energy production.

Collaborators: Double A Willow and SUNY-ESF

Award: $50,000

A kit to modify fumehoods to maintain negative air pressure, reducing wasted energy by more than 95%.

Collaborators: Isolation Sciences and Clarkson University

Award: $50,000

A Smart Wind Turbine Blade incorporating active control capabilities for more efficient power generation.

Collaborators: Vento Tek and Clarkson University

Award: $50,000

Develop a manufacturing process for high quality silicon carbide expatial wafers that improve the reliability and energy efficiency of power devices.

Collaborators: Widetronix Semiconductors and Cornell University.

Award: $50,000

SYRACUSE CENTER OF EXCELLENCE
HEADQUARTERS

A Center for Collaboration and Discovery

This LEED Platinum-designed building will have both laboratory and office space for research and business collaborations on innovative products and services in the core SyracuseCoE focus areas of indoor environmental quality, water resources, and clean and renewable energy.

Most importantly the HQ has lab and office space available for SyracuseCoE partners. Companies and organizations with services, products, and research and demonstration investments in our core areas are welcome to license the use of these unique, world-class facilities and/or locate functions in the building.

Visit syracusecoe.org to learn more about HQ Space Utilization Guidelines, Program Space Types, and the Collaboration and License agreements.

Groundbreaking in June 2005 with NY Gov. George Pataki.

Brownfield site remediation.

Raising the steel frame, April 2008

Pouring the foundation, Nov. 2007

Construction viewed from the HQ webcam.

Signing the "topping off" beam, July 2008.

Syracuse Center of Excellence Headquarters Quick Facts

Cost: $35.6 million (funded from state and private sources)

Size: 55,000 square feet

Location: The three-acre construction site on the corner of Almond and Washington streets is a designated "brownfield," the former site of LC Smith typewriter factory and of Midtown Plaza

Number of Stories: 5

Expected Completion: Fall 2009

Expected LEED Rating: Platinum

Uses: Offices for Syracuse CoE staff, classrooms, public spaces, indoor environmental quality (IEQ), biomass fuel, and other research laboratories for use by Syracuse CoE academic and industry partners

Main Laboratory: Carrier Total Indoor Environmental Quality Lab (Carrier TIEQ, on the third floor)—the only research facility of its kind in the world, a space to conduct controlled experiments on the human response to indoor environments (temperature, air quality, odor, light, etc). Funded by NY State Office of Science, Technology, and Academic Research (NYSTAR) and Carrier Corp

Met Tower: The 150-foot "Urban Ecosystem Observatory" will take measurements of outdoor air quality to help research into urban air pollution and the impact of buildings on urban ecosystems

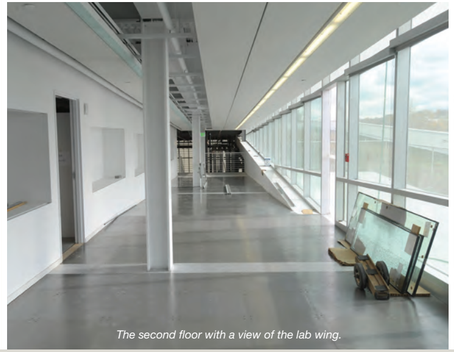
Design Architect: Toshiko Mori

Executive Architect: Ashley McGraw Architects

General Contractor: LeChase Construction Services

Other Design Team Members: Over Arup & Partners (structural engineering), Hargreaves Associates (landscape architects), Burt Hill (lab planner), Transsolar (climate concepts), Stearns & Wheler (civil engineering), O'Brien & Gere (environmental engineer), John P. Stopen Engineering (geotechnical engineering), Peterson Engineering (elevators), C&S Companies (commissioning agent), 7 Group (LEED consultant)

An architect's rendering showing the north face.



The second floor with a view of the lab wing.

Architect Toshiko Mori at a design charrette, Oct. 2007.

Selected Sustainability Features of the SyracuseCoE Headquarters

Ground-source heating and cooling
Heat exchanged with the ground via water circulated through tubing installed in 300-foot-deep wells is used for both heating and cooling, which saves energy compared to traditional systems.

Daylighting
Extensive windows provide natural light to occupants of most indoor spaces, reducing electricity required for artificial lighting.

Form
The building is relatively thin, which provides high level of occupant comfort with ample daylight and opportunities for views and natural ventilation.

Rainwater collection
Rain and water from melting snow is collected from the roof, stored in a 5,000-gallon tank, and used to flush toilets, reducing both the consumption of potable water and the amount of water that is discharged to the sewer.

Green roof
Plantings on the laboratory roof provide thermal insulation, rainwater retention, and a visible connection to nature.

Demand-controlled ventilation
The amount of fresh air delivered to a room varies depending on the number of people who are present, saving energy when rooms are partially occupied.

Photovoltaic panels
There is capacity for panels of photovoltaic cells generate electricity from sunlight supporting part of electricity needs of the building.

Laboratory exhaust
Air from laboratories is exhausted at low speed via a tall stack, which saves energy compared to conventional designs that use blowers to eject exhaust at high speeds.

Insulation
Solid facades include superior insulation to reduce heating and cooling loads.

Landscaping
Shade trees and reflective paving reduce summertime urban heat-island effects.

Radiant ceilings
Most of the heating and cooling in rooms is provided via ceiling panels that are embedded with tubes that carry warm or cool water.

Brownfield redevelopment
For more than 200 years, numerous buildings at the site have served the Syracuse community in a variety of ways, including housing, manufacturing, education, and professional services. As one part of construction of the Syracuse CoE headquarters, environmental contamination associated with previous industrial uses was remediated, restoring the site for sustained use by future generations.

Vapor intrusion system
Ventilation below the foundation prevents underground vapors from entering the building, eliminating a potential source of contaminants in indoor air.

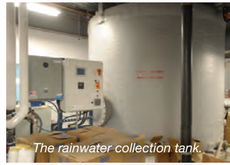
Windows
The south facade features highly insulated glass with integrated electronically controlled blinds that provide solar and glare control. Operable windows allow occupants increased control of indoor environments.

Orientation
The largest faces of the building look to the north and south for good relationship to the sun.

The HQ's glass façade from the southwest corner.

Leading-edge HVAC by Carrier.

Geothermal heating and cooling.



The rainwater collection tank.

The open-plan laboratory wing.

The Air Quality Testing tower and sedum roof.

Healthy Buildings delegates visit the HQ, Sept. 2009.