

# OFF-SITE ASSETS



**The Building Energy and Environmental Systems (BEES) Lab** of Syracuse University's Department of Mechanical and Aerospace Engineering, College of Engineering and Computer Science, is a key research lab that works to advance innovative technologies in the areas of indoor environmental quality, building energy efficiency and building protections by conducting leading edge academic and industrial research.

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**The Building Envelope Systems Test (BEST) Lab** at Syracuse University is a research and development facility designed to monitor the performance of air barriers—systems of materials, such as wall assemblies, that control unintended air movement in and out of buildings.



**Syracuse University Green Data Center** is a first-of-a-kind demonstration of an onsite tri-generation system (power, cooling, and heat) that was custom designed for a data center. The facility also includes IBM's latest computers and computer-cooling technology. The innovations reduce energy

use by 50 percent compared to traditional approaches, making it one of the most energy-efficient data centers in the world.



**The Center for Advanced Systems and Engineering (CASE)** at Syracuse University is an applied research center that catalyzes growth in the high-tech economy of New York State by assembling interdisciplinary academic and private sector teams to develop innovative solutions in complex behav-

ioral, information and communication systems to accelerate business and community growth.



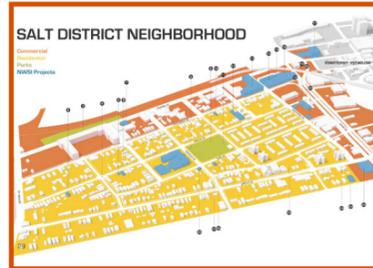
**Smart Grid Lab** at Syracuse University is used to simulate sun and wind to integrate these new power sources into the smart grid system. SU uses the lab to offer courses in power systems, power engineering, small grid systems and power electronics to educate the electrical engineers of the future.

**Syracuse Technology Garden** operated by **CenterState CEO** in downtown Syracuse includes space and services to create and grow new businesses. Services include: assistance with developing business plans, connections to experienced mentors, access to angel investors and venture capital, introductions to potential clients and strategic partners.



provides support for entrepreneurs and early-stage companies through incubation, acceleration, and retention.

**The Clean Tech Center** operated by **CenterState CEO** at the Syracuse Technology Garden is one of six clean technology incubators funded by the New York State Energy Research and Development Authority (NYSERDA). It



real world demonstrations in several of the revitalized neighborhood buildings.

**Near Westside Initiative** is a not-for-profit organization operated out of the Office of Community Engagement and Economic Development at Syracuse University. Near Westside residents have helped SyracuseCoE Partners learn invaluable lessons about bringing innovations from the lab to market through

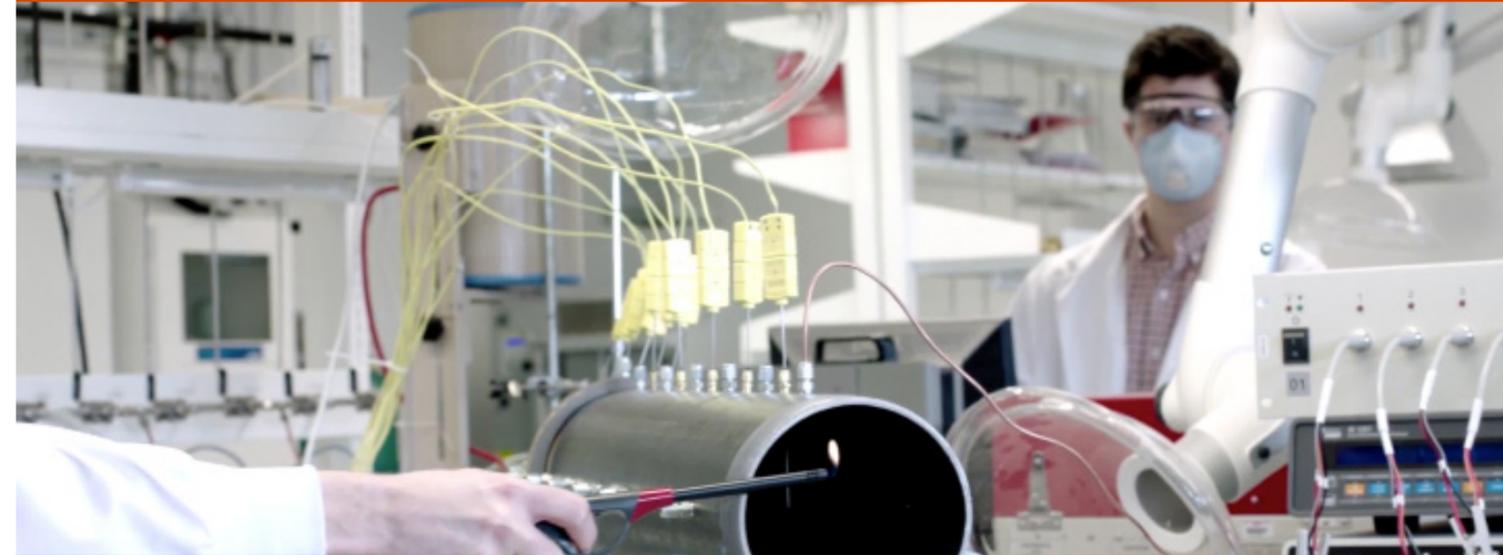


that the city and region has seen in more than 50 years.

**The Connective Corridor** is a civic engagement initiative led by Syracuse University, working with the City of Syracuse and Onondaga County, that brings together urban planning, civil engineering, art, architecture and design, along with principles of smart growth and sustainability – as the largest downtown public works project



## NEW YORK STATE'S CENTER OF EXCELLENCE IN ENVIRONMENTAL AND ENERGY SYSTEMS



# LAB TO MARKET

SyracuseCoE catalyzes  
**RESEARCH, DEVELOPMENT & DEMONSTRATIONS**

to accelerate innovations for  
clean energy, healthy buildings  
and resilient communities.

Beginning with a regional economic development roadmap in 1996, SyracuseCoE collaborators have built an award-winning innovation enterprise that has engaged more than 200 firms and institutions. Its iconic headquarters located in downtown Syracuse is known internationally as a hub for leading-edge ideas and discoveries in clean energy, healthy buildings, and sustainable communities. The investment of \$8.7 million in state, federal, and private funds created seven new labs and testbeds and launched NYE-RIC, a state-wide alliance for energy-efficient building innovations.

## Combustion and Energy Research (COMER) Lab



1 The COMER Lab's vision is to develop alternative energy technologies that improve current thermal systems while reducing harmful emissions. Solid oxide fuel cell system design, oxy-fuel combustion membranes, and thermal transpiration based propulsion devices are some of the major focuses in this laboratory.

## Interactive Design and Visualization Lab



5 The Interactive Design and Visualization Lab is an immersive design environment for simulating the environmental effects and multiuser experience of dynamically responsive building envelope systems and architectural spaces. The lab supports visualization techniques ranging from large digital projections to immersive virtual reality technologies in order to investigate high-performance building materials, systems and spaces.

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## Building Energy and Environmental Systems (BEES) Testbed



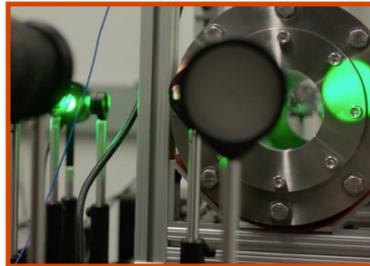
7 Complementing the first-of-a-kind BEES Lab at Syracuse University, the BEES Testbed at SyracuseCoE provides "plug and play" capabilities for prototypes of new heating, ventilation and air conditioning (HVAC) systems and domestic hot water heating technologies.

## SUNY ESF Biofuels Pilot Plant



9 The SUNY-ESF Biofuels Pilot Plant is a key facility in the production of next generation bio-based fuels derived from renewable resources such as locally grown woody feedstocks including plantation-grown willow, switchgrass, and forest-based biomass.

## Thermodynamics and Combustion Lab (TCL)

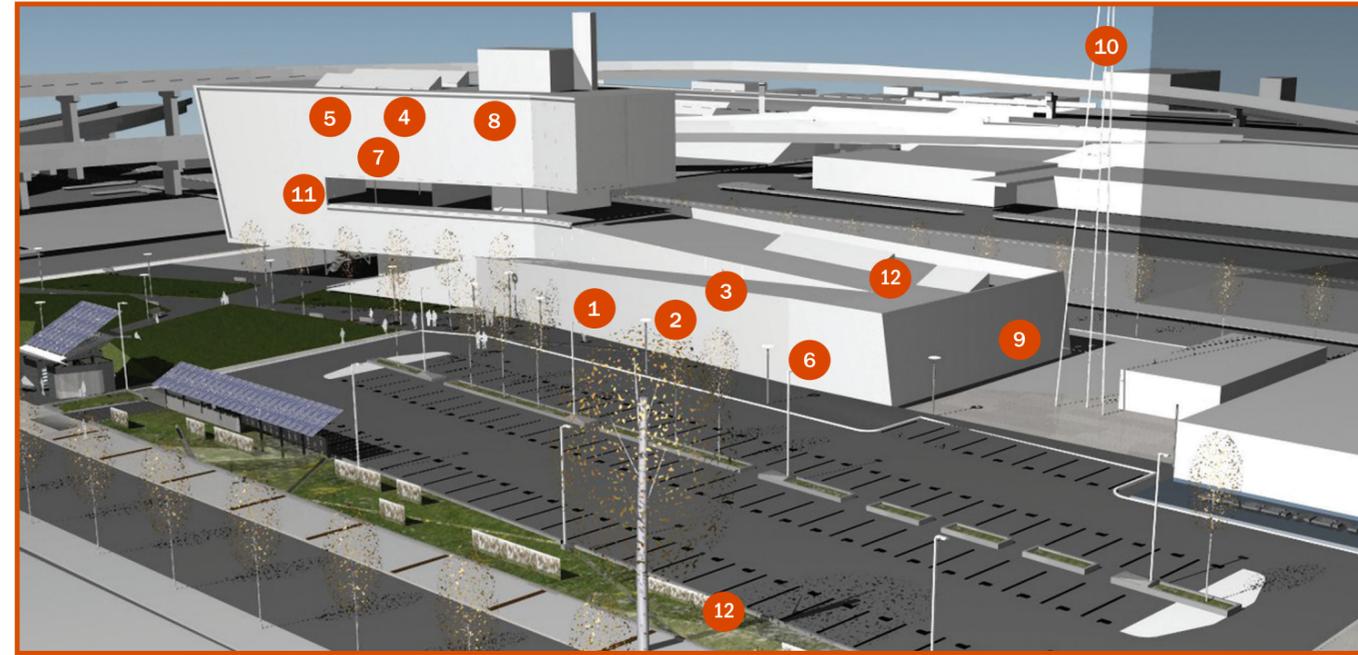


2 The TCL investigates combustion properties of alternative and conventional fuels with the aim of improving energy conversion efficiencies and reducing emissions of harmful byproducts.

## Flow Visualization Lab



3 The Flow Lab studies the dynamics in vortex-dominated hydrodynamic flow fields. This work examines the interaction of static structures with a freestream flow, for applications in civil engineering and aircraft structures. The lab also investigates complex flow fields such as the oscillation of wings, fins, and flukes for swimming and flying.



## Urban Ecosystem Observatory



10 A 150-foot tower at SyracuseCoE HQ is extensively instrumented to measure temperature, humidity, air quality, wind speed, wind direction, and traffic on I-81 and I-690 (including vehicle speed, type, and number of vehicles). The tower provides detailed information about the impacts of urban activities on air quality and other factors.

## Total Indoor Environmental Quality Office Testbed



11 Complementing the Willis H. Carrier TIEQ Lab, the existing office space for the SyracuseCoE staff also serves as a testbed for new energy-efficient technologies, including HVAC, lighting, acoustics, and office furnishings. One project is using electrochromic windows to demonstrate the interactions between daylighting, occupant comfort and energy used for lighting, heating and cooling.

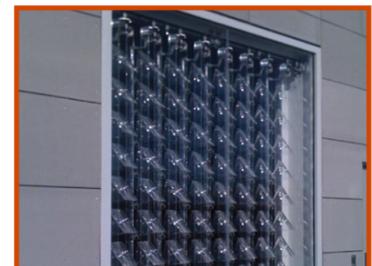
## Willis H. Carrier Total Indoor Environmental Quality (TIEQ) Lab



4 SyracuseCoE is known around the world for the unique capabilities of this lab to study the impact of "total indoor environmental quality (TIEQ)". Factors such as the air temperature, humidity, air quality, lighting, and sound are tested to measure their influence on human performance in offices, schools and other

settings. Current research includes personalized environmental control systems that enable every individual in a workspace to control his or her personal environment.

## Building Envelope System Technology (BEST) Testbed



6 Complementing the BEST Lab on Syracuse University's South Campus, a 16-foot high and 8 foot wide opening in the south face of SyracuseCoE's HQ provides a testbed to evaluate new building envelope systems in a "real building". The current installation

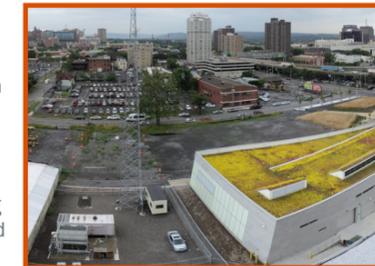
demonstrates a mechanism that tracks the sun through the course of a day, producing electricity, hot water, and daylight for occupants.

## Performance Praxis Lab (PPL)



8 PPL (pee-puh l) is a trans-disciplinary Syracuse Architecture research group comprised of BArch, MArch and MS programs. The aim of PPL is to disruptively transform architecture, urban design and planning practices through applied research, and developing sustainable design workflows and metrics.

## Green Infrastructure Testbed



12 Researchers from SyracuseCoE Partner institutions are conducting research on several different green infrastructure typologies, including the Smart Transportation Testbed and the Living Roof over the Lab Wing. The aim is to understand the hydrologic performance, ecosystem interactions, and functional limitations, as well as demonstrate utility with urban storm water quality and quantity management.