

# Off-Site Assets

Central New York has a rich history of innovation and entrepreneurship in clean energy and precision environmental systems. Additional assets for research, development, and demonstration of advanced building energy and environmental systems include facilities on the campus of Syracuse University and at other research institutions and community partners throughout Central New York.



**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.



**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.



**The Center for Advanced Systems and Engineering (CASE)** is a NYSTAR-designated Center for Advanced Technology (CAT) in complex information systems that provides businesses from a wide range of industry sectors with expertise in all aspects of "big data," from data mining and analytics, to information fusion, predictive analysis, cybersecurity, autonomy, UAV/drones, and the "internet of things."



**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.



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



**The CNY Biotech Accelerator** is led by SUNY Upstate Medical University. Located adjacent to SyracuseCoE in the CNY Innovation Crossroads district, CNYBAC is a 60,000 sq. ft. facility with labs, services, coordinated resources, mentorship and education for individuals and startups involved in the commercialization of biotech and biomedical innovation.



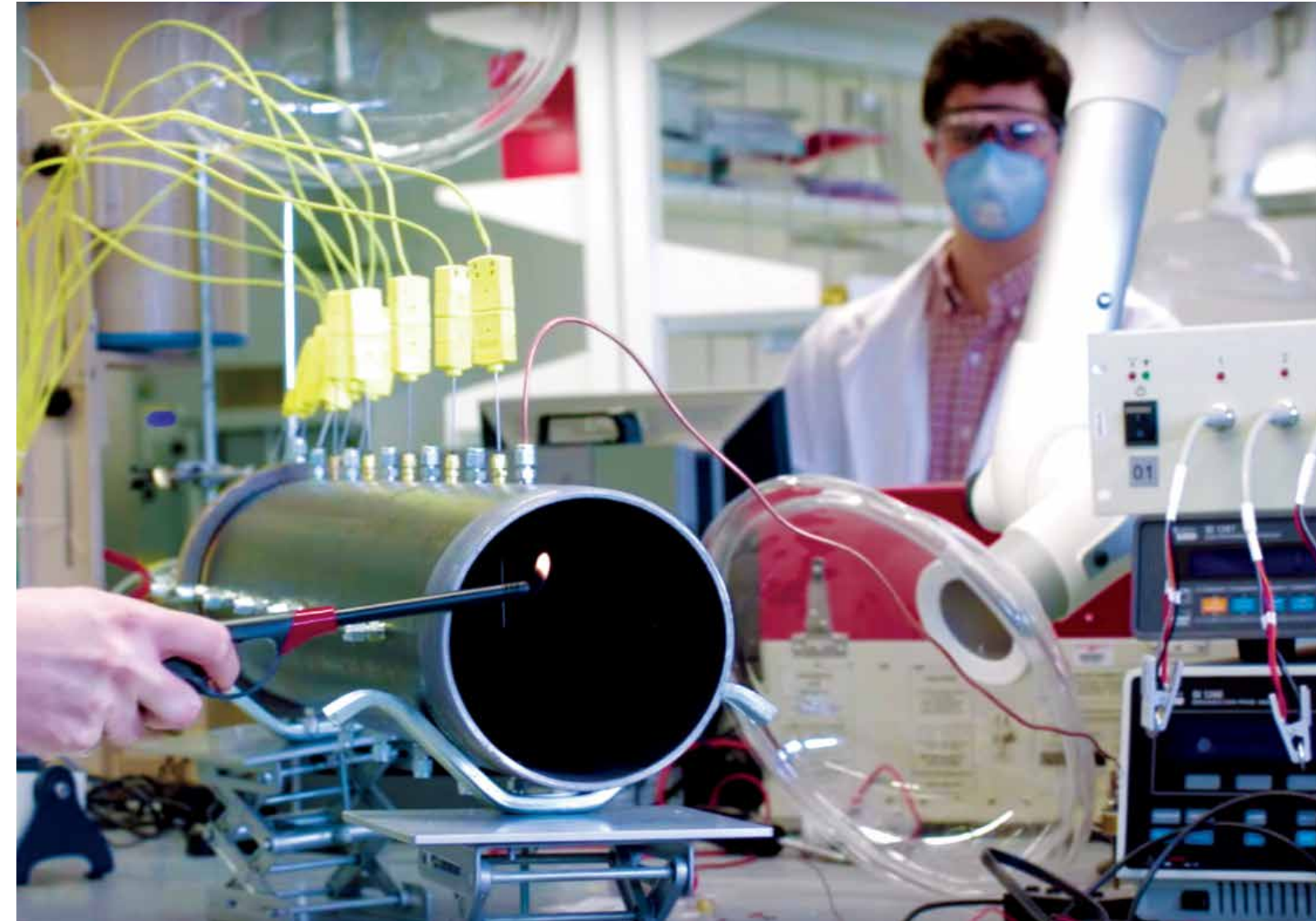
**Field Demonstration Sites** in Syracuse, NY have been used since 2007 for SyracuseCoE to collaborate with community partners to conduct feasibility studies and field demonstration projects at more than 60 sites, including homes, commercial buildings, and whole neighborhoods.



**The New York State Science + Technology Law Center (NYS STLCLC)** is dedicated to providing legal research, education and information to help commercialize new technologies from lab to market.



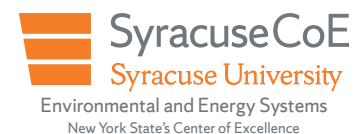
# Lab to Market



## SyracuseCoE Laboratories & Facilities

Research, Development and Demonstrations  
for clean energy, healthy buildings + resilient communities.

Partner with us!  
[syracusecoe.syr.edu](http://syracusecoe.syr.edu)  
315.443.4445



# THE LABS AT SYRACUSECOE

The SyracuseCoE headquarters building is home to exceptional research, development and design (RD&D) labs for environmental and energy technologies and building innovations. This LEED Platinum building has both laboratory and office space for research and business collaborations on innovative products and services in SyracuseCoE's core focus areas of clean and renewable energy, indoor environmental quality and water resources.



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

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.



## Building Energy and Environmental Systems (BEES) Test Bed

Complementing the first-of-a-kind BEES Lab at Syracuse University's College of Engineering and Computer Science, the BEES Test Bed at SyracuseCoE provides plug-and-play capabilities for prototypes of new heating, ventilation

and air conditioning (HVAC) systems and domestic hot water heating technologies.



## Smart Building Controls Test Bed

The 55,000-square-foot SyracuseCoE headquarters facility is a whole-building test bed for advanced sensors and controls, and energy-efficient technologies. Capabilities include RD&D of innovations that enable buildings to change electrical load to

improve interactions with the modernizing power grid.



## Total Indoor Environmental Quality Office Test Bed

Complementing the TIEQ Lab, the existing SyracuseCoE office space also serves as a test bed for new energy-efficient technologies, including HVAC, lighting and acoustics. An electrochromic window project demonstrates the interactions among daylighting, occupant comfort and energy used for lighting, heating and cooling.



## Building Envelope System Technology (BEST) Test Bed

The BEST Test Bed is a 16-foot high and eight-foot wide opening in the south face of SyracuseCoE's headquarters used 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.



## Green Infrastructure Test Bed

SyracuseCoE partners conduct research on several green infrastructure typologies, including the Smart Transportation Test Bed and the green roof. The aim is to understand the hydrologic performance, ecosystem interactions and functional limitations,

as well as demonstrate storm water quality and quantity management.



## Smart Transportation Test Bed

The Smart Transportation Test Bed offers researchers opportunities to explore projects involving photovoltaic arrays, electric grid systems, vehicle charging stations, alternative transportation, including human-powered mobility and the sharing economy, as well as green infrastructure systems and storm water containment.



## Material Archi-Tectonic Research (MATR) Lab

An interdisciplinary research group focusing on the intersection among design, material science and environmental engineering. Ongoing research includes dynamic insulation, 3D-printed nonconventional building materials and 3D-structured soil-based

materials for building performance augmentation



## Combustion and Energy Research (COMER)

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.



## Unmanned Aerial Vehicle Lab

The UAV lab is a complete testing facility for autonomous guidance, navigation and control of UAVs in an indoor environment. The lab is equipped with a sophisticated optical tracking system and decentralized wireless ad hoc network (WANET) for real-time

telemetry, to develop autonomous navigation and control using only onboard sensors.



## Collaborative Project Space

Additional research and office space is available for industry partners working with faculty and students on projects in our areas of focus.



## Interactive Design and Visualization Lab

The Interactive Design and Visualization Lab is an immersive design environment for simulating a dynamically responsive building envelope system. The lab supports visualization techniques ranging from digital projections to immersive virtual reality technologies to

investigate high-performance building materials, systems and spaces.



## Flow Visualization Lab

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.



## Thermodynamics and Combustion Lab (TCL)

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



## Urban Ecosystem Observatory

The 150-foot tower is extensively instrumented to measure temperature, humidity, air quality, wind speed, wind direction and traffic on Interstates 81 and 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.



## Rooftop Research Platform

A full-access rooftop used for the placement of sensors and sampling equipment for air quality research and building system performance studies. Current research using this platform is in the areas of atmospheric particulate pollutants, solar collector performance

(PV and thermal) and LED lighting technology. ●

**SyracuseCoE RD&D labs and test beds combine to create a world-class innovation platform**

Interested in leasing any of these laboratories or testbeds?

Contact us at [syracusecoe@syr.edu](mailto:syracusecoe@syr.edu) with any questions or to learn more!