

**Creating an innovation ecosystem  
to advance New York leadership  
in renewable energy and biofuels technologies**



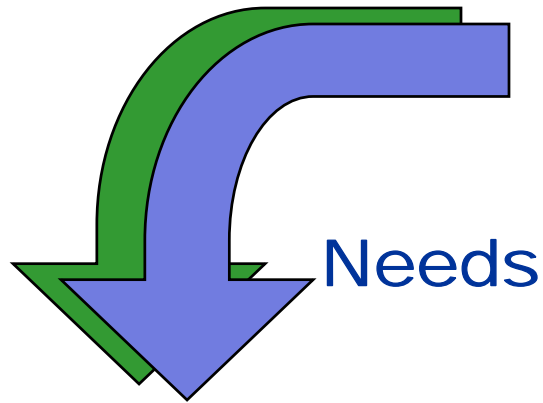
**SYRACUSE CENTER OF EXCELLENCE**  
in ENVIRONMENTAL and ENERGY SYSTEMS

*Creating innovations to improve built and urban environments*

<http://www.syracusecoe.org>

# An “innovation ecosystem”

Learners



*Health, productivity,  
security, & sustainability*

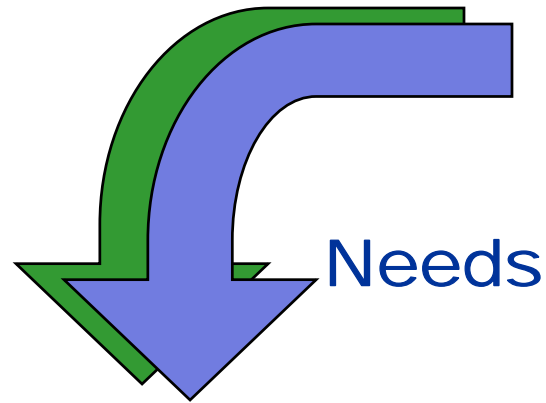
Workforce



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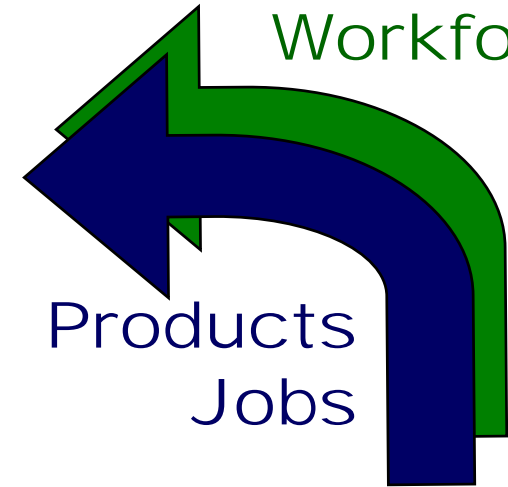
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# Syracuse CoE objectives

- ◆ **Purpose:** create jobs & wealth in NY through collaborations in R&D & education
- ◆ **Mission:** create innovations to improve built and urban environments
  - **Human health**
  - **Productivity**
  - **Security**
  - **Sustainability**



# Scope of interests

- ◆ **Environmental quality systems for “built” environments** (offices, schools, homes, ...) & **urban ecosystems**

- Thermal comfort
- Air quality
- Sound
- Lighting
- Water quality

- ◆ **Energy systems**

- **Renewable sources** (solar, wind, hydro, biofuels)
- **“Clean” technologies**



# Market drivers

## ◆ Human health

- 17.6 million asthma cases in US (4.8M children)
- 50-100,000 deaths annually due to airborne particulate matter

## ◆ Productivity

- \$40-250 billion/yr loss due to poor Indoor Environmental Quality

## ◆ Security

- Traditional heating, ventilating, and air conditioning (HVAC) designs optimize distribution of contaminants throughout zones, buildings
- Watersheds vulnerable to contaminants

## ◆ Sustainability

- \$110 billion annual economic loss due to air pollution in urban areas
- **Decreasing supply of fossil fuels and growing energy demand requires development of alternative, renewable sources**



# Product opportunities

- ◆ **EQS component technologies & processes**
  - Filters & filtration devices, sensors, ...
  - Diagnostic procedures, control methods, ...
  - Design techniques, product standards, ...
- ◆ **“Intelligent” systems for “nested” environments**

*E.g.: Occupant in cubicle in room in floor in building in surrounding airshed*

  - Individualized “microenvironment” at the desktop
  - “Immune” buildings via reconfigurable systems
  - Drinking water supplies protected via distributed sensors
- ◆ **Energy systems**
  - **Renewable & clean technologies, including biofuels**
  - **Integrated heating, cooling & power generation**



# A brief (recent) history

- 1996** **Metropolitan Development Association (MDA)**  
*Vision 2010* plan targets 7 CNY clusters including “Environmental Quality Systems”
- 1998** Indoor Environmental Quality (IEQ) selected as *Vision 2010* EQS initial priority
- ◆ **NYIEQ Center, Inc.** established by MDA via initial awards from US EPA & NY Assembly
  - ◆ **Environmental Quality Systems (EQS) STAR Center** awarded to SU & 11 partners, including SUNY ESF, UMU, & NYIEQ Center
  - ◆ **Syracuse CoE** established, including activities of NYIEQ & EQS STAR Centers
- 2004** Energy systems added to CoE scope



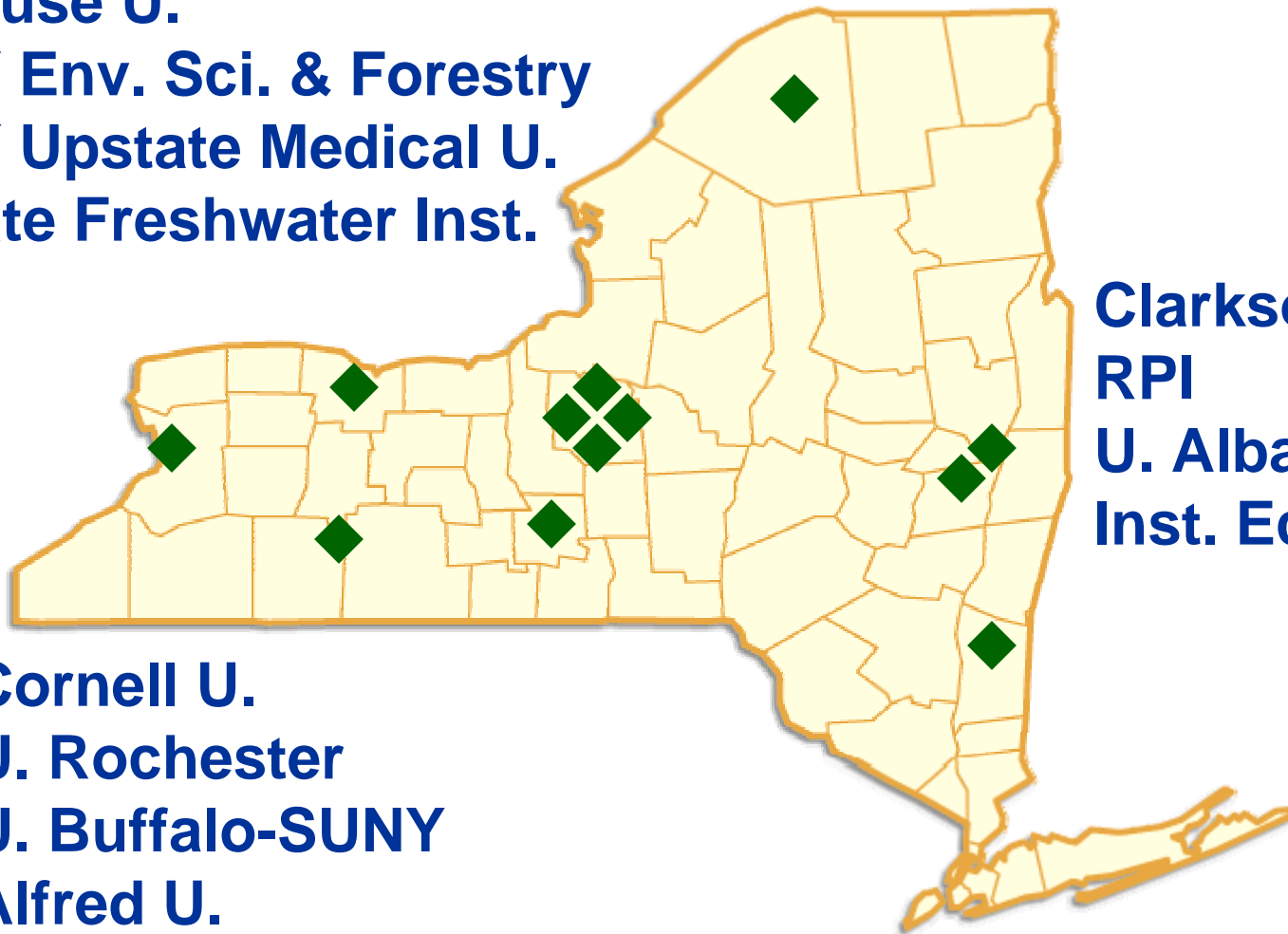
# CoE Organization

- ◆ A **federation** of collaborative partners:
  - **Academic & research institutions**
    - **100+ faculty members, researchers at 12 institutions**
    - Incorporates activities of many centers & programs
    - STAR Center leads most academic research in EQS areas
    - **SUNY ESF leads activities in biofuels & renewable energy**
  - **Companies & economic dev. organizations**
    - **\$100M+ collaborations over 5 years (est.)**
    - NYIEQ Center, Inc. leads the CoE's corporate programs
  - Syracuse University leads overall CoE



# Academic & research partners

Syracuse U.  
SUNY Env. Sci. & Forestry  
SUNY Upstate Medical U.  
Upstate Freshwater Inst.



Clarkson U.  
RPI  
U. Albany-SUNY  
Inst. Ecosys. St.

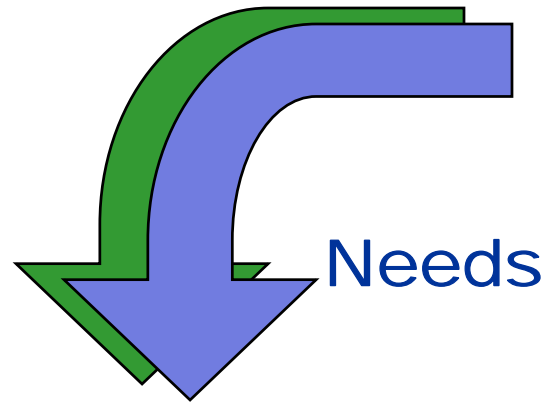
Cornell U.  
U. Rochester  
U. Buffalo-SUNY  
Alfred U.



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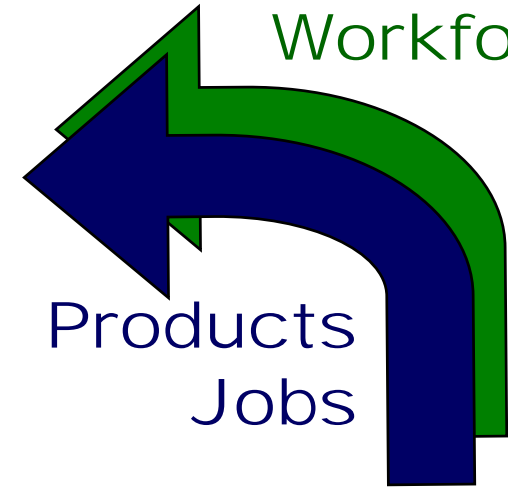
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# NYS & federal commitments

- ◆ **\$76.3M to date in directed awards**
  - **\$47.7M from New York State**
    - \$28.9M commitments by Gov. Pataki for Syracuse CoE facilities
    - \$15.93M NYSTAR awards for EQS STAR Center
    - \$2.83M NYS funds by Assemblyman Magnarelli to MDA & NYIEQ Center
  - **\$28.6M federal funding secured by Rep. Walsh**
    - \$2.5M to MDA/NYIEQ (including \$2M to UMU, SU & ESF)
    - \$3.45M to Syracuse University
    - \$22.66M to CoE (including \$3.8M for NYIEQ Center)
- ◆ **\$31.0M for projects (\$13.9M underway, \$17.1M pending)**
- ◆ **\$45.3M for facilities (\$19.7M underway, \$25.6M pending)**



# Syracuse CoE Headquarters

## ◆ “Hotbed” for collaborations

- “War rooms” for project teams
- Laboratory space for R&D
  - **5,000sf for biofuels**: Ed White (ESF) to coordinate development

## ◆ Testbed

- 60,000sf building designed to field test prototype energy and environmental quality systems
  - **On-site power generation: PVs, fuel cells, wind power, ...**
  - **Combined heating, cooling, and power generation**

## ◆ Showcase

- Facilities for teaching, learning, outreach
- Visible, highly instrumented building systems





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# Site Dedication

June 6, 2005



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# HQ Design Team

## **Ashley McGraw Architects**

Executive Architect

## **Toshiko Mori Architect**

Design Architect

**Arup** MEP & Structural Engineering

**Stearns & Wheeler** Civil Engineering

**Stopen Engineering** Geotechnical

TBA Environmental Engineering

**Hargreaves Assoc.** Landscape Arch.

## **Peterson Engineering**

Telecommunications & elevators

**C&S Engineers** Commissioning

**P. Richard Rittlemann** Lab planning

**Transsolar Energietechnik** IEQ modeling

**John Boecker** LEED rating review

TBA Security



## **Design Team Announcement**

June 15, 2005



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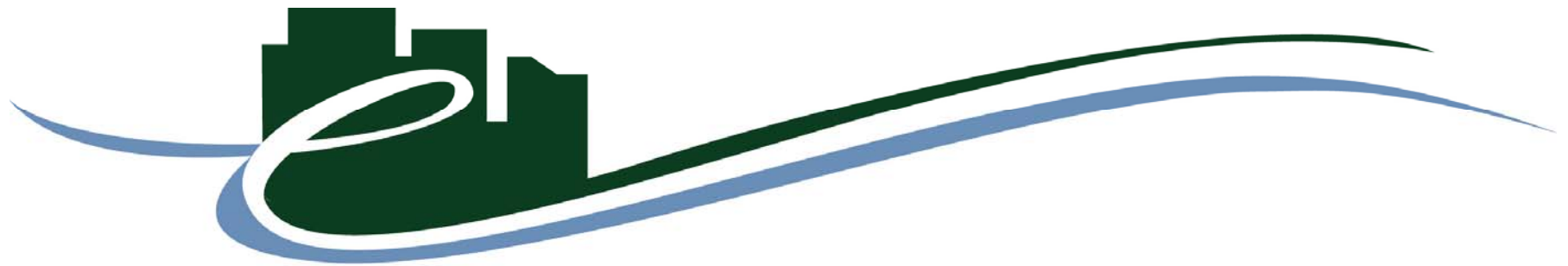
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# Schedule

- Tomorrow:** CoE advisors discuss HQ programming
- Thur 6/30:** Biofuels group meets to envision CoE HQ labs
- July 6-8:** Initial programming workshop with full design team
- Fall 2005:** HQ construction begins  
5<sup>th</sup> Annual Syracuse Symposium on Environmental & Energy Systems  
October 24-25
- Fall 2006:** HQ opens
- Q1 2007:** HQ complete





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