Energy Research

at The State University of New York

Renewable & Alternative Fuels • Energy Production and Storage • Efficiency & Conservation

The State University of New York (SUNY), is the nation's largest comprehensive system of public higher education. SUNY researchers are leading the way to a smarter, more secure and cleaner energy future through innovative approaches to renewable and alternative fuels, energy production, and efficiency & conservation.

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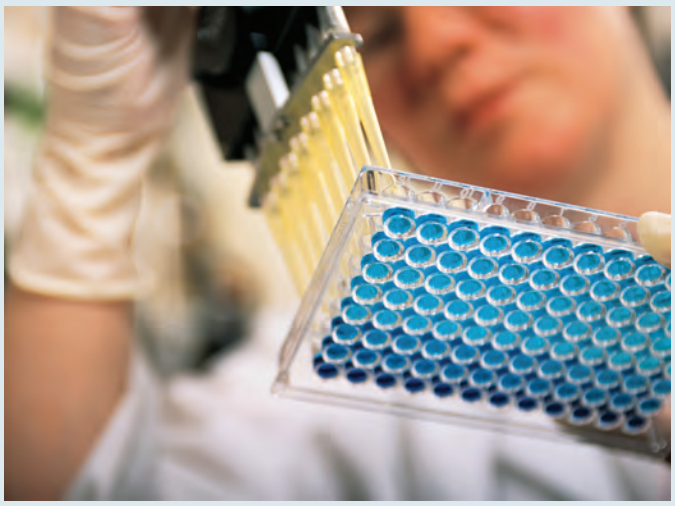

WHO WE ARE

The State University of New York (SUNY) is the nation's largest comprehensive system of public higher education. SUNY's 64 unique institutions offer more than 6,000 fields of study to over 414,000 students. SUNY conducts nearly $900 million in sponsored research annually and ranks in the top 15 U.S. institutions in patents issued each year.

WHAT WE ARE DOING

SUNY researchers are leading the way to a smarter, more secure and cleaner energy future through innovative approaches to renewable and alternative fuels, energy production, and energy conservation. Using state-of-the-art facilities and working with strategic partners, these researchers are exploring novel ways to decrease emissions and improve the environment, reduce dependence on foreign fuel, increase energy security, and boost economic development in New York State and across the country.

RENEWABLE/ALTERNATIVE FUELS

RENEWABLE AND ALTERNATIVE FUELS

SUNY researchers are exploring America's abundant natural resources as cheap, convenient and clean alternatives to traditional fossil fuels. Faculty research in renewable technologies, such as biomass, solar and wind seeks to apply plentiful, domestic resources to energy production with environmentally friendly applications.

- **Anaerobic Methane Digester** – Examining the effects on gas production with various animal and food waste input, particularly the quality of the methane as a fuel and its potential for use in an internal combustion engine.

  Contact: Mr. James VanRiper, SUNY Morrisville, (315) 684-6054, vanripjc@morrisville.edu

- **Biodiesel** – Developing efficient methods for producing biodiesel from vegetable oil.

  Contact: Dr. Matthew Bullwinkel, SUNY Canton, (315) 386-7091, bullwinkel@canton.edu

  Mr. Douglas Hammond, SUNY Cobleskill, (518) 255-5529, hammonds@cobleskill.edu

  Mr. James VanRiper, SUNY Morrisville, (315) 684-6054, vanripjc@morrisville.edu

- **Biohydrogen** – Exploring the use of photosynthetic bacteria in the production of hydrogen.

  Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

- **Biomass** - Using willow as a sustainable, alternative crop for the production of bioproducts, biofuels and bioenergy.

  Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

  Dr. Arthur Hurlbut, SUNY Canton, (315) 386-8601, hurlbut@canton.edu

- **Ethanol and butanol biofuel** – Using wood biomass to naturally and efficiently produce ethanol and butanol to extend gasoline.

  Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

  Dr. Larry Walker, NYS College of Agriculture & Life Sciences at Cornell University, (607) 255-2478, lpw1@cornell.edu

RENEWABLE/ALTERNATIVE FUELS

■ **Hydrogen economy** – Developing better performing distribution, storage and safety systems to accelerate the use of renewable hydrogen.

Contact: Dr. Pradeep Haldar, University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

Dr. Eric Cotts, Binghamton University, (607) 777-2217, ecotts@binghamton.edu

Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Dr. Jim Shelby, NYS College of Ceramics at Alfred University, (607) 871-2470, shelbyje@alfred.edu

Dr. Matt Hall, NYS College of Ceramics at Alfred University, (607) 871-3143, hallmm@alfred.edu

Dr. Devinder Mahajan, SUNY Stony Brook, (631) 632-8052 Devinder.mahajan@notes.cc.sunysb.edu

■ **Hydrogen from coal** – Using nanoparticles to develop membrane reactors that produce hydrogen from coal.

Contact: Dr. Carl R.F. Lund, University at Buffalo, (716) 645-2911 ext. 2211, lund@buffalo.edu

■ **Hydrogen from mixed gas streams** – Recovering and purifying hydrogen from other gases via absorption into hollow glass microspheres (HGMS).

Contact: Dr. Jim Shelby, NYS College of Ceramics at Alfred University, (607) 871-2470, shelbyje@alfred.edu

■ **Hydrogen from water** – Developing a low cost method for generating hydrogen from water.

Contact: Dr. Junghyun Cho, Binghamton University, (607) 777-2897, jcho@binghamton.edu

Dr. Eric Cotts, Binghamton University, (607) 777-2217, ecotts@binghamton.edu

Dr. Doreen Edwards, NYS College of Ceramics at Alfred University, (607) 871-2284, dedwards@alfred.edu

Dr. Scott Misture, NYS College of Ceramics at Alfred University, (607) 871-2348, misture@alfred.edu

■ **Hydrogen sensors** – Developing all-optical hydrogen sensors that can detect low levels of hydrogen concentrations.

Contact: Dr. Michael Carpenter, University at Albany, (518) 437-8685, mcarpenter@uamail.albany.edu

■ **New York Lieutenant Governor's Renewable Energy Task Force** – The Task Force will advise the governor's office on strategies to reduce dependence on fossil fuels.

Contact: Dr. David O. Carpenter, Task Force Member, SUNY Albany, (518) 525-2660, Carpent@uamail.albany.edu

■ **Solar energy** – Exploring the potential of chemical systems for the transformation of solar energy to chemical energy.

Contact: Dr. David F. Watson, University at Buffalo, (716) 645-6800 ext. 2154, dwatson3@buffalo.edu

Dr. David K. Geiger, SUNY Geneseo, (585) 245-5452, geiger@geneseo.edu

Dr. Matthew Bullwinkel, SUNY Canton, 315-386-7091, bullwinkel@canton.edu

■ **Synthesis gas** – Producing a renewable "syngas" from wood biomass as a fuel source for fuel cells and other systems currently using non-renewable natural gas.

Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

■ **Syngas Production from Biowaste** – Examining the production of clean energy from agricultural and municipal biowaste through the process of gasification.

Contact: Dr. Douglas Goodale, SUNY Cobleskill, (518) 255-5332, goodaldm@cobleskill.edu

ENERGY PRODUCTION AND STORAGE

Innovations developed by SUNY researchers in fuel cells and other efficient power generation technologies are helping to design a more sustainable future while reducing the nation's dependency on foreign sources of energy.

■ **Advanced batteries** – Developing batteries that combine high energy density with high charge and discharge capability at low cost and with long life.

Contact: Dr. M. Stanley Whittingham, Binghamton University, (607) 777-4623, stanwhit@binghamton.edu

Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Dr. Clare P. Grey, SUNY Stony Brook, (631) 632-9548, cgrey@notes.cc.sunysb.edu

■ **Advanced capacitors** – Developing capacitors that combine long life and low cost with very fast charge and discharge capabilities.

Contact: Dr. M. Stanley Whittingham, Binghamton University, (607) 777-4623, stanwhit@binghamton.edu

Dr. Seshu B. Desu, Binghamton University, (607) 777-2871, sdesu@binghamton.edu

■ **Energy Storage, Solar Cells and LED** –

Contact: Dr. Seshu B. Desu, Binghamton University, (607) 777-2871, sdesu@binghamton.edu

■ **Fuel cells** – Improving durability, cost effectiveness, performance and commercial viability of fuel cells.

Contact: Dr. Pradeep Haldar, University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

Dr. John Welch, University at Albany, (518) 437-4455, jwelch@uamail.albany.edu

Dr. C.J. Zhong, Binghamton University, (607) 777-4605, cjzhong@binghamton.edu

Dr. Nikolay Dimitrov, Binghamton University, (607) 777-4271, dimitrov@binghamton.edu

Dr. M. Stanley Whittingham, Binghamton University, (607) 777-4623, stanwhit@binghamton.edu

Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

Dr. Hazem Tawfik, Farmingdale State College, (631) 420-2307, hazem.tawfik@farmingdale.edu

Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Dr. Doreen Edwards, NYS College of Ceramics at Alfred University, (607) 871-2284, dedwards@alfred.edu

Dr. Scott Misture, NYS College of Ceramics at Alfred University, (607) 871-2438, misture@alfred.edu

Dr. Sanjay Sampath, SUNY Stony Brook, (631) 632-9512, Sanjay.sampath@sunysb.edu

Dr. Clare P. Grey, SUNY Stony Brook, (631) 632-9548, cgrey@notes.cc.sunysb.edu

Dr. Devinder Mahajan, SUNY Stony Brook, (631) 632-8052, Devinder.mahajan@notes.cc.sunysb.edu

■ **Recycled solar power tubes** – Developing a ceramic coating that can be used to refurbish failed solar collector tubes.

Contact: Dr. Doreen Edwards, NYS College of Ceramics at Alfred University, (607) 871-2284, dedwards@alfred.edu

Dr. William Carty, NYS College of Ceramics at Alfred University, (607) 871-2451, carty@alfred.edu

■ **Solar (photovoltaic) cells** – Developing a new generation of solar cell devices to achieve affordable, widespread and practical photovoltaic power generation.

Contact: Dr. Pradeep Haldar, University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

Dr. Paras N. Prasad, University at Buffalo, (716) 645-6800 ext. 2099, pnprasad@buffalo.edu

Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Mark Schneider, SUNY Delhi, (607) 746-4245, schneims@delhi.edu

Dr. Imin Kao, SUNY Stony Brook, (631) 632-8308, Imin.kao@sunysb.edu

Dr. Chad Korach, SUNY Stony Brook, (631) 632-1182, Chad.korach@stonybrook.edu

Dr. Charles Fortmann, SUNY Stony Brook, (631) 632-9343, Fortmann@ams.sunysb.edu

■ **Thermoelectric generators** – Using thin film multilayer structures to fabricate quantum well materials to recover waste heat from automobiles, furnaces etc.

Contact: Dr. Pradeep Haldar, University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

■ **Ultracapacitors** – Developing ultracapacitors (super-capacitor or electric double-layer capacitor (EDLC)) with higher energy and power density through innovative electrodes and electrolytes to bring significant benefits in both "peak-assist" and "power-assist" applications.

Contact: Dr. Pradeep Haldar, SUNY Albany, (518) 437-8686, phaldar@uamail.albany.edu

■ **Wind turbines** – Advancing wind turbine technology to generate power.

Contact: Asst. Prof. Michael Newtown, SUNY Canton, (315) 386-7219, newtownm@canton.edu

Mr. James VanRiper, SUNY Morrisville, (315) 684-6054, vanripjc@morrisville.edu

■ **Wood biomass** – Producing heat and electric power from agriculture and wood residues and wood biomass.

Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

Barbara Hein, COE in WATER at SUNY Delhi, (607) 746-4594, herinbg@delhi.edu

EFFICIENCY & CONSERVATION

SUNY researchers are designing new technologies and systems that aim to secure energy independence by increasing efficiency and decreasing usage.

■ **Advanced Power Electronics** – Developing cryo-cooled power amplifiers that are more efficient than current technologies.

Contact: Dr. Pradeep Haldar, University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

■ **Biodegradable plastics** – Using forest-derived bioproducts to produce biodegradable plastics that replace conventional, petroleum-based plastics.

Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

■ **Energy Economics** – Resource and Environmental Economics, Energy Economics, Public Economics

Contact: Dr. Zili Yang, Binghamton University, (607) 777-4726, zlyang@binghamton.edu

■ **Fuel and Emissions Sensors** – Chemical sensors compatible for operation within harsh combustion environments resulting in optimized efficiency and minimization of emissions.

Contact: Michael A. Carpenter, Ph.D., SUNY Albany, (518) 437-8686, www.albany.edu/wwwres/sensors

■ **Fuel efficiency** – Exploring the combustion process to design improved fuel injectors for diesel engines.

Contact: Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Dr. Lin-Shu Wang, SUNY Stony Brook, (631) 632-8342, Lin-shu.wang@stonybrook.edu

Dr. James Glimm, SUNY Stony Brook, (631) 632-8355, Glimm@ams.sunysb.edu

■ **Lighting technologies** – Designing new methods and materials to build the light emitting diodes (LED) required for cost effective solid-state illumination technologies.

Contact: Dr. Fatemeh (Shadi) Shahedipour-Sandvik, University at Albany, (518) 437-8686, sshahedipour@uamail.albany.edu

Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Dr. Michael Dudley, SUNY Stony Brook, (631) 632-8500, Michael.dudley@sunysb.edu

■ **Metal halide lamps** – Investigating next generation materials for metal halide lamps that offer higher efficiencies and longer lifetimes than standard incandescent lamps.

Contact: Dr. Matt Hall, NYS College of Ceramics at Alfred University, (607) 871-3143, hallmm@alfred.edu

Dr. Scott Misture, NYS College of Ceramics at Alfred University, (607) 871-2438, misture@alfred.edu

■ **Naturally-chilled H_2O** – Exploring potential for using water from the depths of Lake Ontario to cool City of Syracuse buildings.

Contact: Dr. Neil Ringler, SUNY ESF, (315) 470-6606, neilringler@esf.edu

■ **Next generation superconductors** – Developing high temperature superconductors that can save up to 20 percent of electrical output and has applications in motors, generators, transformers and fault current limiters.

Contact: Dr. Pradeep Haldar, University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

■ **OLEDS (organic light-emitting diodes)** –

Contact: Dr. Bahgat Sammakia, Binghamton University, (607) 777-6880, bahgat@binghamton.edu

■ **Residential home construction** – Designing and testing structures for minimal energy losses.

Contact: Prof. Richard Harrington, SUNY Delhi, (607) 746-4083, harrinre@delhi.edu.

Asst. Prof. Michael Newtown, SUNY Canton, 315-386-7219, newtownm@canton.edu

■ **Ride-sharing** – Developing an application using both internet and mobile phone technologies to connect communities to facilitate ride-sharing.

Contact: Dr. Brooke Singer, SUNY Purchase, (914) 251-6644, Brooke.Singer@purchase.edu

Prof. Peter Ohring, (914) 251-6678, peter.ohring@purchase.edu

■ **Self–cleaning windows and walls** – Exploring Titania (TiO_2), which is biologically and chemically inert, for use in self–cleaning windows and walls.

Contact: Dr. Junghyun Cho, Binghamton University, (607) 777-2897, jcho@binghamton.edu

■ **Solar energy resource management** – Development of satellite remote sensing methods for real-time monitoring of solar energy systems' impact on utility power grids, including outage migration and smart solar load management. This research will maximize use and growth of solar energy.

Contact: Dr. Richard Perez, SUNY Albany, (518) 437-8751, perez@asrc.cestm.albany.edu

FOCUSED FACILITIES

The **SUNY Center for Sustainable and Renewable Energy** located at the SUNY ESF, is a 64-campus research and development clearinghouse in the critical area of energy sufficiency and sustainability.

The Center is presently conducting research and demonstration in the following areas:

- renewable molten carbonate fuel cell operations
- photovoltaic power generation
- solar-fueled hydrogen generation
- biomass energy feedstock agroforestry production
- biomass feedstock production from New York's forest-products industry
- biomass combined heat and power sole-firing and co-firing with fossil fuels energy production
- biomass gasification for synthetic gas
- hydrogen extraction and biotechnical hydrogen production from biomass
- wood-based integrated biorefinary development
- commercial-scale cellulosic ethanol production

Contact: Dr. Edwin H. White, Director, (315) 470-6732, energycenter@esf.edu

The **Energy and Environmental Technology Applications Center (E2TAC)** was created in 1998 to support energy and environmental technology deployment through accelerated commercialization by leveraging partnerships between industry, government and university. It serves as an active expansion of the University at Albany's College of Nanoscale Science and Engineering (CNSE), a $4.2 billion, 450,000-square-foot facility that has attracted more than 250 global corporate partners. Through E2TAC, the College is contributing to technology development that leads to the integration of nanoelectronics and nanotechnology in advanced energy and environmental applications.

Technology Thrusts of E2TAC

- Energy Efficiency
- Ultracapacitors
- Thermoelectrics
- High-temperature Superconductors
- Power Electronics
- Photovoltaics
- Chemical Sensors
- Fuel Cells

E2TAC Education & Outreach Programs

- The College of Nanoscale Science and Engineering offers MS and Ph.D. programs with specializations in energy and environmental technologies.
- NY Loves Energy is designed to promote awareness of the advantages of starting, growing and building energy-related companies in New York State.
- The New York Fuel Cell Network is committed to the development of the fuel cell industry within New York State.
- Tech Valley Energy Forums
- New Energy Symposia
- In partnership with the New York Solar Energy Industries Association and several solar companies, E2TAC created the Solar Initiative of New York (SINY) to assist in raising awareness of the role of photovoltaics in New York.

Business Acceleration

E2TAC is a founding member of the National Renewable Energy Laboratory's Clean Energy Alliance (CEA).

Since 2000, E2TAC has provided guidance to small and start-up organizations in the form of business plan development, networking opportunities and partnerships.

The **National Institute for Sustainable Energy (NISE)** is a world-class center for zero energy and sustainability through a unique partnership with Albany architecture and design firm Einhorn Yaffee and Prescott Architects and Engineers (EYP). Through NISE, EYP and E2TAC collaborate to convert zero energy concepts and innovations into actual business opportunities and revenue-generating initiatives in established markets, including integrated building modeling and energy simulation, energy efficiency, new energy technology, and monitoring and control.

Research supports the development of skills and software necessary to simulate building envelope and system performance and energy consumption. This joint research evaluates and develops different control systems that allow the integration of existing energy sources with alternative energy sources such as wind power, photovoltaics, or photochromatic glass to develop zero energy facilities. This joint program provides leadership in defining and recommending specifications for implementation, advancing policy-relevant knowledge about the most important challenges of energy efficient design, use of clean energy technologies and other critical issues where energy, nanotechnology, environmental policy, and sustainability intersect.

New Energy New York is a consortium of over 40 New York energy-related technology organizations convened by E2TAC to expand and promote energy technology excellence in New York State. The consortium was created to pursue common technology initiatives to bring attention to the area's leadership on clean-energy resources, and provide benefits to each of the members through cooperation and coordination of marketing initiatives. In addition, the consortium promotes expanding economic development opportunities and placing New York State as an important focus of energy development in the nation.

Contact: Dr. Pradeep Haldar, Professor, College of Nanoscale Science and Engineering; Head, Nano-Engineering Constellation; Director, Energy and Environmental Technology Applications Center; University at Albany, (518) 437-8686, phaldar@uamail.albany.edu

The **Solar Energy Center** at Farmingdale State College conducts applied research to support solar products and systems. The Center is accredited as a "Training Institution" and "Continuing Education Institution" on Solar Energy by the Institute of Sustainable Power. This is the first such center to be accredited in the Northeast and the fourth in the entire United States. The Center has a vision to expand on other renewable energy technologies, such as wind and geothermal sources, and to establish a Regional Renewable and Alternate Energy Learning Center.

Contact: Prof. Yelleshpur Dathatri, Director, (631) 420-2450, y.n.dathatri@farmingdale.edu

The **Advanced Energy Research and Technology Center** (AERTC) headed by Stony Brook University, was announced last spring. Its mission will be identification of energy sources which ensure sustained, responsible economic development; encouragement of new investments in energy-related ventures, delivery of energy-related cost savings, and creation of new employment opportunities. It will also prepare New York for the business opportunities and challenges of a "new energy economy.

The AERTC has received a $35 million commitment from New York State to cover upfront costs for construction. The ceremonial groundbreaking took place October 16 on a new Platinum standard building that will host unique state of the art facilities on the cutting edge of energy research, as well as showcase advanced energy saving systems in architecture and design.

The center will promote research in five areas of focus, which leverage the participants expertise in nanotechnology and are aligned with recommendations from Department of Energy's NanoScience in Energy Summit:

- **Renewable energy:** Wind, water, geothermal, ocean, biomass; nanotechnology applied to make powerful photovoltaic cells
- **Hydrogen energy:** Generation, processing, storage; methane hydrate mining; nanotechnology applied to processing and storage
- **Fuel cells:** SOFC and PEM fuel cells; nanotechnology applied to catalytic particles for cell membranes
- **Conventional fuel optimization:** emissions-free coal-burning plants; LNG storage, transport, monitoring; nanotechnology applied to LNG delivery and to SOx / NOx filtration
- **Energy conservation:** high-efficiency experimental houses; computational techniques to optimize power grid

Stony Brook University has extensive experience in nanotechnology and energy research; having received $325 million in research funding from government and private industry. Stony Brook has fostered coordinated research and academic programs across NY universities. In particular Stony Brook is under contract for nanotechnology research at Argonne National Laboratory, National Institute of Standards and Technology (NIST), and Lawrence Berkeley National Laboratory (LBL) and is a major partner in the Center for Functional Nanomaterials at Brookhaven National Laboratory.

Brookhaven National Laboratory (BNL) managed by Stony Brook for DOE is a multi-program national laboratory operated by Brookhaven Science Associates for the U.S. Department of Energy (DOE). Its role for the DOE is to produce excellent science and advanced technology with the cooperation, support, and appropriate involvement of our scientific and local communities. The fundamental elements of the Laboratory's role in support of the four DOE strategic missions are the following:

- To conceive, design, construct, and operate complex, leading edge, user-oriented facilities in response to the needs of the DOE and the international community of users.
- To carry out basic and applied research in long-term, high-risk programs at the frontier of science.
- To develop advanced technologies that address national needs and to transfer them to other organizations and to the commercial sector.
- To disseminate technical knowledge, to educate new generations of scientists and engineers, to maintain technical capabilities in the nation's workforce, and to encourage scientific awareness in the general public.
- high-efficiency experimental houses; computational techniques to optimize power grid

The AERTC will also sponsor outreach and education initiatives (conferences, workforce training, public outreach workshops, summer research for high school students, teacher courses)

An integral part of the AERTC mission is to explain energy policy and emerging technologies to the public. The center will also sponsor numerous outreach activities which include national and international conferences on energy related research, workshops to inform the public of energy issues, workforce training courses, advanced degree programs, distance learning certificates, outreach to schools through special programs designed for k-12 teachers and their students, and interfacing with museum, libraries, and other public information forums.

Contact: Dr. Ann-Marie Scheidt, SUNY Stony Brook, (631) 632-7006, amscheidt@notes.cc.sunysb.edu

Community Colleges and Energy Initiatives

The State University of New York is composed of 64 campuses; four University Centers: Albany, Binghamton, Buffalo and Stony Brook; technology campuses; comprehensive four-year colleges and 30 community colleges. As you have seen in this brochure, the vast majority of energy research is conducted at either our University Centers or our other upper division institutions. What this insert will demonstrate is how SUNY community colleges are not only educating the next generation of the workforce in energy conservation, but are actively engaged in conservation on their individual campuses. Some of our graduates will transfer into a university center or one of our four-year colleges to further their education, but a large number of students will go directly into the workforce to install and repair some of the most technologically advanced energy conservation equipment in today's homes and businesses.

Below are some examples of what is happening in the areas of conservation and workforce training on several of our distinguished community college campuses.

Cayuga Community College

Cayuga Community College administrators are in discussion with local Oswego generating plants about training their next-generation technician workforce, given the impending retirement wave of the next several years, and their next-generation security workforce. We are working with SUNY Oswego and the private sector on the first stages of a comprehensive federal grant that would address these issues. One hallmark is the collaborative approach among Cayuga, SUNY Oswego, the private sector, and the workforce development entities. Cayuga is helping to underline the role of the community colleges, to take the results of the basic research and to help with their practical application with business and industry.

Contact: Pam Freeman, Director of Publications & Communications, (315) 255-1743 ext. 2210, freeman@cayuga-cc.edu

Dutchess Community College

Dutchess Community College has been active in this field for a number of years and in 2003 was awarded the EPA Leadership Energy Award – the first community college in the country to receive this honor.

Current activity involves work with Johnson Controls for a three phase Performance Contract to investigate opportunities for energy savings and implement recommendations funded from these savings. Projects include:

- Replacing a 500 ton electric chiller with two natural gas engine driven chillers and saved in 2006 $18,000, the equivalent of 80,100 kwh of electricity.
- Implementing a Campus Wide Energy Management system allowing for scheduling, nighttime setbacks, economizer controls, and the optimization of equipment operation.
- Installing Variable Speed Drives on the chilled water pumps and air handlers for a savings in 2006 of 274,000 kwh.
- Replacing antiquated oil fired boilers with a geothermal system to heat and cool the Bowne Hall that will result in the energy savings of 37%.
- Upgrading lighting to energy efficient fixtures and installed occupancy and photo-sensors resulting in an average savings of $42,000 per year.
- Changing restroom fixtures to water conserving units.
- Retro-fitting laboratory hoods to reduce the amount of conditioned air exhausted and installing a heat recovery loop to preheat intake air coming into the building.
- Connecting Dutchess Hall to the Hudson Hall heating plant to take advantage of existing excess capacity, replacing two antiquated oil fired boilers.

Contact: Bridgette Anderson, Associate Dean of Administration Campus Facilities and Safety, 845-431-8655, banderso@sunydutchess.edu

Hudson Valley Community College

Hudson Valley Community College has been carrying out a broad program of energy initiatives both on campus and in the classroom. Examples of energy related courses include those covering the theory, design, installation and maintenance of photovoltaic systems, as well as inquiry into the range of alternative fuels.

Contacts: Joseph Sarubbi, Hudson Valley Community College, (518) 629-7275, sarubjoe@hvcc.edu

Anthony Kossmann, Hudson Valley Community College, (518) 629-7272, kossmant@hvcc.edu

Monroe Community College

Green Buildings: MCC is pursuing LEED (Leadership in Energy and Environmental Design) certification for two buildings currently under construction – the Wolk Center for Excellence in Nursing Education and the PAC Center, a recreational and athletic facility — and is committed to doing so for all future construction projects. LEED certification involves following stringent energy conservation standards, and using recycled materials in the construction as well as recycling materials from the construction.

On the Brighton Campus, MCC established a co-generation plant in 2004 which conserves significant energy by producing electricity and using the plant's waste heat to lower fuel costs for heating and air conditioning.

Contact: David Schottler, Associate Vice President, Administrative Services, (585) 292-2814, dschottler@monroecc.edu

Curricular Programs: The MCC Agriculture and Life Sciences Institute advocates on issues relating to land use, offers marketing education and provides academic instruction for existing and future agribusiness professionals, such as farmers, winery operators and employees of companies involved in renewable energy resources, etc. as well as landowners to apply knowledge to their specific area of interest.

Contact: Dr. Bob King, Director, (585) 753-3789, rking@monroecc.edu

A certificate program in sustainability is in the development phase at MCC. Rather than focusing on one particular area of concern, the MCC certificate in sustainability is designed to provide students with a broad understanding of the issues, topics, and disciplines that sustainability encompasses. Its objectives are three fold: to introduce students to the ways that different disciplines affect and are affected by the field of sustainability; to help students understand the complex web of cause and effect that interconnects those disciplines; and to connect an understanding of sustainability to larger issues of energy, the environment, social and economic justice, agriculture, etc.

Contact: Stuart Blacklaw, Dean of Curriculum and Program Development, (585) 292-2189, sblacklaw@monroecc.edu

Co-curricular Programs: A grassroots coalition of MCC employees and students have established the MCC Sustainability Committee, whose mission is to promote sustainability on campus and in the Rochester community by raising awareness, educating, and effecting positive change. Their initiatives include college participation in National Campus Sustainability Day (October 24), including hosting of a national web cast "Building a Durable Future: Community, the Campus, and Deep Economy" and a panel discussion on sustainability, which will cover topics such as energy conservation, agriculture, fair trade, and ecology. Other projects include educational sessions, lectures regarding sustainability, and an ongoing collaboration with the Agriculture and Life Sciences Institute in order to promote local agriculture.

Contact: Matt Fox, Assistant Professor, Transitional Studies, (585) 292-3138, mfox@monroecc.edu

Rockland Community College

Rockland Community College has a number of efforts under way to raise awareness, promote energy efficiency and implement green initiatives on campus which include innovative conservation efforts such as use of rain barrels for landscaping, operating a zero waste building, using compostable consumables in the cafeteria and waterless urinals for the bathrooms.

Educating the campus has become a priority and is conducted through continuous communication such as: monthly "eco-blurbs" and posters to the community; moving beyond just recycling to re-using and reducing; publicizing successes, demonstrated by a decrease in recyclables without an increase in trash with a savings of over $33,000 in the last 6 years in avoided disposal costs and earnings of over $10,000 in cash rebates.

Other programs involve organic gardening, recycled materials purchasing, reusable office supplying exchange, solar energy use, xeriscaping and operation of Rockland County's first certified "Green Building".

Contact: Lorinda Hill, Rockland Community College, (845) 574-4524, lgussow@sunyrockland.edu

Sullivan County Community College

Sustainability has taken on increased emphasis at **Sullivan County Community College** over the years. The college has had a geothermal system in place since 2002 to provide heat and air conditioning for the campus community. In addition, it has offered a variety of in-person and online "green" seminars and classes. In 2007, the faculty adopted a water-based academic theme, further strengthening the college's commitment to providing educational, cultural and social activities that reflect the importance of green thinking. That same year, SCCC entered into an energy performance contract that guarantees to save it more than $1 million in costs.

With an eye to the future, SCCC has plans for a new Center for Advanced Sciences and Technology (CAST) building. The CAST building will be home to both existing and new health sciences, science and green technology educational programs, as well as incorporating state-of-the-art sustainable features into its design. In addition, the building will be located adjacent to a planned Green Technology Commercial Park featuring a shovel-ready site for light industrial manufacturers and distributors of green building projects. Together these projects form a collaborative and cutting-edge approach that links sustainable learning with business in a first-of-its-kind undertaking to be located on a New York college campus.

Contact: Jennie Donohue, Sullivan County Community College, (845) 434-5750 ext. 4351, jdonohue@sullivan.suny.edu

Adirondack Community College, 640 Bay Road, Queensbury, New York 12804, (518) 743-2237, www.sunyacc.edu

Broome Community College, P.O. Box 1017, 907 Front Street, Binghamton, New York 13902, (607) 778-5100, www.sunybroome.edu

Cayuga County Community College, 197 Franklin Street, Auburn, New York 13021, (315) 255-1743 x2208, www.cayuga-cc.edu

Clinton Community College, 136 Clinton Point Drive, Plattsburgh, New York 12901, (518) 562-4100, www.clintoncc.suny.edu

Columbia-Greene Community College, P.O. Box 1000, 4400 Route 23, Hudson, New York 12534-0327 (518) 828-4181, www.sunycgcc.edu

Corning Community College, 1 Academic Drive, Corning, New York 14830, (607) 962-9232, www.corning-cc.edu

Dutchess Community College, 53 Pendell Road, Poughkeepsie, New York 12601, (845) 431-8979, www.sunydutchess.edu

Erie Community College, City Campus, 121 Ellicott Street, Buffalo, New York 14203, (716) 851-1200, www.ecc.edu

Fashion Institute of Technology, 227 West 27th Street, New York, New York 10001, (212) 217-7660, www.fitnyc.edu

Finger Lakes Community College, 4355 Lakeshore Drive, Canandaigua, New York 14424, (585) 394-3500, ext. 7201, www.fingerlakes.edu

Fulton-Montgomery Community College, 2805 State Highway 67, Johnstown, New York 12095-3790, (518) 736-5310, www.fmcc.edu

Genesee Community College, 1 College Road, Batavia, New York 14020, (585) 345-6812, www.genesee.edu

Herkimer County Community College, 100 Reservoir Road, Herkimer, New York 13350-9987, (315) 866-0300 x8261, www.herkimer.edu

Hudson Valley Community College, 80 Vandenburgh Avenue, Troy, New York 12180, (518) 629-4530, www.hvcc.edu

Jamestown Community College, P.O. Box 20, 525 Falconer Street, Jamestown, New York 14702-0020, (716) 665-5220, www.sunyjcc.edu

Jefferson Community College, 1220 Coffeen Street, Watertown, New York 13601, (315) 786-2404, www.sunyjefferson.edu

Mohawk Valley Community College, 1101 Sherman Drive, Utica, New York 13501, (315) 792-5333, www.mvcc.edu

Monroe Community College, 1000 East Henrietta Road, Rochester, New York 14623, (585) 292-2100, www.monroecc.edu

Nassau Community College, 1 Education Drive, Garden City, New York 11530-6793, (516) 572-7205, www.sunynassau.edu

Niagara County Community College, 3111 Saunders Settlement Road, Sanborn, New York 14132, (716) 614-5902, www.niagaracc.suny.edu

North Country Community College, P.O. Box 89, 23 Santanoni Avenue, Saranac Lake, New York 12983-0089, (518) 891-2915, www.nccc.edu

Onondaga Community College, 4941 Onondaga Road, Syracuse, New York 13215, (315) 498-2211, www.sunyocc.edu

Orange County Community College, 115 South Street, Middletown, New York 10940, (845) 341-4700, www.orange.cc.ny.us

Rockland Community College, 145 College Road, Suffern, New York 10901, (845) 574-4138, www.sunyrockland.edu

Schenectady County Community College, 78 Washington Avenue, Schenectady, New York 12305, (518) 381-1304, www.sunysccc.edu

Suffolk County Community College, 533 College Road, Selden, New York 11784, (631) 451-4736, www.sunysuffolk.edu

Sullivan County Community College, P.O. Box 4002, 112 College Road, Loch Sheldrake, New York 12759-4002, (845) 434-5750, www.sullivan.suny.edu

Tompkins Cortland Community College, 170 North Street, P.O. Box 139, Dryden, New York 13053-0139, (607) 844-8222, www.sunytccc.edu

Ulster County Community College, Cottekill Road, Stone Ridge, New York 12484, (845)687-5000, www.sunyulster.edu

Westchester Community College, 75 Grasslands Road, Valhalla, New York 10595, (914) 606-6780, www.sunywcc.edu

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