



SARATOGA TECHNOLOGY + ENERGY PARK

NEXT STEP

A periodic update on the
Saratoga Technology + Energy Park

December 2007 • Issue 5



PAUL D. TONKO
PRESIDENT AND
CEO – NYSERDA

NEW BUILDING AT STEP

The United Group will soon be opening its 105,000-square-foot, LEED®-rated building for light manufacturing, laboratory, and multi-tenant office space in STEP. LEED refers to the United States Green Building Council's Leadership in Energy and Environmental Design.

NYSERDA President and CEO, Paul D. Tonko, said "We, as a State, have an opportunity to lead the nation. We are leading by example." Tonko indicated that new buildings at STEP will contribute to reaching Governor Eliot Spitzer's goal of reducing electricity consumption in New York by 15% by 2015.

continued on page 4

“The New York State Energy Research and Development Authority (NYSERDA) supports clean-energy initiatives that foster economic development, reduce New York's carbon footprint, and ensure a secure energy future. The Saratoga Technology + Energy Park (STEP) is a hub of clean-energy and environmental technology companies, dedicated to researching and developing innovative technologies and services that are helping to bring us closer to energy independence. A growing knowledge-based community, STEP distinguishes itself from other locations through collaboration of companies, resources, and ideas in the heart of New York's Tech Valley.**”**

IN THIS ISSUE

- 1 A message from NYSERDA President and CEO Paul D. Tonko
- 1 New Building at STEP (cont. pg.5)
- 2 Palladium Equity Partners Makes Commitment to Starfire Systems
- 2 STEP Website – Jobs at STEP
- 3 HVCC announces TEC-SMART
- 5 News at STEP
- 5 Alternative Fuel Vehicle Research Laboratory at STEP
- 6 NASA Award for AEC
- 7 ecoPower – AEC Subsidiary
- 7 NYSERDA Funding Opportunities
- 8 Linc – Lighting Cultivator, Inc.
- 8 NYSERDA's Partnership with CEG



NEW BUILDING AT STEP The new 107 Hermes Road is LEED®-rated.

PALLADIUM EQUITY PARTNERS MAKES COMMITMENT TO STARFIRE SYSTEMS

Palladium Equity Partners, LLC, a New York-based private equity firm, and **Starfire Systems, Inc.**, announced that Palladium has committed to invest up to \$10 million in Starfire through the acquisition of preferred stock in a private placement. Palladium's investment will provide growth capital for Starfire and the private equity firm will be Starfire's largest institutional investor.

NYSERDA President and CEO, Paul D. Tonko, said "Starfire is a prime example of a small company achieving growth and success through public and private partnerships, and we at NYSERDA are extremely pleased to see Starfire receive such great support from Palladium. This investment will help Starfire continue to succeed and complement the Governor's efforts to promote the manufacturing of clean-energy and environmentally friendly technologies and enhance economic development in upstate New York."

Palladium Equity Partners, LLC, is an investment firm targeting companies in financial and business services, consumer/retail, food/restaurants, healthcare, manufacturing, and media. Palladium's principals have invested over \$2.5 billion of equity in more than 50 portfolio companies during the last two decades. Formed in 1997, Palladium currently has capital under management in excess of \$7 million.

Peter A. Joseph, a managing director of Palladium, said "Starfire's nanostructured advanced ceramics position the Company

to benefit from trends in the aerospace, automotive, electronics, energy, and other manufacturing industries where advanced materials are central to growth and innovation. Under the leadership of Richard Saburro, Starfire's president, and his team, the Company has emerged as a provider of adaptable, light-weight ceramic products that have superior strength and durability. Starfire products offer innovative alternatives to conventional materials, enabling customers to realize reduced costs with more flexible design capability. We are delighted to make this commitment in support of the growth and success of an excellent New York-based company."



STARFIRE SYSTEMS Starfire Systems, Inc., located at STEP and a key tenant in the new building, is the leading global developer and manufacturer of break-through nanostructured ceramic materials and finished products. Starfire is pioneering nanostructured ceramics in key markets for transportation, aerospace, electronics, and others.

Starfire President and CEO, Richard Saburro, said "Palladium brings both capital and manufacturing experience to Starfire at a crucial time as we expand our operations in a new facility and introduce groundbreaking new products to the industries we serve. Palladium will be a valuable addition to our team at STEP which, under NYSERDA's leadership, has provided strong support for Starfire's growth and development. We look forward to working with Palladium, NYSERDA, and STEP as we continue to develop a leadership position in the advanced ceramics industry, worldwide."

Saratoga Technology + Energy Park
10 Hermes Road
Malta, NY 12020

For information about STEP, please contact Linda Miller
518.862.1090, ext. 3286
lmm@nyserda.org

step.nyserda.org

step@nyserda.org

State of New York

Eliot Spitzer, Governor

New York State Energy Research and Development Authority

Vincent A. Delorio, Esq., Chairman
Paul D. Tonko, President and CEO

STEP is owned and operated by NYSERDA on behalf of the State of New York.

NYSERDA



New York State Energy Research and Development Authority

17 Columbia Circle
Albany, NY 12203-6399

toll free 1-866-NYSERDA
local 518.862.1090

www.nyserda.org
step.nyserda.org

STEP WEBSITE – JOBS AT STEP

Staff members from the Economic Development Unit of NYSERDA have developed "Jobs at STEP," an exclusive amenity to allow STEP companies to place current job postings for employees, internships, and consultants on the STEP Website. For a good look at the employment picture at STEP, please visit:

www.getenergysmart.org/eBusiness/jobs@STEP.do



HUDSON VALLEY COMMUNITY COLLEGE ANNOUNCES TEC-SMART – A TRAINING AND EDUCATION CENTER AT STEP

On September 13, Hudson Valley Community College (HVCC) announced its intention to build a workforce education and training center for high-tech and alternative-energy jobs at STEP.

TEC-SMART, the Training and Education Center for Semiconductor Manufacturing and Alternative and Renewable Technologies, is designed to expand the clean-energy workforce in New York State. To keep up with industry employment needs, TEC-SMART will need to train between 500-600 technicians in the next five to 10 years. In partnership with NYSERDA, other local and state agencies, and industry experts, HVCC will spearhead, coordinate, and develop educational and training programs to ensure TEC-SMART produces skilled technicians ready to meet growing workforce demands for high-tech industry.

As announced by New York State Senate Majority Leader Joseph L. Bruno, State funding of \$13.5 million will be provided for the 35,000 square-foot TEC-SMART, which will include a clean room for semiconductor manufacturing training and facilities for training installation technicians. TEC-SMART is designed to



TEC-SMART AT STEP In September, Hudson Valley Community College announced its intention to build TEC-SMART – the Training and Education Center for Semiconductor Manufacturing and Alternative and Renewable Technologies at STEP.

train some of the 1,200 workers who will work at Advance Micro Devices' planned \$3.2 billion facility. TEC-SMART staff will work with other facilities expected to locate in the region with the explosion of the local semiconductor industry. Chip fabs require technicians to operate sophisticated manufacturing tools and clean-room equipment; skills that can be learned in a two-year degree program.

NYSERDA President and CEO Paul D. Tonko said, "NYSERDA looks forward to having Hudson Valley Community College as a member of the growing STEP community. HVCC will play an

important role at STEP and in the State, providing education and training for New York's future high-tech workforce. Services in this field are increasingly in demand due to the new and innovative clean-energy technologies and services that are entering the marketplace. STEP, a knowledge community, will support that growth with the help of TEC-SMART and through collaboration of companies, resources, and ideas in the heart of New York's Tech Valley."

Construction of the facility is expected to begin in the spring of 2008.



TEC-SMART ANNOUNCED

Hudson Valley Community College announced its intention to build a workforce education and training center for high-tech and alternative-energy jobs at STEP. At the podium, Robert G. Callender, Vice President for Programs at NYSERDA, welcomed New York State Senate Majority Leader Joseph L. Bruno (right); Hudson Valley Community College President Andrew J. Matonak, Ed.D.; and Hudson Valley's Joseph Sarubbi, Department Chairperson - School of Engineering and Industrial Technology, HVCC (left).

THE UNITED GROUP'S NEW BUILDING AT STEP

continued from page 1

This facility, developed by the United Group, will be home to:

- **Starfire Systems, Inc.** – Starfire is redefining advanced material solutions with nanostructured ceramic-forming polymers and silicon-carbide polymer development and applications, including brakes, high-temperature coatings, adhesives, and filters.
- **Building Performance Institute, Inc. (BPI)** – BPI supports the development of a highly professional building performance industry through individual and organizational credentialing and rigorous quality assurance programs.
- **Center for Economic and Environmental Partnerships, Inc. (CEEP)** – CEEP provides opportunities for collaborative efforts to promote development of sound economic and environmental policies and programs.

CEEP will administer executive suite space at STEP.

- **North American Board of Certified Energy Practitioners, Inc. (NABCEP)** – NABCEP supports and works with renewable energy and energy-efficiency industries, professionals, and stakeholders to develop and implement quality credentialing and certification programs for practitioners.
- **groSolar** – groSolar is a leading national distributor and installer of solar energy systems for both residential and commercial installations
- **Lockheed Martin** is an advanced technology company that is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services.

- **The Center for Economic Growth (CEG)** – CEG is a regional economic and business development organization dedicated to attracting high-tech talent and companies to New York's Capital Region. CEG offers assistance with company assessments, business acceleration and planning, lean manufacturing, quality manufacturing, business development, safety, and the identification of partners and grants.
- **Linc** – is a non-profit corporation that fosters economic development and the commercialization of energy-efficient lighting products in New York State.
- **Electrovaya, Inc.** – Electrovaya develops and manufactures rechargeable battery products that use its lithium-ion Superpolymer® battery technology, such as the Scribbler PC.



STEP KEEPS GROWING The first new building at STEP, developed by the United Group, will be home to a number of clean-energy and environmental technology companies. Site work has continued through fair weather and snow.

Construction photos by Kevin Hunt

NEWS AT STEP

TIMBER HARVEST #4

This winter, NYSERDA will conduct its fourth timber harvest, covering +/- 40 acres on the west side of Hermes Road, extending from above the ravine south to the property line with Luther Forest Technology Campus. This area contains primarily red pine. The ravine, however, will not be harvested.

Lighting

Naomi Miller of Naomi Miller Lighting Design was contracted to create the exterior lighting plan at STEP. The plan was approved by both NYSERDA and the Malta Planning Board.

The lighting plan considers many factors, such as reducing or eliminating glare and light trespassing, requires the use of direct cut-off fixtures, and uses environmentally friendly materials.

Lighting will be found at intersections throughout STEP and along the pathway following Hermes Road; lights will be installed late this year. Pathway lights will be on a timer, not on all night.

Signage

Earlier this year, NYSERDA contracted with LandWorks, a Vermont-based company specializing in signage and wayfinding. LandWorks' tasks are to create a user-friendly system for visitors to find their way around STEP, and to create an entire signage system.

This past spring, a signage charrette was led by David Raphael of LandWorks.

A number of good ideas resulted from that meeting. Recently, the first conceptual plans were provided to NYSERDA for review. In the coming months NYSERDA and the charrette team will be provided with drawings of the various sign types.

Outdoor Accessories

In an effort to provide a uniform look at STEP, NYSERDA contracted with Saratoga Associates to research, identify and provide specifications for a number of site accessories to be used throughout the Park. Those items include bike racks, picnic tables and chairs, benches, and urns for cigarette disposal. Saratoga Associates also provided gazebo sketches. Next spring, a gazebo will be installed overlooking the second ravine; a handicap-accessible path from Hermes Road will be constructed.

Infrastructure

Those who work at STEP can attest to the fact that things were torn up this past summer. However, much has been accomplished:

- Roads have been completed
- Water, sewer, gas, and electric have been extended into Phase I
- The sewer pump has been installed and connected to the sewer lines and power
- Most of the landscaping has been completed

The Saratoga Technology + Energy Park's Phase I is now open for business.



ALTERNATIVE FUEL VEHICLE RESEARCH LABORATORY AT STEP

STEP has been selected as the location for the New York State Department of Environmental Conservation (DEC) state-of-the-art Alternative Fuel Vehicle Research Laboratory.

The Lab is in the final design stage, and will have only two other comparable counterparts in the country. This facility will be available to STEP companies when it is not in use by researchers at DEC.

Additionally, Hudson Valley Community College (HVCC) is planning to offer automotive workforce development courses at this facility.



COMMITMENT TO GREEN SPACE

One of the commitments made by NYSERDA was to maintain 77% green space at STEP. All new construction will maintain as small a footprint as possible. Buildings will meet or exceed LEED requirements. Photo by Kevin Hunt

NASA AWARD FOR ADVANCED ENERGY CONVERSION

In April, STEP company Advanced Energy Conversion, LLC (AEC) won a prestigious prize for its integrated motor/pump. AEC's integrated motor/pump was selected from more than 1,000 entries to win the Grand Prize in the Emhart-NASA Tech Briefs "Design the Future" contest. The prize, a 2007 Toyota Prius hybrid, was awarded at a ceremony in New York City.

In conventional electrically driven pumps, the pump and motor are each contained within its own housing and connected through a shaft. The AEC integrated pump provides for the dual use of parts by integrating the rotor of the electric motor with the impeller of the pump in a common housing.

In addition, substantially improved fluid handling performance is achieved from the controllable flow capability inherent in the pump design. The tight coupling between the motor and the pump will facilitate substantial changes in how fluid handling systems are implemented.

The patented AEC integrated motor/pump design includes the following elements:

- A power dense electric motor that is efficient and capable of controlled

operation over a wide speed range

- Substantially improved thermal performance of the electric motor due to direct liquid cooling of the windings
- Reduced physical size by combining the motor and the pump in a single housing
- Reduced motor size by putting the windings in close contact with the fluid. The heat in the windings is efficiently removed, thereby reducing the physical size of the motor, bringing it into line with the size of the pump.



**Advanced
Energy
Conversion**

- Reduced part count by virtue of component integration
- Improved reliability
- Reduced manufacturing cost.

This innovative design uses 30 to 40% fewer parts and is more compact, more efficient, and less expensive than traditional designs. Additional benefits can also be realized in specific applications.

For example, in vehicle cooling systems:

- Radiator size can be reduced through better thermal performance from the controlled flow pump
- Parasitic energy losses are reduced by the elimination of the coolant system drive belts
- Smaller bearings can be used with reduced wear through the elimination of side loads for the electrically driven pump relative to belt-driven pumps

Initial funding for the integrated motor/pump was provided in part by the New York State Energy Research and Development Authority (NYSERDA) and the United States Department of Energy.

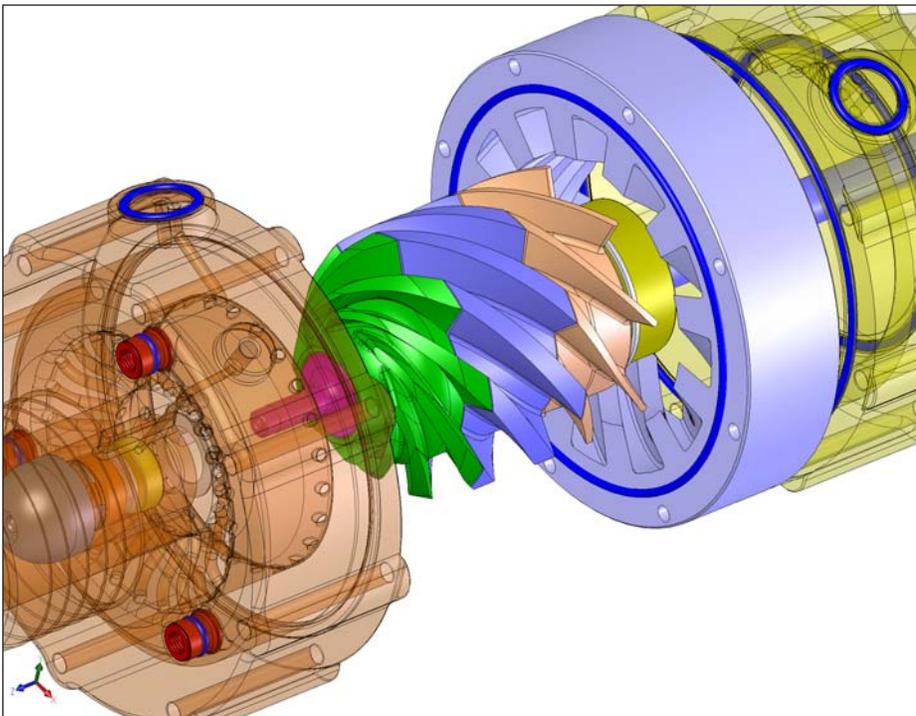
AEC is now in discussions with several companies interested in taking advantage of the integrated motor/pump's features for a wide variety of applications, ranging from vehicle cooling systems, to swimming pool circulating pumps and HVAC systems. AEC is also exploring use of this technology as an integrated turbine/generator for capturing energy that would otherwise be wasted in industrial processes, wastewater systems, and public water supplies.

About Advanced Energy Conversion

AEC is an engineering company with expertise in developing systems solutions using power electronics, embedded controls, and mechatronics. Founded in 1997, AEC grew out of the electric power engineering program at Rensselaer Polytechnic Institute, Troy, New York. AEC finds solutions to market-based problems by improving energy efficiency, reducing emissions, and increasing functionality. AEC is located at STEP.

AEC TAKES THE NASA GRAND PRIZE

AEC's integrated motor/pump was selected from more than 1,000 entries to win the Grand Prize in the Emhart-NASA Tech Briefs "Design the Future" contest. This innovative, integrated motor/pump uses 30 to 40% fewer parts and is more compact, more efficient, and less expensive than traditional designs. Solid model rendering by Al Smith.



ECOPOWER – AEC SUBSIDIARY

ecoPower, LLC, a wholly owned subsidiary of Advanced Energy Conversion, LLC (AEC), was created in response to opportunities created by developments in the energy markets.

The goal of ecoPower is to drive company revenues and profits by developing and bringing to market, proprietary products based on the expanding technology portfolio being generated by AEC's contractual R&D activities. Currently, the first product created by ecoPower – the innovative ecoJoule™ 2500 inverter, which is used in solar installations – is being introduced to the market.

AEC's activities are composed of two separate business units: the Contract Engineering Division and ecoPower, the Products Division. The Contract Engineering Division has served to generate a base of revenue for the AEC, as well as to expand a portfolio of proprietary technology and patents. It also has provided AEC with a well respected

reputation for technical expertise and performance reliability in the marketplace.

The other half of AEC, the Contract Engineering Division, provides State and federal government clients, as well as leading corporate clients, with consulting and contract R&D work in energy conversion applications. Such clients include: Sandia National Laboratories/ American Electric Power; U.S. Department of Energy; Dana Corporation; NYSERDA/ Niagara Mohawk Power Corporation; Eastman Kodak; General Motors; Railpower Hybrid Technologies; Vairex Corporation; Espey Electronics & Manufacturing Corporation; Lockheed Martin; and the U.S. Navy, among others.



IMPROVING ENERGY EFFICIENCY, REDUCING EMISSIONS, AND INCREASING FUNCTIONALITY

ecoPower's first product introduction is the innovative ecoJoule™ 2500 inverter, which is used in solar installations where partial shade may occur.
Photo by Donna Vlahos Abbott

NYSERDA FUNDING OPPORTUNITIES

Renewable, Clean Energy, and Energy Efficiency Product Manufacturing Incentive Program

– PON 1176 This solicitation is designed to expand the level of renewable, clean energy, and energy efficient product manufacturing in New York by offering an incentive for building a manufacturing plant and subsequently producing clean energy products in New York State.

Clean Energy Business Growth and Development

– PON 1124 NYSERDA will partner with companies to reduce the financial and market risk of commercializing innovative technologies, supporting entrepreneurial enterprise, and implementing new business models that will enable adoption and diffusion of clean-energy technologies.

Clean Energy Technology Manufacturing Incentive Program

– PON 1115 NYSERDA invites proposals for the Clean Energy Technology Manufacturing Incentive Program to expand the level of manufacturing of clean energy technology products in New York.

Development at the Saratoga Technology + Energy Park (STEP)

– PON 1116 NYSERDA invites proposals from business entities or developers (Company, Developer, or collectively, Applicant) seeking to construct a building and related improvement at STEP in the Town of Malta, Saratoga County, New York.

Industrial Process & Product Innovation (IPPI)

– PON 1190 The program will support research, development, demonstration, commercialization and deployment of energy-efficient products targeted at industrial applications and innovative and underused manufacturing process improvements.

For more information, visit www.nysERDA.org/funding

LINC – LIGHTING CULTIVATOR, INC. AT STEP

Linc, a non-profit corporation was established by NYSERDA to foster the economic development and commercialization of energy-efficient lighting products in New York State. Linc's charge is to cultivate collaborations among lighting businesses, researchers at RPI's Lighting Research Center, and the investment community, and to increase research and development dollars invested in New York State.



Linc stands for "Lighting Cultivator, Inc.," and its name is intended to highlight the critical importance of building connections among the research, business, and financial communities to bring new, innovative lighting products to market. Linc offers introductions to potential business partners and investors, technical lighting design and evaluation services, and assistance in securing public funding.

Linc will employ outreach and networking efforts to establish a lighting innovation presence at STEP, in the State, and in the nation. It will nurture small and mid-sized companies by seeking innovative

light-related intellectual property from many sources, identifying funding opportunities, and providing business and marketing services.

In 2004, NYSERDA funded the Lighting Research Center (LRC) to develop a feasibility and business plan for a sustainable incubator program to help small New York-based start-up companies commercialize innovative lighting technologies.

The LRC solicited the involvement of key players in the lighting industry to serve on a study advisory board. In 2006, that board recommended that a lighting incubator be established in New York State in collaboration with NYSTAR, STEP, the LRC and the lighting industry.

Linc will establish a field office at STEP, will operate as a virtual incubator by establishing a presence throughout New York State, and will work with the LRC to provide consulting services to its clients under the Lighting Technology Greenhouse (LTG) Program. Linc and the LTG Program will work collaboratively to provide business, financial and technical services to promising lighting ventures doing business in New York State.

Linc will:

- Offer introductions to potential business partners and investors, technical lighting design and evaluation services, and assistance in securing public funding.
- Employ outreach and networking efforts to establish a lighting innovation presence at STEP, in the State, and in the nation.
- Nurture small and mid-sized companies by seeking innovative light-related intellectual property from many sources, identifying funding opportunities and providing business and marketing services.

NYSERDA'S PARTNERSHIP WITH CEG

On October 17, Paul D. Tonko, President and CEO of NYSERDA, announced a planned partnership with the Center for Economic Growth (CEG) to help protect Intellectual Property (IP) at STEP.

"We are looking forward to partnering with CEG," said Tonko, "Such cooperation is of prime importance in making it possible to ensure the security of the legal entitlements of our STEP tenants. IP laws and enforcement vary widely from jurisdiction to jurisdiction. That lack of consistency makes it difficult for companies engaged in innovative scientific advancement to protect themselves and their property. Working with CEG, we plan to give IP help and guidance to established and start-up companies at STEP."

CEG, a business-driven, member-supported not-for-profit corporation established in 1988, has a mission to promote and market New York's Capital Region as a prime business location, as well as to provide management and technical assistance to existing businesses. CEG, which merged with the Capital Region Technology Development Council in 1993, has formed a single economic development organization dedicated to business attraction, expansion, and retention initiatives. CEG entered into a



Memorandum of Understanding (MOU) with NYSERDA to promote the economic growth of New York's Capital Region. CEG's President and CEO, F. Michael Tucker, has actively participated in development of the MOU to set forth and expand the collaboration of the two organizations relating to business development and job creation at STEP.

"The Center for Economic Growth is excited to enter into this agreement with NYSERDA as part of our Business Accelerator program to help more regional technology start-ups evolve from great technical concepts to successful technology companies," Tucker said. "With STEP housing many of the region's emerging environmental and clean-energy companies, this is a natural collaboration between our two organizations."

CEG will offer a suite of programs designed to direct and accelerate the growth of technology and manufacturing companies; facilitate access to funding; and offer business and technology acceleration support to companies ready, willing and able to grow, in-depth business development support to companies seeking to penetrate the Homeland Security, National Security, and Defense markets, as well as technical services to assist companies in establishing or optimizing their operations.

CEG and NYSERDA have agreed to:

- Perform separate duties and responsibilities in a fully collaborative and supportive manner.
- Meet regularly to update joint plans and activities to meet the objectives of the MOU and to approve an annual plan of action.
- Explore additional partnering opportunities as appropriate to support energy and related technology transfer and business development. This may include collaborations with Federal laboratories and regional academic and corporate research centers.