

Dear Research University President:

# The future of the economy and the planet is in your hands.

Cordially,

*Barack Obama*

BY TOM ROBINSON

**P**RESIDENT OBAMA'S PLAN to turn around the U.S. economy includes \$150 billion of investment in green energy over the next 10 years, driving America towards energy independence and creating five million 'green-collar' jobs. That won't happen without a concerted effort by higher education, which includes more than producing technically prepared graduates.

Land-grant universities, with their com-



munity based charters and their research capabilities, have a head start. Margaret Brennan-Tonetta is director of economic development at Rutgers University. Her department is attached to the agricultural experiment station, although it has little to do with growing blueberries or raising chickens. Under her auspices, the Rutgers Energy Institute (REI) integrates Rutgers' expertise in science, engineering, economics and policy, putting it at the forefront of alternative energy research.

"Innovative research and technological advances form the basis of the green jobs sector," she notes. Her vision for a university as an agent of economic growth, therefore, is multifaceted.

## **A different way to develop talent**

Much of the training of a green workforce will be 'conventional.' It's a big job, and community and technical colleges are well suited for it. Tonetta believes many of the five million green-collar jobs look like the blue-collar jobs of yesterday. She asks, "Is welding solar panels a new or different job than welding structural steel? Or is it simply a reclassification?"

Green jobs include biofuels, solar, wind, energy storage and transmission, environmental science, carbon capture and sequestration and nanotechnology. Also encompassed are food production and distribution, finance, entrepreneurship, legal and regulatory enforcement, policy and administration.

Tonetta asserts that the demand for skilled graduates has progressed to the point where universities must consider offering entirely new study fields and majors, beyond the engineering and environmental sciences. "There is a management challenge. And that management challenge requires development of new managerial abilities and capacities," she says. Those new abilities and capacities are likely

*Economic Development Director Margaret Brennan-Tonetta (left) explains the resources available at Rutgers Food Innovation Center. The university's business incubator assists farmers and cooperatives, startup food companies, existing small and mid-sized food companies, and retail and foodservice establishments with development of new product prototypes from concept to commercialization.*



to require the talents and experiences commonly found in adults with work experience.

**Is it a matter of degree?**

A bachelor’s degree in environmental science or electrical engineering earned by a 20-year-old is not an overall solution. And many displaced investment bankers with MBAs or engineers 15 years into their careers have no interest in returning to undergraduate school and repeating English and sociology requirements. And four years in a classroom is not an option for many adults. Yet the demands of the new jobs require advanced education.

Yacov Shamash is dean of the engineering school at Stony Brook University, the SUNY system’s comprehensive campus on Long Island. He is also vice president of economic development, an interesting title for an academic executive. While SUNY has a program to “train” or “retrain” technicians in traditional ways, Shamash sees an opportunity to leverage the experience and expertise of a highly skilled workforce by offering post-Master’s certificates.

Stony Brook’s certificates result from a package of three or four graduate level courses. Admission is more rigorous than for Continuing Education certificate programs which are open to the general public. The certificates themselves are a valuable commodity. They pass the muster of the university’s academic committee like all other degree programs and they exceed



*(L to R) NY State Senator Ken Lavalle, Stony Brook University Vice President for Economic Development Yacov Shamash and noted regional planner Lee Koppelman discuss the impact of technology advancement for Long Island and the Calverton Incubator. The university’s 15,680-square-foot facility (bottom right) helps develop new agriculture, aquaculture, and environmental technologies.*

the thresholds of the regional accrediting body. Certificates must be approved by the state board of education and are often developed in collaboration with an appropriate professional association. They carry weight with employers looking for advanced credentials.

**Bringing innovation to market**

Solar panels on today’s buildings were developed from decades-old technology. Today’s research labs contain nanoscale solar panels, solar sheets and even solar roofing materials that will redefine, in a few years’ time, our concept of solar voltaic energy. The university has

a crucial role in both discovery and implementation.

Campus research enables technology transfer and can propel entrepreneurial activities. Since 1980, universities have helped establish more than 5,000 new companies, the majority of which are still operating. From 1980-2001, the entire growth in net U.S. jobs was attributable to young firms less than five years old. Some 90 percent of U.S. companies employ less than 100 people.

The shift from large corporations to entrepreneurs has opened an opportunity for enterprising universities. “These companies don’t have R&D departments

*New business incubators run by Rutgers (left) and Stony Brook University (right) link college faculty expertise and research resources with entrepreneurs to drive regional economies and create jobs.*





or sophisticated quality assurance processes,” observes Dr. Shamash. “They can use grad students and faculty to perform these essential functions.”

### University as a Regional Talent Magnet

The new green economy will offer significant opportunities to innovative thinkers and entrepreneurs. The entrepreneur converts innovation into economic development. A Small Business Administration study observed that “Innovation without entrepreneurship generally yields minimal local economic impact... Innovations are highly portable, whereas entrepreneurship is people/place-based.”

The Council on Competitiveness (CoC) is a group of corporate CEOs, university presidents and labor leaders committed to creating high-value economic activity in the United States. In 2007, the CoC called on universities to be catalysts for business cluster and regional economic development, and serve as economic magnets to attract investment, entrepreneurs and talent to their regions. The CoC suggested universities restructure their research capabilities to be responsive to local industries, setting up specialized research

### The Roles of the University as an Agent for Economic Development

*Margaret Brennan-Tonetta*

**University as Trainer**—supply skilled graduates

**University as Innovator**—generate and transfer knowledge

**University as Partner**—provide technical expertise to commercialize products, licensing activities and sponsored research

**University as a Regional Talent Magnet**—attract talented, innovative entrepreneurs and professionals

**University as Facilitator**—facilitate public/private communication, research parks and incubators

units, joint cooperative ventures and interdisciplinary projects. Further, it called for new sector-specific programs in high schools, colleges and in continuing education to encourage people to enter and be successful in the green job market.

Stony Brook is no stranger to that mission. In 1994, its Strategic Partnership for Industrial Resurgence (SPIR) helped Long Island recover from the loss of Grumman and a severe downturn in

the aerospace industry. Over the past 15 years, SPIR has worked with 398 New York companies on more than 2,200 projects. The program’s advanced technical assistance has helped create 9,175 jobs and retain 2,490 others.

Stony Brook operates three incubators and a small business development center. As many as 35 companies are active on the campus. The university works closely with the Long Island Angel Network of capital suppliers who provide bridge funding between the initial venture capital stage and the public offering. Shamash claims that hundreds of millions of dollars are flowing into the region as a result.

### Selflessness or self-interest?

Make no mistake about the value the university receives by being a player in the green economy. “This is not public service,” clarifies Shamas. “My role as director of economic development is to improve the competitiveness of SUNY Stony Brook and obtain more research dollars for basic and applied research.”

If that aggressiveness leads to scientific breakthroughs, energy independence and five million green-collar jobs, everybody wins. ■

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