Northern New Mexico Programs in Solar

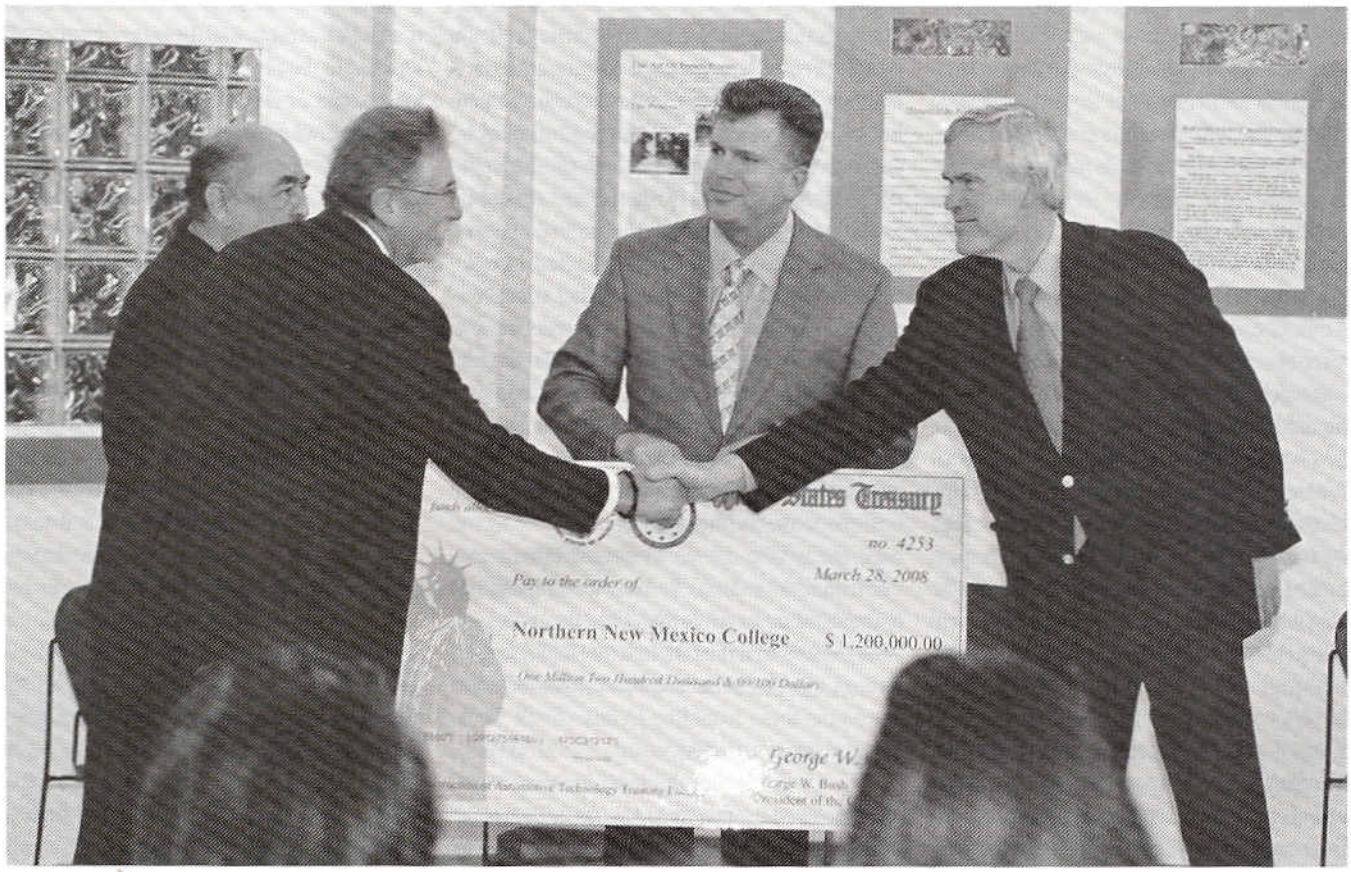
by Karen E. Thuermer

With today's gas prices soaring, no one can dispute the need for alternative energy sources. Experts peg wind, solar, biomass, fuel cells and other technologies as the up-and-coming energy sources that will take the world's population away from its dependence on fossil fuels. Consequently, entire new industries focused on green and sustainable energy are quickly coming to the forefront. With this comes a need for a talented and trained work force.

Yet, most universities today in the United States do not yet offer a course of study that prepares students for a career in alternative or "green" energy. Scores of universities in the U.S. and around the globe are engaged in intense research on the subject. Many have come up with viable solutions, yet lack the investment or business know-how to get them off the ground and to the marketplace.

But this is quickly changing. What appears to be a forerunner of things to come, this fall Northern New Mexico College (NNMC) is commencing a course of study that will prepare the burgeoning new solar industry with a ready, able and trained work force.

The college itself has undergone a transformation from its early days as an institution for training teachers for the state's Spanish-speaking population – when New Mexico was still only a territory – to a technical-vocation-



Northern New Mexico College President José Griego and Board of Regents Chairman Michael Branch (behind Griego) receive a check for $1.2 million from Matt Crow of the U.S. Economic Development Administration (center), and New Mexico Sen. Jeff Bingaman.

ollege Launching New echnologies and Training

l school, and in 2004, the first community college in New Mexico to offer four-year degree – a B.A. in elementary education.

olar Segment

New Mexico is a perfect fit for this new course of study, particularly for ıe solar energy segment. For starters, with 340 clear sunny days per year, ıe state is blessed with an intense amount of sunlight. Some proponents ɔntend that, if tapped, solar energy produced in New Mexico could supply ıough electricity for the entire state.

Another big plus – the U.S. Department of Energy operates its Los amos National Laboratory (LANL) in Los Alamos, N.M., 20 miles from NMC's Española campus. LANL is one of the largest multidisciplinary stitutions in the world.

The New Mexico state legislature also backs green technologies. In)04, it signed a bill charging that the state produced at least 10 percent of : energy from renewable sources by 2010 and 15 percent by 2015. It also ficially designated New Mexico the "Clean Energy State." Gov. Bill chardson was quoted as saying, "I want our state to be one of the ıtion's leading suppliers of clean energy – wind, solar, biomass and zero-ıission coal."

Educators at NNMC see solar energy as one of the hottest sectors in the ıerging market for clean energy. Consequently, under the leadership of ;MC President Dr. José Griego, the college has embarked on what it calls ? Solar Energy Research Park and Academy (SERPA). To help raise funds d set the program on course, Dr. Andrés C. Salazar was enlisted as chair its computer, engineering and technology department and later named lead the project. Today Salazar is one of five persons at NNMC who is ?king grants to fund SERPA and opportunities to work with LANL.

ree Principles, Three Objectives

Basically, SERPA is built on three principles with three objectives:

1. To provide affordable training and education in high-wage, in-nand "green collar" jobs in solar energy and storage practice and sci-?e by offering the following degrees: Associate of Science (technician ining for assembly, installation, repair of solar conversion equipment); :helor of Science in solar engineering (design, development, research of ar conversion devices, controllers, energy storage systems); and Master Engineering in solar conversion systems (planning, management of earch, design, development and deployment of solar energy systems).

2. Be a center in Northern New Mexico for cost-effective applied earch and testing at NNMC of science and technology in alternative ·rgy storage developed by LANL. Without serious research in market-dy efficient technologies, SERPA leaders contend that renewable energy, ecially critically important solar energy, will remain underdeveloped.

3. To help develop governmental policy and guidelines on the use of alternative energy sources as it relates to solar power and storage for residential and commercial use.

Training and Retraining

As part of its goal, SERPA will also provide an advanced retraining center for those in the science, technology and engineering work force who may have recently been laid off or are facing job uncertainty as LANL downsizes and redefines its mission. In that vein, SERPA will also provide a means to retain critical LANL science and technology brainpower in energy and energy storage – workers who might otherwise locate elsewhere.

In a NNMC statement, SERPA leaders stressed that such a loss of talent would prove disastrous not only for Northern New Mexico but the entire state because it would lose some of the best minds in science and technology for the all-important new energy economy. Already the region suffers from very low economic indexes.

"We want to bring economic development here," said Salazar. "And that means jobs."

With Santa Fe located 25 miles to the south of Española, he believes the college can tap into a host of qualified people, such as retired federal employees, who could be advisors to SERPA and benefit the program.

"We think we are in the right place for addressing problems and attracting professors and students," he said.

This would translate into further opportunities for Hispanics seeking a higher education and jobs in tomorrow's emerging technologies. Nearly 80 percent of NNMC's student population is Hispanic, with another 5 percent to 10 percent being Native American. Consequently, work force training is an integral part of the program.

"Work force training means that we have educational programs, and we have three of them: Associate of Applied Science, bachelor's and master's degrees in mechanical engineering," commented Salazar. "For one, our technician-level training involves more than repairing, maintaining and installing systems. This program includes thermal and photovoltaic solar energy. We have always had a program that touched upon solar, but this is completely focused on it."

According to Salazar, NNMC is one of the few universities in the country that offers a bachelor's degree and a master's degree with a concentration in solar energy. "The bachelor's program not only teaches power systems, but solar energy conversion and the storage of energy," he said.

"The master's degree focuses on entrepreneurship and business formation. It encourages students to start a business as well as design a new system." The program commences this fall.

"This is its first semester," he said.

Given the size of NNMC, SERPA will focus on applied research rather than fundamental research.

"NNMC cannot compete with larger universities on fundamental

research," Salazar stated. "But we want to work with institutions like LANL that do fundamental research. While much of LANL's research has to do with nuclear energy, research is underway that focuses on other alternative energy sources like solar."

For example, LANL has done extensive work regarding storage hydrogen fuel cells. "We want to take these discoveries and work with them," Salazar explained. "We want to take those programs and commercialize and patent them. The small college can take one or two and go forward."

A big advantage for NNMC is its close proximity to LANL. The college also employs professors who are experts in solar energy and others with backgrounds in computer science and systems.

Setting Policy

Policy development is also regarded as an important part of the program.

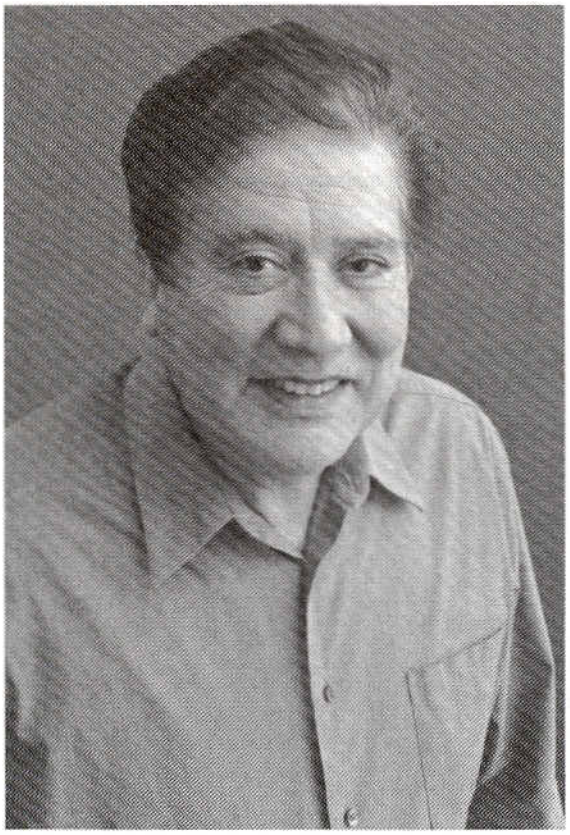
"Here, we are looking at other countries in the world, including Europe and Japan, that are farther along in developing alternative and sustainable energy policies," said Salazar. "Consequently, we want our business department, coupled with our engineering department, to work on policy development for government entities and private foundations that want to see how to accelerate these options."

The effort would include joint research regarding what legislatures and foundations plan to do to address issues, public opinion and economic modeling. In addition, said Salazar, "We want to explore ways that we can help companies co-locate in the valley where the college is located."

Recently, NNMC received $3 million from the state Legislature to support the SERPA initiative. The amount was approved in January 2008 as part of a $9 million funding request introduced in an appropriations bill during the January 2008 legislative session. The bill passed unanimously.

Two million dollars, earmarked for SERPA's infrastructure, is available on July 1, 2009, with the remaining $1 million for operational expenses coming in the form of a bond.

"The bond will be voted on in November. We expect it to pass," Salazar said.



Dr. Andrés C. Salazar, leader of the solar technology and training program, NNMC

Automotive Plans

In addition to solar technologies, college officials have taken a hard look at other industries in need of work force development. Consequently, the automotive industry has been identified as an area in which the college should expand its job-training efforts, despite the fact that New Mexico is not home to an Original Equipment Manufacturer (OEM) such as General Motors, Toyota or Ford.

"The reason we chose this industrial sector is because automotive technicians have been identified as being in short supply nationwide," said Gil Seng, automotive technology department chairman. "New Mexico has an acute shortage. With advancements in automotive industry, the need for specialized training is critical to the industry."

Although the automotive industry is currently experiencing a slowdown, the industry is also quickly moving toward energy-efficient technologies that would wean the automotive industry away from the use of fossil fuels. With advancements in technology and new models on the drawing board that will encompass these advancements, the need for OEM training has become important to job placement, Seng contends.

Consequently, efforts have also lead to NNMC obtaining $1.2 million to fund construction of an automotive technology training facility also on the Española campus. The new facility will allow the college to relocate its automotive technology program from its campus in El Rito to accommodate a greater number of north central New Mexico residents.

"The new building will allow students access without economic hardship because of its new location more centrally located to the population," Seng said.

The educational emphasis at the Automotive Technology Building will be to provide the students with a well-rounded academic and trades-based education. Students that complete the program receive an Associate of Applied Science degree. The goal of the program is to make certain that graduates will be prepared to work in small businesses or become entrepreneurs themselves.

Monies for the latest state-of-the-art equipment to outfit the building will be handed out yearly. For example, for 2007-08, $200,000 was provided to accommodate, among other things, internal network and switching equipment.

Overall, the Automotive Technology Building includes a 12,000-square-foot lab with 10 bays and paint booth, computerized classroom, and capabilities to broadcast classes via Web and ITV.

"It also has a dedicated lab classroom that allows us to bring a vehicle into the lab for the purposes of training," Seng said. "Students can update more current information for completion of projects."

The facility can also be used for retraining employees already involved in the automotive industry. But, as Seng pointed out, the program emphasizes continued education of industry technicians.

One Further Note

While not directly related to the Automotive Technology Building and training program, Salazar points to battery technology for electric cars as offering exciting opportunities for solar energy technologies. As more homes switch to solar energy as a means to supply energy to their homes, one day this energy could also be used to charge up fuel cell batteries used to power one's car. These batteries could also be used to store energy during the nighttime when energy is not being generated from the sun's rays.

In this regard, both new programs at NNMC are set to create synergies in addressing not only the technologies of tomorrow but shaping and developing its much-needed work force.