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New U.S. Institutes Help Tackle Cleantech Workforce Shortage

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Training academies are cropping up to steer students and professionals into clean energy industries that lack manpower to match growing opportunities

By Maria Gallucci, SolveClimate News

A surge in business for algae-biofuels developer Sapphire Energy has led to a new but welcome problem: The firm is needing to hire experienced workers but is finding slim pickings.

The San Diego green crude producer typically hires from within the biomedical field. Employees are paid full-time while they train for work in the developer's labs or at its research and development facility and biorefinery in New Mexico.

But Stephen Mayfield, Sapphire Energy co-founder and director of the San Diego Center for Algae Biotechnology, has a more efficient method in mind.

The algae expert is helping to lead a new post-graduate training program that is building a ready workforce ahead of an anticipated boom in biotechnology development.

Around 100 students are expected to enroll this year in EDGE (Educating and Developing Workers for the Green Economy), a public-private partnership that offers industrial and technical certificate programs in biofuels and biotech production, analysis and processing. For now, the initiative does not include ethanol.

A Masters of Advanced Science will be offered next year through the University of California, San Diego for biotech entrepreneurs.

"The EDGE initiative is really a new paradigm for how academic institutions interact with commercial partners so that we're actually teaching our students skills that they can take out and use to get a job," Mayfield told SolveClimate News.

For businesses, he continued: "It is a cost-saving efficiency move. Now you get employees that come pre-trained."

The initiative is in step with similar efforts nationwide seeking to steer students and second-career professionals into clean energy industries such as wind, solar and geothermal that still lack the manpower to match growing opportunities.

EDGE's first certificate course began in March at MiraCosta community college in northern San Diego County, and a second set of students will start classes this summer.

Tuition will be waived the first two years as the program is tweaked, and course materials will later be packaged for nationwide distribution.

Calif. Biotech Grows by 50 Percent

Mayfield said the idea for EDGE came a couple years back when California's labor agency took interest in the job-creation potential of bioenergy. After meeting with cleantech companies and institutions around San Diego, the agency made available \$4 million in state funding to develop an industry training program.

Overall, the number of industrial biotech companies in California have grown by 50 percent in the last five years, with nearly half of that growth between 2009 and 2010, according to a statewide Industrial Biotech Workforce Survey.

Algae development alone has created 410 jobs around San Diego since 2007, resulting in \$56 million in direct economic activity and \$108 million in overall activity per year, according to a recent analysis by the San Diego Association of Governments (SANDAG), a regional planning agency.

Algae-related jobs could reach 500 this year and up to 700 next year as developers prepare to launch commercial-scale demonstration projects, Mayfield said.

"All of these companies are starting to build their pilot plants, so we'll know a year from now how successful they are," he said. "If they are successful, then it won't be, 'Here's our four pilot plants that we need employees for.' It will go to, 'Here are our 4,000 plants.'"

EcoTech Institute to Help Colo. Compete

In Colorado, that kind of rapid growth is already underway in the wind and solar industries, forcing developers to compete for the small pool of experienced electricians, technicians and engineers.

"If you look at just wind energy, the install base is getting larger and larger, so more players are coming into the space to do the development and construction work," said Doug Nieb of the Broomfield, Colo.-based Renewable Energy Systems (RES) Americas. "Everyone in the industry is competing more broadly for qualified talent."

"[The challenge] is finding people who have some experience in the industry. For example, if you're hiring someone to do electrical work, in the past you've had to go out and find someone with an electrical background and train them to do wind or solar."

To tackle the workforce shortage, the wind developer has teamed up with the one-year-old EcoTech Institute near Denver, which earlier this month unveiled a new \$10 million flagship campus that will host up to 1,200 students.

"As graduates become available from this and other institutions, we'll be able to put them directly into our workforce without having to rely on on-site training," Nieb said.

Some 250 students have been enrolled since last July in two-year associate's degree programs for wind and solar energy technology, electrical engineering technology, energy efficiency, environmental technology and general renewable energy training.

Glenn Wilson, the institute's academic dean, said that EcoTech's parent company Education Corporation of America, which operates private higher education institutions, selected Colorado to host the campus because of its wealth of cleantech companies and top-notch institutions, such as the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) in the city of Golden.

Colorado's renewable portfolio standard (RPS), one of the most aggressive in the nation, was also a plus, considering how the mandate has helped lure developers to the Rocky Mountain state. Under the law, utilities are required to get 30 percent of their electricity from renewable sources by 2020.

"The jobs were there, but the technicians weren't," Wilson said.

"We're seeing a lot of second-career people and a large group that already have college degrees and want to get into the clean energy field, but are stopped because they don't have any good experience," he said of the institute's students.

The number of cleantech companies in Colorado increased 9.6 percent between 2005 and 2010, compared with a 4.2 percent growth nationally, according to a recent study by the Metro Denver Economic Development Corporation.

Some 1,600 cleantech companies directly employed about 19,420 people in the state in 2010, including more than a dozen new wind and solar firms that moved to the state last year.

Denmark's Vestas Wind System A/S said it would create hundreds of new jobs at its three Colorado wind turbine factories, which already employ 1,000 people.

Wilson said Colorado needs a highly skilled workforce to develop, manufacture and install renewable energy systems to keep cleantech companies in the state.

"If they don't get that here, then [companies] will move to other parts of the country or the world where they can," he said.

He added that within the next few years the EcoTech Institute could expand to three or four sites nationwide.

Nevada Opens Geothermal Academy

Whereas California and Colorado are retraining employees for whole new professions, Nevada is looking to recruit new talent and update skills of mature workers for its decades-old geothermal industry.

This summer, the National Geothermal Academy will offer its first set of eight weeklong courses on geothermal energy development and utilization at the University of Nevada, Reno.

"Geothermal had its heyday back in the late 1970s to early 1980s in response to the first energy crisis. But as new sources of oil and gas came online, the interest in geothermal kind of waned a little bit," said academy coordinator Wendy Calvin, who is also director of the Reno-based Great Basin Center for Geothermal Energy.

"Most of those players who were key in geothermal then are still the people who are key now, but they're 30 years older, and they're approaching the ends of their careers. At the same time, there has been a real interest in identifying new renewable energy sources ... and this is spurring development of new geothermal electricity production."

A select group of 40 university students and professionals from across the globe will participate in "modules" on geothermal drilling and engineering, power plant design and construction, business development, permitting issues and other topics.

The academy could also offer web-based instruction in the future to complement its space-constrained summer academy sessions.

The Department of Energy has awarded nearly \$1 million in grants to the multi-university consortium, which is the first comprehensive program of its kind in the nation. Globally, only two similar institutions exist in Iceland and New Zealand.

In the U.S., seven western states plus Hawaii and Alaska have nearly 3,100 megawatts of installed geothermal capacity, about three-fourths of which comes from California, according to data from NREL. Six additional states have plans to tap their geothermal resources.

Geothermal power plants in Nevada — most of which are based in Reno — produce 300 megawatts of power, or enough to provide electricity to more than 200,000 homes.

Calvin said state renewable standards in the region have driven the renewed interest in geothermal development. In Nevada, utilities must get 25 percent of their electricity from renewable sources by 2025.

"There has been a push in the industry driven by the RPS, and since there's growth there, you need to have a new cadre of people to come online" to meet the rising demand, she said.

"The industry as a whole is very excited to see that they can send people that are working for them to get specific training related to geothermal, or that they'll have a crop of educated people to pick from when jobs come up, in terms of the potential

growth of the industry."

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