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Cal Poly Students Install Solar Photovoltaic System on Campus Building

SAN LUIS OBISPO — A multidisciplinary group of engineering and agriculture students designed and installed a grid-tie solar-electric system on the Cal Poly BioResource and Agricultural Engineering (BRAE) Building as part of a new BRAE course, Solar Photovoltaic System Engineering.

Using solar panels provided by SunPower and additional donated solar installation components and supplies from SnapNRack, Sunrun (formerly REC Solar Residential) and Quaglino Roofing, the students — supervised by faculty, industry, and campus facilities professionals — completed the entire project in 10 weeks. Prior to the campus installation, the 41 students completed two other solar installations on low-income houses in collaboration with the Central Coast regional office of GRID Alternatives, a national nonprofit solar company that provides job training in the solar industry by using volunteers on its projects.

The students completed all aspects of a typical residential solar installation, including site planning, electrical and mechanical design, regulatory approval and permit processes, government and utility incentives, and financial return-on-investment analysis, said Professor Art MacCarley, interim BioResource and Agricultural Engineering Department head. “As a service-learning course, the primary objective was the successful completion of an actual project that will become a permanent part of the campus infrastructure,” he said.

The students had less than three months to complete the process, from filing building permits to bringing the system online. “Engineering, regulatory requirements, economic planning and payback analysis, solar power electronics and compliant electrical systems are all learning objectives of this course,” said MacCarley. “Plus the system will offset the electric power use of this and surrounding campus buildings for the next 25 years.”

In addition to bioresource and agricultural engineering, agricultural systems management, and environmental horticultural sciences majors in the College of Agriculture, Food & Environmental Sciences, students from four departments in the College of Engineering participated: electrical, materials, general, and computer engineering. The group also included an exchange student from Brazil enrolled through Extended Education.

MacCarley created the class after SunPower provided more than 1,000 solar panels to the university. This first-of-its-kind project used a fraction of the panels while engaging students fully in the Learn by Doing style of education for which Cal Poly is known.

“It is the first student-designed and -built project of its type to become part of the campus infrastructure,” MacCarley said. “Students developed practical and theoretical skills that will enable them to participate in the growing solar industry, consistent with the energy and environmental needs of the nation and campus sustainability objectives. “We were fortunate to have the full cooperation of Cal Poly’s Facilities Services, especially Dennis Elliot, assistant director of energy, utilities and

sustainability."

The project will result in an estimated electric power savings of $1,600 per year for the campus, replacing utility-generated energy with energy from the sun.

"This is an exciting project for Cal Poly that exemplifies our hands-on, Learn by Doing philosophy," said Andrew Thulin, dean of Cal Poly's College of Agriculture, Food & Environmental Sciences. "Not only does this project have immediate benefits, it also provides an opportunity for students from multiple disciplines and departments to work together to solve real-world problems."

And it is just the beginning. "We have four other solar projects lined up beginning this summer," MacCarley said.

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