

GOLD TREE SOLAR FARM — INNOVATIVELY ADVANCING THE ACADEMIC MISSION THROUGH PUBLIC-PRIVATE PARTNERSHIP AT CAL POLY SAN LUIS OBISPO

FOCUS ON EFFICIENCY

Cal Poly San Luis Obispo's Gold Tree Solar Farm powers the university and is a hands-on learning resource for students.

On an 18.5-acre stretch of pasture at Cal Poly San Luis Obispo, grazing sheep share the land with the university's 4.5 megawatt Gold Tree Solar Farm, which was energized in May 2018. The project demonstrates how campus buildings and infrastructure may also be impactful academic assets.

The solar farm contains more than 16,000 individual solar panels and generates more than 11 million kilowatt hours per year, which is equivalent to powering more than 1,000 homes. It is the largest system for solar power within the California State University system and provides 25 percent of the university's total electrical needs. It will save \$17 million over the next 20 years.

A collaboration between the university's Facilities Energy, Utilities, and Sustainability department and various academic departments, the project is a public/private partnership and funded by a power purchase agreement with REC Solar, a San Luis Obispo-based company founded by Cal Poly graduates.

In addition to powering the university, the Gold Tree Solar Farm is also integrated into the academic curriculum. Academic departments were engaged for input during the project's request-for-proposal phase to identify how they could incorporate the solar project into courses and laboratories. By articulating a vision for the academic applications of such a system in the request for proposals, bidders understood not only Cal Poly's long-term aspirations for the project and the programs it could support, but were motivated to bring even more ideas to the table.

Proposals were evaluated based on vendor qualifications and project experience, as well as their response to the academic opportunities, which were weighted at 10 percent of the evaluation score.

The chosen contractor, REC Solar, also created the interactive Green Power Monitor data portal – a web-based dashboard with a live camera – which provides weather and performance data and is used for applied research and projects by students, staff and faculty. Workshops are held to train faculty and students for the use of the Green Power Monitor data portal.

MILESTONES

June
2016

- Solar farm plan submitted for California Environmental Quality Act review

Jan
2017

- Gold Tree Solar Farm is dedicated

Jan
2018

- Solar farm construction is completed

May
2018

- Solar farm is energized

QUANTIFICATION AND RESULTS

The solar farm produces approximately 11 million kWh per year and provides nearly 25 percent of Cal Poly's total electricity needs from a carbon-free source.

In the first year, the project produced nearly \$1 million in utility savings, and over 20 years, the solar farm's use will result in a \$17 million utility savings.

On the back end, a power purchase agreement was executed between the university and REC Solar at a price that covers the developer's cost of capital, operations and maintenance, overhead, and profit; for this project, it reflects a CSU record low \$0.0605 per kilowatt hour flat rate for 20 years.

IMPACT AND BENEFITS

The Gold Tree Solar Farm's pasture continues as grazing ground and part of the university's Animal Science department's research on vegetation management practices for solar farms.

Since completion, hundreds of students in classes from many disciplines have toured the solar farm, as have city and county officials working on their own renewable energy project plans.

The Gold Tree Solar Farm's approach to project planning for academic innovation is being applied to the next big sustainable infrastructure project at Cal Poly San Luis Obispo: creation of an on-campus recycled water facility to treat campus waste water for agricultural irrigation, providing many new opportunities for curriculum development and applied research.

Negotiations with the solar farm vendor, REC Solar, resulted in a contractual Academic Services Agreement providing:

- \$150,000 to construct a hands-on, 25-kilowatt solar engineering and microgrid laboratory in the campus' Electrical Engineering building and annual funding for five years to support innovative programs:
- \$10,000 annually to support student-founded nonprofit Poly Canyon Ventures with seed funds for student entrepreneurs seeking to commercialize clean-tech business ideas in return for a small equity share in the company should it succeed for reinvestment into new student start-ups.
- \$5,000 per year:
 - To support Animal Science Department research on solar farm vegetation management via sheep grazing
 - To purchase needed Electrical Engineering solar lab equipment and support further curriculum development
 - To support the Cal Poly Center for Teaching, Learning and Technology's Teaching Sustainability Across the Curriculum programs
 - To hire grad students to support the Central Coast Climate Collaborative and create a searchable database of climate-focused researchers across the region's five UC and CSU campuses to connect them with adaptation and resilience project needs in their communities

The university's sustainability efforts, like the Gold Tree Solar Farm, have resulted in several awards and honors, including a Sustainability Tracking, Assessment & Rating System's gold rating, the Association for the Advancement of Sustainability in Higher Education's second-highest honor.

FURTHER REFERENCES

Cal Poly Renewable Energy information:

<https://afd.calpoly.edu/sustainability/campus-action/energy/renewable-energy>

2018 Cal Poly Sustainability Report:

https://afd.calpoly.edu/sustainability/docs/sustainability_reports/2018_sustainabilityreport.pdf

Cal Poly News articles about solar farm:

https://calpolynews.calpoly.edu/news_releases/2017/January/Solar

https://calpolynews.calpoly.edu/news_releases/2019/november/sustainability_awards

https://calpolynews.calpoly.edu/news_releases/2019/november/stars_rating

LESSONS LEARNED

1

Engaging academic partners early along with integrating academic collaboration opportunities into the project planning and the contract documents is essential for maximum academic benefit.

2

A project of this type and magnitude may have many academic opportunities. For example, reach out to campus planners and procurement officers and ask if they have ever considered including academic collaboration opportunities into construction project processes, such as request for quote or request for proposal.

3

Talk to advancement staff, and ask if this is something donors might get excited about.