

FACILITIES MANAGEMENT CONFERENCE 2014

BPA Winning Campus:

California State University,
Northridge

Project Name:

Northridge Portable Solar
Charging Tree

Budget:

\$1,000

Delivery Method:

Student designed and built
Mechanical Structure

Key Contributors:

Abhijit Mukherjee (Faculty)

19 senior design students

Schedule:

2/1/2014 to 4/30/2014

BEST PRACTICE AWARD CATEGORY: STUDENT ACHIEVEMENT AWARDS

Key Challenges

1. Working in a Large Student Team Environment.
2. Design & Fabrication.
3. Limited Budget.

What makes this project a Best Practice Award Winner?

1. **Innovative:** Prototype Design that could be applied for commercial applications.
2. **Cost Savings:** Energy savings through the creation of solar powered charging station.
3. **Process Improvement:** A creative student driven design and fabrication project that highlighted team work and collaboration.
4. **Replicated on Other Campuses:** **Y/N; Why?** Yes, if campus has fabrication facilities.
5. **Contribution to Success of the Campus:** **Y/N; Why?** Yes, project provides prototype solar powered charging station for students, faculty, and staff

Project Description

This was a student-conceived, student-designed and student-executed project carried out under the mentorship of a faculty member. A primary objective of the project was to engage students

in a challenging engineering design project that would be relevant and useful while helping them learn clean energy technologies.



A second goal was to provide students with experience in working in a team setting, in this case a team of 19 students, to help them build important team skills including planning, project management, collaboration and communication. The student team was responsible for all aspects of the project including the procurement of materials within a very limited budget (\$1,000), design and fabrication of the mechanical structure, structural integrity, modeling and testing of the structure in simulated environmental conditions, design and construction of electrical components, technical documentation and final presentation. Students learned to communicate with external parties and be responsible for securing the mechanical and electrical components, including solar panels, within budget. The final design is an elegant, robust and highly functional charging tree, where the campus community can readily charge their cell phones, laptops and tablets. It utilizes a 100W solar panel, a 12V battery, a charge

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controller and a 400W inverter to provide power both day and night. The tree has four hubs each with three different types of cell phone charge adaptors in addition to eight 120V wall outlets.



The project is a model for “learning by doing” and has provided the students with valuable experience in sustainable energy applications. The campus is exploring ways to scale the enterprise and deploy multiple charging trees

throughout the campus. There is also potential for business development based on the design. This is a model of one way in which a campus can provide a living-learning laboratory for students to explore and learn, and the campus can benefit from the creativity, ingenuity and skills of its students.

