



2008 Solar Photovoltaic (PV) System Installations: Guidelines and Application

The Solar Schools Program is a three-pronged effort to reinforce solar science principles in California's classrooms. In 2008, up to 40 schools will be selected to receive these PV systems and tracking tools. Selected schools receive a \$20,000 1-kilowatt electricity-producing photovoltaic (PV) system. To enhance the educational value, they will also receive an online monitoring tool that allows students to calculate and track solar energy production at their schools and correlate that data to weather conditions and locations of the sun... It also allows them to compare their school-specific data with other schools in the program.

The PG&E Solar Schools Program, now in its fourth year, focuses on public schools in underserved communities throughout PG&E's service area. All grant-seekers are invited to apply for both the PV installations and the Bright Ideas cash grants. All successful grantees are expected to send teachers to participate in the curriculum training. This is an exciting program that will have an impact on our students' futures and, hopefully, energize their interest in science.

*Applications must be received by September 22nd to be considered for the 2008 PG&E Solar Schools Program.
Award notifications will be made in October of 2008.*

www.pge.com/solarschools



2008 PG&E Solar Schools Program
Photovoltaic System Installations: Guidelines and Application

Table of Contents:

Section I: PG&E Solar Schools Program Background	3
PG&E Solar Schools Summary	3
PG&E Solar Schools Project Team	3
Design of PV Systems and Data Monitoring Systems for the PG&E Solar Schools Projects	3
System Output	4
Performance Monitoring	4
Value of Donated PV Systems	6
Section II: PG&E Solar Schools Program Application Guidelines	6
Eligibility and Selection Criteria	6
How to Apply	6
Creating an Action Plan	7
PG&E Solar Schools Program Application	9
Final Application Checklist	11

Section I: PG&E Solar Schools Program Background

PG&E Solar Schools Summary

The PG&E Solar Schools Program, now in its **fifth** year, focuses on *public schools in underserved communities within the PG&E service area in Central and Northern California.*

PG&E Solar Schools Project Team

The Foundation for Environmental Education will coordinate the selection of schools and installation of PV and monitoring equipment for these projects. The National Energy Education Development (NEED) program coordinates the Bright Ideas Grants and teacher training. NEED teaches the scientific concepts of energy and provides objective information about conventional and emerging energy sources **as well as** their use and impact on the environment, the economy and society. The Project Selection Team is made up of representatives from the following organizations:

- The Foundation for Environmental Education (FEE)
- Pacific Gas and Electric Company¹
- The National Energy Education Development Project (NEED)²

Design of PV Systems and Data Monitoring Systems for the PG&E Solar Schools Projects

The PV system installed under *the PG&E Solar Schools Program* will look similar to the installation pictured below.



¹ www.pge.com/solarschools

² www.need.org

2008 PG&E Solar Schools Program
Photovoltaic System Installations: Guidelines and Application

System Output

The system is a 1kW PV system, and will produce about 2,000 kilowatt hours of electricity (kWh) on average over course of a year. Output for each system will vary somewhat according to specific site variables, local weather patterns, and other factors. See Figure 1 on the following page for sample system specifications and scale. Schools are encouraged to take these specifications into consideration when assessing the viability of particular sites on the campus.

These PV systems are sized primarily for educational means for the teachers and students, and are not intended to supply the school with a significant percentage of its electricity, although, each school will receive some monetary benefit from the PV electric production at the site.

Performance Monitoring

Installed PV systems will include a performance-monitoring system enabling students (and the community at large) to monitor the production of solar electricity on a “real-time” basis. This information will be accessible through an internet website, and will also allow the community to compare the performance of all systems. Schools selected will need to provide a local LAN connection to allow the monitoring system to communicate with the internet.

2008 PG&E Solar Schools Program
Photovoltaic System Installations: Guidelines and Application

Figure 1: Solar Schools Ground Mounted Pole Configuration

2008 PG&E Solar Schools Program
Photovoltaic System Installations: Guidelines and Application

Value of Donated PV Systems

These PV systems are valued at over \$20,000 and are installed (as described above) at no cost to the school. In addition to the value of the up front donation, the systems will provide some ongoing monetary benefit to the schools (approximately \$200/year). The donation includes the cost of construction, PV modules, inverter (converting DC power from the modules to AC power), and a data acquisition system that will monitor the performance of the PV system.

By accepting ownership of the system, the school will receive the full warranty provided by the system supplier/installer. There is a twenty five year warranty on the modules, and the inverter carries at least a five year warranty. The Installer will also offer a five year service warranty.

There will be no ongoing funding available from the project partners once the system is installed and operational.

Section II: PG&E Solar Schools Program Application Guidelines

Eligibility and Selection Criteria

Any K-12 public school within the PG&E service territory that is currently getting its service from PG&E is eligible to apply. *Eligible schools within underserved communities shall receive first priority in the selection process, which is a standard target of PG&E's Charitable Contributions program. Underserved communities include people with low incomes, people of color, seniors, the disabled, and the LGBT community.*

Up to forty (40) PV systems will be awarded to selected schools that meet eligibility requirements, commit to sending one or more teachers to a training workshop, and commit to an outreach effort to educate both students and the community as a whole about the applications and benefits of solar energy. In addition, each school must also meet physical site requirements as determined by the Foundation for Environmental Education.

How to Apply

Eligible schools must complete the enclosed application and submit it to the Foundation for Environmental Education (address and detailed instructions below). Please read this entire application packet carefully to ensure that you fully understand the obligations of your school should it be chosen to participate.

The following criteria will be given the highest priority in the selection process:

1. Schools in underserved communities, as determined by the percentage of free meals provided by the school or by such other evidence that the schools submit with their applications;
2. Schools that are located in smaller or rural "hard to reach" communities with few solar photovoltaic industry resources or system installations to date;
3. Schools located in areas that contribute to the geographic diversity of our projects throughout the PG&E service territory. and
4. Schools with a demonstrated commitment to teaching energy and environmental principles.

Schools that meet these criteria will be given preference in the selection process:

Successful Applications Will Most Effectively Highlight:

1. Classroom Education

We are looking for schools that will make a sustained commitment to teaching renewable energy and environmental principles. To maximize the educational benefits of this project, a solar energy curriculum package will be provided to each participating school. Each school will agree to integrate this curriculum in the **classroom** on an ongoing basis as a condition of participation. This curriculum will be provided by the National Energy Education Development (NEED) Project and will include a variety of materials, lessons and hands-on activities focusing on solar energy.

2. Community Outreach

Schools selected to participate will agree to host a *Solar Celebration event* in collaboration with project partners to educate the broader community about how the system works. The “*Solarbration*” is to be publicized in local media, as well as posted on appropriate internet websites.

Schools wishing to apply must:

- Complete the enclosed application.
- Submit a Written Narrative/Action Plan. The Written Narrative/Action Plan must be no more than 1000 words and must accompany the application. It should specifically address the areas listed below.
- Provide a picture of the location at the school where the installation is planned. Preference will be given to ground mounted installations (clear of obstructions and shading).
- Provide evidence concerning the number of students attending from low income families. (Please limit this to one additional page where possible.)
- Provide evidence that the school is in a “hard to reach” area.

Creating an Action Plan

A goal of this program is to ensure that these solar installations contribute an important and on-going part of each school’s educational activities. Thus, applicants will be judged heavily on their plans for education and outreach. As part of your Action Plan, please note how your school will promote the installation to the surrounding community, involve students, create interactive activities, and involve the broader community concerning renewable energy issues. The Action Plan should also describe the outreach efforts your school will undertake to educate its students and the community as a whole about the benefits of solar energy.

Some possible outreach activities include:

- Developing new educational activities to integrate into existing curricula
- Developing a student committee to work with the city council or other governing body to pass a local resolution to recognize the school’s work with solar, or support additional solar installations within the community.
- Holding an annual energy fair to educate the community about solar and other renewable energy systems
- Publishing articles in local newspapers about solar energy

Preference will be given to those schools that present a coherent and imaginative set of hands-on activities and objectives that involve a broad cross-section of teachers, students, and administrators

2008 PG&E Solar Schools Program

Photovoltaic System Installations: Guidelines and Application

who are committed to making the solar installation one of the school's cornerstone learning experiences.

When articulating your Action Plan, include the following:

- Identify a Solar Program Coordinator (designated point of contact) and the specific steps he or she will take to ensure that the entire school is made aware of the PV system. Provide a preliminary list of teachers in your school who will be part of this project and participate in curriculum training. Also, list what specific contributions each will make toward educating students and the community about solar energy.
- Describe how the school will link with the local community and businesses through, for example, school-to-work programs, outside speakers, etc., to build awareness of the particular installation and solar energy in general.
- The school must be willing to hold a community *Solar Celebration* within three months of the installation, so that the general community can learn about how the system works. Explain your plans for these public-outreach events.
- Describe any energy or environmental efforts the school has undertaken to date including any energy efficiency or energy conservation actions.

Every school that applies for a PV system will receive a thorough review of its application. Schools selected to participate will be notified by a representative of Pacific Gas and Electric Company. Schools that are not selected for a PV system will be informed and invited to participate in a PG&E sponsored teacher training workshop. Schools that are not selected will be eligible to reapply during future rounds of this program.

2008 PG&E Solar Schools Program: Photovoltaic System Installation Application

PG&E Solar Schools Program Application

Please return your completed application to:

ATTN: Glen Kizer
Foundation for Environmental Education
Thoreau Center for Sustainability
1009 General Kennedy Avenue, #2
San Francisco, CA 94129

You may email (info@learnenergy.org) or fax (480.393.4840) a copy of your application, and send the original via mail to the address above.

1. School Information

Name _____
Address _____

Phone _____
Fax _____
District Name _____
County _____

2. Principal of the School

Name _____
Phone _____
Fax _____
Email _____

3. Designated Project Contact Person

Name _____
Phone _____
Fax _____
Email _____

4. Designate 1-2 educators to attend the NEED teacher training workshop

Name _____
Subject(s) taught _____
Phone _____
Fax _____
Email _____

Name _____
Subject(s) taught _____
Phone _____
Fax _____
Email _____

5. Additional Information

Grades taught at this school _____
Number of students attending this school _____
Number of students in this school district _____
What is your school's PG&E account number? _____

2008 PG&E Solar Schools Program: Photovoltaic System Installation Application

6. If you are NOT selected as one of the PV system recipients, are you interested in being a solar partner with one of the selected schools?

_____ Yes _____ No

7. **Suggested location for the PV array.** Take into consideration visibility, student access, and the absence of shading during most of the day. Please refer to Figure 1 above when assessing shading and general space requirements. Also, please attach a picture of the site(s) you believe are most suitable for the installation. If known, please include the PG&E meter that is closest to the desired installation point. Please describe the area below, and why you feel it is an optimal area for the installation of a PV array.

8. Action Plan

Describe in 1000 words or less your Action Plan for successful integration of the PV system into the physical and educational components of your school/district. (Refer to "Action Plan" in the Guidelines for more complete details.)

9. Letter of Commitment

Attach a letter of commitment signed by the appropriate school officials (either the Superintendent, or another agent with signatory responsibility for the district). This letter is intended as a demonstration of the school's commitment to the project. A final binding agreement will be signed prior to installation.

10. Low Income and "Hard To Reach" Information

If applicable, attach information to document the percentage of "low income students" and evidence that the school is in a "hard to reach area."

11. Schools selected to participate in PG&E's Solar Schools Program must agree to fulfill the following obligations:

1. Accept full ownership of the pre-selected hardware components that comprise the PV system.
2. Maintain full legal and financial responsibility for the system once installed.
3. Implement the solar energy curriculum provided by NEED in its classrooms.
4. Commit to an education/outreach effort that will promote solar energy within the school and community.
5. Designate an individual/team that will 'champion' the project.
6. Gain approval for project participation by the school's decision –maker(s).
7. Host a *Solar Celebration* to educate the general community about how the system works and how it will be used in the education process.

Signed

Principal

Date

Final Application Checklist

Enclosed Attachments:

- Completed application form
- Action Plan
- Picture of area suggested for installation of the PV array
- Letter of commitment
- Low Income and "Hard To Reach" Information

Read and approved your school's obligations should you be selected to participate in this project.

Signed

Title

Date