

Technical Assistance

Counting on Solar Power for Disaster Relief

Using solar cells to generate electricity provides immediate assistance as well as long-term relief in times of crisis.

Portable PV gensets are virtually silent, safe to operate, and environmentally benign; they are also highly reliable.

When disaster strikes, electric power is usually the first critically important service to be lost. And the effects can be devastating. Lights go out. Furnaces, refrigerators, and other electric appliances don't work. Neither do the electric pumps that deliver our drinking water and help treat sewage. Without electricity for homes, hospitals, food stores, and vital municipal services, many of our most important needs go unmet.

What's more, emergency response teams need a reliable source of electric power to even begin to deal with the crisis. Without electricity, gasoline can't be pumped at local service stations to transport emergency supplies, and banks can't provide emergency funds. Without electric power, conventional communication systems won't work. Historically, townspeople and emergency response teams have had only one recourse in such a crisis — they have had to use gasoline- or diesel-powered engine generators to provide emergency power.

The problem with engine generators

Unfortunately, generators that run on fossil fuels like gasoline and diesel oil have problems of their own. For example, they can be dangerous in the hands of untrained users. In the wake of a major disaster such as a flood, tornado, earthquake, hurricane, or fire, newspapers often report incidences of fires, burns, fuel explosions, and even asphyxiations caused by the improper use of a generator.

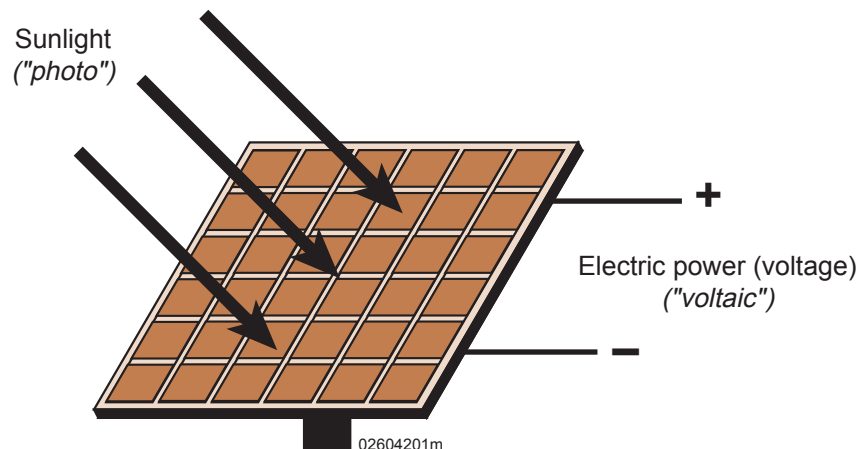
The Federal Emergency Management Agency (FEMA) and other response groups report that generators can also have very short life spans. Many have to be written off the resource list after just one season.

Noise can be a big problem, too. Local response organizations and townspeople alike report that noisy fossil-fueled generators are annoying at best. At worst, the constant loud noise adds to the trauma experienced by emotionally fragile, frazzled victims. But is there a reliable alternative? The answer is yes.



U.S. Department of Energy

Office of Energy Efficiency and Renewable Energy



Photovoltaic cells, which have no moving parts, convert sunlight directly to electricity.

A solar-powered solution

After several years of research and development, portable electric generator sets (gensets) are now entering the marketplace; these gensets either eliminate or reduce the severity of many of the problems caused by fossil-fuel generators. Powered by the sun, like solar cells in space, the new gensets make use of solar electric panels known as photovoltaics (PV) to produce electricity. The electric energy these gensets produce can be used directly or it can be stored in batteries for later use.

The new gensets have many virtues. They are virtually silent, safe to operate, environmentally benign, and seldom (if ever) a fire hazard. They are also extremely rugged, having been designed to withstand the impact of hailstones up to an inch in diameter.

Many of these gensets can be ordered by government agencies directly from the General Services Administration (GSA), and they come in a variety of sizes and capacities. They range from small units that one or two people can carry to larger, "multikilowatt" units that are usually



SunWize Technologies, Inc./PIX07026

Portable products like this SunWize Power Generator can deliver alternating-current or direct-current electric power; they are easy to transport in a car or a small truck.

mounted on trailers. The smaller units can be used to supply power for communications and lights. The larger ones can supply a substantial amount of power (for example, to an emergency health-care clinic) for extended periods of time. Most trailer-mounted gensets also include a small generator and propane tank to ensure the system's reliability when the weather is extremely cloudy or stormy for more than a few days.

Mobile, renewable sources of electricity

PV-powered gensets share at least one characteristic with fossil-fueled generators: they are



Live Oak Solar/PIX07047



Live Oak Solar/PIX07046

Mobile generators like the "T-Rex" from Live Oak Solar can be transported on the ground or in the air.

highly mobile. Small ones can be taken from place to place in the back of a truck. Larger, trailer-mounted units can easily be towed behind a vehicle or transported by plane or helicopter. For these and other reasons, the Department of Defense is using gensets to supply power for activities such as field exercises and rescue-team training courses.

In contrast to fossil-fueled generators, however, PV-powered gensets are fuel-independent. They depend on a normal amount of sunlight rather than on external fuel supplies. In Northridge, California, during the earthquake of 1992, an incident occurred that clearly illustrates the value of this fuel-independence. At that time, two men had to work six hours a day to keep a fossil-fueled generator on a remote ridge supplied with fuel. If the generator had been PV-powered, the men could have spent that time on other important activities.

Confidence based on experience

Photovoltaics has demonstrated its reliability, ruggedness, and versatility in response to some of the most devastating events of the recent past. These include Hurricane Andrew, which roared through southern Florida and the Gulf Coast in 1992, and Hurricane Georges, which devastated parts of Puerto Rico, the Virgin Islands, and four southeastern U.S. states in 1998. PV systems supplied much-needed power for emergency response teams after these storms and several others, to met the needs of local residents, the government, utilities, insurance companies, and other businesses.

In the summer of 1998, the Department of Energy's Federal Energy Management Program (FEMP) purchased eight trailer-mounted, PV-powered gensets specifically for disaster relief demonstrations. The systems included four 1800-watt gensets manufactured by SunWize Corporation and four 360-watt units manufactured by Applied Power Corporation. FEMP subsequently transferred all eight gensets to FEMA to use in training exercises and demonstrations. In December 1998, FEMA formally accepted these units from FEMP at a ceremony at the National Emergency Training Center (NETC) in Emmitsburg, Maryland.

The eight units have already been distributed to various FEMA sites, including the NETC, where they are being used for training. Staff in both agencies are confident that PV gensets are a reliable alternative to fuel-intensive engine generators when power is sorely needed in the wake of a disaster.



James Powell, DOE/FIX07028

In December 1998, John Archibald (center), Director of the Federal Energy Management Program, formally presented eight mobile PV gensets on behalf of FEMP to FEMA; Thomas McQuillan, Director of Resource Preparedness (left), and Kay Goss, Associate Director for Preparedness, Training, and Exercises, accepted for FEMA.

Manufacturers and Distributors of PV Emergency Gensets

Applied Power Corporation
1210 Homann Dr., S.E.
Lacey, WA 98503
206-438-2110

Live Oak Solar
232 Anacapa St., Suite 1B
Santa Barbara, CA 93101
805-966-9034

Direct Global Power, Inc.
P.O. Box 1058
Schenectady, NY 12305
518-395-5021

Power Pod Corporation
Box 321
Placerville, CO 81430
970-252-1978

Energia Total
P.O. Box 2544
Corrales, NM 87048
877-890-1534

Solar Electric Specialties
P.O. Box 537
Willits, CA 95490
707-459-5132

Independent Energy Solutions
1273 Linda Vista
San Marcos, CA 92069
760-752-9706

SunWize Technologies, Inc.
90 Boices Ln.
Kingston, NY 12401
914-336-0146

IPC Photcomm
4585 McIntyre
Golden, CO 80403
800-999-8208

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National Renewable Energy Laboratory
1617 Cole Blvd.
Golden, CO 80401
303-384-6469

For information about the solar system manufacturers listed on the GSA Federal Solar Schedule, contact Vicki Moore, GSA contracting officer, 817-978-8632, or see the solar schedule on the Internet: <http://www.gsa.gov/regions/7fss/7fx/schedules> (click on Schedule 62, Part II).



For More Information

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