



POWERED BY

SU

by Barbara Lerman-Golomb

BY THE

N

The Sun has been producing energy for billions of years. The Sun's light strikes the Earth continuously with energy so great that it's more than 10,000 times the amount the world uses.

Solar power is a clean and renewable energy source. It never runs out, unlike fossil fuels such as oil, natural gas, and coal, which can't be replenished and produce greenhouse gas (GHG) emissions that contribute to pollution and climate change. In the United States, buildings such as offices, homes, and stores use 40% of our energy and 70% of our electricity, producing over one-third of GHG emissions—more than any other part of the U.S. economy. Since sunlight is the most abundant resource on Earth, rooftop solar capturing is a sustainable way to reduce energy use around the globe. Across the United States, nearly 78 gigawatts (GW) of solar panels have been installed, enough to power 14.5 million homes. The surge of interest in solar energy is also creating well-paying job opportunities. The United States added 110,000 new clean energy jobs in 2018. Solar panel installer is expected to be one of America's fastest growing jobs through 2026.

A solar cell converts sunlight into electricity. It works in a similar way to photosynthesis, in which plant leaves gather sunlight and convert it into stored chemical energy, producing oxygen. Both solar cells and plants harvest energy from sunlight. The solar cells used to generate solar energy are called photovoltaic (PV) cells. Photovoltaic solar cells collect sunlight, changing the Sun's energy into electricity. A solar panel is made up of groups of solar cells. The more solar panels you have on a rooftop, the more solar energy you can produce.

People often wonder how solar energy works on days when the Sun isn't shining or at night. This is when solar battery storage comes in.



Solar cells absorb sunlight and convert it into electricity.

Solar batteries can be installed as part of a solar panel system, which works by storing the excess energy solar panels produce, thus providing a backup source of power for later use. This is a kind of resiliency planning that is more critical than ever with our changing climate, which is leading to more frequent and more intense extreme weather events that can cause power outages.

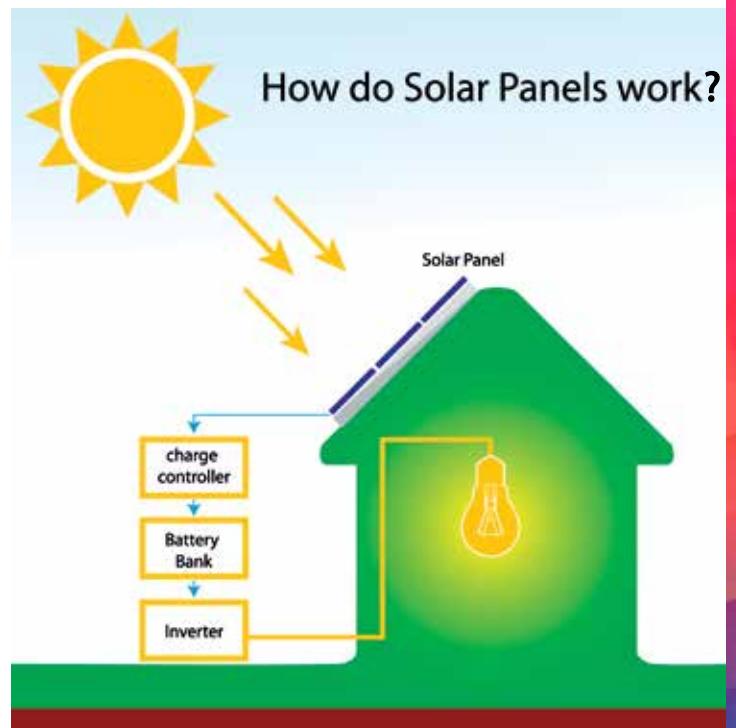
An environmental organization in New York City called Solar One demonstrates many innovative ways that solar energy energizes communities. Their Here Comes Solar (HCS) program helps get rooftop solar panels installed on buildings. HCS partners with local environmental justice groups to make solar power accessible, affordable, and equitable for working-class communities, which are the most impacted by pollution and climate change. One way HCS does this is by bringing clean electricity to underserved communities through shared community solar programs. Renters can purchase a share of a solar installation to get the benefits of clean energy without having to put solar panels on their buildings. They also have a project to install solar panels on public housing buildings in Harlem and Brooklyn, New York, that will help 350 low-income households save money on their electricity bills. Almost a third of households in the United States are energy burdened, which means they struggle to pay their energy bills, which are among their biggest expenses.

Solar One's Green Workforce Training (GWF)



A group of students intalls solar panels.

program provides hard-skills training for people who have experienced roadblocks to employment, such as homelessness or being incarcerated. They receive instruction and certification in “green” construction, building operations and maintenance, solar PV installation, and more. “Green” means the building practices are





Students and teachers from the Green Design Lab pose with a rooftop solar project.

environmentally responsible and resource-efficient.

Solar One also delivers a K-12 environmental, science, technology, engineering, and math (STEM) education program called Green Design Lab (GDL) in New York City and Newark, New Jersey. The curriculum has reached more than 20,000 students and more than 1,000 schools since 2009. GDL uses the school community as a laboratory for learning and a tool for creating change, helping students develop as environmental stewards and leaders. Students and their teachers study units on energy, water, air, materials science, food, and the impacts of climate change. GDL's hands-on activities develop critical thinking and problem-solving skills. For example, students design and construct mini-solar powered racecars or build batteries to power a small motor, while learning about the importance of energy storage. In the Schoolyard Solar activity, students build a PV system that uses solar energy to power small devices like cell phones and laptops.

In Solar One's summer program, Career CLUE (Community Learning, Understanding, and Experience), high school students explore careers in



Students in Solar One's education program design mini-solar powered racecars.

the field of clean energy and participate in service-learning projects and exciting field trips like touring a solar array or a rooftop farm. Solar One has even helped place Solar CTE (Career and Technical Education) students in summer internships installing solar PV on New York City school buildings.

When it comes to creating sustainable environments and a healthier future for us all, the Sun has a starring role.

Barbara Lerman-Golomb began her career at *Nickelodeon* and *Scholastic*. She has published widely on a range of subjects for all ages and authored and designed a variety of learning materials for leading publishing and edutainment companies. As an experiential environmental educator, she works to create sustainable communities. Barbara also enjoys being a staff member at Solar One.

FAST FACTS

- » In 1839, a young French physicist named Edmond Becquerel discovered what is now known as the photovoltaic effect. His father, Antoine Becquerel, was a well-known scientist who was interested in electricity. Edmond became fascinated with the way light worked. When he was 19, he discovered that electricity could be produced through sunlight.
- » The first people known to apply solar energy on a large scale were the ancient Egyptians, who used it to heat their homes. They designed and built houses so that the buildings stored up the Sun's heat during the day and then released it at night.