

6.5

Solar in K-12 Curriculum

Around the country, solar educational materials have been developed for incorporation into school K-12 curricula. If the state has already integrated a solar-related K-12 curriculum into its education requirements, use the accredited curriculum as a starting point. If there is no approved curriculum, work with local and state educational boards to create appropriate materials and help teachers use them effectively. To integrate solar energy into the K-12 curriculum in a community, community leaders must work within established state and local curricula guidelines, create a mechanism for training teachers to deliver the information, and consider how teachers can show students a solar energy system in action. It's important to understand any constraints on teaching materials and determine how solar information can be included to maximum effect.

BENEFITS

Solar technologies installed at schools are excellent showcases for displaying the benefits of solar and other forms of **renewable energy**. Incorporating solar energy science into the K-12 curriculum and installing solar technologies at local schools educates not only children but also the community. And because the students of today will become the workforce of tomorrow, instilling interest in solar energy at a young age can help prime a future solar workforce.

Implementation Tips and Options

- Identify and draw from curricula that have been developed in other areas.
- Work with local and state curriculum developers to ensure that the materials meet the standards for education.
- Offer the curriculum to local educators and train them to use it properly. Involving teachers early on helps build support for adopting the curriculum.
- Develop a “solar for schools” program that includes not only curriculum but also incentives for installing solar systems, monitoring their energy production, loading the data onto a Web site, and using those data as a tool within the curriculum.

- Work with owners of existing solar energy systems in the area to create a list of solar **arrays** that are available as field-trip destinations for students. Distribute this list to teachers, particularly those at schools that lack an on-site solar energy system.

Examples

Austin, Texas: Promoting Solar in Schools

In 2006, Austin Energy launched its Solar for Schools program, which offers **photovoltaic** (PV) installations to area schools. Austin's program is part of the broader Texas Solar for Schools program, sponsored by the Texas State Energy Conservation Office. By 2009, the Texas program installed PV systems at 42 schools across the state. As of spring 2010, Austin had installed 32 systems at area schools. This represents 81.8 kilowatts of total capacity with an estimated annual production of 136,004 kilowatt-hours. Students can monitor energy production from the solar installations via a Web site. Staff from Austin Energy worked with Austin Independent School District science teachers to develop a solar energy curriculum. On May 13, 2010, the Austin City Council entered into a 2-year agreement with the school district to install solar panels and solar outdoor learning centers at up to 21 schools. The solar installations will generate power for the schools and give children an opportunity to participate in interactive lessons on solar energy.

New Orleans, Louisiana: Launching the Solar Schools Initiative

The city of New Orleans is working with the local utility Entergy New Orleans and the U.S. Green Building Council to implement a solar schools initiative. Through a Solar America City grant, a U.S. Department of Energy (DOE) technical team was brought to New Orleans to analyze new construction and major renovations of municipal buildings and schools for applicability of energy efficiency and solar technologies. Four schools were selected for the installation of solar arrays: Warren Easton Senior High School, Joseph A. Craig Elementary, William Frantz Elementary, and Henry Allen Elementary. As of October 2010, all but Henry Allen had been completed and are being used as models for solar installations on municipal buildings. In conjunction with the installations at these schools, New Orleans is developing a solar curriculum for implementation during the 2011–2012 school year that will be used to teach students about energy efficiency and renewable energy. **Energy audits** of the New Orleans schools are included in the curriculum, which allows students to gain “hands-on” experience with tracking actual building energy consumption.

Visit www.solaramericacommunities.energy.gov for more inspiring examples from communities across the United States. 

Additional References and Resources

WEB SITES

Florida Solar Energy Center: Education

www.fsec.ucf.edu/en/education/k-12/curricula/index.htm

The Florida Solar Energy Center (FSEC) has designed many curriculum materials for K-12 teachers and schools, in accordance with state standards. This Web site describes these materials and features links to useful Web sites. FSEC also administers the SunSmart Schools Program.

The NEED Project: Putting Energy into Education

www.need.org/curriculum-guides

The National Energy Education Project (NEED) developed a K-12 solar curriculum that can be downloaded from this Web site.

National Renewable Energy Laboratory Education Programs

www.nrel.gov/education/k12_students.html

The National Renewable Energy Laboratory's (NREL's) programs promote science, mathematics, and technology education using renewable energy to capture student interest.

Southface: Building Know-How for a Sustainable Future

www.southface.org/

Southface Institute, a nonprofit organization governed by a volunteer board of industry experts, has been recognized for excellence by DOE, the U.S. Environmental Protection Agency, and numerous industry and community organizations. The Web site contains a comprehensive list of educational resources and materials for teachers interested in incorporating solar energy into their curriculum. The information emphasizes solar energy and also describes activities and lessons encompassing other forms of renewable energy and energy conservation.

Texas State Energy Conservation Office: Renewable Energy Lesson Plans

www.infinitepower.org/lessonplans.htm

The Texas State Energy Conservation Office created the Infinite Power of Texas Renewable Energy Educational Campaign to accelerate the acceptance of renewable energy resources in the state. The lesson plans available on this Web site were developed by a team of professional educators and renewable energy experts, and include teacher resource guides, reading passages for students, student worksheets, and many other helpful improvements in an easy-to-download format.



*A 3kW rooftop PV was installed in the Center City District of Philadelphia.
(Mercury Solar Solutions/PIX18063)*