



BIOMASS



GEOTHERMAL



HYDROPOWER



SOLAR



WIND

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WISCONSIN SOLAR USE NETWORK

Photovoltaic panels on the Waunakee High School roof.

Many schools across the country are not only studying solar power in the classroom, they are putting the sun to work to provide lighting, heating and cooling to school buildings. In the past few years, a number of schools in Wisconsin have installed successful solar electricity projects and have introduced this popular subject into their science programs.

Showcasing solar (or photovoltaic) power at schools introduces solar energy to the next generation of energy users and educates them about electricity, astronomy and the environment. Curriculum is available to support these activities.

WHY INTRODUCE PHOTOVOLTAIC PROJECTS IN SCHOOLS?

- Bringing photovoltaics to students is an important first step to increasing the use of solar energy in the community.
- Schools make an excellent showcase for the benefits of solar electricity.
- By learning about solar energy as part of the science curriculum, students get a constructive head start on real-world energy concerns about reducing the need for dwindling and polluting fossil fuels.
- Solar energy projects can be easily expanded to include efficient uses of energy, including daylighting, low-wattage lighting, heat pumps, and better insulated windows, walls and roofs.

OTHER CONSIDERATIONS

Realistic expectations. Although a solar electric system can provide some of the school's electricity requirements, a solar project is most cost effective as an educational demonstration. Greater impact on the school's energy bills could be made by pursuing energy efficiency strategies within the building and its mechanical systems.

Commitment. The most successful school solar projects have been those where teachers and administrators have worked together with the community to raise the necessary funding and to integrate the project fully into the school cur-



ENERGY CENTER OF WISCONSIN

Northland College in Ashland, Wisconsin, is committed to renewable energy on campus. The Environmental Living & Learning Center, a sustainable residence hall, employs solar thermal water heating (installed on roof), solar electric panels (on freestanding racks) and an abundance of natural daylighting.

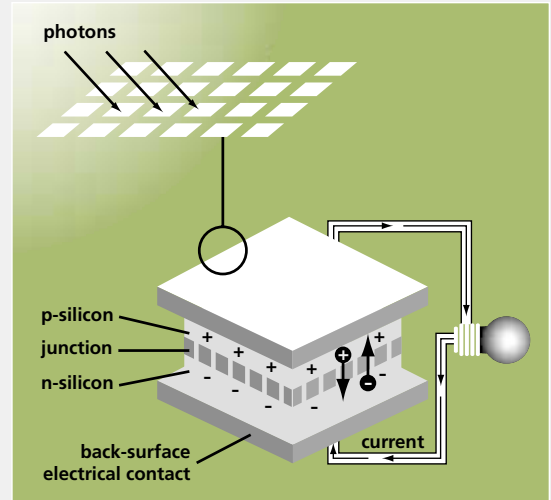
riculum. Leadership and commitment are both required in what is essentially a long-term process.

Strategies. Solar electric systems installed for educational reasons need not be large, but they should be visible and accessible. Precise monitoring systems are usually installed to allow students to track energy and climatological data. The solar electric systems installed on schools typically range in cost from \$10,000 to \$25,000, depending on the system's size and monitoring system.

Photovoltaic or solar electricity

The word *photovoltaic* comes from the Greek *phos* meaning "light" and from the word *volt*, for Alessandro Volta, the man who first devised apparatus for developing electric currents. Photovoltaic or "PV" materials have the ability to generate a current of electricity when exposed to light. Photons, which make up light, knock electrons from the front to the back of the PV material, creating an electrical current. Electrical generation within a solar cell is nonmechanical. There are no moving parts, only moving electrons, and therefore it is silent, clean and continues indefinitely as long as the light source is present.

Solar panels are constructed of photovoltaic (or PV) cells, the basic components required to produce solar electricity. These cells are made of specially formulated silicon materials. PV cells can be built into frames and installed on roofs or on freestanding racks installed on the ground. Recent solar technology includes building components that incorporate solar cells into walls, windows and roofing systems.



The structure of a photovoltaic cell.

HERE IN WISCONSIN

Schools are choosing to go solar to fulfill a number of energy needs: heating water, bringing natural daylight to classrooms and producing electricity and space heat. Solar energy also powers school zone flashers and safety lights for parking and outdoor areas. Utilities have sited photovoltaic systems on schools through voluntary programs where consumers pay a little extra to support renewable energy.

Many schools in Wisconsin already have solar electric systems. Wisconsin Public Service Corporation has installed 15 solar electric systems on high schools across its service territory through the Solar Wise® for Schools program. Madison Gas and Electric is installing solar electric systems on every high school in its service territory. Other schools, including Waunakee Community High School, Saint Mary Central High School, in Neenah, and the Evansville Community High School, are installing solar electric systems on their own.



Two-kilowatt photovoltaic system installed on the roof of Waunakee High School.

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