

Chapter 14

MULTICULTURAL CONNECTIONS

● Sun Power

For thousands of years, people have used the power of the sun. In ancient times, the Greeks built their houses facing the south so that they would be warmed by the sun's rays in winter. Such planning helped the Greeks reduce their use of more costly fuels, such as wood and charcoal. The Romans later added their own methods to those of the Greeks—using glass windows to increase the effectiveness of solar heating to warm their homes, baths, and greenhouses. Solar energy was so important to the Romans that access to sunlight was guaranteed by law.

Modern Solar Collectors

Centuries later, during the 1970s, high oil prices and gasoline shortages helped revive interest in solar energy. One solar design, pioneered in Israel, uses parabolic (curved) mirrored dishes to concentrate the sun's energy and heat steam. The steam then powers a turbine that produces electricity. Electronic tracking devices allow the solar collectors to follow the sun across the sky, creating a very efficient system, which can turn 23% of the energy in sunlight into electricity.

A simpler type of solar collector is the solar panel. A solar panel is made up of many solar, or photovoltaic, cells, such as the ones used in solar-powered calculators. These cells convert energy from sunlight into moving electrons—electric current. A solar panel is tilted towards the sun to collect the sun's energy. One solar panel can generate from 30 to 60 watts of power when the sun is at its peak. Unused energy can be stored in batteries that can hold enough power to last up to five sunless days.

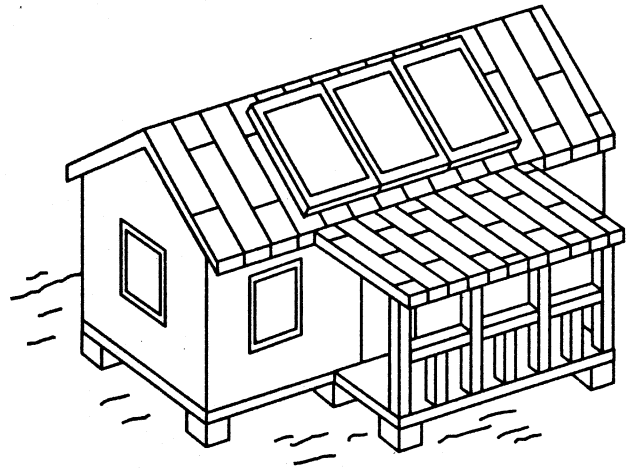
Solar Energy Use Worldwide

Continued improvements in solar technology have led to lower costs and greater efficiency, making solar energy a more attractive option around the world, especially in unindustrialized nations. By the early 1990s, more than 200,000 homes in Mexico, Indonesia, South Africa, Sri Lanka, and other developing nations were using rooftop-mounted solar systems to generate electricity.

Solar energy can play an important role in unindustrialized nations in bringing power to the more than 2 billion people who are still without electricity. Many of these people live in

remote rural areas where there are no power plants or access to power lines. Instead people in these isolated communities generally use diesel generators, kerosene lamps, and batteries for light and power.

A simple solar energy system can change all that. For example, in farming villages in the Dominican Republic, small solar panels (1-m square) have been installed on the roofs of houses. The solar panels turn the sun's rays into electric current for household use. At the end of the day, the extra electrical power can be stored in a battery for later use.



Solar energy has also transformed lives in remote Himalayan villages in northern India. Before the arrival of solar power, villagers had to use diesel generators to produce electricity. But diesel fuel was costly, hard to transport into these mountain villages, and it polluted the environment. Villagers now have solar panels that provide the electricity they need—a renewable, low-cost, and nonpolluting source of energy.

Solar power can do more than just light homes. In other areas of India, solar power has been put to use in agriculture. There are more than 90 million small farms in India, where farmers often have no access to water during the dry summer months. There is water available for irrigation, but no power to pump it to the fields. As part of an ambitious solar energy program, villagers and solar technicians have worked together in many farming communities to install solar-powered water pumps. With the newly available water, farmers can produce more food to feed their families and sell at market.

Multicultural Connections (continued)

The future of solar energy looks bright as well. The United Nations has declared 1995–2005 the World Solar Decade in an effort to promote the use of sun power worldwide. Through this pro-

gram, the U.N. plans to create an international network of centers for solar education and research.

Making the Connection

One way solar energy is used in many parts of the world is to heat water. Using simple materials and working in a small group, design and test a solar water heater of your own. Share your design with your classmates.

1. Why do you think people all over the world have tried to harness solar power? _____

2. People in many unindustrialized countries use kerosene lanterns for light. Kerosene is a petroleum product. What reasons might there be for these people to use solar power instead? _____
