

Photovoltaics: Electricity from Sunlight

Overview

Photovoltaics is a technology in transition. Photovoltaic (PV) power has long been cost-competitive in a variety of off-grid applications; and as the cost of PV electricity continues to fall, this environmentally benign technology is becoming increasingly attractive to electric utility companies. In the United States, photovoltaics is currently making the move from primarily remote, stand-alone applications to utility grid support.

According to the Solar Energy Industries Association (SEIA), total grid-connected photovoltaic generating capacity in 1994 was about 18 MW, spread across 36 states. Although stand-alone applications are difficult to quantify because they are so widely dispersed, there are an estimated 25,000 homes in the United States powered exclusively by photovoltaics.

More than 850 U.S. companies are currently involved in the manufacture and sale of photovoltaic modules and system components. The industry brings in more than \$300 million in revenues annually and employs 15,000 people — most of them in high-quality jobs, such as manufacturing, engineering, sales, installation, servicing, and maintenance.

International sales continue to drive the PV industry. The largest market for photovoltaics is in the developing world, where two billion people still do not have electricity in their homes. Photovoltaic systems are particularly well suited to this market because of their high reliability, their suitability for applications of almost any size, and the fact that they do not need costly transmission lines. Approximately 70% of U.S. photovoltaic manufacturing output is exported.



Sacramento Municipal Utility District/PIX02439

Through its PV Pioneers program, the Sacramento Municipal Utility District (SMUD) installs and operates grid-connected, rooftop PV systems on customers' homes. The program creates jobs in the utility's service area and reduces the need for SMUD to purchase electricity from other regions.

Success Stories

The United States leads the world in photovoltaic research and manufacturing, accounting for 43% of global PV module production in 1995. The growing international popularity of photovoltaics is creating an increasingly buoyant domestic PV industry, and U.S. manufacturers are scaling up their production facilities to take advantage of emerging markets. These expansions are creating skilled jobs in several states.

U.S. Manufacturers Lead the Way

Siemens Solar Industries (SSI), based in Camarillo, California, is the world's largest manufacturer of photovoltaic cells and modules. In 1995, the company shipped 17 MW of photovoltaic modules, representing half of U.S.

production and 21% of total world production that year. To help meet growing worldwide demand, SSI completed a \$3 million expansion of its facility in Vancouver, Washington, in February 1996. The expansion created 33 new jobs in the Vancouver area, and all work on the facility was awarded to local contractors, further contributing to the local economy. SSI employs a total of approximately 350 people at its facilities in California and Washington.

Solarex, the second largest PV manufacturer in the United States, has been in business for over 20 years. During the late 1970s and early 1980s, as oil prices rose, major oil companies began investing in renewable energy as a hedge against an uncertain future in fossil fuels. Amoco Corporation bought Solarex in 1983. Most of the oil