

Solar Energy

The Global Photovoltaic Market

Excerpt from *Powering Our Future: An Energy Sourcebook for Sustainable Living*. The text was modified to fit the website.

The sun is a colossal fusion reactor radiating heat in excess of 11,000 degrees Fahrenheit (6,100 degrees Celsius). As the nuclei of hydrogen atoms fuse together, helium and vast amounts of energy are released. The earth is a direct beneficiary of this light and heat, receiving one of the most crucial ingredients to the existence and perpetuation of life. The sun has been burning for more than 4.5 billion years, and scientists believe it has at least as many years remaining in its lifecycle. The global population uses less energy in 27 years than the earth receives from the sun in a single day. With such power, there is ample opportunity for the global community to obtain a substantial portion of its energy needs from this ubiquitous source. The sun provides a tremendously powerful source of renewable energy, which has the potential of supplying part or all of the energy needs of billions of people. From passive solar design to photovoltaic (PV) cells to solar cookers and water heaters, people of all backgrounds, budgets, and geographical locations have viable opportunities to reap the benefits of the sun's powerful rays.

The potential of the solar industry has been severely underdeveloped. Currently, the global community derives three-hundredths of 1 percent of its electricity directly from the sun. While PV technology contributes to the global electricity share only meagerly, the growth of the industry is tremendous. Worldwide, PV sales increased at an average rate of 20 percent annually during the 1990s and then leaped to 33 percent per year since the turn of the millennium. Between 2000 and 2002, there were more than 70,000 PV systems installed in Japan, 10,000 in the United States, and tens of thousands in Europe. When off-grid systems are included, the global community receives several gigawatts of electricity from the sun's rays. Many energy experts believe that the solar energy market will continue to grow lucratively, well into the next decade as manufacturing costs continue to drop.

The United States pioneered many of the solar technologies that are having commercial success today; however, European and Japanese companies have joined in, and are now reaping the harvest of today's double-digit, solar product expansion. Not coincidentally, the nations that are reaping the economic benefits of having the largest solar manufacturing industries also have the greatest government incentives to install the technology. Japan, with more than 70,000 homes equipped with PV cells, is the leading manufacturer of PV systems, with 43 percent of the global share of production. Europe, led by Germany, and the United States produce 25 percent and 24 percent of the global market respectively. European nations and Japan have committed substantially more funding toward the research and development of marketable solar technologies than other regions of the world. These nations also have the advantage of citizen commitment and government subsidies for renewable technologies that are more generous than those available to U.S. firms. One of the most crucial differences is that governments in Europe and Japan tax fossil fuels heavily to pay for some of the hidden costs associated with their combustion. These taxes are partially used to offset the billions of government dollars spent on pollution-related illness, while funding programs to advance energy efficiency and renewable alternatives. This tax naturally discourages wasteful consumption of resources and consequently helps to reduce air pollution and greenhouse gas emissions. These densely populated, energy-hungry regions have the added disadvantage of expensive and limited land on which to build power plants, forcing them to seek innovative solutions.

Sources

http://solstice.crest.org/solar/solar_intro.html, accessed November 13, 2004. "An Introduction to Solar Power" was jointly produced by the Renewable Energy Policy Project (REPP) and the associated organization, the Center for Renewable Energy and Sustainable Technologies. REPP provides credible information and policy analysis with the intention of accelerating the expansion of renewable energy technologies.

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