

damaging solvents, and saves energy, time, and labor costs. Further, it allows the use of new materials such as lightweight alloys, and enhances design freedom by creating the opportunity to produce unique complex shapes. Manufacturers report a 20 percent savings in metal machining processes

Securing Future Energy Supplies

Today more than 85 percent of the useful energy and power produced in the United States comes from boilers, furnaces, and internal combustion engines that rely on fossil fuels. The Nation's increasing dependence on imported oil makes us vulnerable to supply disruptions and related price shocks. Although natural gas and coal are mostly domestic fuels, the heavy reliance on fossil fuels necessitates costly efforts to control pollution. Improving the Nation's ability to develop cleaner technologies and secure future energy supplies is vital to our economic, environmental, and social well-being.

The Department of Energy seeks to achieve this goal by research and applied technology development aimed at diversifying energy sources--especially promoting increased use of indigenous resources, including oil, gas, coal, nuclear, and renewable energy. We also support efforts to increase the efficiency of electric energy distribution and storage. To better ensure early commercial application of successful technologies, this research and development will be based on cost-shared joint government-industry-university collaborations wherever possible. Some success stories on the supply side of the energy ledger are highlighted in the following paragraphs.

Renewable Energy

The Department supports a balanced development and deployment effort on promising renewable energy technologies aimed at increasing the production and use of domestic energy resources, and is working with industry to strengthen the technology base leading to new products and processes for the commercial market. The number of private-sector partners willing to cost-share key research projects is evidence that the private sector has a legitimate interest in these technologies. Research and development on photovoltaics, solar thermal, wind, biomass, and geothermal energy will help strengthen the Nation's energy security, promote sustainable energy approaches, and increase U.S. industrial competitiveness. The goal in this program area is to triple the U.S. nonhydropower renewable energy capacity by the year 2000.

Continued cost reductions fostered by our strategic research, development, and deployment activities can ensure the United States a place in an emerging multi-billion-dollar clean energy market. The establishment of footholds by U.S. based firms in international sales activity is clearly vital. Currently, U.S. photovoltaic and geothermal companies are worldwide leaders as a **result of Department of Energy investments** in advanced technology development. **More than 70 percent of U.S. photovoltaic manufacturing output is exported, resulting in more than \$90 million in annual revenues.** U.S. companies have installed more than 1,000 megawatts of geothermal facilities in other countries and have orders for an additional 2,000 megawatts, creating an annual income stream of **\$250 million.**

Photovoltaics

Research and development supported by the Department of Energy has been instrumental in the discovery, synthesis, and development of state-of-the-art semiconducting and photonic materials and devices. Photovoltaic technology converts photons (light) into electricity. Today photovoltaic cells power a wide variety of devices, including spacecraft, watches, calculators, highway signs, navigational aids, emergency telephones, and relay stations; in developing countries, photovoltaic cells power entire remote villages. Photovoltaic systems are an ideal, environmentally sensitive technology for bringing people in remote sites such basic services and amenities as light, water, communications, power for businesses, and power for other productive uses.