

The 25 successful projects highlighted in this document include the following:

- low-emissivity windows which could capture 20-50 percent of the residential market by 1990;
- surface-wave fluorescent lamps which promise a 50 percent reduction in electrical energy requirements for fluorescent lighting; and,
- ground-coupled heat pumps which can pay for themselves in 3-5 years with energy savings.

Transportation Systems (OTS)

While other sectors of the U.S. economy have reduced fuel consumption, energy use in the transportation sector has grown. Transportation accounts for 63 percent of U.S. oil consumption, using 18 percent more oil than is produced domestically. At this time there is no economically feasible substitute for oil. However, there is a great potential for saving energy through the development of cost-effective fuel oil substitutes and more efficient energy-using technologies. To exploit this potential, the Office of Transportation Systems has sponsored research on innovative materials, advanced engines, alternative fuels, and electrically powered vehicles. In addition, much of the research sponsored by OTS has the potential both to lessen reliance on oil in the transportation sector and to reduce air pollution from vehicle emissions. Among the 14 OTS success stories described on the following pages are:

- the first electric vehicle with a useful range over 100 miles -- GM plans limited domestic production of a van using this technology;
- ceramic turbine rotors which allow practical application of turbocharger technology -- in 1986 the Nissan 300ZX became available with ceramic turbine rotors; and,
- ceramic coatings for diesel components that will yield a direct fuel economy benefit of nearly 4 percent for advanced diesel engines.

Industrial Programs (IP)

Until 1986 industry was the most energy-intensive sector of the U.S. economy. Of particular significance is the production of chemicals, petroleum, primary metals, paper, stone-clay-glass, and food industries, which account for two-thirds of all industrial energy use. To address the energy conservation needs of this key economic sector, DOE's Office of Industrial Programs sponsors research aimed at improving the energy-efficiency of industrial processes and energy conversion equipment; develops systems for the simultaneous production of electricity and process heat (cogeneration); and explores the potential of technologies that can use multiple fuels. IP also ensures that the technologies it develops are environmentally sound and is particularly active in technology transfer activities designed to assist small and medium-sized industrial facilities in analyzing their energy use. Twenty-nine successful IP research projects are summarized in this document, including:

- a slot forge furnace that offers energy savings of 50 percent or more;
- a high-efficiency welding unit -- 31,000 units are presently in use, saving approximately 1.1 trillion Btu per year; and,
- a low-speed diesel cogeneration system that could save as much as 171 trillion Btu by the year 2010.