

Introduction

The Department of Energy's (DOE's) Office of Conservation and Renewable Energy proudly presents this summary of some of its most successful projects and activities. The projects included in this document have made significant contributions to improving energy efficiency and fuel flexibility in the United States.

The energy savings that can be realized from these projects are considerable. Americans have shown an impressive ability to reduce energy consumption since 1973. Studies show that 34 quadrillion Btus (quads) of energy were saved in 1988 alone as a result of energy conservation and other factors.* These savings, worth approximately \$180 billion, represent more energy than the United States obtains from any other single source. The availability of new, energy-efficient technologies has been an important ingredient in achieving these savings.

Federal efforts to develop and commercialize energy-saving technologies and processes are a part of the reason for this progress. Over the past 10 years, DOE has carefully invested more than \$2 billion in hundreds of research and development (R&D) projects to ensure the availability of advanced technology in the marketplace. These energy-efficient projects are carried out through DOE's Office of Conservation and Renewable Energy and reflect opportunities in the three energy-consuming, end-use sectors of the economy: buildings, transportation, and industry.

*From *Energy Conservation Trends*, September 1989, DOE/PE-0092, Washington, DC: U.S. Department of Energy, Office of Conservation and Renewable Energy.

Once energy-saving developments are successfully transferred to the private sector, market forces allow companies and consumers to select the best technologies. The nation reaps the rewards from these research investments in the form of energy savings, reduced dependence on foreign oil, cleaner air and water, improved industrial productivity, new jobs, and cost savings, which accumulate year after year.

There is ample evidence that the energy technologies from the Office of Conservation and Renewable Energy are having a favorable impact in all economic sectors. For example, by systematically tracking the use of these technologies, the office determined that more than 46 trillion Btus were saved during 1989 alone. Similarly, private companies paid more than a half-million dollars in royalties and licensing fees for transportation technologies developed through the office's R&D programs. Likewise, the 37 licenses granted to private companies for a variety of energy-saving building equipment testify to the commercial value of those technologies.

Since this document, *A Compendium of Energy Conservation Success Stories*, was first published in September 1988, more projects have been added to the list of successes. In addition, new information has become available about further energy savings achieved by the projects described in that first publication. This edition of the *Compendium* updates the success stories summarized in the earlier document and showcases a number of successful new projects in energy efficiency.

What Is a Btu?

A British thermal unit, abbreviated Btu, is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near 39.2° F. In more practical terms, it is approximately equal to the energy provided by one lighted match tip. The annual energy consumption of an average home is approximately 138 million Btus.

To help describe very large quantities of energy, we generally speak in terms of quads. Quad is an abbreviation for one quadrillion Btus (1,000,000,000,000,000 or 10^{15}). This measure can be better understood if you think of one quad as the energy in a train of oil tank cars stretching from New York to Denver and back again. One quad is also equivalent to 26 days of U.S. gasoline use or 27 hours of world energy use (1987 data). In 1989, the United States consumed a total of 80 quads of energy.