

7.2 ENERGY SAVINGS OF THREE ERIP-SUPPORTED TECHNOLOGIES¹

7.2.1 Methodology

The amount of energy saved by the introduction of a new technology is difficult to estimate. One must consider a host of factors, including:

- the energy consumed by technologies that the new technology has displaced;
- any changes in the energy efficiency of the new technology over the lifetime of its operation; and
- any differences in the embodied energy required to produce the new technology and the technologies that are displaced.

Because of these complexities, it was not feasible to assess the energy saved by all of the ERIP-supported technologies that have entered the market. Instead, we examined the 15 ERIP-supported technologies that had achieved the greatest dollar value of cumulative sales through 1990², under the assumption that these represent the technologies that are likely to have generated the greatest energy benefits. Each of these 15 technologies was examined to assess the feasibility of producing an estimate of energy savings based on available documentation. This process resulted in narrowing the analysis to three technologies. It is anticipated that future research will address the energy savings of some of the remaining technologies.

The three inventions examined in this chapter are the:

- Brandon replacement packing rings for steam turbines;
- Electronic Octane® controls for automotive engines; and
- Thermefficient-100® industrial water heater.

These three technologies accounted for \$144.4 million in cumulative sales through 1990, which represented 28.7% of the sales of ERIP-supported technologies accumulated to that point.

A similar set of steps was taken for each of these technologies to estimate their energy savings. First, existing documentation on the technology was reviewed, including the NIST technical evaluation and information from previous ORNL evaluations of the Program. Additional information on the technology was solicited from the inventor and/or the licensee, including recent sales of the technology, and information from secondary sources was compiled, such as statistics from the Energy Information Administration. Second, a detailed analysis of energy savings was prepared and sent to a researcher at ORNL with expertise in the field of the particular technology. The detailed analysis was then revised, based on comments by the expert. Third, the revised analysis was

¹ Steve Cohn is the primary author of this section.

² The selection of technologies for detailed analysis of energy impacts was based on historic data (i.e., sales through 1990) because this information was all that was available when the detailed analyses were initiated. Only subsequently were sales data through 1992 available.