

## EXECUTIVE SUMMARY

This report presents the results of an evaluation of the economic impacts of the Energy-Related Inventions Program (ERIP), a joint program of the U.S. Department of Energy (DOE) and the National Institute of Standards and Technology (NIST). The evaluation was undertaken primarily to obtain up-to-date information on the commercial progress of ERIP inventions—including the market entry of ERIP technologies and the resulting sales and jobs. In addition, the evaluation seeks to: (1) estimate the energy and environmental benefits of ERIP technologies, (2) document and assess the amount and sources of funds that have been used to develop ERIP inventions, and (3) identify other commercial products that have spun off from ERIP projects.

As of October 1991, a total of 557 inventions were recommended to DOE by NIST, which screens all submitted inventions in terms of technical merit, likelihood of commercial success, and potential energy impact. To reduce the cost of data collection while maximizing the coverage of successful ERIP technologies, a sampling design involving two subsamples was employed. The first subsample includes 133 inventions identified by past research and key informants to be most promising in terms of market entry and commercial success. The second subsample contained the remaining 424 inventions. An attempt was made to reach all 557 inventors, but a special effort was made to contact the subsample of 133 promising inventors.

A 16-page questionnaire was developed to collect sales, employment, fund-raising, and other data for 1991 and 1992. Ultimately, survey data were collected from 253 inventors (105 promising inventors and 148 of the other inventors), or 45% of the 557 ERIP inventors. Most of the surveys were conducted by mail (N=197), and the remaining (N=56) by telephone. Nonresponse bias was found to exist, but could be addressed in the data analysis. Historic information from previous evaluations is also available for 189 additional inventors, bringing the total sample size to 442 of the 557 inventions.

Analysis of the survey data reveals that 1991-92 was a successful period for many ERIP technologies.

- By the end of 1992, at least 129 ERIP technologies had entered the market, representing a 23% commercialization rate.
- These 129 technologies generated total cumulative sales of \$763 million (in 1992 dollars).
- In 1992 ERIP inventors earned royalties of \$1.0 million, and over the lifetime of the program, royalties total \$18.6 million.
- With \$41 million in grants awarded from 1975 through 1992, and \$106 million in program appropriations over the same period, ERIP has generated a 19:1 return in terms of sales values to grants and a 7:1 ratio of sales to program appropriations.