REPORT SUMMARY

SUBJECTS: Hydroelectric systems / Decision analysis / Risk assessment / RD&D planning methods

TOPICS: Hydroelectric power plants; Commercialization; Decision analysis; Risk assessment; Research and development planning

AUDIENCE: Corporate planning and generation managers

Evaluation of EPRI Options for the Development and Commercialization of Modular Small Hydroelectric Power Plants

Market potential is a major factor in assessing technologies for R&D funding. Here, a conceptual framework and a quantitative methodology are used to evaluate EPRI's role in developing the nation's small-hydro resources.

BACKGROUND: In 1982 the Energy Storage and Hydroelectric Generation Program at EPRI faced an important funding decision: whether to participate in a demonstration of pump-as-turbine and other modular technologies at small hydroelectric sites. The demonstrations would cost several million dollars, and the benefits were uncertain. It was appropriate to evaluate EPRI's options in terms of what impact they would have on small-hydro development.

OBJECTIVES: To evaluate alternative EPRI roles in the commercialization of modular small hydroelectric power plants and to test a conceptual framework developed under earlier EPRI research.

APPROACH: Researchers began with a conceptual framework (described in EPRI report EA-2926) for assessing the value of alternative EPRI roles in the commercialization process. First, they quantified the small-hydro market potential. In doing so, they used both detailed site data from the U.S. Army Corps of Engineers and a site value model that considers resource availability, technology costs and efficiencies, and regional utility cost information. Next, they quantified the impact of alternative EPRI roles on the rate of development of the nation's small-hydro systems. Their estimates of the development rate were based on a commercialization model that accounted for such issues as uncertainty and the real and perceived costs of dealing with a new technology. A site-by-site evaluation was performed on more than 1200 high-potential small-hydro sites.

RESULTS: Using the modeling results, researchers were able to estimate the value of different EPRI roles in stimulating small-hydro development. These potential roles fell into three categories. The first—information dissemination and the development of improved planning procedures—appeared to be the most cost-effective for EPRI to sponsor: an expenditure of only $100,000 to $500,000 would provide utility customers with benefits worth $100 million.

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