

TECHNOLOGY AND MARKETS

ADVANCED ENERGY/ ENVIRONMENTAL TECHNOLOGY COMMERCIAL- IZATION

ERI analyzes U.S. and foreign markets for advanced energy and environmental technologies; assesses the barriers to the commercial use of such technologies; and recommends actions for industry, governments and financial institutions to mitigate these barriers. ERI also analyzes incentive mechanisms for creating the environment for commercial introduction of advanced technologies.

ERI assists its clients in developing new energy projects by providing strategic planning, coordination, and analysis to introduce fossil energy, renewable energy and environmental technologies throughout the world.

ENERGY PLANNING AND PROGRAM EVALUATION

ERI advises its clients about key factors that may affect their investment and communication strategies, including their planning, programs and projects in the United States and internationally.

ERI also evaluates major energy programs to assess their effectiveness and identify strategies for improving them.

ELECTRIC POWER INDUSTRY SUPPORT

ERI conducts analyses of emerging issues related to regulations, privatization, industry restructuring, financing, technology choice and associated environmental impacts.

ERI assists both U.S.-based and non-U.S. based power producers in assessing the cost-effectiveness of options to improve plant performance and extend the useful lives of power plants.

ENVIRONMENTAL POLICY AND TECHNOLOGY ANALYSIS

ERI conducts assessments of environmental regulatory issues affecting the power industry, including performance requirements, emissions trading, technology markets, byproduct markets, and compliance issues.

ERI investigates the scientific, regulatory, technological and policy issues associated with domestic and international environmental requirements.

ERI also performs policy and analytic studies on a wide variety of issues related to global climate change.

ADVANCED ENERGY/ENVIRONMENTAL TECHNOLOGY COMMERCIALIZATION

ASSESSMENT OF BARRIERS

ERI assesses barriers to the commercial use of advanced energy technologies in developed and developing countries. ERI also recommends actions that can be taken by industry, governments and financial institutions to remove these barriers. Recent ERI efforts in this area include the following.

- Barriers to Investing in Cogeneration Projects in China. ERI analyzed the risks facing cogeneration developers and the barriers to foreign investment in cogeneration development in China. ERI also identified the key policies and legislation that will influence the future of cogeneration in China, and recommended specific actions that can be taken to address existing barriers.
- Distributed Energy in the Southern States. ERI identified the key barriers to deployment of distributed energy technologies in the Southern U.S. states. ERI revealed many misperceptions about such barriers, prioritized the actual barriers and, by facilitating workshops with important regional stakeholders, developed a vision, strategy and action plan for overcoming those barriers.
- Strategic Plan for Carbon Sequestration and Clean Coal Technologies. ERI identified the key barriers to broader deployment of clean coal technologies, including carbon sequestration, through extensive stakeholder interviews. It revealed many perception-based barriers that can be reduced through strategic education and outreach efforts. ERI designed a detailed action plan for education and outreach to address the barriers and promote deployment.

MARKET ANALYSIS

ERI conducts domestic and international market analyses for advanced energy technologies. ERI identifies incentive mechanisms that help promote the commercial introduction of advanced energy systems.

- Domestic and International Markets for IGCC. ERI thoroughly assessed the international and domestic markets for integrated gasification combine cycle (IGCC) technology. ERI summarized current fossil-fuel applications of gasification technology and identified the likely path of IGCC market adoption, including factors affecting its competitiveness. ERI determined each region and country's IGCC market potential post-2005. ERI ranked and assessed the countries with the greatest potential for IGCC market penetration.
- International Markets for Renewable Energy Technologies. ERI assessed the potential market for renewable energy technologies in 28 target countries by analyzing over 300 market and resource assessments. Solar/photovoltaic, hydroelectric, biomass, geothermal, and wind resources were examined. ERI suggested ways to improve future renewable market assessments.
- Issues Affecting Deployment of U.S. Clean Coal Technologies in Indonesia. ERI identified the issues affecting deployment of U.S. clean coal technologies (CCTs) in Indonesia (e.g. high capital cost and perceived lack of operational experience). ERI also found Indonesia to be a potentially key CCT market, and recommended actions to promote U.S. CCT opportunities in Indonesia.

ADVANCED ENERGY/ENVIRONMENTAL TECHNOLOGY COMMERCIALIZATION

TECHNOLOGY ANALYSIS

ERI provides strategic planning, coordination, analysis and advice on introducing advanced technologies into the commercial marketplace. Recent efforts include the following.

- Analysis of IGCC for U.S. Rural Electric Cooperatives. ERI analyzed the environmental, economic and market issues associated with use of coal-based integrated gasification combined cycle (IGCC) for three rural U.S. electric cooperatives that are planning capacity additions. ERI analyzed site-specific issues, technology configurations, byproduct options and IGCC competitiveness for each of the three cooperatives.
- Feasibility Study for Plant to Convert Coal to Dimethyl Ether in China. ERI participated in a feasibility study for a plant to convert coal to dimethyl ether (DME) in the Ningxia Autonomous Region of China. ERI performed technical and economic assessments of the markets for the plant's principal products (DME, methanol and sulfur), and an environmental assessment for the plant.
- Demand Assessment for Air Pollution Control Technologies and Services. ERI assessed the potential demand for air pollution control technologies and services in 10 countries (in Asia and Central/Eastern Europe) that are imposing stricter emission limits for coal-based power plants. For each country, ERI identified power plant configurations, rehabilitation options, and applicable environmental requirements. ERI also estimated the current and potential U.S. pollution-control market opportunities for each country.

POLICY ANALYSIS

ERI provides advisory services regarding changes to policies and regulations that may affect the introduction, use and competitiveness of advanced technologies.

- U.S. Policies Affecting Coal and Clean Coal Technology Deployment. ERI analyzed the political and policy factors that are influencing the use of coal for power generation in the U.S. These included RD&D programs for CCTs, incentives for investing in CCTs, and related environmental rules and policies.
- Policies to Promote Clean Cogeneration Development in China. ERI helped develop new guidelines for cogeneration technology selection and use in China. The new guidelines were a departure from China's traditional rules. ERI and the China Energy Conservation Investment Corporation totally revised the guidelines to encourage cleaner fuels, advanced technologies (domestic and foreign), and market-based decision-making. The Chinese government fully approved and implemented the new guidelines.
- Policy analysis briefs. ERI provides series of briefs on a monthly or bimonthly basis to clients on key policy issues affecting technology deployment. Such briefs have encompassed a broad range of issues, including U.S. global climate change policy developments, multi-pollutant control proposals, and state and federal air quality regulatory changes. ERI's policy briefs highlight key recent developments, clarify the context for understanding such developments, and identify their strategic implications and importance.

ENERGY PLANNING AND PROGRAM EVALUATION

STRATEGIC PLANNING

ERI provides strategic advice regarding factors that may affect its clients' policies, programs and projects. Recent efforts in this area include the following.

- Value of Emission Offsets in Selected U.S. States. ERI examined current air regulatory requirements and announced new capacity in selected U.S. states in order to identify the potential value of emission offsets created by its client's activities. ERI also identified the factors and upcoming state proceedings that could significantly affect the value of those offsets in the marketplace.
- Markets for Small Steam Turbines in India and China. ERI analyzed the key factors affecting markets for small (<20 MW) steam turbines in India and China, including government policies and industry practices that influence the production and demand for small turbines in each country. ERI estimated the market potential for steam turbines of 6 to 20 MW capacities in each country.
- Development of a Coal Policy for Brazil. At the request of the Brazilian Government and U.S. Department of Energy, ERI assisted in developing Brazil's national coal policy. ERI assessed the potential role of Brazil's coal resources for fueling economic growth and the role of clean coal technologies to meet Brazil's energy needs and strict environmental requirements.

EVALUATION OF PROGRAMS AND PROJECTS

ERI evaluates major energy programs and projects and makes recommendations for improving them. Some recent ERI projects in this area are described below.

- Evaluation of USEA's Energy Partnership Program. ERI conducted an impact assessment of the U.S. Energy Association's Energy Partnership Program, which partners U.S. utilities and energy regulatory agencies with counterpart organizations in developing countries. Through a detailed questionnaire, ERI identified the Program's significant development impacts, contribution to power-sector reform and achievement of relevant USAID strategic objectives. ERI also recommended ways to improve the program and its implementation.
- Evaluation of the China Sustainable Energy Program. ERI evaluated the China Sustainable Energy Program (CSEP), a program funded by the Packard and Hewlett Foundations and administered by the Energy Foundation to help China develop policies to meet its energy requirements in an environmentally acceptable manner. In conducting the evaluation, causal chains and key performance indicators were developed and more than 100 senior Chinese and foreign experts were interviewed to develop a set of findings and recommendations for improving the program.
- Evaluation of the UK's Coal Research and Development Programme. ERI led a panel of international experts to evaluate the progress of the Coal Research and Development Programme of the United Kingdom's Department of Trade and Industry. Through expert interviews and other inputs, ERI helped identify the Programme's successes and deficiencies and made recommendations. The report will help shape the future direction and funding of the program.

ELECTRIC POWER INDUSTRY SUPPORT

STRATEGIC PLANNING

ERI develops strategic plans for the current and future utilization of power plants by assessing their competitive position and investment requirements for continued operation under alternative market and environmental conditions.

- Assessment of Fossil Energy Options to Repower Nuclear Plants. ERI assessed the fuel supply infrastructure required to convert 47 nuclear power plants scheduled for relicensing through 2015 to either natural gas or coal. ERI analyzed the logistics and deliverability of the fuel supply infrastructure associated with using natural gas and/or coal at each site.
- Outlook for U.S. Coal-Based Power Production. ERI identified the key factors affecting the direction of the U.S. coal-based power market and the strategies of major U.S. coal-based power companies to maintain and expand coal use. ERI provided case studies of three companies and examined the role of various coal-based technologies.

MARKET ASSESSMENT

ERI investigates and assesses international markets to identify opportunities for development by the electric power industry, by analyzing relevant economic, regulatory, technological and geopolitical factors.

- Market Analysis for Advanced Turbine Systems. ERI analyzed the potential markets for advanced turbine systems (5-15 MW) in the U.S. and provided an assessment of the competition and barriers to their use. ERI analyzed the potential industrial and utility markets, life-cycle competitiveness of these systems, and the appropriate turbine size suitable for the identified markets.
- U.S. Opportunities in Brazilian Coal and Power Markets. ERI provided a comprehensive review of changes taking place in Brazil's power industry. ERI also identified opportunities and barriers to foreign (U.S.) participation in its power program by examining key factors and experience. ERI recommended actions to overcome the barriers and to increase investment.

FINANCING AND CONTRACTUAL ISSUES

ERI assesses financing and contractual options and strategies for power projects.

- Resource Guide to Project Financing. ERI developed a comprehensive guide to multilateral, national export-credit and other sources of power project financing and guarantees. The guide included detailed summaries of loan, guarantee, insurance, policy and performance (including environmental) requirements and offerings.
- Analysis of Power Purchase Agreements. ERI identified the effect of U.S. wholesale electricity competition on the provisions of Power Purchase Agreements, across a selection of fuels, technologies and plants. ERI also identified the reasons, effects and implications of the contractual changes.

ENVIRONMENTAL POLICY AND TECHNOLOGY ANALYSIS

ENVIRONMENTAL REGULATORY SUPPORT

ERI advises clients on regulatory developments and compliance trends and assists in the preparation of strategic responses, including the drafting of formal comments in regulatory proceedings.

- Environmental Policy Tracking. ERI advises clients on initiatives underway in the U.S. to limit emissions from the power sector. ERI identifies the implications of carbon, mercury, particulate and other potential limits for specific power-sector fuels, technologies and plants. ERI also drafts comments for state and federal proceedings.

GLOBAL CLIMATE CHANGE

ERI advises clients on policy and analytical aspects of climate change, including control technologies, emissions trading, offsets and joint implementation. Examples of ERI's recent efforts are provided below.

- Carbon Management Strategies. ERI summarized the voluntary carbon-management actions taken by U.S. power companies and the rationale for such actions prior to a regulatory requirement. ERI advised clients on the value of four carbon management strategies and their use in practice: bilateral trades, intra-firm trading, joint implementation projects and section 1605(b) filings.
- Handbook of Climate Change Mitigation Actions for Developing Country Utilities and Regulatory Agencies. ERI developed this handbook as a summary of "best practices" to assist developing countries in reducing greenhouse gas emissions. The handbook discusses each mitigation action, sources of further information, conditions to determine applicability, cost-effectiveness, and the emission reductions that can result from each action.

ALTERNATIVE TECHNIQUES

ERI assesses alternative technology scenarios' impacts on emissions.

- Alternative Paths for Advanced Fossil Energy Technologies. ERI quantitatively assessed the effect of alternative economic and technology paths on U.S. power-sector carbon emissions through the year 2050. Variables analyzed include (1) electricity supply growth, (2) coal, nuclear and natural gas capacity growth, (3) coal capacity retirements and (4) clean coal technology deployment.
- Environmental Benefits of Alternative Energy Technologies. ERI assessed the methodologies used to compare clean energy technologies' environmental impacts. ERI also analyzed the impact of these methodologies on U.S. energy/environmental policies.
- Role of Nuclear Power in Carbon Reductions. ERI assessed the importance of global and regional avoided emissions from nuclear power generation for compliance with carbon emission-reduction targets. ERI created briefing books that identified the quantity and value of carbon emissions avoided by new nuclear power capacity in a variety of operational, market and regulatory scenarios.