

Economics of Small Reactors: NERA Research Project

Small reactors promise low-cost and carbon-free nuclear electricity without the large capital cost and long lead time of large light-water reactors.

NERA invites you to participate in research on the economics of small reactors.

There is a lot of interest in small reactors from utilities, the nuclear industry, regulators, and others. Small reactors have the potential to remove some key industry hurdles, including large project capital cost and long lead time. Small reactors will allow phased modular investments and will diversify construction and operational risk across multiple units. Small reactor designs may also lower O&M cost through simplified designs, phased and less frequent refueling, and other features. Small reactor vendors plan to use mass production in factories to achieve lower capital cost, higher quality, and shorter construction time.

However, skeptics point to the loss of scale economies achieved by large conventional light-water reactor designs, a new set of safety and licensing issues that will challenge the NRC, the potential need for changes to existing NRC regulations, and the need for more research, development, and commercialization for some small reactor designs.

A key question is whether the benefits offered by small reactors will be enough to overcome these challenges. NERA believes that a well-structured economic analysis can help resolve this question. Such an analysis can also provide a useful tool to help small reactor vendors and potential buyers in their decision-making process.

NERA plans to undertake a comprehensive analysis of small reactor economics. Our small reactor economics research study will examine benefit/cost issues associated with size and other relevant reactor design attributes. We will include a range of small, advanced, and alternate reactor designs in the study, and the final study report will provide an overall economic assessment of each of these small reactor designs.

Our approach will be attuned to the realities of the utility industry and informed by our extensive work on nuclear power industry issues, electricity industry power plant valuations, electricity integrated resource plans, electricity markets, and related projects.

We offer you a chance to participate in this study.

Questions the Study will Answer:

What are the small reactor models and designs and the key features of each?

What are the potential benefits of small reactors?

What are the challenges facing small reactors?

How do small reactors compare to large Generation III Nuclear power plants and to other energy resources?

What are the key issues that small reactors must resolve for commercial success?

Timing

The Study will start in June 2010 and be completed by the end of calendar-year 2010.

Study Approach

Stage 1: Data Collection – NERA will collect data from public documents and reports on small reactors, supplemented by telephone discussions with selected parties. We will supplement public information on small reactor design attributes with information provided by vendors, regulators, trade groups, and others.

Stage 2: Model Development and Analysis – NERA will define the various benefits and challenges that are attributed to small reactors and develop an economic model to estimate the impact of each factor.

Stage 3: Draft Report – NERA will prepare a draft report that will be distributed to selected parties for comment.

Stage 4: Final Analysis and Report – NERA will use feedback from draft reviews to refine its analyses and to develop a final report.

Study Benefits

The NERA Small Reactor Economics Study will provide the following benefits:

- **Industry Input** – Selected parties will have the opportunity to review and comment on the draft study/report, as well as the overall and design-specific conclusions. NERA will also conduct interviews with selected parties.
- **Final Report** – The final report will provide results and implications of our analysis.
- **Economic Model** – An economic model will be developed to assess the benefits and costs of small reactor projects based on generic inputs and assumptions. This economic model will be discussed and described in the final study report; the model can be used by buyers and sellers of small reactors to help them with decision-making.
- **Credit and Attribution** – The report will include a list of contributors.

How you can sign-up

Participation in the study is open to anyone, but focused on vendors, regulators, and others with activity in small reactors. To the extent that a particular small reactor design vendor does not participate, NERA will base the information for that small reactor design and its attributes only on information gathered from public sources.

To participate in the study, contact Edward Kee via email at edward.kee@nera.com or at +1 202 370 7713.

About NERA

NERA Economic Consulting (www.nera.com) is a global firm of experts dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges. For over half a century, NERA's economists have been creating strategies, studies, reports, expert testimony, and policy recommendations for government authorities and the world's leading law firms and corporations. With its main office in New York City, NERA serves clients from more than 25 offices across North America, Europe, and Asia Pacific.

NERA's Nuclear Energy Capabilities

NERA's nuclear experts have the skills and experience to help companies considering or implementing an investment in nuclear power make the right decisions at every stage of the process, including assessment of the strategic and economic aspects of pursuing a nuclear project, regulatory approval and rate cases, design/vendor evaluation and selection, market analysis, project planning and development, and risk assessment and mitigation.

Our experts have extensive hands-on experience in the nuclear power industry, have worked on nuclear projects around the world, and are grounded in all aspects of the supply chain and fuel cycle. We have unparalleled expertise in applying rigorous economics and the analytical tools and techniques needed to help companies make the right nuclear choices. Because so much of NERA's analysis is subjected to close scrutiny by regulatory bodies and courts, we have built a reputation for unmatched reliability and objectivity. We have been and continue to be involved in the cases arising from the development and operations of nuclear projects.

Study Leaders

Edward Kee

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Mr. Kee is a Affiliated Consultant in NERA's Washington, DC office. He specializes in the electricity industry with experience in nuclear power, electricity markets, restructuring, regulation, private power, and related issues. He has provided testimony as an expert witness on a range of electricity industry issues in state and federal courts, before the Federal Energy Regulatory Commission, and before other legal and regulatory bodies. Mr. Kee also provides strategic advice to companies and governments on issues related to the nuclear and electricity industries.

Mr. Kee holds an MBA from Harvard University and a BS in systems engineering from the US Naval Academy.

Jonathan Falk

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Mr. Falk is a Vice President in NERA's New York office. He has worked on a variety of issues involving the modeling of investment and industry structure. He has recently been involved in the creation of novel insurance products to transfer price risk in electric markets, with a specific focus on nuclear plants. In nuclear power specifically, he worked on the prudence of nuclear expenditures in the 1980's, worked on market rules to integrate nuclear plants into restructured competitive electric markets, and has spoken at numerous conferences on the economics of new nuclear units. He is the current developer of the NERA Electric Market Model, which estimates market clearing prices in heretofore regulated markets. He has studied market power questions in emerging electricity markets and has estimated the social benefits of real-time pricing options for electricity, as well as questions of valuation and the financial risks associated with restructured electric markets. He has also advised on the structure of market rules and has created a number of models to value flexibility in utility planning.

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