

## **A NEW NUCLEAR PLANT IN TEXAS: HAS THE TIME COME TO BEGIN THE PROCESS?**

**John R. Redding**

*President, Arcturus Energy Consulting and  
Energy Advisor to TIACT*

*Mr. Redding is an expert with respect to new power plant development—an expertise he developed during the course of 28 years with GE Power Systems (now GE Energy) prior to becoming an independent consultant. Mr. Redding just completed a \$650,000 study project that was partially funded by the U.S. Department of Energy to determine the feasibility of building new generation capacity to primarily serve large industrial consumers, in this case, the chemical industry located on the Texas Gulf Coast. He is currently working with a public hospital in the San Francisco Bay Area to develop the business case for self-generation that would include a power plant and several alternative energy technologies. In 2001 and 2002, he worked with elected officials, business and environmental leaders, and the community to permit the much-needed Metcalf power plant, now nearing completion in South San Jose.*

*Since the beginning of the California energy crisis in 2000, Mr. Redding has focused his interests on end-user issues. He helped to found and was the first chair of the Energy Committee of the Silicon Valley Manufacturing Group, a position he held for two and a half years. He also chaired the SVMG's energy legislative committee. Under his leadership, the SVMG has taken an increasingly active and influential role in advocating for energy policy and legislation important to large industrial end users.*

*In 2003, Mr. Redding stepped down from participating in these committees as a representative of General Electric but was paid a high compliment by his colleagues at the SVMG who retained his services as an energy advisor. He represents the SVMG before the California PUC in a number of proceedings and at the California legislature on proposed energy legislation. He is currently under consideration by the Schwarzenegger administration for appointment to the California Energy Commission.*

*Mr. Redding earned a Master of Science degree in power plant engineering from Purdue University and a MBA from Santa Clara University. His corporate training during his years at GE includes Six Sigma (greenbelt level), media relations and marketing communications.*

## ABSTRACT

### A New Business Model for Nuclear Power Projects

#### INTRODUCTION

*Why are more nuclear power plants not being built?"*

This was the question on everyone's mind at two meetings of large chemical manufacturers hosted by the Texas Institute for the Advancement of Chemical Technology (TIACT) in 2003. Although everyone, including speakers from the nuclear industry and government, seemed to agree that building more nuclear power plants was a very good idea, no one could put their finger on exactly why none were. For the chemical manufacturers located on the Texas Gulf Coast the lack of a ready answer spurred them into action.

Natural gas is an important and in most case irreplaceable feedstock for the manufacture of chemical products, including those found in every household. Thus the rise in natural gas prices, attributable in large measure to the diversion of natural gas stocks to the generation of electricity, is of serious concern and has resulted in the closure of many facilities and loss of jobs. The chemical producers believe that the long-term solution to higher natural gas prices is the construction of new nuclear plants. They also believe that it is in their best interest to pro-actively support efforts to do so. Their support has been provided through TIACT who has partnered with the Department of Energy to undertake and co-fund this study to see if the nuclear generation option is a feasible business proposition in Texas. Arcturus Energy and EnergyPath, Inc. performed the study (with the active participation of Dr. Holland of TIACT) in partnership with Sandia National Laboratories and Black & Veatch.

#### Overview of Results

Construction of a new plant in Texas is not being hindered or delayed by a lack of

- Ready customers willing to enter into long term power purchase agreements
- Good sites on which to locate one or two units
- Pre-licensed, advanced nuclear plant designs and qualified suppliers
- A manageable, although not fully tested, licensing process
- Companies ready to join an ownership consortium under the right conditions
- Recognition of the many "non-economic" benefits of nuclear power.

These and other project fundamentals were all found to be present. What is preventing a new plant from being built is the lack of a business model that can overcome the formidable financial risks confronting the would-be owners, especially for a plant that is to be located in the deregulated ERCOT (Electric Reliability Council of Texas) market. These risks appear daunting and are no doubt one of the chief reasons that no nuclear plants are being built in Texas or elsewhere in the U.S. However, an important finding of this study is that these risks should not inhibit a management team from proceeding with project development.

The new business model overcomes the current paralysis by breaking the project financially into manageable stages. At each stage the need for development capital is appropriately matched to the level of risk. This is referred to as tollgate investing. The business model also uses an entirely new risk management strategy, one that attempts to reduce the most important risks (the cost of the plant and the potential for delays during construction) very early in the development of the project when capital outlays are smallest. To quantify the benefit of these actions required the application of a financial evaluation derived from financial options theory. Our analysis reveals there is enough “option value” to justify moving forward immediately with the first phase of this project. As validated by the study’s outside financial consultant, the management structure of the team most likely to be successful with this new business model looks more like that of a Silicon Valley entrepreneurial group than an electric utility.

## CONCLUSIONS

The chemical manufacturers that make up the membership of TIACT continue to be strong advocates of nuclear power. A year ago the path that led to the construction of a new nuclear plant could not be discerned. Now with the results of this study in hand, TIACT has a roadmap that points the way forward. It is the intention of TIACT to use the findings of this study as the means for marshalling the interest that many parties in Texas have expressed for moving forward with a new nuclear project.

# A New Nuclear Plant in Texas?

*Key Results of the TIACT-DOE Study*

John Redding  
President  
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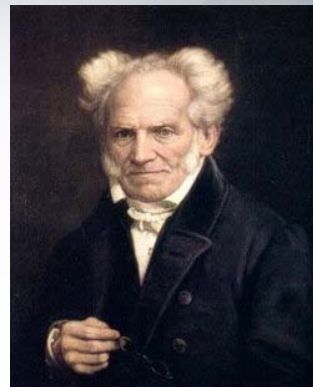
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# A New Nuclear Plant in Texas?



“All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.”

-- Arthur Schopenhauer



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## Is Now the Time to Proceed?



- Diminishing Reserve Margins in ERCOT by 2010
- Presence of large end users whose needs would be well met by nuclear generation
- At least two good sites



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## More Reasons to Proceed



- Several advanced nuclear plant designs from which to choose
- A much improved and more dependable licensing process
- Growing acceptance of nuclear power as an important energy and environmental resource

**The New York Times**  
ON THE WEB

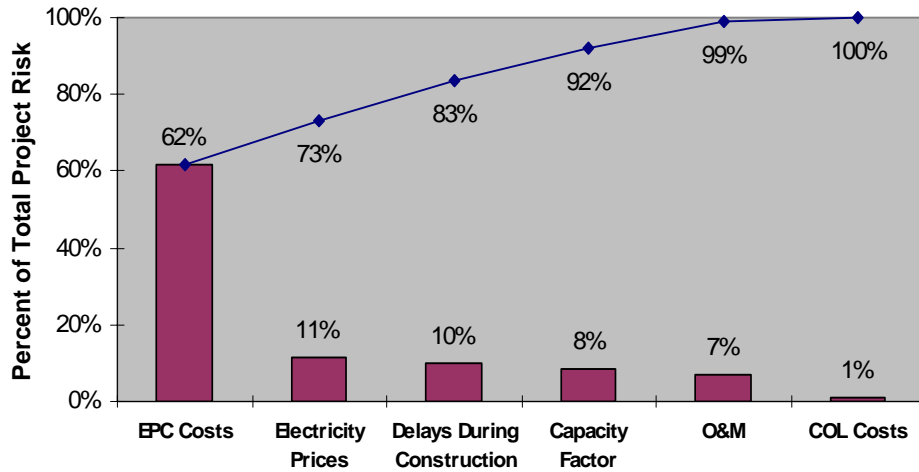
April 9, 2005  
OP-ED COLUMNIST  
**Nukes Are Green**  
By NICHOLAS D. KRISTOF

*...But it's time for the rest of us to drop that hostility to nuclear power. It's increasingly clear that the biggest environmental threat we face is actually global warming, and that leads to a corollary: nuclear energy is green...*



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## Several Risks Stand in the Way



## A New Business Model Is Needed



*"The problems speak for themselves;  
pray speak of the solutions."*

-- Winston Churchill

Owner	Share	MW
Industrial end users	15%	210
Municipal utilities	50%	700
REPs	10%	140
Private Investor Groups	15%	210
Nuclear Industry Firms	10%	140
<b>TOTAL</b>	<b>100%</b>	<b>1400</b>

- Close relationship with end users
- New ownership arrangements
- Innovative risk management
- Tollgate investing
- Financing plan that builds upon the new business model



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## A New Business Model Is Needed



- Risk Management →
- Obtain binding commitment from suppliers for plant capital cost
  - Early community outreach
- Tollgate Investing →
- Small investment when risk is highest
  - Obtain information or outcome that reduces risk
  - Option to abandon project at each tollgate



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## What's Next?



- Form a consortium of investors and potential owners
- Put a small management team in place
- Attract development capital and seek DOE assistance
- Execute on the roadmap

First step is to formalize the consortium in about 6 months time



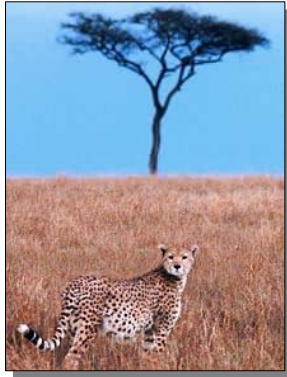
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## Why Should We Start Now?



*"He who waits until the whole animal  
is visible spears its tail."*

*--East African Proverb*



### **First mover benefits:**

- Suppliers are hungry and eager for a strategic win.
- There are incentives contained in Energy Bill for the first few plants.
- Capture sooner rather than later the benefits of nuclear power when carbon restrictions raise electricity prices.

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