

Mr Bruce Lacy, President, Lacy Consulting L.L.C., USA Nuclear Investment: Performance and Opportunity

Introduction:

Nuclear power plant ownership in the United States has continued its steady trend toward ownership consolidation and removal of assets from rate regulated environments that began in 1998. This is paralleled by changes in companies providing nuclear services and growing talk of building new units. Worldwide, new nuclear plant construction and related supplier investment is proceeding around the world. The nuclear fuel supply part of the business is seeing interest and excitement that would have been almost inconceivable a decade ago. Nuclear is now increasingly being recognized for its energy, economic and environmental benefits.

For investors, this is a time of opportunity. And the opportunity is strongly supported by excellent performance trends and fundamental changes in the US electricity business. But in order to benefit from these changes, investors must remain cautious and be committed to comprehensively and thoroughly understanding the individual and interrelated technical, regulatory and political issues that surround this useful and powerful technology.

For investors, nuclear should be seen as having moved from a “red light, do not proceed” to a “yellow light, proceed with caution.”

US Nuclear Generation Investment Opportunities

Opportunities continue for the purchase of existing nuclear plants and there is a wave of enthusiasm for the construction of new nuclear plants. This situation is driven by the overall increasing demand for electric energy combined with shrinking reserve margins for existing capacity.

The situation for new nuclear is made particularly more favorable as a consequence of important developments over the last decade. These include:

1. Restructuring and development of wholesale markets.
2. Rising cost of nuclear generators' competitors and nuclear generators improving operating cost and production performance.
3. Increasing emphasis on environmental issues where nuclear has sustainable advantage.
4. Increasing interest in energy supply security, price stability and fuel diversity.
5. Maturing of the technology and its regulation with logical improvements for new designs and regulatory processes for new power plants.

6. Improving public opinion and more open support by leaders.
7. Increasing recognition of nuclear as an available technology.

Figure 1 provides an update of the state of sales of US nuclear power plants. This Figure, first published in 2004 (Reference 1), shows the very strong correlation between restructuring in the US and the continuing trend toward ownership consolidation. The major change between 2004 and 2006 is the shift away from the sale of plants located in restructured states to sale of plants in un-restructured states. Until the sale of the Vermont Yankee plant, completed in July 2002, all other nuclear plant sales had been for plants located in restructured states. The sales of plants in restructured states all benefited from state regulatory frameworks or policies that fostered the sales. Obtaining state approval for a sale in an un-restructured state is a miniature form of restructuring for the nuclear plant.

The Vermont Yankee sale was followed by additional sales from un-restructured states. The sale of Kewaunee in Wisconsin to Dominion closed in July 2005. The sale of a majority interest in Duane Arnold in Iowa to FPL Group closed in January 2006. Agreement for the sale of Palisades in Michigan to Entergy was announced in July 2006. And plans for a multi-option bidding process for the future operation or ownership of the Point Beach units were announced in June 2006.

The motivation for the sale of these assets by rate-based utilities is summed up well by Eliot Protsch, Chief Financial Officer of Alliant Energy, former majority owner of Duane Arnold, “Nuclear plant ownership and operation represents above average financial and operating risk for smaller capitalization utilities with interests in one or two plants. When this is paired with the long-term systematic decline in nuclear-related earnings due to depreciating rate base and the sub-optimum risk/reward ratio for shareowners in a cost

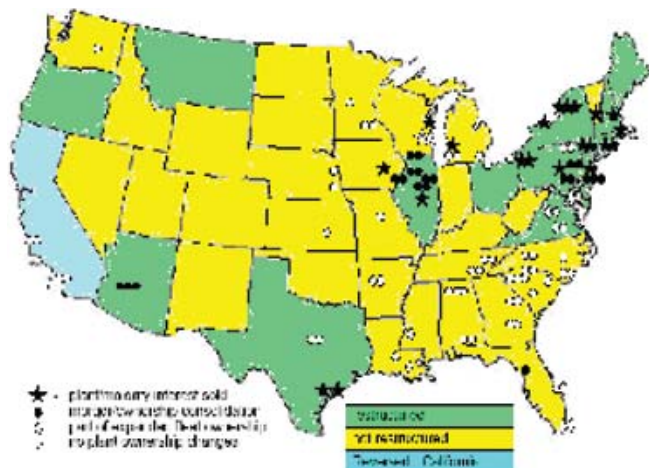


Figure 1: Ownership Changes of US Nuclear Power Plants

of service relicensing environment, an incentive oriented PPA with a new owner who has scale and expertise can be a win/win for customers and shareowners.”

It is important to note that all the plants that have been sold in the US since 1998 are being operated as merchant plants by their new owners. The term “merchant” is used here to mean plants where the off-take price is determined by contracts and open competitive markets, not determined by cost-of-service rate regulation.

Successful plant buyers, notably Constellation, Dominion, Entergy and FPL Energy, are all characterized by their commitment to growing nuclear ownership and operation and their willingness to do so for the newly acquired assets outside of rate regulation. Each has multiple plants owned by their rate regulated subsidiaries and has bought two or more plants that now operate as merchant plants.

Ownership of these plants as merchants provides investors with opportunities not available to them in cost-of-service rate environment. In cost-of-service rate regulation, investors have no sustainable opportunity for a better than average rate of return. Regardless of how well operating staffs cut costs and improve capacity factors, regardless of the increasing costs of competing forms of generation, regardless of the environmental benefits provided by nuclear generation, the utility earnings for a cost-of-service nuclear plant revert back to the average rate of return allowed on rate base after each successive rate case. As a merchant plant, these benefits can be significant and sustainable and consequently can materially improve the earnings and share prices of their owners.

License renewal and power up-rate (increase in rated capacity) initiatives provide the best value for investors if done after the plant has moved to a merchant environment. If done in cost-of-service rate regulation, the benefits to investors are essentially lost at the next rate case.

Perhaps most interesting, a merchant plant in a competitive

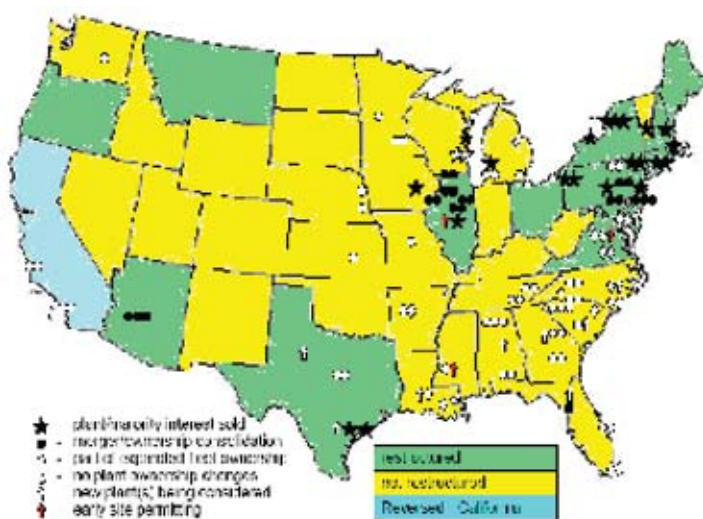


Figure 2: New US Nuclear Construction Under Consideration

environment may provide a bridge to the environmental community. Ralph Cavanagh of the Natural Resources Defense Council offered this challenge to nuclear proponents: “The nuclear industry should support carbon taxes or mandatory carbon limits supplemented by emissions trading, along with open and competitive auction-based resource procurement throughout the utility sector.” There is room for differences of opinion as to the prospective successful bidder in any such auction. However, the basic concept of bidding opens the door for all forms of generation, including nuclear, for a market approach to meeting the needs of customers for electric energy in an economic and environmentally responsible manner.

Adding nuclear plants to merchant generating fleets via purchase is not the only path for benefiting investors. PECO was an early pioneer in the creation of a nuclear merchant fleet in its AmerGen venture with British Energy. PECO merged with Unicom (parent of Commonwealth Edison) to form Exelon which has significant nuclear assets in restructured states, Illinois and Pennsylvania. This is an alternative path for providing opportunities for increasing nuclear scale and related fleet operational synergies. The recent effort by Exelon to merge with PSE&G, in restructured New Jersey, is a continuation of this philosophy.

FPL Group and Constellation in their recent merger effort see similar opportunity for bringing together two companies with significant nuclear and merchant interests.

The sale of a significant ownership interest in the South Texas Project to NRG Energy via private equity interests is another example of how nuclear plants are leaving rate regulation and moving into merchant environments.

While *Figure 1* shows considerable progress toward ownership consolidation in the US, it also shows that there are still opportunities for further consolidation of smaller nuclear interests into larger fleets.

Along with continuing interest in existing plants, companies are looking seriously at building new nuclear generating plants.

Figure 2 shows the status of publicly announced new plant construction in the US. The number of public discussions shown is only a subset of an even larger set of private discussions and the publicly disclosed information is subject to regular change.

The interest is further fueled by incentives in the US 2005 Energy Policy Act that provides a variety of incentives for new commercial nuclear construction. The program shown on *Figure 2* and whose full scope is yet to be revealed is an ambitious program that will tax the resources of the industry to accomplish and some proposals will likely fall short.

While many of the discussions involve new plants in cost-of-service electric business environments, there is clearly interest by some in merchant plants with the most definitive action to date by NRG Energy. NRG Energy has recently clearly stated its intention to build two merchant Advance Boiling Water Reactors (ABWR's) at its STP site on the Gulf Coast of Texas and is already moving aggressively with the USNRC and GE to make this happen.

US Nuclear Generation Investment Performance

The buying and selling of nuclear power plants in the United States continues to provide important insight into the results of investing in such assets.

Figure 3 shows the average change in seller share price (adjusted by the S&P 500 Utility Price Index) for all of the sellers for whom publicly traded share price information is available. On average, sellers have seen a 4% improvement in share price (adjusted) from the announcement of intent to sell until announcement of a transaction. On average, sellers have seen an additional 6.9% improvement in share price (adjusted) from the time of announcement of the transaction until closing, which increases to 9.6% one year after closing.

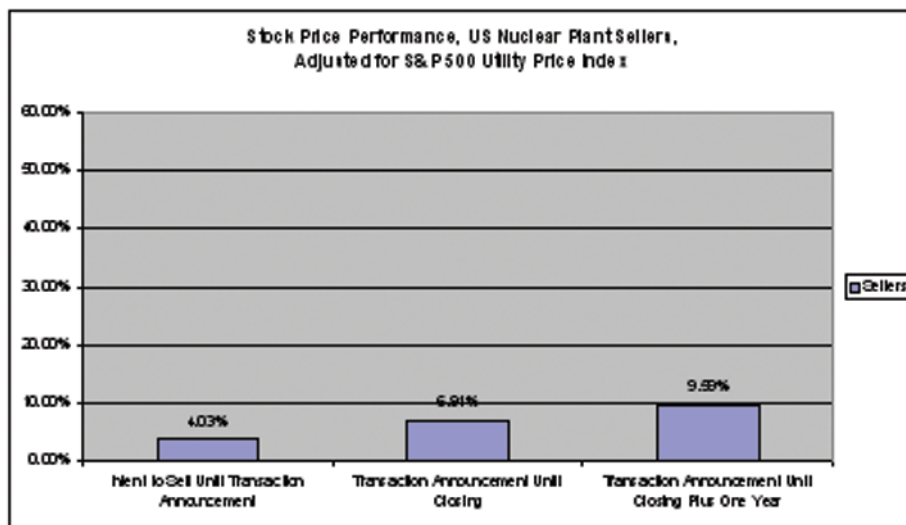


Figure 3

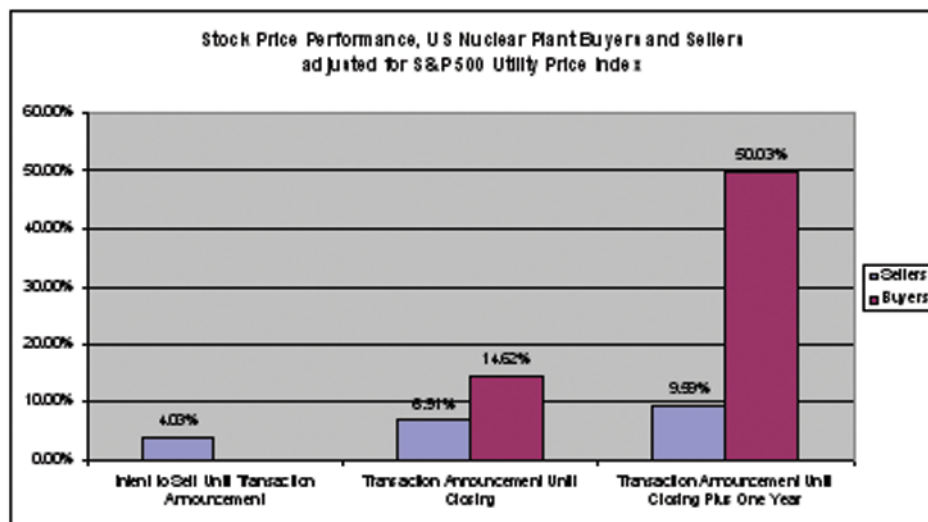


Figure 4

Figure 4 expands on Figure 3 by including the average change in buyer share price (adjusted by the S&P 500 Utility Price Index) for all buyers. The results are impressive and even more so when compared with the previously noted seller benefits.

On average, buyers have seen an increase of 14.6% in their share price (adjusted) from time of announcement of the transactions until closing. Adding a year onto this period shows an increase of just over 50%!

Two points need to be emphasized on this average change in share price. First is that there are many other activities taking place within each of the companies at the same time that they are buying or selling a nuclear plant, each with the opportunity to impact share price. While there is clearly some element of cause and effect here, the exact amount is subject to speculation. Second is that an effort has been made to adjust out a portion of industry-wide influences that affect all utility stocks to a greater or lesser degree. This is accomplished by adjusting each stock price for the changes in the S&P 500 Utilities Price Index for the same period.

The performance of these stocks over the noted timeframe surrounding the transaction raises the question of the overall

performance and trend for nuclear related investments over a longer period of time and on a less episodic basis.

The Lacy Nuclear Index (LNI)TM provides insight into the performance and trend of US nuclear generation investments. The LNITM (described in more detail in Appendix A) is based on the stock prices of a combination of publicly traded US companies weighted according to their level of financial commitment to commercial nuclear generation.

The LNITM provides a summary of nuclear investment performance in a form that can be compared to other indexes and companies. This aids investors and others interested in commercial nuclear investments. The LNITM is intended to provide an independent and un-biased view of nuclear investment performance. No attempt is made to "manage" the LNITM to influence its performance or to favor any particular stock.

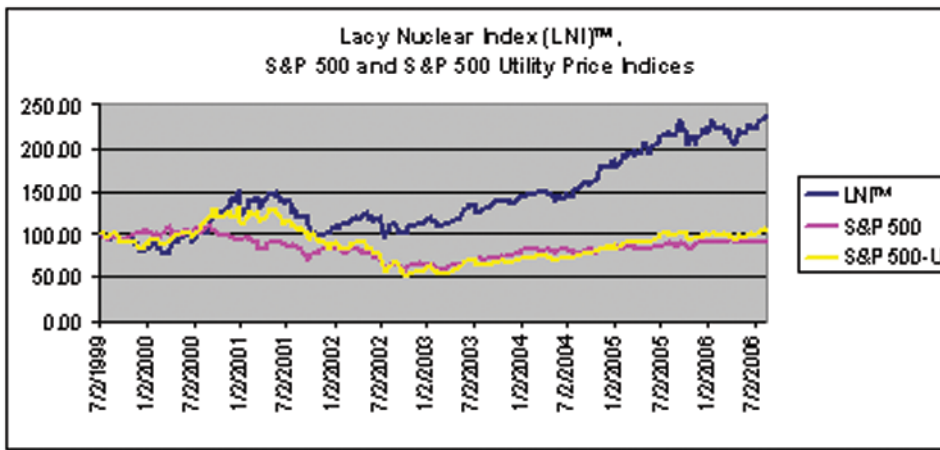


Figure 5

Figure 5 shows the performance of the LNI™ since its inception in 1999 versus the Standard and Poors 500 (S&P 500) and Standard and Poors 500 Utility Price (S&P 500-U) Indices. While experiencing some fluctuation, two observations can be made. The first is that the LNI™ began moving ahead of both S&P indices in the late 2000 timeframe. The second is that the LNI™ is continuing to widen the gap with the two S&P indices. As suggested earlier, this is not to conclude a direct cause and effect relation between buying nuclear plants and above average stock performance, however, the correlation is striking and several of the companies included in the LNI™ indeed recognize the contributions to earnings of their merchant nuclear plants.

Figure 6 shows the LNI™ with the major US nuclear generation investors, all of which are included in the LNI™. The S&P 500 Utility Price Index is included for comparison. Several observations are warranted. Even though there is considerable spread in the stock price performance of the companies, all of them are showing clear performance above the S&P 500 Utility Price Index. The top performers are Exelon and Entergy with respective improvement since 1999 of more than 180% and 150%. Constellation and Dominion are both in the range of 80-90% improvement and FPL Group is in excess of 50%. There is probably more than a casual relationship between the stock performance of Exelon and Entergy and the fact that they have the largest merchant nuclear interests.

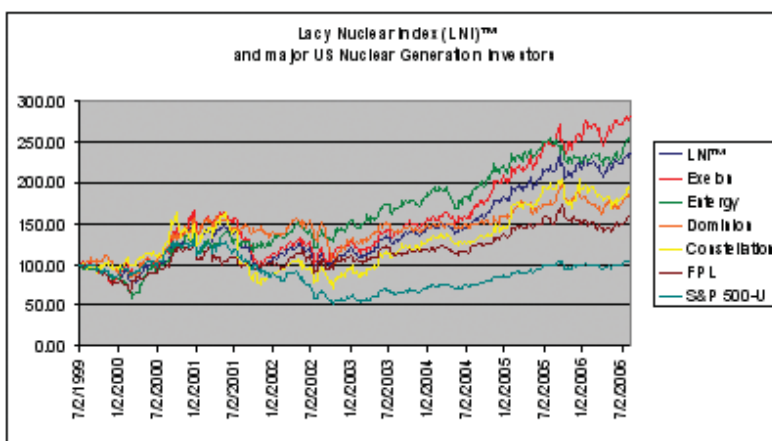


Figure 6

The LNI™ shows the strong performance of companies that have taken advantage of opportunities to invest in existing nuclear plants and there are growing opportunities to invest in new plants. But what are the challenges associated with those opportunities?

US Nuclear Generation Investment Challenges

The 1970s and 1980s provide many lessons regarding investment in commercial nuclear energy, but it is also important that investors focus on the right lessons and not the wrong ones.

As the American humorist, Mark Twain once said, “A cat will sit on a hot stove only once, but it will not sit on a cold one again either.”

Experience and foresight suggests an extensive list of challenges for new US nuclear generation investment. These include:

1. The overall business environment, e.g. interest rates, inflation and investor preferences, will likely change over the construction period of a new nuclear plant, e.g. 5-7 years. A key issue is whether to build a new nuclear plant in cost-of-service or as merchant business environment. The tradeoff involves the package of limited upside opportunities for investors combined with cost-of-service rate regulation or the higher upside opportunity combined with greater risk found in a merchant environment. Nuclear is not the only option available for investors and matching investor interest with the opportunity is essential.
2. The demand and price for electric energy will continue to change as the economy changes and existing or new technologies influence the market for electricity.
3. State regulation will continue to pervade numerous aspects of siting and operating electric generating facilities, even in states that have restructured. This can include construction and technology moratoriums, price controls, new externalities, certificates of need for new plants, license renewals, power-uprates and approval of mergers.
4. Federal regulation by multiple agencies, notably the US Nuclear Regulatory Commission which has the lead role in the licensing of any new nuclear plant and its operation (or lack of operation) once built, and other agencies affecting electric energy production and transmission, and environmental policy will all play important and changing roles.

5. New designs to be built, even though in large part evolutionary, will still pose new technology risk that may not appear until well into the operating phase.
6. The new plant licensing process is a good but untried concept and the courts will likely be involved in what the final version looks like.
7. The long-term commitment required for nuclear will continue to engage companies and policy makers in nuclear waste, spent fuel storage and decommissioning debates.
8. The historical dilution and dispersion of nuclear ownership, which has progressively diminished since 1999, still impairs favorable nuclear public policy action.
9. Public opinion and public policy, currently favorable but vulnerable, can and should be expected to continue to develop at both the federal and state levels. There is a very powerful feedback loop from real and perceived nuclear performance into public opinion and public policy. The favorable feedback is very gradual; the negative feedback can be devastatingly quick.
10. A tremendous increase in the nuclear talent pool will be needed by all involved to support a major growth in nuclear generation. This includes the staffing needs of the reactor designers, the engineering, procurement and construction contractors, the operators and the regulators.

These challenges are not insurmountable but deserve full respect, particularly when one considers the size of investments being considered for new nuclear generation.

Other Nuclear Investment Opportunities, Performance and Challenges

Looking at non-US and non-generating nuclear investment opportunities, performance and challenges can provide additional useful perspective. These will be touched on here.

New commercial nuclear generating plants are being actively considered or pursued in multiple countries around the world. Notable examples include China, Taiwan, Finland, India, Japan, Romania and South Korea.

As the major reactor designers and manufacturers focus on new plants, the already large demand for nuclear service personnel will only increase. Lyle Bohn, Senior Vice President, Nuclear Support Services for the Nuclear Management Company, summed up the situation, "The existing service providers are already stretched thin. This may provide the opportunity for a new player to step into a market that is poised for growth."

The recent purchase of Westinghouse for US\$5 billion by Toshiba and as yet undisclosed partners is perhaps one of the most dramatic examples of new investment.

The run up in uranium prices and the stock prices of uranium companies is another example of major changes in the nuclear industry. *Figure 7* shows the increase in stock price of Cameco (CCJ) since July 1999 compared to the LNI(tm). The increase is little short of astonishing. However, *Figure 7* also shows that not all stocks rise with the current nuclear enthusiasm. The stock price for USEC (USU) has been largely flat over the same time period. Both companies are primarily "nuclear" companies competing in global markets.

The astonishing rise of Cameco and flat performance of USEC is testimony to the powerful impact that different technologies and global events can have on different companies depending upon their products and markets. It is also wise to be reminded that there are significant parts of the global nuclear industry that are either privately or government owned. This puts the public investor at risk of private or political decisions.

Investor activity and interest is not just limited to new plants and uranium. An example of this is the recent transaction whereby Duratek, a major provider of radioactive waste services, was bought by Energy Solutions, owned by a private equity group. In this case investors are certainly not being scared off by nuclear waste.

While the US has perhaps the most and highest profile activities taking place that are

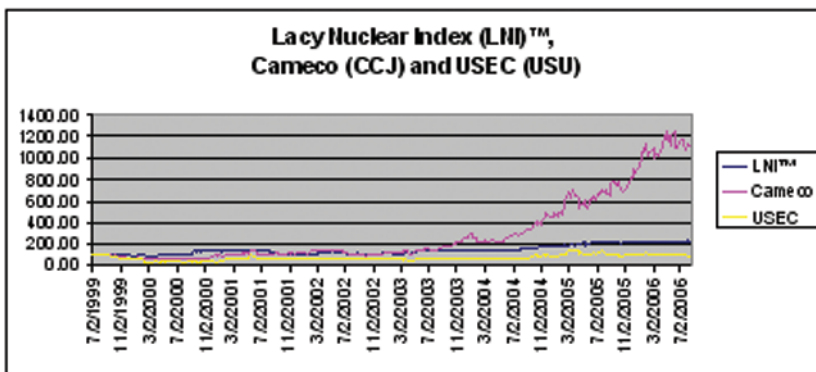


Figure 7

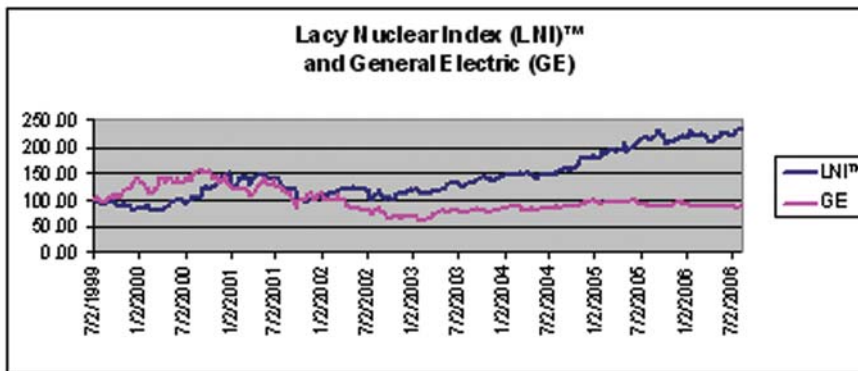


Figure 8

testing the merchant plant and competitive environment issues, it is by no means the only example. The Romanians are taking a merchant approach to their new nuclear plant construction program, are using a standard AECL (Atomic Energy Canada, Ltd.) CANDU design, and are relying on an international financing effort for phases of construction.

Figure 8 provides a final look at the stock price of a company with a broad nuclear role, General Electric (GE). GE, along with Areva and Toshiba/Westinghouse, will play a major role in new reactors. However, GE is also a reminder of the dilution of nuclear investment in larger companies. The stock price of GE is driven by a large number of factors unrelated to nuclear and there are no discernable shifts in GE's stock price even remotely like the upward trend shown by the utilities in Figure 6 or Cameco in Figure 7.

Recommendations

As seen in the performance discussion, companies with nuclear investments can provide above average performance that is attractive to investors. Also, as seen in the discussion of other nuclear investment opportunities, nuclear can provide better and poorer performance compared to generation investments. This can range from the spectacularly high to the totally uninspiring.

The wide range in performance combined with the likelihood that only a portion of the generating plant proposals will be finished should guide the prospective investor to be very cautious.

Four recommendations are offered. These relate primarily to investors considering new generation investment, but they also apply in varying degrees to other types of nuclear investment. They are:

1. Give thorough consideration to the business environment in which the investment will be made. This should start with careful examination of merchant or cost-of-service options. Even if committed to construction in a cost-of-service environment, a review as though the plant will be a merchant in a wholesale environment may be a useful "stress test" of the prospective investment.

2. Review all technical, regulatory and political aspects of the construction, transition to operation and operating phases of the prospective new plant. This should be comprehensive and thorough. Particular attention should be paid to the potential for interaction between the technical, regulatory and political issues as a problem in one area may cascade into others. Also, given the global nature of the nuclear business and its many connections into world politics, this review should include relevant international considerations. Shortcuts in early phases can have long-term impacts in subsequent phases.

3. Tailor investor involvement to match different phases. Consider that the varying risk profiles of the different stages of bringing a new nuclear plant on-line may provide opportunity for different classes of investors who have different appetites for risk. The construction phase can be likened to a sprint; the operating phase is a marathon. The transition between the two, like passing the baton in a relay race, also poses its own set of risks and opportunities. Investor support should be cultivated and seen as a strategic strength.

4. Know your exit strategy. The complexities of constructing a new nuclear plant suggest that key performance triggers need to be a subset of a larger process of monitoring all the key technical, regulatory and political inputs that will affect the effort. A "stress test" of the prospective plans may be useful in identifying key risks. This should be in place before initiating the investment.

Conclusion

The performance of investments to date is excellent and opportunity abounds. The challenges are many and substantial. But if approached carefully, the "yellow light, proceed with caution" can be turned to the "green light, proceed with confidence" and nuclear energy can be a long-term source of sustainable energy for a long-term sustainable future.

References:

1. Nuclear Power Plant and Corporate Financial Performance in a Liberalized Electric Energy Environment, World Nuclear Association, September 2004.
2. World List of Nuclear Plants, Nuclear News, March 2006

Appendix A

The Lacy Nuclear Index (LNI)[™]

The Lacy Nuclear Index (LNI)[™] provides a summary of nuclear investment performance for investors and others interested in commercial nuclear energy. The LNI[™] can be compared with other investment indexes and the performance of individual companies.

The LNI[™] is composed of publicly traded stocks or ADR's (NYSE) for selected companies with investments in commercial nuclear plants. Stocks currently included in the LNI[™] are Constellation Energy Group (CEG), Dominion Energy (D), Entergy Corporation (ETR), Exelon (EXC) and FPL Group (FPL).

The LNI[™] was set at 100.00 on its inception date of July 2, 1999. The start date was selected based on the successful closing by Entergy of its Pilgrim transaction the prior month.

The LNI[™] is calculated using a relative weighted methodology where the weighting for each stock included is determined by the amount of a company's nuclear investment.

The relative weightings of stocks in the LNI[™] are proportionally adjusted when a stock is added or deleted, or the weighting of an existing stock is adjusted based on significant new nuclear investment. These adjustments are typically due to plant sales or company mergers. The adjustment preserves the relative weightings of individual stocks and the overall value of the index at a constant level at the time of the adjustment.

Plant sales and company mergers are monitored with the intention of considering additions or changes to the companies in the LNI[™]. In addition to US companies, this includes major European and Asian companies in both generation and non-generation nuclear activities.

Note that the LNI[™] is not actively managed and is not intended to show what investment return could be achieved if a collection of nuclear related stocks were actively managed.

The LNI[™] is update weekly with the closing prices of the constituent stocks as of the last trading day of each week.

The current LNI[™] can be found at www.lacyconsultinggroup.com.