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I would like to thank Chairman Voinovich, Ranking Member Carper and all of the distinguished members of this Subcommittee for the honor of being invited to contribute to the important work you are doing here today. The views I will express are my own and do not represent the viewpoint of my employer, the Arlington, Virginia-based investment bank Friedman, Billings, Ramsey & Company, Inc.

Let me begin by offering my admiration for the Members of this Subcommittee and the foregoing panel of Nuclear Regulatory Commissioners. Oversight of the nation's nuclear power industry requires an impressive breadth of financial, legal and technological knowledge.

My comparatively modest task is to serve the men and women who manage institutional assets on Wall Street. Like you and the Commissioners, they are busy and committed professionals who bring a wide range of skills and expertise to their also-critical roles in stewardship of the nation's economy. To the best of my ability, I provide these institutional investors with my interpretation of the energy policy actions taken here in Washington.

Put another way, I analyze the busy people here in Washington for the busy people on Wall Street. Today, it will be my privilege to turn the process around and offer my assessment of institutional investors' attitudes towards the current nuclear regulatory environment.

The Investment Decision

Financial investors seek returns that outperform industry benchmarks. An investor's charter or institutional mandate may define the class and type of portfolio assets in which he or she might invest. These choices may vary considerably across different firms, funds and asset classes but, whatever the criteria, timeframe or "style" involved, investors generally seek to allocate the capital entrusted to their care to the highest-yielding investments among competing alternatives.

Asset managers and corporate executives within energy and utility companies face similar challenges when considering energy investments. Energy projects usually require years of development once the investment decision has been taken, but the price of a given commodity may change abruptly (and often) within the sustained time period required before cash flows begin. Furthermore, demand for a given commodity can also change, potentially transforming an attractive profit opportunity into a financial loss, sometimes as a result of unforeseen developments.

The debt and equity markets incorporate a measure of the risks inherent to any individual utility or energy firm that might undertake a new nuclear power facility into that firm's

“weighted average cost of capital”, taking into account both the rate of return a firm must offer its debt holders and the cost to the firm of issuing new equity. It is usually more expensive for firms of any kind to undertake higher-risk projects or for higher-risk firms to issue equity or debt to fund the same type of projects routinely undertaken by lower-risk firms. From the investor’s point of view, riskier investments must pay higher returns to be worth considering alongside less risky investments.

Financial investors may also modify expected project returns by multiplying projected future revenues by a coefficient that encapsulates the probability of a successful project or project stage, using this “expected value” in their risk-adjusted return calculations. Modeling project and securities values requires investors to make subjective assumptions about future conditions using all available information. This can explain the discrepancy in analysts’ estimates for different securities. At the same time, investors may show enthusiasm for firms with strategic advantages vis-à-vis their competitors or for industries characterized by the prospect of rapid earnings growth. Likewise, investors may be highly sensitive to the prospect of a significant change in time prior to project completion. Lack of visibility into future regulatory or political circumstances or other key externalities may reduce investors’ perceptions of the future value of a given firm’s securities.

In the end, investors do not refuse to purchase riskier securities. Rather, the aggregated capital markets demand higher returns to mitigate the effects of higher associated risks. The capital budgeting process can result in firms (or investors) pursuing other options

when Wall Street demands a higher rate of return than firms undertaking new projects can afford to pay (or choose to pay given the returns they expect to receive from the underlying project). For many years, a combination of these dynamics has driven capital away from new nuclear power facilities and towards other forms of power generation.

The Opportunity Ahead

The nation's 103 nuclear power plants currently provide approximately 20% of U.S. electricity and a total capacity approaching 98,000 MWt . With EIA projections of electricity demand growth through 2025 of 1.5% per annum, new nuclear power plant construction will be necessary to retain at least a proportional role for nuclear power in the nation's future power needs. (A May 15, 2006 letter from Chairman Diaz to this Subcommittee's leadership projected 3,795 MWt of power uprates at 23 nuclear power plant units over the next five years, implying new capacity creation of at least 40,000 MWt to retain a fixed 20% role within the generating portfolio).

This represents a significant change. Since the Three Mile Island accident in 1979, the combination of potentially long delays associated with new reactor permits, high up-front capital costs, unclear regulatory risk horizons and once-cheaper natural gas-fired generation has deterred new nuclear reactor construction. On the other hand, the Energy Policy Act of 2005[1] created several meaningful incentives for new plant construction:

[1] http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ058.109.

- Section 602 of the Act reauthorizes the Price-Anderson Act through December 31, 2025, limiting the financial risk to operators in the untoward event of a reactor accident.
- Section 638 of the Act offers the Secretary of Energy authority to enter into contracts to provide "standby support" to new power plant sponsors totaling up $500 million (for the first two plants) to offset capital costs associated with certain delays during Nuclear Regulatory Commission approval, Congressional oversight and judicial review or litigation.
- Section 1306 of the Act creates an eight-year, 1.8-cent per kilowatt hour production tax credit for new advanced nuclear power facilities subject to certain capacity limits.
- Section 1703 of the Act includes advanced nuclear power facilities as eligible projects for federal loan guarantees for 80% of project cost.

In addition, the Energy Policy Act of 1992 overhauled the licensing process to create the combined Construction and Operating License (COL) in place today under 10 CFR 52.

Two Potential Outstanding Issues

Using EIA's projected[2] capital costs of $2,014/kW, a 1,000 MWt new nuclear plant would be a $2 billion undertaking that will require project sponsors to source capital from the debt and equity markets. The capital structure of any prospective transaction would likely reflect the character of the project sponsor itself. Merchant generators might structure more debt-leveraged transactions to take advantage of the lower cost of capital associated with federal loan guarantees under Section 1703 of the Act (thereby

[2] 2006 EIA *Annual Energy Outlook*. Table 38, p. 77.

minimizing the dilutive effects of new equity issues) while regulated utilities might set 50:50 debt-to-equity project capital structures in order to expand their equity rate bases.

Irrespective of capital structure, it may not become clear until after advanced nuclear plant applications have been formally submitted and the capital raising process has begun whether incentives will be enough to generate investor enthusiasm at financial terms that meet the constraints of the project sponsors.

It is my view, based on conversations with clients and colleagues, that the current policy framework leaves two issues outstanding that could potentially result in investors assigning greater risk premiums to new offerings in support of advanced reactor construction.

The first of these is the potential for delay. In any discounted cash flow analysis, of project (or securities) valuation, time is a critical factor. Because a dollar next year is worth less than a dollar today, longer project delays even at a low cost of capital will diminish cash-on-cash returns. The effect is not just limited to the cash flows available to equity shareholders; the prospect of execution risk in tandem with significant financial leverage could potentially erode a project sponsor's creditworthiness.

The legislated incentives for new plant construction suggest a favorable economic result for an on-time completion scenario: the first plants in service will be eligible to receive production tax credits of 1.8 cents per kilowatt hour – a potential boost worth 20% (or far

more) of average retail price for electricity produced[3]. The problem is that project sponsors cannot capture this economic benefit until the plants go into operation (and only if operation commences before December 31, 2020). Because new reactors will provide the first test of the combined COL process, investors are likely to consider the unlikely prospect than an unexpectedly long delay might outstrip even the $500 million offset provided under section 638 (a consideration that becomes much more relevant for plants 3-6, where the offset is only $250 million, or plants 7+, for which no offset is provided). Nuclear Regulatory Commission reviews of the operators' inspections, tests, analyses and acceptance criteria may also contribute unpredictable delays to the final stage of the process. Regulated utilities might be able to recoup unforeseen costs associated with delays through rate-base proceedings, but competitive pressure could force merchant generators to offer power at prices closer to prevailing competitive levels, creating the prospect for diminished project returns.

The second area outstanding issue is waste storage. Unanticipated additional capital expenditures by project sponsors to construct waste storage could also negatively affect project returns. According to the testimony of Paul Golan, the Acting Director of the Department of Energy's Office of Civilian Radioactive Waste Management, before the full U.S. Senate Environment and Public Works Committee on March 1, 2006, the nation's power plants maintain more than 50,000 metric tons of nuclear waste at 122 temporary storage facilities in 39 states. Mr. Golan suggested during his March testimony

[3] Again, using EIA numbers. At an average retail price of 7.62 cents per kilowatt hour across all sectors and all users for most recent data available, 1.8 cents would represent 23.6% of end-user retail price. See website at http://www.eia.doe.gov/cneaf/electricity/epa/epat7p4.html.

that he hoped to publish a schedule this summer for the Department to submit its permit application for Yucca Mountain to the Nuclear Regulatory Commission.

While Yucca Mountain operations could conceivably begin before new nuclear reactors even go into operation (and therefore well before new nuclear waste would be ready for transportation from onsite facilities to geologic storage), institutional investors must also take into consideration the prospect that federally-provided permanent geologic disposal of nuclear waste may not become operational at Yucca Mountain or anywhere else, in the near-term, intermediate term or even at all. A recent newspaper article[4] projected that new storage at PG&E's Diablo Canyon facility could cost as much as $200 million. If project sponsors were to bear the costs of constructing storage facilities to accommodate waste from new reactors (in addition to the 2,000 incremental metric tons each year created by the existing fleet of reactors), the additional spending could also diminish expected project returns.

In closing, it is my view that the capital markets will most efficiently support the policy goal of expanding low-emissions, high-capacity electricity generation through the construction of new nuclear power plants when institutional investors face minimum risks associated with regulatory delay and waste storage costs.

This concludes my prepared testimony.

[4] Baker, D. "Waste storage dilemma crimps nuclear future." *The San Francisco Chronicle.* June 11, 2006.