BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070650-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S PETITION TO DETERMINE NEED FOR TURKEY POINT NUCLEAR UNITS 6 AND 7 ELECTRICAL POWER PLANT

DIRECT TESTIMONY & EXHIBITS OF:

JOHN J. REED

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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DOCKET NO. 07_____-EI

OCTOBER 16, 2007

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is John J. Reed. My business address is 293 Boston Post Road West, Marlborough, Massachusetts 01752.

Q. By whom are you employed and what is your position?

A. I am the Chairman and Chief Executive Officer of Concentric Energy Advisors, Inc. (CEA).

Q. Please describe your duties and responsibilities in that position.

A. CEA is an economic advisory and management consulting firm, headquartered in Marlborough, Massachusetts, which provides economic and financial services relating to energy industry transactions, energy market analysis, litigation, and regulatory support.

Q. Please describe your educational background and professional experience.

A. I have more than 30 years of experience in the energy industry, having served as an executive in energy consulting firms, including the position of Co-Chief

Executive Officer of the largest publicly-traded management consulting firm in the U.S. and as Chief Economist for the largest gas utility in the U.S. I have provided expert testimony on a wide variety of economic and financial issues related to the energy and utility industry on numerous occasions before administrative agencies, utility commissions, courts, arbitration panels, and elected bodies across North America.

Q. Have you previously provided expert testimony?

A. Yes. I have been accepted as an expert in dozens of jurisdictions in the United States and Canada.

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring Exhibits JJR-1 through JJR-4, which are attached to my direct testimony.

Exhibit JJR- 1	Curriculum Vitae
Exhibit JJR- 2	Testimony of John J. Reed 1997 – 2007
Exhibit JJR- 3	CO_2 Reductions by Technology Type
Exhibit JJR- 4	2007 U.S. Electricity by Technology Sector vs. 2030 US Electricity by Technology Sector Including Advanced Technologies

Q. What is the purpose of your testimony?

A. My testimony explains why FPL's proposal to pursue the development of new nuclear generation is appropriate given the significant uncertainty that currently exists regarding future environmental policies, renewable resource development potential, fossil fuel prices, and the ultimate cost of long lead time baseload generating technologies such as new nuclear facilities and integrated gasification combined cycle (IGCC) facilities. In addition, my

testimony addresses the regulatory policies and processes that are needed to maintain a balanced and flexible "regulatory compact" between Florida Power & Light Company (FPL) and the Florida Public Service Commission (the Commission), which will simultaneously serve to establish a new nuclear plant as a baseload option for FPL and protect FPL's customers from being limited to potentially uneconomic generating resource commitments.

II. SUMMARY AND CONCLUSIONS

Q. Please briefly review your conclusions regarding the current environmental and regulatory policy issues that FPL is facing.

A. While the precise timing and details remain uncertain, it is reasonably anticipated by most industry observers and others that there will be some form of greenhouse gas (GHG) regulation. Whether it be federal, regional or state regulation, it is anticipated that such regulation will include potential requirements for significant GHG reductions in the not too distant future, and certainly within FPL's current resource planning horizon. Florida itself appears to be moving toward requiring material reductions in GHG emissions. Indeed, those that have been proposed by Governor Crist are as ambitious as any in North America. In addition, a penetration level of renewable generation technologies that is several times higher than current levels is being discussed in Florida. These emerging and, to a certain extent, competing objectives are made more challenging by the fact that Florida's

electric demand growth is among the highest in the nation, and Florida's indigenous resources which can be used for renewable generation (e.g., hydro, wind, wood, geothermal) are not abundant and/or economic.

As a consequence of its limited indigenous resource base, its rapid demand growth and its focus on environmental stewardship, Florida's electric generation mix has become increasingly reliant on natural gas as a generation fuel. If the state's next two decades were to mirror the past two decades, Florida's generation mix would become unacceptably dominated by gas-fired generation, and the state would be highly susceptible to gas price spikes and acutely vulnerable to gas supply disruptions. Furthermore, the state would fall short of achieving any meaningful reductions in GHG levels and achieving renewables targets.

Q. What are your conclusions about the other sources of uncertainty and change that FPL must consider?

A. On top of the policy challenges, FPL faces an energy market in which fossil fuel prices have risen dramatically and natural gas and fuel oil price volatility has increased significantly, and in which the costs, not related to performance of alternative baseload generating technologies (e.g., new nuclear), are uncertain and evolving. The surge in political and regulatory support for renewable generating technologies has somewhat accelerated the development pace for these alternatives, and new technologies, such as ocean current/wave/thermal projects, are beginning to be developed. However, it is

becoming increasingly clear that it would require a quantum jump in the performance and/or a quantum reduction in the cost of these alternatives before renewables can be expected to provide any more than single-digit percentage contributions to the nation's (or Florida's) generating resource mix. Furthermore, most renewable resource options are unable to meet baseload generating needs, but are better positioned as intermediate and peaking resources that enable a utility to replace its gas- and oil-fired generation. Even with a heavier emphasis on the development of renewable resources in Florida, the realities of: 1) land use economics, 2) a relatively low level of renewable resource availability, and 3) the incompatibility of renewables that involve combustion or incineration with GHG reduction targets, make it very unlikely that the state can count on renewables to meet the bulk of its incremental power supply needs or to be the principal means of providing significant reductions in GHG levels over the next ten to twenty years.

Q. If supply-side resources face so many challenges, is there a better alternative in vigorously pursuing demand side management and demand reduction (DSM) programs?

A. These programs should be vigorously pursued, and FPL is recognized throughout the electric utility community as being one of the most aggressive and successful utilities in the nation in achieving cost-effective DSM programs. However, there is no likelihood that even the successful utilization of all of the available cost-effective DSM programs can do anything more

than slow the demand growth that the system is facing, and thus will not eliminate the need for new non-GHG-emitting baseload resources in order to both meet demand and mitigate GHG emissions.

Q. What are the consequences of these circumstances and challenges for FPL?

A. Quite simply, in an era of increasing uncertainty, FPL is appropriately focusing on creating and preserving a high level of resource optionality for its system. Given FPL's current fuel mix, the addition of non-fossil fuel, non-GHG-emitting sources for generation is necessary to maintain system reliability, increase fuel diversity and allow progress toward meaningful GHG reductions. This is especially important for long lead time generating resources such as new nuclear, which, if not purposefully pursued and preserved, will be unavailable when a final commitment needs to be made to new supply-side and demand-side solutions.

Q. How does the option of a new nuclear plant fit into these competing objectives?

A. The addition of new nuclear resources would be a major step toward the decarbonization of FPL's resource mix and achieving any GHG reduction targets. It is extremely unlikely that FPL can achieve any meaningful reduction in GHG emissions, let alone reach aggressive targets that may be instituted, without significantly expanding its nuclear power resources. Although the ultimate cost of these resources can only be estimated at this time and the deployment timeline is long, it is clear that if FPL does not

commit to at least enabling this alternative now, new nuclear resources will not be available within the next decade or more. The global competition for the raw materials and professional services needed to construct new nuclear facilities will place continued pressure on securing these resources.

It is also clear that the approval FPL is seeking in this proceeding will not foreclose any options for cost-effective renewable resources or DSM programs that can be developed over the intervening years. Renewable resources and DSM programs, even if successful beyond anything seen in recent trends, may allow FPL to avoid a heavier dependence on fossil fuels, but should not be falsely viewed as direct competitors or alternatives to a new nuclear facility, which is the best option FPL currently has for a non-GHG-emitting baseload resource addition. The projected resource needs of FPL's service area are large enough to accommodate all of the renewable resources that are likely to be available plus the proposed new nuclear facilities.

Q. What regulatory policy initiatives have you concluded are necessary for FPL to create an option for new nuclear resources?

A. Even with all of the federal support that has been developed to encourage nuclear power's renaissance in the United States, it is unreasonable to expect any regulated utility to pursue this option under the regulatory regime that existed twenty years ago when the last group of nuclear plants became operational. The nuclear prudence cases of that era, which consumed years of hearing time and cost utility investors more than $18 billion, left a lasting

impression on all who participated in that set of processes. Commitments that had been made with the expectation of reducing customer's bills ended up becoming "bet the company" gambles that left no post-Three Mile Island (TMI) nuclear project unscathed. This time around, the stakes are equally high and the lessons from the 1980s have not faded to the point that proponents of new nuclear units will be willing to enter into a highly asymmetric risk-reward regulatory paradigm with billions of dollars at risk.

I fully endorse FPL's proposed approach to creating an option for a new nuclear resource. This approach substitutes an open, options-based, collaborative and comprehensive resource planning process for the all-or-nothing "used and useful" regulatory paradigm that prevailed in the 1980s. Under this process, optionality can be maximized, new developments can be reflected in the resource plan, and the complex tradeoffs that are likely to arise can be fully evaluated and resolved. As a result, FPL's customers will not be asked to face the economic, environmental and energy reliability consequences of a resource plan that is constrained by inaction to ever greater dependence on fossil fuels and their energy delivery infrastructure.

FPL's proposed annual review process, consistent with the Commission's Nuclear Power Plant Cost Recovery Rule, Section 25-6.0423, F.A.C. permits rational and economically efficient decision-making and aligns customer and investor interests far better than the regulatory process of the 1980s did. But

this framework will require continued active and responsive regulatory support for the successful deployment of new nuclear generation in Florida. In exchange for a high level of assurance of recovery of prudently incurred costs, customers will benefit from a process that provides assurance that uneconomic projects will not be pursued.

III. AVAILABLE RESOURCES IN TODAY'S HIGHLY UNCERTAIN MARKET

Q. Please explain the more recent sources of uncertainty and complexity in the resource planning process.

A. Over the last few years we have seen a significant increase in concerns about energy security, GHG emissions, and energy price volatility, leading in various jurisdictions to policy shifts in favor of renewable energy, new nuclear facilities and advanced clean coal facilities as potential solutions or, at least mitigating measures, for one or more of these concerns.

In Florida, Governor Crist has called for the establishment of GHG reduction targets that would be as aggressive as any in North America:

By 2017:	Reduce GHG emissions to 2000 levels
By 2025:	Reduce GHG emissions to 1990 levels
By 2050:	Reduce GHG emissions by 80% of 1990 levels

The Governor has also requested that the Commission initiate a rulemaking to consider requiring that utilities produce at least 20% of their electricity from renewable sources, with a strong focus on solar and wind energy.

FPL faces significant challenges harmonizing these two important policy objectives under consideration in Florida, *i.e.*, aggressive standards for GHG reductions and renewable energy content, while continuing to provide adequate, reliable, and reasonably priced electric service to one of the fastest growing areas in the country.

Q. Are there uncertainties associated with choosing a new nuclear plant as a generating resource?

A. Yes, there are. Foremost among these are the cost and the timeline for deployment of this option. What is virtually certain, however, is that new nuclear plants will require several years for planning, permitting and construction, and that there is no conceivable "cookie cutter" or "shortcut" approach to getting one built and operational. Successful implementation will require almost a tripling of the development term associated with more conventional gas-fired combined-cycle option. Mr. Scroggs addresses these uncertainties in his testimony.

Q. Are there similar uncertainties for other non-GHG-emitting resources?

A. Yes. For example, it is often suggested that there could be substantial improvements in the cost, performance, and reliability of renewable energy alternatives in response to greater demand. As discussed later in this

testimony, for example, many people have predicted that the cost per square meter of solar photovoltaic panels will decrease significantly as production of these units' scales up to meet increased demand. Others predict that new renewable generating technologies, such as ocean current/wave/thermal resources, will be commercialized and provide a clean, affordable means of producing electricity. The future cost and performance parameters of these alternatives are inherently uncertain, which adds to the challenges facing electric resource planners. And, of course, cost is not the only potential factor that could limit penetration of these resources. Property rights and permitting issues, among others, will also affect the deployment of such resources, in terms of both number of installations and location.

Q. You stated earlier that your review of FPL's resource plan indicated that it is highly unlikely that FPL could even come close to achieving any meaningful reduction in GHG emissions without additional nuclear resources. What review have you performed and what is the basis for your conclusions?

A. I have reviewed the testimony in this application, FPL's most recent CO_2 projections, FPL's most recent 10-year Site Plan and several studies of renewable resource potential. The analysis presented by FPL witness Kosky in Exhibit KFK-4 and FPL witness Sim in Exhibit SRS-10 indicates that under a non-nuclear generation approach to resource planning, CO_2 emissions from FPL's own generation resources are expected to increase 63% by 2021 as compared to the 2005 levels, or a 3.3% compound annual growth rate over

this period. However, if Governor Crist's CO_2 reduction targets become law in Florida, FPL will be required to achieve a 42% reduction from the non-nuclear generation approach levels to achieve the proposed 2017 CO_2 target. In addition, in order to achieve the 2025 target proposed in Executive Order 07-127, FPL would be required to achieve a 67% reduction from the projected non-nuclear approach levels. These are enormous reductions for any utility, and are even more challenging for a utility that has already achieved a successful track record of pursuing DSM programs and deploying new high-efficiency, low emitting gas-fired combined-cycle units. Such targeted reductions could not be achieved solely through reliance on cleaner technologies for new generation, because these CO_2 reduction targets would be far greater than FPL's projected growth in energy requirements. Achieving these goals would require a "decarbonization" of FPL's existing resource mix. This would be facilitated by substituting new low-carbon resources for expiring high-carbon purchased power contracts and by reducing the capacity factors for FPL's existing oil-fired resources. Again, assuming the 2025 target for CO_2 reductions is adopted in Florida, based on current projections, *all* new generation added by FPL after 2017 would have to be non-GHG-emitting resources. Quite simply, there is no plausible scenario in which such CO_2 targets could be achieved in a cost-effective manner without new nuclear resources.

Q. How can the Commission be certain that FPL's proposal for two new nuclear units at the Turkey Point site is the most cost-effective solution for simultaneously achieving targeted GHG reductions and meeting FPL customers' energy requirements?

A. Until the cost estimates for FPL's two proposed nuclear units have been further developed, it is not possible to reach a definitive answer to this question. But absolute certainty, if such a concept ever exists, is not required today. Rather, based on all the information available today, it is important to take the steps and make the expenditures necessary to retain the option of new nuclear capacity coming on line in 2018. Even as FPL moves forward with this process, the question will need to be posed again and addressed in each annual resource review to determine if the answer remains the same. This is precisely the process contemplated by the Commission's Nuclear Cost Recovery Rule and FPL's proposal in this proceeding.

The ultimate answer will hinge on balancing at least two key economic considerations: 1) the cost of alternate means of meeting the projected electric demand; and 2) the cost and significant uncertainties of alternate means of meeting any GHG reduction targets.

While it is premature to quantify a potential cost "premium" for the nuclear option as a means of meeting electric demand, if there is such a premium, it is beginning to be possible to quantify the avoidable costs for alternate GHG

reduction strategies. For example, current estimates for the costs of carbon capture and sequestration (CCS) in an IGCC unit are approximately $30 to $40/ton of CO_2, excluding any cost premium for the IGCC unit itself. The costs for high levels of CCS in an ultra super critical pulverized coal (USCPC) unit are estimated to be $30 to $50/ton of CO_2, and for a natural gas-fired combined cycle (NGCC) plant the costs are estimated to be $50 to $86/ton of CO_2. When these estimated CCS costs are applied to the CO_2 emission levels for each technology, we can derive a "justifiable cost premium" for any non-GHG emitting resource as compared to these alternatives. That comparison is presented in Table 1 below:

Table 1: Avoidable CCS Costs and Justifiable Power Cost

Technology	CCS $/ Ton CO_2[1]	Ton CO_2/MWh	Justifiable Power Premium for Non-CO_2 Technologies ($/Mwh)
USCPC	$30 - $50	0.9105[2]	$27.32 - $45.53
IGCC	$30 - $40	0.9665[3]	$29.00 - $38.66
NGCC	$50 - $86	0.3750[4]	$18.75 - $32.25

Of course, these figures assume that the only means of achieving CCS is to do so at that particular type of plant. If public policy permits GHG reduction targets to be met through national or international mitigation strategies, then the justifiable cost premium for non-CO_2 emitting technologies could be less.

[1] Based on a compendium of sources, including Standard & Poors, Black and Veatch and the Intergovernmental Panel on Climate Change. (2006$)

[2] Clean Coal Technology Selection Study, Black and Veatch, January 2007, at 5-10.

[3] Id.

[4] West County Energy Center.

Q. What role have you assumed for new renewable energy resources in FPL's portfolio?

A. I have assumed that FPL pursues all of the cost-effective renewable resources that are available to it. Moreover, even if the "cost-effectiveness" constraint is relaxed, the renewable resource potential in Florida is still not sufficient to defer the need for new generating resources even by one to two years. As shown in Exhibit SRS-3 from the testimony of FPL Witness Sim, there is still a need for 3,956 MW of generating resources assuming Turkey Point 6 & 7 come online in 2018 and 2020, respectively. Therefore, there would exist the opportunity for renewable energy resources to meet almost 4,000 MW of need prior to 2018, which is four times the capacity potential from renewable technologies that has been projected for the entire state.[5]

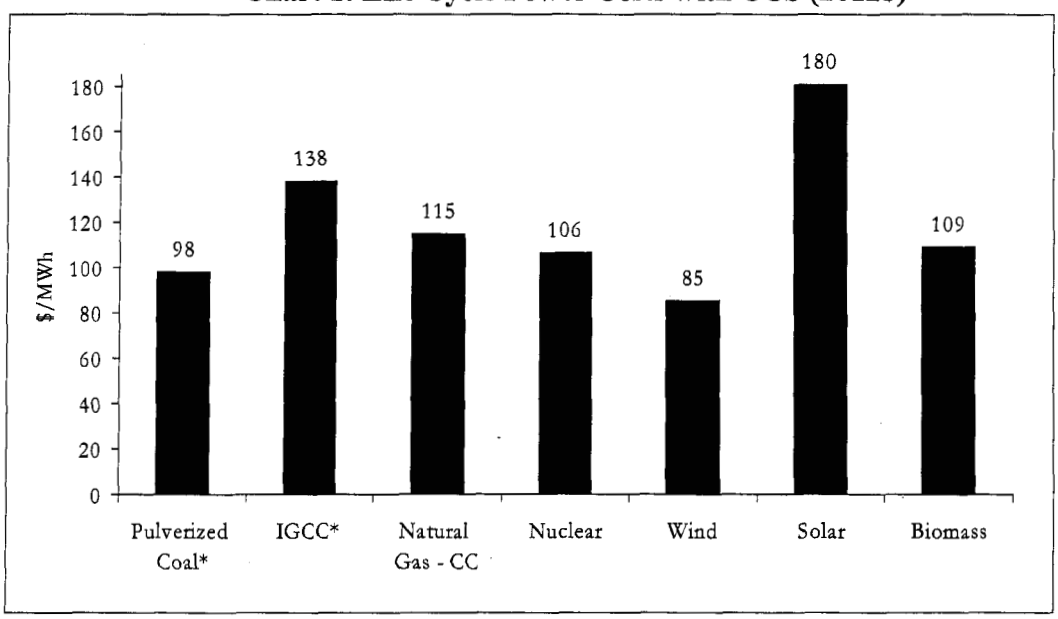
Let me begin by pointing out some of the realities of renewable resource development in broader terms. Renewable power generation resources have received broad public support for almost two decades. All of the development to date has led to non-hydroelectric renewable resources contributing about 2.3% of annual energy production for the United States. The Energy Information Administration (EIA) projects that with a continued policy push and technological advancement, non-hydro renewables could account for 3.6% of electric production by 2030.[6]

[5] The renewable resource potential in Florida is discussed in the Direct Testimony of FPL Witness McBee in this proceeding.

[6] EIA, Annual Energy Outlook 2007, February 2007, p. 86.

Standard & Poor's recently performed an analysis of power generation technologies that could be employed to help mitigate GHGs on a national level. As shown in Chart 1 below, the life cycle costs of certain renewables, like wind and biomass, are somewhat comparable to fossil and nuclear capital costs. Other renewables, like solar, have much higher life cycle costs than fossil and nuclear. The Standard & Poor's analysis, supplemented by FPL-specific information, produces the following estimates of life-cycle costs based on an assumed cost for CCS of only $10/ton.

Chart 1: Life Cycle Power Costs with CCS (2012$)[7]



Other studies by the EIA,[8] General Electric[9] and the engineering firm of Burns & McDonnell[10] confirm these relative rankings, and also note that solar-

[7] Standard & Poor's, "Which Power Generating Technologies Will Take the Lead In Response to Carbon Controls?", May 11, 2007, p. 5. This analysis assumes the maximum achievable capacity factors for each technology. *Pulverized coal and IGCC data from the Clean Coal Technology Selection Study, Black and Veatch, January 2007.

[8] EIA, Assumptions to the Annual Energy Outlook 2007, February 2007, p. 77.

photovoltaic and fuel cells have current costs that extend far beyond the range shown in the chart above.

Q. Are the costs in Florida for these various renewable alternatives likely to be similar?

A. No, in general, I would expect them to be higher. The unit power costs shown in Chart 1, which reflect national averages, are the quotient of total costs divided by the total output. Florida specific data indicate that installed costs for renewables are generally higher, and output is lower, leading to state-specific costs that range from slightly higher than national averages (biomass), to far higher than national averages (wind).

The higher installed costs for Florida renewable resources reflect higher land costs, higher labor costs, and in some cases, more expensive technology (e.g., the use of off-shore wind vs. on-shore wind). The lower output levels reflect Florida's relatively poor wind and solar resources, leading to lower capacity factors for these technologies. The combination of, for example, a 25% cost premium and a 35% lower level of output yields a total cost that is almost twice the "average" level.

Q. What is your understanding of the future renewable generating resource potential in Florida?

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[9] Abate, Victor, "Unlocking America's Energy Resources: Next Generation", Written Testimony before the House Subcommittee on Energy and Air Quality, May 18, 2006.

[10] Burns & McDonnell, "Analysis of Baseload Generation Alternatives: Big Stone Unit II", September, 2005.

A. It has been estimated that the total incremental capacity potential from renewable technologies (without regard to economics) could be as much as 1,000 MW for the entire state of Florida. This estimate is consistent with the Commission's and the Florida DEP's assessment of renewable resources from January 2003.[11] These estimates are presented and discussed in the Direct Testimony of FPL Witness McBee in this proceeding.

The renewable resource potential for each state in the continental United States has also been analyzed by the Union of Concerned Scientists (UCS). The UCS ranks Florida's renewable resource potential (as a percent of state electric consumption) as 46th out of the 48 states.[12] Notably this evaluation was performed without regard to cost-effectiveness.[13] Almost three-quarters of Florida's potential is in the solar-photovoltaic category, which is by far the most expensive option studied. This ranking reflects the scarcity of commercially-viable renewable resources in the state.

Q. The Governor's recently announced targets for renewable resources stress the importance of wind and solar power as non-GHG-emitting resources in terms of CO_2 reductions. You have already discussed the relatively high cost of solar applications, but is there potential for wind resources in Florida?

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[11] Florida Public Service Commission and the Florida Department of Environmental Protection, "An Assessment of Renewable Electric Generating Technologies for Florida", January 2003, p. 2.

[12] Union of Concerned Scientists, "Plugging In Renewable Energy: Grading the States", May 2003, p. 39.

[13] The UCS study does not consider different electric consumption levels or patterns across the U.S., and is measured based on total energy consumption.

A. There is some potential, but it is quite modest. Florida is one of only three states in the United States where virtually the entire state is ranked as being in Wind Power Class 1, which equates to essentially zero wind resources.[14] Florida's only measurable wind resources are offshore, which make development of these resources far more expensive than onshore.

Offshore wind resources also raise significant issues regarding siting, permitting, and cost-effectiveness as recently experienced by projects in the U.S. Northeast.[15] It should also be noted that Florida's offshore wind resources are modest enough to require the utilization of at least 8,000 turbines that if strung together would line the entire coast of the state to produce the same amount of electric energy (not capacity) that could be produced by FPL's proposed new nuclear facilities at Turkey Point.

Q. Are there other renewable resource technologies in Florida with potentially fewer hurdles to overcome in terms of siting and land use issues as compared to wind resources?

A. Yes, but only on a small scale. A recent study examined the land use characteristics for the biomass, wind, and solar facilities that would produce the same annual energy output as one 1,000 MW nuclear facility. Table 2, below shows the results of this analysis:

[14] National Renewable Energy Laboratory, "Classes of Wind Power Density".

[15] Suffolk Life, "LIPA Likely to Abandon Wind Park Project", August 29, 2007.

Table 2: Land Use Requirements by Technology[16]

Technology	Land (acres)	Relationship to Nuclear
1,000 MW Nuclear	100	N.A.
Biomass Equivalent (30% combustion efficiency, cultivated land)	617,500	6,175 times
Solar Equivalent*	37,050	370 times
Wind Equivalent	190,190	1,902 times

* Excludes storage area requirements

Q. Your discussion of renewable energy alternatives has not mentioned the potential from ocean energy projects. Are these projects viable for commercial application as baseload generating resources within the 10-year development period for a new nuclear facility?

A. No. Ocean energy projects come in many forms, such as ocean current turbines, tidal power projects, wave energy conversion systems and hybrid offshore wind/water projects. Since these projects are in the development phase, most proponents of these systems are focusing on 2020 and beyond before utility-scale commercial applications are considered possible. While the potential for these technologies is substantial (in terms of the raw energy contained in the water resources), there are numerous engineering, environmental, and legal challenges that need to be overcome before even

[16] Jesse H. Ausubel, "Renewable and Nuclear Heresies", March 10, 2005, at pp. 4-5.

proof of concept projects, pilot projects, and demonstration projects can be achieved.

FPL has received one ocean current project proposal in its most recent Renewables RFP, which offers to produce energy only, not capacity, but would help to further the development of this technology. This project, which is planned to be 100 MW and on-line by 2011 is currently under review by FPL.

Ocean energy projects are good examples of moderate- to high-potential, long-term alternatives for baseload generation that we should all hope to see reach commercially viable status. However, they also exemplify the kind of quantum leap in technology, performance and cost reduction that will be required in order for a renewable energy technology to make a major contribution to the nation's electric energy mix.

Q. After considering all of the existing and potential contributions from renewable resources, what conclusion have you reached regarding the impact of renewables on FPL's request in this proceeding for a need determination for two new nuclear facilities at the Turkey Point site?

A. I have concluded that FPL's need will not be eliminated even if renewable resources achieve a level of development that is far greater than expected. As discussed earlier, currently deployed renewable technologies, such as waste-to-energy, biomass, landfill gas and hydro, appear to have only about 1,000

MW of total development potential in Florida, even if this development is not constrained by economics. This is the equivalent of less than one year of growth in Florida's electric requirements (even if all renewables were treated as capacity resources). Achieving any level of significant contribution from wind resources is highly unlikely given Florida's lack of viable wind resources. Solar thermal, solar photovoltaic and ocean energy projects would all require quantum leaps to achieve a significant, cost-effective level of penetration in the Florida market. While we can be hopeful that these breakthroughs may occur, prudent resource planning would not rely on these events in order to meet projected demand.

In addition, from a policy perspective, I do not believe that it is appropriate to consider renewables development as competing against new nuclear resources for inclusion in FPL's resource mix. While the best information currently available is that FPL can easily absorb all of the renewable resources that are likely to be available to it, the question that should be asked is: if renewables far exceed this development estimate, what changes should be made in the resource plan? I would not want to essentially squander the good fortune of highly successful renewable resource development by sacrificing the only conventional generation alternative that is essentially a non-GHG-emitting resource. This renewables "bonus," if realized, could be much more effectively used to back down FPL's purchases from coal-fired resources, or to back down generation at existing fossil-fuel fired units in order to reduce

FPL's reliance on the more price-volatile and supply-constrained fossil fuels, and for FPL to have a better chance of achieving any GHG reduction targets. Relying on better-than-expected results in one potentially environmentally-beneficial sector as a basis for giving up another environmentally-beneficial resource would be both short-sighted and self-defeating.

Q. Can the combination of more robust DSM programs and more robust renewables development eliminate the need for FPL's proposed new nuclear resources?

A. No. This is even more unlikely if we are to consider the "need" for a resource to be based on both the ability to serve new load and the ability to reduce GHG emissions. To meet the magnitude of GHG reductions that have been proposed for Florida will require a continued strong DSM plan, robust renewables development, significant new nuclear resources, successful strategies for carbon sequestration, and more.

The Electric Power Research Institute (EPRI) has just published a Discussion Paper entitled "The Power to Reduce CO_2 Emissions: The Full Portfolio," which examines the nation's ability to reduce CO_2 emissions from the power sector to 1990 levels by 2030. Exhibits JJR-3 and JJR-4 present two important charts taken from the Discussion Paper.

As shown on Exhibit JJR-3, in order to be able to return to 1990 levels for CO_2 emissions from the power sector, on a national level, all of the following achievements will be needed over the next 23 years:

- Using energy efficiency measures to slow load growth from 1.5%/year to 1.1%/year
- Tripling the growth in renewable generation
- Dramatically increasing nuclear generation levels by building more than 50 new nuclear plants
- Doubling the rate of efficiency improvement in clean coal technologies and retrofitting these technologies into about one-half of the existing coal-fired fleet
- Achieving wide-spread deployment of CCS at coal plants after 2020
- Achieving major breakthroughs in Plug-In Hybrid Electric Vehicles (PHEVs), which can be utilized as resources on an "intelligent grid" and reaching a 30% market share for these vehicles by 2030, and
- Successfully increasing the role of distributed energy resources (including distributed solar) from less than 0.1% of baseload requirements to at least 5% of baseload requirements.

Candidly, achieving any one of these objectives would be a challenge. But achieving the GHG target studied (reducing CO_2 emissions from the power sector to 1990 levels by 2030) requires that *every single one* of these strategies be fully successful.

This challenge is even more daunting for Florida, which is currently experiencing annual load growth that is far in excess of the national average, is considering more ambitious GHG reduction targets than those modeled by EPRI, and which, at present, has more limited commercially available renewable resources than almost any other state in the country.

Q. Given the magnitude of the GHG reduction challenge, what are the implications for FPL's resource plan and its request for a need determination in this case?

A. To meet aggressive GHG reduction targets, whether state or national-imposed, it is clear that even with two new nuclear units at Turkey Point, FPL and the entire state of Florida will need to undergo a dramatic transformation of the electric production and electric consumption sectors over the next 20 years.

The key to doing this while discharging the traditional utility mandates of satisfying demand and achieving the lowest reasonable cost for customers will be to maximize the number of options in the resource planning portfolio, and to be responsive to market developments as they occur over the development term for new resources. Of these, today nuclear generation appears to be the best choice; this technology appears to be essential to meeting incremental demand and at the same time meeting any GHG reduction targets. While conditions can, and will, change over the next 10 years, the costs for new nuclear units should improve relative to competing technologies as more of these units are deployed and become operational. But the framework

contemplated by the Commission's Nuclear Cost Recovery Rule and FPL's proposal in this proceeding fully allows for such changing conditions to be considered and evaluated throughout the process relative to the development of Turkey Point 6 & 7.

The most important conclusion for the Commission is that entering into the transformational process that must occur in Florida's electric sector over the next 20 years without having new nuclear units as a viable option in the resource portfolio would confine FPL and the state to an energy future that is risky, potentially costly, and unresponsive to the likely environmental policies.

IV. REGULATORY COMPACT NEEDED TO SUCCESSFULLY ESTABLISH THE NUCLEAR DEPLOYMENT OPTION

Q. Does FPL's proposal to construct Turkey Point 6 & 7 require any regulatory policy initiative from the Commission?

A. Yes. This case is a ground-breaking proceeding. While a number of new nuclear plant proposals have been announced[17] and two have filed their federal applications at the NRC,[18] this is one of the first state-level filings for

[17] Nuclear Regulatory Commission, "New Reactor Licensing Applications (Site and Technology Selected)", August 14, 2007. Plans have been announced for at least 17 new nuclear power facilities.

[18] Constellation filed its combined license application (COLA) in July 2007 for Calvert Cliffs Unit 3.

a new nuclear facility in the nation in over 25 years. Given the billions of dollars of investment in nuclear plants that was disallowed by state regulators in the 1980s, the actions of this Commission with regard to cost recovery mechanisms and assurances for prudently incurred costs will be keenly watched by *all* industry participants and investors, not just the Florida stakeholders.

Q. What messages or assurances do you believe the industry will be seeking from the Commission?

A. Quite simply, a recognition that the State of Florida intends to avoid the prior regulatory and economic debacle that marked deployment of the nation's current nuclear fleet, as well as affirmation that the Commission and the State stand behind FPL's efforts to establish this option for its customers. Specifically, there will be a focus on the regulatory compact between FPL and the Commission and whether the Company, and its investors, can be assured that FPL will receive a return of and on its prudently incurred costs without the use of new standards of review or hindsight that was sometimes applied during the last round of nuclear construction.

Q. Are you familiar with Section 25-6.0423 of the Florida Administrative Code, the Florida Public Service Commission's (PSC) Nuclear Power Plant Cost Recovery Rule?

A. Yes.

Q. Does that rule sufficiently address the regulatory paradigm shift required to enable new nuclear plants?

A. The Nuclear Power Plant Cost Recovery rule, and the enabling legislation (section 366.93, Florida Statutes), strongly suggest that the Florida Legislature and the Florida PSC wish to provide a framework within which the Commission has the opportunity to address and avoid many flawed aspects of other states' past regulatory processes. That being said, given the magnitude of the pending investment and past experience with the regulatory climate and rules changing as rate increases for cost recovery were sought, it will be incumbent upon this Commission to continue its willingness to embrace these initiatives on an ongoing basis as this process unfolds. This requires that the Commission stand behind the Company's decisions that were prudent, based on the best information available at the time the decision was made, and resist any temptation to engage in hindsight. While this is true for all regulatory processes, it is even more important given the size and duration of a commitment to a new nuclear unit.

Q. Would you briefly summarize the regulatory processes that were applied to, and the financial consequences of, the nuclear development era that occurred in the US in the 1970s and '80s?

A. In short, the events at TMI in 1979 led to significant changes, delays, and additional costs for nuclear plants still under construction. As the costs for these plants soared beyond expectations, social and political pressure mounted against the rate increases that were required to recover the full investment utilities had made. In response to these pressures, some regulatory commissions disallowed cost recovery using newly created variations on the

prudence and "used and useful" standards. Several state regulatory processes did not effectively or fairly deal with the realities of the safety-mandated changes and costs associated with building that generation of nuclear plants.

Q. Was any one party responsible for the cost overruns and financial losses associated with the post-TMI nuclear units?

A. No. Responsibility for those costs exceeding expectations was widespread and cut across all segments of the industry. The following is a summary of the challenges and shortcomings, by industry segment, that were encountered in the post-TMI nuclear development era:

- Design/Build - Ongoing changes to design contributed to expanded regulatory review and resulted in delays and cost overruns, some stemming from a desire to continually improve design and pursue cost-effectiveness, some a direct response to NRC-mandated changes.
- National Regulatory - Elongated review processes, sometimes stemming from design changes, resulted in an NRC review process that frequently added years to the development process.
- State Regulatory - Changing policies on cost recovery, the use of hindsight to disallow cost recovery, and the highly aggressive use of prudence proceedings to respond to political pressures regarding rate shock, were the leading cause of billions of dollars in disallowances.
- Utility Sponsors - Many imprudence disallowances were really political judgments on the viability of the rate increases required if plant costs were fully recovered under traditional ratemaking.

Overall, utility behavior did not warrant the extreme regulatory results that many had imposed on them.

Q. How did these issues manifest themselves in economic terms?

A. The financial effect of the cost overruns and subsequent disallowances were felt in many ways. For example:

- Over $18 billion in nuclear construction costs were disallowed;
- Several utilities were forced into bankruptcy;
- Numerous utilities suffered large decreases in stock value; and
- Decades of litigation led to more than $100 million and untold man-hours being spent litigating these disputes.

The economic consequences of a utility's decision to develop a nuclear power plant turned out to be a "bet the company" decision which many utilities made and lost. These projects led to long and contentious regulatory proceedings, often resulting in multi-year delays before costs were put into rates. Many utilities spent tens of millions of dollars each pursuing rate recovery and defending themselves in prudence proceedings. Without interim rate relief for the utilities, these delays further exacerbated the economic impact as allowance for funds used during construction (AFUDC) continued to accumulate on the construction work in progress (CWIP) balances.

Q. What was the regulatory basis for the series of prudence disallowances?

A. The lack of a clear basis for prudence determinations was part of the problem. The regulators looked at everything from truly "dishonest, or obviously wasteful or imprudent actions"[19] to results-oriented hindsight reviews which determined whether plants turned out to be economic a decade or more after construction was begun.

Q. Would you describe in greater detail the state level regulatory policies that contributed to these disallowances?

A. Certainly. While there was an array of contributing factors, the key problems stemmed from state regulatory processes that abandoned traditional standards of prudence *after* billions had been spent.

In addition, some of the rate-making principles, such as the used and useful standard, whereby a utility had to get a plant into service in order for it to be included in rate base, understandably led to some irrational choices on the part of utilities. The economic incentives were not aligned between the utility and its customers. While some choices regarding plant construction were understandable and rational from a utility management perspective, they were neither rational nor wise from a customer perspective.

Across the industry both the prudence review process and the economic alignment between the parties need to be corrected for the next generation of

[19] This was the U.S. Supreme Court standard in effect at the time. *Missouri ex. rel. Southwestern Bell Tel. Co. v. Public Service Commission*, 262 U.S. 276 (1923), separate concurring opinion of Justice Brandeis.

nuclear plants to be successfully pursued and result in a cost-effective and environmentally- acceptable resource.

Q. Were any specific prudence standards applied?

A. Yes; however, the standards used by regulators evolved from traditional prudence reviews to include also an "economically used and useful" standard which, based on hindsight determined what portion of a plant's prudently incurred cost was "economically" useful in providing service to customers. The recovery of prudently-incurred costs was further narrowed by the adoption of more onerous standards such as an "economic benefits test" and eventually simple "risk sharing," whereby costs were simply declared unrecoverable on the basis that the total cost was too large for customers alone to bear the burden.

Q. In what ways were these various prudence tests problematic?

A. Generally, the concern with application of these various standards was that they were developed and applied *after* the plant was committed to and largely built. In addition, these various tests were used to incrementally diminish the amount of investment that utilities could include in rate base. For example, in the Wolf Creek case before the Kansas Corporation Commission (KCC), the KCC ultimately approved the following set of disallowances as shown in Table 3, below:

Table 3: KCC Treatment of Wolf Creek Costs

	($ Million)
Total Plant Cost	$2,904.0
Imprudence Disallowance	$256.1
Excess Capacity Disallowance	$1,524.1
Economic Value Disallowance	$411.2
Total Disallowance	$2,192.3
Fully Recoverable Costs	$711.7

The KCC did eventually allow for partial, delayed recovery of the excess capacity and economic value disallowances through depreciation expense over the life of the plant.[20]

Q. What was the magnitude of the nuclear disallowances imposed on utilities?

A. Table 4 below summarizes some of the largest disallowances by plant and illustrates the magnitude of the issue faced by the utility sector.[21] While the total disallowance from these 26 plants is a staggering $18 billion (in mid-1980s dollars), the fact that six units had an aggregate disallowance of $10 billion highlights the underpinnings of the current market-perceived risk as new nuclear generation is pursued.

[20] R.J. Rudden Associates, Inc., "Nuclear Prudence Reviews: Retrospective and Commentary", April 1987, p. IV-5.

[21] Thomas P. Lyon and John W. Mayo, "Regulatory Opportunism and Investment Behavior: Evidence From the US Electric Utility Industry", June 2000, p. 46.

Table 4: Cost Disallowance by Plant ($Million)[21]

Unit	Utility	Disallowed
Nine Mile Point 2	Multiple	$ 2,141
Diablo Canyon 1&2	Pacific Gas & Electric Co.	$ 2,000
Wolf Creek 1	Multiple	$ 1,618
Shoreham 1	Long Island Lighting	$ 1,395
Comanche Peak 1&2	Texas Utilities	$ 1,381
Fermi 2	Detroit Edison Co.	$ 1,310
River Bend 1	Gulf States Utilities Co.	$ 1,297
Susquehanna 1&2	Pennsylvania Power & Light	$ 847
Clinton 1	Illinois Power Co.	$ 665
Perry 1	Multiple	$ 665
Seabrook 1	Multiple	$ 646
Vogtle 1&2	Georgia Power co.	$ 541
Hope Creek 1	Multiple	$ 512
Callaway 1	Union Electric Co.	$ 414
South Texas 1&2	Houston Lighting & Power	$ 376
Limerick 1	Philadelphia Electric Co.	$ 369
Millstone 3	Multiple	$ 353
Waterford 3	Louisiana Power & Light	$ 284
Braidwood 1	Commonwealth Edison Co.	$ 278
San Onofre 2&3	Multiple	$ 252
Grand Gulf 1	Multiple	$ 246
Palo Verde 1-3	Multiple	$ 188
Byron 2	Commonwealth Edison	$ 181
Beaver Valley 2	Multiple	$ 125
Summer 1	South Carolina Electric & Gas	$ 123
Byron 1	Commonwealth Edison	$ 102
TOTAL		**$ 18,308**

Q. Can you quantify the economic loss associated with the application of various prudence and economic benefits tests as applied to the last generation of nuclear plants?

A. The total economic loss is enormous but virtually impossible to quantify. It would include the investments that were disallowed, the impact on stock prices of the utilities, the cost of the various litigious proceedings in which

investment decisions were arbitrated, and the increased capital costs for utilities and their customers which were felt for years following these losses.

Q. How is it that the economic consequences were felt by customers when the various state commissions explicitly excluded costs from rate base?

A. While state commissions excluded those specific dollars from being collected, the overall effect of that loss was reflected in capital markets, and the resulting higher costs were incurred by utilities and ultimately included in the costs passed through to customers. In some cases, nuclear prudence disallowances led to the bankruptcy of the sponsoring utility. These regulatory actions put significant upward pressure on the cost of capital for virtually all utilities as the potential risk of a disallowance was considered by the market. As a September 1, 1988 article in Public Utilities Fortnightly pointed out, the early cancellations of nuclear plants (up until 1983) led to only modest stock price movements as compared to the Standard & Poors Utilities average, but those effects became much more adverse as the changing regulatory climate was observed and concerns spread about disallowances.[22]

Q. How did Florida's regulatory process, with respect to the last generation of nuclear plants, compare to the rest of the country?

A. My understanding is that three of FPL's four nuclear units went into rates without any disallowances or lengthy prudence process. St. Lucie 2, the last nuclear plant that FPL placed into service, was subjected to a detailed cost review, but the process did not result in a major cost disallowance. The fact

[22] Public Utilities Fortnightly, "Regulatory Issues in Nuclear Power Plant Cancellations", September 1, 1988.

that the Commission has not used onerous prudence reviews for FPL's past nuclear units is helpful, but the financial community remains wary of future proceedings based on the national experience with the last wave of new nuclear units.

Q. Have the flaws in the prior processes been recognized and addressed?

A. Yes, for the most part. The flaws in the processes were widely recognized and much was subsequently written about the possible ways of correcting these problems going forward. However, they have not been formally "addressed" insofar as no new nuclear plants have been proposed which would afford regulators an opportunity to rectify the approach and regulatory compact. One group that offered a comprehensive review of the past practices and made specific suggestions for the next generation was the National Regulatory Research Institute (NRRI). In its 1985 report, The Prudent Investment Test in the 1980's, NRRI recommended four guidelines for successful use of the prudent investment test. In summary those guidelines were:

i. Utilities should be afforded the presumption of prudence,

ii. Regulators should be prohibited from use of hindsight; the application of the prudence standard should be based on whether a decision was reasonable at the time it was made,

iii. Regulators should be prohibited from supplementing the reasonableness standard with other standards that look at the outcome of a decision, and

iv. Regulatory inquires should be factual inquiries and testimony should be based on facts, not opinion.

In addition to the NRRI report, there were many other contemporaneous acknowledgements of the flawed and frustrating prudence review process. The manner in which prudence cases were handled was recognized as likely to have an impact on future investors, as noted in a brief filed by Kansas Gas & Electric in the Wolf Creek case:

> ... there will come a time when Kansas Gas and Electric or some other Kansas company must build another power plant in order to assure an adequate and reliable supply of electric energy in Kansas. When that time comes, investors will have to decide if and at what price they are willing to invest in the Kansas electric energy infrastructure. One important factor in their decision making will no doubt be their memory of how the Wolf Creek rate cases were handled.[23]

Q. What actions if any, have been taken to correct those problems?

A. Virtually all nuclear industry segments are approaching this potential new generation of nuclear power plants with an eye toward correcting the flaws of the past.

[23] R.J. Rudden Associates, Inc., "Nuclear Prudence Reviews: Retrospective and Commentary", April 1987, p. V-11.

- Design/Build – Engineering and construction firms and equipment manufacturers are standardizing designs and, in some cases, initiating the NRC approvals to establish certified designs which can become the basis for subsequent Construction and Operating License (COL) Applications, thus facilitating the potential pace of the licensing process.
- National Regulatory – Federal efforts to alleviate delay and the cost of delay have been embraced both legislatively through incentives in the Energy Policy Act (EPACT) of 2005 and at the NRC with its COL process, described by other FPL witnesses.
- Industry Consortiums – Utility sponsors and technology vendors have formed industry consortiums, such as NuStart Energy, to collectively take the early steps in identifying how the deployment of new nuclear generation will be executed. These reviews have been conducted proactively and with the full cooperation of the NRC to work out many of the practical detailed issues related to meeting the requirements of 10 CFR Part 52. The consortiums are responsible for the development of two reference COLAs that are scheduled to be submitted in 2007.
- Utility Sponsors - Utilities have been working with all stakeholders to assess the opportunity for new nuclear facilities to meet the needs of their customers cost-effectively and in compliance with emerging environmental standards. In addition, these utility sponsors are beginning to make their filings at the federal level, and now with this

application at the state level to ensure that plans can go forward within a stable and predictable long-term regulatory framework.

Each of these groups is working toward offering a viable solution to the growing and competing needs nationwide for increased baseload electric generation, along with decreased GHG emissions and vulnerability to fossil fuel prices.

Q. Is the financial community prepared to support utilities embarking on construction programs for a new fleet of baseload nuclear generation?

A. Yes. The financial community recognizes that significant capital projects will be required to meet the growing national demand and will stand behind utilities engaged in developing these projects, so long as the risks are managed and prudent cost recovery is assured.

Specifically with regard to nuclear, the market in general, and rating agencies in particular, recognize the importance of environmental issues as well as traditional utility obligations in the coming decades and note the economic advantage that nuclear power can have in a carbon-constrained world.

> Climate change appears set to emerge as an overarching policy consideration that will affect how utilities procure resources, although issues of cost, system reliability, fuel diversity, and other factors can be at odds with carbon controls.[24]

[24] Standard & Poor's, Ratings Direct, "Which Power Generation Technologies Will take the Lead in Response to Carbon Controls?", May 11, 2007, p. 3.

These parties stand ready to support the commencement of a new nuclear development program with the appropriate regulatory and political assurances of cost recovery.

Q. Do you have reason to believe that rating agencies are concerned about regulatory support for cost recovery of large baseload units such as Turkey Point 6 & 7?

A. Yes. Rating agencies are concerned that the level of infrastructure investment needed to meet growing demand in an environmentally acceptable manner will create the same "perfect storm" of economic and political pressures that preceded the prudence disallowances and hindsight reviews of the past.

Moody's has noted:

> Conceivably, the combination of rising costs, higher infrastructure investment needs and larger or more frequent requests for rate relief could create pressure for future incremental rate relief from state regulators, or at a minimum, raise the uncertainty level associated with expected recoveries—thereby directly affecting one of our primary rating drivers. This potential for increased regulatory uncertainty and pressure for rate relief might peak several years from now, at precisely the time when many companies are completing their base-load generation construction projects or other non-discretionary infrastructure investment projects and

> the potential for rate shock to consumers would be highest. ...However, none of the issues currently facing the industry are new. In fact, the utility sector has faced an environment with eerily similar uncertainties in the past. The risk, in our opinion, is whether or not the experiences of the past will be repeated in the future. The most significant risk might be future disallowances of investments that were made with an understanding that those investments were prudent and necessary at the time they were made.[25]

Similarly Standard & Poors is very focused on the regulatory message:

> Standard & Poor's expects that the credit implications of building new nuclear plants will center on timely and on-budget construction and the ability to quickly recover capital costs with a reasonable rate of return. ...Until the plant goes into service, recovery of all or a majority of financing costs in rates, such as construction work in progress (CWIP) would not only demonstrate regulatory support and a willingness to provide ongoing support in the future, but also ensure that a utility's cash generation does not suffer. Just as important, such a provision would demonstrate clearly that regulators:

[25] Moody's Investors Service, Global Credit Research, "Storm Clouds Gathering on the Horizon for the North American Electric Utility Sector", August 2007, pp. 1, 15.

- Share the utility's vision of building a new nuclear plant,
- View the construction of the plant as effectively addressing a utility's increasing demand, and are willing to provide the necessary political and financial support.[26]

Q. Does this support indicate that the Commission needs to essentially *pre-approve all* costs associated with the Turkey Point 6&7 project?

A. No. Both the Company and the financial market participants will look for the Commission to reasonably and appropriately apply the Nuclear Cost Recovery Rule and appropriate prudence standards, including those standards set forth in sections 403.519(4)(e) and 366.93, Florida Statutes. Standard & Poor's notes that it looks:

> .... for a regulatory framework that provides for a fair opportunity to recover prudently incurred costs, even through changing regulatory commissions. Without such a framework, a utility's financial condition may rapidly deteriorate.[27]

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[26] Standard & Poor's Ratings Direct, "Why U.S. Utilities Are Seeing Nuclear Power In A New Light", January 9, 2007, pp. 9-10.

[27] Standard & Poor's, Rating Direct, "Which Power Generation Technologies Will take the Lead in Response to Carbon Controls?", May 11, 2007, p. 7.

However, all industry segments want to be assured that the standards will be not be revisited as the project progresses, thereby jeopardizing recovery of and return on investments that were deemed prudent by the Commission at the time they were made.

Q. What are some of the key elements of Florida's regulatory policy that will need to be embodied in Commission actions and orders to enable a cost-effective nuclear resource for FPL's customers?

A. FPL will need to be able to demonstrate throughout the development process that it has the support and backing of the state in general and the Commission in particular, and that such support will manifest itself in recovery of and on its prudently incurred costs in developing this non-GHG-emitting baseload resource. While the new nuclear cost recovery rule and approval of this request by FPL will be viewed as positive, past experience combined with the size of the financial commitment will continue to engender concern and skepticism from some financial market participants, as noted in the following statement:

> Investors are open and interested but still need to be convinced. The financial community has long memories. They lost tens of billions of dollars during the 1980s and 1990s when utilities built the current reactors.[28]

[28] Nuclear News, "High Cost Seen as Roadblock to New Nuclear Plants", March 28, 2007.

The Florida Commission and all other stakeholders need to be aware of the ongoing need to support the project and ensure a viable cost recovery mechanism for prudently incurred costs.

Q. Do you have particular recommendations regarding regulatory policy?

A. Only very generally at this time. First, the Commission should stand ready to re-affirm its policy initiatives that are codified in the Nuclear Power Plant Cost Recovery Rule, Section 25-6.0423, F.A.C. I note, however, that the market will be watchful and react with great swiftness and severe financial consequences if the Commission's administration of that rule is not consistent with market expectations.

Additionally, the following actions by the Commission would be supportive of this effort by FPL:

1. Having the Commission enunciate its policies regarding the application of prudence standards, so all parties know the rules as they embark on this process.
2. Implementing rules which would continue to allow pre in-service cost recovery so as to avoid the problems of hindsight reviews and to avoid the impact of spiraling AFUDC experienced in the past.
3. Acknowledging the likely rate impact of building the next generation of clean baseload technology; recognizing that the

higher cost associated with new nuclear baseload generation will not be used as a measure of imprudence for FPL and that it is understood that GHG reduction and energy security/diversity benefits will carry a cost premium.

4. Communicating to FPL and the financial community that the *quid pro quo* for the cost recovery assurances is that customers will have the right to expect that the nuclear development alternative will be deferred, modified or cancelled if market conditions, costs, alternatives or policies change so as to make the nuclear development option uneconomical or otherwise unattractive.

5. Embracing greater regulatory certainty to ensure that the utility will not be laden with a perverse incentive, seen in the past among other utilities, to press forward with completion of a plant simply to meet the used and useful standard, regardless of the results of updated demand, cost and technological data.

Q. You have noted that FPL is one of the first in the nation to have filed for state regulatory approval of a nuclear plant, and yet it is not first in terms of projected on-line date or in the queue at the NRC. How would you characterize FPL's approach to the approval process?

A. While I think either sequence (NRC first or State PSC first) is acceptable, FPL's approach is consistent with Florida's recent mandates in the resource planning process. The recent focus on GHG reduction and renewables

development will add a significant complexity to FPL's already significant task of resource planning for 20 years or more. In addition, as discussed above, the Company believes, and I share its belief, that no new nuclear baseload plant will be built in the next decade without some form of customer support, in the form of a reasonable assurance of recovery of prudently incurred costs. FPL is mindful of the financial market's need to see on-going state-level regulatory support for this type of project. Given this business context and the relative speed of the Commission's need determination process, it is reasonable to seek this approval in order to determine the financial viability for a decision to proceed.

Q. How do you expect the annual review process will affect the development of Turkey Point 6&7?

A. The Nuclear Power Plant Cost Recovery Rule, and the protections it appears to afford project sponsors, such as annual Commission reviews and approvals, timely cost recovery, and a commitment that costs once approved and determined to be prudent "will not be subject to disallowance or further prudence review," offers the necessary regulatory certainty to become a national example of an effective and equitable regulatory construct for enabling development of capital-intensive, environmentally-acceptable baseload resources. I would caution however that the rule is only as good as its application. Many of the failed regulatory processes of the past were the result of changing regulatory policies after the fact. Informed participants and observers are aware that the actions of one commission cannot bind future

commissions, and this knowledge and the vivid memories of the enormous disallowances of the past will require repeated reaffirmation of the Commission's cost recovery framework.

The Commission has promulgated the rules necessary to enable FPL to pursue this vital and valuable resource for its customers, and for all of the state's residents that benefit from reduced GHG emissions. The review process allows all parties to continuously re-evaluate and assess the "going forward" benefits. This reassessment will be viewed as a rational and constructive element in the regulatory process as long as FPL is at the same time assured of recovery of the prudently-incurred costs of preserving this option for customers.

Q. Does this conclude your direct testimony?

A. Yes.

John J. Reed
Chairman and Chief Executive Officer

John J. Reed is a financial and economic consultant with more than 25 years of experience in the energy industry. Mr. Reed has also been the CEO of an NASD member securities firm, and Co-CEO of the nation's largest publicly traded management consulting firm (NYSE: NCI). He has provided advisory services in the areas of mergers and acquisitions, asset divestitures and purchases, strategic planning, project finance, corporate valuation, energy market analysis, rate and regulatory matters and energy contract negotiations to clients across North and Central America. Mr. Reed's comprehensive experience includes the development and implementation of nuclear, fossil, and hydroelectric generation divestiture programs with an aggregate valuation in excess of $20 billion. Mr. Reed has also provided expert testimony on financial and economic matters on more than 125 occasions before the FERC, Canadian regulatory agencies, state utility regulatory agencies, various state and federal courts, and before arbitration panels in the United States and Canada. After graduation from the Wharton School of the University of Pennsylvania, Mr. Reed joined Southern California Gas Company, where he worked in the regulatory and financial groups, leaving the firm as Chief Economist in 1981. He served as executive and consultant with Stone & Webster Management Consulting and R.J. Rudden Associates prior to forming REED Consulting Group (RCG) in 1988. RCG was acquired by Navigant Consulting in 1997, where Mr. Reed served as an executive until leaving Navigant to join CEA as Chairman and Chief Executive Officer.

REPRESENTATIVE PROJECT EXPERIENCE

Executive Management

As an executive-level consultant, worked with CEOs, CFOs, other senior officers, and Boards of Directors of many of North America's top electric and gas utilities, as well as with senior political leaders of the U.S. and Canada on numerous engagements over the past 20 years. Directed merger, acquisition, divestiture, and project development engagements for utilities, pipelines and electric generation companies, repositioned several electric and gas utilities as pure distributors through a series of regulatory, financial, and legislative initiatives, and helped to develop and execute several "roll-up" or market aggregation strategies for companies seeking to achieve substantial scale in energy distribution, generation, transmission, and marketing.

Financial and Economic Advisory Services

Retained by many of the nation's leading energy companies and financial institutions for services relating to the purchase, sale or development of new enterprises. These projects included major new gas pipeline projects, gas storage projects, several non-utility generation projects, the purchase and sale of project development and gas marketing firms, and utility acquisitions. Specific services provided include the development of corporate expansion plans, review of acquisition candidates, establishment of divestiture standards, due diligence on acquisitions or financing, market entry or expansion studies, competitive assessments, project financing studies, and negotiations relating to these transactions.

Litigation Support and Expert Testimony

Provided expert testimony on more than 125 occasions in administrative and civil proceedings on a wide range of energy and economic issues. Clients in these matters have included gas distribution utilities, gas pipelines, gas producers, oil producers, electric utilities, large energy consumers, governmental and regulatory agencies, trade associations, independent energy project developers, engineering firms, and gas and power marketers. Testimony has focused on issues ranging from broad regulatory and economic policy to virtually all elements of the utility ratemaking process. Also frequently testified regarding energy contract interpretation, accepted energy industry practices, horizontal and vertical market power, quantification of damages, and management prudence. Have been active in regulatory contract and litigation matters on virtually all interstate pipeline systems serving the U.S. Northeast, Mid-Atlantic, Midwest, and Pacific regions.

Also served on FERC Commissioner Terzic's Task Force on Competition, which conducted an industry-wide investigation into the levels of and means of encouraging competition in U.S. natural gas markets. Represented the interests of the gas distributors (the AGD and UDC) and participated actively in developing and presenting position papers on behalf of the LDC community.

Resource Procurement, Contracting and Analysis

On behalf of gas distributors, gas pipelines, gas producers, electric utilities, and independent energy project developers, personally managed or participated in the negotiation, drafting, and regulatory support of hundreds of energy contracts, including the largest gas contracts in North America, electric contracts representing billions of dollars, pipeline and storage contracts, and facility leases.

These efforts have resulted in bringing large new energy projects to market across North America, the creation of hundreds of millions of dollars in savings through contract renegotiation, and the regulatory approval of a number of highly contested energy contracts.

Strategic Planning and Utility Restructuring

Acted as a leading participant in the restructuring of the natural gas and electric utility industries over the past fifteen years, as an adviser to local distribution companies (LDCs), pipelines, electric utilities, and independent energy project developers. In the recent past, provided services to many of the top 50 utilities and energy marketers across North America. Managed projects that frequently included the redevelopment of strategic plans, corporate reorganizations, the development of multi-year regulatory and legislative agendas, merger, acquisition and divestiture strategies, and the development of market entry strategies. Developed and supported merchant function exit strategies, marketing affiliate strategies, and detailed plans for the functional business units of many of North America's leading utilities.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2002 – Present)
Chairman and Chief Executive Officer

Navigant Consulting, Inc. (1997 – 2002)
President, Navigant Energy Capital (2000 – 2002)

Executive Director (2000 – 2002)
Co-Chief Executive Officer, Vice Chairman (1999 – 2000)
Executive Managing Director (1998 – 1999)
President, REED Consulting Group, Inc. (1997 – 1998)

REED Consulting Group (1988 – 1997)
Chairman, President and Chief Executive Officer

R.J. Rudden Associates, Inc. (1983 – 1988)
Vice President

Stone & Webster Management Consultants, Inc. (1981 – 1983)
Senior Consultant
Consultant

Southern California Gas Company (1976 – 1981)
Corporate Economist
Financial Analyst
Treasury Analyst

EDUCATION AND CERTIFICATION

B.S., Economics and Finance, Wharton School, University of Pennsylvania, 1976
Licensed Securities Professional: NASD Series 7, 63, and 24 Licenses

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BOARDS OF DIRECTORS (PAST AND PRESENT)

Concentric Energy Advisors, Inc.
Navigant Consulting, Inc.
Navigant Energy Capital
Nukem, Inc.
New England Gas Association
R. J. Rudden Associates
REED Consulting Group

AFFILIATIONS

National Association of Business Economists
International Association of Energy Economists
American Gas Association
New England Gas Association
Society of Gas Lighters
Guild of Gas Managers

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

REGULATORY AGENCIES

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Colorado Public Utilities Commission				
Xcel Energy	8/04	Xcel Energy	Docket No. 031-134E	Cost of Debt
Conn. Department of Public Utilities Control				
Southern Connecticut Gas	2/04	Southern Connecticut Gas	Docket No. 00-12-08	Gas Purchasing Practices
Southern Connecticut Gas	4/05	Southern Connecticut Gas	Docket No. 05-03-17	LNG/Trunkline
District Of Columbia PSC				
Potomac Electric Power Company	3/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts (Direct)
Potomac Electric Power Company	5/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts (Supplemental Direct)
Potomac Electric Power Company	7/99	Potomac Electric Power Company	Docket No. 945	Divestiture of Gen. Assets & Purchase Power Contracts (Rebuttal)

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

Federal Energy Regulatory Commission				
Iroquois Gas Transmission System, L.P.	97	Iroquois Gas Transmission System, L.P.	RP97-126-000	Cost of Service, Rate Design
BEC Energy - Commonwealth Energy System	2/99	Boston Edison Company/ Commonwealth Energy System	EC99-___-000	Market Power Analysis – Merger
Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc.	10/00	Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc.	Docket No. EC00-___	Market Power 203/205 Filing
Wyckoff Gas Storage	12/02	Wyckoff Gas Storage	CP03-33-000	Need for Storage Project
Indicated Shippers/Producers	10/03	Northern Natural Gas	Docket No. RP98-39-029	Ad Valorem Tax Treatment
Maritimes & Northeast Pipeline	6/04	Maritimes & Northeast Pipeline	Docket No. RP04-360-000	Rolled-In Rates
ISO New England	8/04	ISO New England	Docket No. ER03-563-030	Cost of New Entry
Transwestern Pipeline Company, LLC	9/06	Transwestern Pipeline Company, LLC	Docket No. RP06-614-000	
Hawaii Public Utility Commission				
Hawaiian Electric Light Company, Inc. (HELCO)	6/00	Hawaiian Electric Light Company, Inc.	Cause No. 41746	Standby Charge

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

Indiana Utility Regulatory Commission				
Northern Indiana Public Service Company	10/01	Northern Indiana Public Service Company	Docket No. 99-0207	Direct Testimony, Valuation of Electric Generating Facilities
Iowa Utilities Board				
Interstate Power and Light	7/05	Interstate Power and Light and FPL Energy Duane Arnold, LLC	Docket No. SPU-05-15	Sale of Nuclear Plant
Interstate Power and Light	5/07	City of Everly, Iowa	Docket No. SPU-06-5	Public Benefits
Interstate Power and Light	5/07	City of Kalona, Iowa	Docket No. SPU-06-6	Public Benefits
Interstate Power and Light	5/07	City of Wellman, Iowa	Docket No. SPU-06-10	Public Benefits
Interstate Power and Light	5/07	City of Terril, Iowa	Docket No. SPU-06-8	Public Benefits
Interstate Power and Light	5/07	City of Rolfe, Iowa	Docket No. SPU-06-7	Public Benefits
Maryland Public Service Commission				
Potomac Electric Power Company	8/99	Potomac Electric Power Company	Docket No. 8796	Stranded Cost & Price Protection (Direct)

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

Mass. Department of Public Utilities				
Boston Edison Company	8/97	Boston Edison Company	D.P.U. No. 97-63	Holding Company Corporate Structure
Berkshire Gas Company	6/98	Berkshire Gas Mergeco Gas Co.	D.T.E. 98-87	Regulatory Issues
Eastern Edison Company	8/98	Montaup Electric Company	D.T.E. 98-83	Marketing for divestiture of its generation business.
Boston Edison Company	98	Boston Edison Company	D.T.E. 97-113	Fossil Generation Divestiture
Boston Edison Company	98	Boston Edison Company	D.T.E. 98-119	Nuclear Generation Divestiture
Eastern Edison Company	12/98	Montaup Electric Company	D.T.E. 99-9	Sale of Nuclear Plant
Michigan Public Service Commission				
Detroit Edison Company	9/98	Detroit Edison Company	Case No. U-11726	Market Value of Generation Assets
Consumers Energy Company	8/06	Consumers Energy Company	Case No. U-14992	Sale of Nuclear Plant
Minnesota Public Utilities Commission				
Xcel Energy/No. States Power	9/04	Xcel Energy/No. States Power	Docket No. G002/GR-04-1511	NRG Impacts
Interstate Power and Light	8/05	Interstate Power and Light and FPL Energy Duane Arnold, LLC	Docket No. E001/PA-05-1272	Sale of Nuclear Plant
Northern States Power Company d/b/a Xcel Energy	3/06	Northern States Power Company	Docket No. E002/GR-05-1428	NRG Impacts on Debt Costs
Northern States Power Company d/b/a Xcel Energy	11/06	Northern States Power Company	Docket No. G002/GR-06-1429	Return on Equity

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

Missouri Public Service Commission				
Missouri Gas Energy	1/03	Missouri Gas Energy	Case No. GR-2001-382	Gas Purchasing Practices; Prudence
Aquila Networks	2/04	Aquila-MPS, Aquila_L&P	Case Nos. ER-2004-0034 HR-2004-0024	Cost of Capital, Capital Structure
Aquila Networks	2/04	Aquila-MPS, Aquila_L&P	Case No. GR-2004-0072	Cost of Capital, Capital Structure
Missouri Gas Energy	11/05	Missouri Gas Energy	Case Nos. GR-2002-348 GR-2003-0330	Capacity Planning
National Energy Board of Canada				
Alliance Pipeline L.P.	6/97	Alliance Pipeline L.P.	GH-3-97	Market Study
Maritimes & Northeast Pipeline	97	Sable Offshore Energy Project	GH-6-96	Market Study
Maritimes & Northeast Pipeline	2/02	Maritimes & Northeast Pipeline	GH-3-2002	Natural Gas Demand Analysis
TransCanada Pipelines	8/04	TransCanada Pipelines	RH-3-2004	Segmented Service
Brunswick Pipeline	9/06	Brunswick Pipeline	GH-1-2006	Market Study
TransCanada Pipelines Ltd.	3/07	TransCanada Pipelines Ltd.: Gros Cacouna Receipt Point Application	RH-1-2007	

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

New York Public Service Commission				
Brooklyn Union Gas Company	8/95	Brooklyn Union Gas Company	Case No. 95-6-0761	Panel on Industry Directions
Central Hudson, ConEdison and Niagara Mohawk	9/00	Central Hudson, ConEdison and Niagara Mohawk	Case No. 96-E-0909 Case No. 96-E-0897 Case No. 94-E-0098 Case No. 94-E-0099	Section 70
Central Hudson, New York State Electric & Gas, Rochester Gas & Electric	5/01	Joint Petition of NiMo, NYSEG, RG&E, Central Hudson, Constellation and Nine Mile Point	Case No. 01-E-0011	Section 70, Rebuttal Testimony
Rochester Gas & Electric	12/03	Rochester Gas & Electric	Case No. 03-E-1231	Sale of Nuclear Plant
Rochester Gas & Electric	01/04	Rochester Gas & Electric	Case No. 03-E-0765 Case No. 02-E-0198 Case No. 03-E-0766	Sale of Nuclear Plant; Ratemaking Treatment of Sale
Oklahoma Corporation Commission				
Oklahoma Natural Gas Company	6/98	Oklahoma Natural Gas Company	Case PUD No. 980000177	Evaluate their use of storage
Oklahoma Gas & Electric Company	9/05	Oklahoma Gas & Electric Company	Cause No. PUD 200500151	Prudence of McLain Acquisition
Ontario Energy Board				
Market Hub Partners Canada, L.P.	5/06	Natural Gas Electric Interface Roundtable	File No. EB-2005-0551	Market-based Rates For Storage

Rhode Island Public Utilities Commission				
Providence Gas Company and The Valley Gas Company	1/01	Providence Gas Company and The Valley Gas Company	Docket No. 1673 and 1736	Gas Cost Mitigation Strategy
The New England Gas Company	3/03	New England Gas Company	Docket No. 3459	Cost of Capital
Vermont Public Service Board				
Green Mountain Power	12/97	Green Mountain Power	Docket No. 5983	Tariff Filing
Green Mountain Power	7/98	Green Mountain Power	Docket No. 6107	Direct Testimony
Green Mountain Power	9/00	Green Mountain Power	Docket No. 6107	Rebuttal Testimony
Wisconsin Public Service Commission				
WEC & WICOR	11/99	WEC	Docket No. 9401-YO-100 Docket No. 9402-YO-101	Approval to Acquire the Stock of WICOR
Wisconsin Electric Power Company	1/07	Wisconsin Electric Power Co.	Docket No. 6630-EI-113	Sale of Nuclear Plant

COURTS AND ARBITRATION

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
American Arbitration Association				
Attala Generating Company	12/03	Attala Generating Co v. Attala Energy Co.	Case No. 16-Y-198-00228-03	Power Project Valuation; Breach of Contract; Damages
State of Colorado District Court, County of Garfield				
Questar Corporation, et al	11/00	Questar Corporation, et al.	Case No. 00CV129-A	Partnership Fiduciary Duties

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

State of Delaware, Court of Chancery, New Castle County				
Wilmington Trust Company	11/05	Calpine Corporation vs. Bank Of New York and Wilmington Trust Company	C.A. No. 1669-N	Bond Indenture Covenants
Illinois Appellate Court, Fifth Division				
Norweb, plc	8/02	Indeck No. America v. Norweb	Docket No. 97 CH 07291	Breach of Contract; Power Plant Valuation
Independent Arbitration Panel				
Alberta Northeast Gas Limited	2/98	ProGas Ltd., Canadian Forest Oil Ltd., AEC Oil & Gas		
Ocean State Power	9/02	Ocean State Power vs. ProGas Ltd.	2001/2002 Arbitration	Gas Price Arbitration
Ocean State Power	2/03	Ocean State Power vs. ProGas Ltd.	2002/2003 Arbitration	Gas Price Arbitration
Ocean State Power	6/04	Ocean State Power vs. ProGas Ltd.	2003/2004 Arbitration	Gas Price Arbitration
Shell Canada Limited	7/05	Shell Canada Limited and Nova Scotia Power Inc.		Gas Contract Price Arbitration
International Court of Arbitration				
Wisconsin Gas Company, Inc.	2/97	Wisconsin Gas Co. vs. Pan-Alberta	Case No. 9322/CK	Contract Arbitration
Minnegasco, A Division of NorAm Energy Corp.	3/97	Minnegasco vs. Pan-Alberta	Case No. 9357/CK	Contract Arbitration
Utilicorp United Inc.	4/97	Utilicorp vs. Pan-Alberta	Case No. 9373/CK	Contract Arbitration
IES Utilities	97	IES vs. Pan-Alberta	Case No. 9374/CK	Contract Arbitration

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

State of New Jersey, Mercer County Superior Court				
Transamerica Corp., et. al.	7/07	IMO Industries Inc. vs. Transamerica Corp., et. al.	Docket No. L-2140-03	Breach-Related Damages, Enterprise Value
Province of Alberta, Court of Queen's Bench				
Alberta Northeast Gas Limited	5/07	Cargill Gas Marketing Ltd. vs. Alberta Northeast Gas Limited	Action No. 0501-03291	Gas Contracting Practices
State of Utah Third District Court				
PacifiCorp & Holme, Roberts & Owen, LLP	1/07	USA Power & Spring Canyon Energy vs. PacifiCorp. et. al.	Civil No. 050903412	Breach-Related Damages
U.S. Bankruptcy Court, District Of New Jersey				
Ponderosa Pine Energy Partners, Ltd.	7/05	Ponderosa Pine Energy Partners, Ltd.	Case No. 05-21444	Forward Contract Bankruptcy Treatment
U.S. Bankruptcy Court, So. District Of New York				
Johns Manville	5/04	Enron Energy Mktg. v. Johns Manville; Enron No. America v. Johns Manville	Case No. 01-16034 (AJG)	Breach of Contract; Damages
U.S. Bankruptcy Court, Northern District Of Texas				
Southern Maryland Electric Cooperative, Inc. and Potomac Electric Power Company	11/04	Mirant Corporation, et al. v. SMECO	Case No. 03-4659; Adversary No. 04-4073	PPA Interpretation; Leasing

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

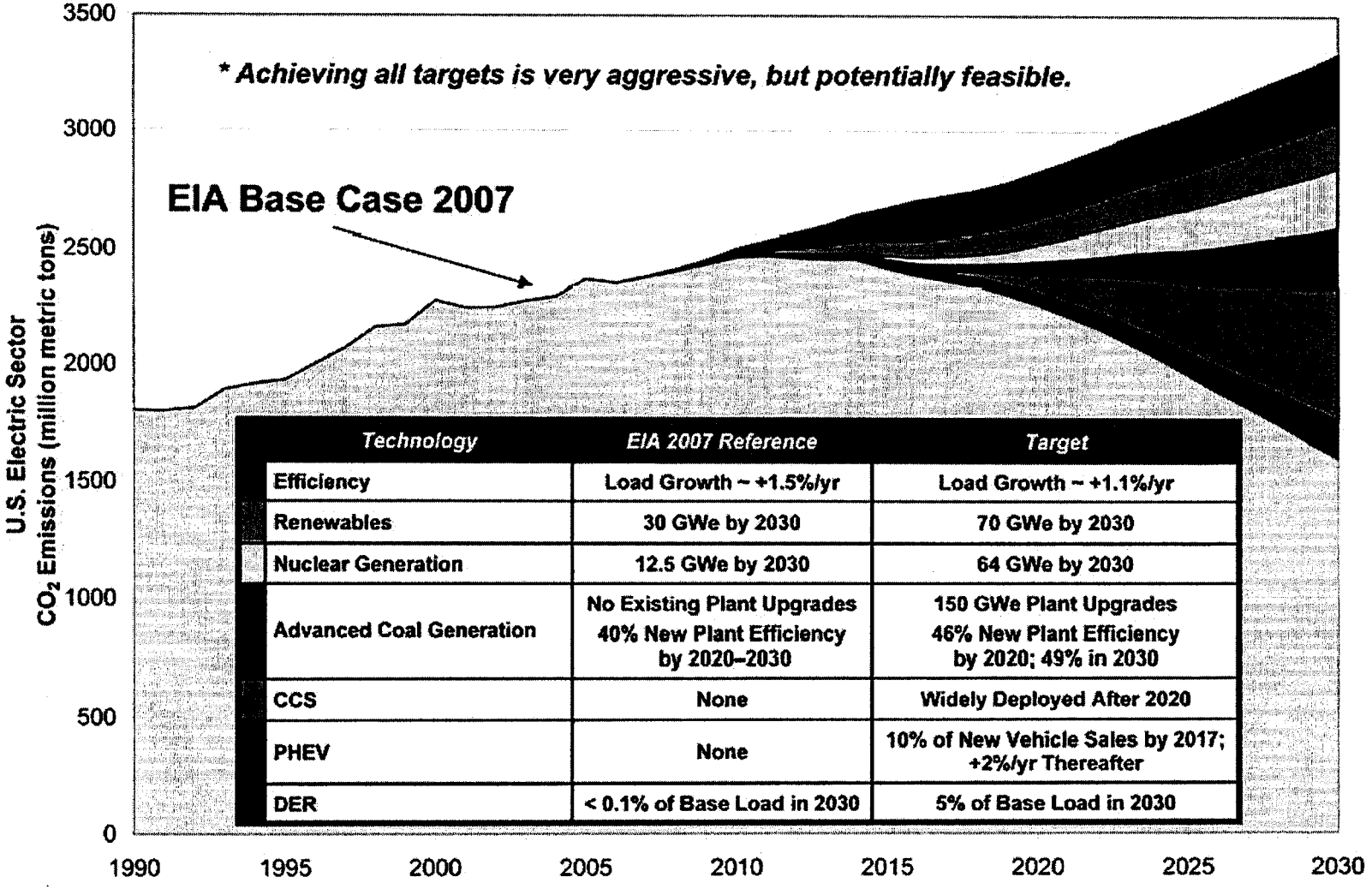
U. S. Court of Federal Claims				
Boston Edison Company	7/06	Boston Edison v. Department of Energy	No. 99-447C No. 03-2626C	Spent Nuclear Fuel Litigation
U. S. District Court, Northern California				
Pacific Gas & Electric Co./PGT PG&E/PGT Pipeline Exp. Project	4/97	Norcen Energy Resources Limited	Case No. C94-0911 VRW	Fraud Claim
U. S. District Court, District of Connecticut				
Constellation Power Source, Inc.	12/04	Constellation Power Source, Inc. v. Select Energy, Inc.	Civil Action 304 CV 983 (RNC)	ISO Structure, Breach of Contract
U.S. District Court, New Hampshire				
Portland Natural Gas Transmission and Maritimes & Northeast Pipeline	9/03	Public Service Company of New Hampshire vs. PNGTS and M&NE Pipeline	Docket No. C-02-105-B	Impairment of Electric Transmission Right-of-Way

Docket No. 07____-EI
Expert Testimony of John J. Reed
Exhibit JJR-2, Page 10 of 11

EXPERT TESTIMONY OF JOHN J. REED 1997-2007

U. S. District Court, Southern District of New York				
Central Hudson Gas & Electric	11/99	Central Hudson v. Riverkeeper, Inc., Robert H. Boyle, John J. Cronin	Civil Action 99 Civ 2536 (BDP)	Expert Report, Shortnose Sturgeon Case
Central Hudson Gas & Electric	8/00	Central Hudson v. Riverkeeper, Inc., Robert H. Boyle, John J. Cronin	Civil Action 99 Civ 2536 (BDP)	Revised Expert Report, Shortnose Sturgeon Case
Consolidated Edison	3/02	Consolidated Edison v. Northeast Utilities	Case No. 01 Civ. 1893 (JGK) (HP)	Industry Standards for Due Diligence
Merrill Lynch & Company	1/05	Merrill Lynch v. Allegheny Energy, Inc.	Civil Action 02 CV 7689 (HB)	Due Diligence, Breach of Contract, Damages
U. S. District Court, Eastern District of Virginia				
Aquila, Inc.	1/05	VPEM v. Aquila, Inc.	Civil Action 304 CV 411	Breach of Contract, Damages
District of Columbia Court City Council				
PEPCo	7/99		Bill 13-284	

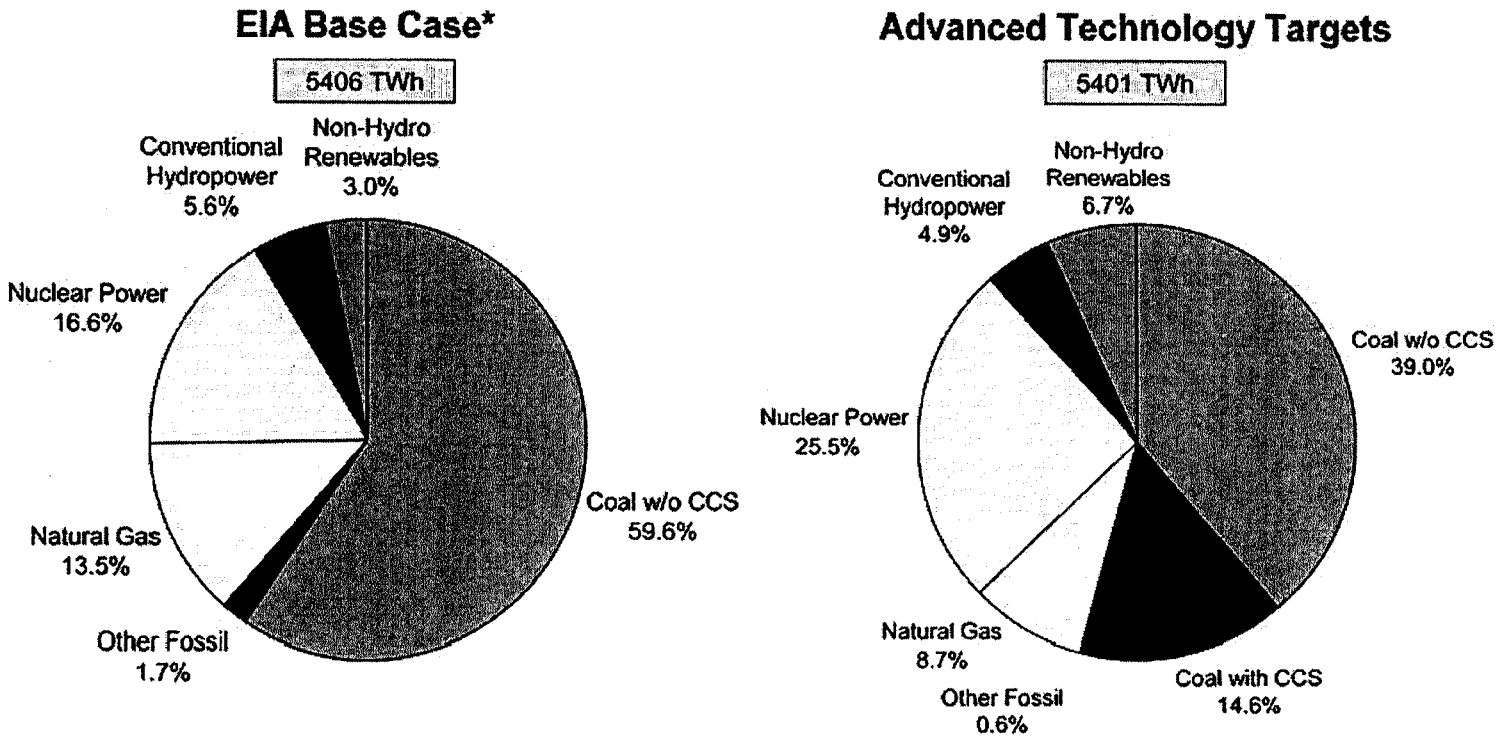
Docket No. 07____-EI
Expert Testimony of John J. Reed
Exhibit JJR-2, Page 11 of 11



Technology	EIA 2007 Reference	Target
Efficiency	Load Growth ~ +1.5%/yr	Load Growth ~ +1.1%/yr
Renewables	30 GWe by 2030	70 GWe by 2030
Nuclear Generation	12.5 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Existing Plant Upgrades 40% New Plant Efficiency by 2020–2030	150 GWe Plant Upgrades 46% New Plant Efficiency by 2020; 49% in 2030
CCS	None	Widely Deployed After 2020
PHEV	None	10% of New Vehicle Sales by 2017; +2%/yr Thereafter
DER	< 0.1% of Base Load in 2030	5% of Base Load in 2030

Source: "The Power to Reduce CO2 Emissions, The Full Portfolio", Electric Power Research Institute Energy Technology Assessment Center, August, 2007

Docket No.07_____-EI
CO_2 Reductions by Technology Type
Exhibit JJR-3, Page 1 of 1



Base case from EIA "Annual Energy Outlook 2007"

Source: "The Power to Reduce CO2 Emissions, The Full Portfolio", Electric Power Research Institute Energy Technology Assessment Center, August, 2007.

Docket No. 07_____-EI
2007 US Electricity by Technology Sector vs. 2030 US Electricity by Technology Sector Including Advanced Technologies
Exhibit JJR-4, Page 1 of 1