

ALL RISK, NO REWARD:

**Why Munis and Coops Should Not Subsidize
The Nuclear Renaissance**

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Capital markets will not underwrite the construction of new nuclear reactors because of the severe technology, policy, regulatory, execution, marketplace and financial risks that they face.

Shifting the risk to muni and coop ratepayers does not eliminate risk, it just exposes captive ratepayers to the excess costs that high risk project impose.

The Economic Risks of New Nuclear Reactor Projects

<u>Category</u>	<u>Source</u>	<u>Specific Risks Identified in the Analysis</u>	<u>Category</u>	<u>Source</u>	<u>Specific Risks Identified in the Analysis</u>
Technology	New Technology Risk	First of a kind costs	Marketplace	Uncertain demand growth	Slowing due to recession
		Long-lead time			Shifting due to debt and loss of wealth
	Alternative technologies	Efficiency potential identified		Uncertain fuel costs	Natural gas price decline
		Renewable cost declines		Reactor Costs	Long lead time
Policy	Shifting focus	Emphasis on efficiency reduces need			Cost overruns
		Emphasis on renewables reduces need		Rate shock reduces demand	
	Flexible GHG reductions	Lowers carbon cost	Financial	General Conditions	Tight money
					New Liquidity requirements
Regulatory	NRC Regulatory Reviews	Lack of Experience			High-risk premiums
		Change of requirements		Utility Finance	Increased nuclear operating exposure
		Design flaws and revisions	Existing debt and need to refinance		
		Site specific contentions	Financial ratio deterioration		
	Loan Guarantee Conditions	Taxpayer protections inhibit loans		Rising cost of debt	
	Rate Review	Recovery of costs challenged		Limited & declining cash & equivalents	
Execution	Construction Risk	Lack of experience		Weak balance sheets	
		Counterparty risk	Project Finance	Underfunded pension plans	
	EPC contract uncertainties	Cost escalation and volatility		High hurdle rate for risky projects	
	Size, cost and complexity	Cost overruns		Impact of large project	
		Delays	Debt load and service burden impact		
				Capital structure distortion	

SOURCES OF DATA SLIDES

External Shocks Energy Information Administration. *Annual Energy Review*.

Texas Net Generation: EIA, Natural Gas Monthly

The Recession: CPS presentations

Projections of Peak Load: Progress Energy 2008 10-year plan, p. 2-7; 2009 10-year plan, p. 2-6; Florida Power and Light, 2008 10-year plan, p. 40; 2009 10-year plan, p. 45;

Crude oil & Natural Gas Prices: Source: Energy Information Administration, Petroleum Spot Prices, http://tonto.eia.doe.gov/dnav/pet/xls/PET_PRI_SPT_S1_M.xls, Natural Gas Future Prices, Contract 1: http://tonto.eia.doe.gov/dnav/ng/xls/NG_PRI_FUT_S1_M.xls

Nymex Futures: Testimony of Garry Miller, Docket No. 090009, May 1, 2009, Exhibit GM-1; Energy Information Administration, Annual Natural Gas Futures Contract 1, http://tonto.eia.doe.gov/dnav/ng/xls/NG_PRI_FUT_S1_M.xls; Annual Florida Gas Price Sold to Electric Power Companies; <http://tonto.eia.doe.gov/dnav/ng/hist/n3045B3a.htm>; FPL Need Study for electrical Power Docket No. 07-0650, Appendix E, Nymex Futures Contract, http://www.nymex.com/ng_fut_csf.aspx, visited 7/11/2009

Levelized Cost of Low Carbon Resources: Congressional Budget Office, *Nuclear Power's Role in Generating Electricity*, May 2008, p.13; Kaplan Carbon Sources Stan, *Power Plants: Characteristics and Costs*, Congressional Research Service, November 13, 2008, Appendix B; Staff draft, *Comparative Costs of California Central Station Electricity Generation Technologies Cost of Generation Model*, August, 2009, p. 18; Lazard, *Levelized Cost of Energy Analysis—Version 2.0*, June 2008, p. 10; *Levelized Cost of Energy Analysis – Version 3.0*, for efficiency, onshore wind, biomass, natural gas, coal and nuclear and solar PV, as reported in World Resources Institute, *Renewable Energy Opportunities in Florida*, April 2009; Lovins Amory, and Imran Shiekh, and Alex Markevich, *Nuclear Power: Climate Fix or Folly?*, December 31, 2008. Draft, p. 2; Moody's, *New Nuclear Generating Capacity: Potential Credit Implications for U.S. Investor Owned Utilities*, May 2008, p. 15; National Research Council of the National Academies, *America's Energy Future: Technology and Transformation, Summary Edition* (Washington, D.C.: 2009), p. 58; Renewable Energy Policy Network for the 21st Century, *Renewables 2007: Global Status Report*, 2008; Standard and Poors, *Assessing the Credit Risk of Competing Technologies for New U.S. Nuclear Power Plants*, August 13, 2008, p. 11.

Overnight Costs: Mark Cooper, *The Consumer Economics of Nuclear Reactors: Renaissance or Relapse?*, Institute for Energy and the Environment, Vermont Law School, June 2009, p.24.

Nuclear Reactor Characteristics: <http://www.nuclear.gov/np2010/neScorecard/neScorecard.html>, Company web sites for stock price, Annual Reports for shares outstanding, Exhibit JJR-3 Comparison of Cost Estimates for New AP-1000 Reactors, Docket No. 0900009-EI, for AP-1000 costs Mark Cooper, *The Economics of Nuclear Reactors: Renaissance or Relapse?*, Institute for Energy and the Environment, Vermont Law School, June 2009, p. 24. <http://www.vermontlaw.edu/Documents/Cooper%20Report%20on%20Nuclear%20Economics%20FINAL%201.pdf>

FPL Carbon Compliance: Florida Power and Light, Docket No. 090009 EI, OPC's Third Set of Interrogatories, Question No. 47, p 1 of 2; EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111th Congress, 6/23/09, p. 14, using the highest price and converting real to nominal dollars at the 2.5% rate of inflation assumed by FPL

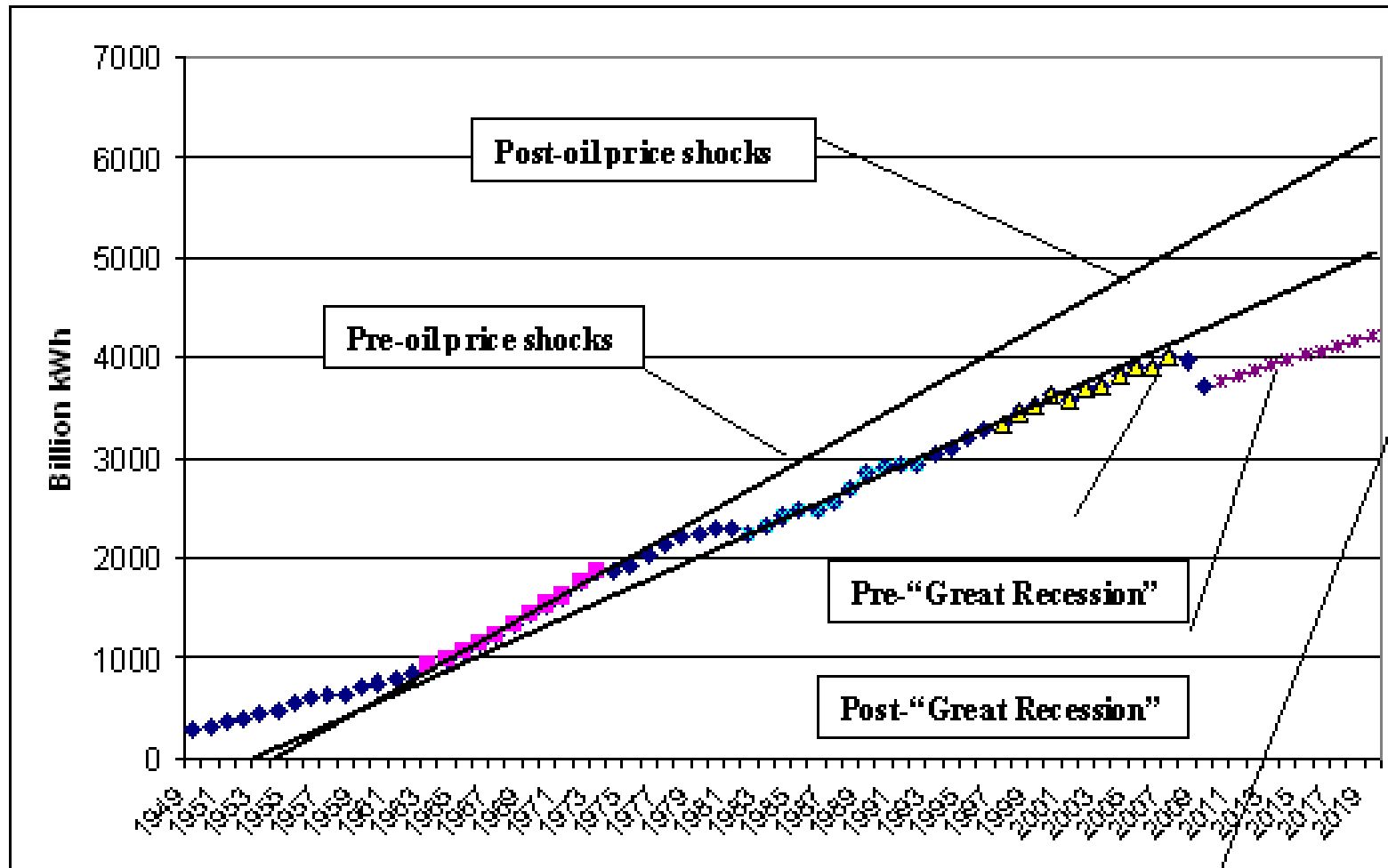
Reactor Costs: See Nuclear Reactor Characteristics.

Marketplace Risk:

Demand

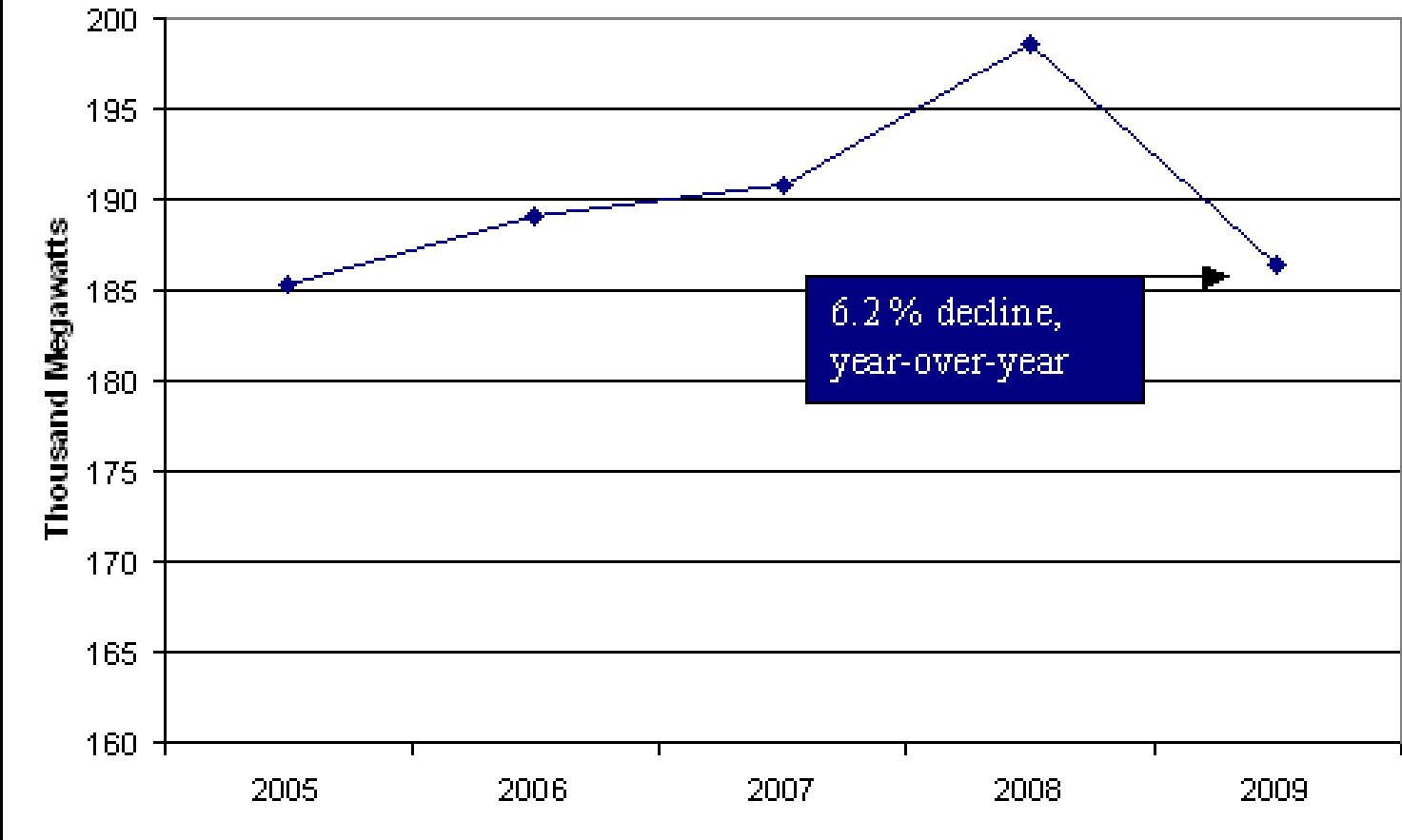
Supply

External Shocks and Public Policy Shift the Level and Growth Rate of Demand

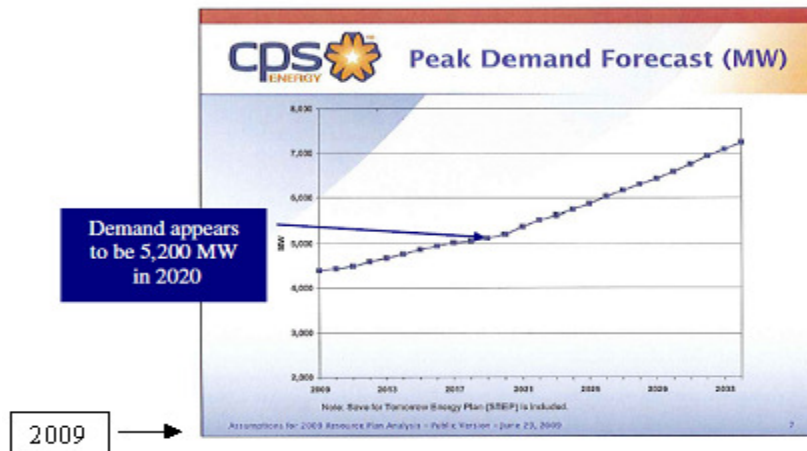
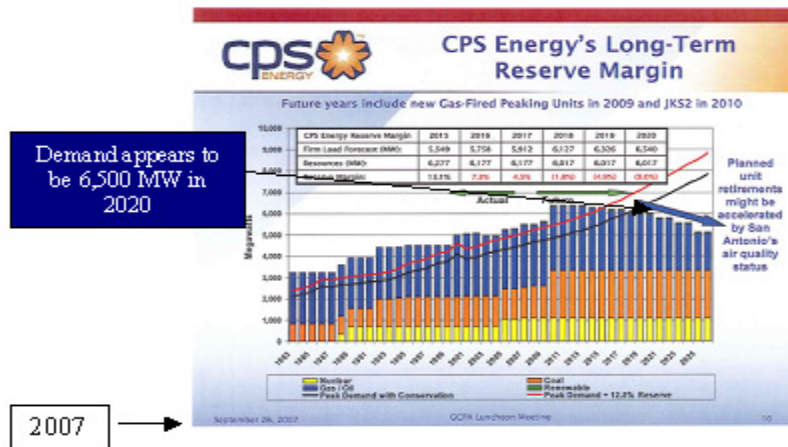


HR 2454, Title I & II
Efficiency only (20%)

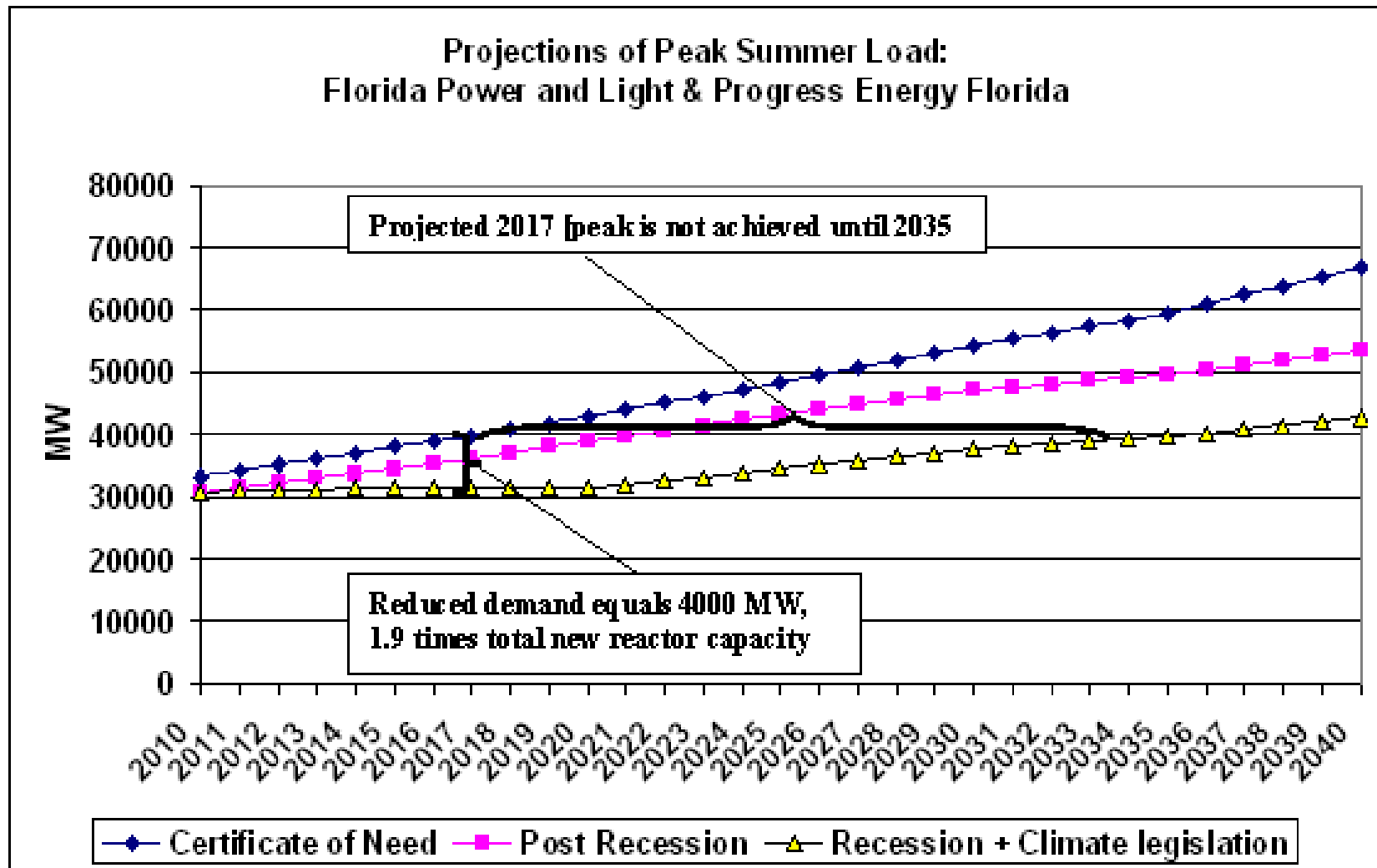
Texas Net Generation: January to June



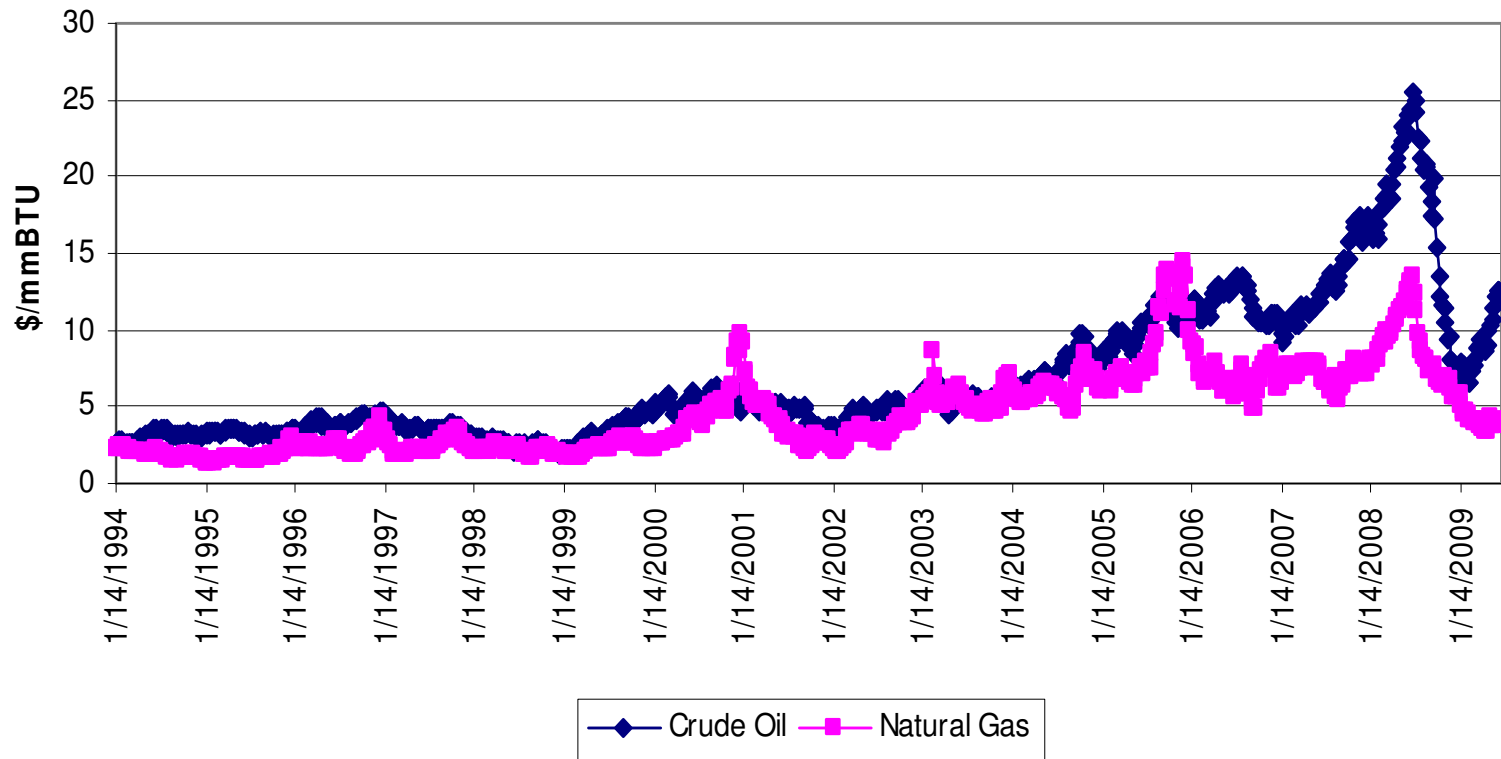
The recession appears to have reduced CPS projected peak demand significantly



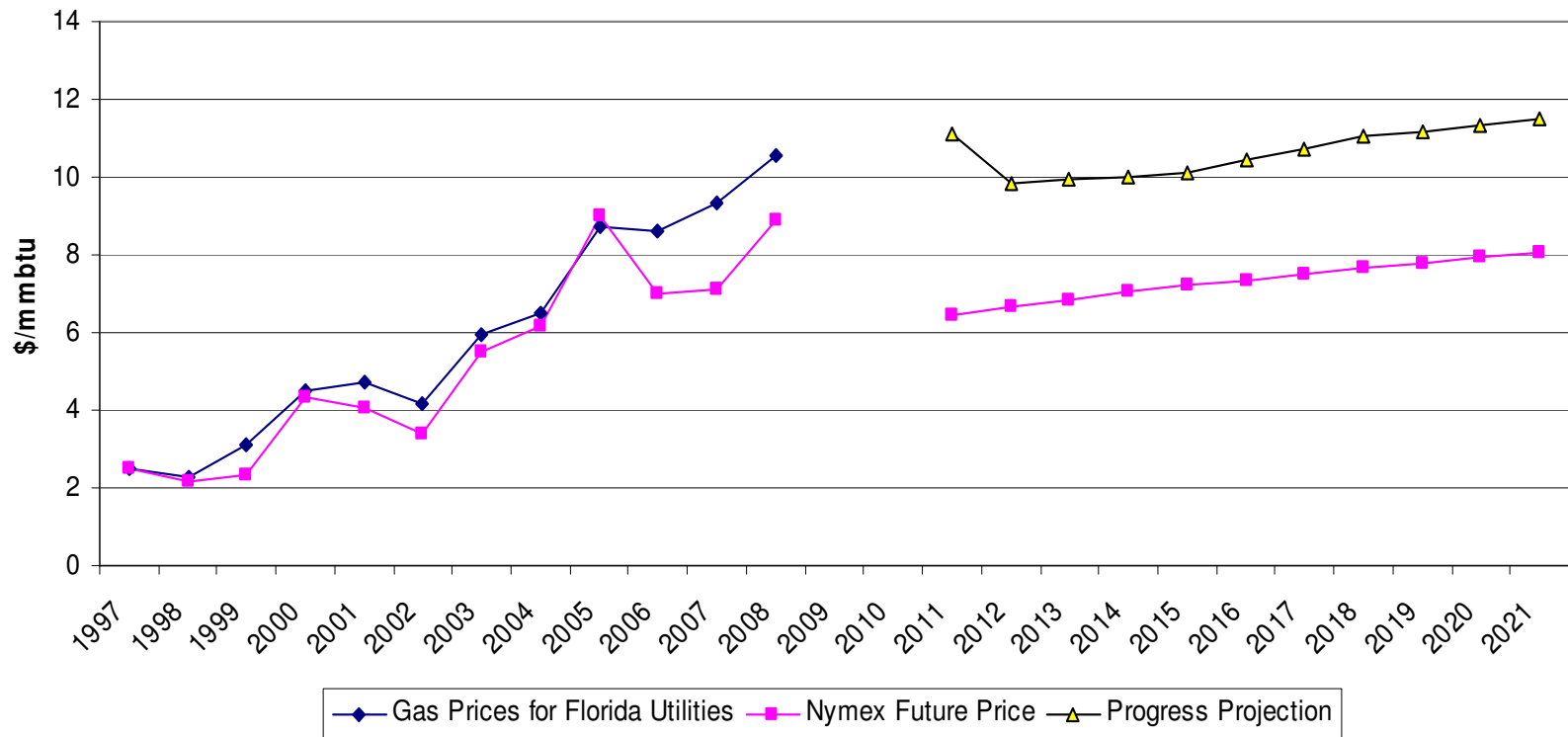
Projections of Peak Summer Load: Florida Power and Light & Progress Energy



Crude Oil and Natural Gas Prices



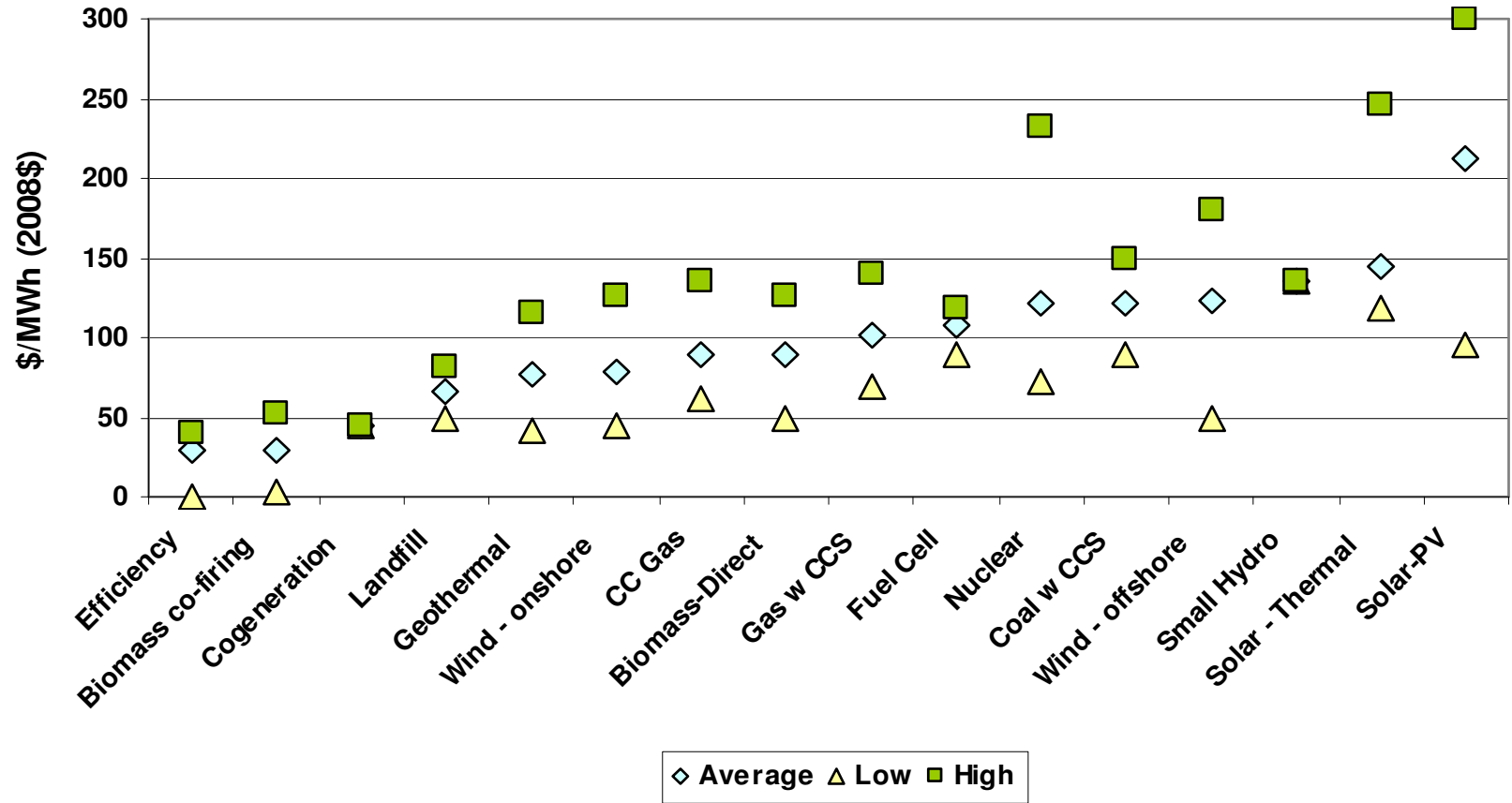
Nymex Gas Futures v. Gas Delivered to FLA Utilities



Technology Risk:

Lower Cost Alternatives

Levelized Cost of Low Carbon Resources to Meet Electricity Needs



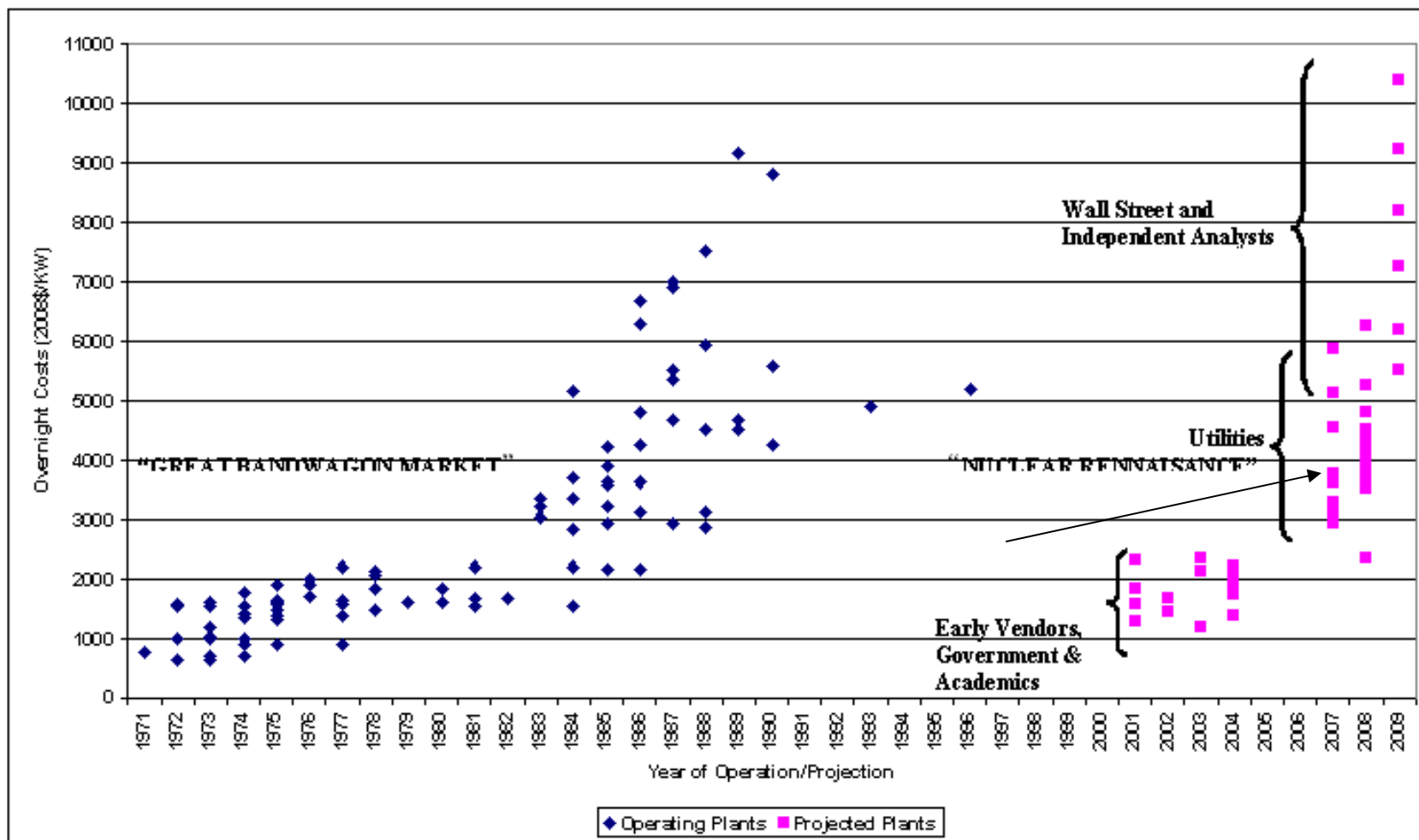
Execution Risk

Cost Overruns

Delays

Financial Downgrades

Overnight Cost of Completed Nuclear Reactors Compared to Projected Costs of Future Reactors



Key Nuclear Reactor Project Characteristics and Adverse Events

Company	Project Name	Company # of Project	Design Type	Reference Design	Units at site	State	Units in State	Power Pool	Brownfield (1 = yes)	Moody's Level of Activity	Capital as % of Market Cap	Adverse Events
Ameren	Callaway	1	EPR	0	2	MO	2	SPP	1	1		Cancelled because of no CV
Southern	Vogtle	1	AP1000	1	2	GA	2	SERC	1	3	57	Negative financail advice
SCEG	Summer	1	AP1000	0	2	SC	4	SERC	1	3	140	Downgrade
FPL	Turkey Pt.	1	AP1000	0	2	FL	4	FRCC	1	1	65	Application not filed, Struggli
NRG	STP	1	ABWR	1	2	TX	6	ERCOT	1	3	100	Struggling to find partners
Luminant	Comanche	1	USAPWR	1	2	TX	6	ERCOT	1	0		Suspended
Progress	Harris	2	AP1000	0	2	NC	2	SERC	1	1		
Dominion	N. Anna	1	ESBWR	1	1	VA	1	SERC	1	1		Suspended
Detroit Ed	Fermi	1	ESBWR	0	1	MI	1	MAIN	1	1		
Entergy	River Bend	2	ESBWR	0	1	LA	1	SERC	1	1		Delayed, Changed design
PPL	Bell Bend	1	EPR	0	1	PA	1	ECAR	1	2	125	Cancelled because of no CV
Unistar	Cohert	2	EPR	1	1	MD	1	MAAC	1	3	70*	
Unistar	Nine Mile	2	EPR	0	1	NY	1	NPCC	1	3	70*	Suspended
Entergy	Grand Gulf	2	ESBWR	0	1	MS	1	SERC	1	1		Delayed, Changed Design
Duke	Lee	1	AP1000	0	2	SC	4	SERC	0	2	86	Delayed due to lack of dema
Exelon	Victoria	1	ESBWR	0	2	TX	6	ERCOT	0	1		Delayed, Changed design
Nustar	Bellefonte	1	AP1000	0	2	AL	2	SERC	0	1		Cancelled due to lack of nee
Progress	Levy	2	AP1000	0	2	FL	4	FRCC	0	2	173*	Delayed due lack of work Au
* These percentages are for each project in a 2 project company, Unistar claculation puts ownership a 50%												

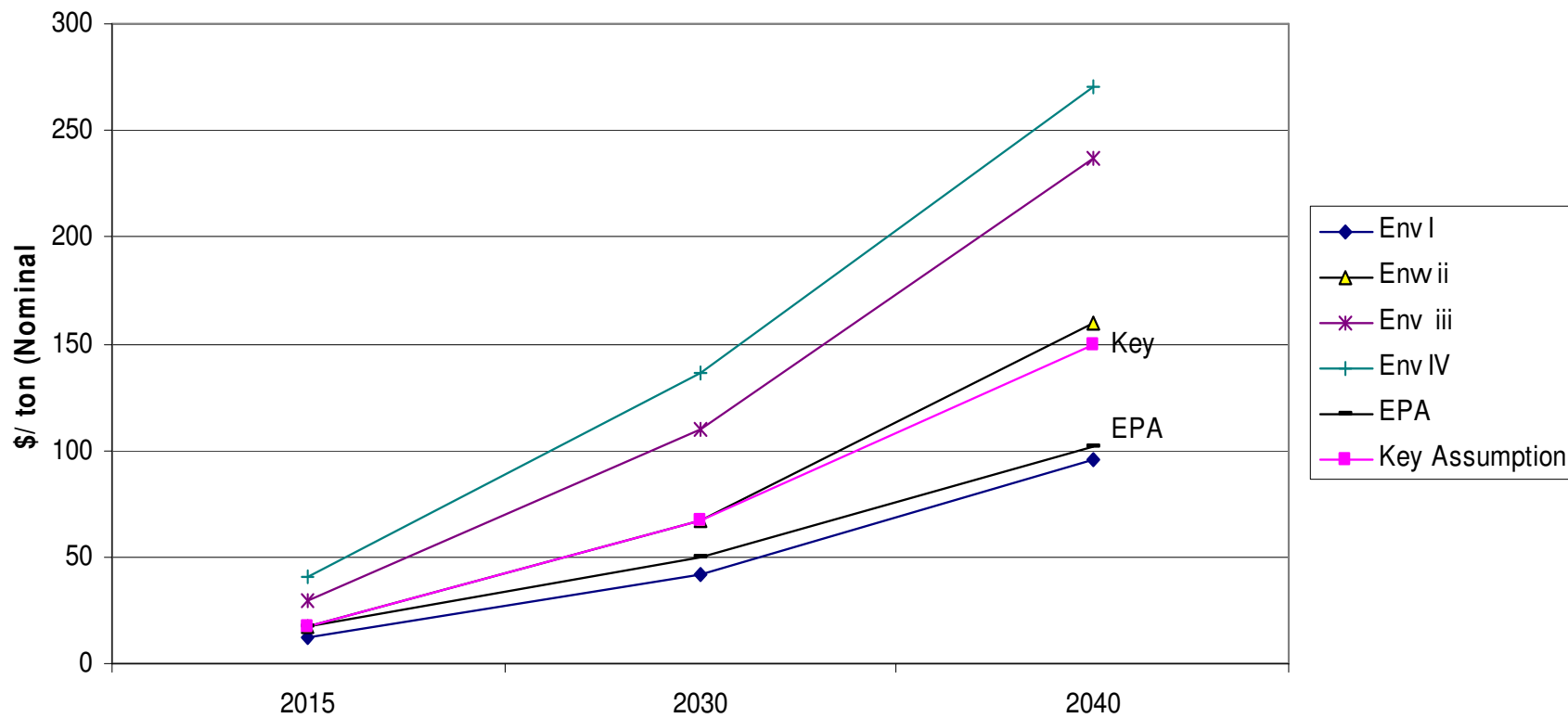
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Dominion	N. Anna	1	ESBWR	1	1	VA	1	SERC	1	1		Suspended
Detroit Ed	Fermi	1	ESBWR	0	1	MI	1	MAIN	1	1		
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Entergy	Grand Gulf	2	ESBWR	0	1	MS	1	SERC	1	1		Delayed, Changed Design
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Policy Risk:

Efficiency and renewables mandates reduce the need for non-renewable generation and combine with additional flexibility to reduce the projected cost of carbon far below what was initially expected.

FPL Carbon Compliance Cost v. EPA



Financial Risk:

Utility balance sheets cannot support the projects, even with loan guarantees and CWIP

Reactor Costs Compared to Market Capitalization of Active Projects

Utility	Reactor	Market Capital (Billion)	Reactor Capital Requirement (Billion)	Reactor as % of Market Cap.
Duke	Lee	\$19.8	\$17	86%
Florida Power & Light	Turkey Point	21.4	14	65
Progress	Levy	17	9.8	173
SCANA	Sumner	5.8	4.1*	140
Southern	Vogtle	14	24.5	57
NRG	South Texas	6.5	6.5*	100
CPS	South Texas	6.3	6.5*	100
Unistar	Calvert	5.9	4.2*	71
	Nine Mile Pt.		4.2*	71
PPL	Bell Bend	11.2	14	125

Threats to Taxpayers and Ratepayers

<u>Area of Impact</u>	<u>Threat to Taxpayers and ratepayers</u>	<u>Likelihood of impact</u>
Technology choice	Failure to adopt least cost approach	Certain
Project completion	Burden of failed projects	Highly likely
Project oversight	Lax review of project management	Highly likely
Financial ratings	Downgrade or Negative	Near certainty
Discount rate	Misallocation of resources	Certain