



Synapse
Energy Economics, Inc.

Senate Bill 152 Merrimack Station Scrubber

New Hampshire Senate Energy, Environment
& Economic Development Committee

March 13, 2009

David Schlissel

- Consulting on energy and environmental issues.
- 19 professional staff with over 200 years of experience studying the electric power industry.
- Clients have included
 - US EPA, US DOE, US DOJ.
 - Regulatory Commissions in 11 states
 - Consumer Advocates and AGs in 20 states, including NH
 - Large and small cities and towns, including Littleton, NH
 - National Association of Regulatory Commissioners
 - Non-governmental clients including local and national environmental and consumer organizations

- Engineering degrees from Massachusetts Institute of Technology and Stanford University.
- Law degree from Stanford School of Law.
- 35 years of experience in electric resource planning.
- Testified as expert witness in more than 100 state regulatory commission proceedings and state and federal court cases.
- Lead author of *Don't Get Burned, the Risks of Investing in New Coal-Fired Power Plants*, February 2008, and other Synapse reports on proposed coal-fired power plants and greenhouse gas regulation.

Key Questions

1. Is it prudent to invest \$457 million to control SO_x and Mercury at the Merrimack Station, an aging coal-fired power plant, when the nation is on the brink of regulating greenhouse gas emissions and mandating very dramatic reductions in Carbon Dioxide (CO_2) emissions, and there are other significant potential costs?
2. Are there less costly alternatives than installing a scrubber at the Merrimack Station?
3. Is the scrubber project a path to a renewable future in New Hampshire or an expensive bridge to the past?

Why Re-Examine Decision to Install Scrubber at Merrimack Station

Prudent risk assessment and wise business practices require that major project commitments be re-examined when circumstances change significantly.

- Since 2006:
 - Estimated cost of scrubber has increased by 83 percent.
 - Federal regulation of greenhouse gas emissions imminent..
 - U.S. experiencing severe recession and financial crisis
 - Increased recognition of the benefits of and the need for energy efficiency and renewable resources.

Coal Project Cancellations and Delays

- More than 80 proposed coal projects have been cancelled or delayed significantly since mid-decade.
- Proposed coal projects have been rejected by state utility commissions and health agencies in North Carolina, Florida, Virginia, Oklahoma, Washington, Oregon, Kansas and Wisconsin.
- Concerns over construction costs and future possible CO2 regulations have been contributing factors.
- Just this week, the Louisiana Public Service Commission ordered ongoing construction of coal project halted to re-examine the prudence of completion in light of changed circumstances.



Preliminary Synapse Findings

1. PSNH substantially overstates the benefits from the scrubber project and understates the possible future cost of power from the Merrimack Station.
2. PSNH talks about dangerous reliance on foreign energy sources but relies on Venezuela for approximately 40% of the coal burned at Merrimack.
3. The future cost of power from Merrimack will be impacted by federal regulation of coal ash and new, stricter federal Mercury MACT regulations. It also could be affected by the costs of converting the Station to a closed-cycle cooling water system. There is no evidence that PSNH has considered any of these costs in its cost estimates.

Preliminary Synapse Findings (2)

4. Affordable and timely alternatives to a scrubber exist to significantly reduce SO_x and mercury emissions from Merrimack
5. Coal is the most carbon intensive fuel. Natural gas-fired plants emit approximately 60 percent of the CO_2 per unit of output as a coal plant. Energy efficiency and renewable resources do not emit CO_2 .
6. Federal regulation of greenhouse gas emissions from coal-fired power plants is imminent and will require steep reductions in CO_2 emissions beyond those required under RGGI.

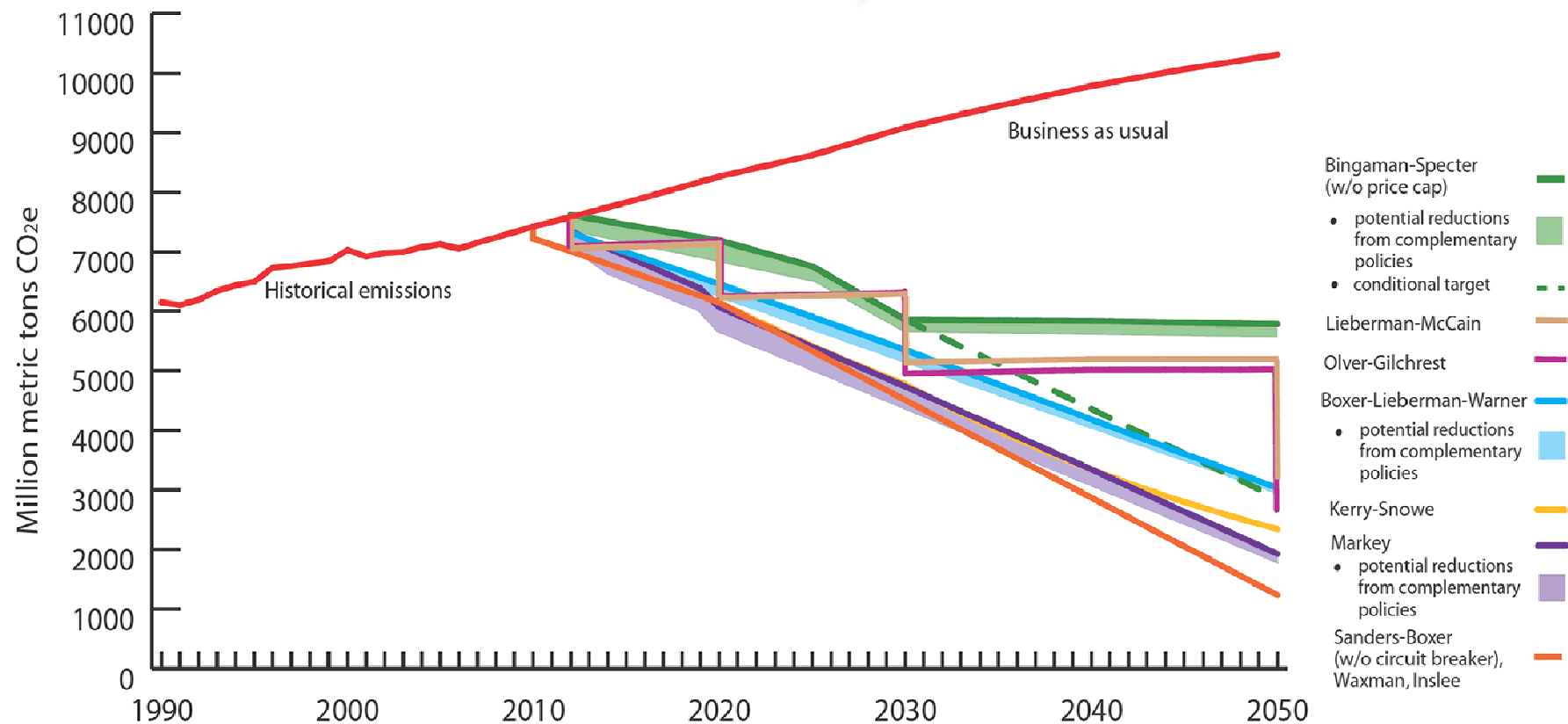
Preliminary Synapse Findings (3)

7. Independent analyses show potential prices for purchasing CO₂ emissions under a federal cap-and-trade system could be far higher than PSNH has assumed.
8. If more reasonable CO₂ prices are assumed, the cost of power from Merrimack could range from between 11.0 and 14.7 cents per KWh – much higher than the 10.0 cents per KWh claimed by PSNH.
9. PSNH's claim that much of the estimated construction cost is under fixed price contracts is surprising given the general industry experience where vendors and suppliers are unwilling to agree to fully fixed price contracts because of cost uncertainties.

Preliminary Synapse Findings (4)

10. There are less expensive alternatives to Merrimack that would produce local jobs, reduce environmental impact, and avoid the risk of expensive future regulatory costs that would be borne by New Hampshire citizens.
 - * Purchasing power from the market
 - * Energy efficiency
 - * Renewable resources
 - * Transmission system upgrades
 - * New natural gas-fired combustion turbine or combined cycle capacity or increased output at existing plants

Federal Regulation of CO₂ Emissions is a Matter of When, Not If



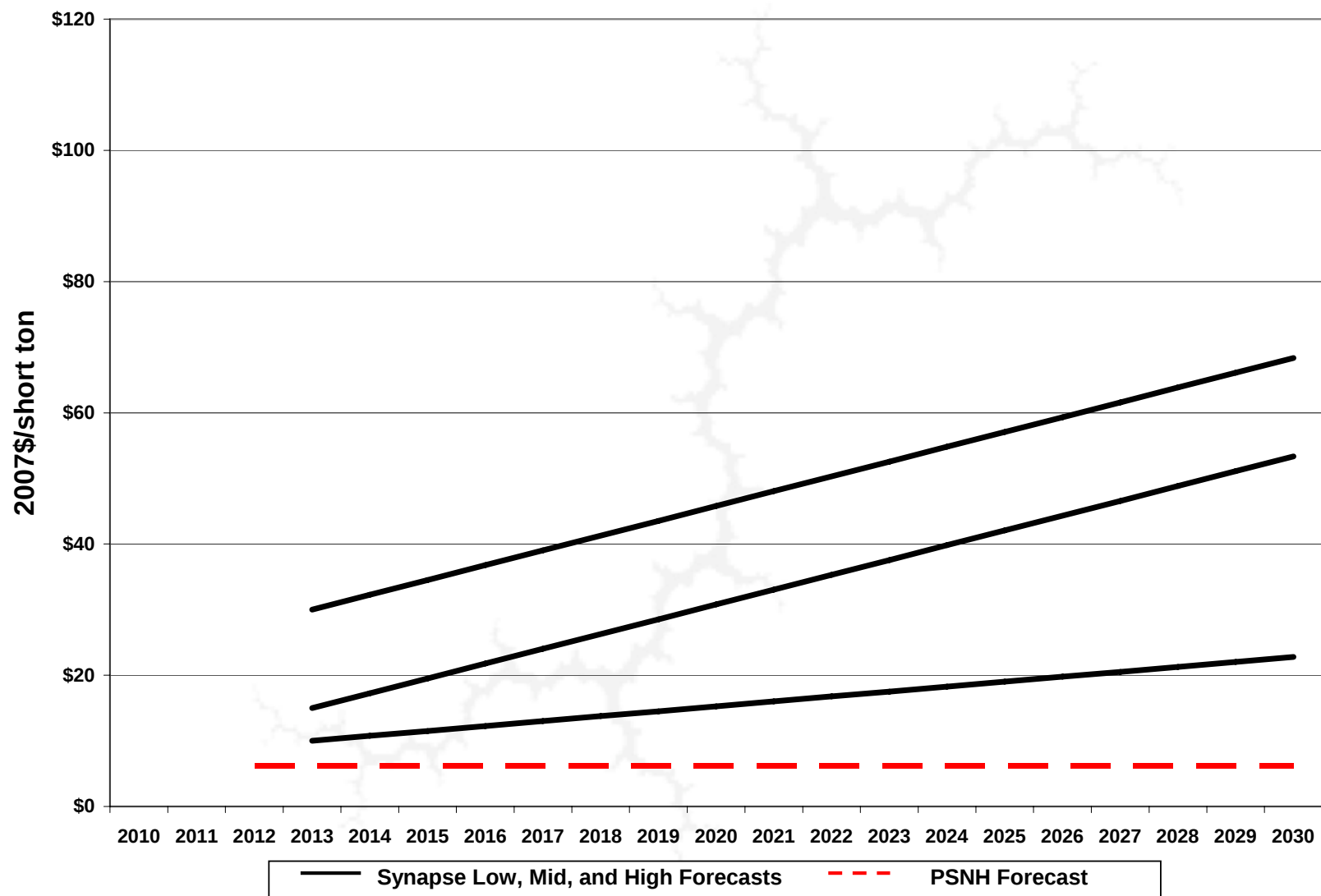
WORLD RESOURCES INSTITUTE

For a full discussion of underlying methodology, assumptions and references, please see <http://www.wri.org/usclimatetargets>. WRI does not endorse any of these bills. This analysis is intended to fairly and accurately compare explicit carbon caps in Congressional climate proposals and uses underlying data that may differ from other analyses. Price caps, circuit breakers and other cost-containment mechanisms contained in some bills may allow emissions to deviate from the pathways depicted in this analysis.

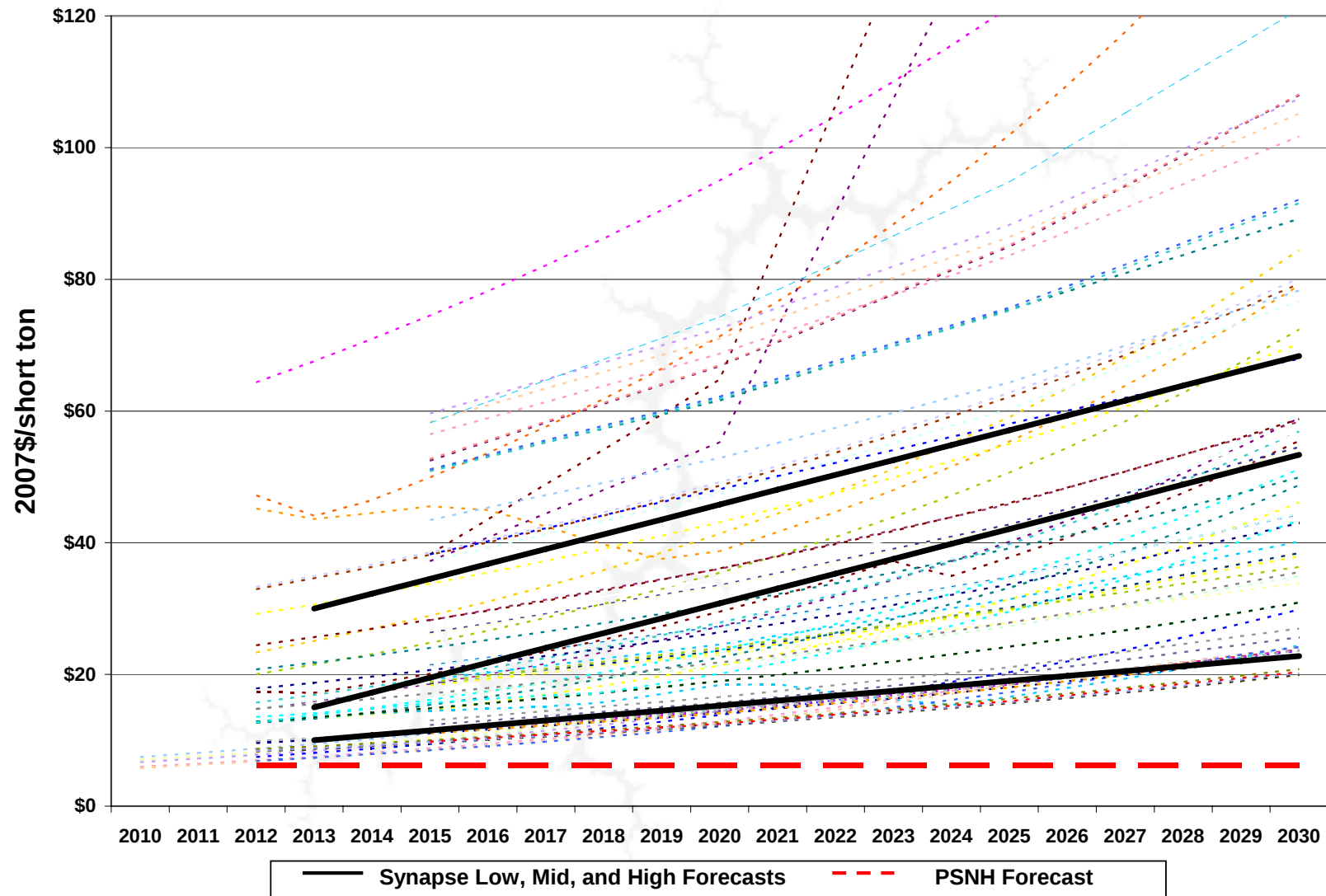
Federal Regulation of CO₂ Emissions is a Matter of When, Not If – The Obama Plan

- Federal cap-and-trade system
- Reduce CO₂ emissions to 14 percent below 2005 levels by 2020
- Reduce CO₂ emissions to 83 percent below 2005 levels by 2050
- Essentially would represent the steepest lines in the previous figure
- All emissions allowances would be auctioned. None would be distributed free.

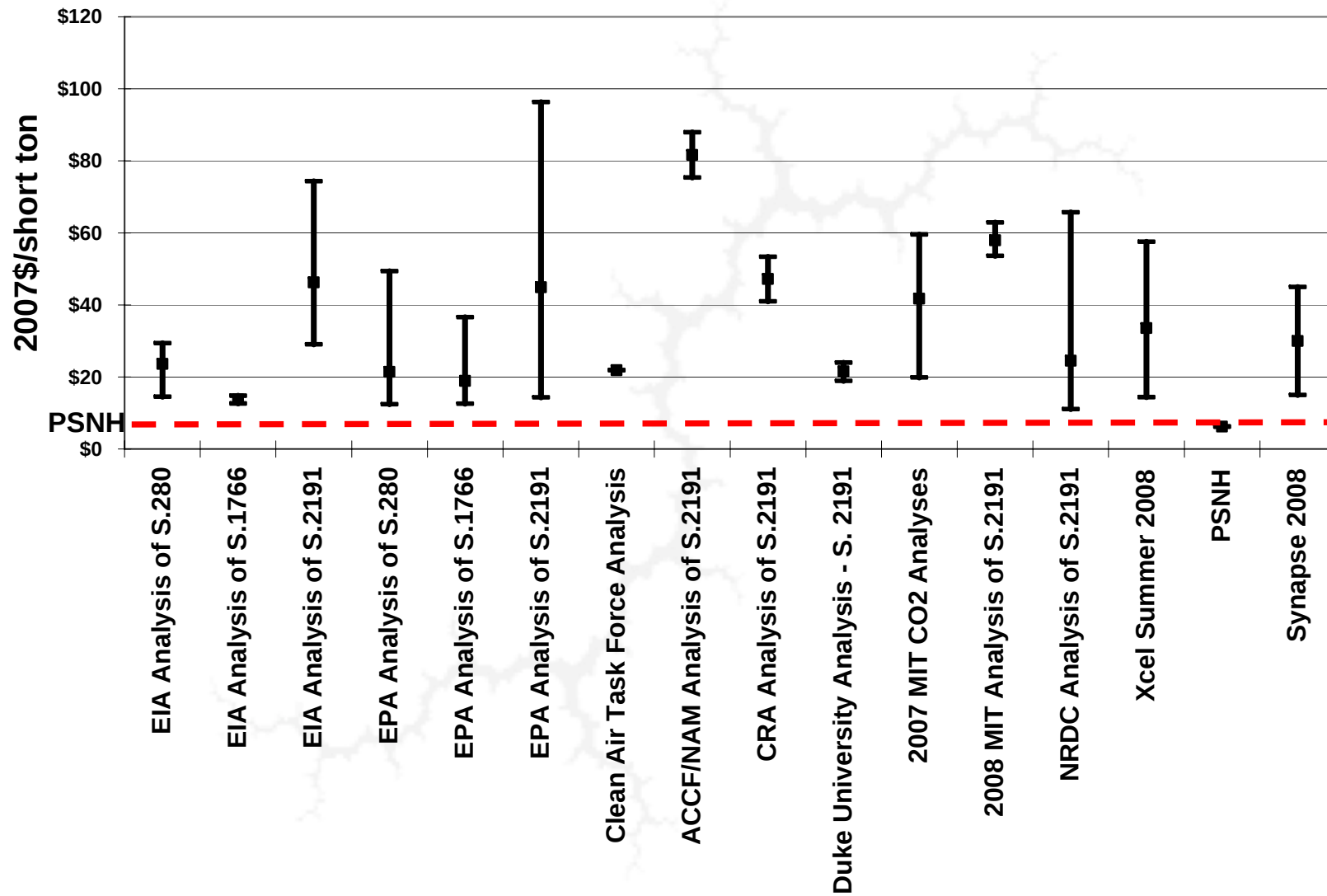
PSNH vs. Synapse CO₂ Price Forecasts



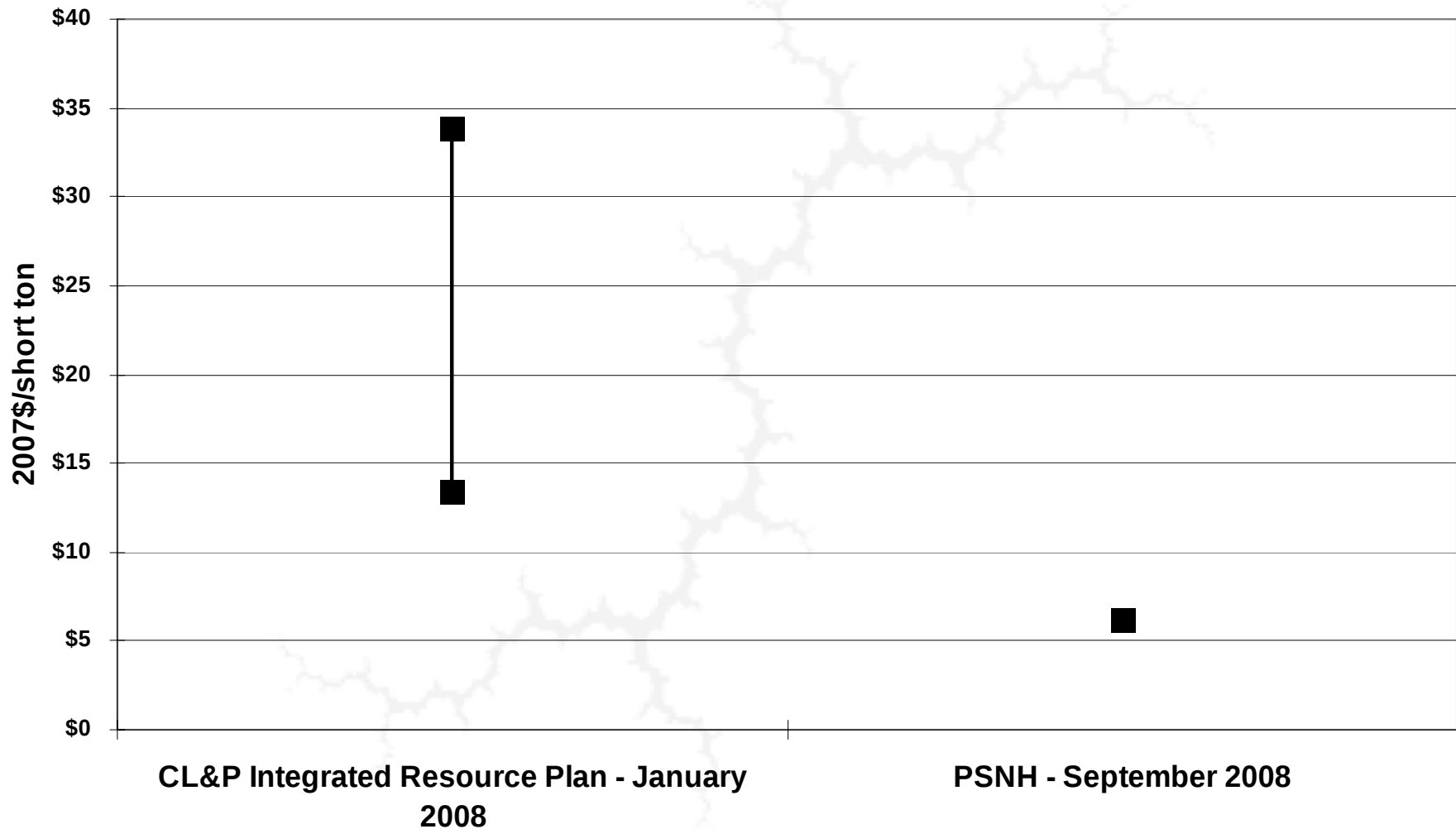
PSNH vs. Results of Modeling of Current GHG Legislative Proposals (Annual CO₂ Prices)



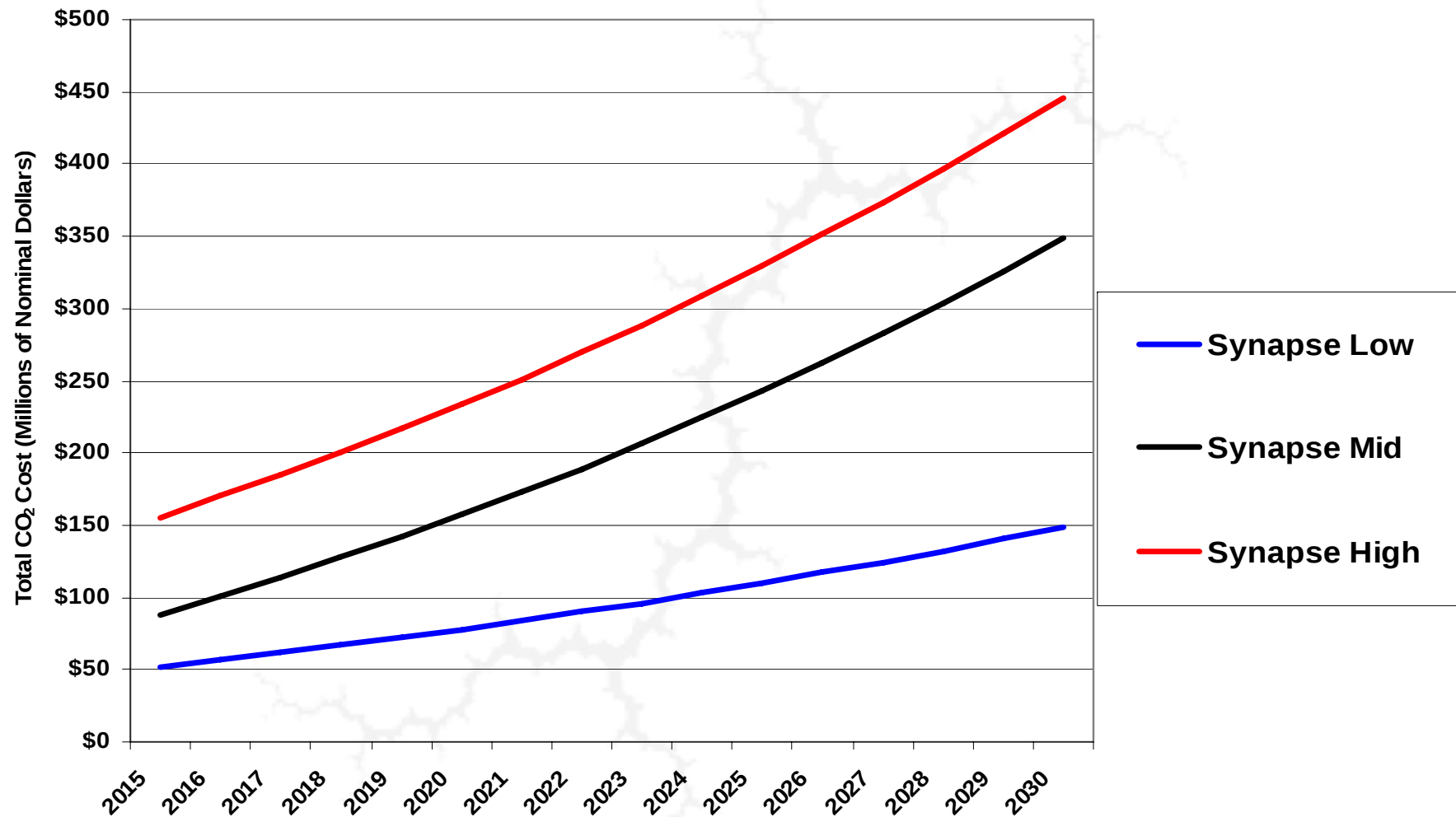
PSNH vs. Results of Modeling of Current GHG Legislative Proposals (Levelized Prices)



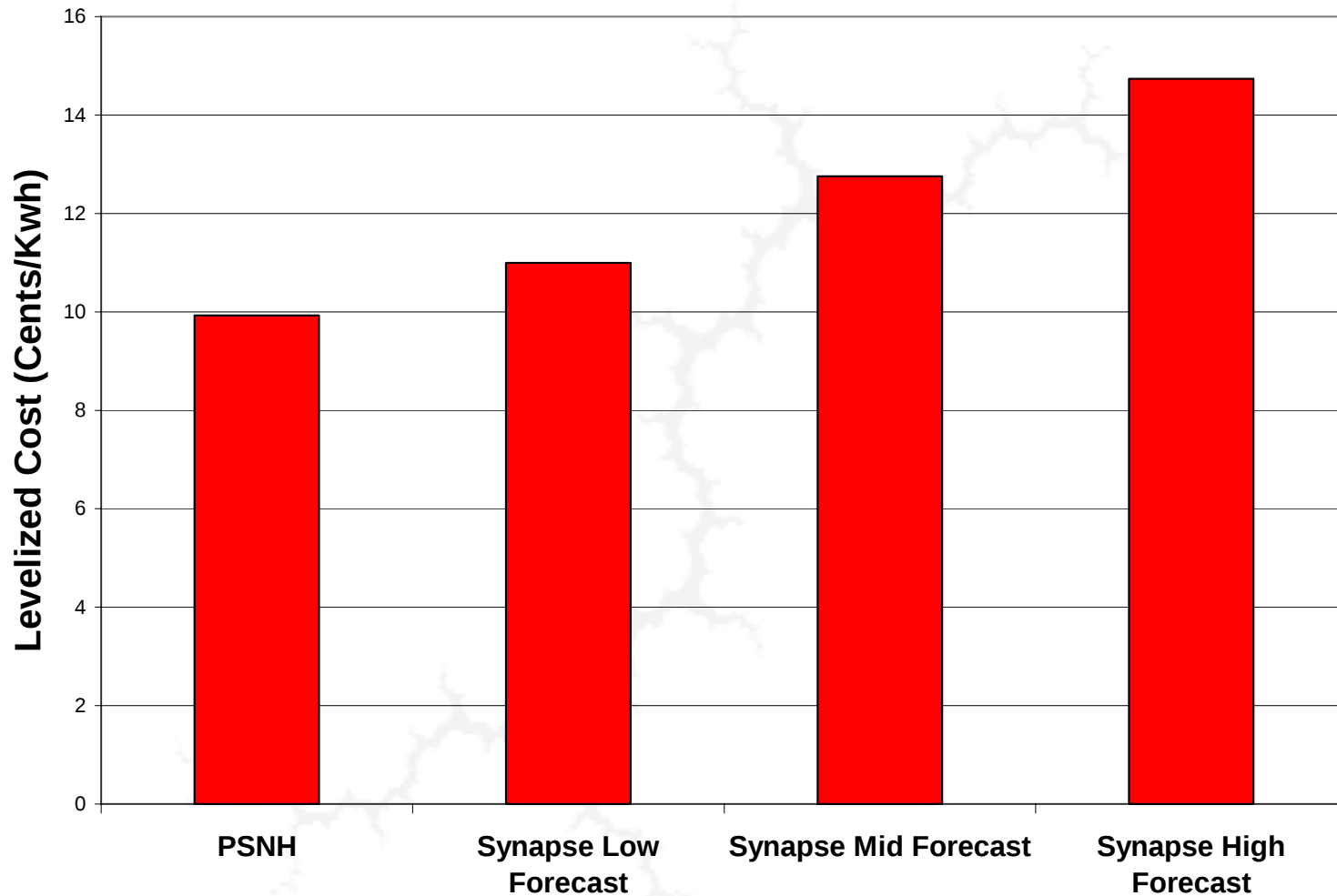
Northeast Utilities Assumed CO₂ Allowance Prices in Resource Planning



Total Annual CO₂ Expenditures for Merrimack with Synapse Prices

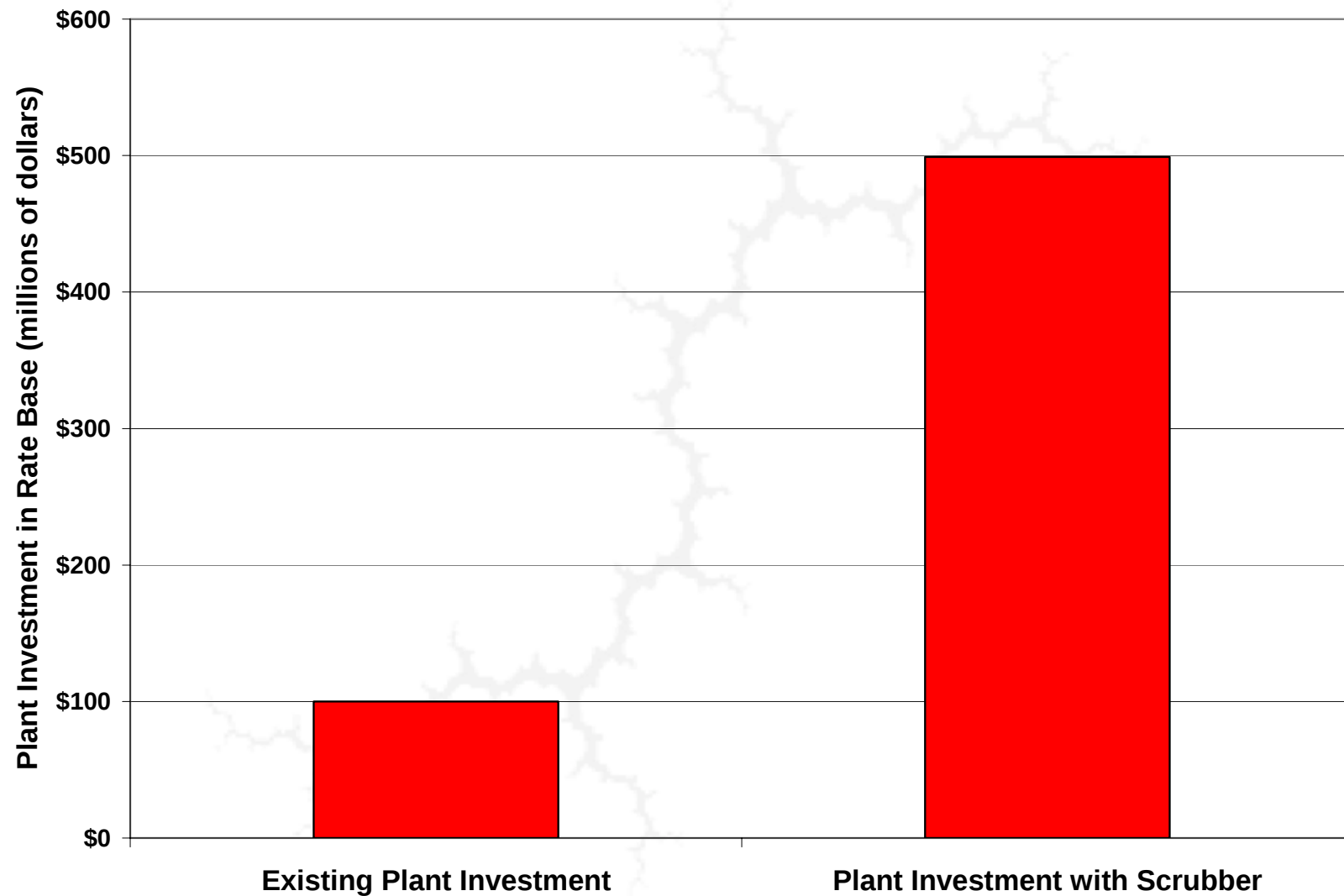


Merrimack Station Future Cost of Power with CO₂ Costs



- Costs do not reflect (1) converting to closed-cycle cooling, (2) any new federal Mercury MACT rules or (3) any new federal coal ash rules.

Impact of Scrubber Project on Investment in Merrimack Station - 2013



Impact of Scrubber Project on PSNH Yearly Return on Investment - 2013

