Using a gift of ten years: Planning CPS Energy's Future

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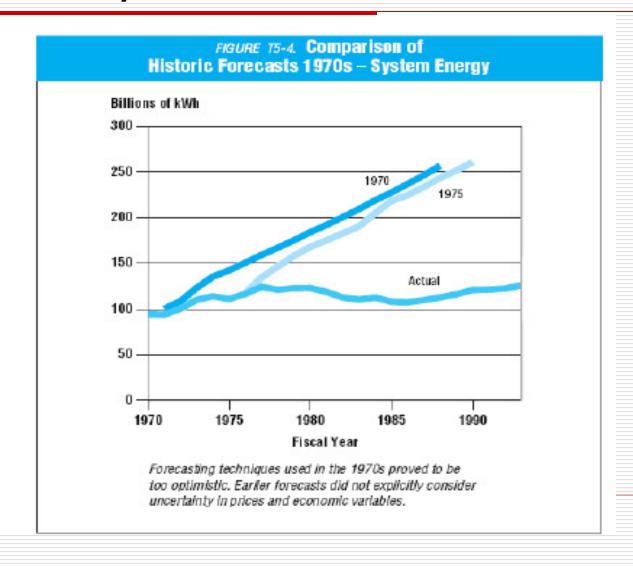
President, Institute for Energy and Environmental Research

San Antonio, September 15, 2009

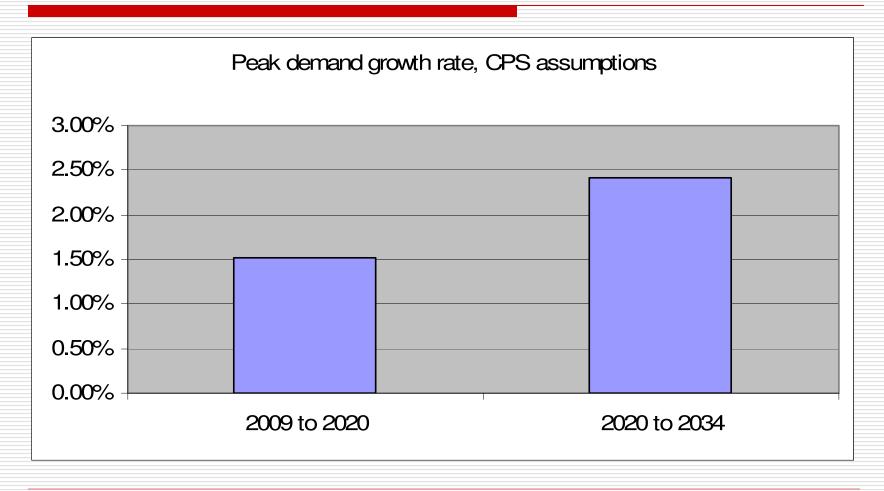
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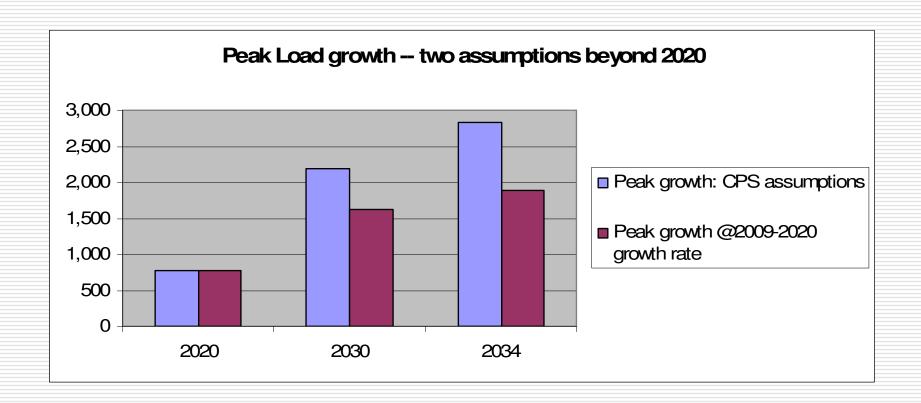
1970s and 1980s TVA: A Cautionary Tale

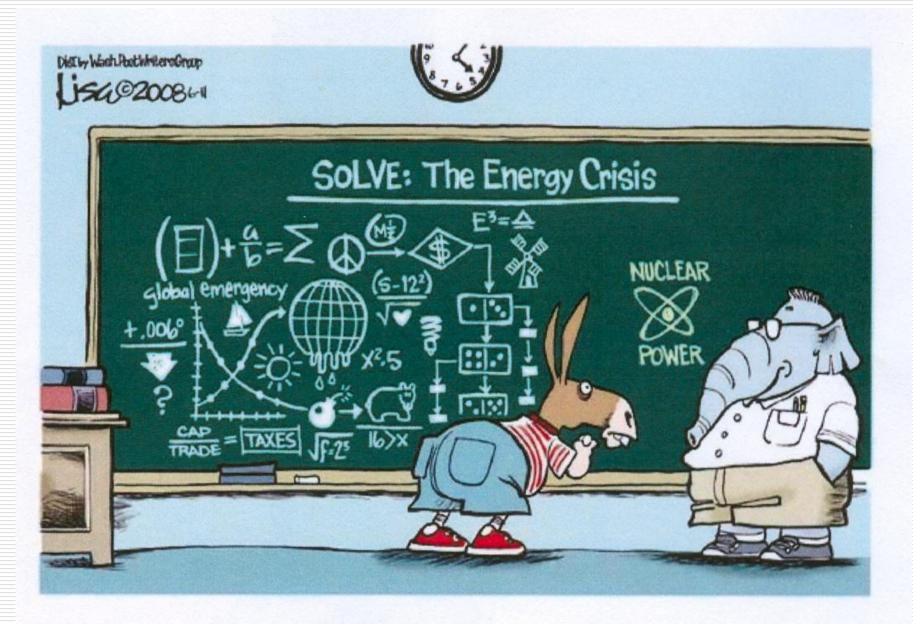


Hidden in the numbers: efficiency magically goes away in 2020

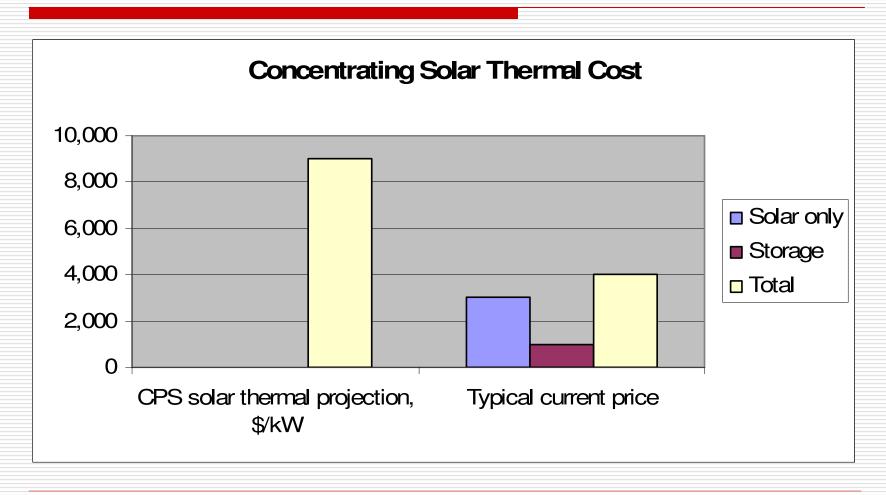


Wishing for 1,000 MW more demand?





Overestimating Solar Thermal Costs (with 6-hour storage)



Baseload output from wind (2,000 MW) + CAES (900 MW), CO2 emissions: 5% of coal

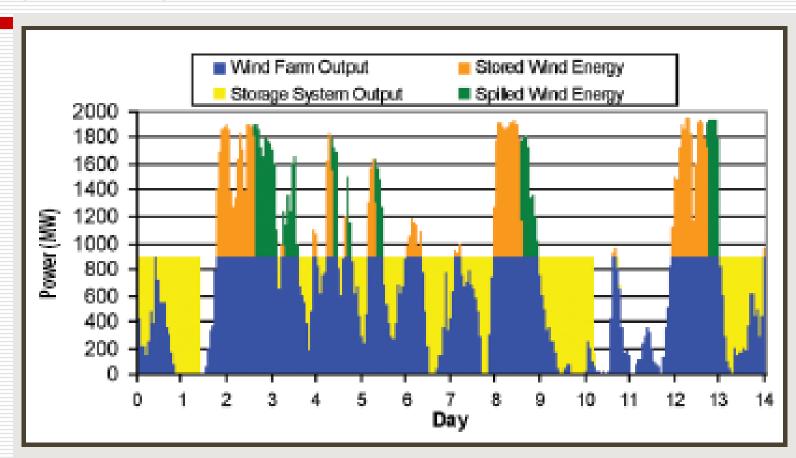
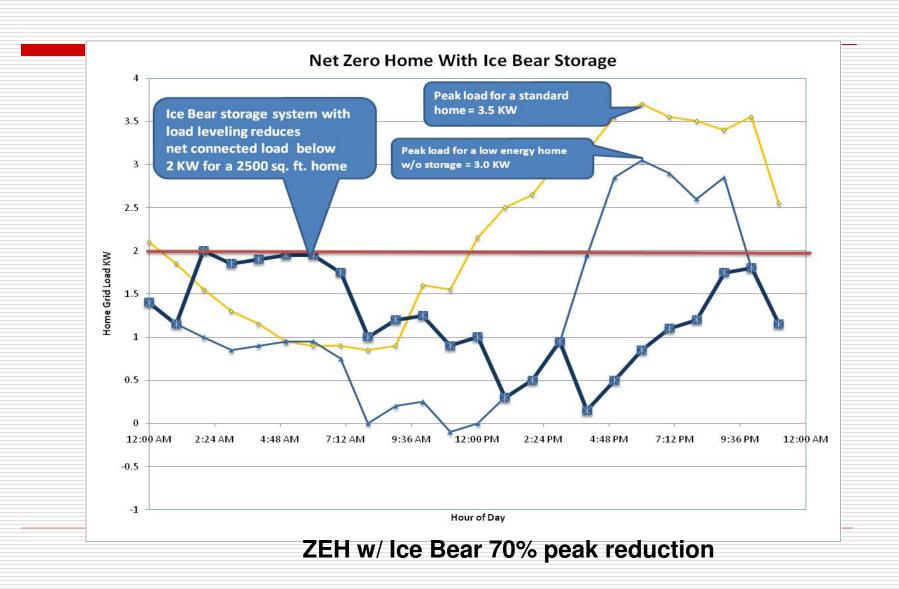


Figure 3. Sample Baseload Wind Generator Output (Target Output = 900 MW)

SMUD ZEH with Energy Storage, Courtesy Ice Energy



Risks of the present road

- □ Betting the company with \$5.2 billion (not to speak of delays, cost escalations) more than the net value of electricity system.
- ☐ Betting on a 10 to 20 year forecast
- No consideration of fundamental change in demand patterns that is largely exogenous to CPS Energy – e.g. national appliance and building standards.
- Potential for collapse of off-system sales: 1st Qtr 2009 was 35 percent lower than corresponding 2008 period April to April 12 month decline 25%. Risk that power cannot be sold.
- ☐ Spent fuel risk: Federal government may do reprocessing, which would increase cost. France has not solved the waste problem.
- Low cost assumed for a very speculative technology coal with CCS (though risks outlined)
- Considerable loss of flexibility to respond to changing conditions in growth
- □ Various other financial risks associated with nuclear

The road not being taken

Examples: □ Efficiency and distributed resources as a major revenue stream □ Firm up wind with Compressed Air Energy Storage – ~400 MW with current plan, could be more. □ Pilot wind firming with sodium-sulfur batteries (in use in Japan with wind) □ Optimize solar and wind □ Solar thermal with storage as a mainstay □ Establish infrastructure for integrating significant amounts of PV for solar PV – e.g. start with a few MW of sodium-sulfur batteries on demand side of substations where there are major

□ Solid biomass (various) with IGCC

PV installations

CHP with natural gas or solid biomass (18 MWth IGCC plant demonstrated in Sweden with wood, straw and 50% mixed municipal waste stream of paper, plastics, etc.)

End note

Carbon-Free and Nuclear-Free: A Road Map for U.S. Energy Policy by Arjun Makhijani

Much literature available and downloadable version of the book, available at no cost, on the Web at http://www.ieer.org/carbonfree/CarbonFreeNuclearFree.pdf

The book can be purchased in hard copy at www.rdrbooks.com or www.ieer.org