

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

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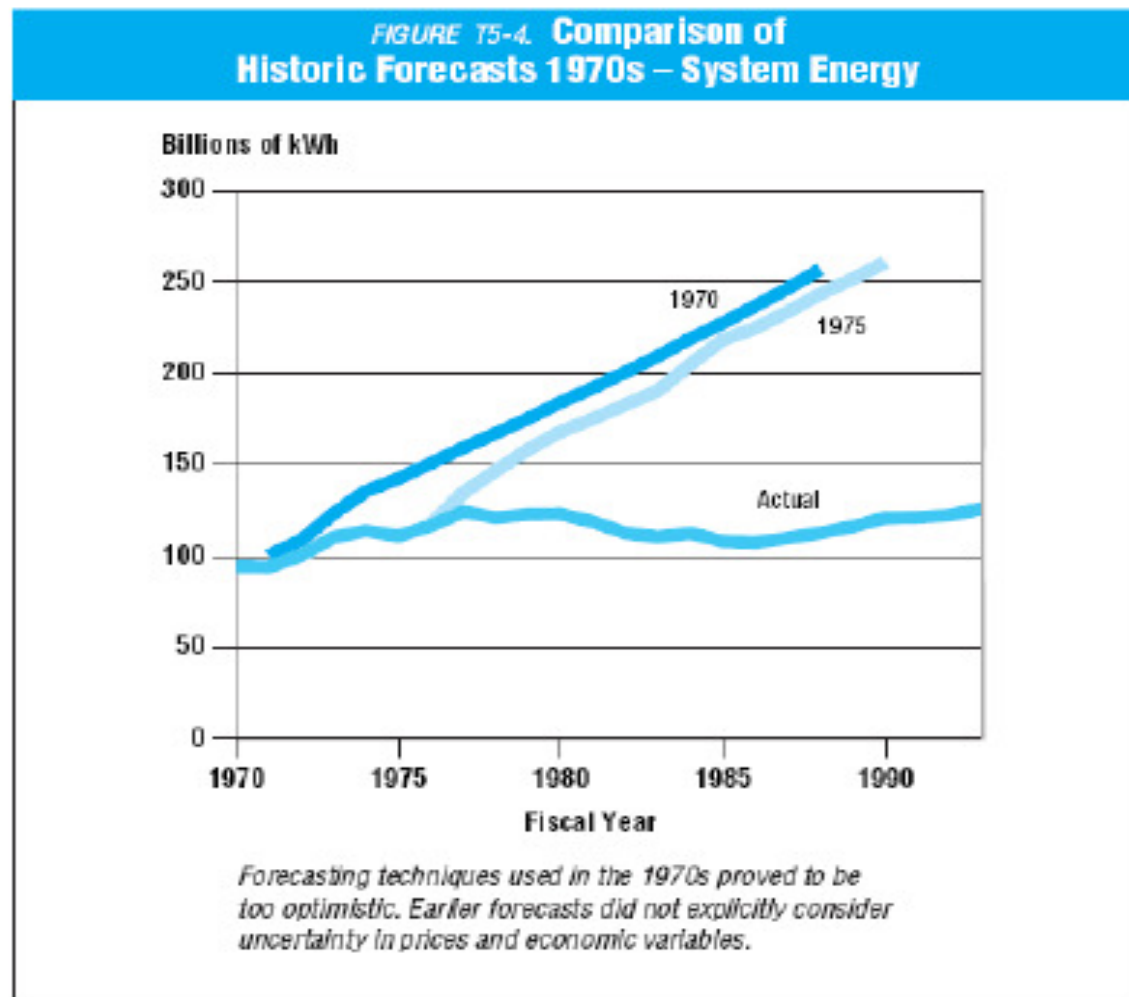
President, Institute for Energy and Environmental
Research

San Antonio, September 15, 2009

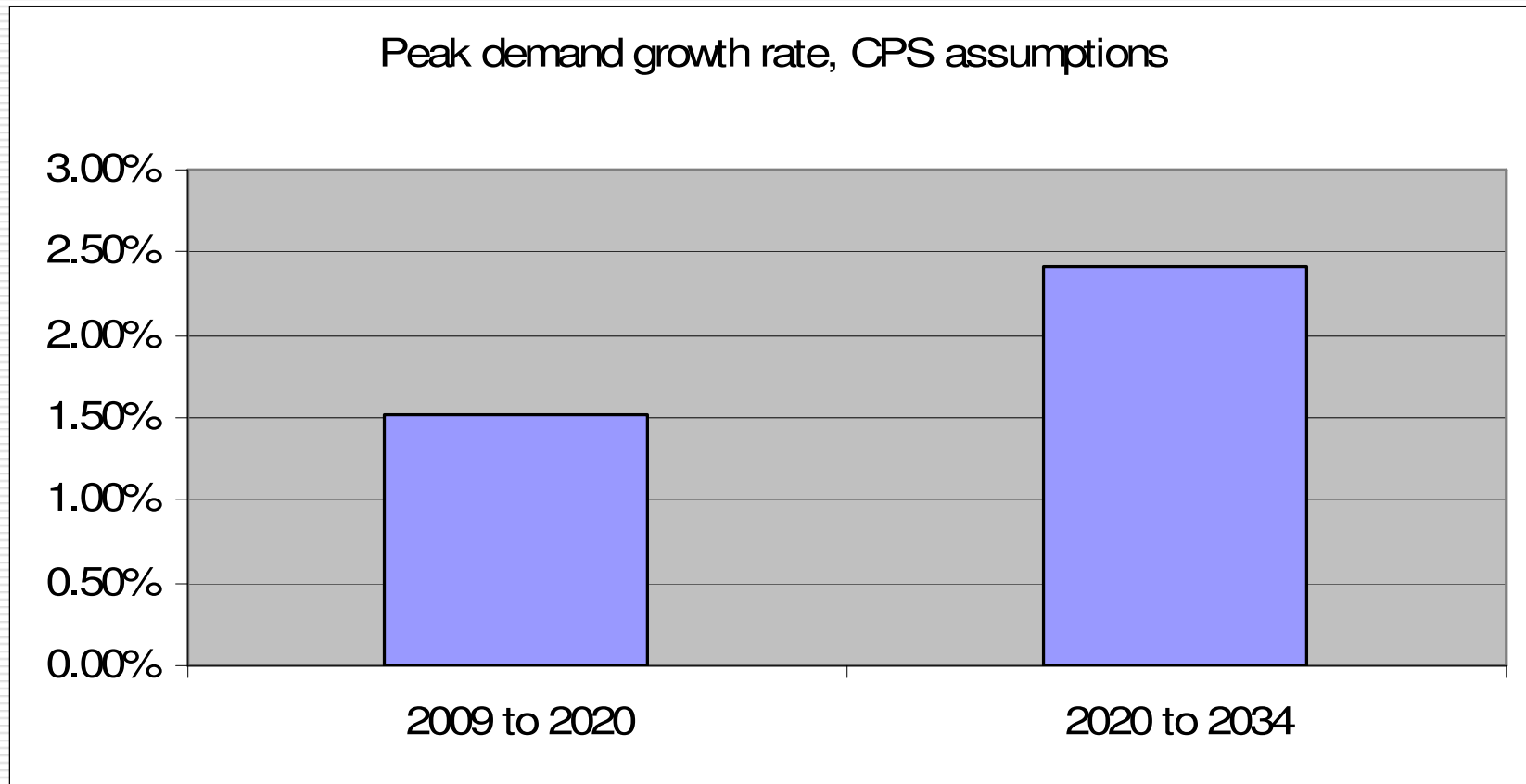
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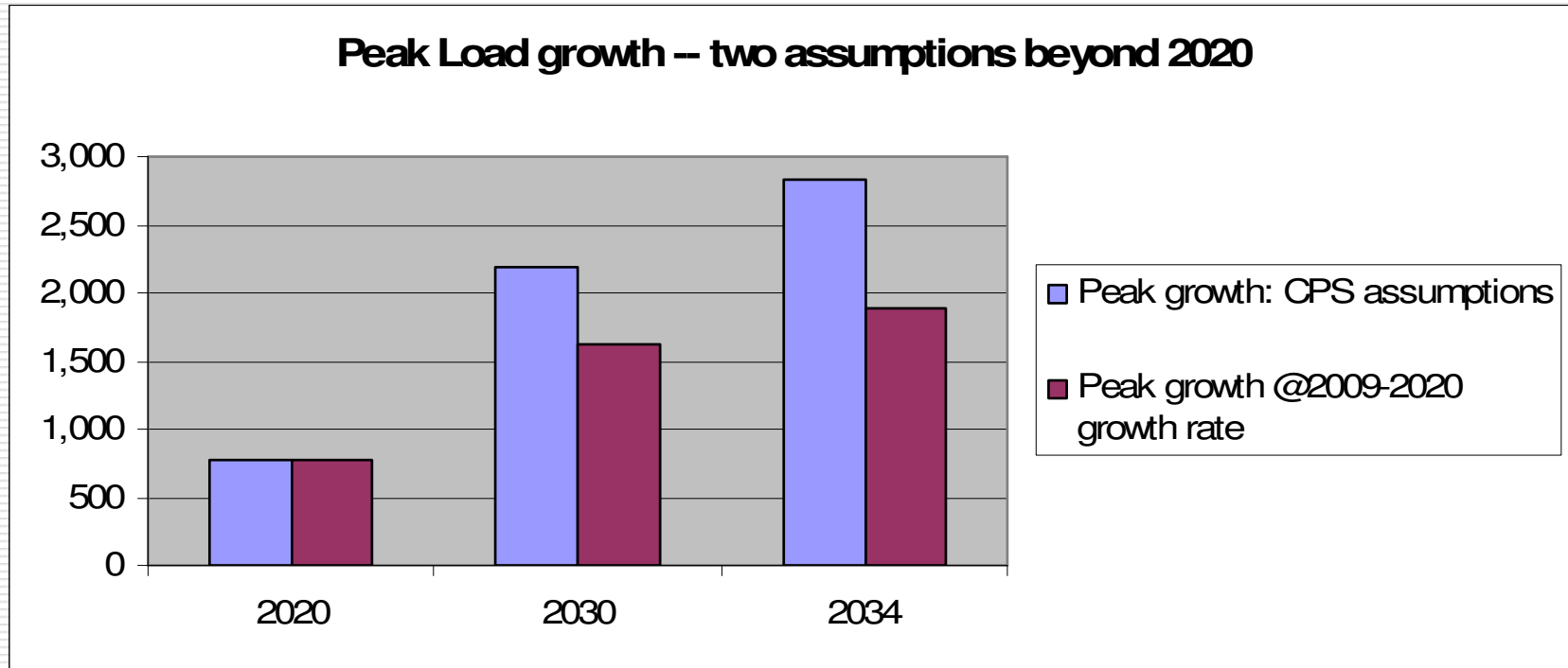
1970s and 1980s TVA: A Cautionary Tale



Hidden in the numbers: efficiency magically goes away in 2020



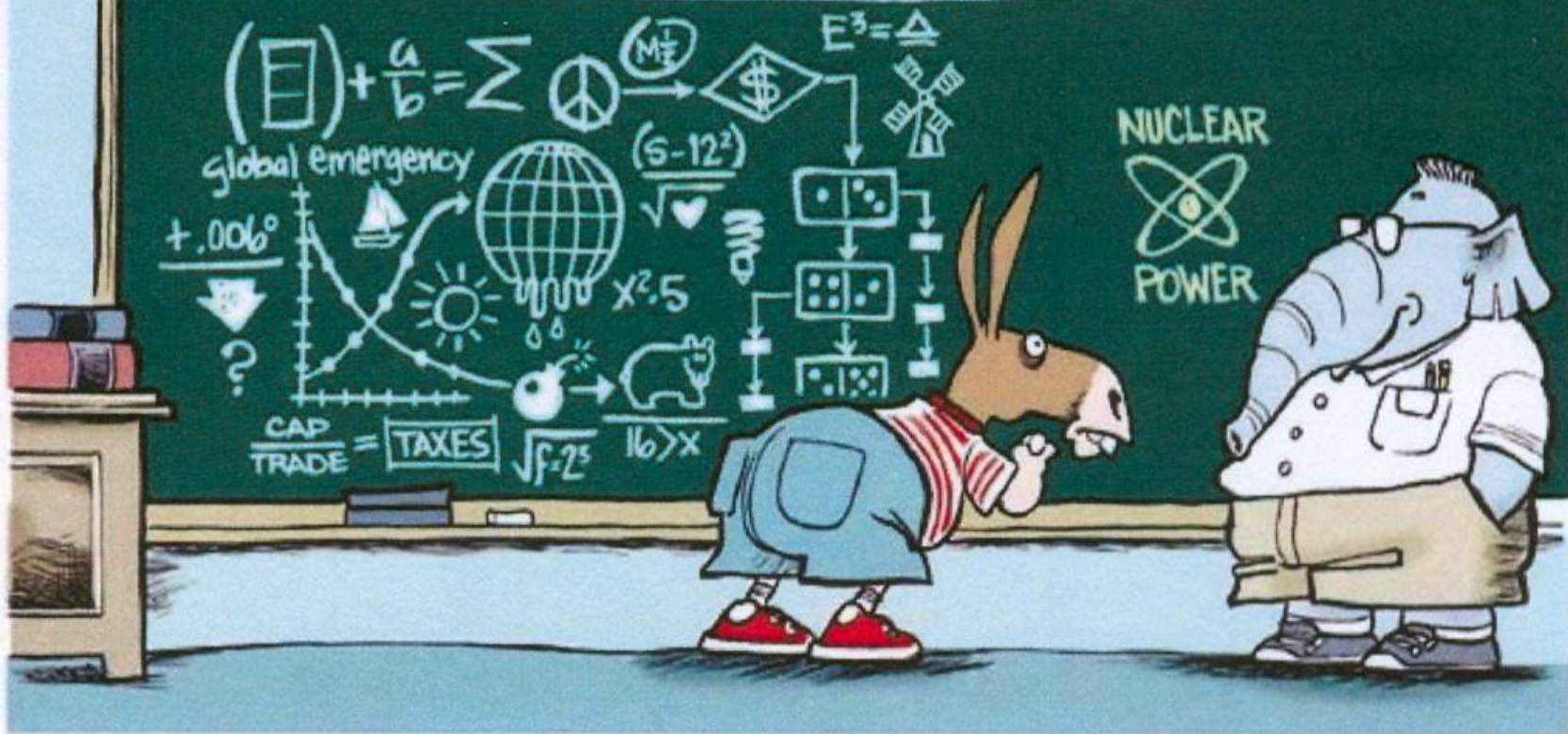
Wishing for 1,000 MW more demand?



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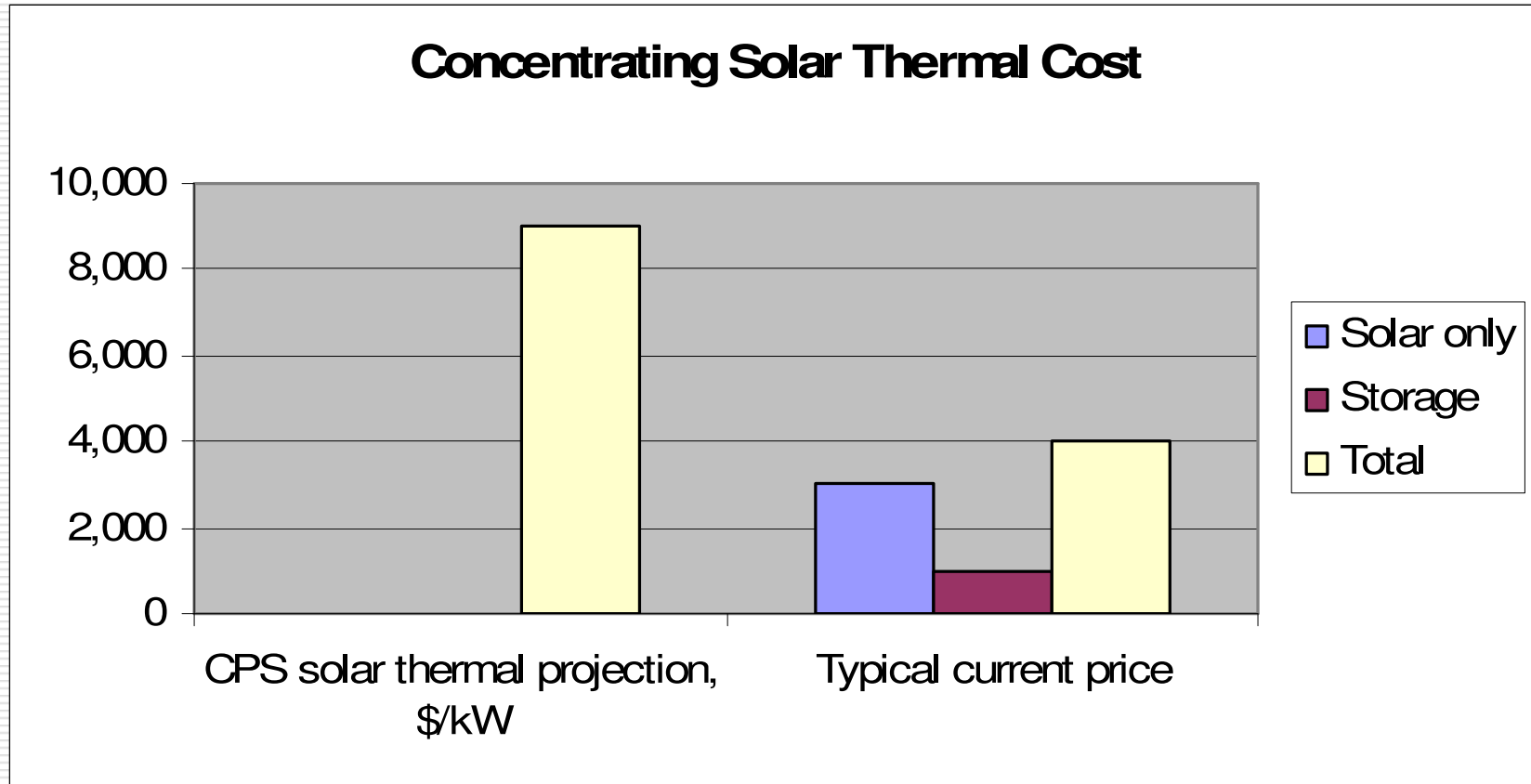


SOLVE: The Energy Crisis



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Overestimating Solar Thermal Costs (with 6-hour storage)



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

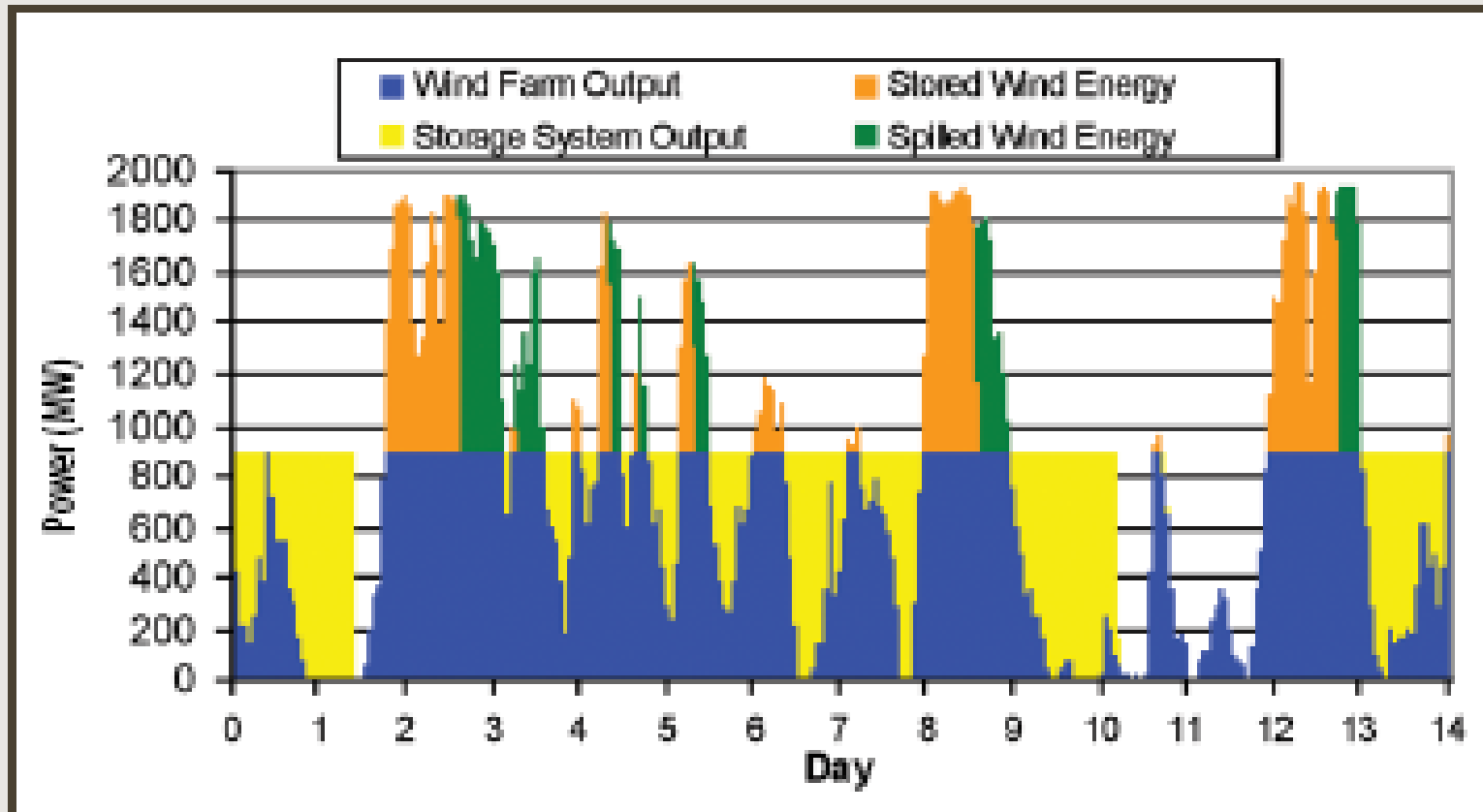
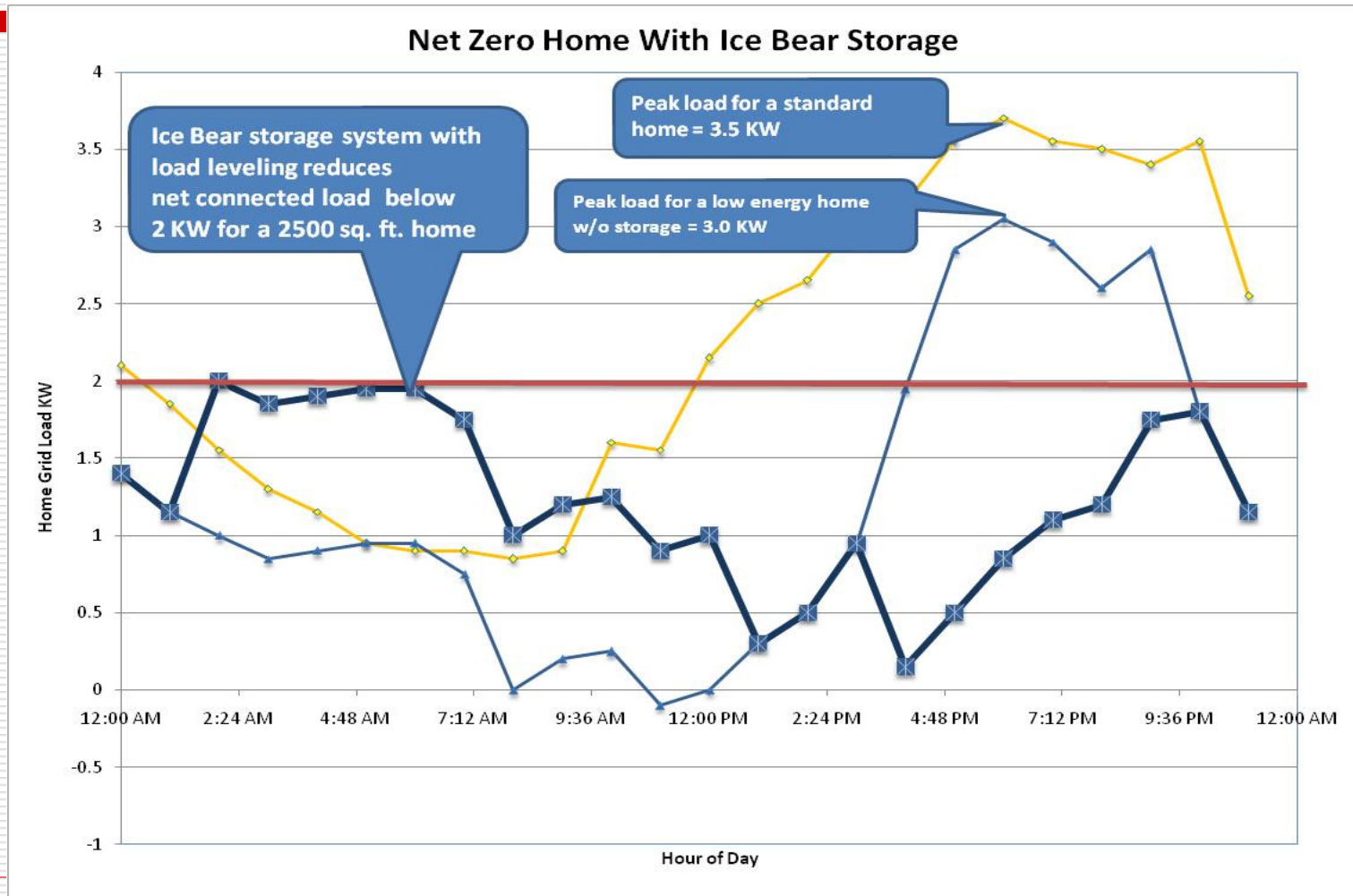


Figure 3. Sample Baseload Wind Generator Output (Target Output = 900 MW)

SMUD ZEH with Energy Storage, Courtesy Ice Energy



ZEH w/ Ice Bear 70% peak reduction

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
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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 PV installations
 - ❑ Solid biomass (various) with IGCC
 - ❑ 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.)
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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
