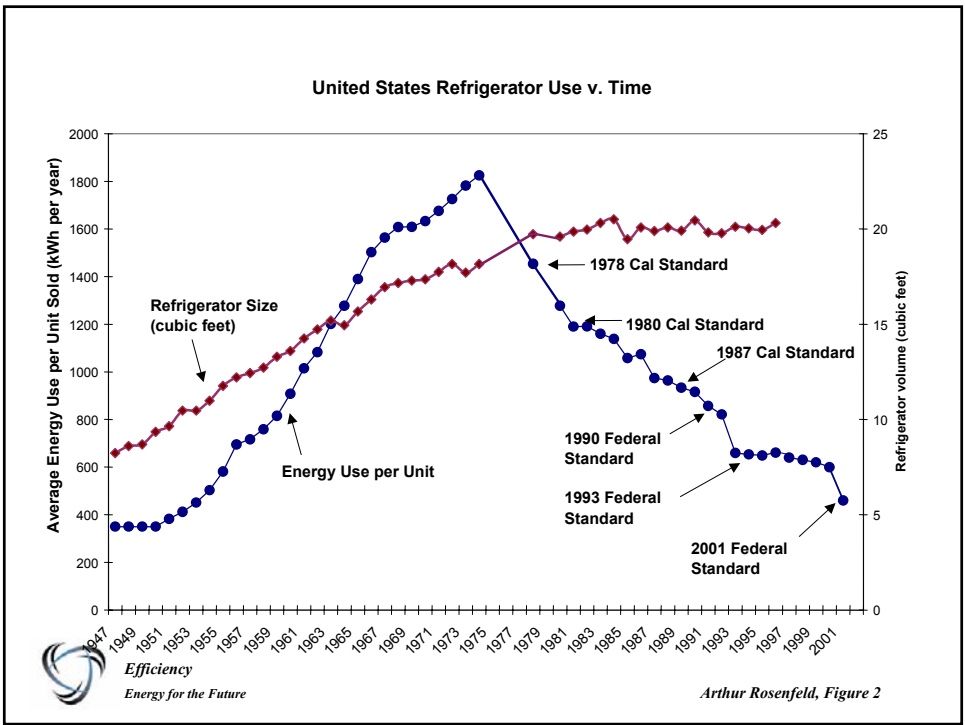
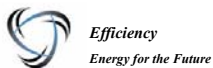


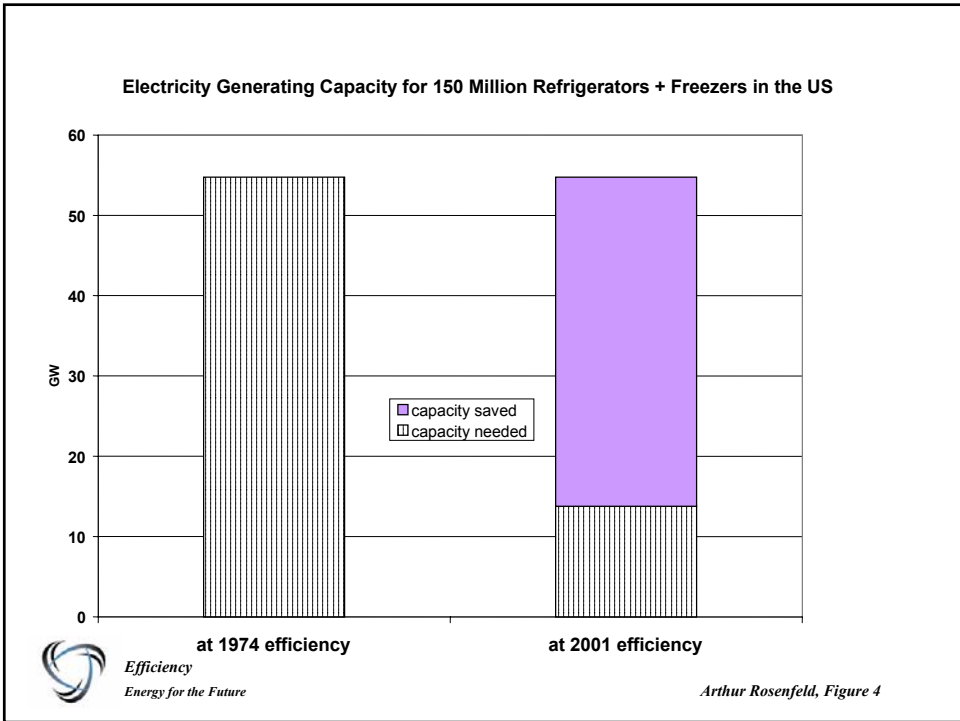
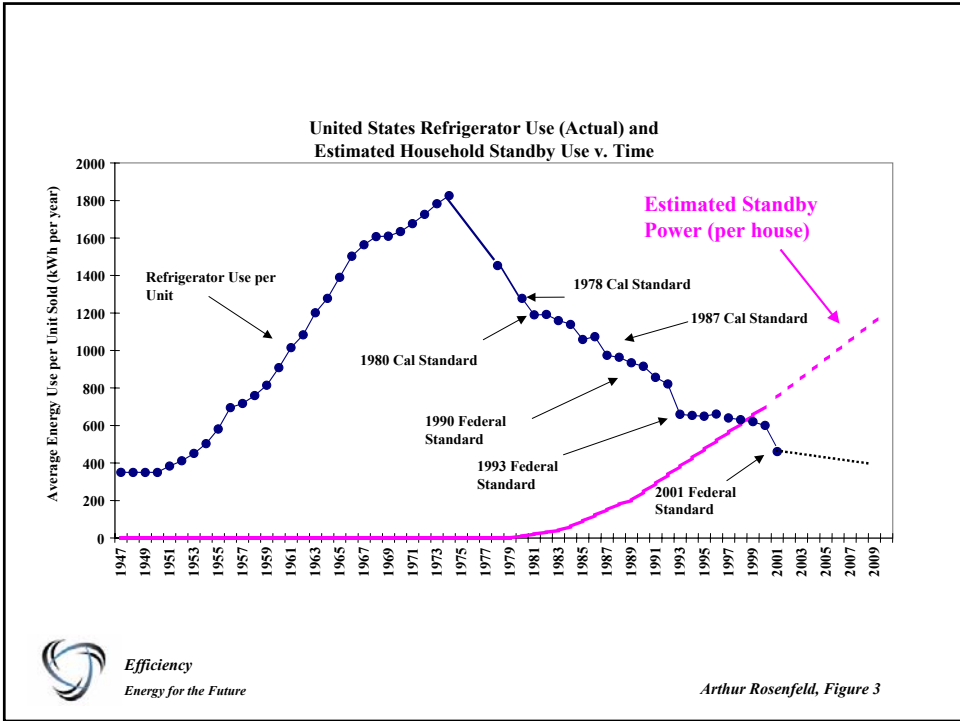
The California Vision: Reducing Energy Intensity 2% Per Year

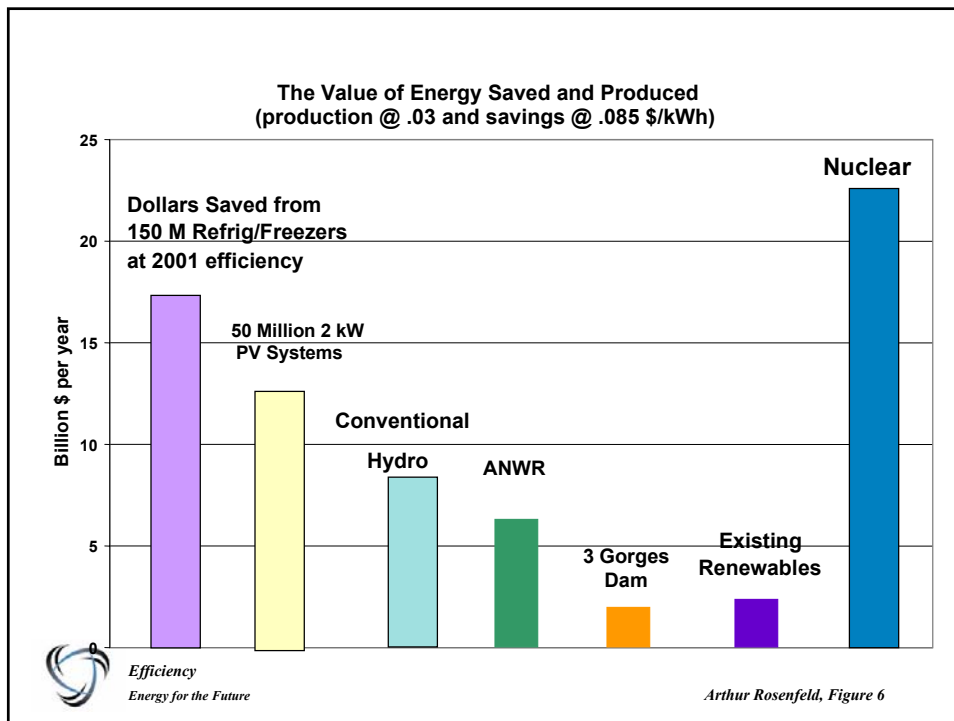
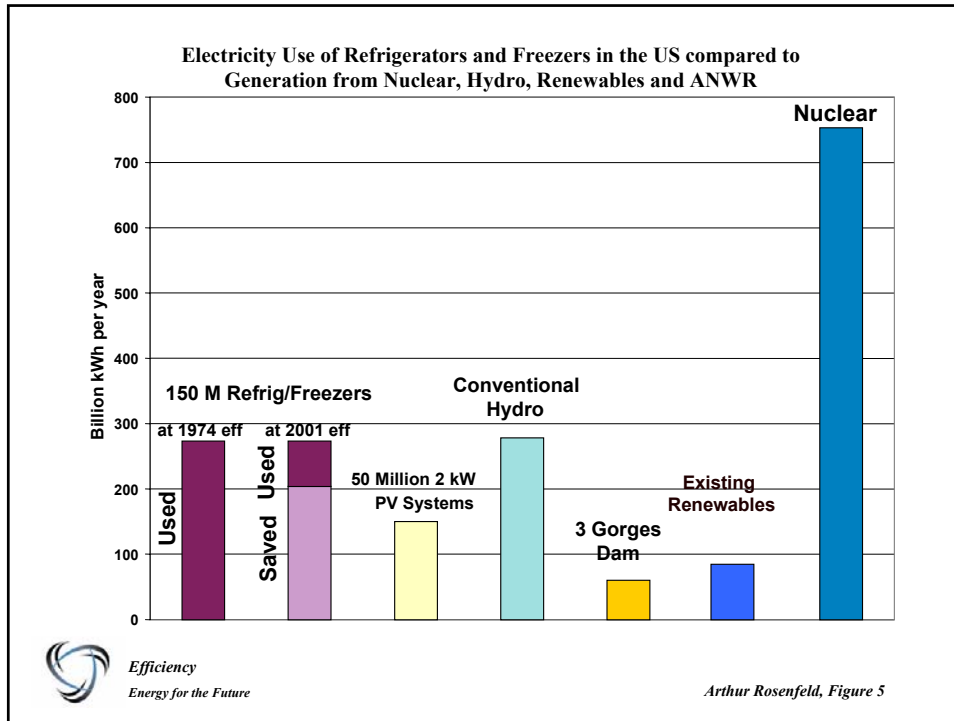
prepared for
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<http://www.energy.ca.gov/commission/commissioners/rosenfeld.html>







3 Gorges Dam vs. added Appliances in 2010

3 Gorges: 18 GW x 3,500 hours/year = 63 TWh at wholesale

	Refrigerators	Air Conditioning	Total
Estimated Sales 2003 - 2010	125 Million	100 Million	
Today's Use			
per unit per year	440 kWh	360 kWh	
2003-2010 sales at this efficiency	55 TWh	36 TWh	91 TWh
Least Cost Optimum			
per unit per year	265 kWh	233 kWh	
2003-2010 sales at high efficiency	33 TWh	23 TWh	55 TWh
Percent Saved	40%	35%	
Savings from Least Cost Optimum	22 TWh	13 TWh	35 TWh

Conclusion: Optimum appliances could save 35 TWh/year, about one-half of 3 Gorges generation in 2010. Savings at retail at least twice as valuable as wholesale, so economically equivalent to the entire 3 Gorges project.



Efficiency
Energy for the Future

Source: David Fridley - LBNL

Arthur Rosenfeld, Figure 7

Estimated Power Saved Due to Air Conditioning Standards (1974 - 2002)

	SEER	COP	EER
1975 Average	NONE	2	7
1992 Standard	10	2.5	9
2006 Standard	12	3.2	11
SEER= Seasonal Energy Efficiency Rating			
COP = Coefficient of Performance			
EER = Energy Efficiency Rating, 3.415 x COP			

**So, Standards have avoided (9/7 -1) or 28% of peak
and the new 2006 will avoid (11/9 - 1) or 22% of peak GW
For a Grand Total Savings of 50%**



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Arthur Rosenfeld, Figure 8

Estimated Power Saved Due to Air Conditioning Standards (1974 - 2002) (cont'd)

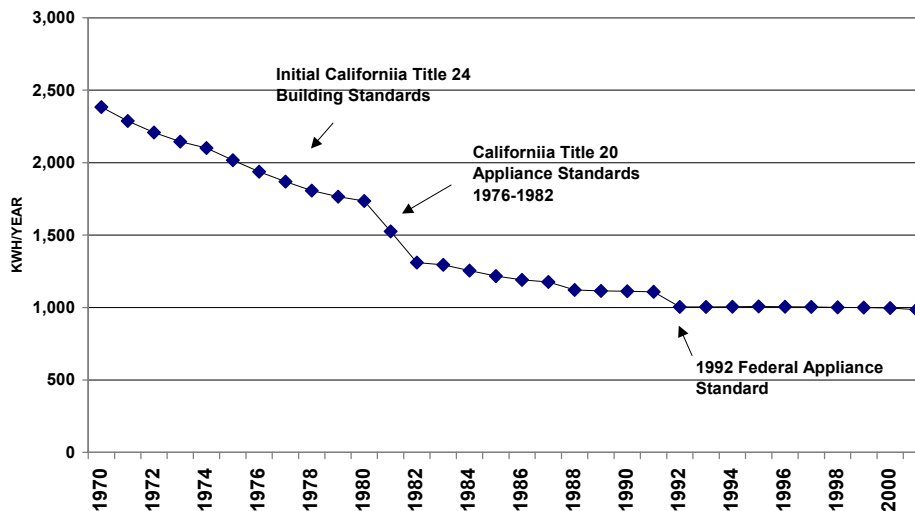
- ◆ Peak Power for United States Air Conditioning ~ 250 GW
- ◆ But standards cover only residential and rooftop units ~ 200 GW
- ◆ Avoided GW: 50% of 200 GW = 100 GW
- ◆ Comparisons:
 - California Peak Load ~ 50 GW
 - United States Nuclear Plants net capability ~ 100 GW
- ◆ Cooler roofs will save another 10% of 200 GW
 - Flat roofs, new or replacement, should be white
 - To be required in 2005 California Building Standards
 - Sloped roofs, new or replacement, can be colored but cool
 - Each strategy saves 10%, so 20 GW total
- ◆ Just switching a-c equipment located outside to white should save another 1%, or 2 GW



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Arthur Rosenfeld, Figure 9

Annual Usage of New Residential Air Conditioners in California 1970 - 2001



Efficiency
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Source: CEC Demand Analysis Office

Arthur Rosenfeld, Figure 10

