

**Successes of Energy Efficiency:
The United States and California
National Environmental Trust**

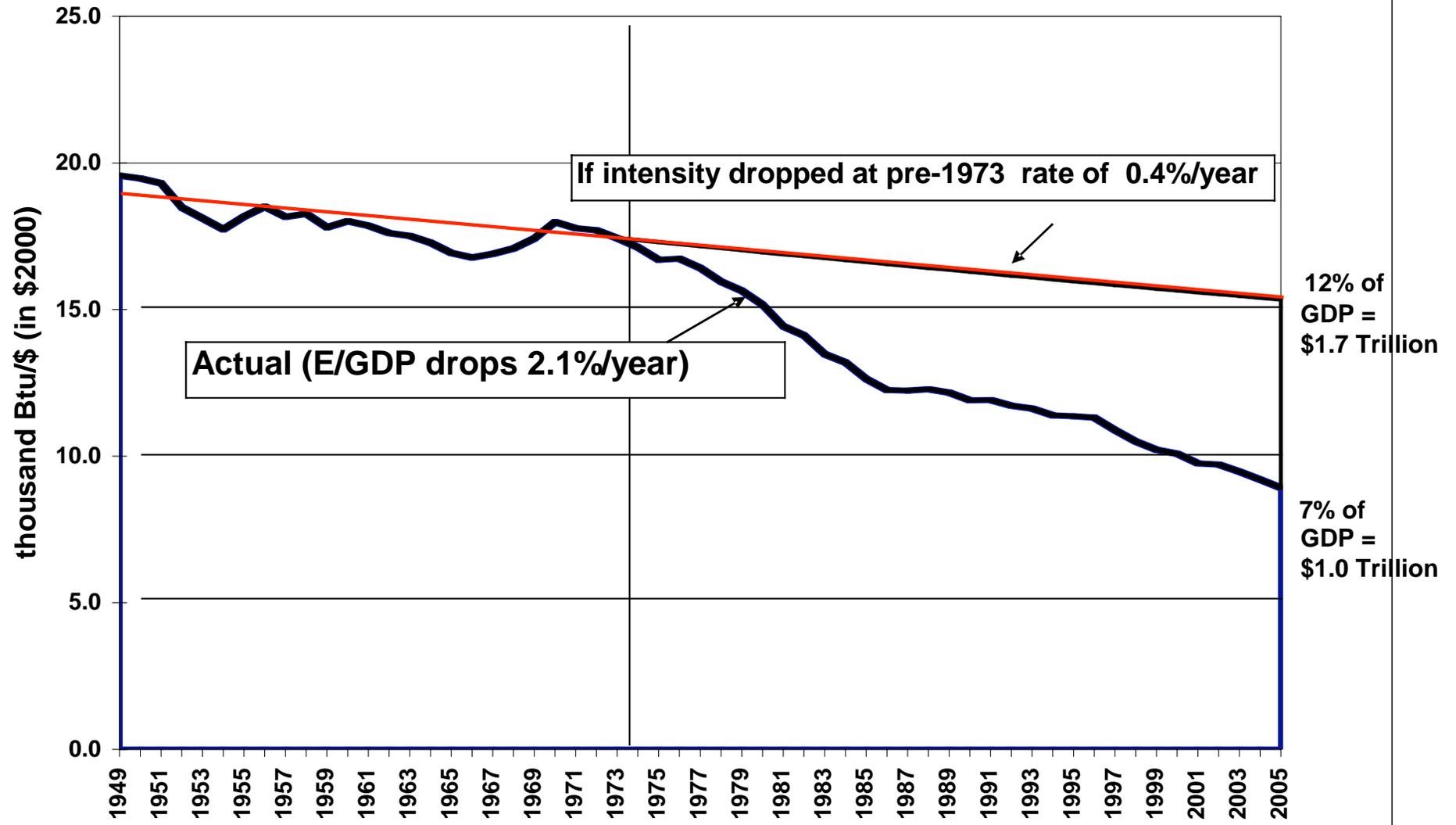
May 2, 2007

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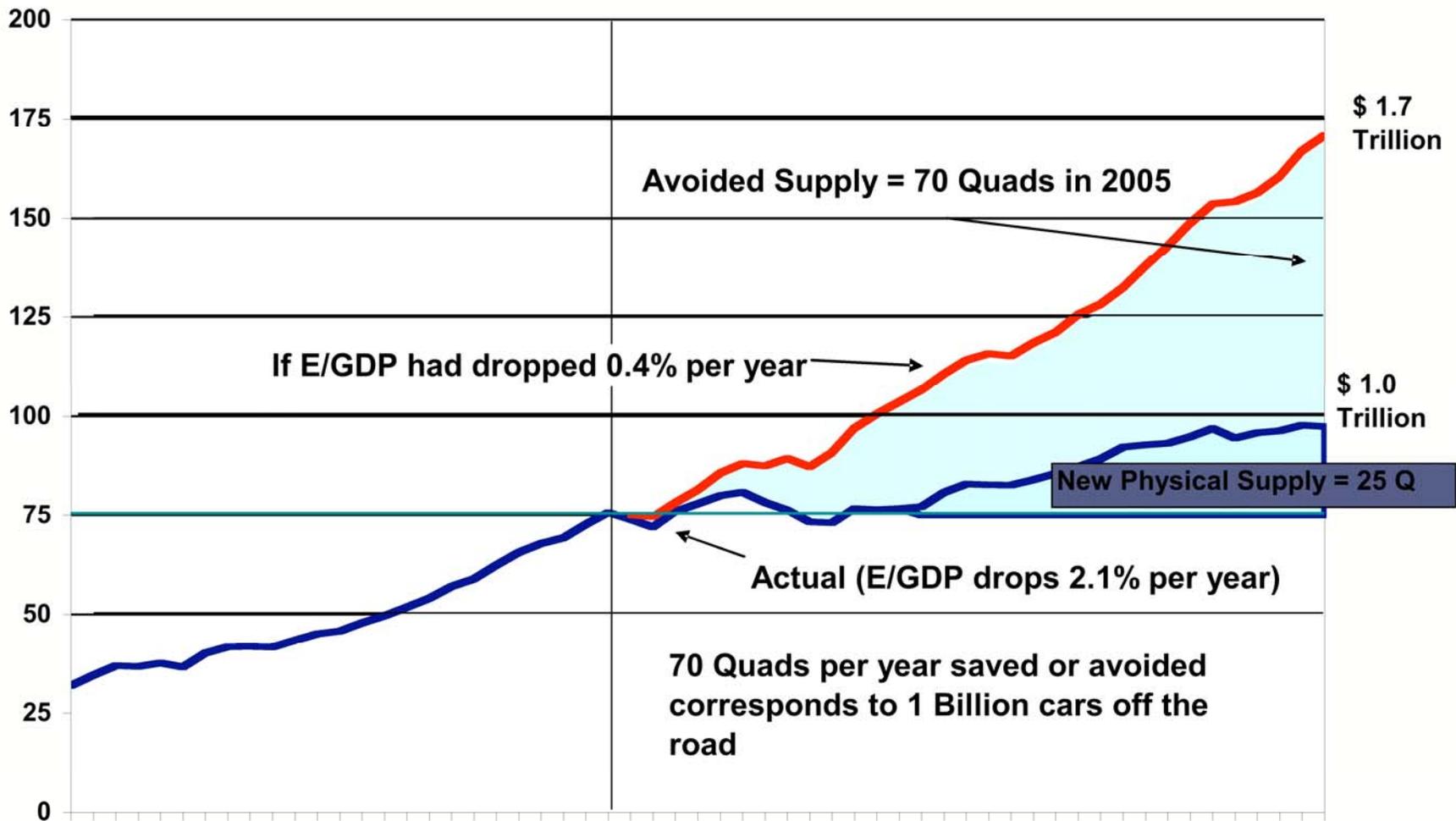
<http://www.energy.ca.gov/commission/commissioners/rosenfeld.html>

or just **Google “Art Rosenfeld”**

Energy Intensity in the United States 1949 - 2005



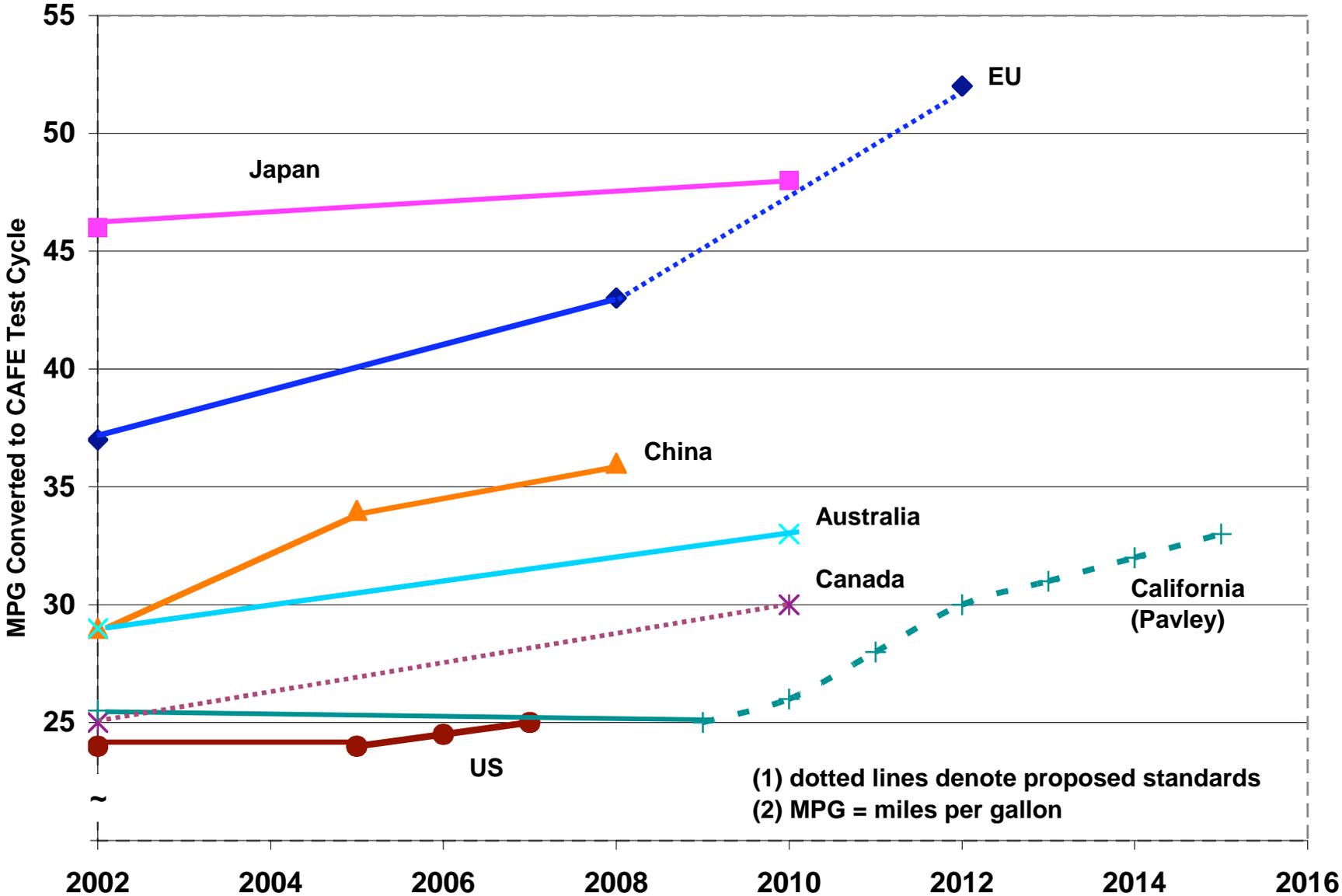
Energy Consumption in the United States 1949 - 2005



How Much of The Savings Come from Efficiency?

- ◆ Easiest to tease out is cars
 - In the early 1970s, only 14 miles per gallons
 - Now about 21 miles per gallon
 - If still at 14 mpg, we'd consume **75 billion gallons more** and pay **\$225 Billion more** at 2006 prices
 - But we still pay **\$450 Billion per year**
 - If California wins the “Schwarzenegger-Pavley” suit, and it is implemented nationwide, we'll save **another \$150 Billion per year**
- ◆ Commercial Aviation improvements save another **\$50 Billion per year**
- ◆ Appliances and Buildings are more complex
 - We must sort out true efficiency gains vs. structural changes (from smokestack to service economy).

Comparison of Fuel Economy – Passenger Vehicles



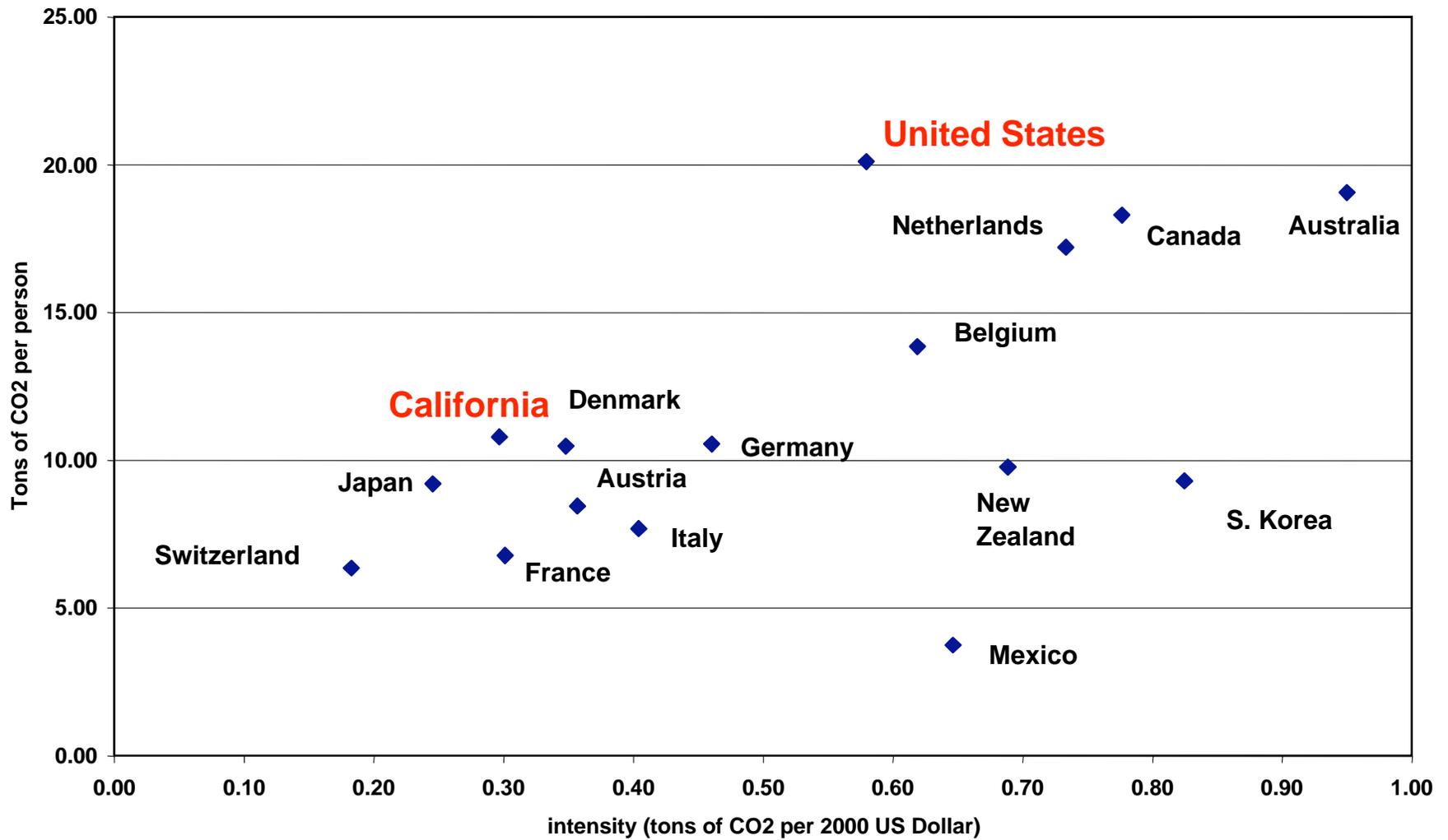
How Much of The Savings Come from Efficiency (cont'd)?

- ◆ Some examples of estimated savings in 2006 based on 1974 efficiencies minus 2006 efficiencies

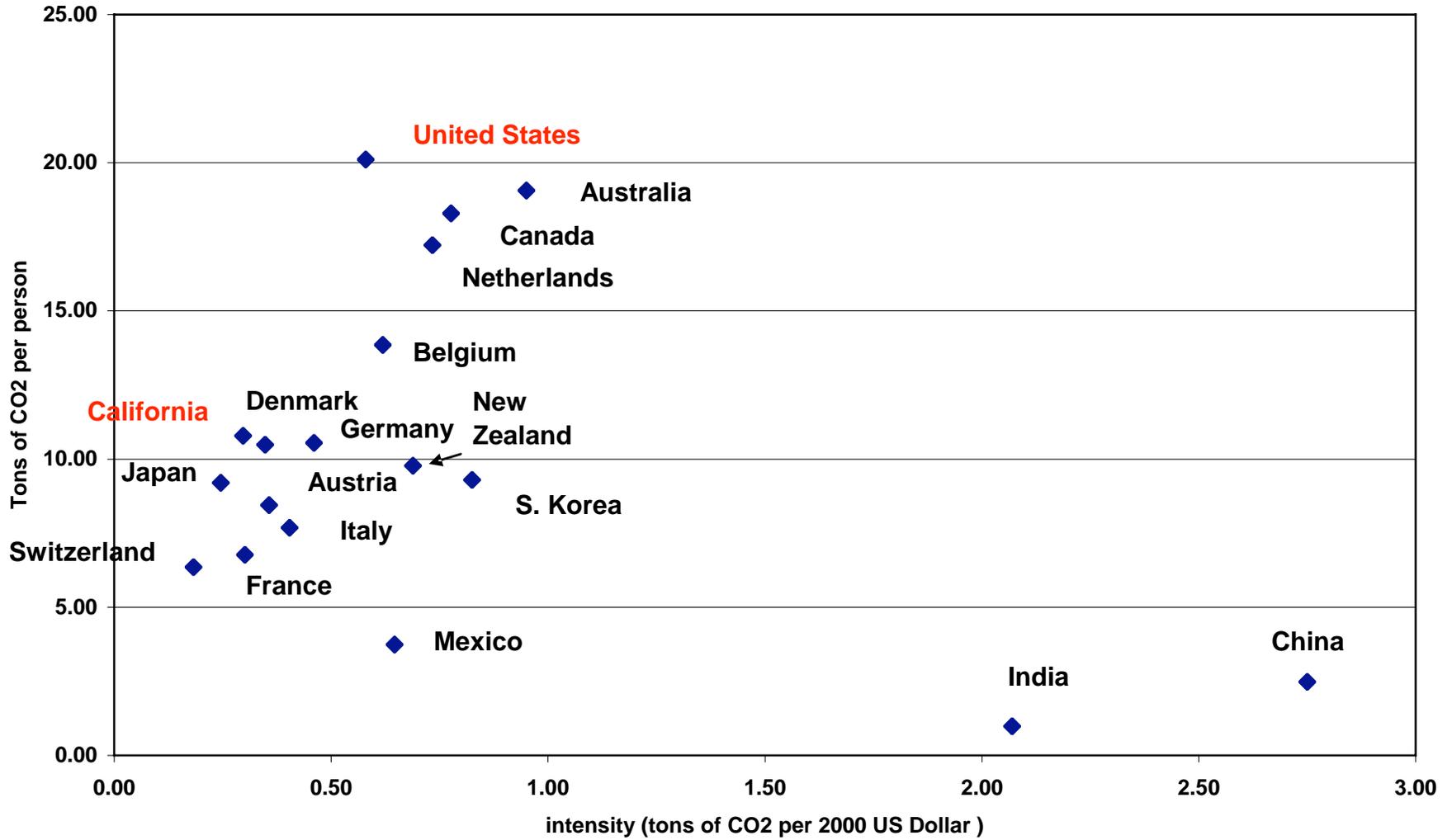
	Billion \$
Space Heating	40
Air Conditioning	30
Refrigerators	15
Fluorescent Tube Lamps	5
Compact Fluorescent Lamps	5
Total	95

- ◆ Beginning in 2007 in California, reduction of “vampire” or stand-by losses
 - This will save \$10 Billion when finally implemented, nation-wide
- ◆ Out of a total **\$700 Billion**, a crude summary is that 1/3 is structural, 1/3 is from transportation, and 1/3 from buildings and industry.

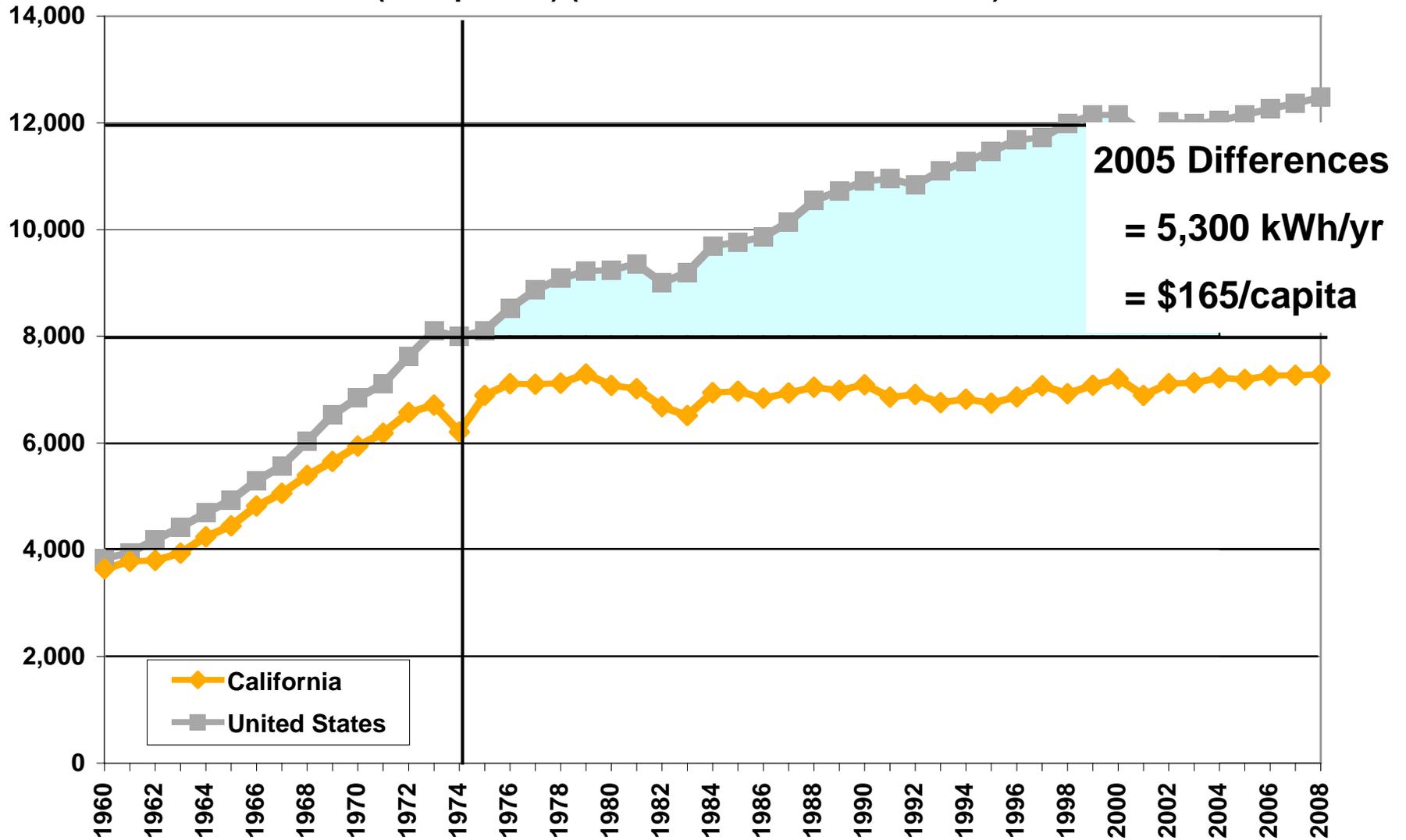
Carbon Dioxide Intensity and Per Capita CO2 Emissions -- 2001
(Fossil Fuel Combustion Only)



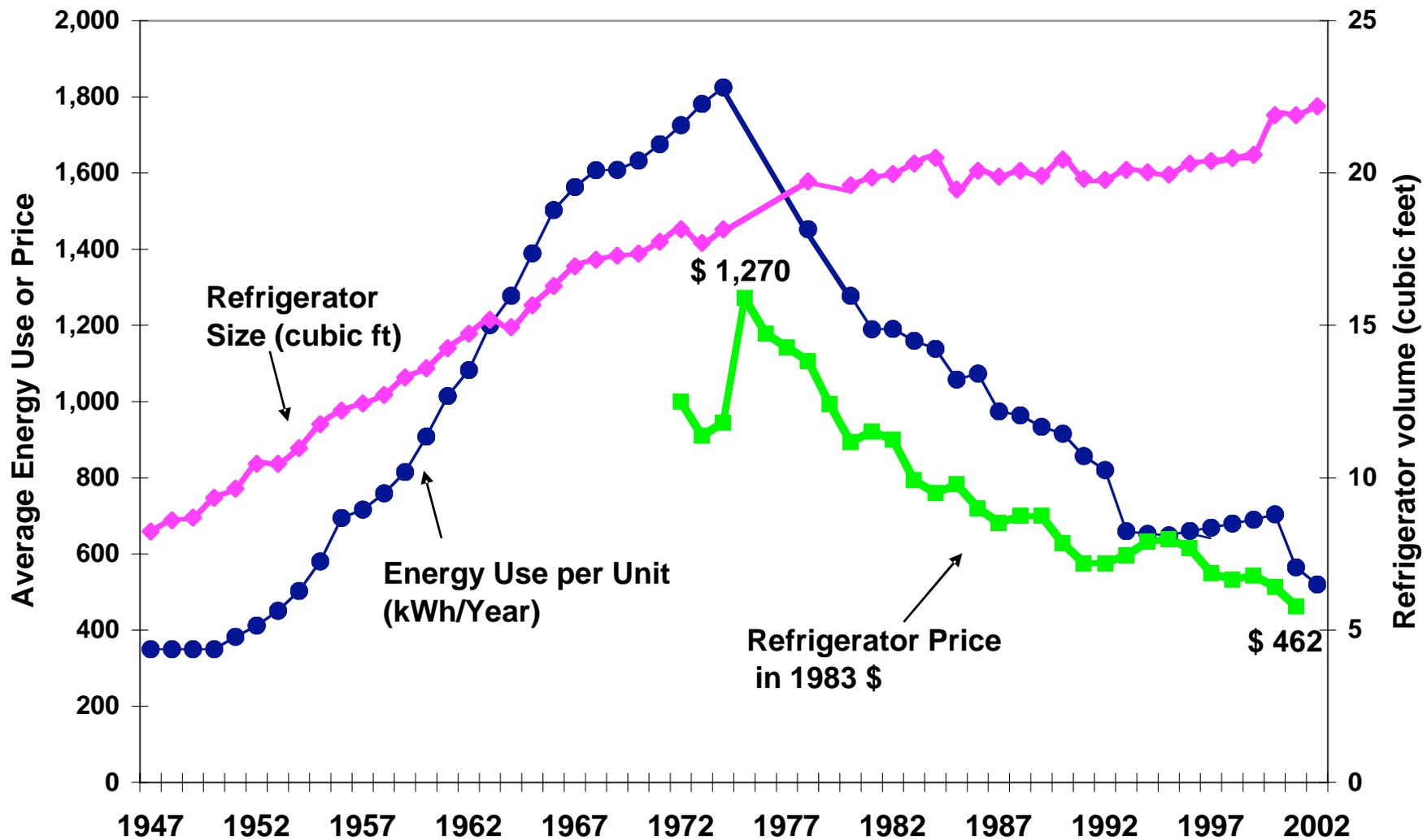
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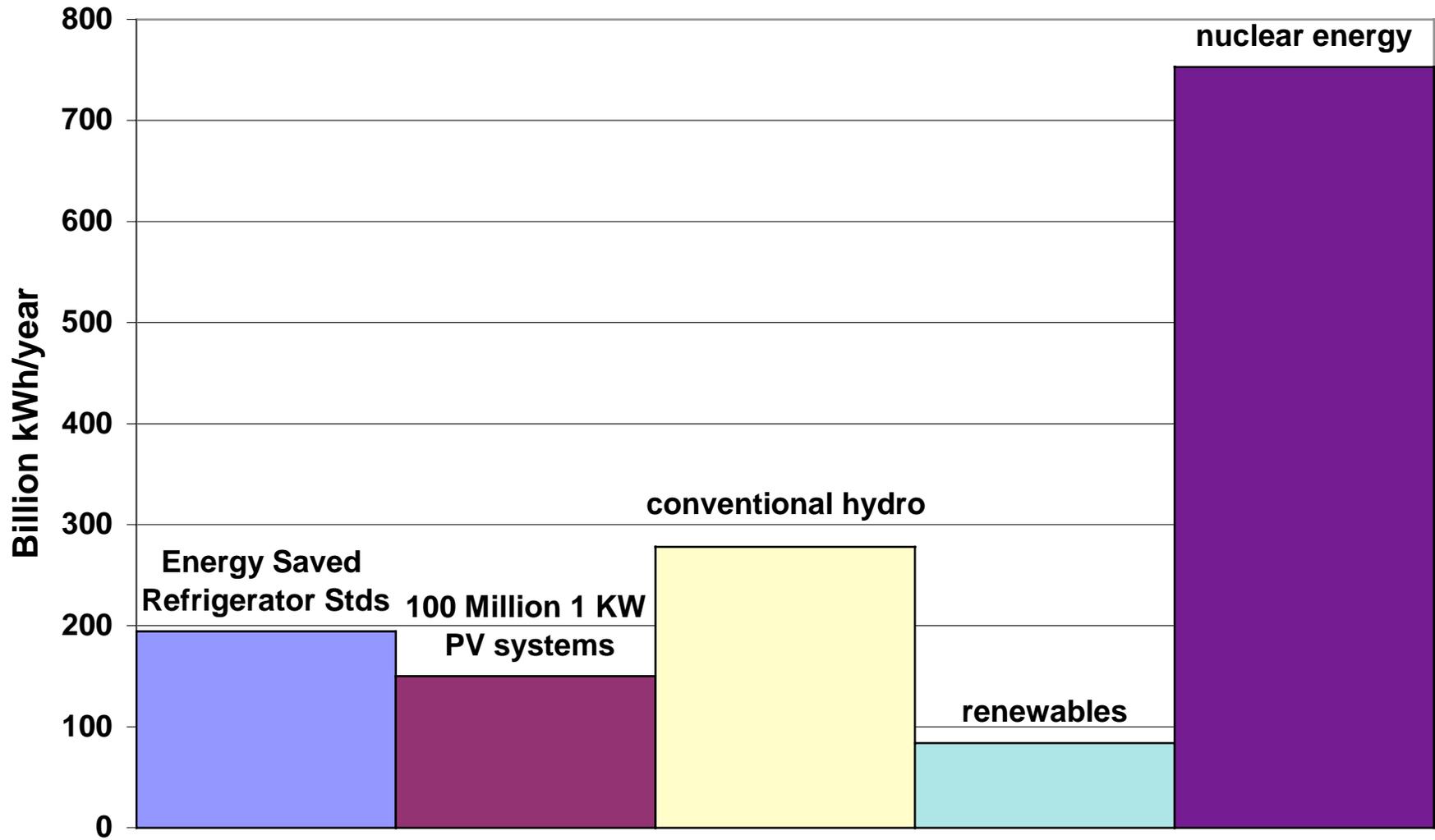
**Per Capita Electricity Sales (not including self-generation)
(kWh/person) (2005 to 2008 are forecast data)**



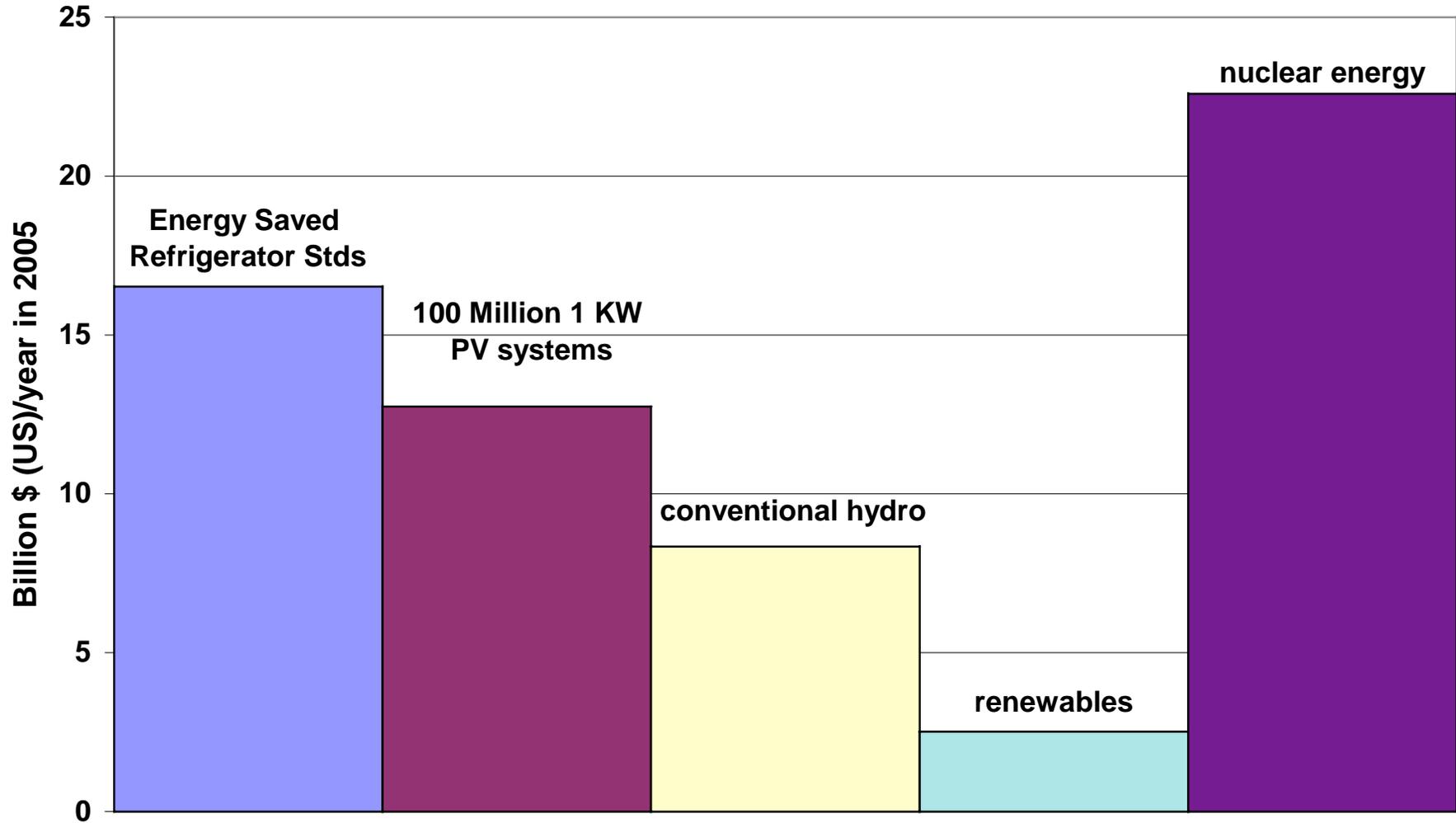
New United States Refrigerator Use v. Time and Retail Prices



Annual Energy Saved vs. Several Sources of Supply

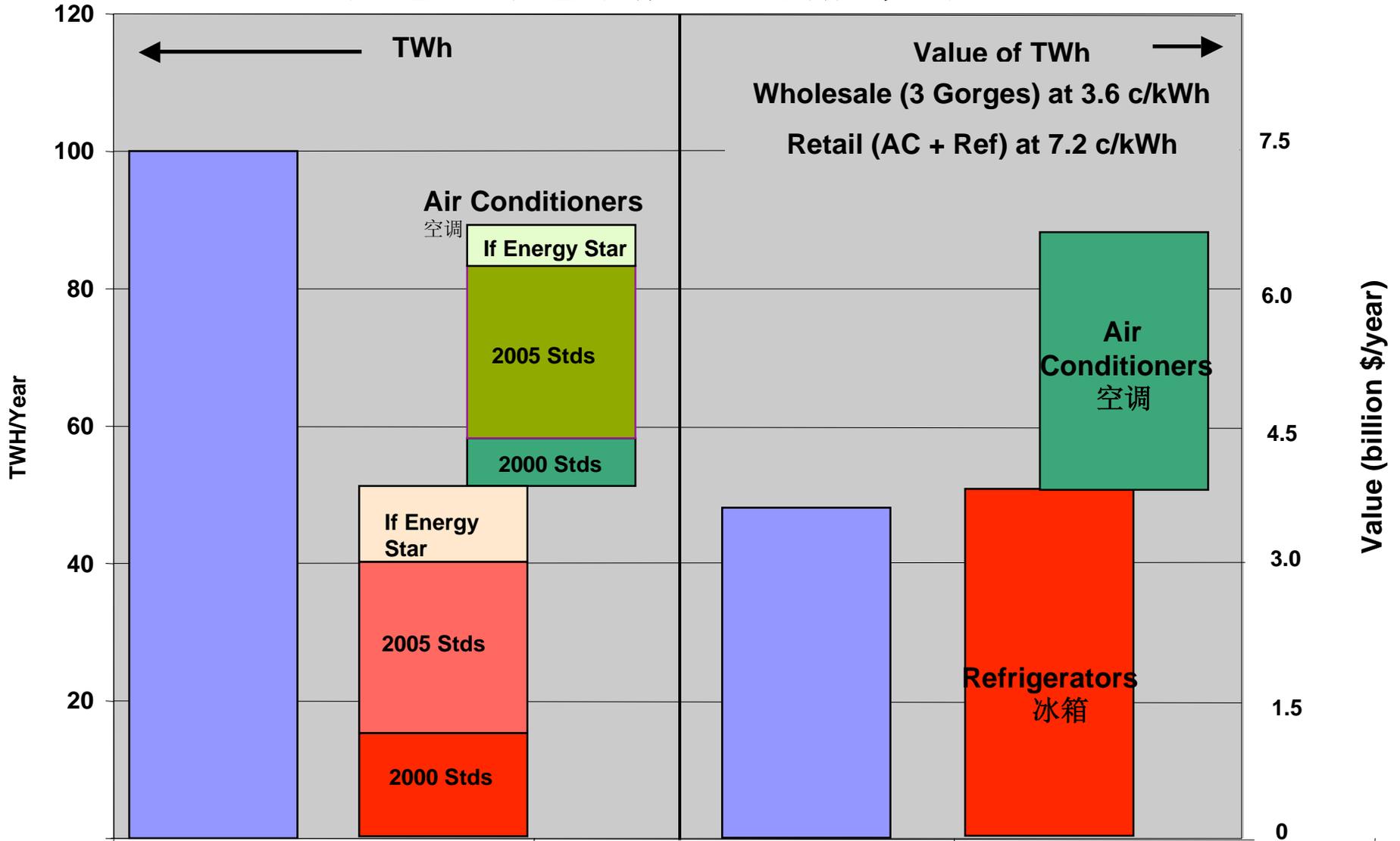


**Value of Energy to be Saved (at 8.5 cents/kWh, retail price) vs.
Several Sources of Supply in 2005 (at 3 cents/kWh, wholesale price)**



Comparison of 3 Gorges to Refrigerator and AC Efficiency Improvements

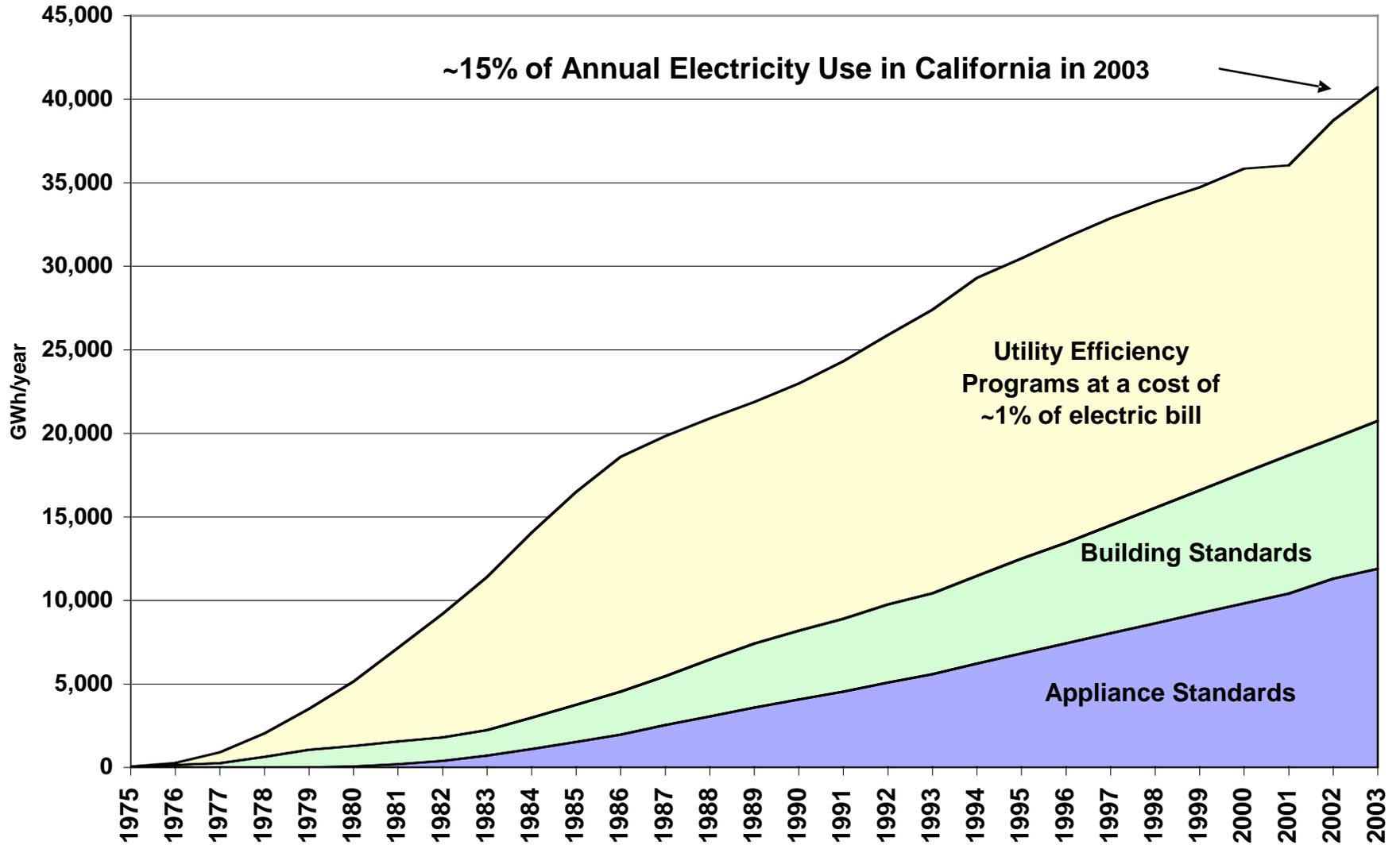
三峡电量与电冰箱、空调能效对比



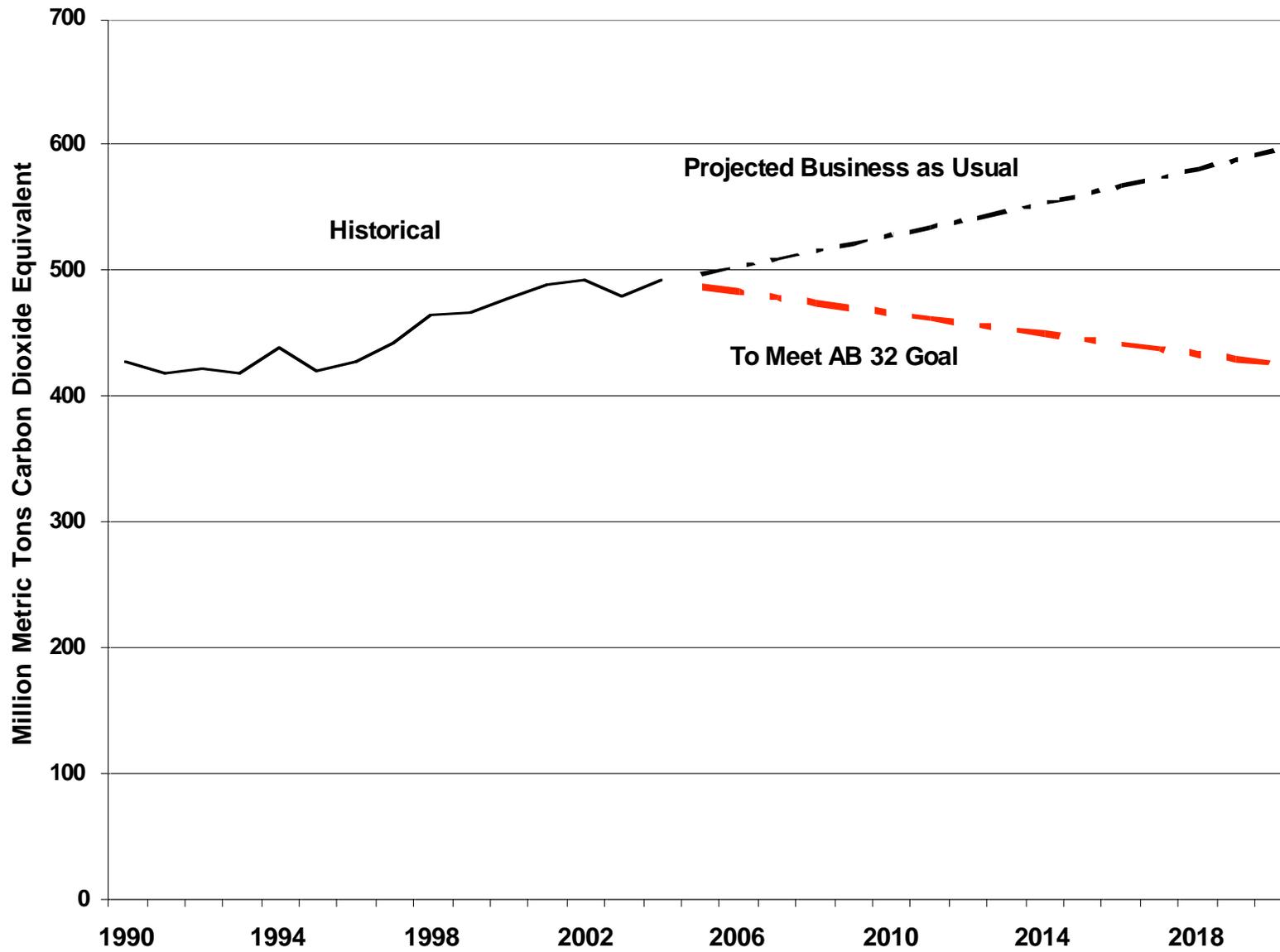
3 Gorges 三峡
Savings calculated 10 years after standard takes effect. Calculations provided by David Fridley, LBNL

3 Gorges 三峡
标准生效后, 10年节约电量

Annual Energy Savings from Efficiency Programs and Standards

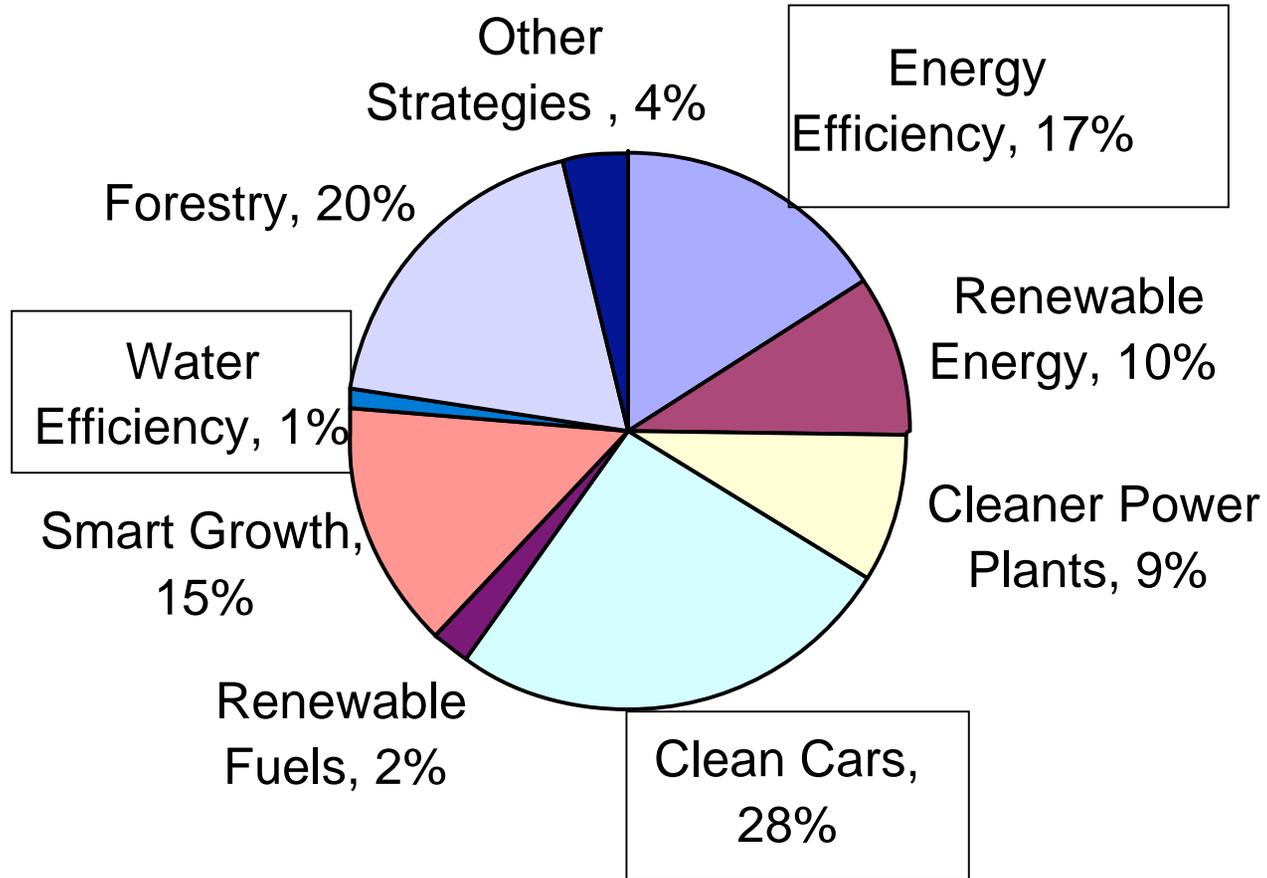


CO2 Emissions in California: Historical and Projected



Strategies for Meeting California's CO2 Goals in 2020

Total Reductions = 174 Million metric Tons CO2 equivalent



Source: Stabilization Wedges: Pacala and Socolow, Science Vol 305, page 968

