7th International Conference for Enhanced Building Operation
November 1, 2007
San Francisco

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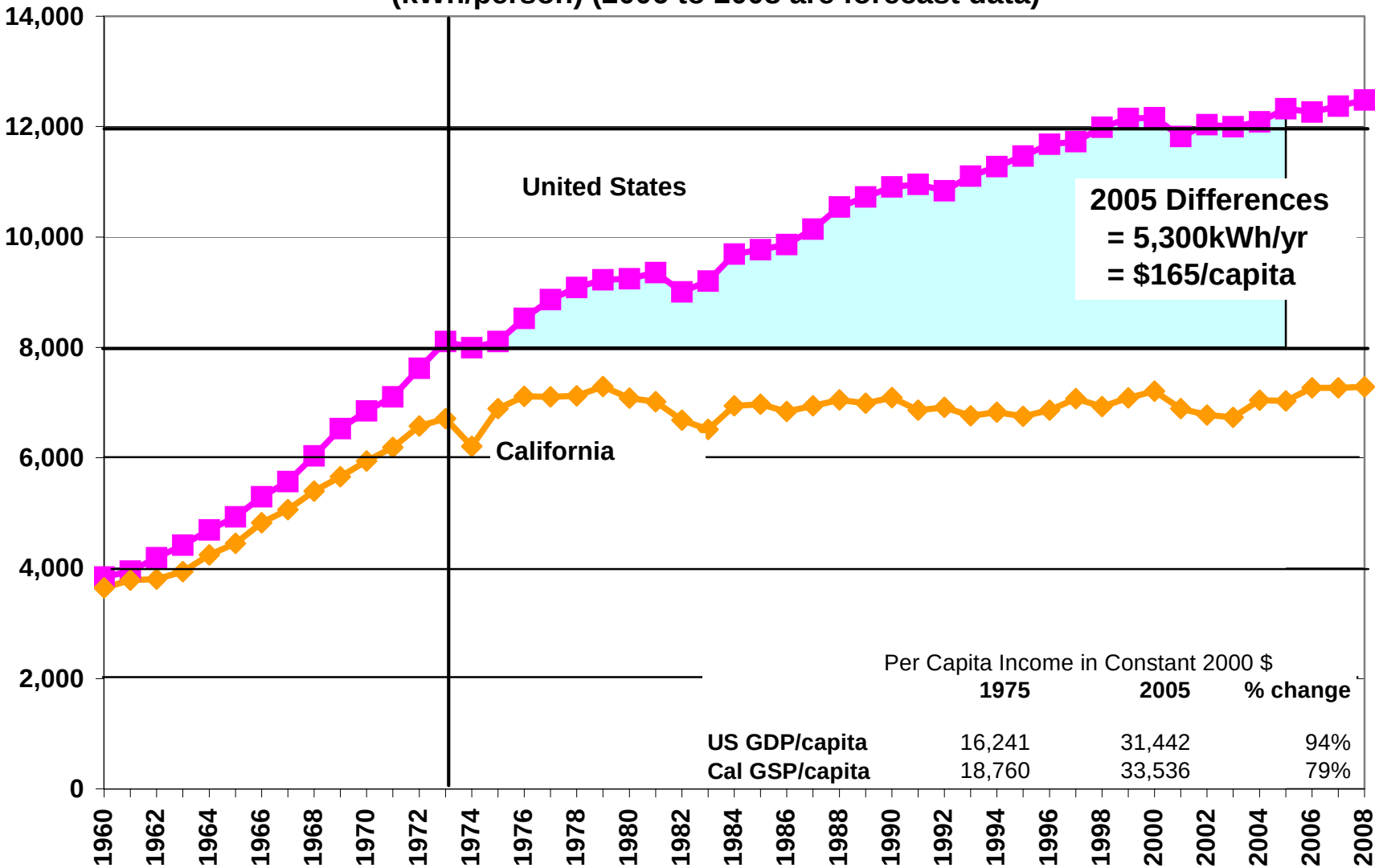
http://www.energy.ca.gov/commission/commissioners/rosenfeld.html

or just Google “Art Rosenfeld”

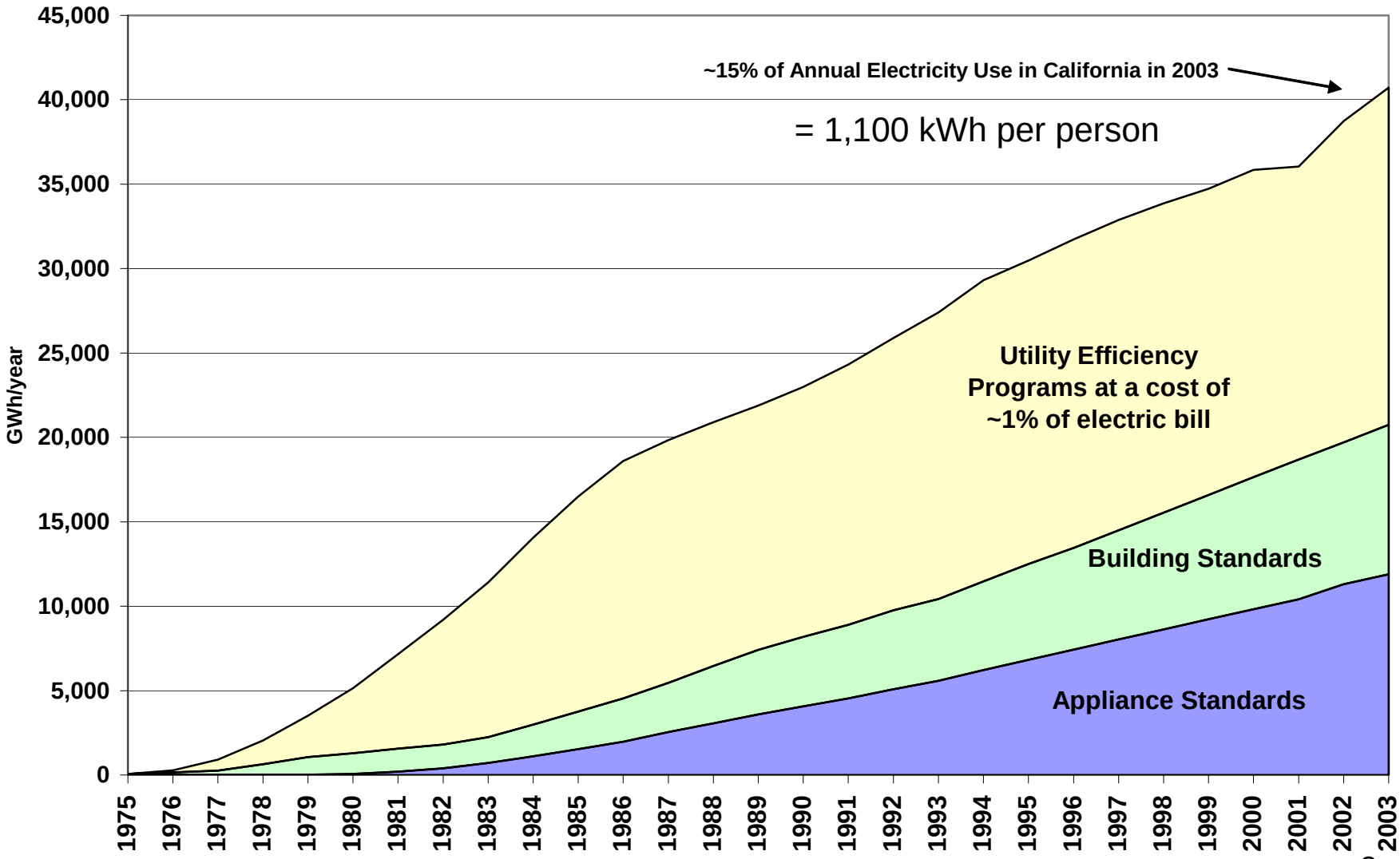
Per Capita Electricity Sales (not including self-generation) (kWh/person) (2006 to 2008 are forecast data)



Per Capita Income in Constant 2000 $

	1975	2005	% change
US GDP/capita	16,241	31,442	94%
Cal GSP/capita	18,760	33,536	79%

Annual Energy Savings from Efficiency Programs and Standards



Accounting for the Difference: US and CA

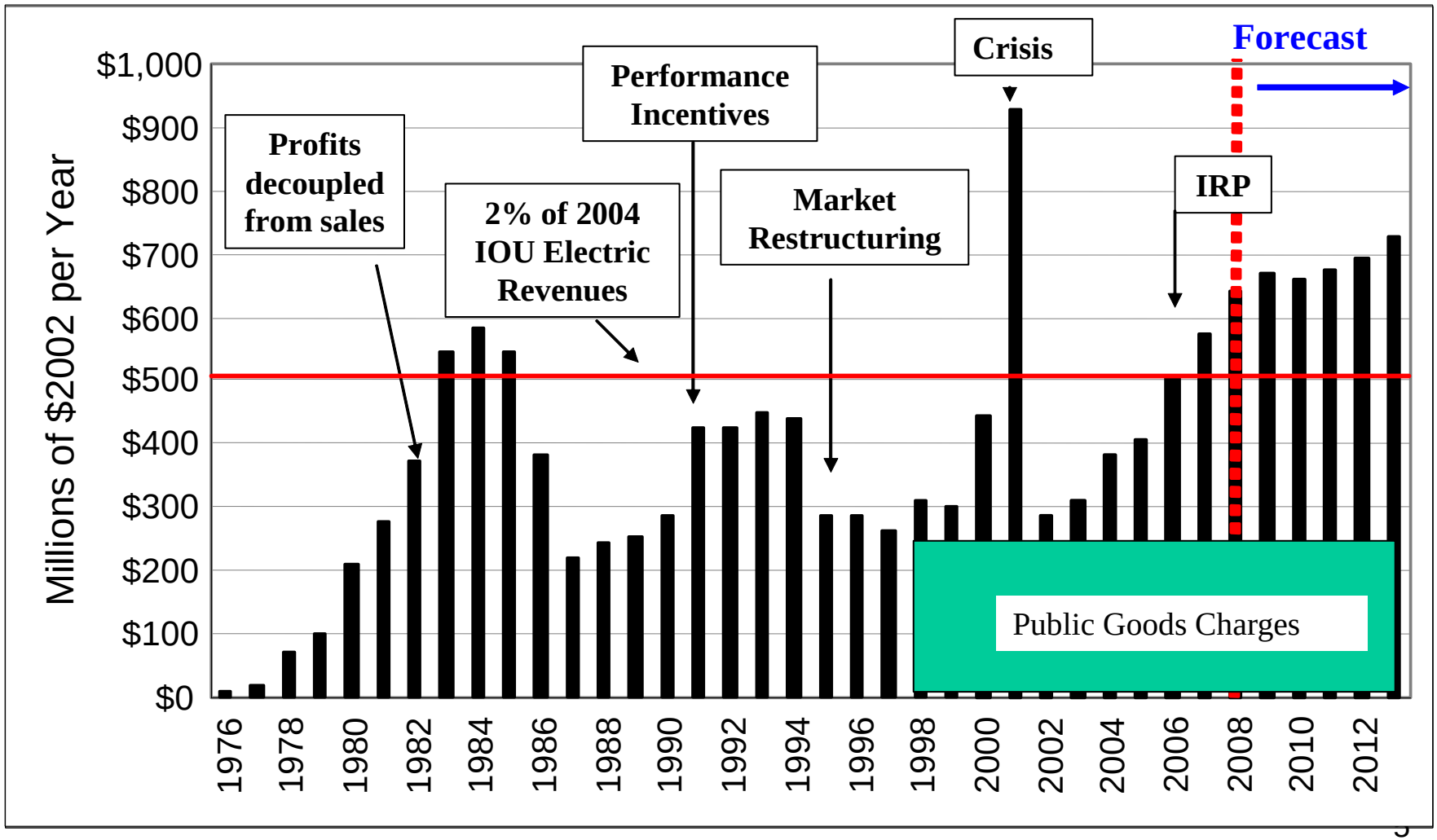
- An estimate from Anant Sudarshan, graduate student of Professor James Sweeney, Stanford University, forthcoming paper in the Energy Journal

Per Capita Electrical Usage (kWh)

	Residential (2001)		Commercial (2003)	Industrial(2002)	
US actual	4,253		4,170	3,475	US actual
CA actual	2,225		2,803	1,393	CA Actual
heating	196		1,132	1,321	Usage and intensity differences
cooling	417			257	Self-generation
water heating	238				
income	(131)				
household size	385				
urban conc	325				
Unexplained	**594**		**236**	**504**	**1,334**

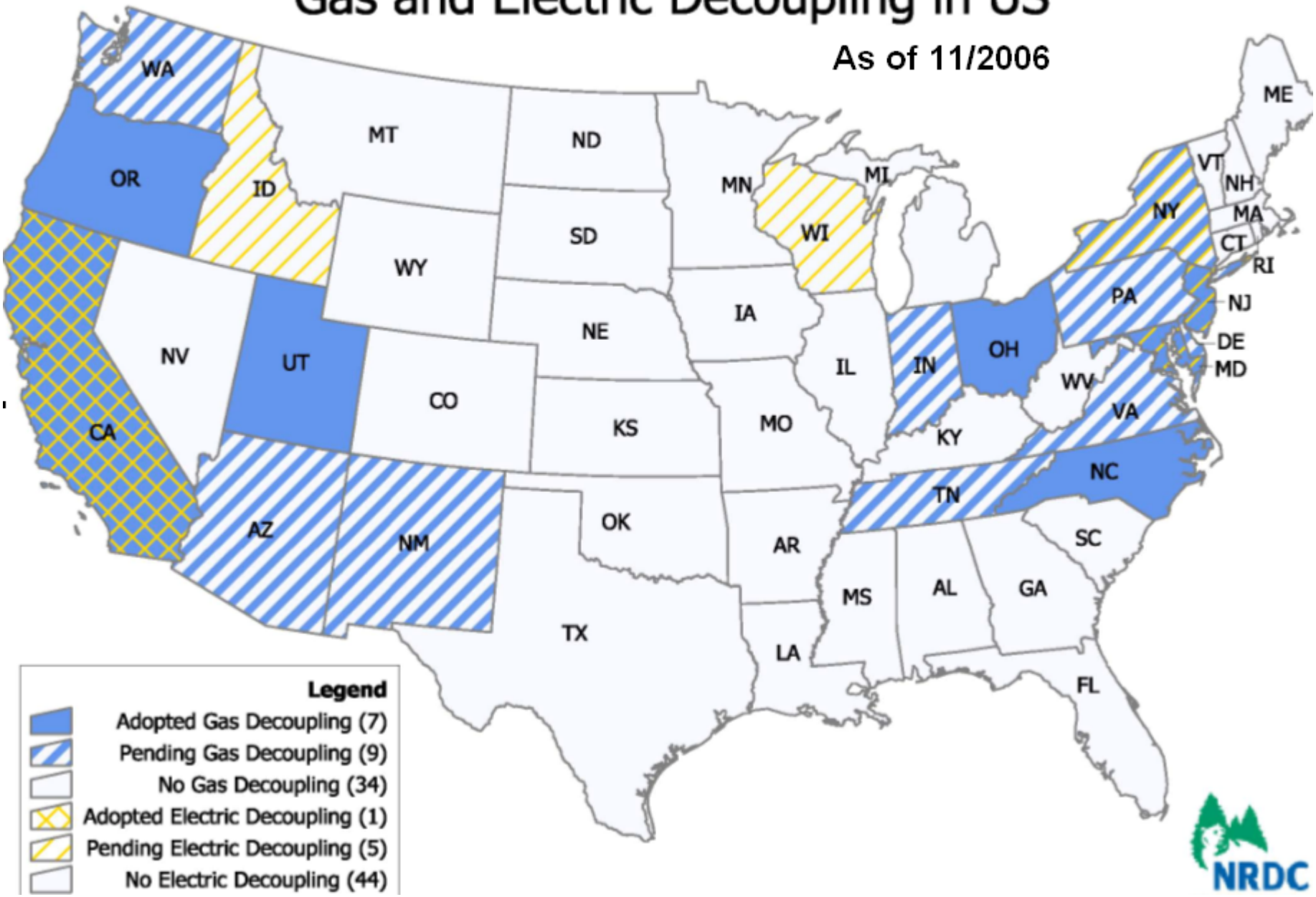
- CEC estimate of 1,100 kWh per person from standards and programs (previous figure)

California IOU's Investment in Energy Efficiency



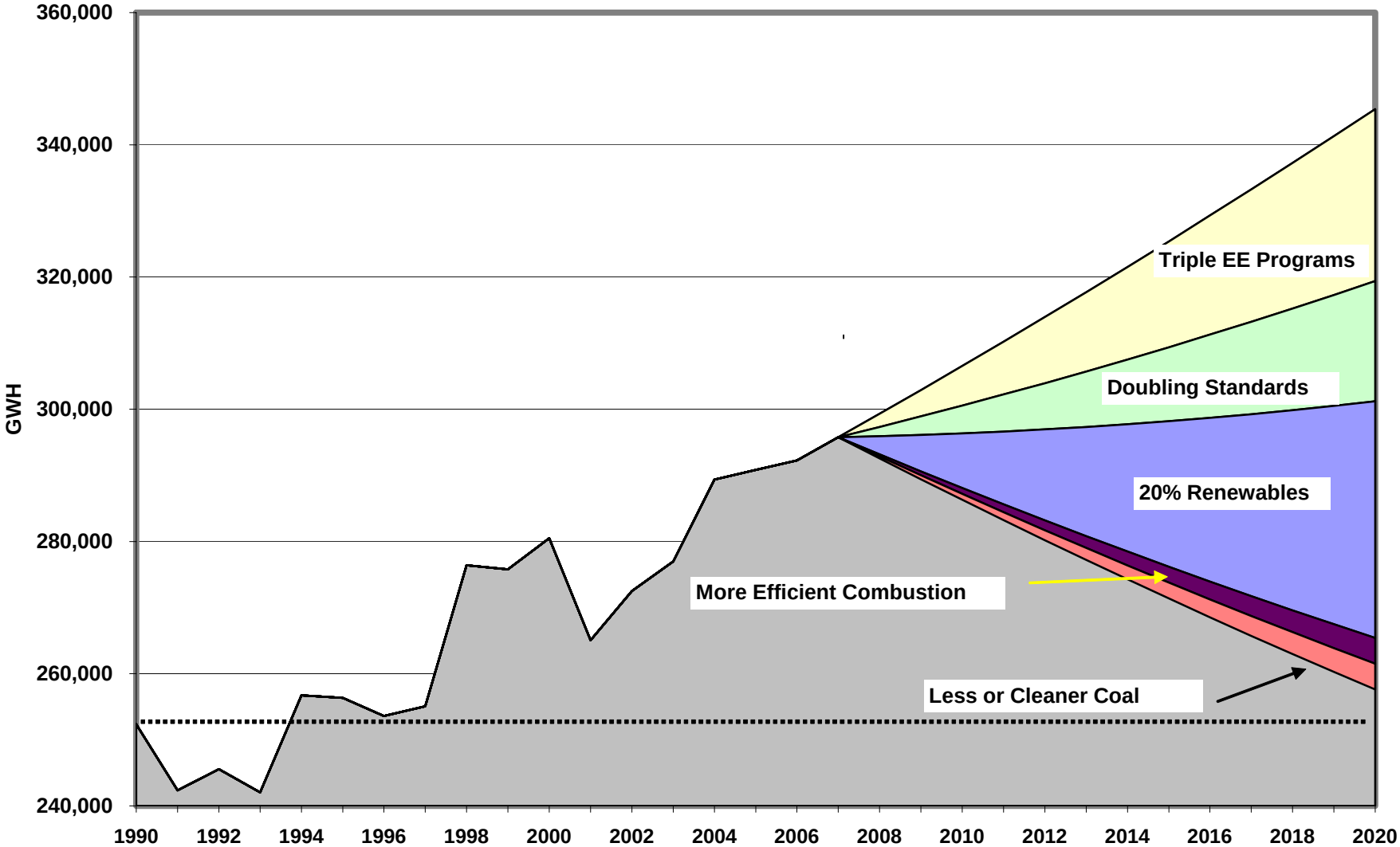
Gas and Electric Decoupling in US

As of 11/2006



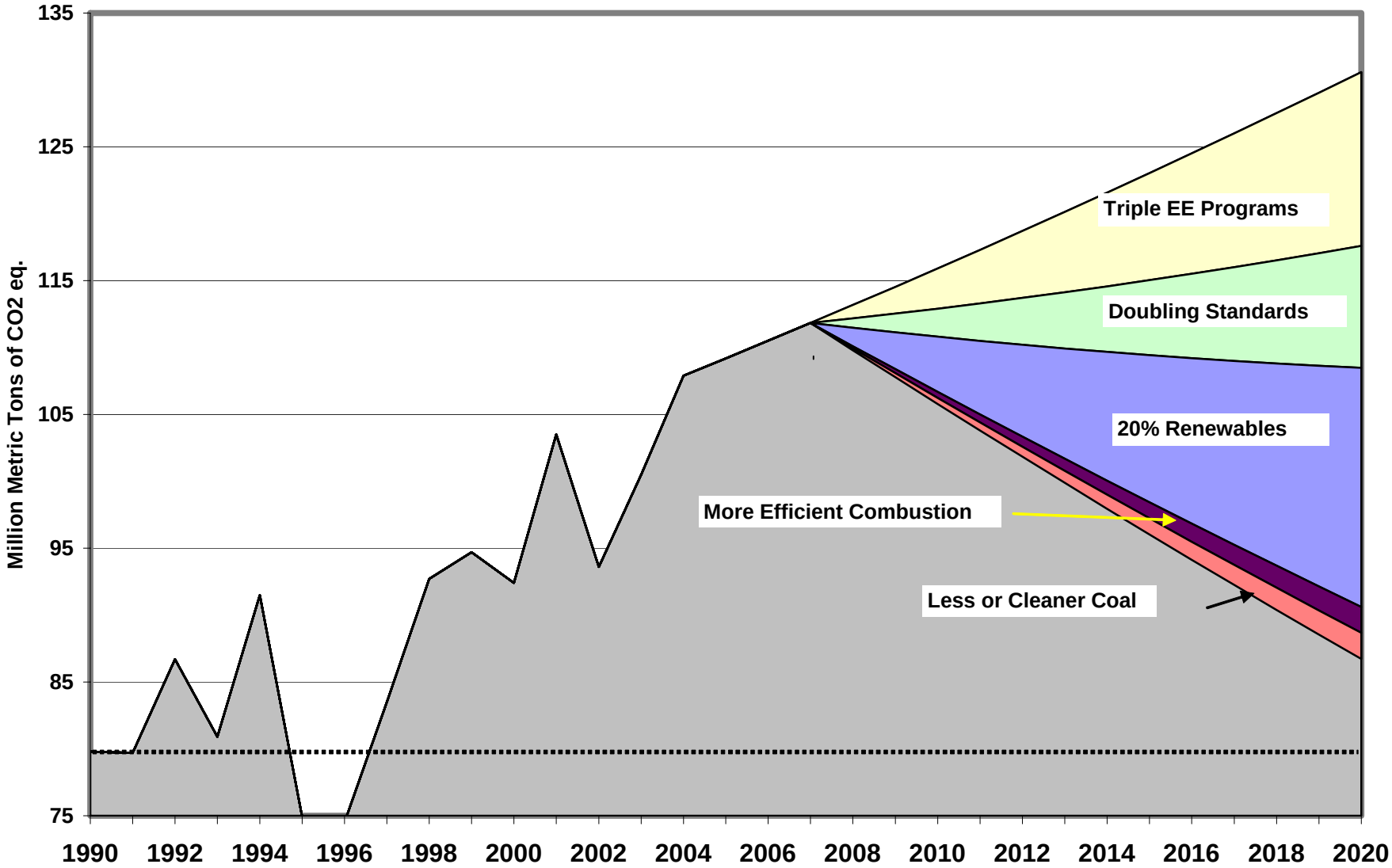
NRDC

Possible Strategies to Reduce Electricity Sector Carbon Emissions in California, ignoring ramp up times and other implementation issues -- The ELECTRICITY Perspective



Source: Pat McAuliffe, pmcaulif@energy.state.ca.us

Possible Strategies to Reduce Electricity Sector Carbon Emissions in California, ignoring ramp up times and other implementation issues -- The CARBON Perspective



Source: Pat McAuliffe, pmcaulif@energy.state.ca.us

AB 1103(Saldana) Energy Benchmarking
Chapter Number 533, Statutes of 2007

[the CEC has worked with EPA to adapt EPA's " Portfolio Manager" to CA Commercial End Use Survey – CEUS]

January 1, 2009

- Electric and gas utilities must maintain records of the energy consumption data of all nonresidential buildings to which they provide service, in a format compatible for uploading to Energy Star Portfolio Manager, for at least the most recent 12 months.
- Upon authorization of building owner or operator, electric or gas utility must upload all of the energy consumption data for a building to the Energy Star Portfolio Manager.

January 1, 2010

- Nonresidential building owner or operator must disclose Energy Star Portfolio Manager benchmarking data and ratings, for the most recent 12-month period, to a prospective buyer, lessee, or lender.

AB 662(Ruskin) Water conservation Chapter Number 531, Statutes of 2007

- **Summary:**
  - This bill would clarify and reinforce the **Energy Commission's** authority to set appliance and building standards that save both energy and water
  - Require that the standards for minimum levels of operating efficiency be based on efficiencies that will reduce the energy or water consumption growth rates
  - Do not result in any added total costs over the designed life of the appliances concerned.

See also AB 1560 (Huffman)

AB 1560(Huffman) Public Resources Building standards; CHAPTER 532, Statutes of 2007

- **Summary:**
  - Would require the Energy Commission to prescribe, by regulation, water efficiency and conservation standards for new residential and non-residential buildings.
  - Demonstrate that the adopted water efficiency or conservation standards are necessary to save energy.
  - The standards adopted would be required to be cost effective when amortized over the economic life of the structure compared with historic practices.

AB 1109(Huffman) Lighting efficiency and hazardous waste.
Chapter Number 534, Statutes of 2007

- **Summary:**
  - Requires the Department of Toxic Substances Control to prescribe schedules for reducing the maximum levels of mercury and lead, per lumen
  - The **CEC** to adopt minimum energy efficiency standards for all general purpose lights on a schedule specified in regulations
  - To reduce average statewide electrical energy consumption by **not less than 50% from the 2007 levels for indoor residential lighting by 2018**
  - **Not less than 25% from the 2007 levels for indoor commercial and outdoor lighting by 2018**

AB 1470(Huffman) Solar energy: Solar Water Heating and Efficiency Act of 2007
CHAPTER 536, Statutes of 2007

- **Summary:**
  - Would establish the Solar Water Heating and Efficiency Act of 2007.
  - Promote solar water heating systems and other technologies that reduce natural gas demand.
  - The CPUC to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.
  - **Funding level not to exceed $250 million over the course of the 10-year program.**
  - **[See $3B Calif. Solar Initiative T-24 linkage below]**

AB 1613(Blakeslee) Energy: Waste Heat and Carbon Emissions Reduction Act
Chapter Number 713, Statutes of 2007

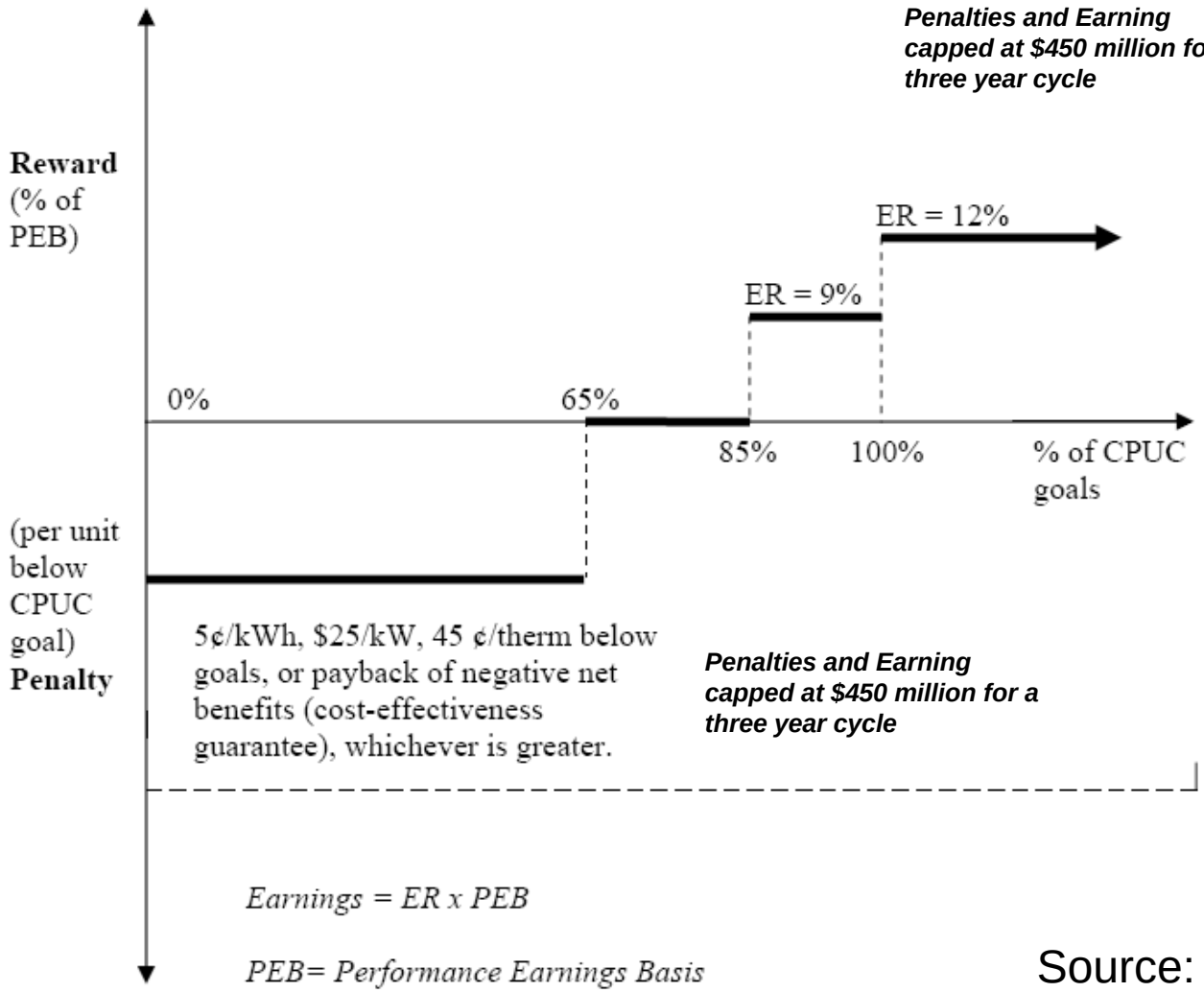
- **Summary:**
  - Would enact the Waste Heat and Carbon Emissions Reduction Act
  - to dramatically advance the efficiency of the state's use of natural gas by capturing unused waste heat,
  - to reduce wasteful consumption of energy, and
  - to support and facilitate both customer- and utility-owned combined heat and power systems.

Shareholder Profits

- Moving beyond Decoupling to Decoupling Plus i.e. “Reverse Coupling”
  - The more saved by the customer the higher the profit margin on efficiency investments and programs

Energy Efficiency Incentive Mechanism Earnings/Penalty Curve

(D.07-09-043, p. 8)



Source: NRDC; Chang and Wang, 9/26/2007

New Solar Homes Partnership (Administered by the Energy Commission)

- Solar incentives for new residential buildings
- Goal: 400 MW of residential PV by 2016
- BUT, solar incentives are tied to Energy Efficiency
- Must meet EE targets in order to be eligible for rebates on installed solar
- Sends a message:

  Efficiency 1st , Solar 2nd … Preferably Both!

New Solar Homes Partnership Efficiency Tiers

Tier	Efficiency Target	Cost Premium	Incentive
I	15% better than T-24 Energy Star Appliances & T-24 Lighting	~$1,000	$500
II	35% better than T-24 overall 40% better than T-24 (cooling) Energy Star Appliances & T-24 Lighting	~$3,000	$2000

Notes on Tier II:

- Immediate Positive Cash Flow, even without incentives.
- Energy Commission Preferred Level
- Moves Towards Zero Energy New Homes
- Achieved by Current *Building America* Homes in California

Tier II Efficiency Versus Solar: The Economics (3 ways), without incentives

- To save 3,000 kWh/yr, you can:
  - Invest $3,000 in EE

    -OR-
  - Invest $17,000, before rebates, in solar
- Annual Return On Investment:
  - 17% for EE
  - 4.5% for solar
- Cost of Conserved Electricity:
  - 8.5¢ per kWh for EE
  - 27¢ to 37¢ per kWh for Solar, after state and federal rebates

*Based on data from Consol and CEC

For peak reduction, we recommend both!

Recent CPUC Proceedings and Efforts

- California Institute for Climate Solutions (under discussion)
  - University of California directed
  - $60 million per year for 10 years
- Direct metering of commercial accounts
  - Eliminates billing based on a formula (e.g. sq. feet)
- “Big Bold” Initiatives
  - Res/Small commercial HVAC efforts – higher efficiency systems, better installation, verifying refrigerant chare, measure duct leaks
  - Zero Energy New Residential Buildings by 2020
  - Zero Energy New Commercial Buildings by 2030
  - Industrial sector to save 100% of economic potential for energy efficiency by 2015
  - http://www.cpuc.ca.gov/eeworkshop/CPUC-new/design/docs/BigBold_4%20strategies.pdf

Early Action Items – AB 32, 7 MtCO2/yr
California Air Resources Board

SF_6 reductions from non-electricity sector
Reduction of emissions from consumer products
Smartway Truck Efficiency
Tire inflation
Reduction of PFCs from semiconductor industry
Green ports
Refrigerant tracking, reporting and recovery program
Energy efficiency of California cement facilities
Blended cements
Anti-idling enforcement
Research regarding nitrogen land application efficiency

APPENDIX C – Staff Evaluations of Other Approved or Recommended Early Actions

Forestry protocol adoption
Manure digester protocol for calculating greenhouse gas mitigation
Guidance and protocols for local governments to facilitate GHG emission reductions
Guidance/protocols for businesses to facilitate GHG emission reductions
Cool communities program
Anti-Idling enforcement
Cool paints for automobiles
Cement (A): Energy efficiency of California cement facilities
Cement (B): Blended cements
Enforcement of federal ban on HFC release during service/dismantling of MVACs
Addition of AC leak test and repair requirements to Smog Check
Collaborative research to understand how to reduce GHG emissions from nitrogen land application
Specifications for commercial refrigeration
Reduce methane venting/leaks from oil and gas systems
Require low GWP refrigerants for new MACS
Hybridization of medium- and heavy-duty vehicles
Reduce sulfur hexafluoride (SF6) from electrical generation
Refrigerant tracking, reporting and recovery program
Foam recovery / destruction program
Alternative suppressants in fire protection systems
Strengthen light-duty vehcile standards
Truck stop electrification with incentives for truckers
Vessel speed reduction
Transport refrigeration units, electric standby
Stationary agricultural engine electrification

Sustainable Energy Financing District
Berkeley, California

- New variant of “on-bill” financing by a utility
- The **City** provides financing directly to home owner
- Retrofit and perhaps Solar installation done on existing building by ESCO or solar installer
- Loan repaid to the City through higher “property” assessment
  - These stay with the building if sold
- Triggers the Berkeley residential or commercial energy conservation ordinances (RECO and CECO, now applied at time of sale)