

California's New Climate Change Policy

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Climate Change as an Issue in California

- 2002: AB1493 passed to reduce GHG emissions from motor vehicles in California.
- January 2004: Governor Schwarzenegger takes office. Committed to support AB 1493 and act on climate change.
- September 2004: California Air Resources Board approves regulations to implement AB 1493.
- June 2005: Governor Schwarzenegger announces GHG emissions reduction targets for California:
 - By 2020, to reduce emissions back to the level of 1990
 - By 2050, to reduce emissions 80% below 1990

California's 2006 GHG laws

- AB 32, places a cap on all GHG emissions in California; requires that, by 2020, these be reduced to their 1990 level. A reduction of ~29% compared to BAU in 2020, and 15% compared to 2005 emissions.
- SB 1368 Prohibits any load-serving entity from entering into long-term financial commitment for baseload generation unless GHG emissions are less than from new, combined-cycle natural gas. Applies to out-of-state generators, also to municipals.

Other components

- AB 1493 Imposes emissions cap on fleet of new model vehicles sold in California.
 - Enacted 2002; regulations issued 2004
 - Near term (2009-2012): 22% reduction in GHG emissions (grams of CO₂e/mile)
 - Mid-term (2013-2016): 30% reduction in GHG emissions
- Low Carbon Fuel Standard: $\geq 10\%$ emission reduction by 2020
- CPUC Carbon adder \$8/ton
- Million solar roof Initiative. \$3.2B subsidies for solar, especially photovoltaic.
- Renewable Portfolio Standard 20% by 2010, 33% by 2020

- Taken together, these are the most ambitious and comprehensive effort to control GHG emissions in force in the US.
- They apply:
 - To all GHGs, not just CO₂ (CO₂ from fossil fuel combustion is 81% of all GHGs in CA)
 - To all sources, not just electric power plants (= 22% of all GHG emissions in CA).
- The only other binding cap on emissions is Regional GHG Initiative in 9 northeastern states (RGGI).
 - RGGI applies only to GHG from electricity; target is to reduce emissions 10% below 2005 level by 2019.

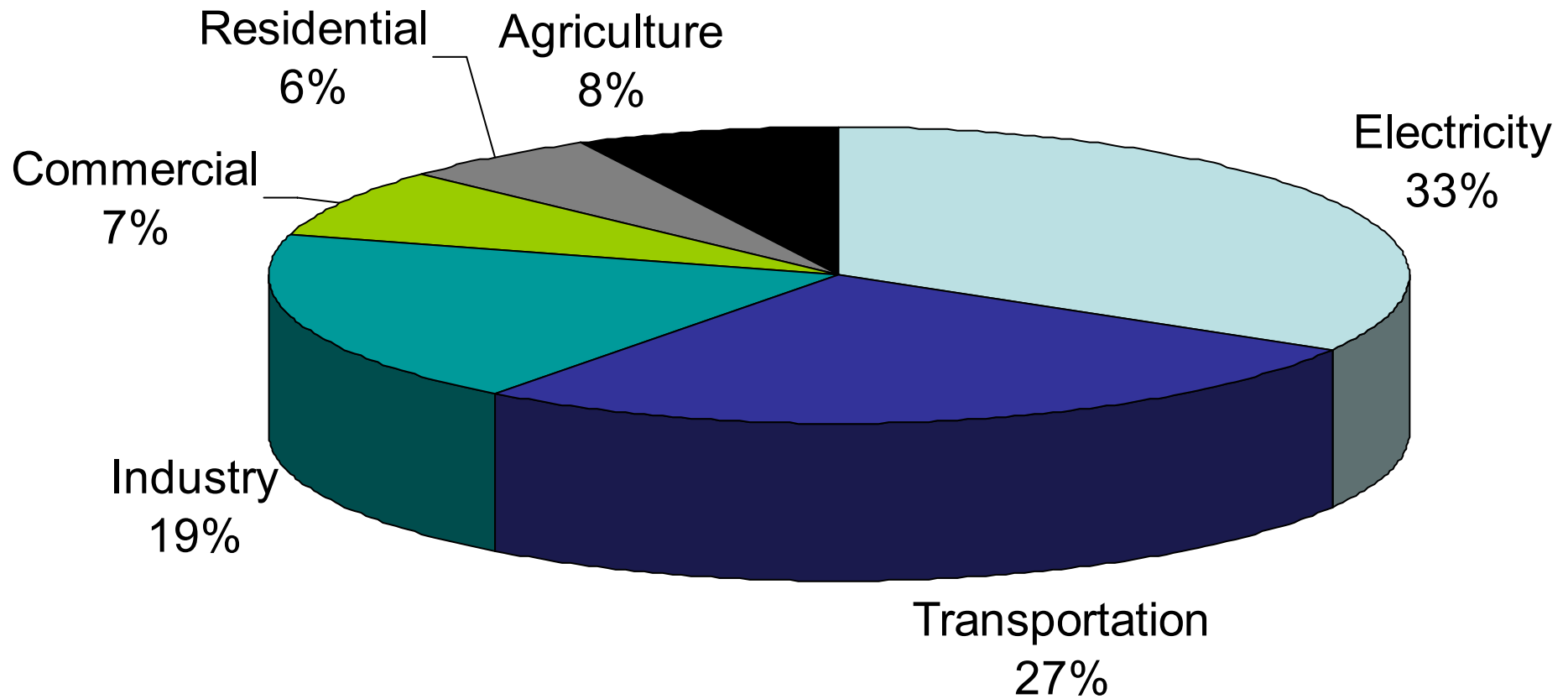
California approach

- Legislation sets ambitious goal.
- Leaves it to an agency to figure out how to attain the goal and over what time path.
- Legislation lays down some constraints – cost-effective, not disproportionately burdensome, etc – but leaves wide latitude for implementation.
- Contrast with the situation in Washington, where vested interests are more strongly entrenched and there is no commitment to action until the political economy is worked out.

The contrast with RGGI

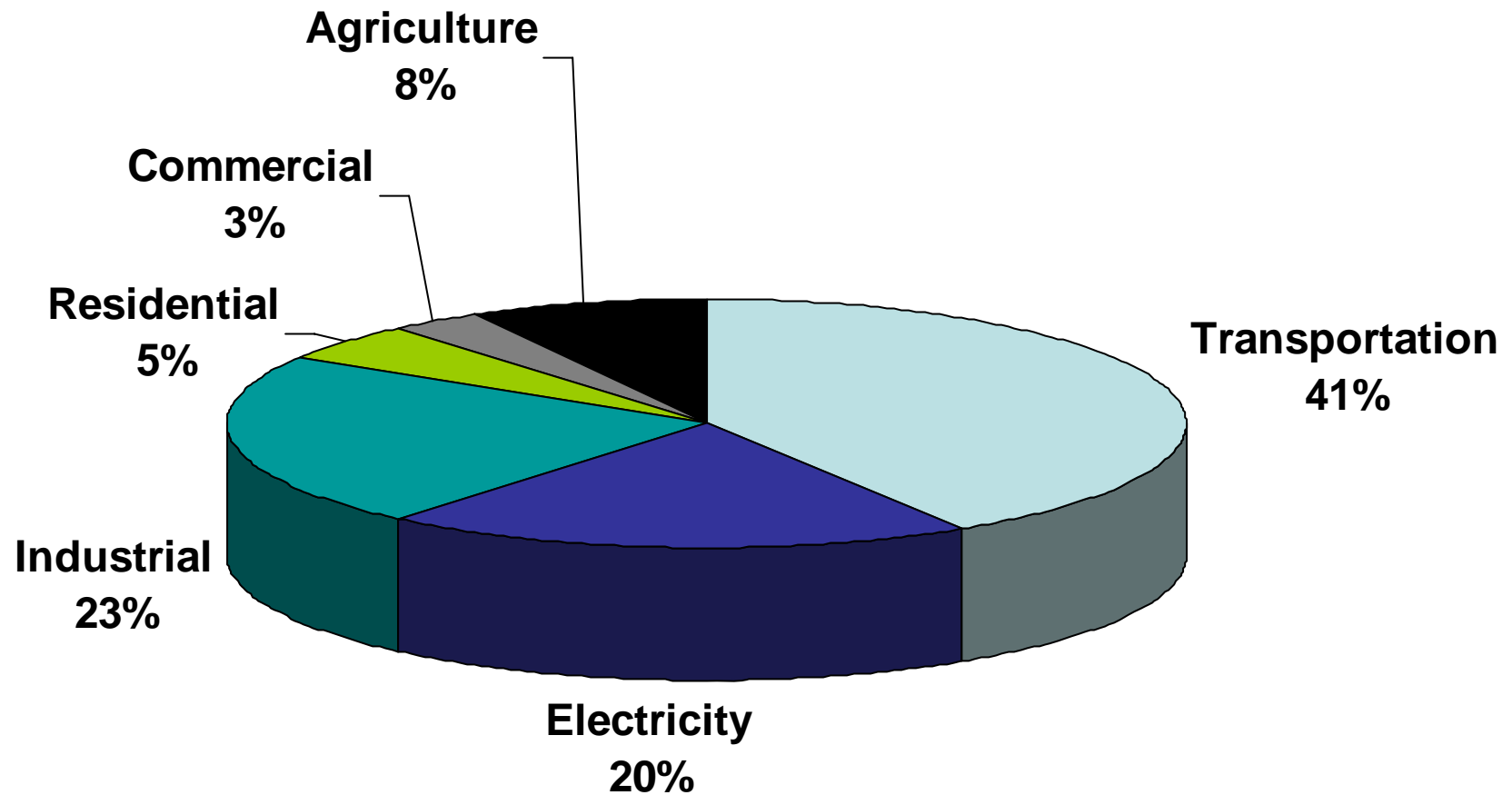
- A different inspiration
 - RGGI: SO₂ emission trading under 1990 CAA
 - CA: 1988 California regulation of automotive air pollution emissions
- A different approach
 - RGGI: emission trading
 - CA: Performance standards, efficiency standards, perhaps emission trading
- A different objective
 - RGGI: Influence federal GHG legislation
 - CA: Do the right thing for California

US Greenhouse Gas Emissions



California GHG Emissions (2002)

6.2% of US GHG emissions; 1.2% of world's emissions



California's unique history

- California has a unique history, unlike that of any other state in the US, with regard to:
 - controlling air pollution from automobiles
 - regulating energy efficiency
- In both cases, California pioneered regulatory approaches that were later copied by the federal government and applied to other states.
- This experience provided the foundation for California's new GHG initiative.

Air pollution control in California

- 1943 First smog episodes in Los Angeles.
- 1945 Los Angeles establishes Bureau of Smoke Control.
- 1947 Law authorizes creation of an Air Pollution Control District in every county. The Los Angeles County Air Pollution Control District (APCD) is established, the first in the nation.
- 1952 Dr. Arie Haagen-Smit discovers cause of smog.
- 1955 Los Angeles County Motor Vehicle Pollution Control Laboratory begins within LAPCD.
- 1959 Law for State Department of Public Health to establish air quality standards and necessary controls for motor vehicle emissions.
- 1960 Motor Vehicle Pollution Control Board is established to test and certify devices for installation on cars for sale in California

Air pollution control in California, contd

- 1961 PVC emissions controls required for new cars in sold in 1963.
- 1966 Auto tailpipe emission standards for hydrocarbons and carbon monoxide adopted by the California Motor Vehicle Pollution Control Board, the first in the nation. California Highway Patrol begins random inspections of smog control devices.
- 1967 California Air Resources Board (ARB) is created from the merging of the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory.
- Federal Air Quality Act of 1967 enacted. Allows California a waiver to set its own emissions standards based on California's unique need for controls. Other states may copy California standard if they wish.

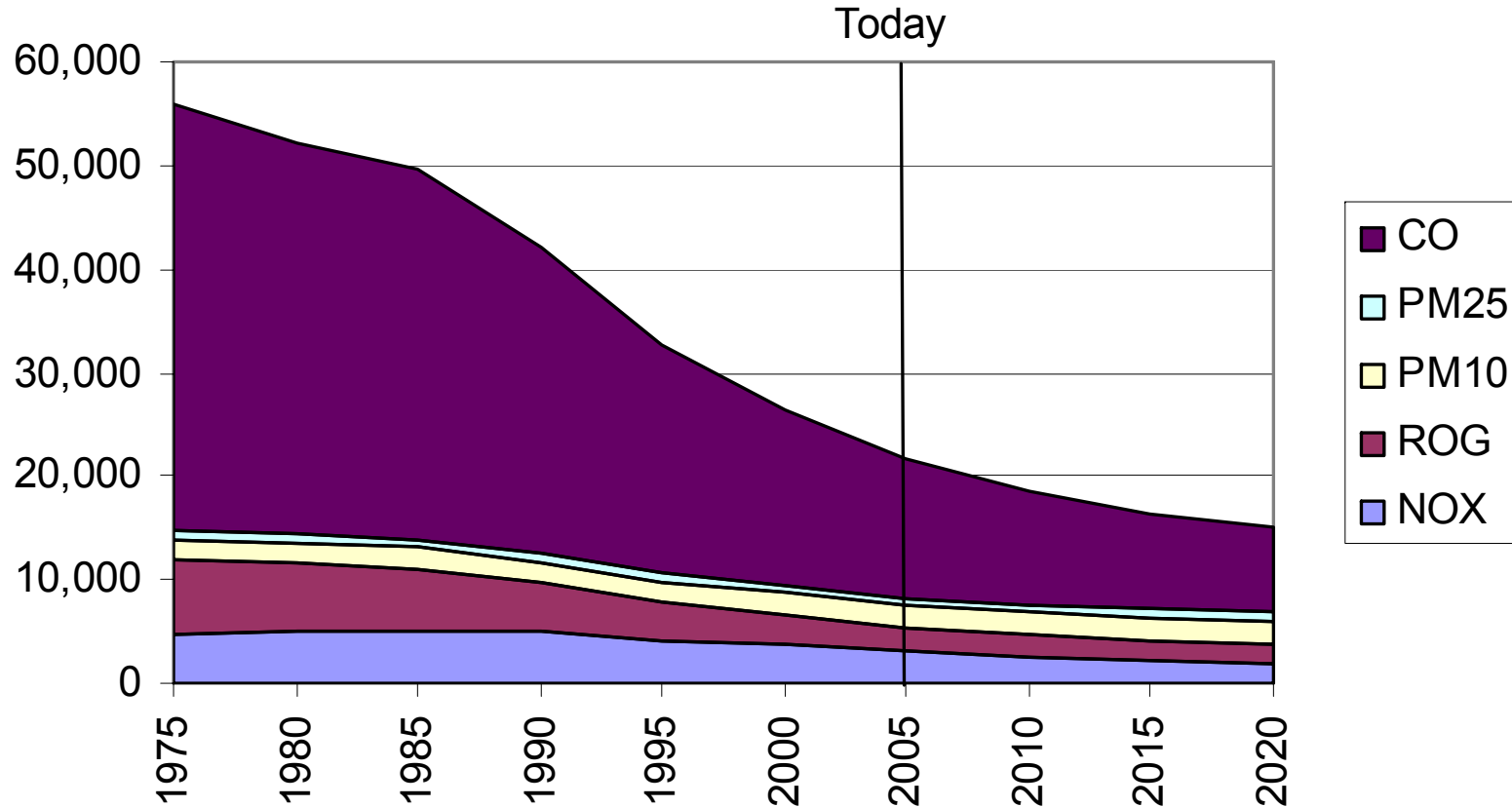
- Since 1967 a waiver has been requested and granted, in whole or in part, 53 times – until now. These include
 - the first introduction of NO_x standards for cars and light trucks (1971)
 - heavy-duty diesel truck standards (1973)
 - Two-way catalytic converters (1975)
 - unleaded gasoline (1976)
 - the low-emissions vehicles (LEV) program (1994 and 1998)
 - zero-emissions vehicles (1990)
 - evaporative emissions standards and test procedures (1999).

- The LEV program is the primary California emissions standard that has been adopted by other states. It originated from the California Clean Air Act (CCAA) of 1988, which instructed CARB to “achieve the maximum degree of emissions reduction possible.”
- In response, in 1990, CARB approved an ambitious new program of stringent exhaust emissions standards for NO_x, carbon monoxide and particulate matter, starting in model year 1994.
- Rather than requiring every vehicle to meet the same emissions standard, the LEV program introduced a fleet-based approach.
- In both the legislative language and the framing of the rule-making by CARB, AB 1493 is the direct descendant of LEV and the 1988 CCAA. In turn, AB 32 is the direct descendant of AB 1493

Air pollution control

- The population of California grew from 21.5 million in 1975 to almost 35.5 million in 2005, and the vehicle miles traveled grew from about 389 million miles per day in 1980 to 873 million miles per day in 2005.
- Yet, over this period, there has been a major reduction in the statewide emission of criteria air pollutants.

CARB Impact on Air Pollution Emissions in California (tons/day, annual average)



Source: California Air Resources Board 2005 Almanac (web)

Energy efficiency

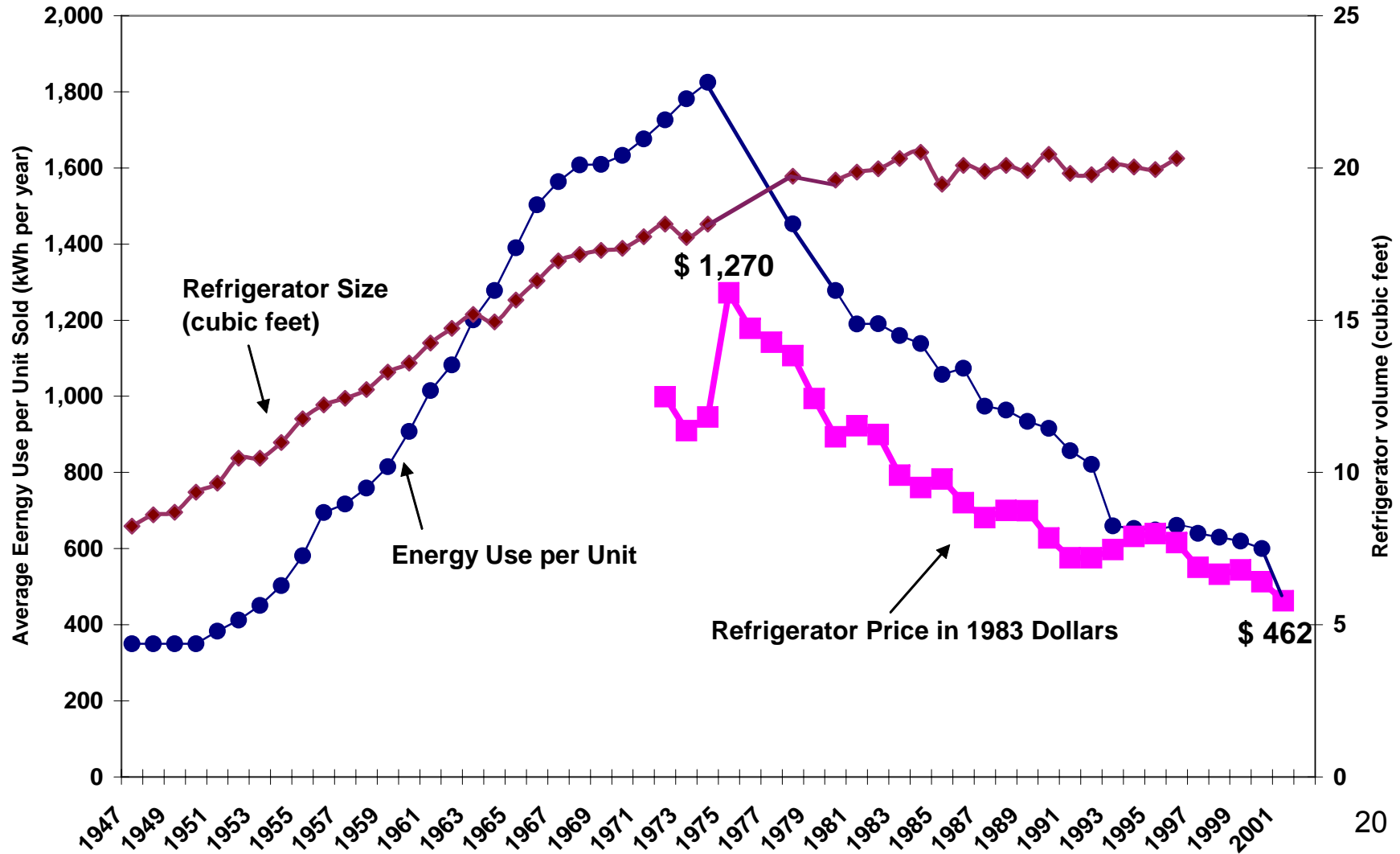
- A distinctive feature of California over the last 30 years has been its regulatory approach to promoting energy efficiency through the California Energy Commission and the California Public Utility Commission. CPUC authority applies to investor-owned utilities; CEC to municipals as well.
- The result has been a wave of regulation-induced technical change.

Energy Efficiency in California

- In 1974, the California Energy Commission was created with five major responsibilities:
 - Forecasting future energy needs and keeping historical energy data
 - Licensing thermal power plants 50 megawatts or larger
 - Promoting energy efficiency through appliance and building standards
 - Developing energy technologies and supporting renewable energy
 - Planning for and directing state response to energy emergency
- Since 1975, CEC has promulgated energy efficiency standards for buildings and energy-using appliances and equipment.

C-8	Standards for Air-Cooled Computer Room Air Conditioners.....	114
C-9	Standards for Water-Cooled, Glycol-Cooled, and Evaporatively-Cooled Computer Room Air Conditioners.....	114
C-10	Standards for Large Air-Cooled Packaged Air Conditioners.....	115
D	Spot Air Conditioner, Ceiling Fan, Evaporative Cooler, Whole House Fan, and Residential Exhaust Fan Test Methods.....	53
E-1	Gas and Oil Space Heater Test Methods.....	54
E-2	Standards for Gas Wall Furnaces, Floor Furnaces, and Room Heaters.....	86
E-3	Standards for Gas- and Oil-Fired Central Boilers.....	87
E-4	Standards for Gas- and Oil-Fired Central Furnaces.....	87
E-5	Standards for Boilers.....	116
E-6	Standards for Furnaces.....	116
E-7	Standards for Duct Furnaces and Unit Heaters.....	117
F-1	Small Water Heater Test Methods.....	55
F-2	Standards for Large Water Heaters (Effective January 1, 1994 through October 28, 2003).....	88
F-3	Standards for Large Water Heaters (New Standards Effective October 29, 2003).....	89
F-4	Standards for Large Water Heaters (Existing Standards Remaining in Effect On and After October 29, 2003).....	89
F-5	Standards for Small Water Heaters That Are Not Federally-Regulated Consumer Products.....	118

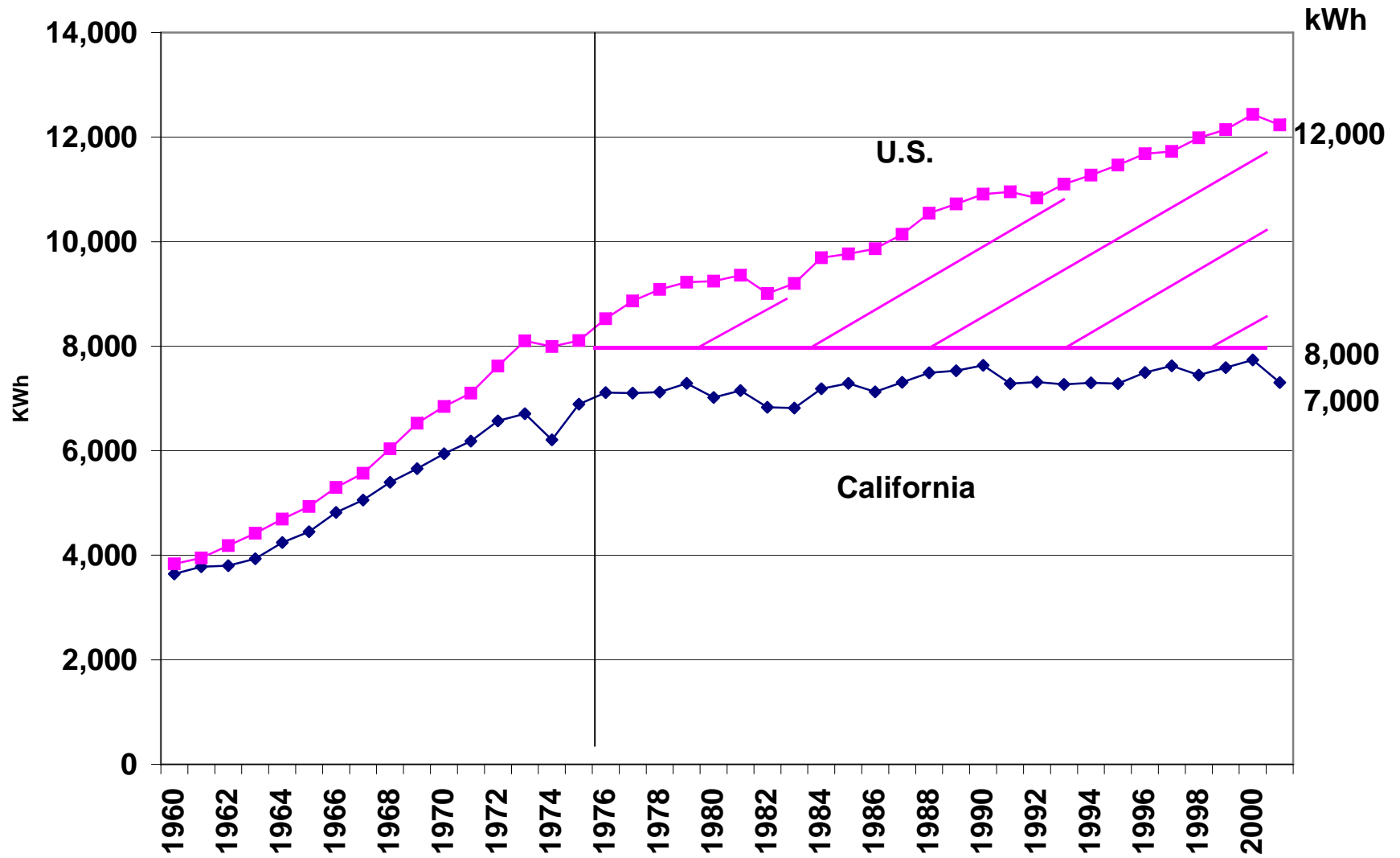
Inflation-adjusted price of refrigerators dropped from \$1270 (1974) to \$462 (2001)



California Public Utility Commission

- Regulates investor-owned electric and gas utilities.
- Has energetically pushed them to promote energy conservation.
- Adopted rate decoupling for natural gas in 1978 and electricity in 1982. Ensures that utilities receive their expected revenue even if energy efficiency programs reduce their sales.
- 2003 Energy Action plan establishes a “loading order” of preferred options for electricity : efficiency, renewables, natural gas.

Total Electricity Use, per capita, 1960 - 2001



AB 32 Schedule

- September 2006 – Law signed by Governor
- June 2007 – List of Early Action Items
- January 2008 – 2020 limit set and mandatory reporting initiated
- June 2008 – Draft Scoping Plan Released
- January 2009 – Scoping Plan Adopted, markets and regulatory scope outlined
- January 2010 – Early Action Items implemented
- January 2011 – Earliest date for markets
- January 2012 – First enforceable caps

- Working committees for technology advancement & environmental justice; public hearing process for stakeholder input.
- Implementation is occurring with active support from many sectors of business community, including (more or less) 3 major investor-owned electric utilities, Chevron, and especially Silicon Valley.
- Active NGO support
 - NRDC, Environmental Defense, Union of Concerned Scientists, Silicon Valley CEO group
 - UK Consulate has been extremely helpful
- For information:
- <http://www.climatechange.ca.gov/>
- <http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.htm>

What California is proposing

- The Draft Scoping Plan, issued at the end of June, calls for a mix including:
 - Regulatory measures
 - Performance standards
 - Best management practices
 - Hold local governments accountable in land use decisions ?
 - Emission trading
 - Downstream approach
 - Only a subset of sectors covered at first
 - Capped sectors also subject to regulatory measures
 - Technology development and promotion (for 2050 target)

Table 4: Sector Responsibilities Under Cap-and-Trade Program
 (MMTCO₂E in 2020)

Sector	Projected 2020 Business-as-Usual Emissions		Projected 2020 Emissions After Implementation of Other Recommended Measures		Preliminary 2020 Emissions Limit under Cap-and-Trade Program
	By Sector	Total	By Sector	Total	
Transportation	225	512	163	400	365
Electricity	139		94		
Commercial and Residential	47		42		
Industry	101		101		

Table 2: Recommended Greenhouse Gas Reduction Measures

Recommended Reduction Strategies	Sector	2020 Reductions (MMTCO ₂ E)
The Role of State Government <ul style="list-style-type: none"> Reduce carbon footprint Set an example 	Various	1-2 ¹⁷
California Cap-and-Trade Program Linked to WCI: Emissions cap of 365 MMTCO ₂ E covering electricity, transportation, residential/commercial and industrial sources by 2020. Shaded reductions contribute to achieving the cap.		
California Light-Duty Vehicle GHG Standards <ul style="list-style-type: none"> Implement Pavley standards Develop Pavley II light-duty vehicle standards 	Transportation	31.7
Energy Efficiency <ul style="list-style-type: none"> Building and appliance energy efficiency and conservation <ul style="list-style-type: none"> 32,000 GWh reduced electricity demand 800 million therms reduced gas use Increase Combined Heat and Power (CHP) electricity production by 30,000 GWh Solar Water Heating (AB 1470 goal) 	Electricity & Commercial and Residential	26.4
Renewables Portfolio Standard (33% by 2020)	Electricity	21.2
Low Carbon Fuel Standard	Transportation	16.5
High Global Warming Potential Gas Measures	High GWP	16.2
Sustainable Forests	Forests	5
Water Sector Measures	Water	4.8 ¹⁸
Vehicle Efficiency Measures	Transportation	4.8
Goods Movement <ul style="list-style-type: none"> Ship Electrification at Ports System-Wide Efficiency Improvements 	Transportation	3.7
Heavy/Medium Duty Vehicles <ul style="list-style-type: none"> Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency) Medium- and Heavy-Duty Vehicle Hybridization Heavy-Duty Engine Efficiency 	Transportation	2.5
Million Solar Roofs (Existing Program Target)	Electricity	2.1
Local Government Actions and Regional GHG Targets	Land Use and Local Government	2
High Speed Rail	Transportation	1
Landfill Methane Control	Recycling & Waste	1
Methane Capture at Large Dairies	Agriculture	1 ¹⁹
Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	Industrial	TBD
Additional Emissions Reduction from Capped Sectors		35.2
Total Reductions		169

- Cap-and-trade program is intended to cover 85 percent of the state's emissions.
- Propose capping electricity and industry beginning in 2012, and transportation and commercial and residential natural gas by 2020.
- Commits to "consideration" of a California Carbon Trust. This trust could be funded through allowance auction revenues, carbon fees, or public-goods charges on water.
- Key elements yet to be addressed:
 - The method of allowance distribution
 - How to apply cap for electricity -- “considering” first deliverer approach
 - Potential constraints on the system, including trading in communities with disparate environmental impacts
 - Safety valve

Offsets

- Limited to 10%??
- Highlights "projects in the Mexican border region" as an area of "particular interest, considering the opportunity to realize considerable co-benefits on both sides of the border."
- "If offsets are used for compliance purposes, the reductions must be real, **additional**, verifiable, enforceable and permanent." AB 32 does not include the term "additional." This may render carbon finance opportunities inapplicable for many renewable energy projects currently in operation or construction in California, considering their low carbon attributes may not be additional to business as usual.
- Offsets from in-state landfill and biogas capture projects and forestry projects may be sufficiently additional to qualify as compliance.

Climate litigation (Attorney General)

- Automobile industry sues in 2004 to block implementation of AB 1493. Suit finally rejected 2007.
- September 2006, AGO sues automobile manufacturers for public nuisance damages experienced by California as a result of climate change. Dismissed by judge on legal technicality; dismissal being appealed.
- April 2007, new AGO, Jerry Brown, files law suit against San Bernardino County, rapidly growing area in Southern California, for updating its General Plan without considering the impact of future urban growth on GHG emissions. Suit stirs political uproar. Suit is settled in August 2007 with the county committing itself to cutting GHG emissions attributable to its own governmental operations and its future land use decisions.
- Sets a crucial precedent for local government in California.

Climate diplomacy

- A distinctive and deliberate component of Schwarzenegger's strategy, starting with visits to the UK in fall, 2004.
- Builds on predecessor's agreement in 2003 with Oregon and Washington to collaborate in GHG emissions.
- Vigorously expanded by Schwarzenegger into Western Climate Initiative.
- Serves as means of limiting potential leakage and creating a political front as well as broadening an emission trading market.

Western climate initiative (WCI)

- Launched in February 2007 by Governors of Arizona, California, New Mexico, Oregon and Washington.
- Utah, British Columbia and Manitoba joined in Spring 2007; Montana in January, 2008; Quebec in April, 2008; and Ontario July, 2008. Other US and Mexican states and Canadian provinces have joined as observers.
- Goals are to:
 - Collectively reduce GHG emissions 15 percent below 2005 levels by 2020 (essentially AB 32)goal);
 - Create a regional Climate Registry by January 2008;
 - Design a “regional market-based multi-sector mechanism” by August 2008.

WCI members Aug 2008

