

California's Efforts to Reduce Greenhouse Gases through State and Local Action

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The US Doesn't Have A Climate Change Policy – But California Does

- California has adopted a series of laws and policies to tackle climate change:
 - Energy-efficient buildings
 - lower-emissions industrial processes
 - more fuel-efficient transportation vehicles
 - cleaner fuels
- However, to attain the targeted reductions, California must find additional strategies to reduce greenhouse gas emissions, especially from the transportation sector
 - further increase transportation efficiency
 - shift transportation to less CO2 intensive modes
 - slow or reverse growth in VMT.
 - A second CA law incentivizes these changes.

California's climate change program is rekindling interest in urban planning and analysis:

- methods for quantifying travel changes and emissions reductions, ranging from spreadsheet approaches to integrated transportation land use models.
- Transportation supply, pricing, and regulatory measures and land use policies that could reduce overall travel.

BUT

- Emissions reduction in the face of continued growth is a major challenge
- Political will and institutional capacity to change, and change fast enough, remains in question.

Some Facts about California

- Current Population: 38 M
- economy about the size of France or Great Britain
- Growth Projections: 50 M by 2025-2030, 66 M by 2050, possibly approaching 100 M by end of century
- Land Area – about the size of Japan



Greenhouse Gases in CA

- World's 10th -12th largest emitter of greenhouse gases (6.2% US emissions, 12% pop.; but 1.4% world emissions, 0.6% world pop.)
- Relatively clean power
- Mild climate in coastal areas – moderate heating and cooling needs

BUT

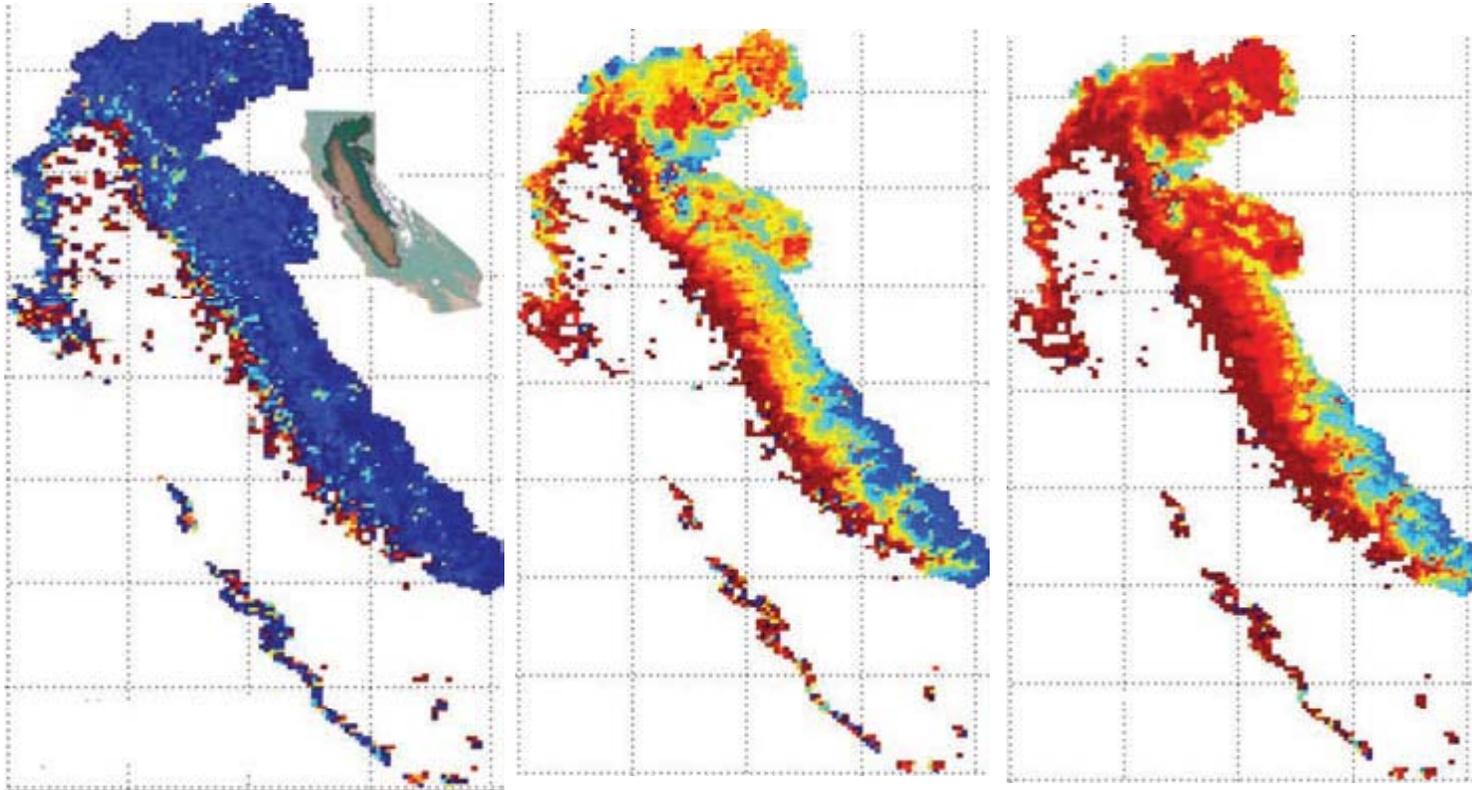
- Transportation: almost 40% of latest GHG inventory; share is probably lower than usual because of recession

GHG Risks to CA

- Loss of 30 - 90% of snowpack – major source of drinking & irrigation water
- Increases in wildfires
- Sea level rises and damage to coastlines
- Heat waves could become more common
- Smoggy days could increase if demand for electricity soars in summers



April snow water equivalent under projected temperature increases 2030, 2060, 2090



Projected temperature increases: 0.6°C (2020–2039), 1.6°C (2050–2069), and 2.1°C (2080–2099), expressed as a percentage of estimated present conditions (1995–2005). SWE is snow water equivalent.

Early Initiatives: Voluntary and Regulatory

- **Green Building Standards:** construction materials and practices, appliances, lighting, HVAC standards
- **State leadership** in building design and location, reduction in energy use
- **California Climate Action Registry:** voluntary reporting of direct and indirect greenhouse gas emissions by private and public sector
- **Electric Utility Renewable Portfolio Standard:** 20% of utility retail sales of electricity by 2017, or an increase of at least 1% per year.
- **Utility GHG Analysis in Procurement:** analyze GHG impact in procurement decisions (triggers requirements for mitigation under CA environmental law); report GHG emissions as condition for new licensing

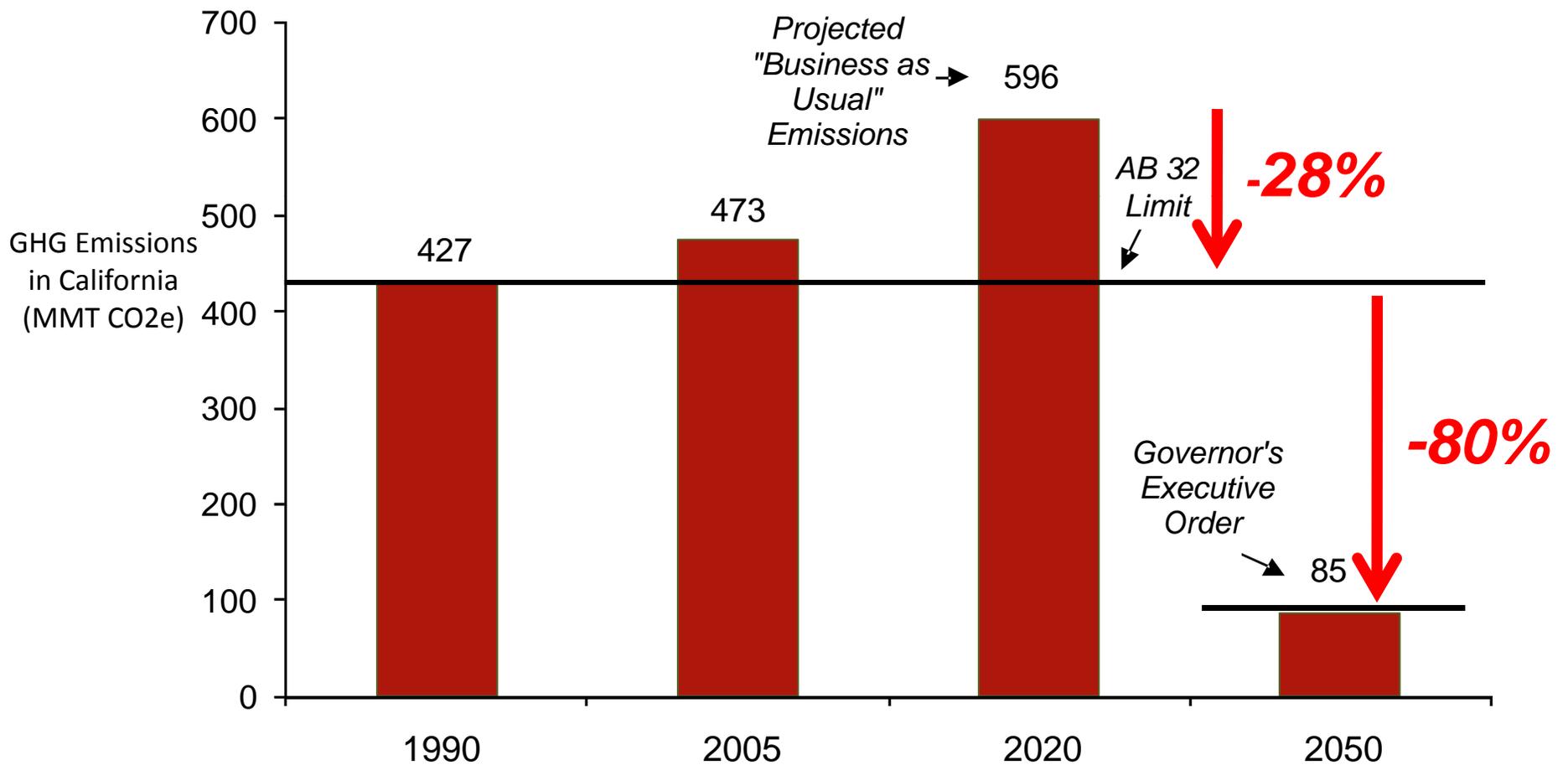
2002 Legislation to Reduce GHG from Cars & Light Trucks -AB 1493 (Pavley)

- Authorized the California Air Resources Board (CARB') to regulate light-duty motor vehicle emissions of GHGs - regulations issued in 2004, to take effect in 2009.
- 11 other states signed on to join CA in requiring these standards
- Automakers filed lawsuits - claimed CO2 not a pollutant - lost
- CA had to request waiver from US EPA to have its own tougher standards – requested in 2005, but EPA stalled , finally denied the request in late 2008.
- Obama Admin reversed – granted waiver June 30, 2009
- New requirements issued 2010 will reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016
- Next steps – add in plug-in hybrids and zero-emission vehicles

AB 32- CA Global Warming Solutions Act of 2006 & Executive Order S-3-05

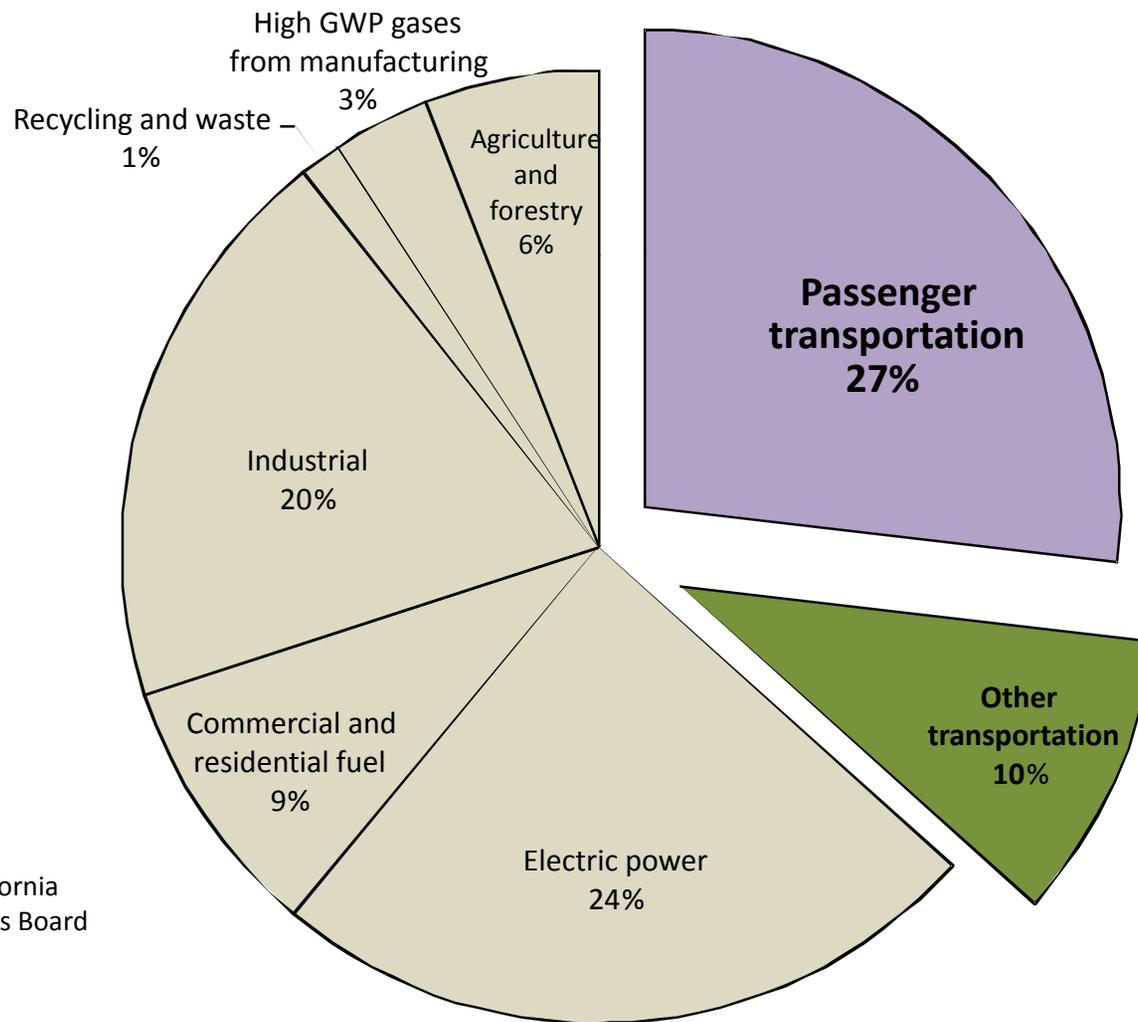
- Enforceable reduction in greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) -- same as in Kyoto Protocol
- **State-wide enforceable reductions of GHG to:**
 - **2000 levels by 2010 (11% below business as usual)**
 - **1990 levels by 2020 (25% below business as usual)**
 - **80% below 1990 levels by 2050 (EO S-3-05)**
- CA Air Resources Board is lead agency for implementation – treating GHG as another form of pollution

AB 32 calls for deep GHG reductions in all sectors



Source: California Air Resources Board

Transportation emissions are the largest source of GHGs...



Source: California Air Resources Board

Cap and Trade Program

- Already in use in New England Consortium
- CA : an overall limit on GHG emissions from capped sectors will be established and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs. CARB must adopt the cap-and-trade regulation by January 1, 2011, and the program itself must begin in 2012.
- CARB is working with six other western states and four Canadian provinces through the **Western Climate Initiative (WCI)** to design a regional cap-and-trade program that can deliver GHG emission reductions within the region at costs lower than could be realized through a California-only program.

Low-Emission and (Near) Zero-Emission Vehicles

- The next round of emissions standards will integrate requirements for reducing smog and greenhouse gas emissions into the Low-Emission Vehicle (LEV) III regulations, giving auto engineers a clear target for meeting environmental standards over the next 15 years.
- Pathway to even lower emissions: CARB plans to integrate its “zero-emission” vehicle requirements into the standards: battery electric, fuel cell and plug hybrid electric vehicles.

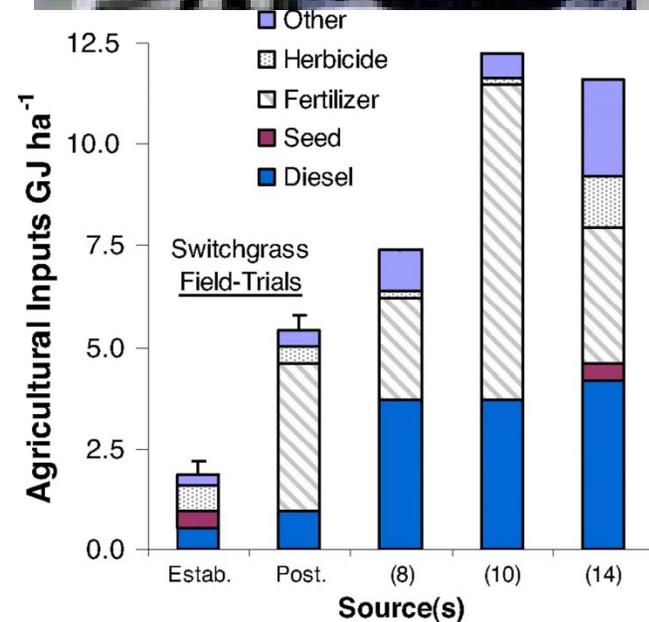


Low Carbon Fuel Standard

requirement: oil companies and other fuel providers must reduce GHG emissions of transportation fuels by at least 10 percent by 2020 (becomes effective end of 2010)

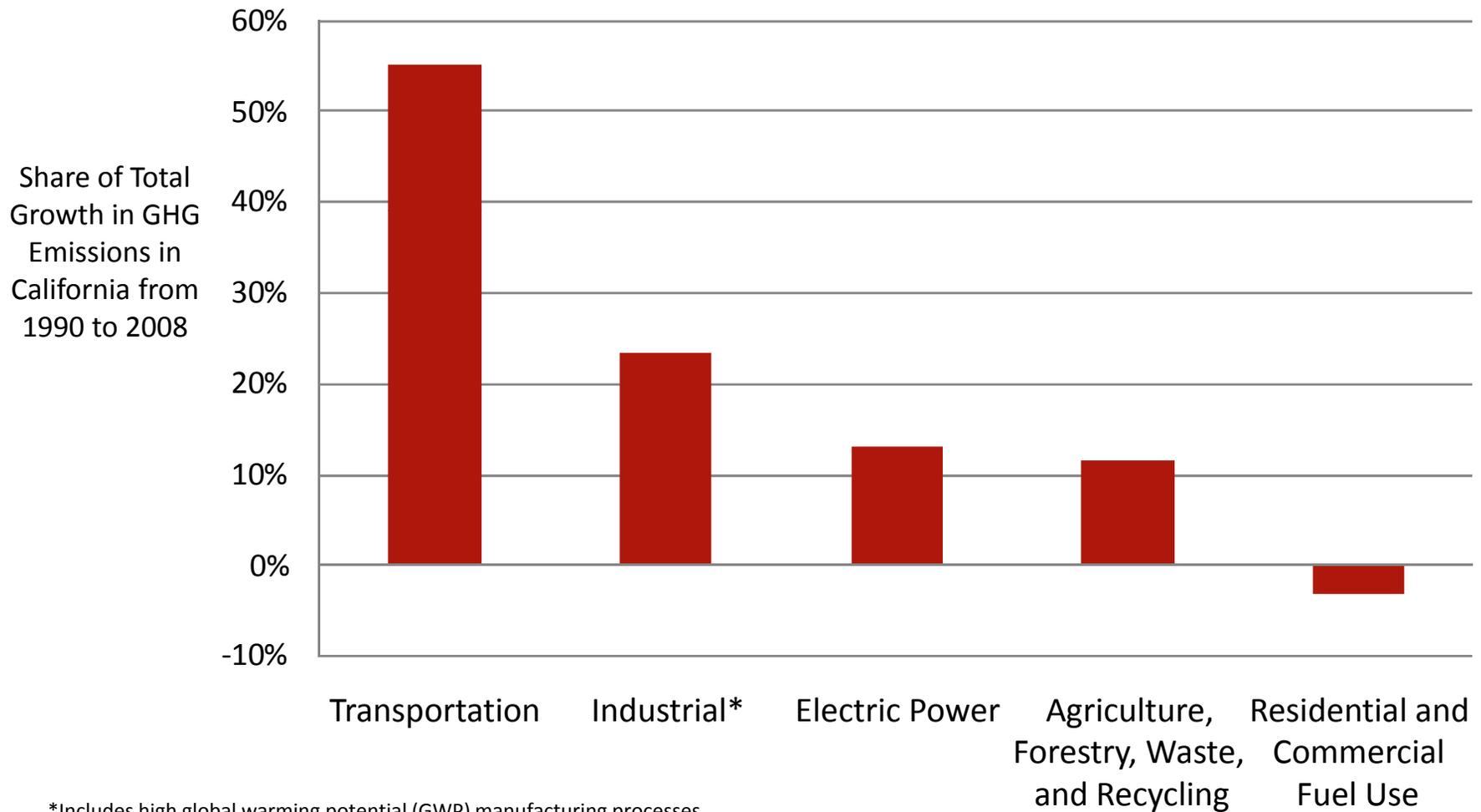
providers will choose how they reduce the carbon intensity of their products:

- blending low-carbon biofuels into conventional gasoline
- selling low-carbon fuels such as hydrogen
- buying credits from providers of other low-carbon fuels (such as low-carbon electricity or natural gas)
- Encouraging plug-in hybrids and other ZEVs



Schmer M R et al. PNAS 2008;105:464-469

...and growing fastest.



*Includes high global warming potential (GWP) manufacturing processes

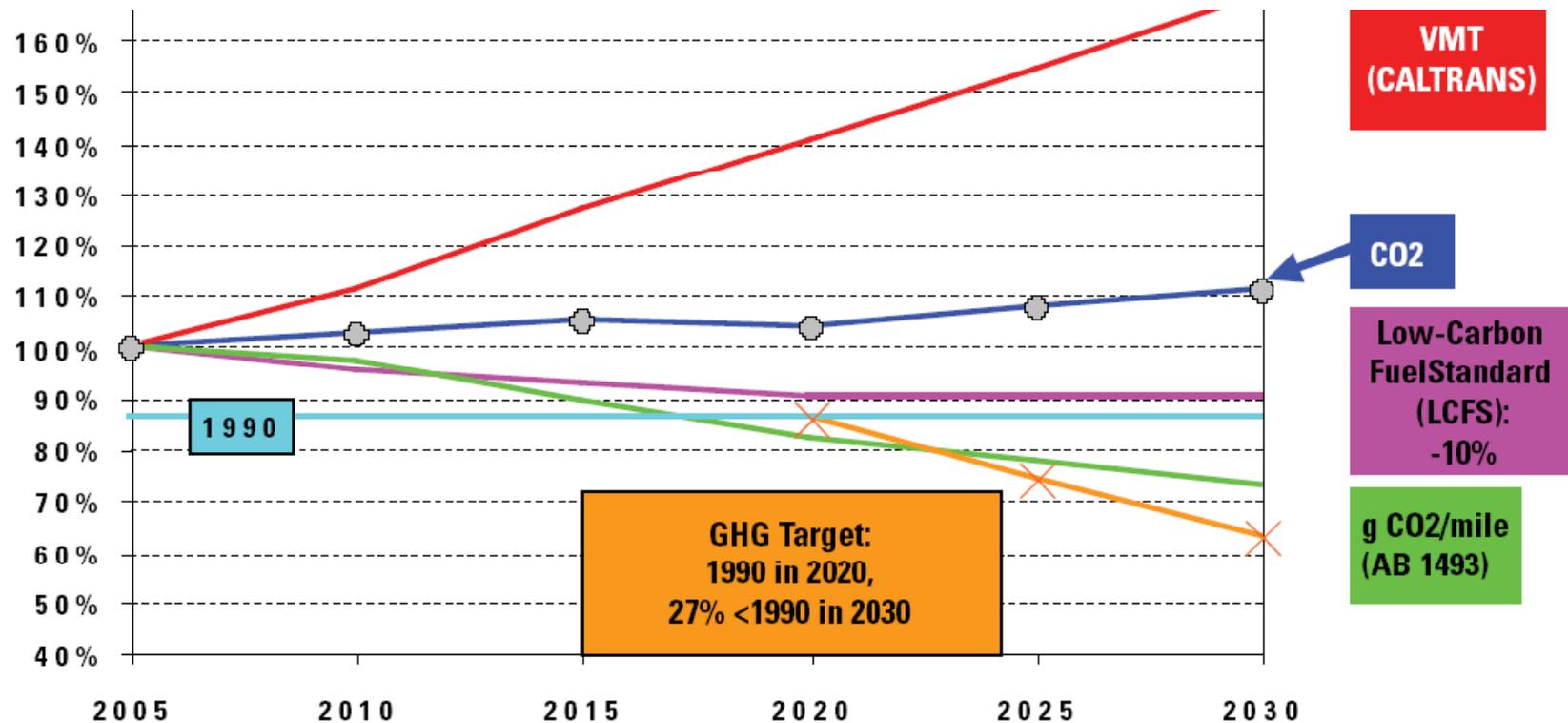
Source: California Air Resources Board

CA Transportation Emissions - 2007

- 62% gasoline (almost all private vehicles)
- 19% distillates (mostly trucking)
- Most of rest - jet fuels (regulated by international law)
- Business as usual forecasts: VKT will increase faster than population or economic activity



Rising VMT threatens to overwhelm GHG savings from cleaner fuels and vehicles



What's driving VMT growth?

- Population growth
- Economic growth
- Development at urban fringe and beyond
- Development a long way from job centers
- Low density development – too spread out to walk or bike
- Single use development – nothing much to walk or bike to

SB 375 – Plans and Incentives to Reduce VMT (VKT)

- Requires ARB to set regional GHG emissions reduction targets, in consultation with stakeholders; updates every 4- 8 yrs through 2050
- Requires metropolitan planning organizations (MPOs) to develop **sustainable communities strategies (SCSs)** to reduce GHG, align housing & transportation, create implementation incentives to achieve AB 32 targets
- Requires analyses of plan's success (monitoring and feedback) and revision of targets if needed, BUT no ability of ARB to mandate strategies

SB 375 Cont.

- Requires rezoning for increased density to meet “fair share” housing requirements and maintain affordability long term (30-55yrs)
- Promotes TOD: mixed use development within 20 min walk of transit
- Provides relief from some environmental analyses for projects that meet planning requirements and reduce GHG

Summary: California GHG Policy Today

- Through a series of legislation and regulatory initiatives, California has essentially adopted the Kyoto Protocol
- California has started to implement GHG reduction strategies through regulations on industry, power production, transportation, and highly potent GHG emissions.
- California has established new standards for MV emissions and fuel carbon content
- California has enacted laws to reduce VMT
- SO...
- **HOW'S IT GOING?**

2020 targets can be met, but 2050?

- Cleaner fuels and more efficient vehicles should be enough, together with controls on industry and power plants (etc.) to meet the 2020 targets
- the emissions standard alone will cut GHG emissions by ~30 MMTE in 2020 (18% reduction) and over 50 MMTE (27% reduction) in 2030.
- This is not quite transportation's proportional share of emissions reductions, however, and reduced VMT growth seems necessary to achieve the 2050 targets

SB 375 to the rescue?

- SB375 has ambitious goals:
 - “The nation’s first law to control greenhouse gas emissions by curbing sprawl” (*NYT*, 11-6-08)
 - Counts on MPOs to be able to develop sound sustainable development strategies to meet mandated GHG reduction targets, and to convince or incentivize locals to go along

...but its means are modest.

To parody Teddy Roosevelt: Speak loudly but carry a little stick?

- Law does not create negative consequences for local govts. who do not cooperate (through regional agency and state govt could make certain programs only available to those who comply with regional SCS)
- MPOs are governed by local elected officials (council of govts. model) - so in some sense would have to enforce against each other
- Targets set for regions after negotiations with CARB: based on PER CAPITA reductions rather than total regional reductions : 7-8% reductions from 2005 levels by 2020 over and above motor vehicle and fuel impacts, ~15% reductions by 2030 (major metro areas only)
- Few incentives available at this time
 - Streamlining of environmental reviews more valuable to developers than cities
 - State has cut funds for transit, redevelopment because of budget problems
 - Fiscal constraint makes supportive local infrastructure difficult (sewers, transit)

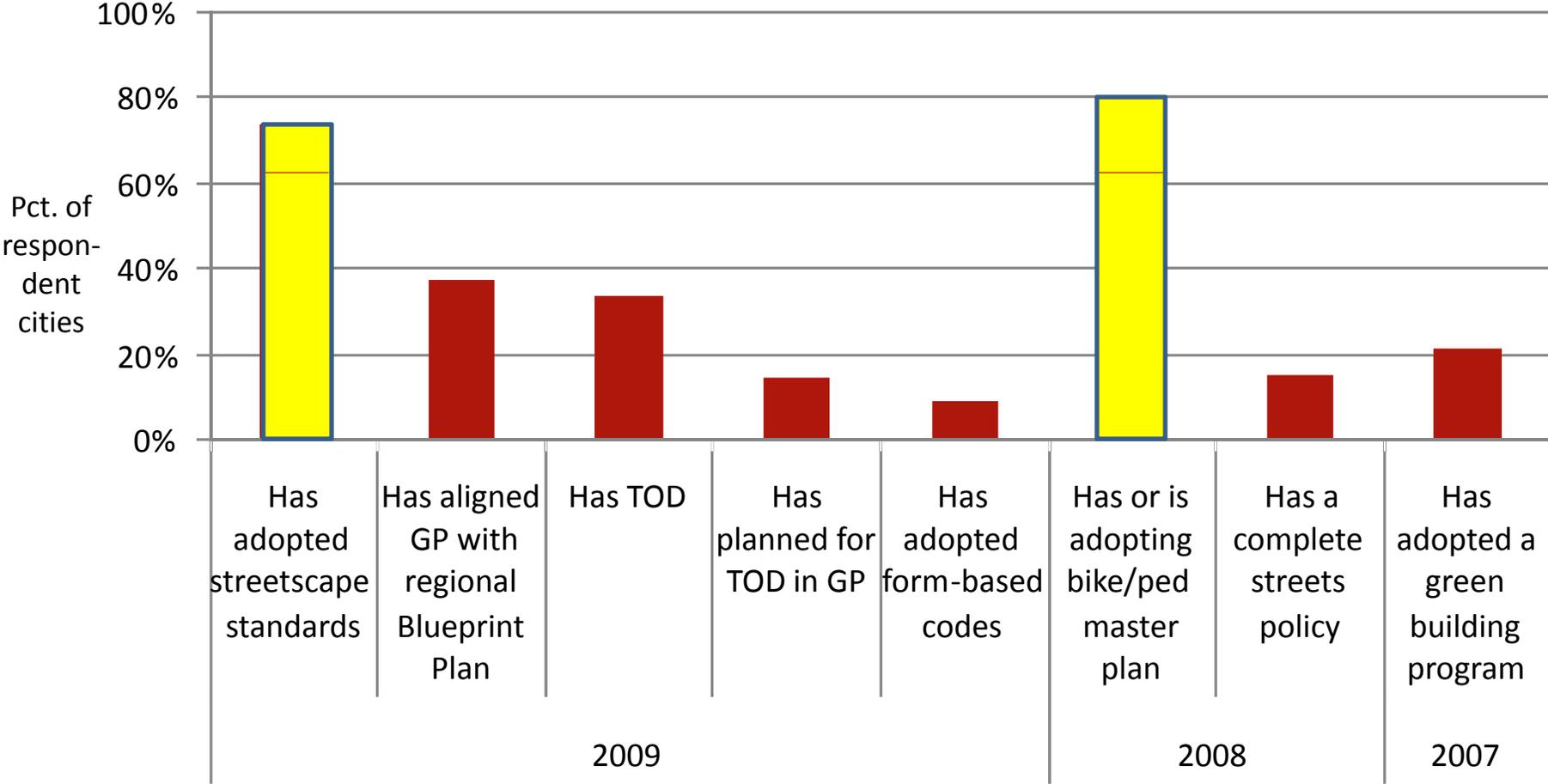
Still - most California cities are adopting climate policies (based on surveys in 2008 & 2009)

	<u>Pct. of Cities</u>	<u>Survey Year</u>
Conducts CEQA analysis of climate effects of projects	76%	2008
Has adopted or is adopting climate or GHG policies or programs	76%	2009
Has adopted	17%	2009
In progress	59%	2009
Has adopted climate change or GHG language in General Plan	29%	2009
Has adopted a GHG emissions baseline	27%	2009
Climate action plan	15%	2009

Survey Findings: Local Govt. Actions

- Mitigation of GHG as part of project environmental review and approval: 76%
- In compliance with regional “blueprint” plans – early sustainability strategies: 38%
- Green building requirements over and above state code reqts: 22%
- Bike, ped plans: 80%
- TOD plans: 37%
- Full climate action plan: 15%

Most cities have streetscape and bike/ped measures...but not too much more than that.



How does climate policy activity vary by city type? (surveys and interview findings)

- Cities that have aligned their General Plan with the regional Blueprint
 - Are major job centers , including suburban jobs centers
- Cities with Climate Action Plans and TODs
 - Are large job centers with high-income, white, Democratic residents
 - Have denser, more expensive, older housing, and higher shares of residents and city workers who commute by transit

Politics, geography, and affluence influence TODs and CAPs, while density and transit influence regional coordination

	<u>Has TODs</u>	<u>Has CAP</u>	<u>Has Aligned GP with Blueprint</u>
Population (log)	+ **		
Percent of Population That Is Not White-non-Hispanic		- **	
Ratio of # Jobs to # Residents Who Work (log)			
Percent of Population 25 or Older with a BA or Higher Education			
Median Household Income (log)			
Percent Registered Democratic		+ ***	
Housing Unit Density (2000) (log)			+*
Percent of Homes That Are Single-Family Detached			
Percent of Homes in Buildings with 10+ Units			
Median Reported Home Value			
Median Year Housing Stock Was Built			
Percent of Residents Who Commute by Transit (log)			
Percent of City Workers Who Commute by Transit (log)			+ ***
Has TOD	na		
Regional Dummy Variables: Bay Area, Sacramento Metro Area, San Joaquin Valley, Los Angeles Area, San Diego Area			
SF Bay Area	+ **		

* Indicates significant at p<.10, ** significant at p<.05, *** significant at p<.01

Sources: Governor's Office of Planning and Research, 2006-08 American Community Survey, 2000 Census

Interviews confirm there are opportunities and challenges

- CAPs provide benefits
 - Coordinate and prioritize smart growth policies
 - Support existing plans for infill
 - Can use for plan-based CEQA mitigation
- But many obstacles remain
 - Market interest, NIMBYs sometimes pose obstacles
 - But the main problem is financing for infrastructure and amenities (e.g. sewers, transit, parks)
- SB 375 promising but weak
 - Has prompted broader conversation
 - But is an “unfunded mandate”
 - A zero-sum game - central cities vs. outlying communities

CAPs need improvement

- Inconsistent methods
 - How to count transportation emissions (e.g., how do you allocate at a city level the impact of intercity and inter-jurisdictional trips? through Count all trip origins?)
 - How to account for regional mitigation –e.g. how to account for infill that allows less development in more auto oriented locations?
- Need to quantify implementation measures' effectiveness
 - Identify estimated emissions reductions, costs, and timeline for each measure
 - Account for cumulative impact of overlapping measures, alternatives including pricing and land use
 - Simple elasticity models and summation or advanced integrated land use transportation modeling (black box concerns vs. over simplification?)
 - Tracking and monitoring effectiveness

Conclusion

- California cities are developing climate policies
- They are responding to the new state requirements, but their efforts are still largely uncoordinated and un-standardized
- The challenges are formidable
 - Technical
 - Financial
 - Institutional

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