



# California's Climate Law: What's Missing Is What Matters Most

W. David Montgomery



INTERNATIONAL

American Enterprise Institute  
Washington, DC  
June 28, 2007

# CRA Analysis of California Climate Policy Issues

- **Guiding questions**

- Will AB 32 impose a cost on the California economy?
- How can AB 32 and SB 1368 be implemented to avoid unnecessary costs and unanticipated effects?

- **Most sophisticated modeling of California policies**

- State of the art economic model of California
- Detailed model of electricity capacity expansion and dispatch

- **Concentration on elucidation of issues**

- How large are the economic stakes in getting the design right?
- What are the key design choices?
- What are the potential unintended consequences for energy markets outside California?

# Principal Findings

- **Greenhouse gas controls will impose costs on California**
- **Cap and trade beats command and control**
  - The high costs of sector specific regulation
  - Layering regulation atop cap and trade
- **Uncertainty about future policies and goals matters now**
  - Near term consequences of long term expectations
  - Costs of regulatory uncertainty
  - Only radically new technologies can make 80% goal feasible
- **Cost risks are high without a price safety valve**
  - Risks of unexpectedly high abatement costs
  - Unnecessary carbon price volatility
- **Other cap and trade design issues**
  - Broad coverage is impossible with a downstream system
  - Offsets can reduce but not eliminate costs
  - Linkage to other systems can produce unexpected results
- **A state cannot efficiently regulate emissions outside its boundaries**
  - Importance and difficulty of policy toward electricity imports
  - Current approach cannot avoid perverse consequences

# Development of California's Climate Rules – What's Missing Is How To Do It

- **Executive Order S-3-05**
  - Targets for 2010 – 2050
  - Agencies develop proposals and recommendations
- **AB 32 – leave it to CARB**
  - A cap on total ghg emissions at 1990 levels to be achieved in 2020
  - Timeline for implementation with requirements for various studies
  - No real direction on content of implementation
- **SB 1368 -- a transitional requirement?**
  - Emission performance standard for power purchased under long term contract by IOU's and munis
  - To be put in effect in 2007 and later reconciled with mandatory caps
- **EO S-20-06 – back to markets?**
  - The governor's response to opposition to market based approach
  - Market Advisory Committee to recommend market based measures

# How We Did the Study

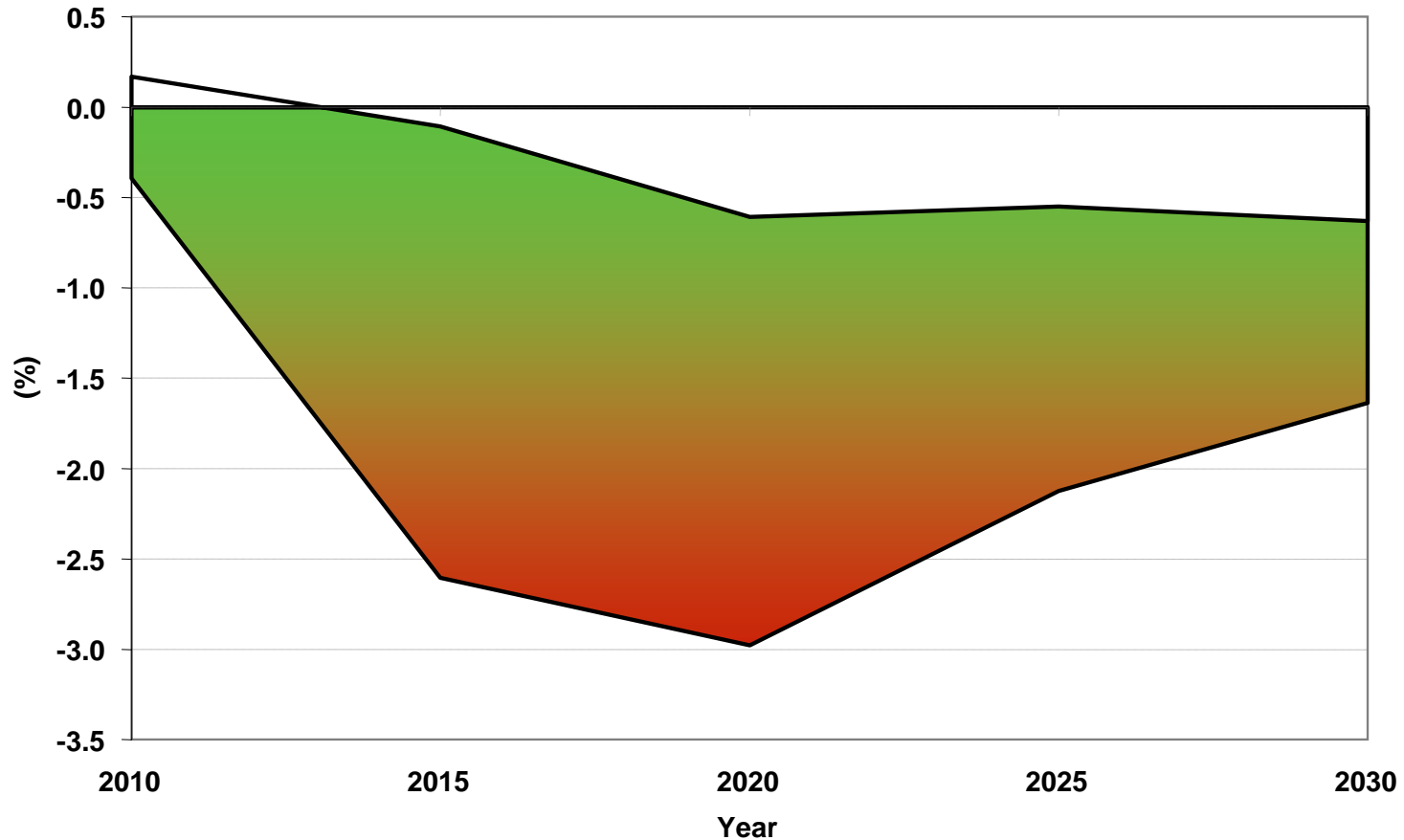
- **To support policy design a model must provide insights into changes in behavior and market responses**
- **Questions about policy design raised by AB32, SB1368 and EO S-20-06**
  - Broad design choices
  - Details of how the electricity sector will be regulated
- **Capabilities required to compare different policy choices**
  - How incentives are altered and how markets will respond
  - Representation of decisions at a level of detail appropriate for comparison of the proposed policies
- **CRA's MRN-NEEM model provided these capabilities for the first time in the California debate**

# What Kind of Modeling Capabilities are Required?

- **Sound treatment of economic decisions and markets:**
  - Household and business decisions based on rational economic calculations
  - Complete accounting for factor inputs so that all costs are accounted for
  - Supply and demand equilibrium that supports efficient use of limited resources unless there are specific market failures represented in the model
- **Detail sufficient to differentiate the impacts of alternative policy approaches**
  - Detailed representation of the electricity sector since this sector is the subject of the most complex and critical regulatory interventions, especially in the near-term
  - Explicit treatment of key technologies whose availability influences costs of meeting targets, such as nuclear power, CCS, and transportation fuels
- **Time horizon long enough to account fully for effects of policies on investment decisions**
- **Impossibility of outsmarting agents about future price trends and policy decisions**
- **Sufficient regional and sectoral detail to capture important consequences for the rest of the United States**

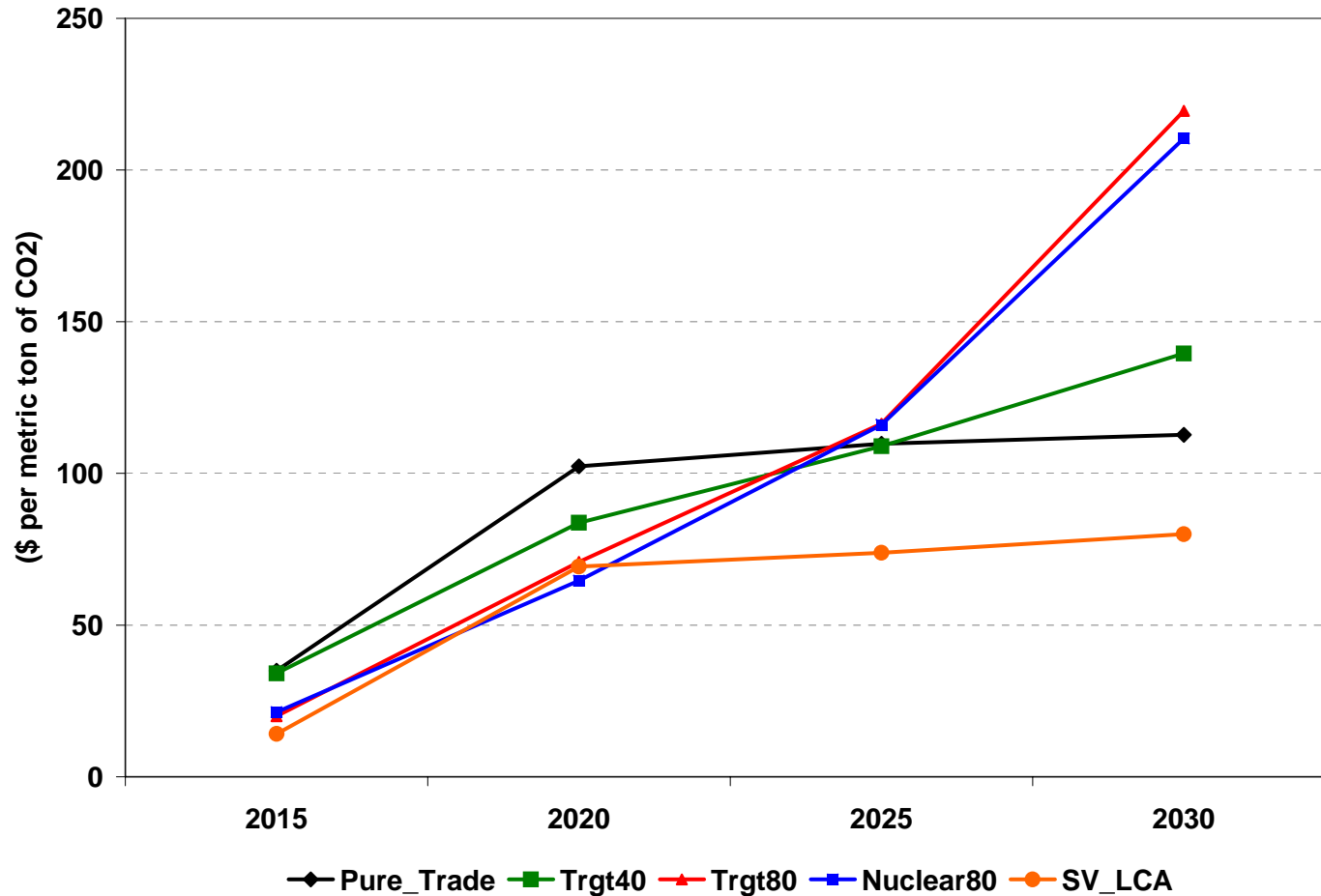
# There Will Be A Cost

Range of Impacts on California Gross State Product  
for All Scenarios (Percent Change from Baseline)



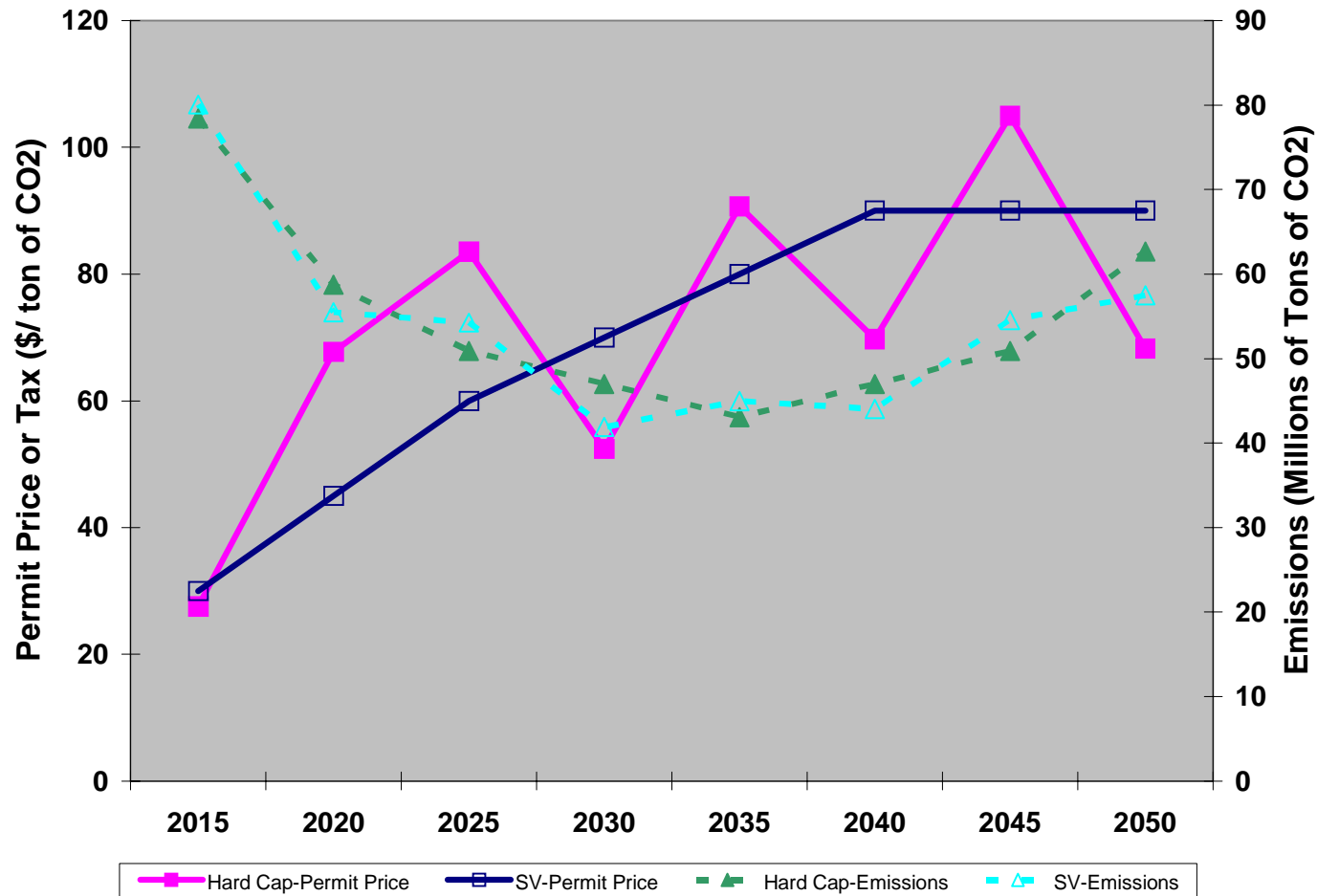
# Carbon Prices Depend on Policy Design and Outlook

## Price of Carbon Allowances Under Alternative Scenarios



# Price Volatility Is Likely to Be A Problem Under Hard Caps

Comparison of Variability in Carbon Prices and Emission Levels Between Price and Quantity Approaches

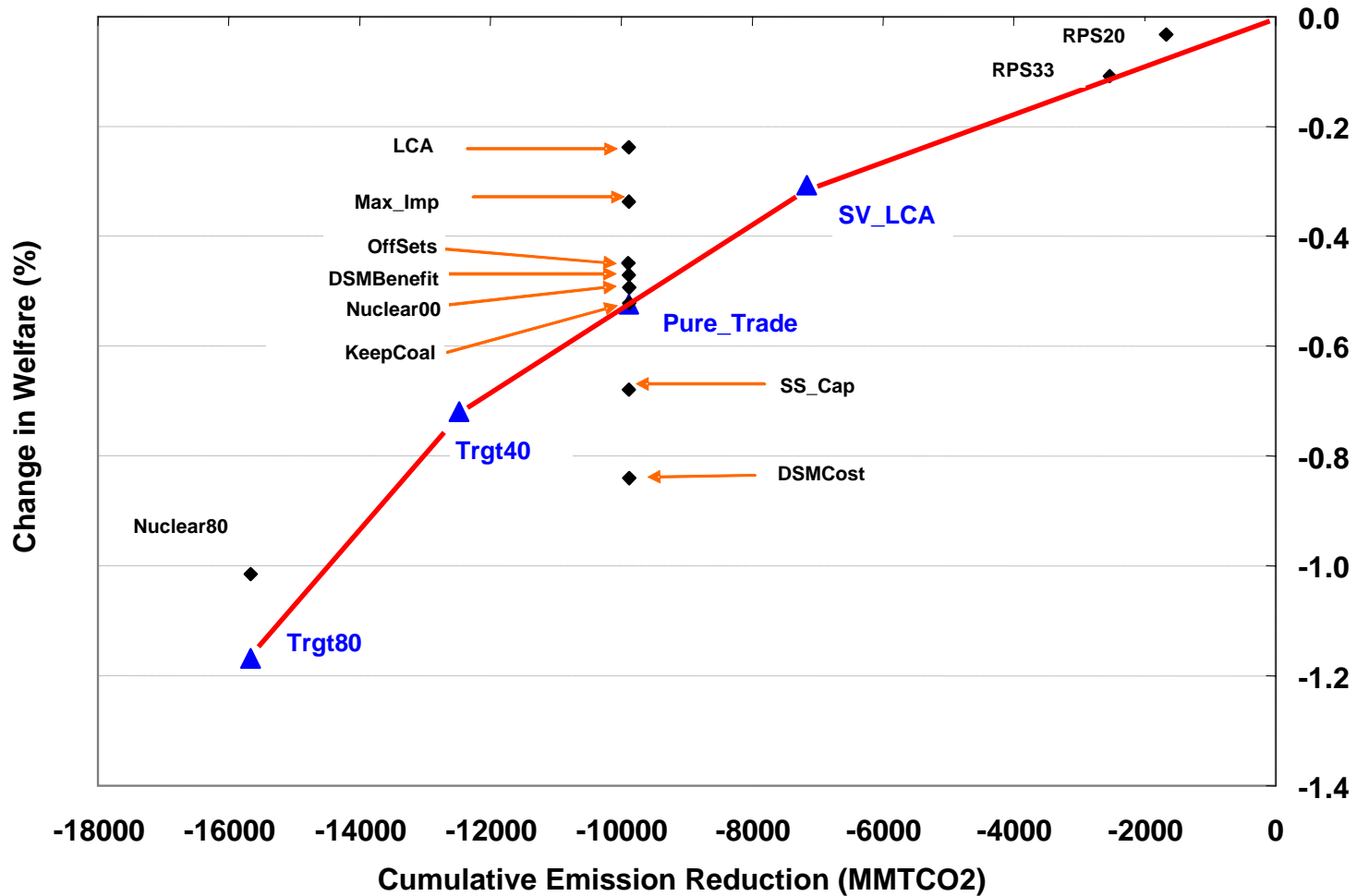


# Safety Valve – Why Is It Missing and What Could It Accomplish?

- **Claims that achieving California’s climate goals could benefit the state economy appeared immediately after their announcement**
  - Economic modeling was based on studies by state agencies that concluded that a set of largely regulatory policies would have low costs and large benefits
- **Basing targets on optimistic cost projections can produce a nasty surprise if the optimism is unfounded**
  - Accepting a safety valve based on the optimistic cost projections would guard against this possibility
- **Our safety valve case did just this**
  - Accept a set of optimistic assumptions about cost of new technologies and energy efficiency
  - Calculate carbon price to meet targets based on these assumptions
  - Use this carbon price as a safety valve using standard cost assumptions
- **Result – safety valve can reduce costs by almost 50% if optimism turns out to be unfounded**

# Policy Design Matters

Range of Impacts on California Economic Welfare for All Scenarios (Percent Change from Baseline)



# Restrictions On Trading Raise Costs

- **It is difficult to model the true economic cost of hybrid policies or restrictions on trading**
  - A broad cap and trade system or carbon tax minimizes cost by providing an incentive for every decision that has an effect on greenhouse gas emissions
  - Regulatory approaches fall short because California ARB cannot anticipate all the circumstances and information available to each of the 20 million residents of California
  - Unfortunately, neither can a modeler
- **Therefore, no model can address all the ways in which a regulatory system fails to equalize marginal costs**
  - Sector specific caps served as a proxy for command and control regulations that fail to equalize marginal cost
  - Hybrid policies combining regulatory and market approaches – e.g. RPS and DSM programs – illustrate the effects of constraining choices through regulatory mandates
- **Policymakers need to understand what is at stake in the choice between market based and regulatory policies**

# Demand Side Management Can Raise or Lower Costs Depending On Whether It Corrects a True Market Failure

- **Polar views on DSM are that it**
  - Provides emission reductions at zero cost by requiring or incentivizing cost-effective conservation that households and businesses otherwise ignore
  - DSM only works because utilities raising rates to fund programs that provide a subsidy to induce adoption of costly conservation measures
- **Imposing costly DSM on top of comprehensive cap and trade leads to inefficient choice of measures and significant cost increases**
- **Free DSM provides relatively small reductions in cost**

# RPS Do Little To Reduce Emissions By Themselves and Increase Cost of Market Based Measures

- **20% and 33% Renewable Portfolio Standards fall far short of holding electricity emissions to 1990 levels**
- **Imposing RPS along with a comprehensive cap and trade program eliminates more cost-effective options**
  - RPS forces more expensive wind to replace less costly IGCC and gas to meet same target
  - As a result welfare losses are greater when RPS is combined with cap and trade

# California's Experiment Could Radically Alter Power Markets in the Western U.S.

- **California has adopted ambitious targets for reducing its greenhouse gas emissions, and is also attempting to regulate emissions from imported power**
- **The California PUC has issued rules for how utilities in California can contract for new power supplies**
- **The result of these rules is likely to be**
  - Increased costs of power in California
  - Contract shuffling, in which California utilities try to shed their long term coal commitments and buy up all existing hydro, wind and nuclear generation
  - Long term contract markets dry up as California utilities “wash” emissions from coal-based imports by switching to short term purchases
  - Prices could therefore become much more volatile in the West, as they were in the California energy crisis
- **Contract shuffling and nearly 100% leakage is an ironic but likely result of California rules**

# Critical Policy Insights

- **Only a comprehensive market-based approach can allow the most cost-effective actions to be identified, innovated, and applied**
- **Long term goals are prohibitively costly without new technologies, including zero-carbon transportation fuels, nuclear power, and carbon capture and sequestration**
- **Attempting to regulate emissions from electricity imports without a regional emissions trading system creates an unavoidable tradeoff between leakage and cost**
- **Imposing regulations only on the electric sector is counterproductive, even though electricity will be the source of 55% of emission reductions in the short run**

**W. David Montgomery**  
**CRA International**  
**1201 F Street NW, Suite 700**  
**Washington, DC 20004**  
**(202) 662-3840**  
[wdm@crai.com](mailto:wdm@crai.com)

**For a copy of the CRA report:**  
<http://www.crai.com/Showpubs.asp?Pubid=7285>



INTERNATIONAL