



# Climate Change Legislation

The View from Capitol Hill

NACWA Seminar

Palm Springs

November 7, 2007

# Climate Change Basics

## The Greenhouse Effect

### NATURAL GREENHOUSE EFFECT

The greenhouse effect is a natural warming process. Carbon dioxide ( $\text{CO}_2$ ) and certain other gases are always present in the atmosphere. These gases create a warming effect that has some similarity to the warming inside a greenhouse, hence the name "greenhouse effect."

### ENHANCED GREENHOUSE EFFECT

Increasing the amount of greenhouse gases intensifies the greenhouse effect. This side of the globe simulates conditions today, roughly two centuries after the Industrial Revolution began.

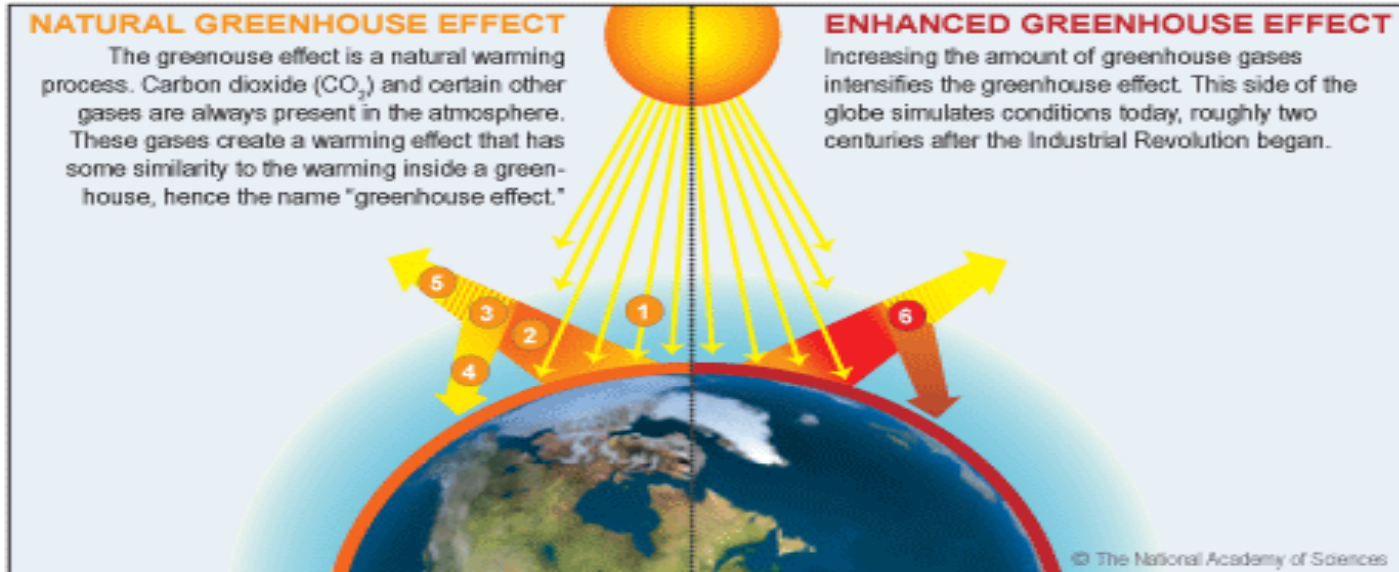


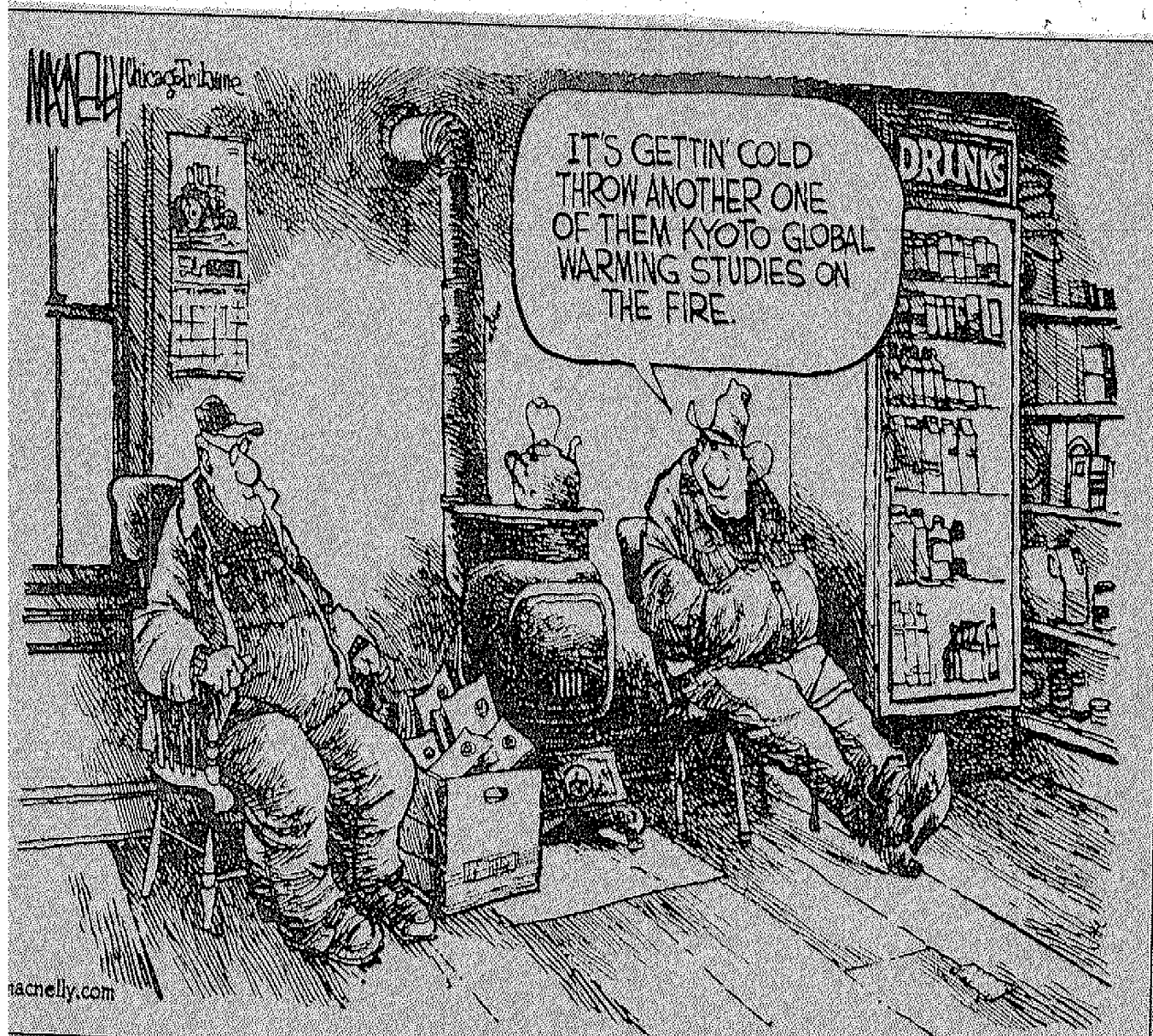
Illustration of the greenhouse effect (courtesy of the Marion Koshland Science Museum of the National Academy of Sciences). Visible sunlight passes through the atmosphere without being absorbed. Some of the sunlight striking the earth **1** is absorbed and converted to heat, which warms the surface. The surface **2** emits infrared radiation to the atmosphere, where some of it **3** is absorbed by greenhouse gases and **4** re-emitted toward the surface; some of the heat is not trapped by greenhouse gases and **5** escapes into space. Human activities that emit additional greenhouse gases to the atmosphere **6** increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the earth.

Image Source: The National Academy of Sciences

# True Believers



# Skeptics Remain



# International Climate Initiatives

- Kyoto Protocol



- Clean Development Mechanism

- E.U. Emissions Trading System



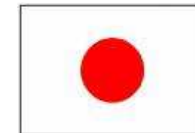
- Asia-Pacific Partnership



- New South Wales Trading System



- Japanese Voluntary Emission Trading Scheme (JVETS)



- G-8 Pledge



# State/Regional Climate Initiatives

## ➤ California A.B. 32 (Global Warming Solutions Act)

- Mandatory 75% cuts
- Trading allowed but discretionary
- CARB / Cal-EPA rulemaking ongoing



## ➤ Regional Greenhouse Gas Initiative (RGGI)

- Electric utilities in 10 Northeast states
- Mandatory reductions with trading
- 2009 start date



## ➤ Western States Climate Initiative

- 10 western states
- Follows California model
- Mandatory reductions

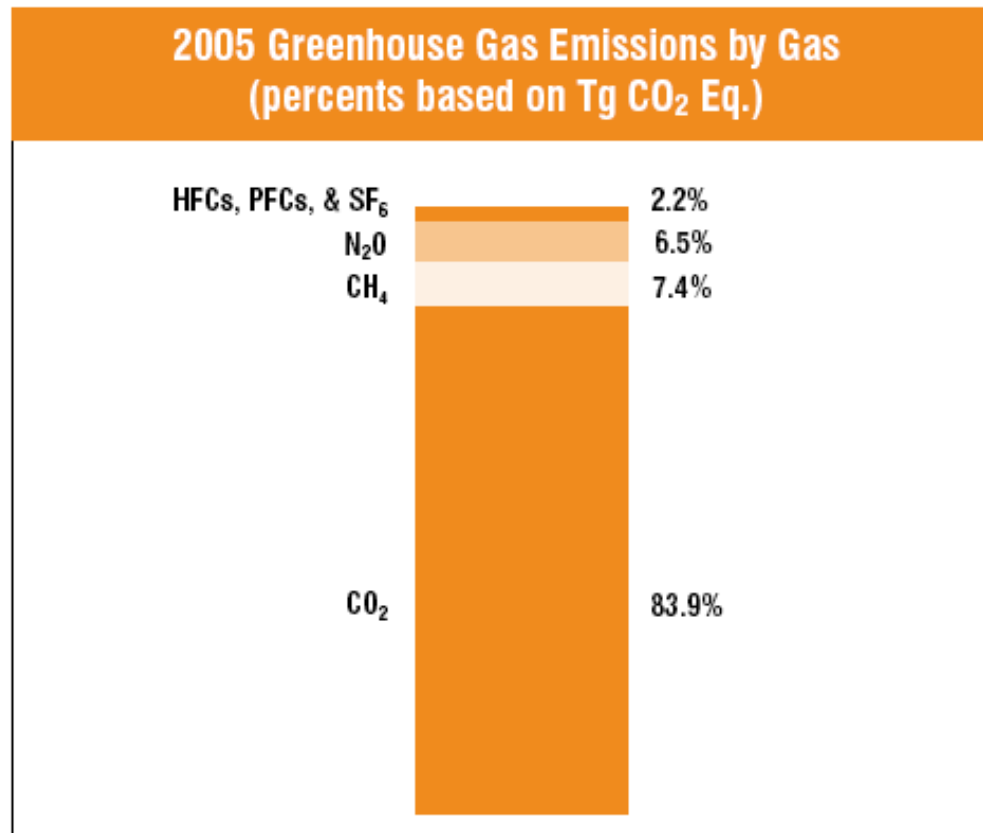


## ➤ State mini-NEPAs (require review and/or mitigation) (e.g., CA; MA; King Co., WA)

# Climate Goals

- Limit global warming to less than 1.5°C / 2.7°F
- Stabilize atmospheric GHG concentrations at 450-550 ppm (compared to pre-industrial levels of 280 ppm)
- Current levels at ~ 381 ppm  
(Source: Carbon Dioxide Information Analysis Center)
- Reduce U.S. totals by 96 million MtCO<sub>2</sub>e per year in U.S. (Lieberman-Warner bill)
- 1.8 billion MMtCO<sub>2</sub>e reductions by 2050 (Bingaman-Specter bill)
- Coupled with international reductions

# U.S. Greenhouse Gas Emissions (2005)



Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (EPA, 2005)

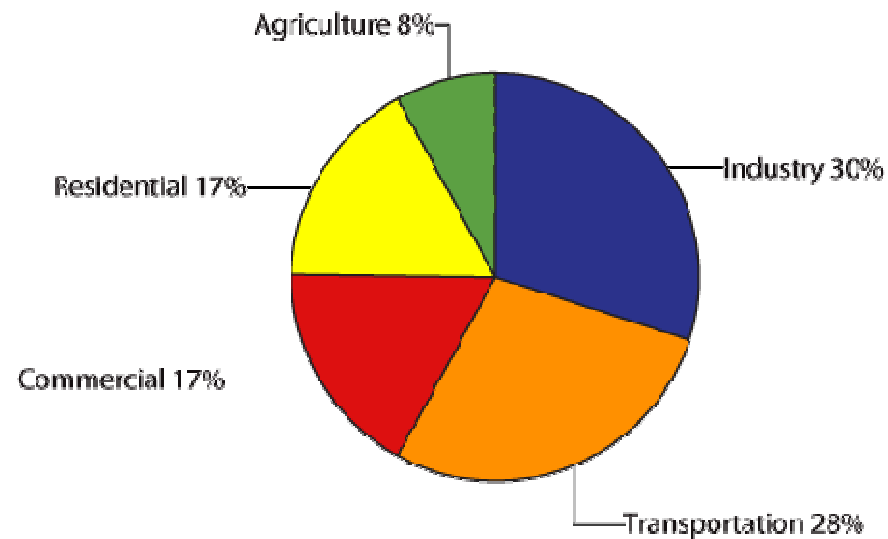


# Greenhouse Gas Emissions by Sector

## United States 2004

### Greenhouse Gas Emissions by Sector

United States, 2004



Total Emissions\* = 7,074 MMT CO<sub>2</sub>E

\* Net Emissions (Sources + Sinks) = 5,204 MMT CO<sub>2</sub>E

\*\* High GWP Gases include: HFCs, PFCs, and SF<sub>6</sub>

Data expressed in Million Metric Tons of Carbon Dioxide Equivalents (MMT CO<sub>2</sub>E)

Source: US EPA Inventory of Greenhouse Gas Emissions and Sinks, 2006.

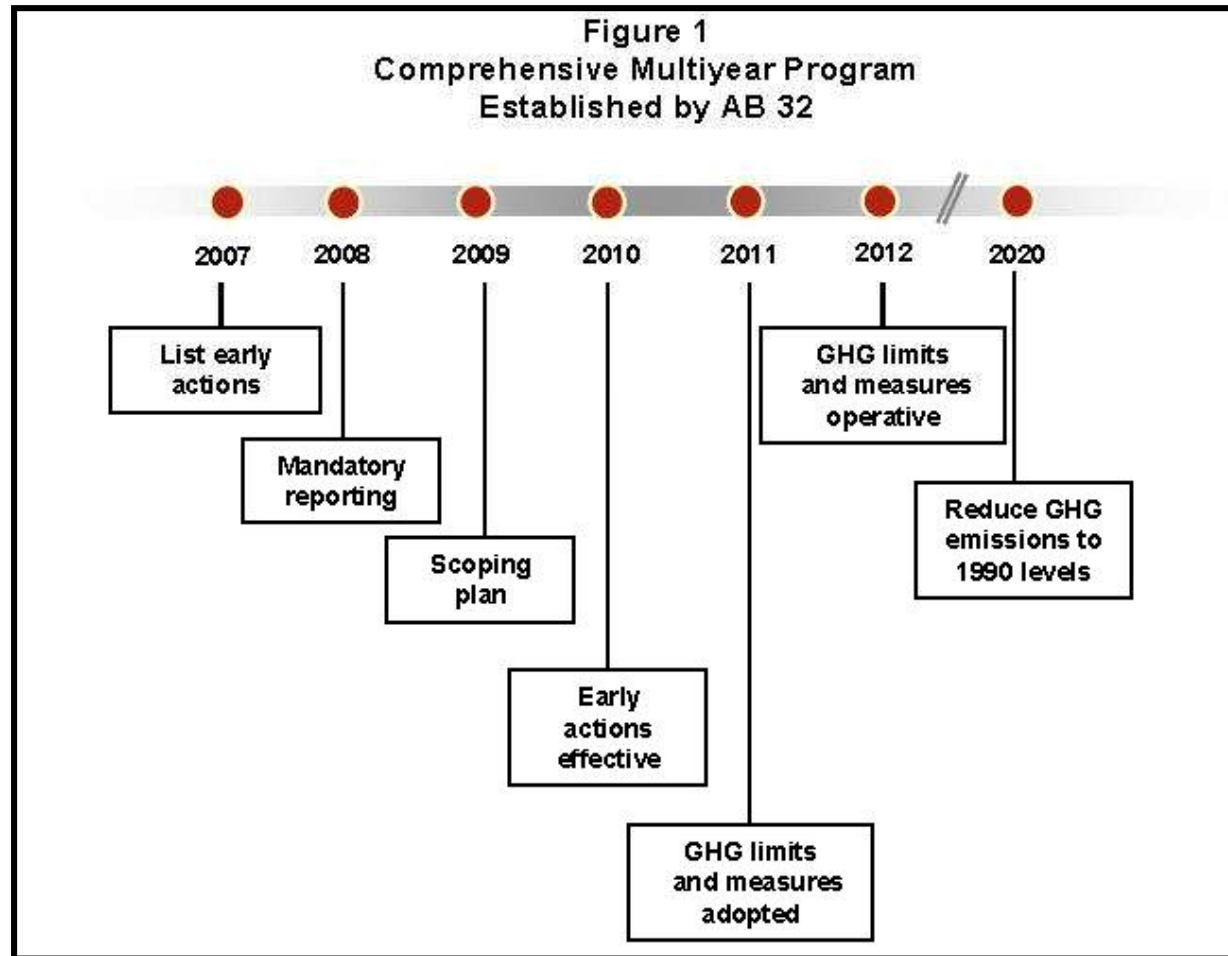
Source: Pew Center on Global Climate Change

# California's AB 32



- Phased approach
  - GHG reduction to 1990 levels by 2020
  - 80% below 1990 by 2050
- Allows, but does not mandate, cap-and-trade market
- Requires early action
- CARB decides which sectors regulated

# AB 32 Timeline



*Chart from CARB Proposed Early Actions Report, 4/20/07*

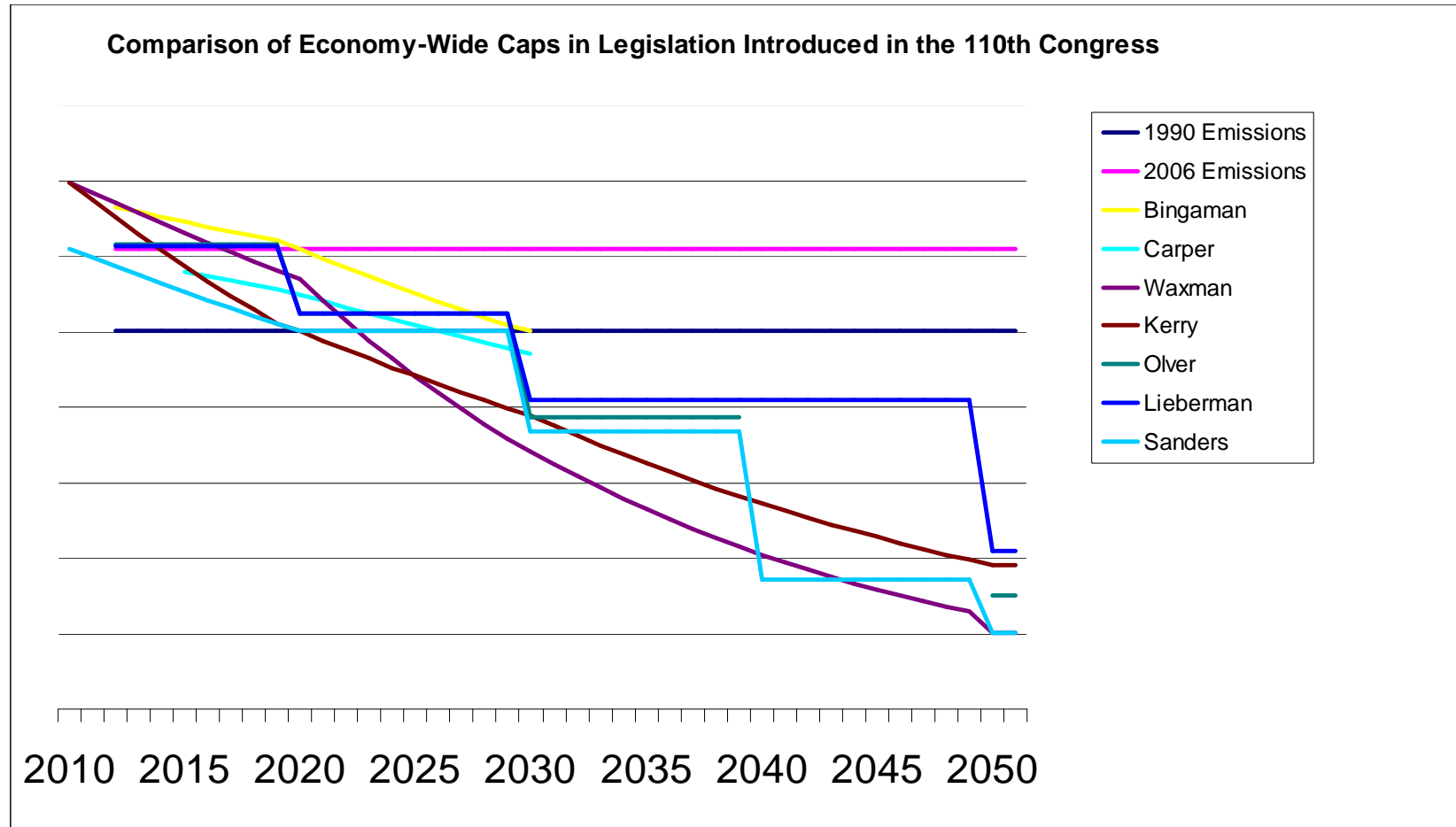
# Federal Cap-and-Trade Bills

## (110<sup>th</sup> Congress)

- S. 2191 Lieberman-Warner “America’s Climate Security Act of 2007”
- H.R. [TBD] Dingell-Boucher Climate Bill
- S.1766 Bingaman-Specter “Low Carbon Economy Act of 2007”
- S.1177 Carper “Clean Air Planning Act of 2007”
- S.1168 Alexander-Lieberman “Clean Air/Climate Change Act of 2007”
- S.1201 Sanders “Clean Power Act of 2007”
- H.R.1590 Waxman “Safe Climate Act of 2007”
- S.485 Kerry-Snowe “Global Warming Reduction Act of 2007”
- H.R.620 Olver “Climate Stewardship Act of 2007”
- S.317 Feinstein “Electric Utility Cap and Trade Act”
- S.309 Sanders “Global Warming Pollution Reduction Act”
- S.280 McCain-Lieberman “Climate Stewardship and Innovation Act”



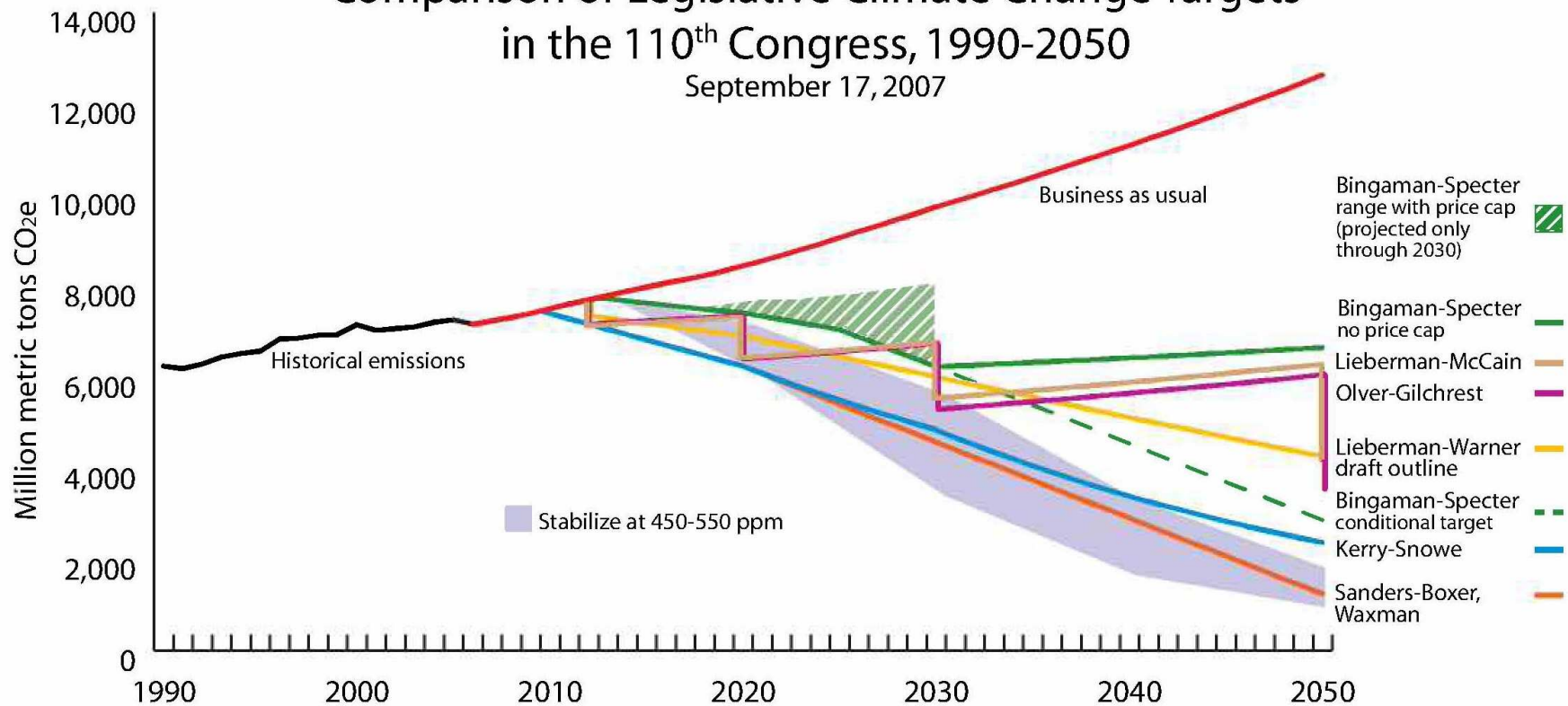
# Comparison of Federal Climate Change Bills



Source: Beveridge & Diamond, P.C.

# Comparison of Legislative Climate Change Targets in the 110<sup>th</sup> Congress, 1990-2050

September 17, 2007



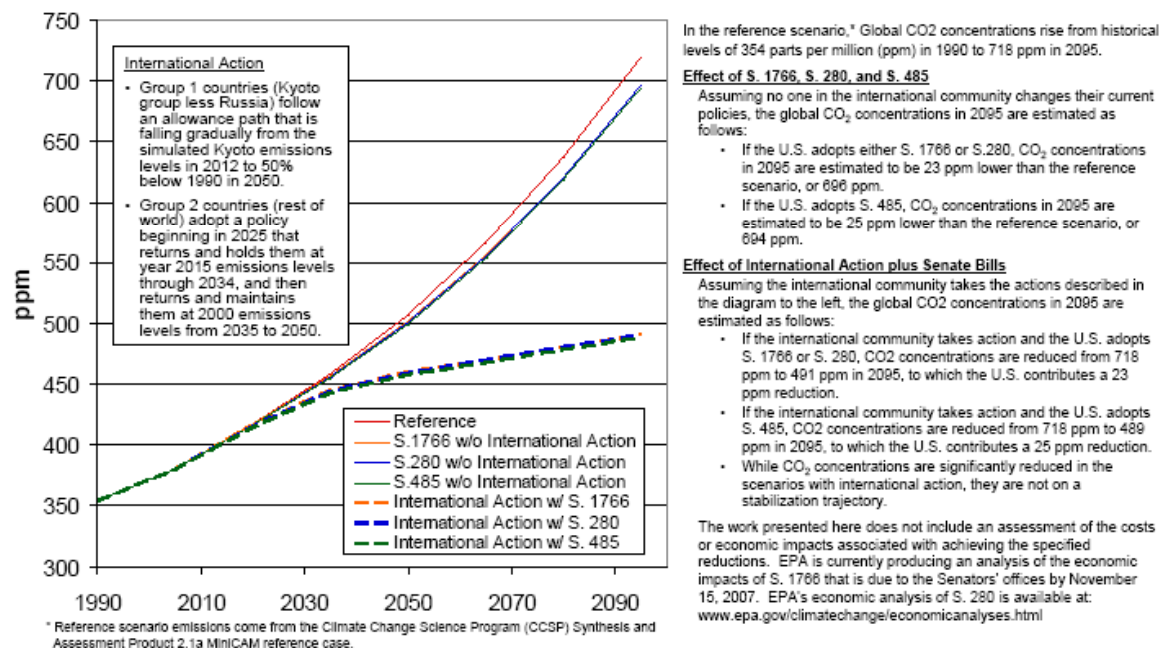
WORLD RESOURCES INSTITUTE

For a full discussion of underlying methodology, assumptions and references, please see <http://www.wri.org/usclimatetargets>. WRI does not endorse any of these bills. This analysis is for comparative purposes only. Data post-2030 may be derived from extrapolation of EIA projections.

# U.S. Reductions w/o International



## Global CO<sub>2</sub> Concentrations (MiniCAM)

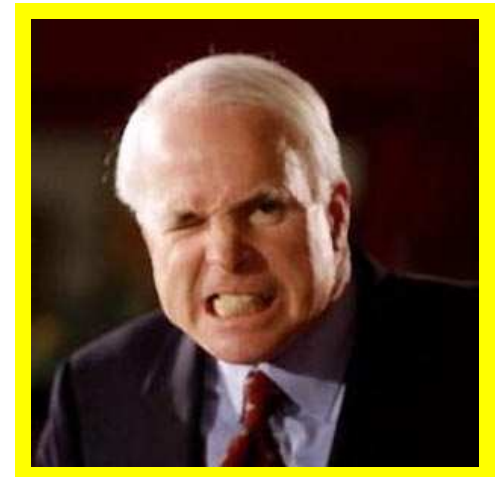
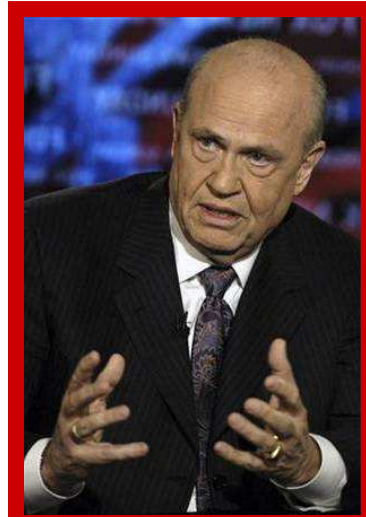


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Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (EPA, 2005)



# Presidential Candidates on Climate Change





# Key Design Elements

- Carbon constrained economy starting 2012 (coincides with end of Kyoto).
- Bills seek 70-80% cuts below current levels by 2050.
- Focus on fuels, electric generation and heavy industry; other sectors too difficult to regulate.
- Gradual reductions to allow phase-in of new technology.
- Cost-containment mechanisms (Carbon Board, safety valve, offset trading).
- Early action credits prior to 2012 (look back period uncertain).
- Periodic re-evaluation by NAS, EPA and/or NOAA.
- Tie-in with CAFE and RPS, demand reduction.
- Enforcement (penalties, inc. citizen suits)
- Delegation to USEPA (devil is in the details)



# Gases Potentially Covered

- **“Kyoto” GHGs**
  - Carbon dioxide ( $\text{CO}_2$ )
  - Nitrous oxide ( $\text{N}_2\text{O}$ )
  - Methane ( $\text{CH}_4$ )
  - Sulfur Hexafluoride ( $\text{SF}_6$ )
  - Perfluorocarbons (PFCs)
  - Hydrofluorocarbons (HFCs)
- **4 Pollutant Bills**
  - Sulfur dioxide ( $\text{SO}_2$ )
  - Nitrogen Oxides ( $\text{NO}_x$ )
  - Mercury (Hg)
  - Carbon Dioxide ( $\text{CO}_2$ )
- **Others? (water vapor,  $\text{NO}_x$ , ozone, CO)**



# Targeted Sectors

- **Electric utilities** (coal, oil, gas)
- **Industrial Sources**
  - Refineries
  - Fuel importers
  - GHG importers
  - Aluminum smelters
  - Acid plants
  - Cement kilns
- **Large manufacturing**  
(>1,000 or 10,000 mMT/yr)
  - Food
  - Nonmetallic Mineral
  - Paper
  - Primary Metals
  - Chemicals
  - Petroleum and Coal
- **Transportation** (probably thru fuels)
- **Commercial**
  - **Wastewater treatment**
  - Buildings
  - Institutional boilers
  - Landfills
- **Residential** (probably too diverse to regulate)
- **Agricultural** (probably too diverse to regulate)
- **Other sectors** (possibly determined by agency)

# Trading under Federal Cap-and-Trade

- Most bills would allow free **trading** of allowances within cap.
- Most bills **allocate** some allowances for free, **auction** an increasing percentage over time.
- Most bills would allow trading of “**offsets**” from outside cap at some level.
- Some bills provide for “**linkage**” with similar international trading regimes (Kyoto CDM, JI).
- Some bills would require **foreign goods** to be carbon-reduced through tariff or offsets.

# Choices in Cap-and-Trade

- Scope of cap
  - What industries under cap?
  - What stakeholders benefit from revenue?
- Point of regulation (upstream, downstream, midstream)
- Auction v. Allocation
  - Based on historic or performance metrics?
  - Likely phase-in auction
  - \$50-300 billion annual revenue
- Safety valve v. Other cost-containment
- Regulatory agency
  - EPA (leading), DOE, Ag, NOAA/Commerce
- Allow or preempt state initiatives?
- Allow banking / borrowing of allowances?
- Use of domestic offsets and/or int'l allowances/offsets?

# **S.2191 - America's Climate Security Act of 2007**

## **(Lieberman-Warner)**

- 63% reduction from 2005 levels
- Coverage: energy, transportation and manufacturing sectors (not commercial or residential)
- 6 Kyoto gases
- Efficiency standards for appliances and buildings
- 96 million tons/year reduction of cap
- Does not regulate WWTPs under cap

# Carbon Tax

- Still in the mix
- Dingell Proposal
  - \$50/ton carbon tax on upstream fuels (coal, petroleum, natural gas).
  - \$0.50/gallon tax on retail fuels (gas, av gas, kerosene) but not diesel or biofuels.
- Bingaman-Specter \$12 per ton safety valve – carbon tax by another name?

# Global Warming “Pork”

- Various forms:

- Revenue recycling
- Allocation set asides
- Grant programs
- R&D programs



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- Major beneficiaries

- Agriculture (biological and soil sequestration)
- Coal (carbon capture & sequestration)
- Adaptation programs (e.g., Alaska)
- Technology development (grants)
- Consumers / ratepayers
- Disadvantaged communities, low income



# Strategic Planning

- Support/ oppose/ shape climate change legislation
- Be at the table - not on the menu
- Early Action
  - Uncertain look back period
  - Prepare now, reduce after legislation clarified

# WWTFs Affected ?

- Emissions reporting obligation
  - Carbon footprint accounting
  - Measurement equipment/protocols
- Increased fuel prices
- Vehicle/tailpipe regulation (increase costs)
- Possible direct regulation

# WWTP Under Cap?

- Wastewater treatment = 5% U.S. methane emissions, 2% U.S. nitrous oxide\*
- Wastewater = 0.5% all GHG emissions\*
- Probably too small for regulation but watch California

\* Source: USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005

# GHG Reduction Opportunities

- CHP (combined heat and power)
  - Only 544/1000 large WWTPs have anaerobic digestion\*
  - Only 19% of those utilize biogas
  - Potential for 2.3 million tons/year CO<sub>2</sub>e reductions
  - EPA offers assistance
  - SRF potentially available
- Green Infrastructure
  - Reduced wastewater volumes = energy reduction = carbon reduction
- Energy Efficiency
- Renewable energy (solar, wind, geothermal)
- Biodiesel from waste
- Vehicles (hybrid, fuel cell) / Commuting

\* Source: USEPA CHP Report (2007)

# Market Opportunities

- Carbon Credits (offsets)
  - Voluntary market price \$4-12/ton
  - Expected mandatory market \$20-40/ton
  - Wastewater + trucked septic, farm manure, etc.
  - Lieberman-Warner bill Sec. 2403(b)(4) allows wastewater offsets
  - Offset providers/aggregators available to partner [www.carbonoffsetproviders.org](http://www.carbonoffsetproviders.org)
- RECs (renewable energy certificates)
  - 27 States and District of Columbia have Renewable Portfolio Standards

# Carbon/REC Markets (U.S.)

- B2B voluntary
- Retail / Internet voluntary
- CCX (Chicago Climate Exchange)
- EPA Methane to Markets
- RGGI
- State RPS programs
- EPA Green Power Program
- The Climate Registry – 39 states, 2 provinces

# Questions?

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