



California's Climate Change Activities

Tom Hamilton
Energy Program Manager
Quality Built, Inc.

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What do we Call it?

- Global Warming
- Climate Change
- Greenhouse Gas Emissions
- Ozone Layer Depletion
- Planet is Melting



Global Climate Change

- Rising Concentrations of Greenhouse Gases
- Rising Average Global Temperatures
- Changes are being documented
- Potential Effects on California



IPCC Report

- Intergovernmental Panel on Climate Change
- Summary for Policymakers
- 99 IPCC Countries
- 122 Lead Authors



Terms

- Anthropogenic – Human induced
- Radiative forcing – measure of influence a factor has on the balance of incoming and outgoing energy.



Human Affect

- Emissions of greenhouse gases and aerosols due to human activities continue to alter the atmosphere in ways that are expected to affect the climate.
- Concentrations of atmospheric greenhouse gases and their radiative forcing have continued to increase as a result of human activities.



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What is Greenhouse Gas?

Greenhouse Gas	Source
Carbon Dioxide (CO ₂)	Combustion
Methane (CH ₄)	Landfills, coal mines, oil/gas production, agriculture
Nitrous Oxide (N ₂ O)	Combustion, Fertilizers
Hydrofluorocarbons (HFCs)	Semiconductors, refrigeration, fire protection
Perfluorocarbons (PFCs)/C _x F _x)	Semiconductors, refrigeration, fire protection
Sulfur Hexafluoride (SF ₆)	Electrical Power circuit breakers, switchgear



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Why do we Care?

- Global average temperature has increased over the 20th century by about 0.6°C.
- Snow cover and ice extent have decreased
- Global average sea level has risen and ocean heat content has increased
- Changes have also occurred in other important aspects of climate.



Fun Facts

- A sea level rise of 39 inches (1 meter) would turn about 56 million people in 84 developing countries into refugees
- If the Greenland ice sheet melted the sea level could rise 7 meters.
- 1990's was the warmest decade and 1998 was the warmest.



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Do we care?

Topic	Republicans	Democrats	Independents
#1 item	Terrorism	Health Care	Terrorism
Energy	13	13	9
Environmental	16	10	8
Global Warming	21	17	19

The PEW Research Center, Global Warming: A divide on causes and solutions, 1/24/2007



California...

- 34 million people and growing
- 5th largest economy in the world
- 5th largest consumer of energy
- 2nd largest consumer of gasoline
- 5th most economical energy consuming economy
- 40% of western US electricity market
- Lowest US per capita electricity usage



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California...

- Peak demand – 51,859 megawatts (2003)
- Over 53,700 megawatts generated
- Over 25.5 million vehicles
- 80% live near the coast
- 50% of water supply from snow pack
- 20% of electricity from hydropower
- 29% of peak from air conditioning



California Sea Levels

- California has seen a 7" rise in 150 years
- IPCC projects 4 – 35" sea level rise by 2100
- Concerns over levee stability and salt water intrusion



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California Snow Pack

- Warmer Winters Have:
 - Reduced snow pack
 - Earlier snow melt
 - Decreased spring runoff by 10%
 - Major effects on water supply, water distribution, and water ways



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When did this start?

- 1988 AB 4420 – Potential impacts of climate change
- 1991 – Global Climate Change: Potential impacts and Policy Recommendations
- 1997 – Global Climate Change Report: Greenhouse Gas Emissions Reduction Strategies for California



1991 Recommendations

- Promote Energy-Efficiency
- Account for environmental externalities
- Promote renewable generation
- Promote high-efficiency gas generation
- Improve forestry, solid waste and recycling, and livestock management



1991 Recommendations

- Expand markets for alternative fuels
- Promote R&D on biomass-based fuels
- Reduce vehicle miles traveled
- Expand land use planning to manage transportation demand



2000 Efforts

- SB 1771 & 527
 - Greenhouse Gas Emissions
 - California Climate Action Registry
 - Update of GHG inventory (every 5 years)
 - Climate Change Program



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2000 Efforts

- AB 2076
 - Reduce Petroleum Dependence
 - Transportation Energy Efficiency Measures
 - Advanced vehicle technologies, including alternative fuel vehicles
 - Non-Petroleum and Alternative Fuels
 - Measures to Affect Consumer Fuel Demand



Reducing Petroleum Dependence

- Reduce fuel demand to 15 percent below the 2003 level by 2020
- Double nation fuel economy standards
- Increase the use of alternative fuels to 20 percent by 2020



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California Energy Report

- Integrated Energy Policy Report
 - Partner with neighbors
 - Require reporting of power plant GHG emissions
 - Support the goals to reduce petroleum consumption
 - Use sustainable energy and environmental designs in state buildings.
 - Require state agencies to incorporate climate change mitigation and adaptation strategies in planning and policy documents



West Coast Governor's Global Warming Initiative

- California, Oregon and Washington
- Reduce GHG emissions on west coast
- Focusing on:
 - Energy efficiency
 - Renewable energy
 - Port and truck stop emissions
 - State fleets
 - Emission inventories and reporting protocols



Joint Agency Climate Team

- Resources Agency
- California EPA
- Business, Transportation and Housing
- General Services
- Office of Planning and Research



Schwarzenegger's Action Plan for California's Environment

- Recommend GHG emission reduction target
- Accelerate the RPS to 33% by 2020
- Accelerate use of solar photovoltaic
- Reduce electricity consumption by 20%
- Reduce petroleum dependence
- Create the "Hydrogen Highway"
- Coordinate with the Northeast and Europe
- Implement the Green Building Bank



California Global Warming Solutions Act of 2006

- Mandatory Reporting
 - 1/1/08 require annual reporting
- 1990 State GHG Emissions
- 2020 Emission Limit
- Early Action Emission Reduction Measures
- Scoping Plan



California Global Warming Solutions Act of 2006

- Emission Limits in 2012
- Market-Based Compliance Mechanisms
- Enforcement
- Safety Valves
- Advisory Committees
 - Environmental Justice
 - Economic Technology Advancement



California's Contribution?

- Major emitter of GHG
- Significant actions underway
 - Energy Efficiency
 - Renewable resources
 - Environmental protection
 - Inventories
 - R&D Program
- Regional leader
- Significant adverse impacts



Cap and Trade

- Regulatory authority sets a cap on total emissions
- Authority creates allowances to emit a specific quantity
- Authority distributes allowances
- Allowances are measured
- If there are excess (credits) it can sell them
- Not enough then it must buy them
- If not met penalties and/or sanctions



RESNET Effort

- Currently looking at opportunities
- Housing one of the largest exporters of GHG
- How to aggregate the savings
- Calculations