

Do your part to reduce your carbon footprint,
invite your livestock to live under the same roof.....



2005 Executive Order Established Statewide GHG Targets

“I SAY THE DEBATE IS OVER. WE KNOW
THE SCIENCE. WE SEE THE THREAT.
AND WE KNOW THE TIME FOR ACTION
IS NOW.”

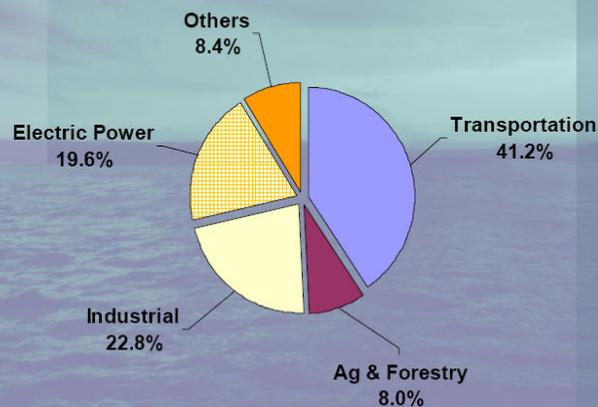
Governor Arnold Schwarzenegger
June 2005



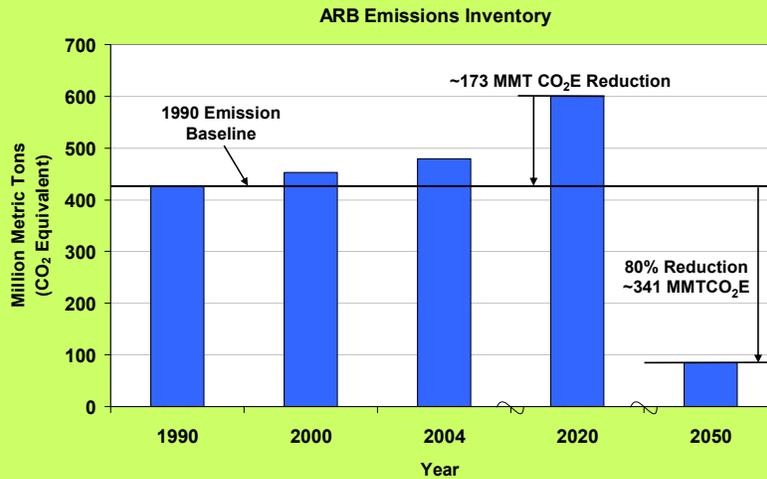
What Is The Global Warming Solutions Act of 2006

- **AB 32 sets in statute emission target to reduce GHG emissions to 1990 levels by 2020**
- **ARB given authority to monitor and regulate GHG sources**
- **Cal/EPA and Climate Action Team coordinate statewide climate policy**
- **Coordinate with other states and countries to reduce emissions**

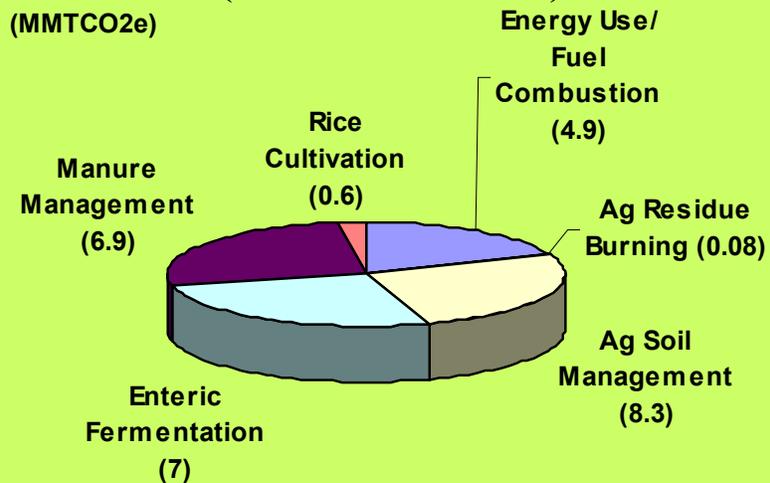
Climate Change Emissions -- California



Magnitude of the Challenge



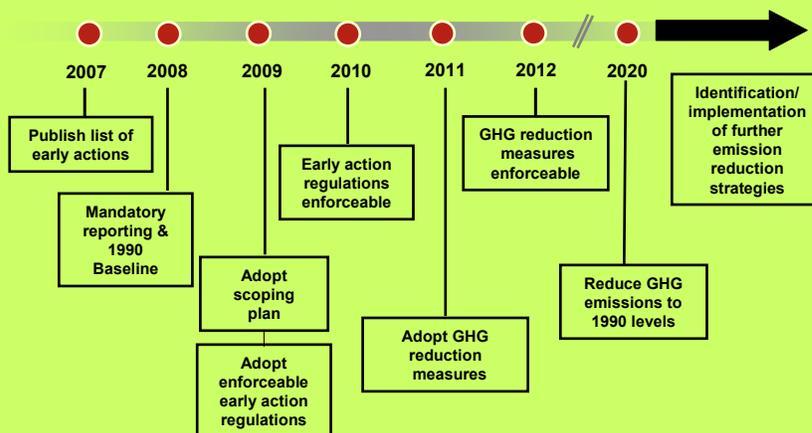
2004 Agricultural GHG Emissions (28 MMTCO₂e)



Total Agricultural Emissions

- **1990 Baseline Emissions:**
23.4 MMTCO₂E (5% of Statewide total)
- **2004 Baseline Emissions:**
27.9 MMTCO₂E (6% of Statewide total)
- **2020 Preliminary Forecasted Emissions: 31.9**
MMTCO₂E

AB 32 Timeline



Scoping Plan

- **Describe how California will reduce GHG emission levels to 1990 levels by 2020**
- **Identify mix of strategies to achieve 2020 emission target**
- **Sector-based approach**
- **Provide a vision for a low carbon future between 2020 and 2050**
- **Complete by end of 2008**

Tentative Scoping Plan Development Schedule

Nov 30, 2007	Scoping Plan Kick-Off Workshop
Dec 6 & 7, 2007	Board Hearing - 1990 Baseline, Mandatory Reporting
Dec 14, 2007	Sector Summary Workshop (Sac)
Jan 16, 2008	Mechanisms Workshop (Oakland)
Mar 24, 2008	Scoping Plan Scenarios Workshop (Sac)
June 2008	Draft Scoping Plan released
July 2008	Workshops on draft plan (Statewide)
Oct 2008	Final Staff Proposal released
Nov 20-21, 2008	Board Hearing - Scoping Plan

California Agriculture and Climate Change



Advisory Committees

- Environmental Justice
- Economic & Technology
Advancement
- Market Advisory

ETAAC GOALS

- *Advise ARB on activities that will facilitate investment in and implementation of technological research and development opportunities that will assist in the reduction of greenhouse gas emissions.*
- *Including, but not limited to, identifying new technologies, research, demonstration projects, funding opportunities, developing state, national, and international partnerships and technology transfer opportunities, and identifying and assessing research and advanced technology investment and incentive opportunities*
- *Advise the ARB on state, regional, national, and international economic and technological developments related to greenhouse gas emission reductions.*

ETAAC SUBJECT AREAS

- **MANURE MANAGEMENT/DIGESTER TECHNOLOGY:** expand on the recently developed protocol and projects that can reduce methane from manure management and produce renewable energy.
- **ORCHARD, VINEYARD & RANGELAND MANAGEMENT FOR CARBON STORAGE:** explore management practices that could enhance above and below ground carbon sequestration
- **REFORESTATION AND RIPARIAN RESTORATION ON FARMS AND RANCHES:** restoration projects that have the potential to increase carbon storage and provide other environmental and wildlife benefits
- **BIOMASS UTILIZATION AND BIOFUELS:** Use of abundant agricultural byproducts including prunings, straws, processing wastes, etc. for production of biofuels using biochemical and thermo chemical technologies
- **EFFICIENT FERTILIZER AND WATER USAGE/ENTERIC FERMENTATION:** Evaluate methods to reduce emissions from fertilizer use and livestock feeding activities

Summary of California Agricultural Programs to Reduce GHG Emissions

	Potential California Program Size			Estimated Reduction	Net Annual California Reduction Potential	
	Gross (units/yr)	Technical (units/yr)	Units	Unit Factor (MTCO ₂ E/yr)	Gross (MMTCO ₂ E)	Technical (MMTCO ₂ E)
Manure-to-energy facilities	3,600,000	1,800,000	head	1.70	6.1	3.1
Enteric Fermentation	4,100,000	2,050,000	head	0.39	1.6	0.8
Ag Biomass Utilization	21,000,000	8,000,000	dry tons	0.51	10.7	4.1
Dedicated Bio-Fuels Crops	1,000,000	500,000	acres	1.92	1.9	1.0
Soil Carbon Sequestration	10,000,000	5,000,000	acres	0.61	6.1	3.1
Farmscapes Sequestration	500,000	500,000	acres	5.80	2.9	2.9
Fertilizer Use Efficiency	10,000,000	5,000,000	acres	0.36	3.6	1.8
TOTAL					33.0	16.7

Potential Agriculture Strategies



- **Livestock emissions**
- **Energy (biomass/biofuels/ renewable energy)**
- **Efficiency improvements**
- **Sequestration**
- **Research**

Research

- **Explore improved agricultural practices and their impacts**
- **Potential Approaches**
 - **Life Cycle Analysis**
 - **Best Practice Protocols**
 - **Fertilizer N₂O Emissions**

Resources

<http://www.arb.ca.gov/cc/cc.htm>

Chuck Rice, KSU	Charlie Walthall, ARS/USDA
Louise Jackson, UCD	Will Horwath, UCD
Richard Howitt, UCD	Steve Kaffka, UCD
Jeff Mitchell, UCD	Frank Mitloehner, UCD
Johan Six, UCD	David Smart, UCD
Dan Sperling, UCD	
Bryan Jenkins, CA Biomass Collaborative/UCD	
Paul Buttner, California Rice Commission	
Paul Martin, Western United Dairymen	
Justin Oldfield, CA Cattlemens Association	
Allen Dusault, Sustainable Conservation	
Amy Luers, Union of Concerned Scientists	
Guido Franco, CEC	
Sophia Curiel, CDFA	Steve Shaffer, CDFA

A New Conservation Market

