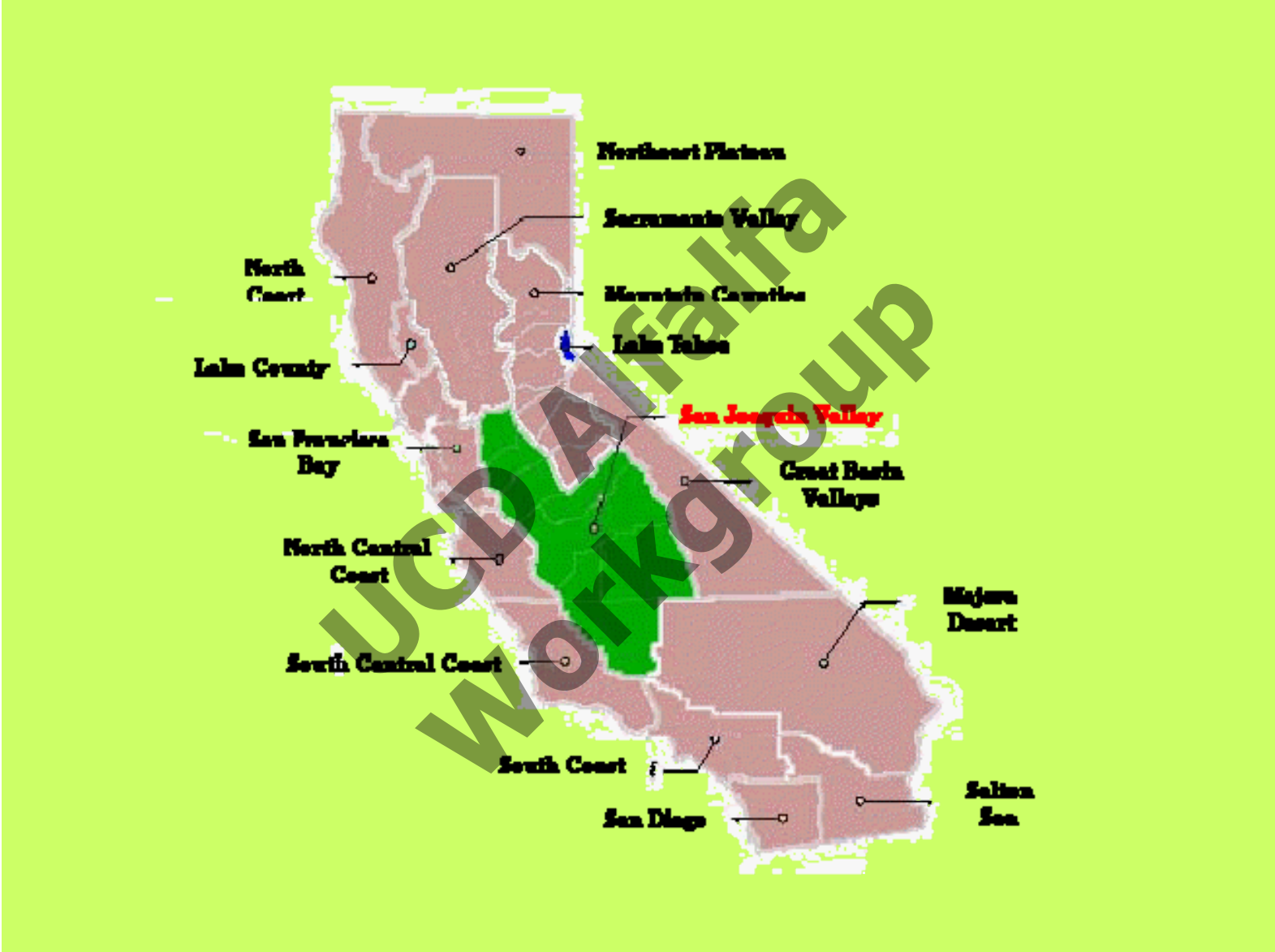
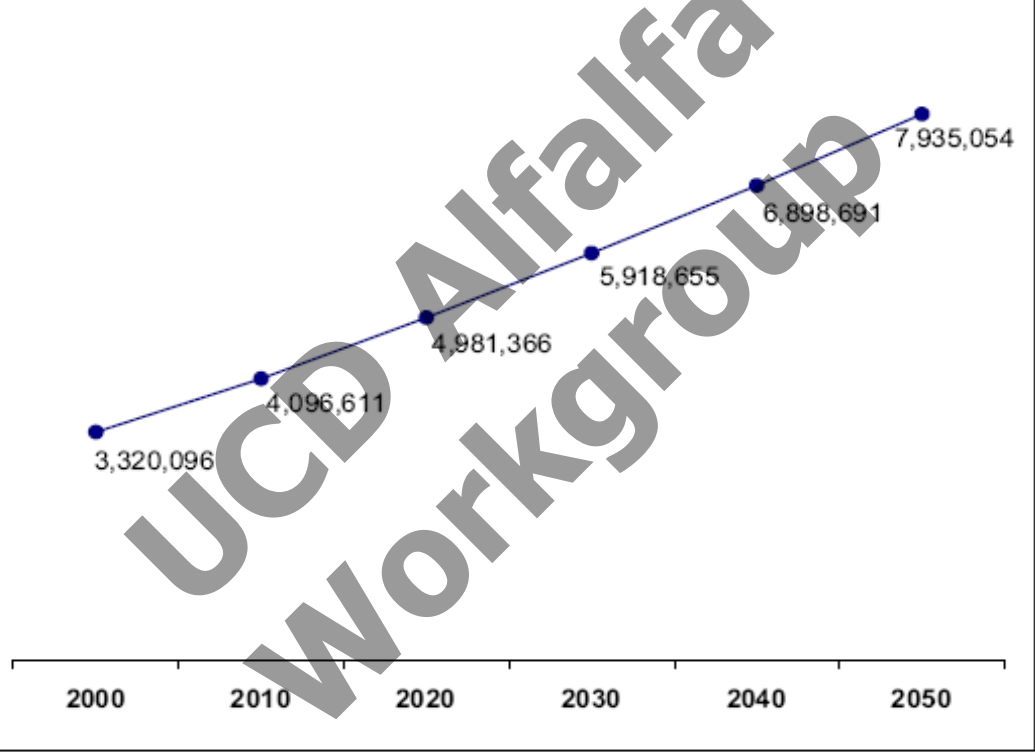


Upcoming Environmental and Regulatory Challenges



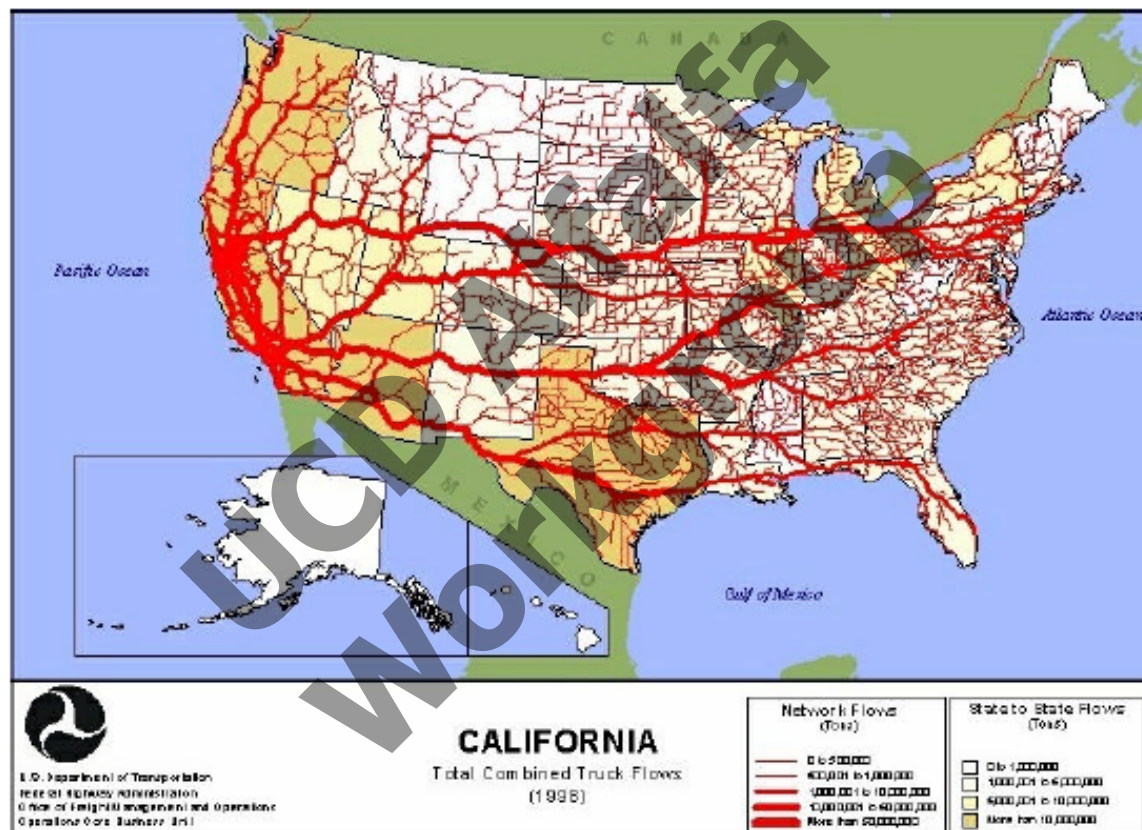


Projected Population for the San Joaquin Valley (2000-2050)



Data Source: State of California Department of Finance, Demographic Research Unit, (May 2004);
Graph Source: The Great Valley Center (www.greatvalley.org, Modesto, California)

Figure 1: National Truck Flows To/From California





Trucks: Estimated Average Annual Daily

1998



2020



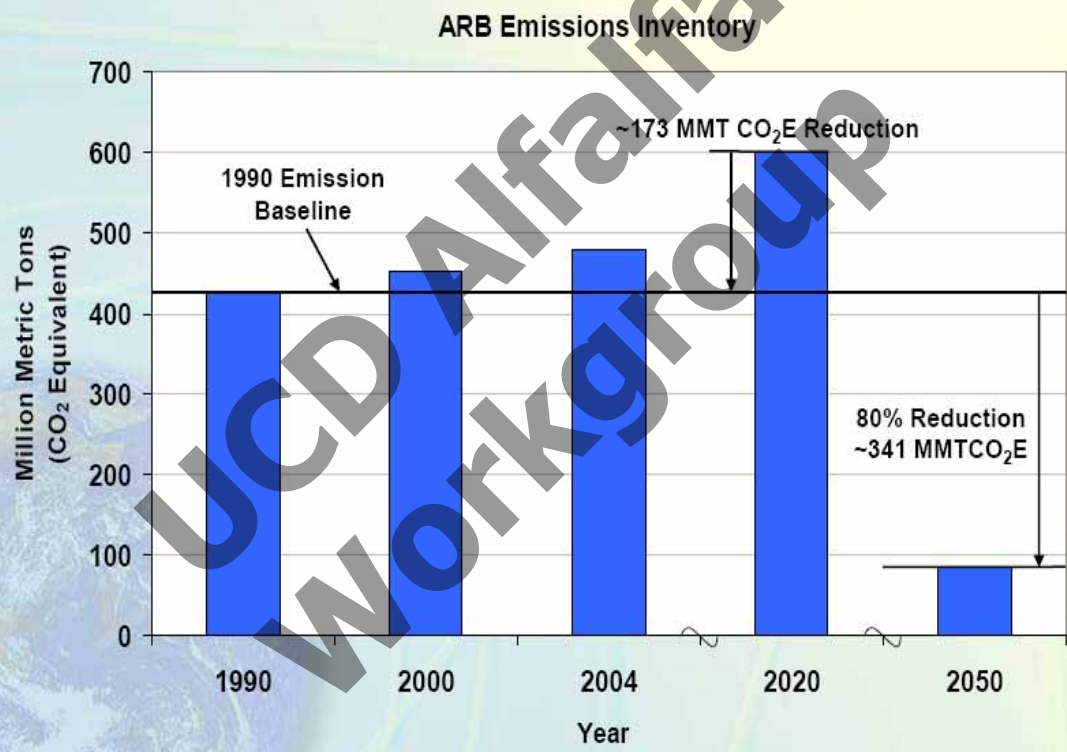
“I SAY THE DEBATE IS OVER! “

GLOBAL WARMING SOLUTIONS ACT OF 2006

BY 2020, 30% REDUCTION TO 1990 LEVELS
BY 2050, 80% REDUCTION TO 1990 LEVELS

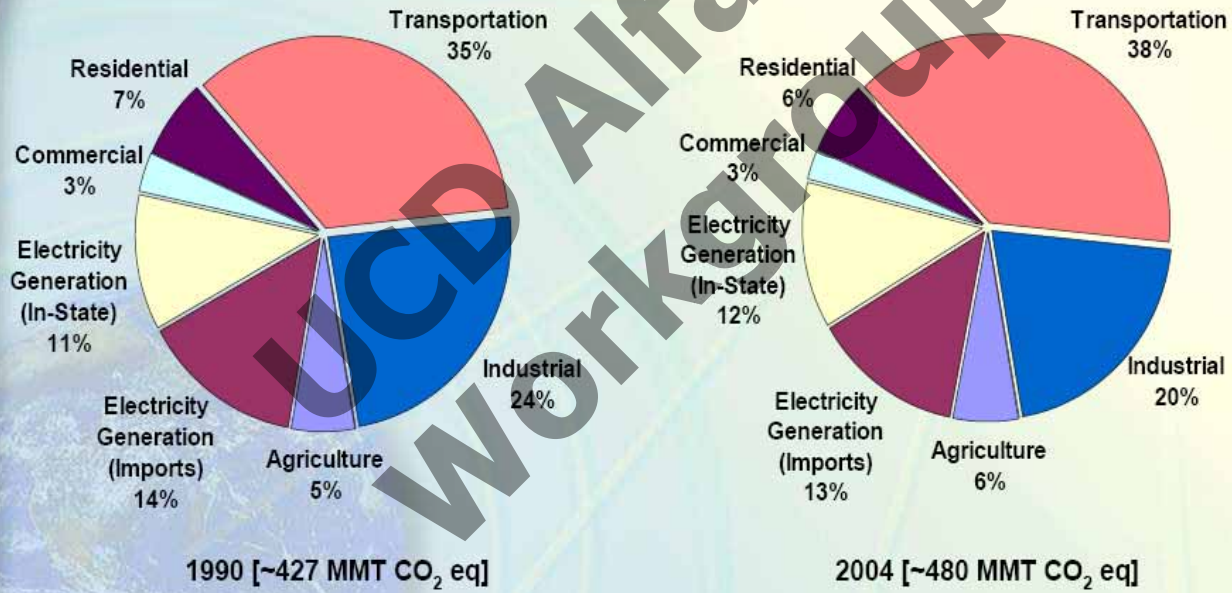


Magnitude of the Challenge



California GHG Emissions

GHG EMISSIONS BY SOURCE



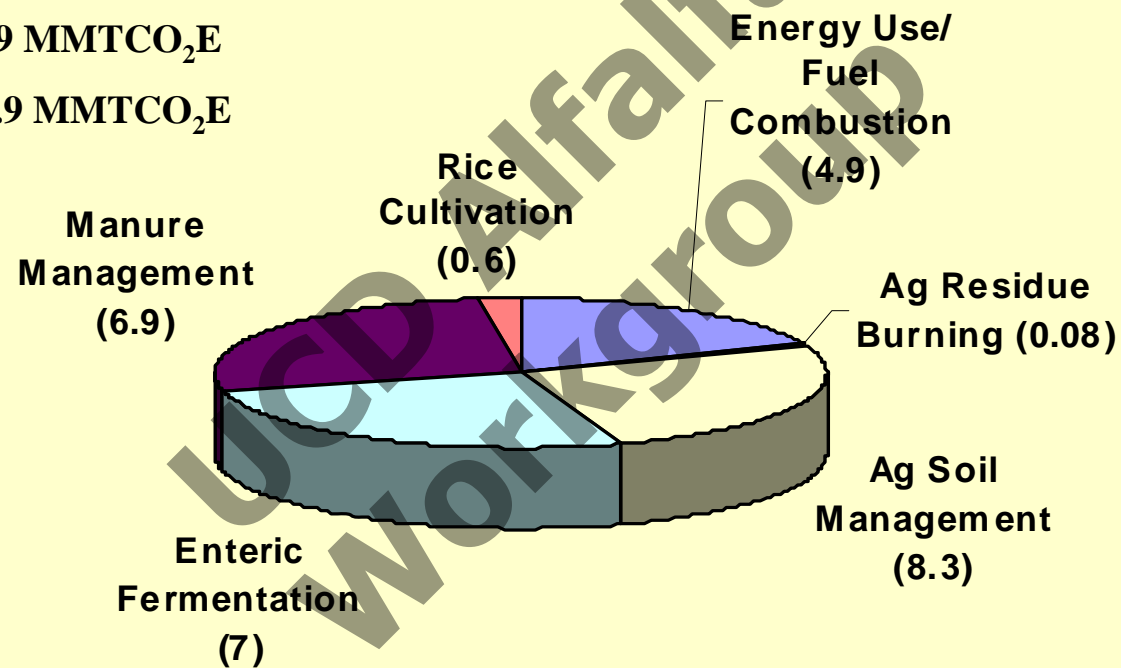
2004 Total Ag GHG Emissions in CA

Baseline Emissions

1990= 23.4 MMTCO₂E

2004=27.9 MMTCO₂E

2020= 31.9 MMTCO₂E



Potential Agriculture Strategies



- Livestock emissions
- Energy (biomass/biofuels/renewable energy)
- Efficiency improvements
- Land use
- Research

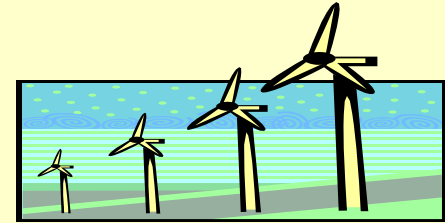
Livestock Emissions

- Reduction of GHG emissions from livestock operations
- Potential Approaches
 - ▣ Manure Management
 - ▣ Enteric Fermentation





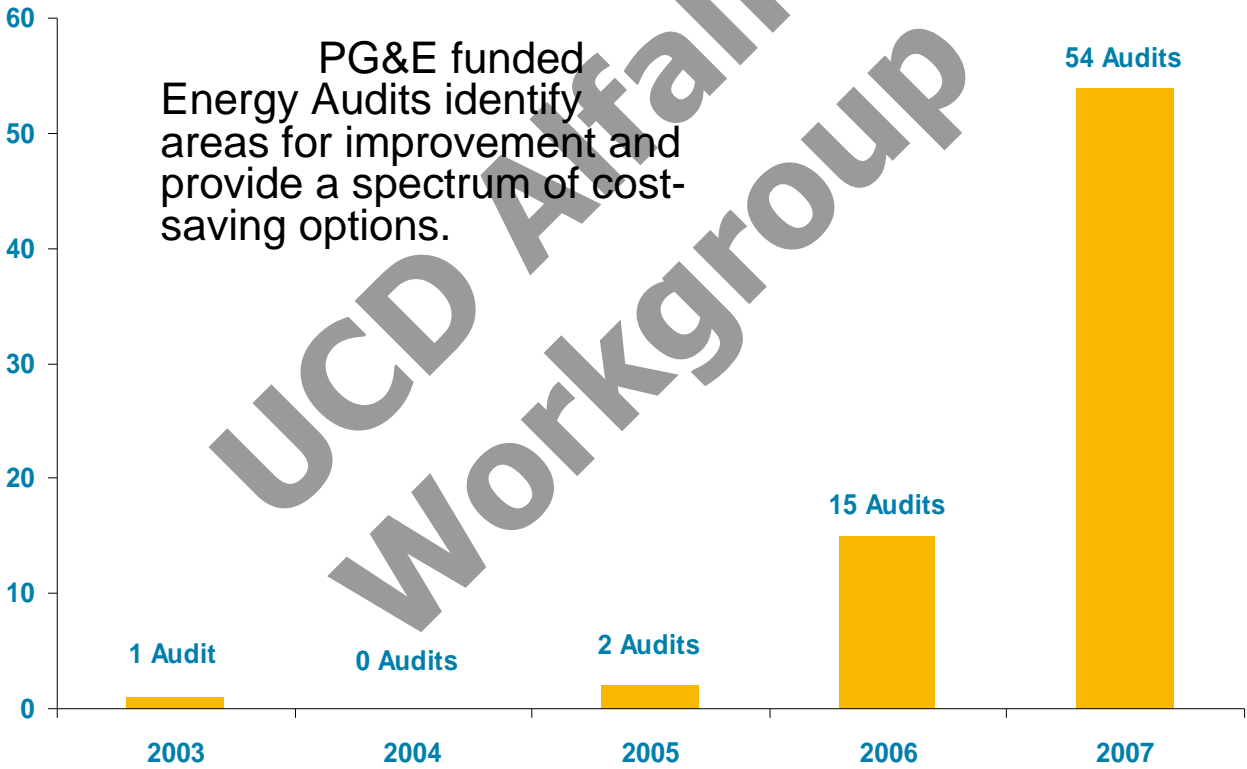
Energy



- Production and use of renewable fuels in place of fossil fuels
- Potential Approaches
 - ▣ Agricultural waste stream utilization
 - ▣ Bio-fuel crops
 - ▣ Renewable energy (solar, wind)



PG&E Winery Energy Audits



Efficiency Improvements

- Reduce GHG emissions through more efficient agricultural practices
- Potential Approaches
 - ▣ Crop Management
 - ▣ Water Management
 - ▣ Pump Efficiency and Electrification
 - ▣ Conservation Tillage
 - ▣ Fertilizer Use Efficiency



Research on GHG Emissions from Nitrogen Fertilizers

ARB wants to better understand nitrous oxide (N₂O) emissions from agricultural ecosystems under California specific conditions

Two phase research project- 1st phase data used to develop CA specific baseline emissions & validate N₂O emission models

Second phase will look at improved fertilizer management practices

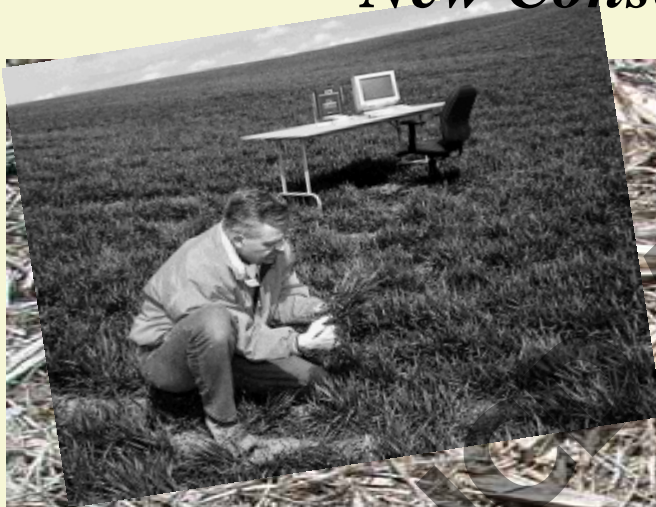
ARBs estimates N₂O at 15.6 MMTCO₂E, 2.8 % of CA total GHG emissions. Ag soil is 50 % of that total

4.9 MMTCO₂E of N₂O emissions from ag soil results from application of organic and synthetic fertilizers

Joint research by ARB/CEC/C DFA with research teams from CSUF/UCD w/ multiple crops in dif climates to begin early 2009

www.arb.ca.gov/ag/fertilizer/fertilizer.htm

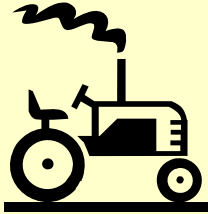
*Land Use- Soil Sequestration
Production Practices that Lead to a
New Conservation Market*



Carbon Breakfast Club

Yolo/Solano

- ❖ Objective: Develop markets for rangeland carbon offsets in CA by 2012
- ❖ Barrier: Lack of basic and applied science demonstrating beneficial practices
- ❖ Activities:
 - Science synthesis, literature review (Whendi Silver, UCB, Valerie Eviner, UCD)
 - Issue Paper-Identify issues that need to be addressed in developing rangeland sequestration protocols-EDF, CA Cattlemen's Association, Audubon, CA
- ❖ Needs: Additional funding for field research on various CA rangeland soils



Research

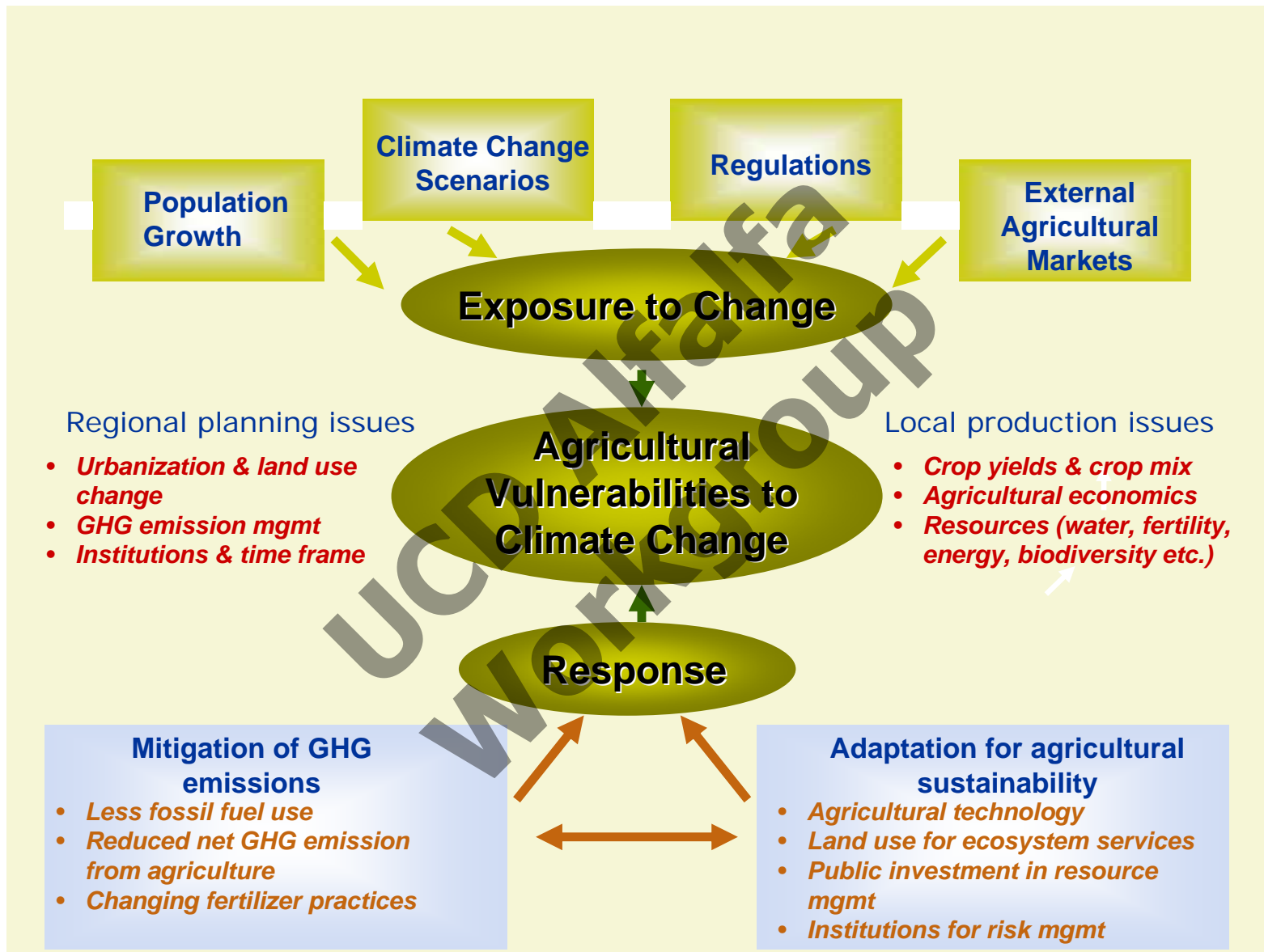


- Explore improved agricultural practices and their impacts
- Potential Approaches
 - ▣ Life Cycle Analysis
 - ▣ Best Practice Protocols
 - ▣ Fertilizer N₂O Emissions

Potential for Adaptation to Climate Change in an Agricultural Landscape in the Central Valley of California

Scenarios Analysis Project
California Energy Commission

Louise Jackson
Dept. of Land, Air and Water Resources
Agricultural Sustainability Institute (ASI)
University of California Davis





Wine Industry GHG Protocol

www.wineinstitute.org/ghgprotocol



A CREDIBLE, FREE, EASY TO USE, WINE INDUSTRY SPECIFIC PROTOCOL AND CALCULATOR THAT WILL SATISFY GHG ACCOUNTING NEEDS:

- Operational tracking
- Market access
- Future regulatory requirements
- Carbon credit accounting

Partners: California International Wine Institute, New Zealand Winegrowers, Winemakers' Federation of Australia, South African Wine and Spirit Board, Provisor Lt

Rules, Rules and More Rules

- Farm/CAFO/when exceed certain air quality threshold (most prevalent in SJV and South Coast)
- Fugitive dust plans for farms over 100A in SJV and elsewhere
- Replace In-Use Stationary and Portable Diesel Agricultural Engines-primarily irrigation pumps
- Field equipment/Tractor rule in 2009 will require replace or retrofit
- Forklift rule- 4 or more used in packinghouses, post harvest facilities (i.e.cotton gins, hullers) retrofitted or replaced by 1//09, 1/11, and 1/13
- Complete ban on ag burning in SJV as of 2010, most already banned
- Pesticide-use reduction due to VOC's-esp fumigants
- Vapor recovery systems on above-ground gasoline storage tanks



Proposed In-Use Heavy-Duty Diesel Vehicle Regulation

UCD Air Quality
Workgroup



Scope and Applicability

- Medium and Heavy-duty diesel vehicles operating in California
 - Trucks, buses, cranes, yard trucks, other
- Any person, business, or government agency who owns or sells a vehicle in California that is subject to the regulation
 - Includes federal fleets
- Includes vehicles designed to be driven on-road, even though they might not be registered to be driven on-road

Vehicle Types



Concrete Mixer



Dump Truck



Drill Rig



Water Truck



Hay Squeeze



Tow Truck



Reefer Van



Fuel Tank Truck



Passenger Bus

Exemptions

- Vehicles already subject to an ARB In-Use regulation
- Emergency vehicles
- Tactical military vehicles
- Excludes personal use vehicles
 - ❑ Motorhomes
 - ❑ Pickups and other vehicles under 14,000 lbs GVWR



Meeting the Compliance Requirements

- Apply a verified diesel emission control strategy (VDECS)
- Replace with a cleaner new or used vehicle
- Install cleaner engines (repower)



Catalyzed wall flow filter

Alternative Ag Compliance Proposal

- ❖ **Low use**- must operate less than 100 hours and 1000 miles/yr
- ❖ **Limited-Mileage Agricultural Vehicle** – ag vehicles exempt until 1/1/17 that operate < 15,000 miles (pre-1996 engine), 20,000 miles (1996- 2005 engine), or 25,000 miles (2006 or newer engine)
- ❖ **Low-Mileage Agricultural Vehicle** – ag vehicles exempt until 1/1/23 that operate <10,000 miles/yr
- ❖ **Specialty Agricultural Vehicle** – exempt until 1/1/23 ag vehicles that are a nurse rig, cotton module mover, water truck, feed truck or mixer-feed truck used exclusively at feedlots.
- ❖ **NOx Mileage Exempt Vehicles** - limited to heavy heavy-duty vehicles (GVWR>33,000 lbs.) operated < 7,500 miles, and medium heavy-duty vehicles (GVWR 14,000 #-33,000#) operated < 5,000 miles.
[Still requires diesel particulate filter (DPF); and replacement of the truck by 12/31/20 & Electronic Tracking System for hours of use]

The Wild Wild West

