Sector-Based Workshop

Agriculture Sector

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What’s in the Agricultural Sector
Challenges and Opportunities

- Complex biological systems
- Diverse source types
- Life-cycle analysis complex
- Potential for sequestration and emission reductions
- Potential measures oriented toward voluntary approaches
2004 Agricultural GHG Emissions (MMTCO2e)

- Manure Management (6.9)
- Enteric Fermentation (7)
- Rice Cultivation (0.6)
- Energy Use/Fuel Combustion (4.9)
- Ag Residue Burning (0.08)
- Ag Soil Management (8.3)
Agricultural Emissions

- **1990 Baseline Emissions:** 23 MMTCO$_2$E
- **2004 Baseline Emissions:** 28 MMTCO$_2$E
- **2020 Preliminary Forecasted Emissions:** 32 MMTCO2E
Emission Forecast Issues

- Adaptation to climate change
- Types of produce
- Efficiency
- Livestock management
Potential Agriculture Strategies

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

• Reduction of GHG emissions from livestock operations

• Potential Approaches
  – Manure Management
  – Enteric Fermentation
Energy (Biomass/Biofuels)

• Use of renewable fuels in place of fossil fuels

• Potential Approaches
  – Agricultural Waste Stream Utilization
  – Bio-Energy Crops
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
• Promote conservation and carbon sequestration through land use approaches

• Potential Approaches
  – Agricultural Easements
  – Agricultural Land Retirement
  – Farmscape Sequestration
• Explore improved agricultural practices and their impacts

• Potential Approaches
  – Life Cycle Analysis
  – Best Practice Protocols
  – Fertilizer N$_2$O Emissions (Early Action)
  – Solar Ponds
Emission Reduction Approaches

- Policy Options Include:
  - Direct Regulation
    - May be feasible for some discrete aspects
  - Market Mechanism
    - Could become a source of offsets
    - Unlikely to be directly within a market system
  - Incentives
  - Identification of Best Practices
Scoping Plan Process

• Climate Action Team Sub-group
• Interagency/Multi-stakeholder Agriculture Sector Scoping Workgroup
• ARB Staff Agriculture Sector Technical Team
• Scoping Plan Products
• Scoping Plan Development & Adoption
Potential Impacts of Unmitigated Climate Change on Agriculture

- Decreased milk production
- Decrease in chill hours required for fruit and nuts
- Increased risk of water shortages
- Increasing temperatures could decrease yields
- Increased pest pressure and expanded range for many agricultural pests
- Production losses in some of California’s most important crops
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