



Colorado Climate Action Panel  
Agriculture, Forestry, and Waste  
Policy Work Group  
Meeting #5  
May 4, 2007



# Agenda

- Introductions
- Approval of draft summary of Policy Work Group (PWG) Call #4
- Review CAP Meeting Issues
- Discuss/Develop Policy Option Straw Proposals
- Next Steps for the PWG
- Review and discussion of the Colorado GHG Inventory and Forecast
- Agenda, Time and Date for Next Meeting
- Public Input and Announcements

# CAP Meeting #3 Issues

- Discussion of PWG-pertinent issues from previous day CAP meeting

# AFW PWG Policy Options

<b>Preliminary Number</b>	<b>Title</b>
AFW-1	Agricultural Crop Management
AFW-2	Forestry Programs to Enhance GHG Benefits
AFW-3	Manure Management and Energy Utilization
AFW-4	Preserve Lands with Carbon Storage Value
AFW-5	Prevent Landfilling of Unprocessed Organic Material
AFW-6	Landfill Methane Energy Programs
AFW-7	Biodiesel Production
AFW-8	Reductions in On-Farm Energy Use
AFW-9	Biomass Feedstocks for Energy Production
AFW-10	Ethanol Production

# Development of Policy Option Straw Proposals

- See Current Policy Options Document posted at the AFW web page

# Next Steps for the PWG

- PWG volunteers help draft the following sections:
  - Policy Description
  - Policy Design
  - Existing Policies/Programs In Place
  - Implementation Mechanisms
  - Feasibility Issues
- CCS drafts the remaining sections

# Inventory and Forecast of Colorado GHG Emissions

- Preliminary analysis for further discussion and revision
  - Inventory of historical emissions from 1990 to most recent data year
  - Projection of emissions to 2020
- Prepared by CCS for Colorado Department of Public Health & Environment (CDPHE) under contract to the Western Regional Air Partnership (WRAP)

# Coverage

- Six gases per USEPA and UNFCCC guidelines
  - Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF<sub>6</sub>)
  - Black Carbon considered separately
- All major emitting sectors
  - Electricity
  - Fossil Fuels
  - Residential, Commercial, Industrial Fuel Use
  - Transportation
  - Agriculture, Forestry and Waste
  - Industrial Processes and Other Sources

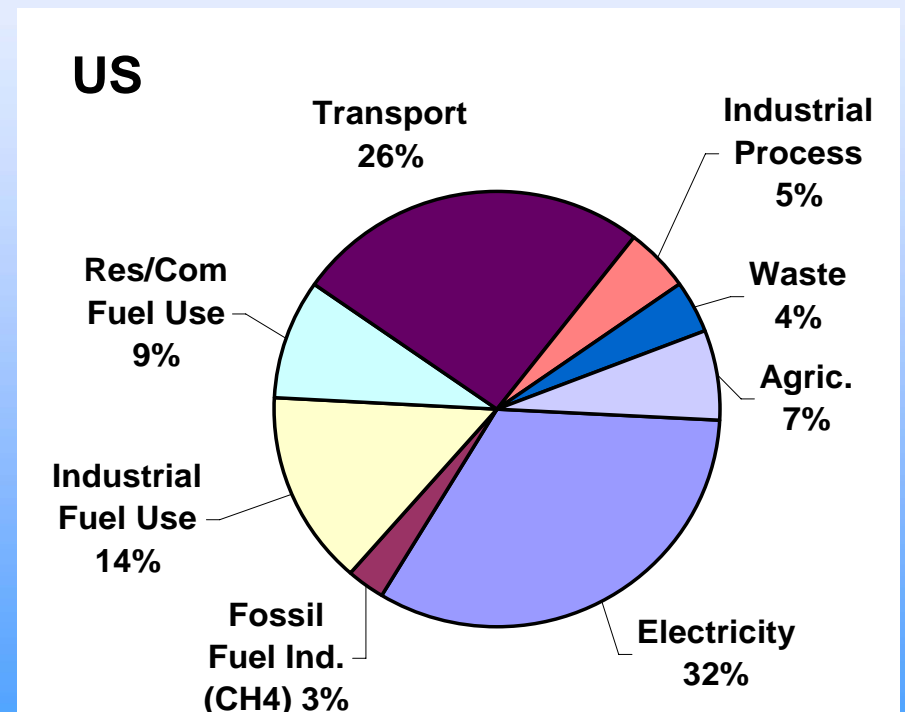
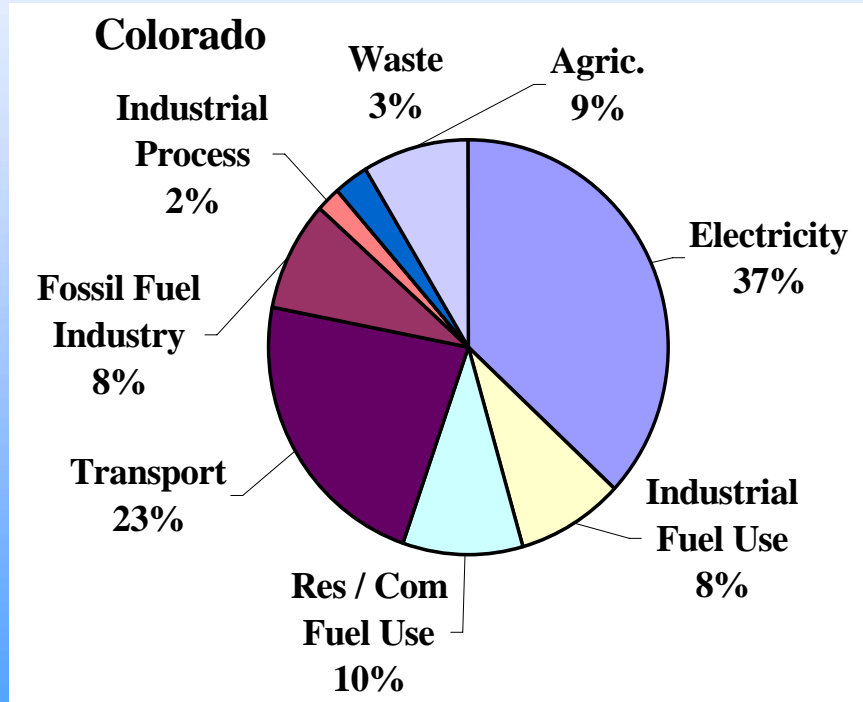
# Inventory Approach

- Standard US EPA and UN methodologies, guidelines, and tools
- Emphasis on transparency, consistency, and significance
- Preference for Colorado or regional data, where available
- Consumption and production-basis emissions from electricity generation
  - Very simplified approach used for initial analysis

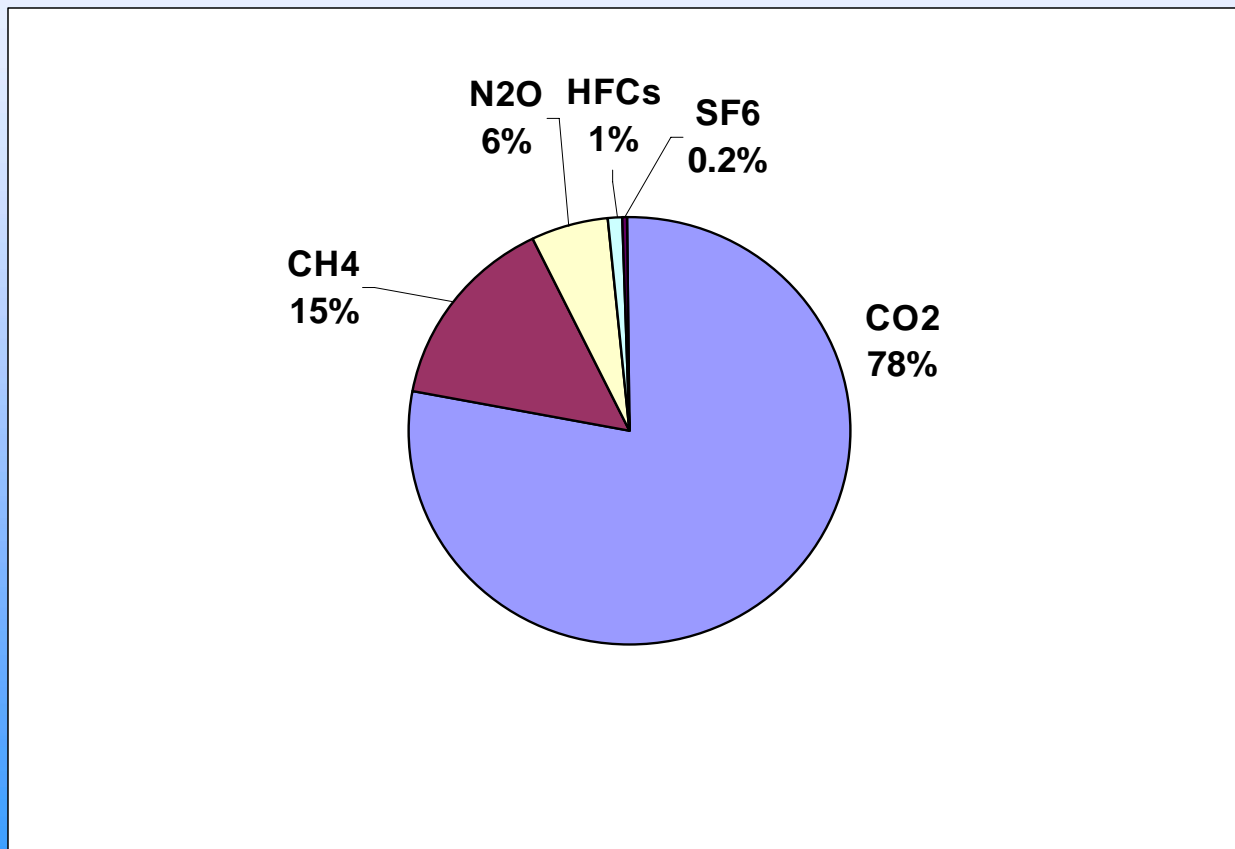
# Projection Approach

- Reference case assumes no major changes from business-as-usual (BAU)
  - Includes approved policies and actions to the extent possible (e.g., Energy Efficiency, Renewable Energy)
- Growth assumptions from existing sources
  - US Census and Bureau of Labor & Statistics
  - US Energy Information Administration

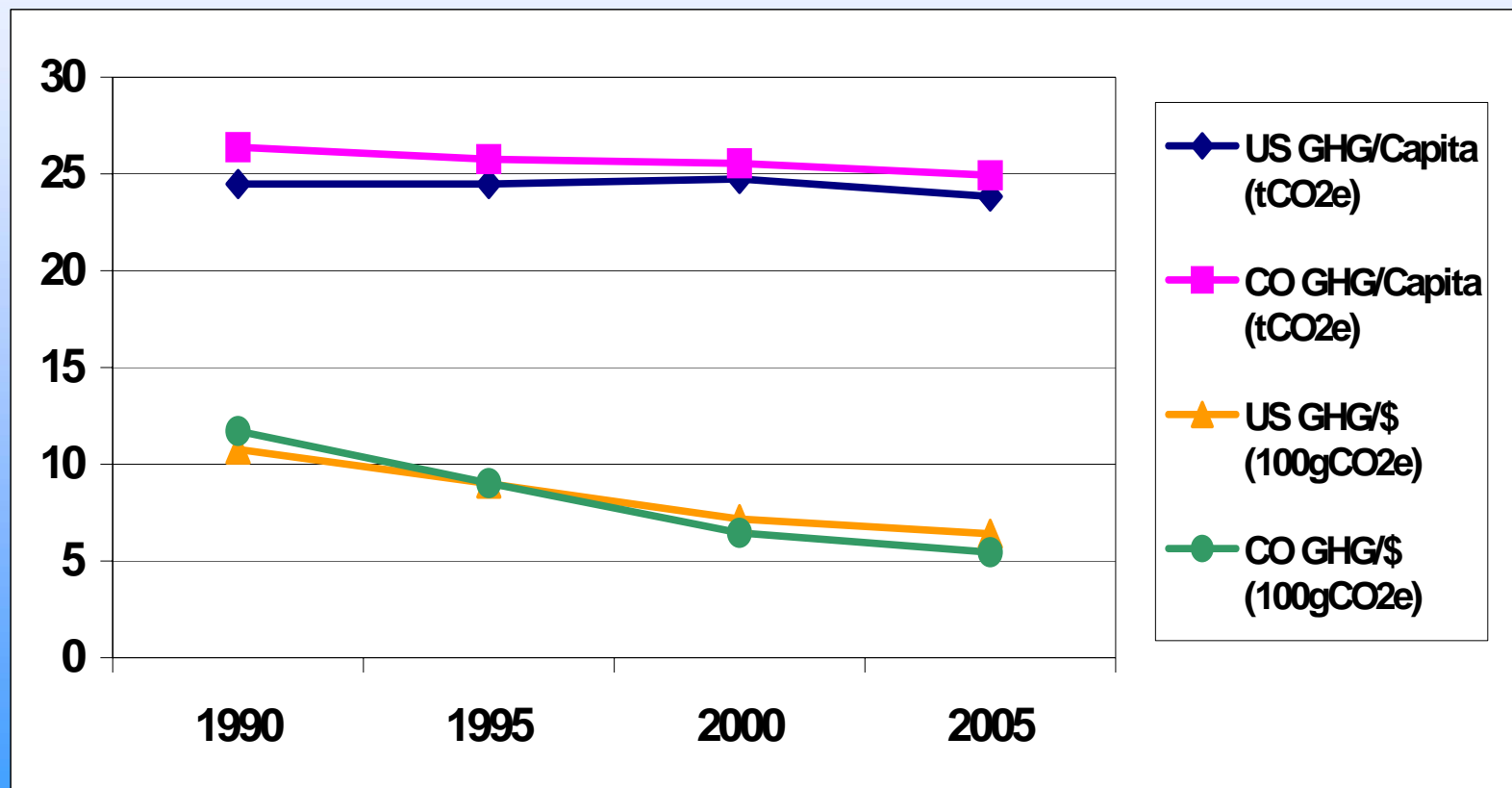
# Colorado & US Emissions By Sector, Year 2000



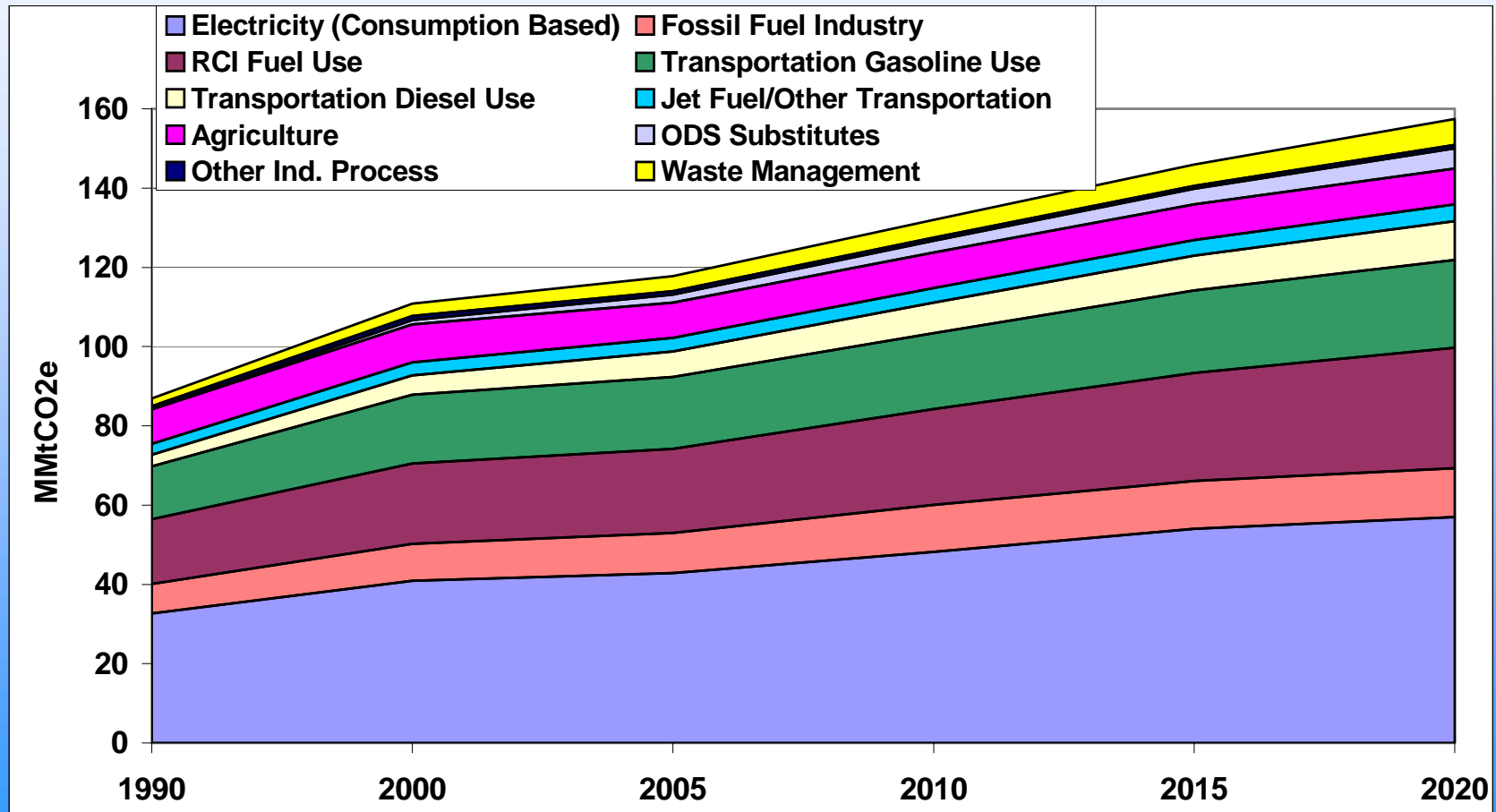
# Colorado Emissions By GHG, Year 2000 (MMtCO<sub>2</sub>e Based)



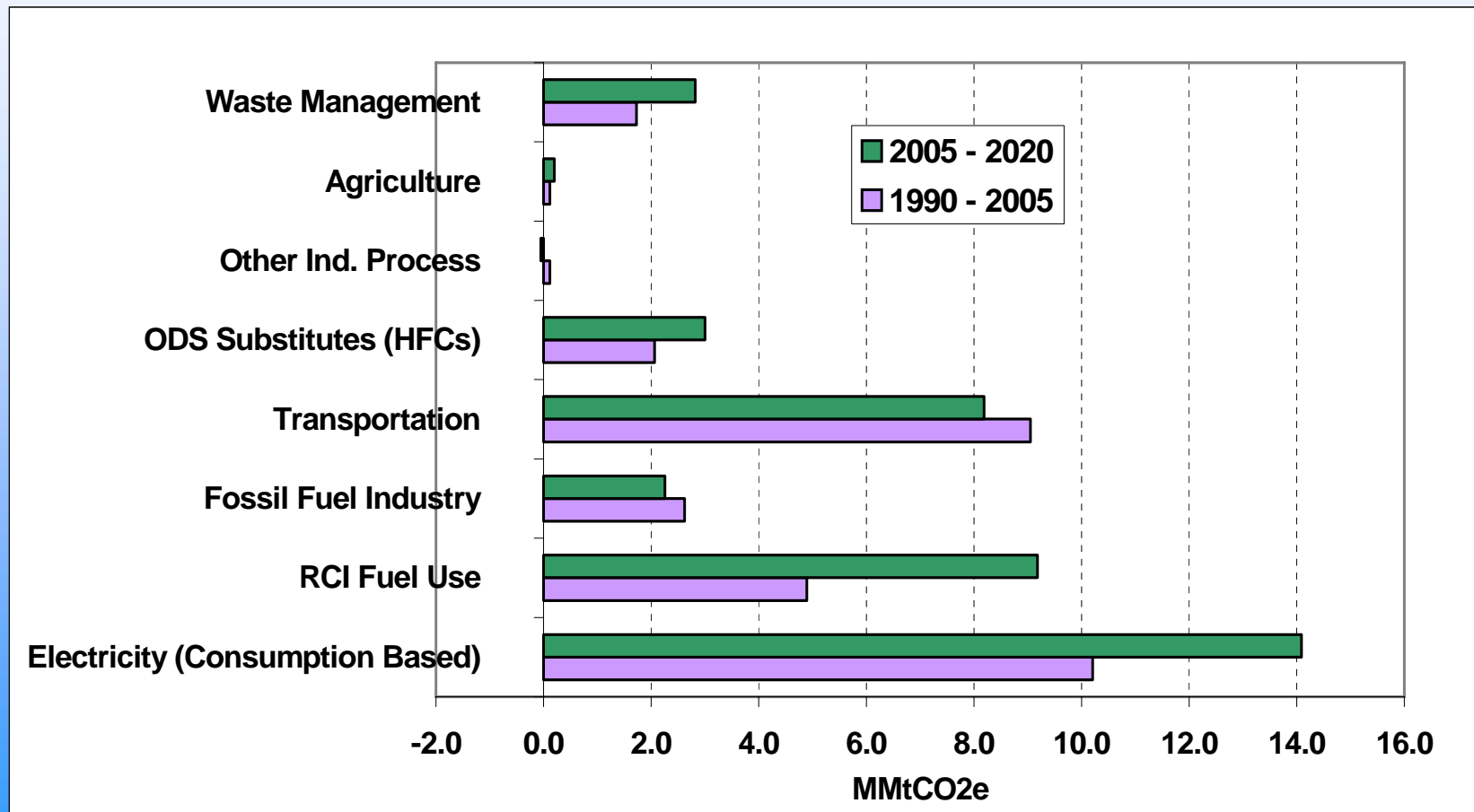
# Per Capita and GSP/GDP GHG Emissions, 1990-2002



# Gross Colorado GHG Emissions By Sector, 1990-2020



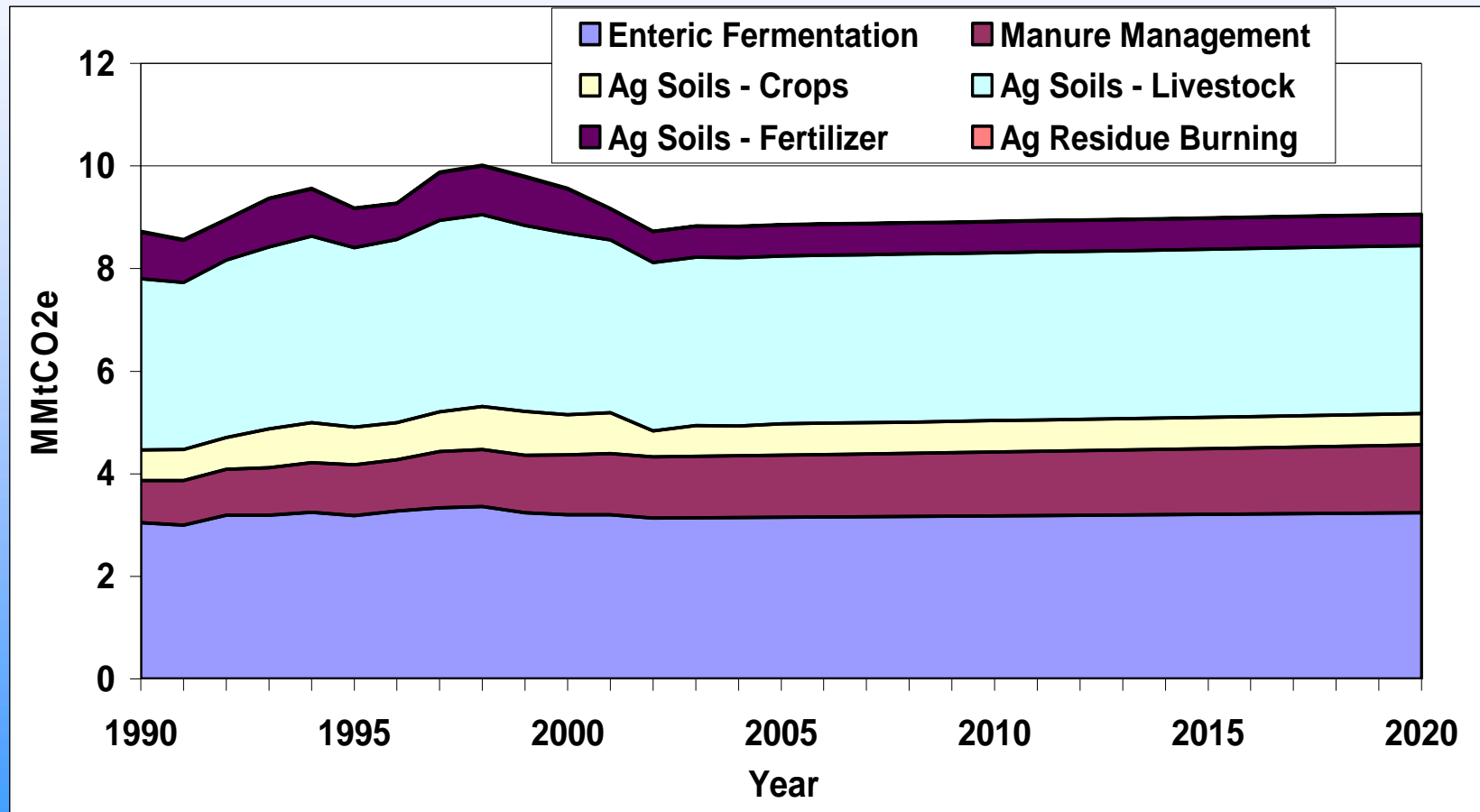
# Colorado Emissions Growth (MMtCO<sub>2</sub>e Basis)



# Key Points

- Preliminary draft prepared by CDPHE and CCS under WRAP project
- Preliminary draft for PWG and CAP review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a baseline for modeling or compliance for individual sources
- Consumption and Production methods
- Net and Gross methods

# Agriculture



# Agriculture

- Data Sources
  - Crop Acreage: USDA/NASS
  - Livestock: USDA/NASS
  - Fertilizer: Fertilizer Institute
- Methods
  - Crops: SGIT emission factors and crop acreage
  - Livestock: SGIT emission factors and livestock populations
  - Fertilizer: SGIT fertilizer consumption
  - No growth assumed for Ag Soils and Ag Residue Burning emissions
  - 1997 USDA estimates for Ag soil carbon sinks (-2.0 MMt)

# Agriculture

- Key Assumptions
  - No growth or significant change in crop production for the future
  - Dairy cattle population growth (1.8%/year); no growth for other livestock categories
    - Based on Colorado Agricultural Statistics Service data
- Key Uncertainties
  - Projection data

# Forestry

Carbon Pool	MMtCO <sub>2</sub> e/yr
Live Trees	-15.3
Standing Dead Trees	-1.5
Live Understory	-0.9
Down and Dead Trees	-1.0
Forest Floor	-5.2
Soils	-7.1
Harvested Wood Products	-0.8
<b>Total</b>	<b>-31.8</b>

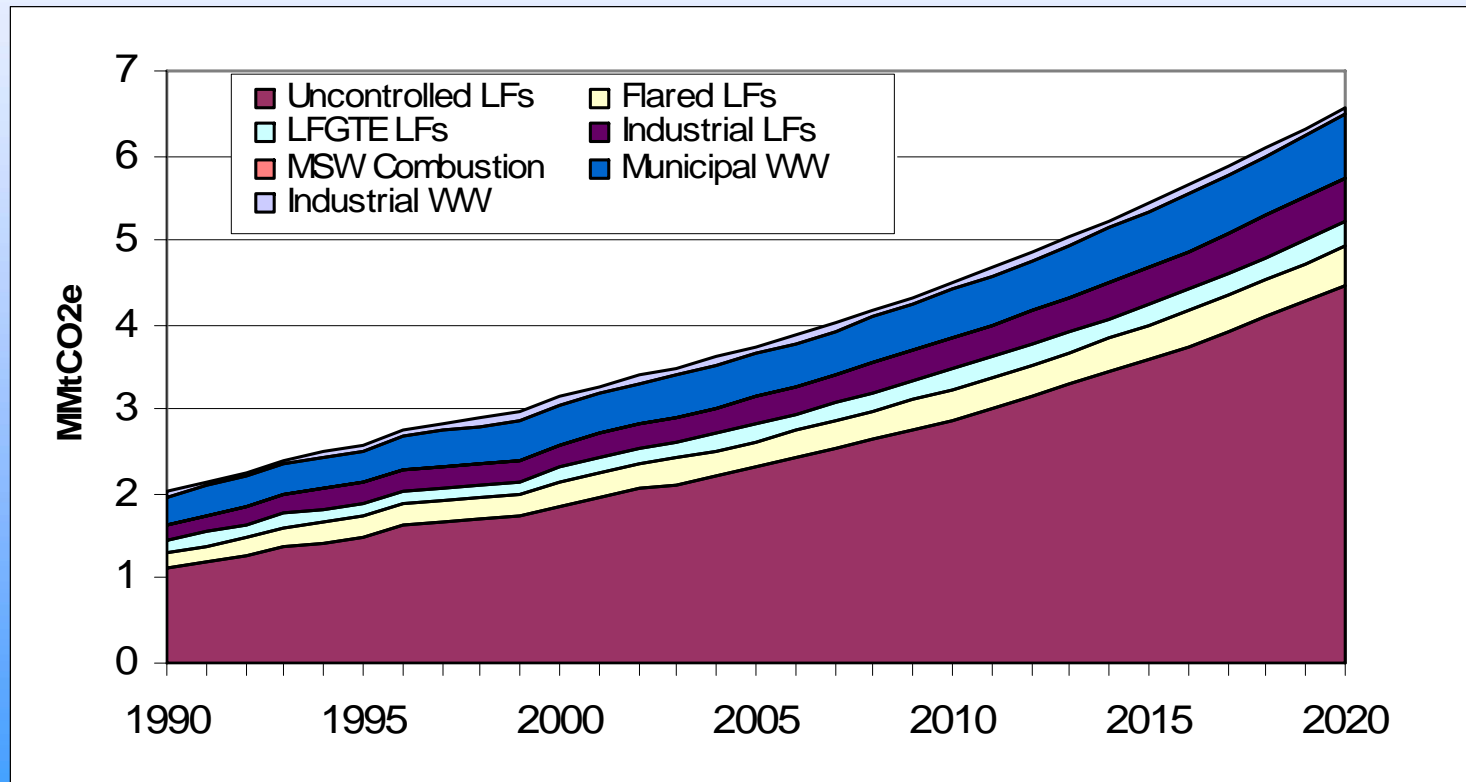
# Forestry

- Data Sources
  - USFS carbon stock for 2 inventories (1983/1984-2005) based on FORCARB2 model
  - USFS also provides modeled estimates for harvested wood products
- Methods
  - Forestry: USFS FORCARB2 carbon stock change model provides carbon pools for each inventory cycle
  - Flux calculated for each pool based on difference in time between inventory cycles
  - Carbon pool data for the 1983/1984-2005 time-period used to quantify flux.

# Forestry

- Key Assumptions
  - 1983-2005 carbon stock change representative of current conditions
  - No significant change in sequestration from 2006-2020
- Key Uncertainties
  - Effects of future development on forested acreage
  - Effects of near-term climate change on forest sequestration levels
  - Effects of increasing wildfire activity on sequestration levels

# Waste Management



# Waste Management

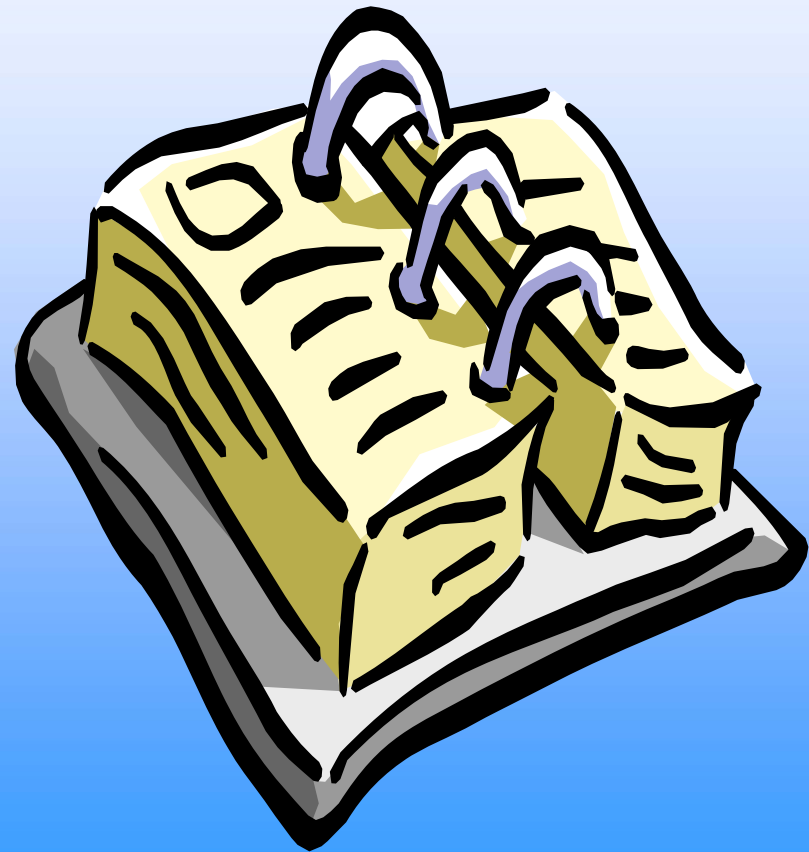
- Data sources
  - EPA LMOP Database
  - CDPHE Survey on landfills
  - CDPHE data on WW flows for meat/poultry processors
  - State population and SGIT default data for municipal WW treatment
- Methods
  - SGIT with data sources above
  - CCS post-processing to account for controls and growth

# Waste Management

- Key Assumptions
  - Growth Rates
    - Landfills – based on historic emissions growth
    - Industrial WW – held constant at 2005 levels
    - Municipal WW – CO population projections
- Key Uncertainties
  - Future controls applied to uncontrolled landfills
  - Industrial landfills – SGIT default of 7% of municipal landfills
  - Industrial WW – growth for meat/poultry; lack of data for pulp/paper and food/vegetable processing

# Next PWG Meeting

- Agenda:
  - Review results of CAP Meeting on 5/22
  - Discuss Next Steps on Policy Option Development
  - Continue review and potential revision of Colorado GHG inventory and forecast, as needed
- Date & Time: see next slide
- CO CAP Meeting on May 22



# Remaining PWG Meetings

- CAP Meeting Schedule: 5/22; 7/12; 9/11 or 9/12.
- Suggested PWG Dates: 5/24; 6/15; 7/13; 8/2 or 8/3.

# Public Input, Announcements