



Colorado Climate Action Panel  
Agriculture, Forestry, and Waste  
Policy Work Group  
Meeting #2  
February 14, 2007



# Agenda

- Introductions
- Approval of draft summary of Policy Work Group (PWG) Call #1
- Review and discussion of the Catalog of States Actions
- Review and discussion of the Colorado GHG Inventory and Forecast
- Next Steps of PWG's
- Agenda, Time and Date for Next Meeting
- Public Input and Announcements

# Catalog of States Actions

- Refer to updated handout
  - Draft preliminary rankings of GHG potential, cost/cost savings for review and revision
  - Notation of actions from AZ, NM and MT
  - Supplemental descriptions of catalog actions (separate document)
  - Addition of new potential actions

# 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

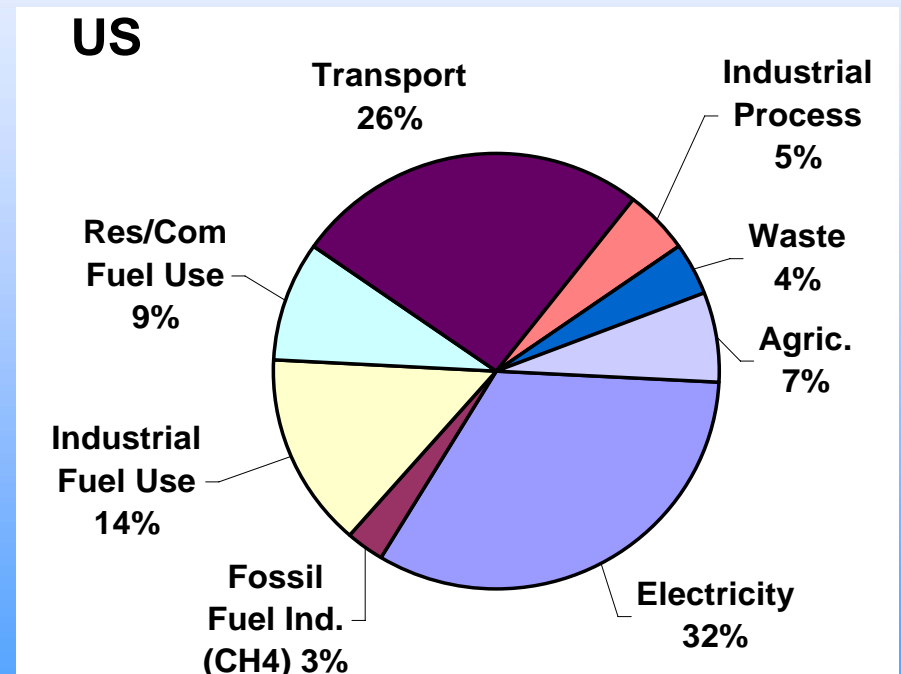
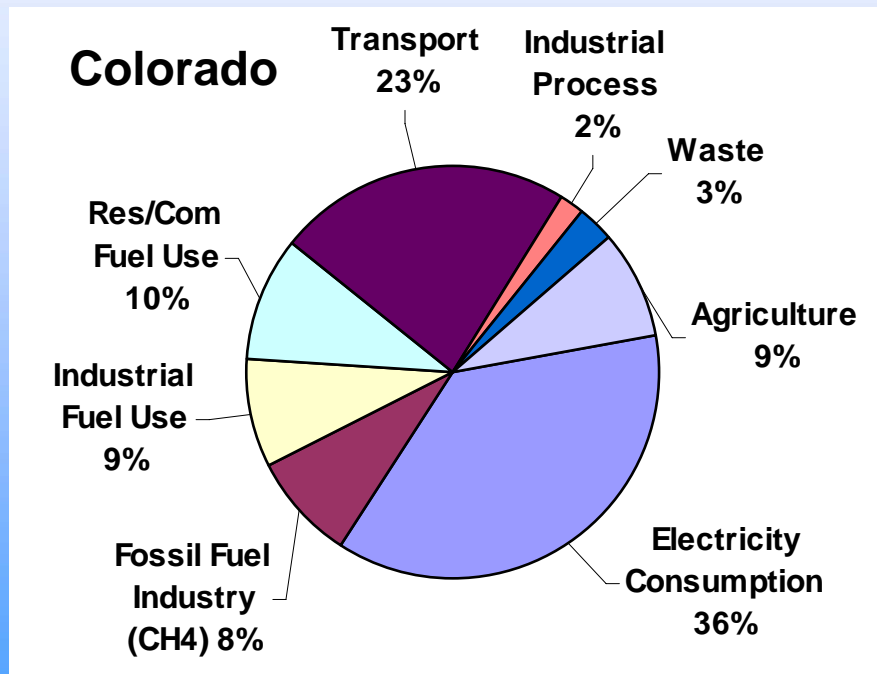
# Inventory Approach

- 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

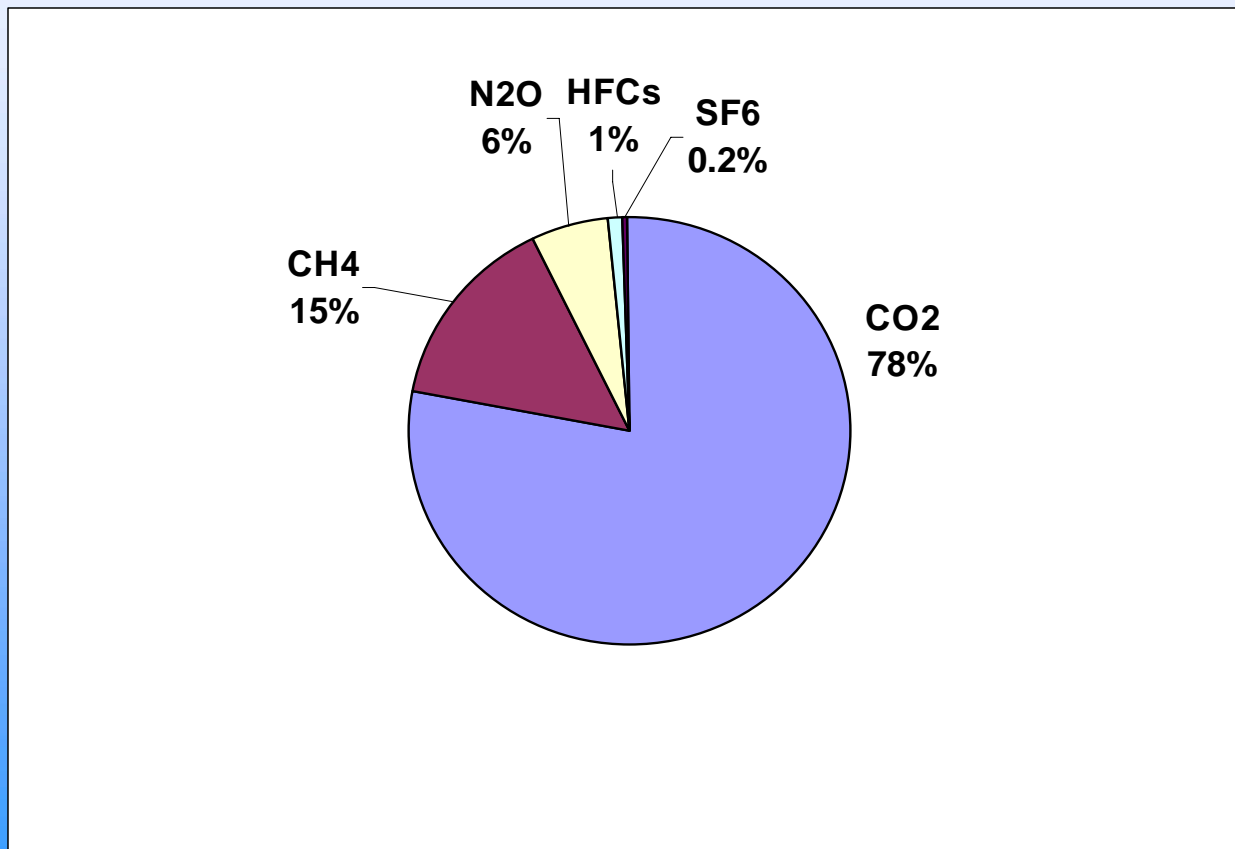
# Projection Approach

- 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

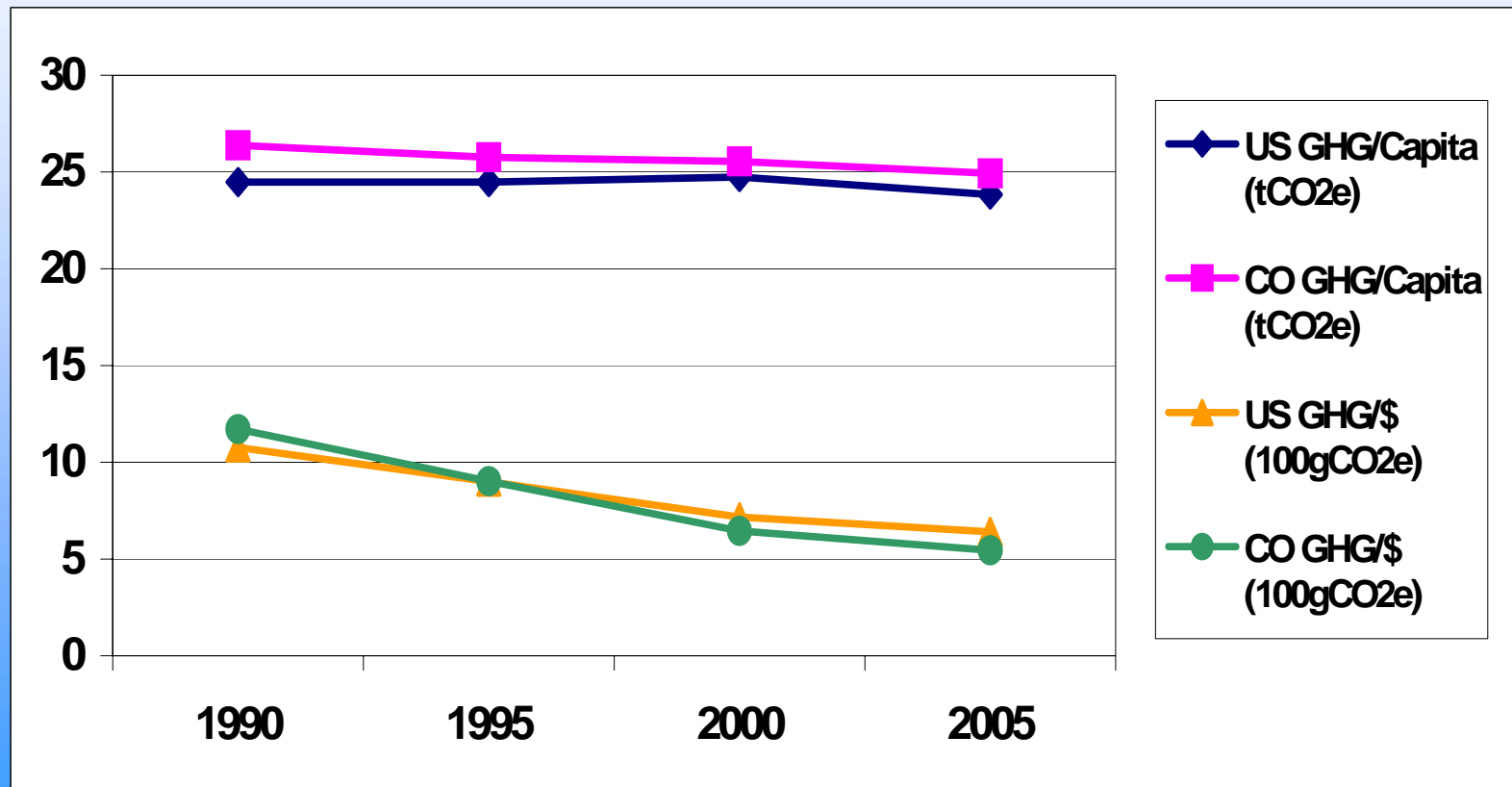
# Colorado & US Emissions By Sector, Year 2000



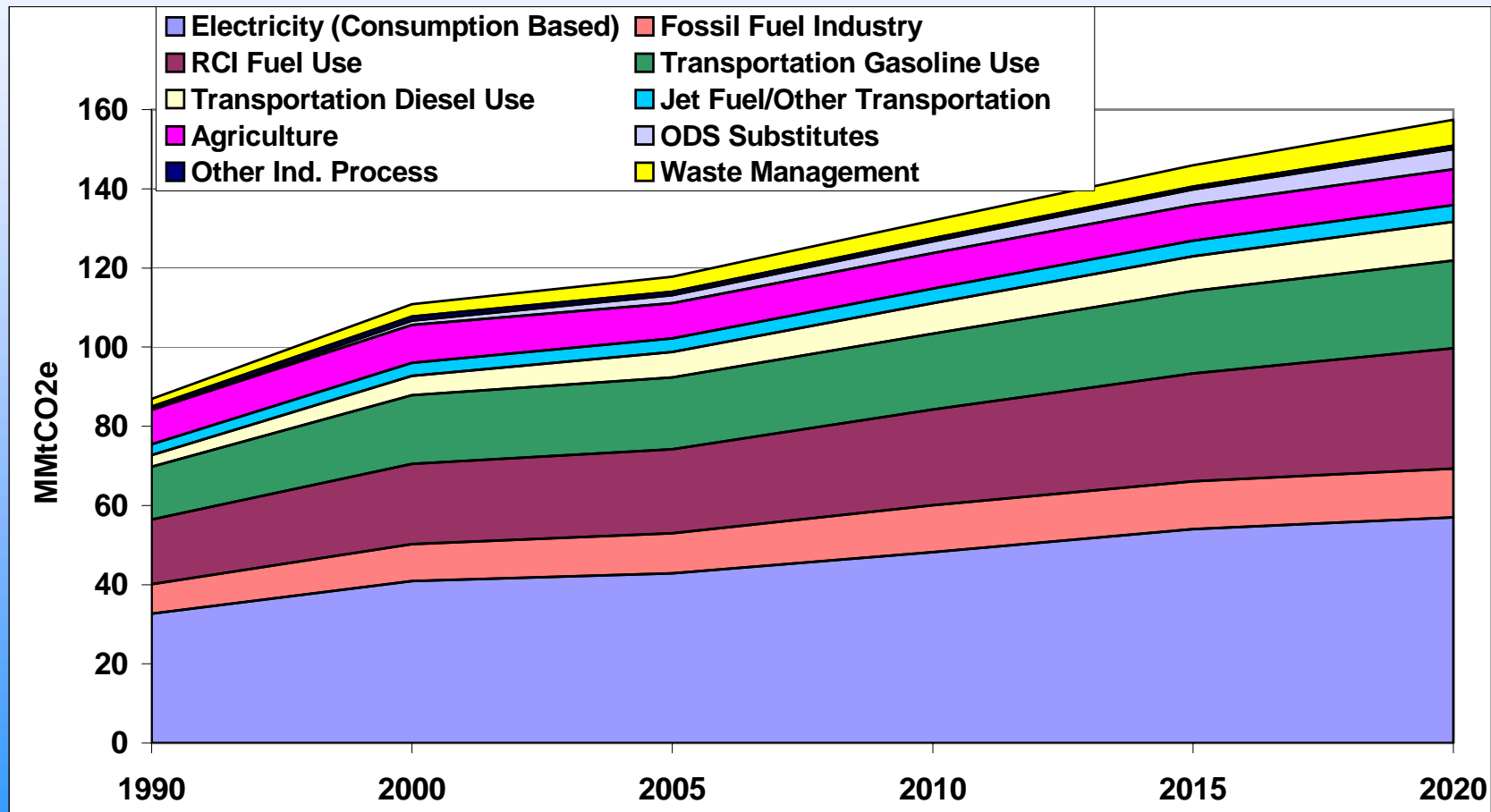
# Colorado Emissions By GHG, Year 2000 (MMtCO<sub>2</sub>e Based)



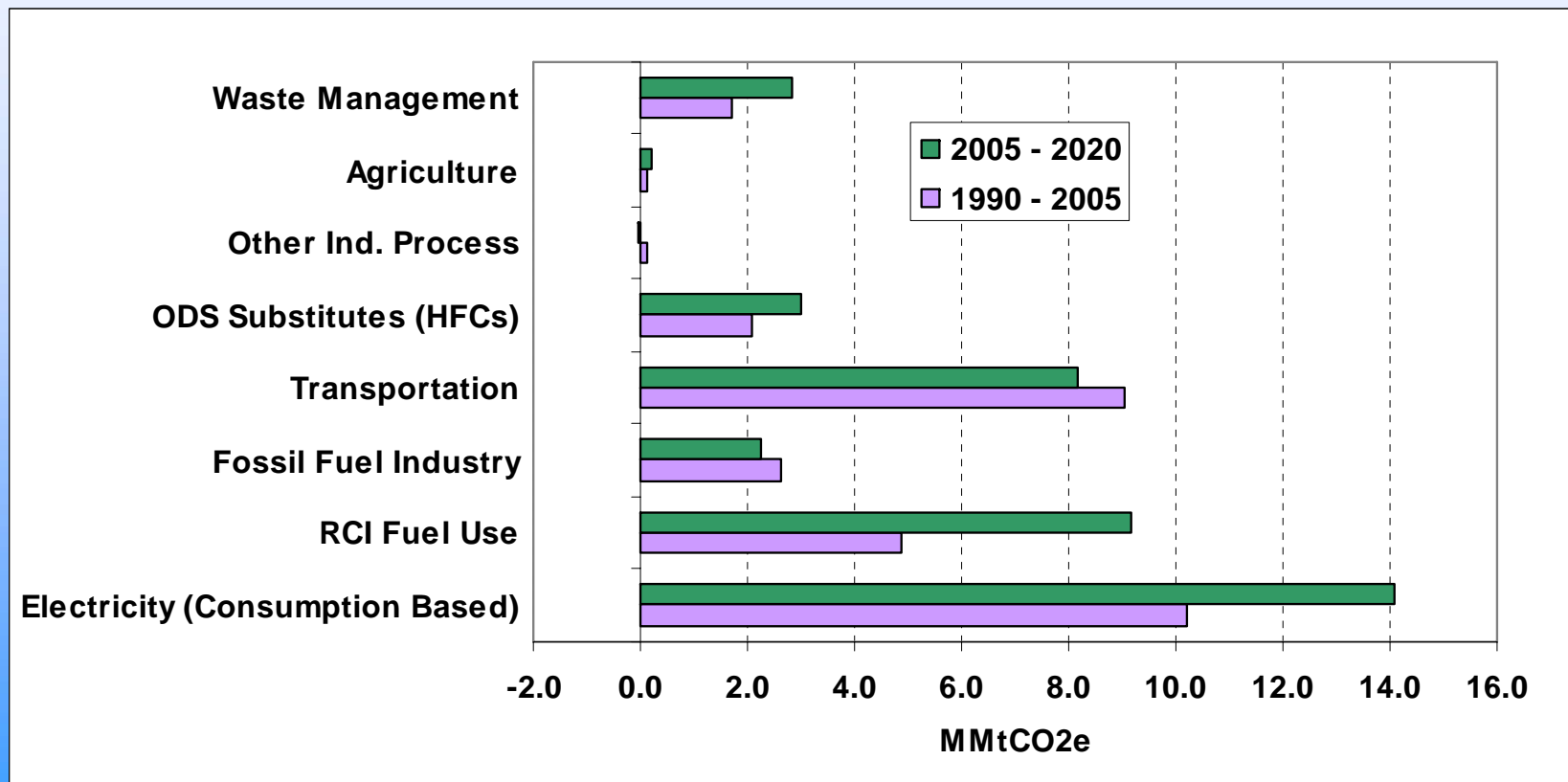
# Per Capita and GSP/GDP GHG Emissions, 1990-2002



# Gross Colorado GHG Emissions By Sector, 1990-2020



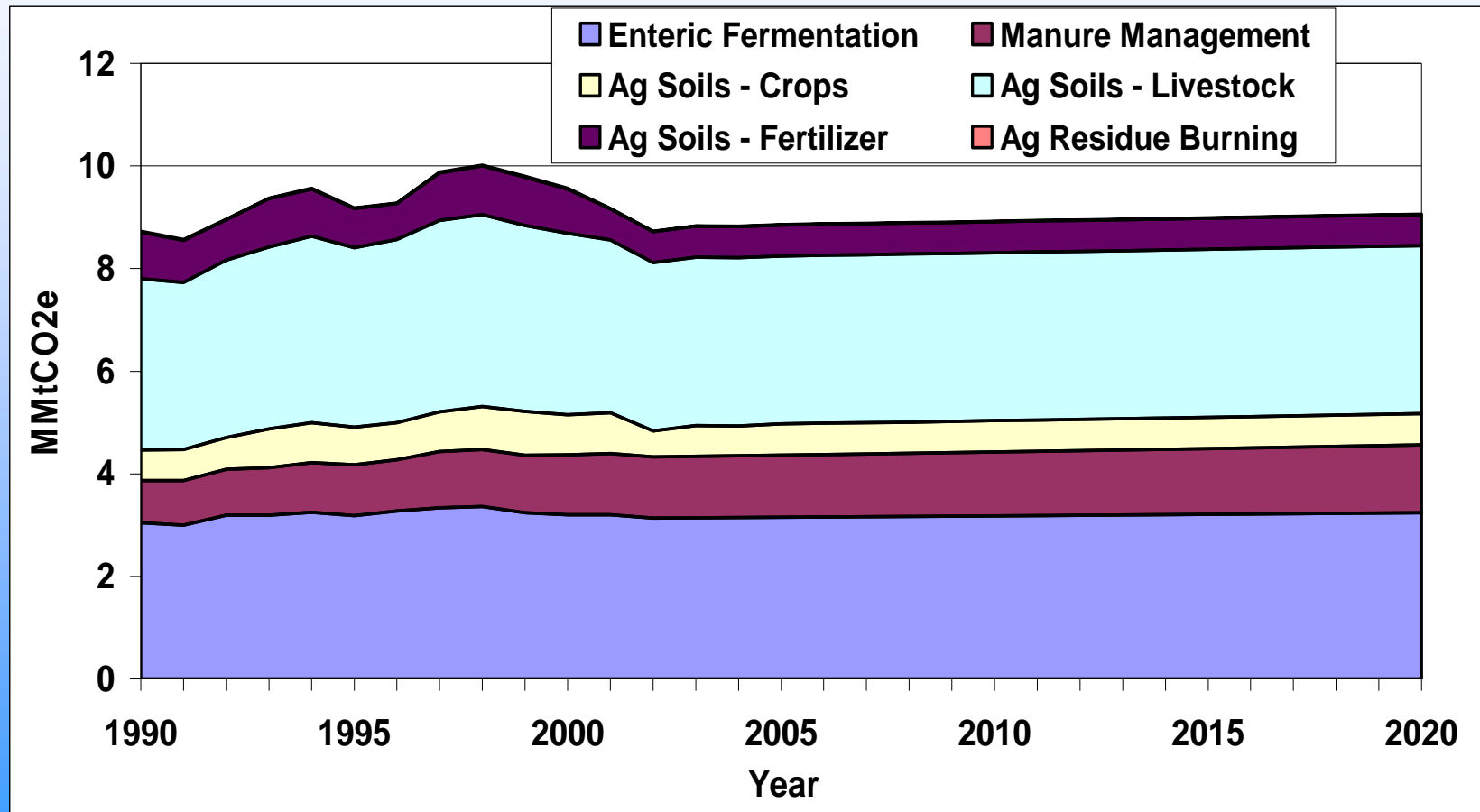
# Colorado Emissions Growth (MMtCO<sub>2</sub>e Basis)



# 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>

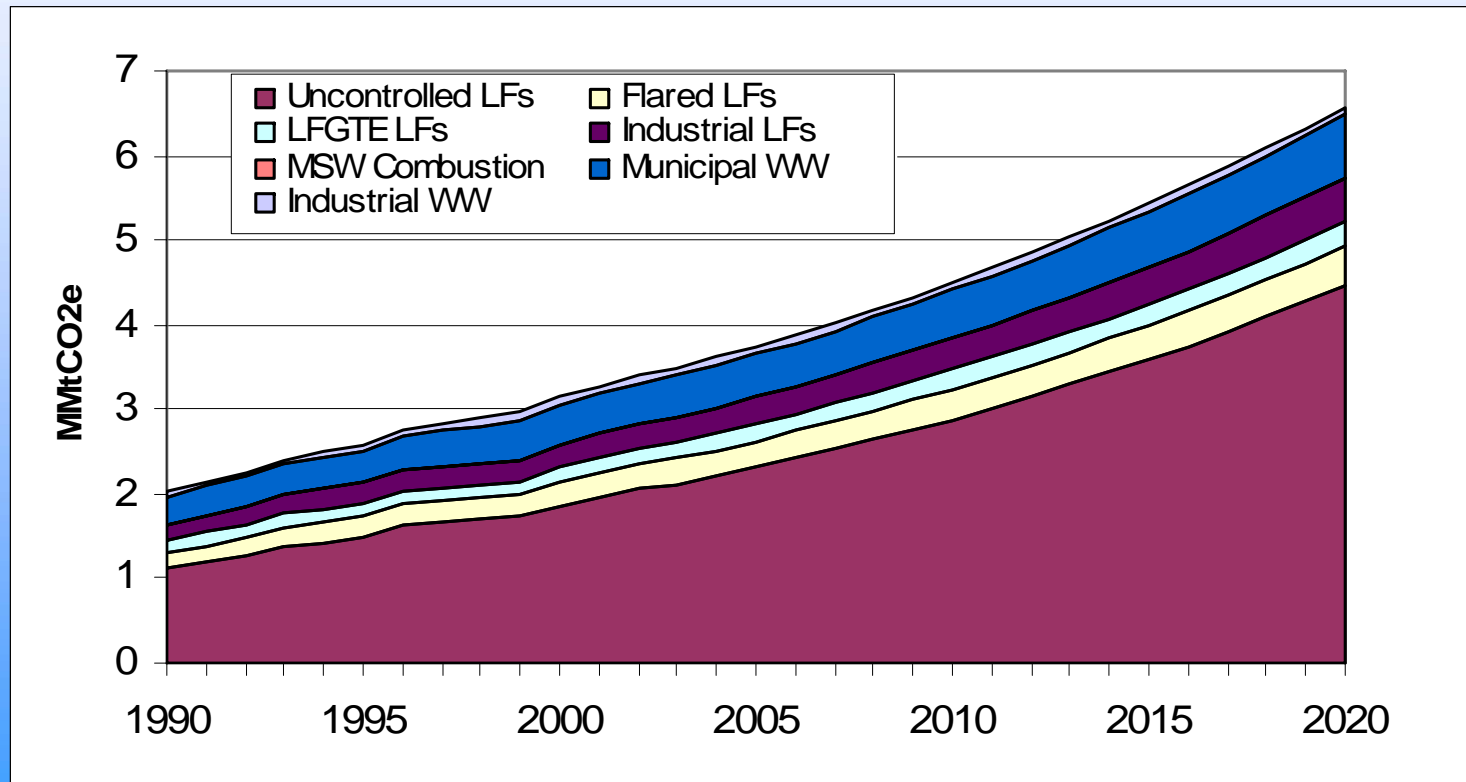
# Forestry

- 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

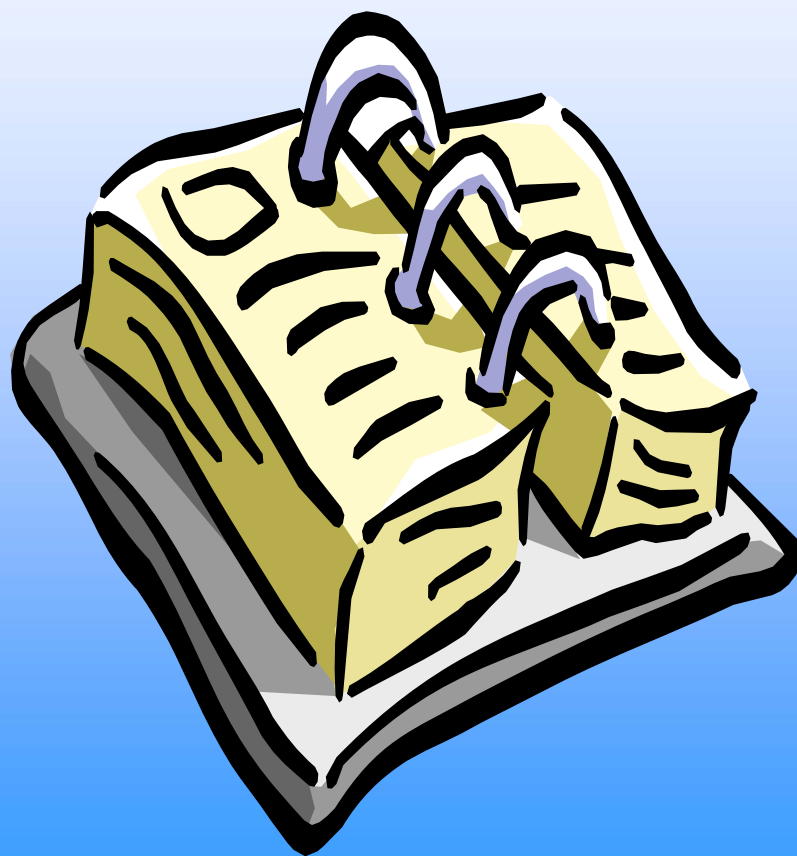
- Data sources
  - EPA LMOP Database
  - CDPHE Survey on landfills
  - CDPHE data on WW flows for meat/poultry processors
  - State population and SGIT default data for municipal WW treatment
- Methods
  - SGIT with data sources above
  - CCS post-processing to account for controls and growth

# 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:
  - Begin balloting for top priorities for analysis in each PWG
  - Continue review and potential revision of Colorado GHG inventory and forecast
- Time and Location TBD



# Public Input, Announcements