



Colorado Climate Action Panel
Agriculture, Forestry, and Waste
Policy Work Group
Meeting #4
April 2, 2007



Agenda

- Introductions
- Approval of draft summary of Policy Work Group (PWG) Call #3
- Review Balloting on Policy Options
- Assign TWG Volunteers to Assist in Drafting Policy Options
- 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

Results of Balloting on Policy Options

- See Balloting Results distributed via email prior to the call
- All ballots received were tallied and options were then sorted
- Recommendations for consolidation were reviewed and applied
- Consolidated options were renamed to reflect the combined option

AFW PWG Policy Options

Preliminary Number	Preliminary Title
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

Assignment of PWG Volunteers

- See Policy Template posted at the AFW web page
- 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 (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF₆)
 - 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

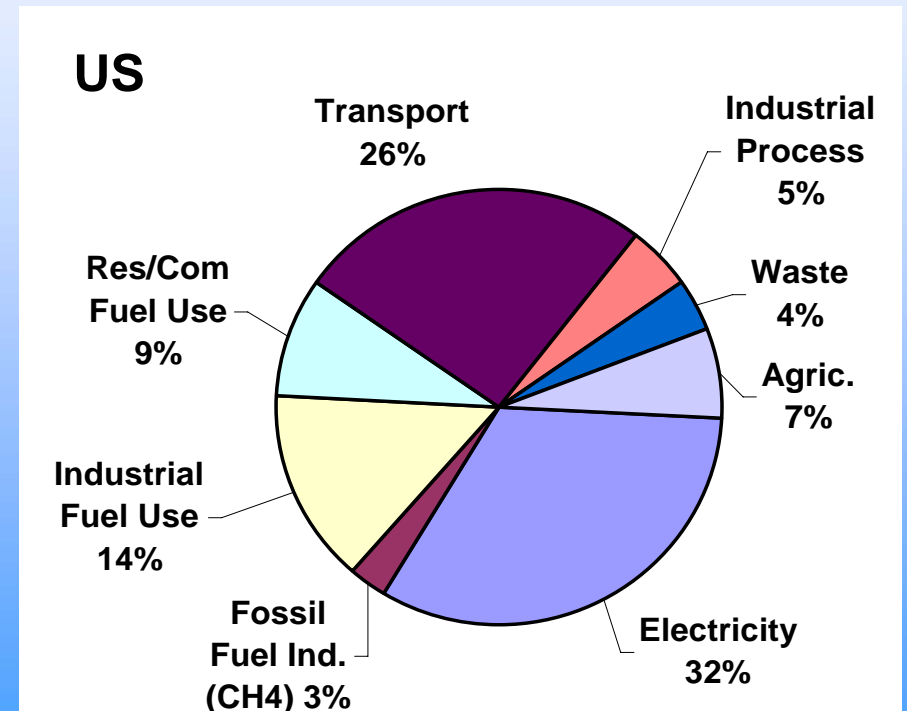
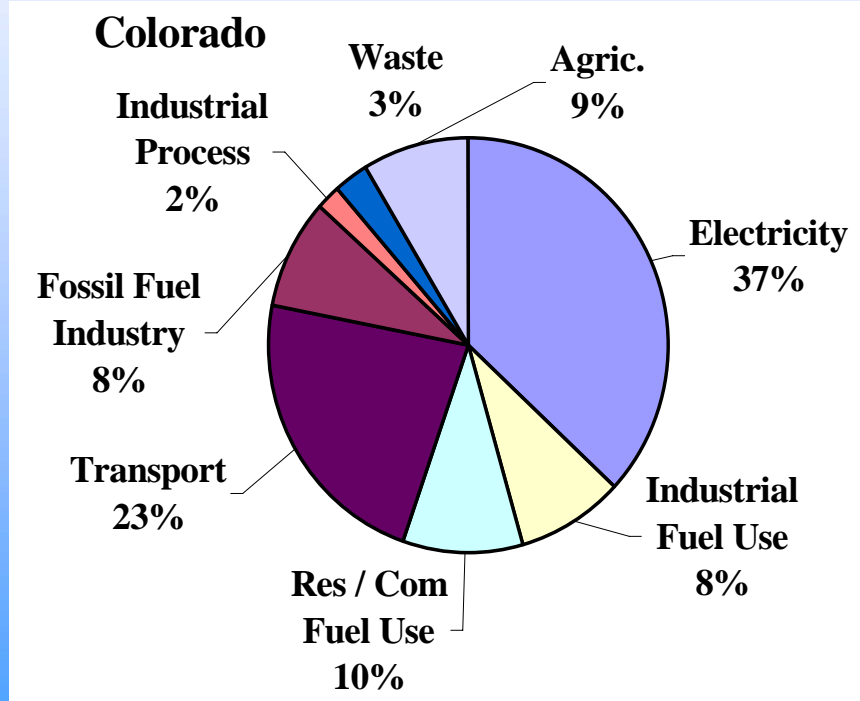
Inventory Approach

- 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

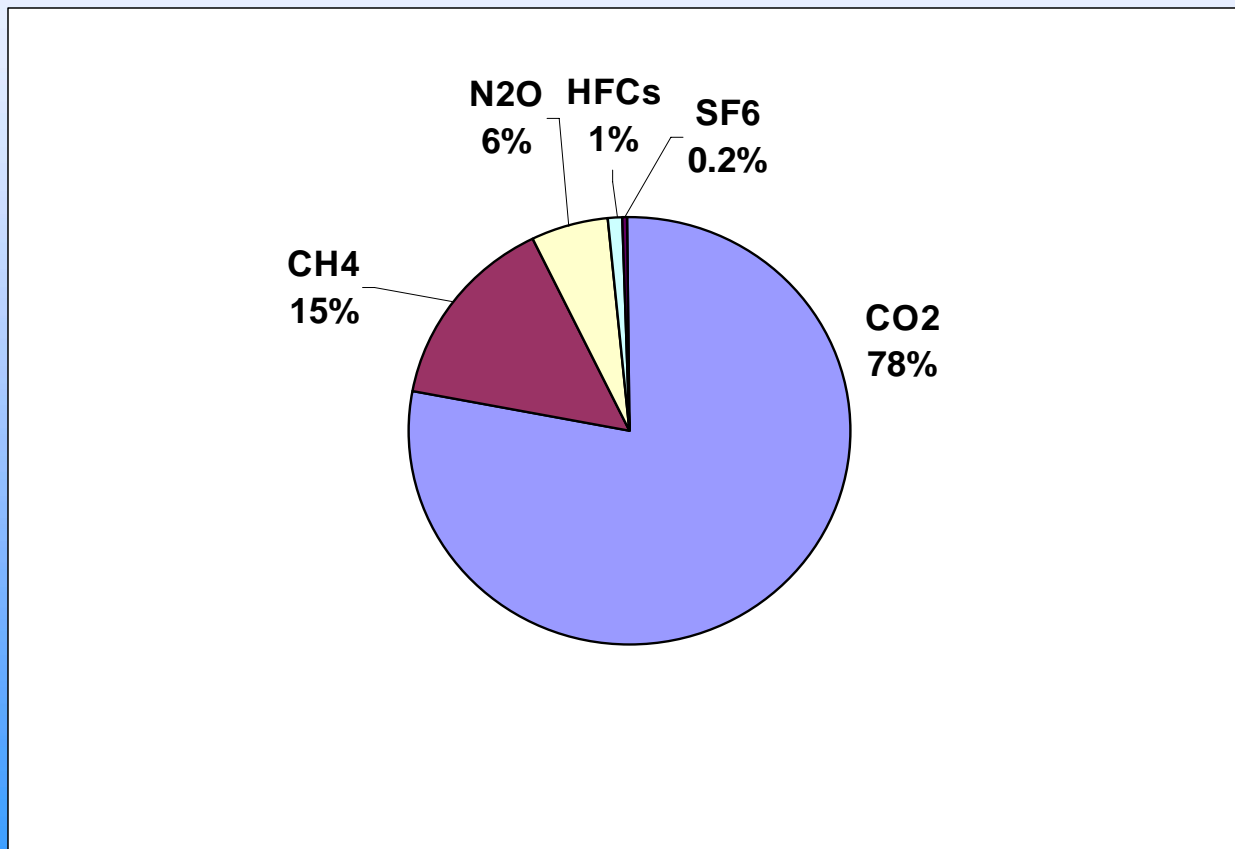
Projection Approach

- 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

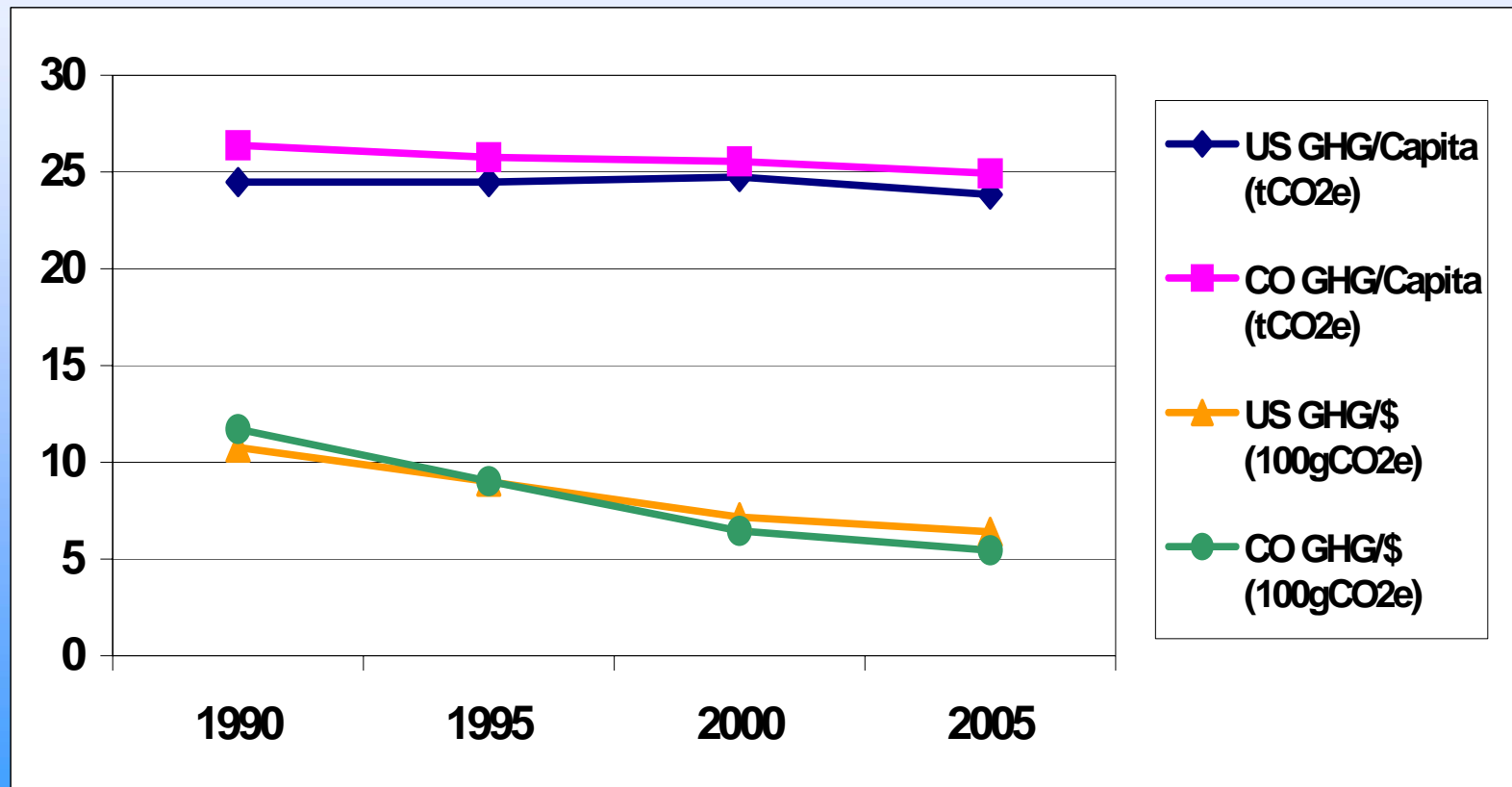
Colorado & US Emissions By Sector, Year 2000



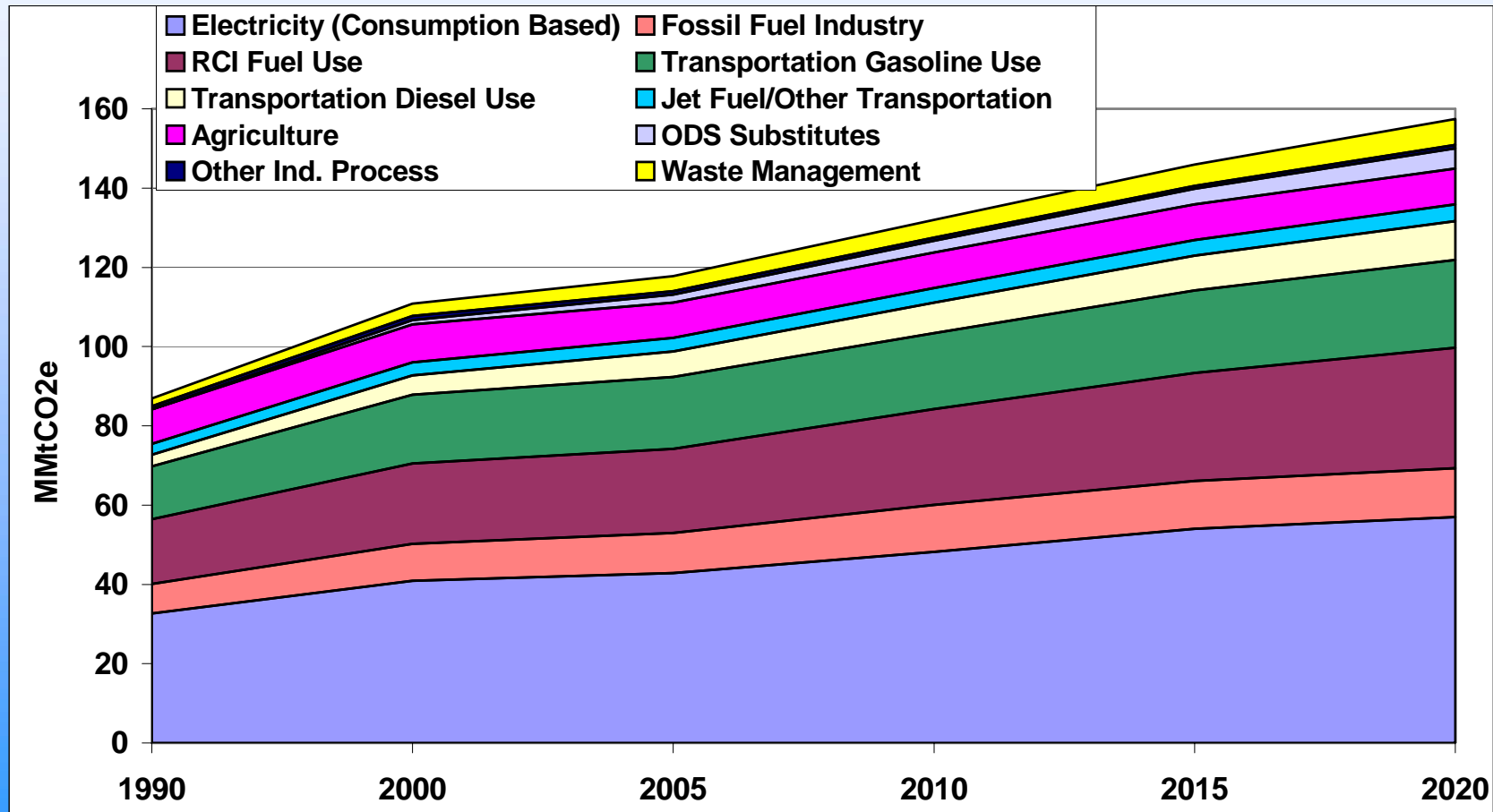
Colorado Emissions By GHG, Year 2000 (MMtCO₂e Based)



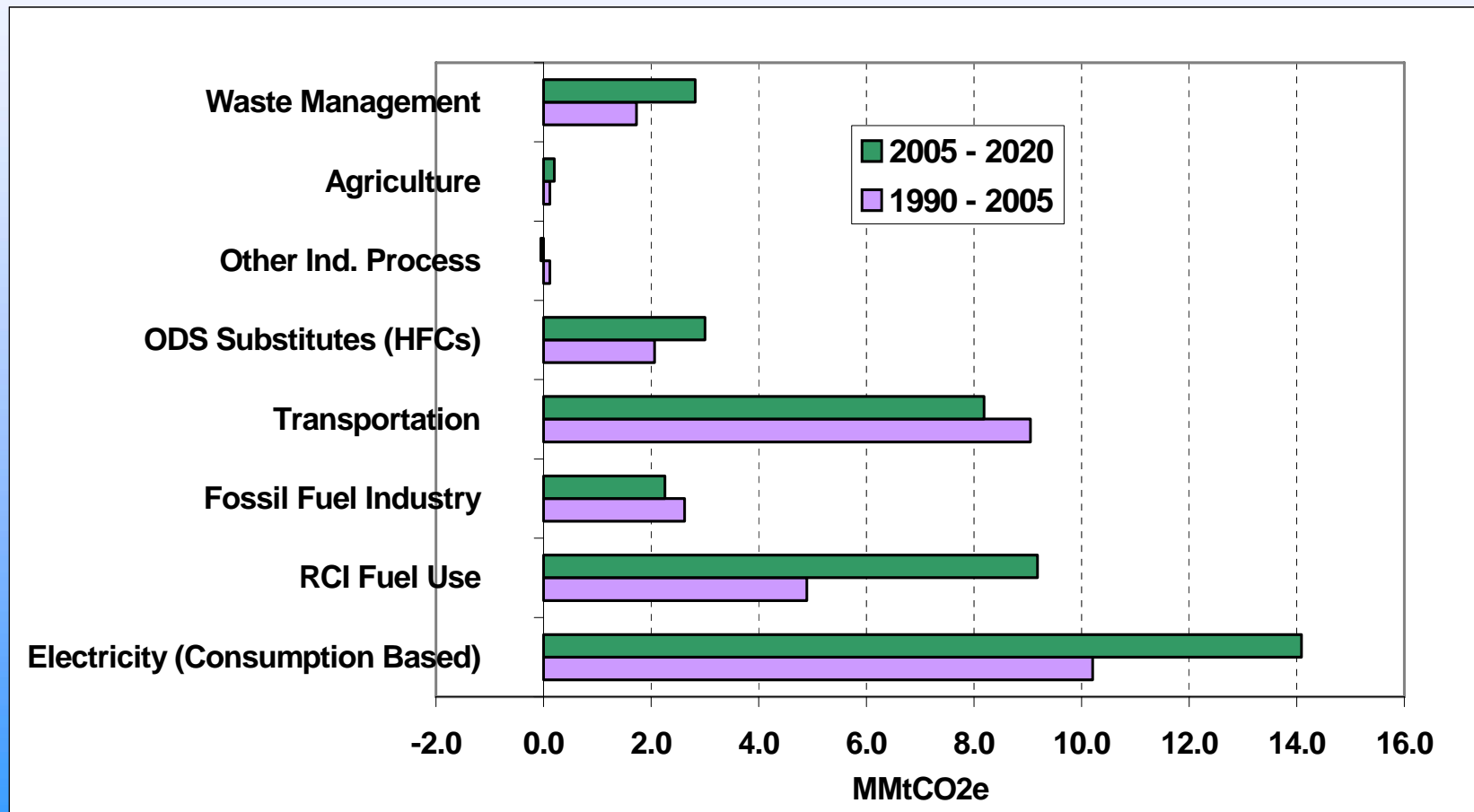
Per Capita and GSP/GDP GHG Emissions, 1990-2002



Gross Colorado GHG Emissions By Sector, 1990-2020



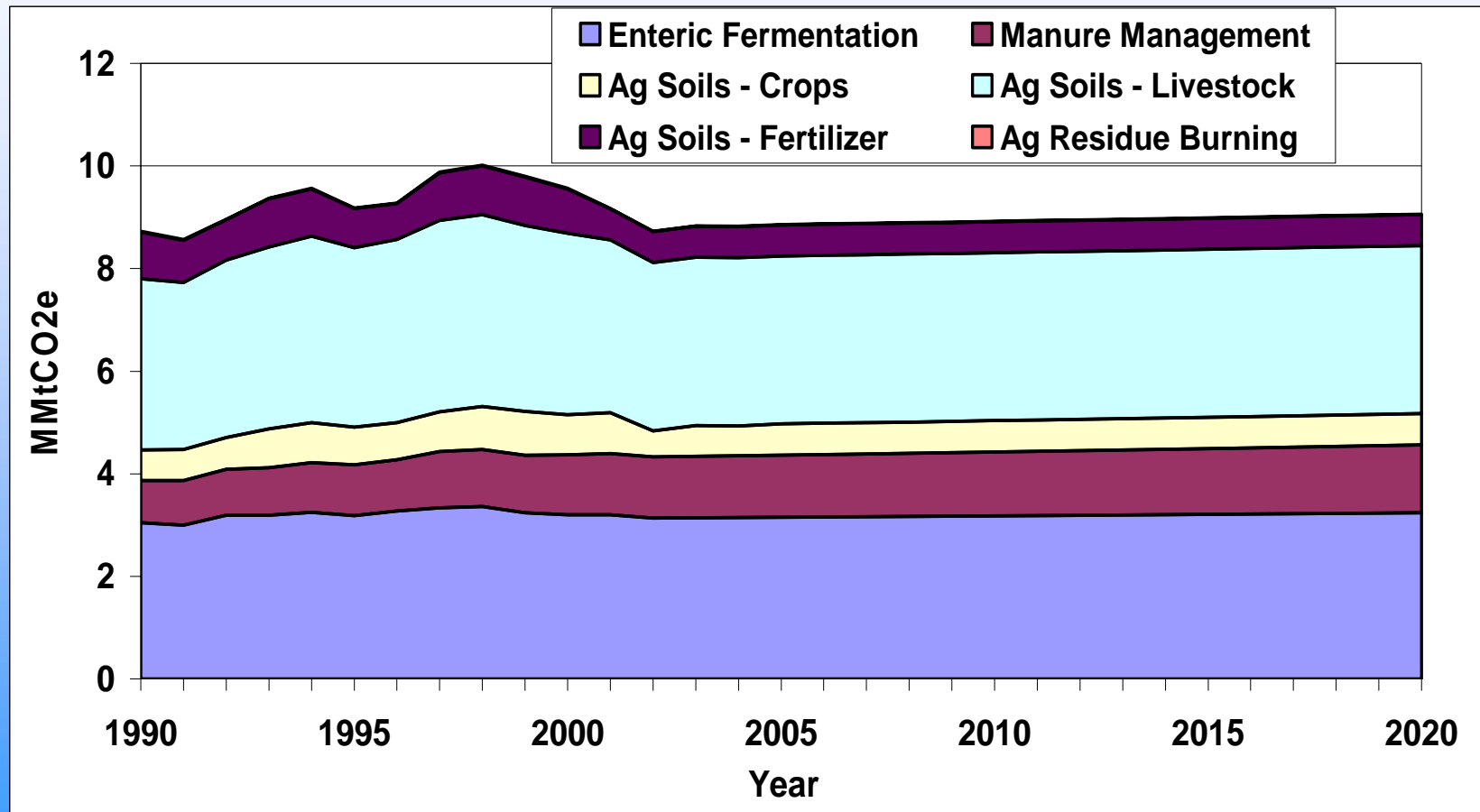
Colorado Emissions Growth (MMtCO₂e Basis)



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 ₂ 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
Total	-31.8

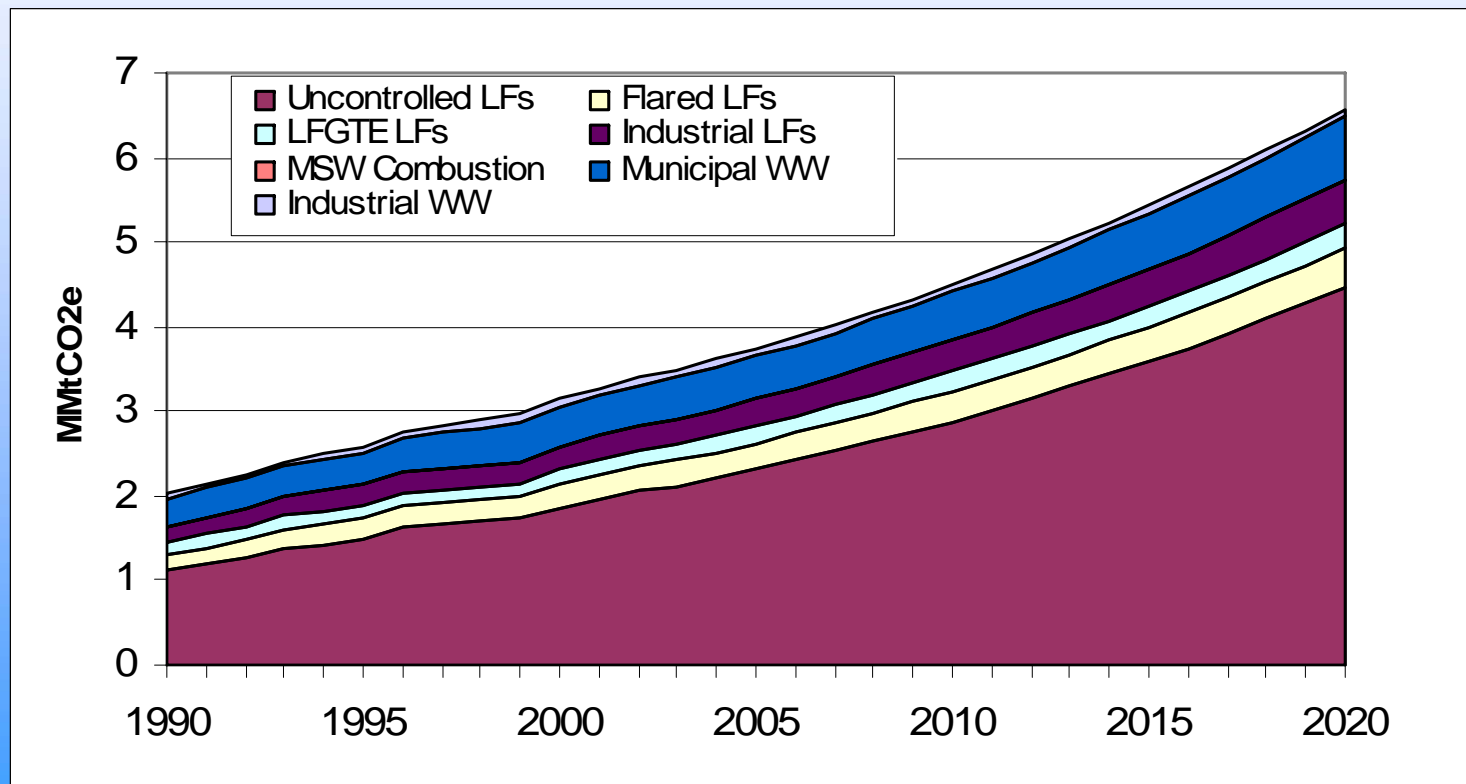
Forestry

- 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

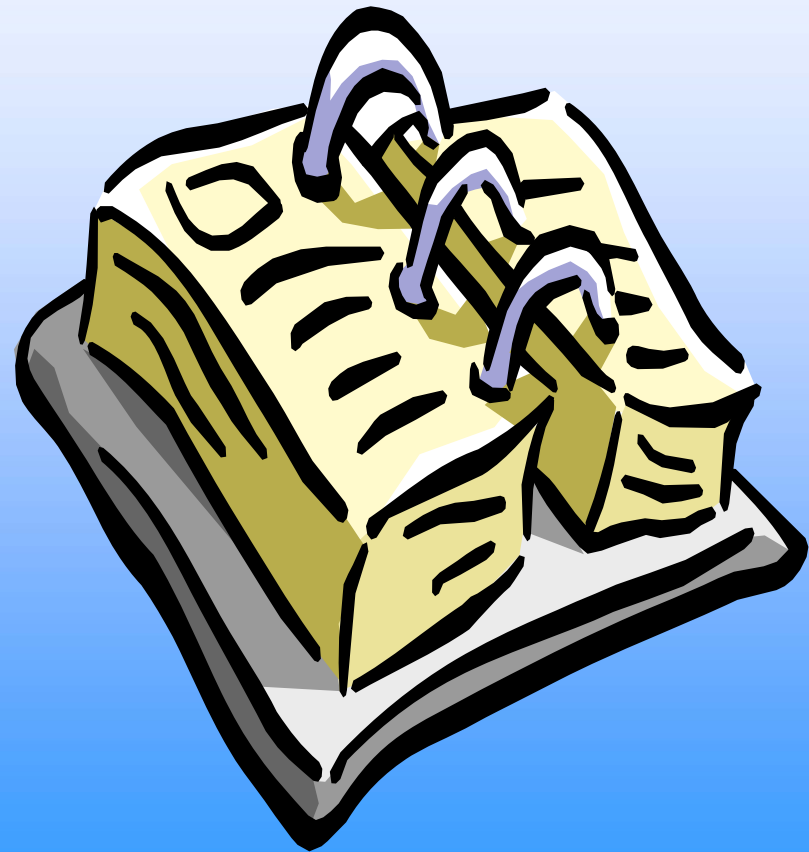
- Data sources
 - EPA LMOP Database
 - CDPHE Survey on landfills
 - CDPHE data on WW flows for meat/poultry processors
 - State population and SGIT default data for municipal WW treatment
- Methods
 - SGIT with data sources above
 - CCS post-processing to account for controls and growth

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 5/3
 - Discuss Development of Straw Proposals
 - Continue review and potential revision of Colorado GHG inventory and forecast
- May 4, A.M. Time TBD (in-person @ NREL)
- CO CAP Meeting on May 3



Public Input, Announcements