

Agriculture, Forestry, and Waste Management Technical Work Group Teleconference Meeting #1

August 31, 2006

Introductions

- Technical Work Group (TWG) members
- MT DEQ
- CCS TWG leaders
- Public

Today's Agenda

- Introductions
- Purpose and Goals
- Review of the CCAC and TWG process
- Review and Discussion of the Montana Emissions Inventory & Forecast
- Review and Discussion of the Catalog of State Actions
- Next Steps for TWGs
- Agenda, Time and Date for Next Meeting
- Public Input and Announcements

Part 1

- CCAC and TWG Process

Purpose & Goals

- December 13, 2005 Letter from Montana Governor Brian Schweitzer
 - Montana Climate Change Advisory Committee
 - Climate Action Plan
 - CCAC policy recommendations
 - Montana Greenhouse Gas Emissions Inventory and Forecasts

Roles & Responsibilities

- Process requested by Governor Brian Schweitzer
- MDEQ provides coordination and organization
- State agencies act as advisors
- CCAC members make recommendations
- TWGs advise stakeholders
- Public input and review for stakeholders
- CCS provides evaluative facilitation, final report

Timing

- CCAC meetings
 - July, September, December, February, April, May
- TWG calls
 - Regularly scheduled
 - Two to three 90 minute calls in between each CCAC meeting
- Work Products
 - Initial GHG inventory & forecast: December 2006
 - Report to the DEQ Director: July 2007

Ten Step Work Plan

1. Develop initial GHG inventories and forecasts
2. Identify possible GHG mitigation options
3. Identify initial priorities for evaluation
4. Evaluate supply potential, cost effectiveness; additional and feasibility issues as needed
5. Identify barriers, alternative policy design needs
6. Modify, add or subtract options as needed
7. Evaluate cumulative results of options
8. Iterate to consensus, with votes as needed
9. Aggregate options into implementation scenarios
10. Finalize recommendations and report language

TWG Next Steps

- Review and revision of Montana Greenhouse Gas (GHG) Inventory and Forecast
- Identify “priorities for analysis” from Catalog of State’s Actions
 - Add existing and new MT options as needed
 - Rank and screen options
 - Suggest initial “priorities for analysis” to the CCAC

Sample Potential Options - Agriculture

Option No.	Climate Mitigation Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost or Cost Savings	Ancillary Impacts, Feasibility Considerations	Notes
AFW-1	AGRICULTURE – PRODUCTION OF FUELS AND ELECTRICITY					
1.1	Manure Digesters/Other Waste Energy Utilization**					
1.2	Biodiesel Production (incentives for feedstocks and production plants)					
1.3	Biomass Feedstocks for Electricity or Steam Production**					
1.4	Ethanol Production					

Decision Criteria

- GHG reduction potential (CO₂e)
- Cost per ton GHG removed
- Additional issues
- Feasibility issues

Policy Template



Policy Description:

Policy Design:

- **Goals:**
- **Timing:**
- **Coverage of Parties:**

Implementation Methods:

Related Policies/Programs in Place:

Estimated GHG Savings and Costs per tCO₂e:

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Key Uncertainties:

Additional Benefits and Costs:

Feasibility Issues:

Status of Group Approval:

Level of Group Support:

Barriers to Consensus:

End Product/Final Report

- Executive Summary
- Background, Purpose And Goals
- Policy Recommendations & Results
 - Agriculture, Forestry & Waste Management
 - Energy Supply
 - Residential, Commercial, Industrial
 - Transportation & Land Use
 - Cross Cutting Issues
- Appendices

Part 2

- MT Greenhouse Gas Inventory and Forecast review

Montana GHG Emissions

- Inventory and Reference Case Projections
- Initial analysis by CCS for further discussion and final revision
 - Inventory of historical emissions from 1990 to most recent data year (2000-2004, depending on sector)
 - Projection of emissions to 2020

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
 - Residential, Commercial, Industrial Fuel Use
 - Transportation
 - Agriculture and Forestry
 - Industrial Processes and Other Sources

Inventory Approach

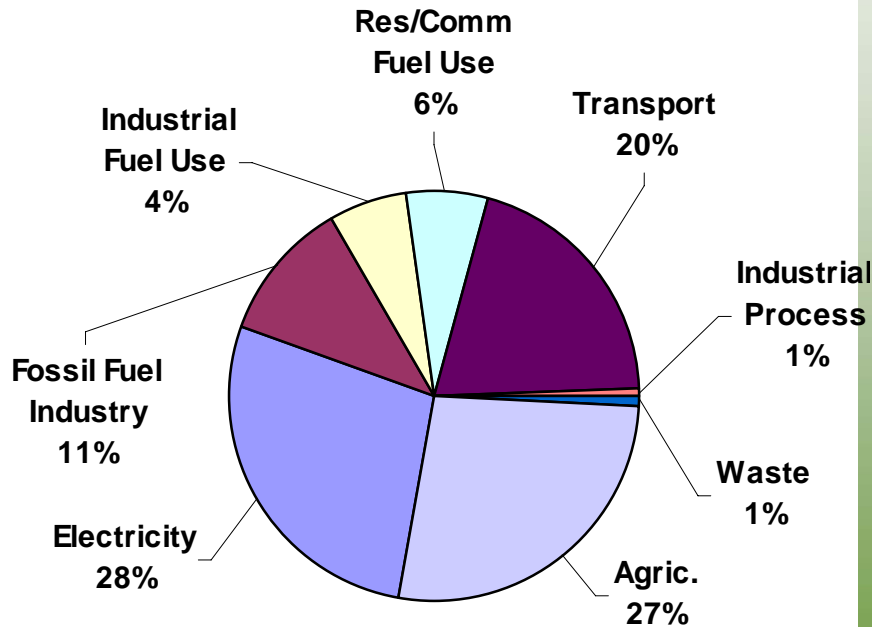
- Standard US EPA and UN methodologies, guidelines, and tools
- Emphasis on transparency, consistency, and significance
- Preference for Montana or regional data, where available
- Consumption and production-basis emissions from electricity generation
 - Very simplified approach used for initial analysis

Projection Approach

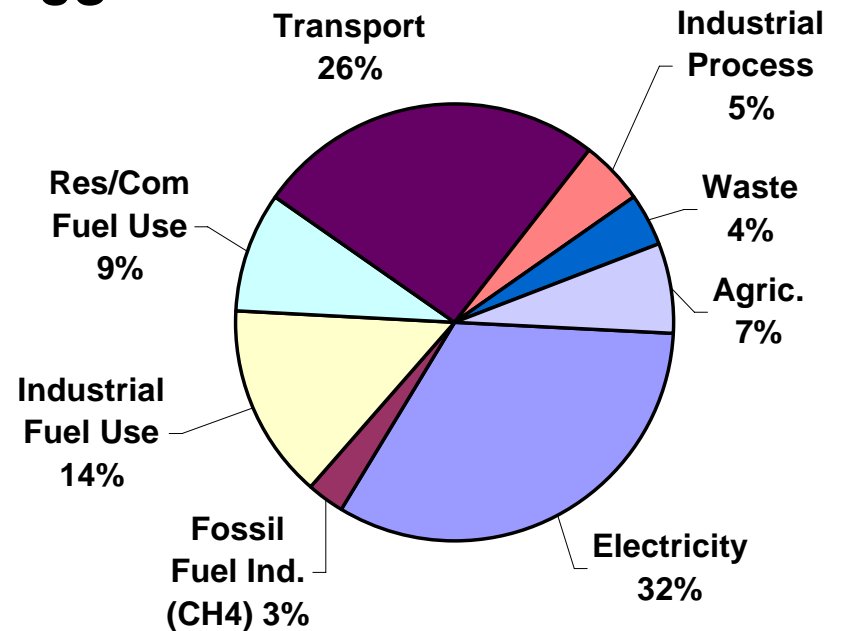
- Reference case assumes no major changes from business-as-usual
 - Includes approved policies and actions to the extent possible (e.g. Environmental Portfolio Standard)
- Growth assumptions from existing sources
 - US Census and Bureau of Labor & Statistics
 - US Energy Information Administration
 - Western Regional Air Partnership

Montana & US Emissions By Sector, Year 2000

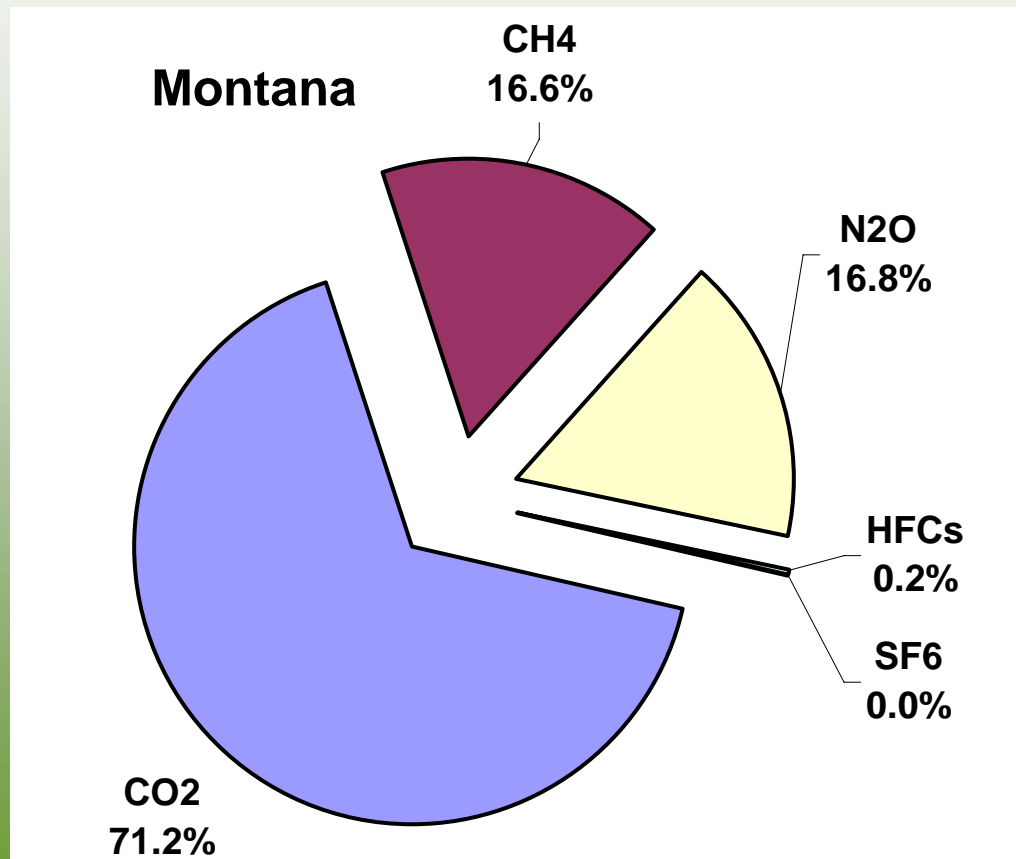
Montana



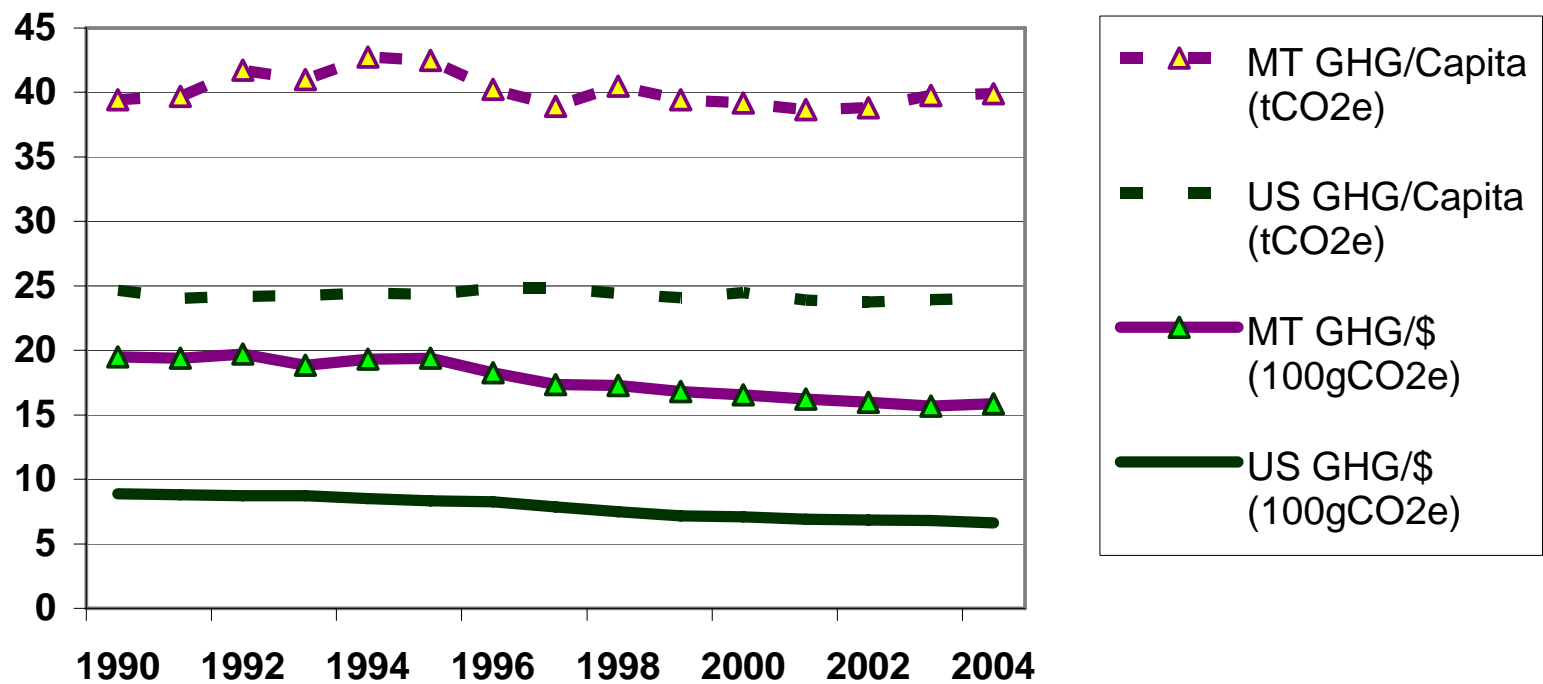
US



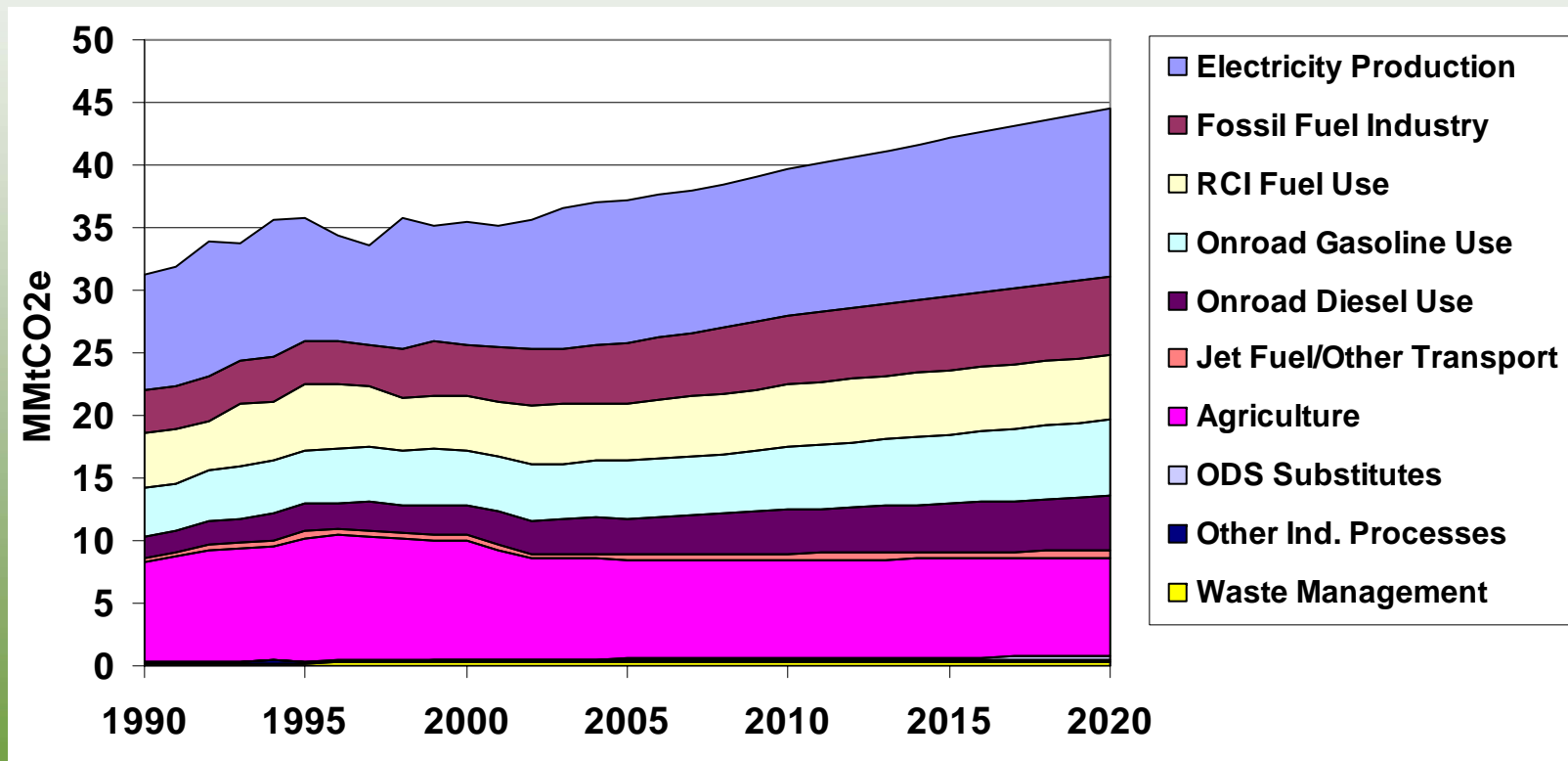
Montana Emissions By GHG, Year 2000



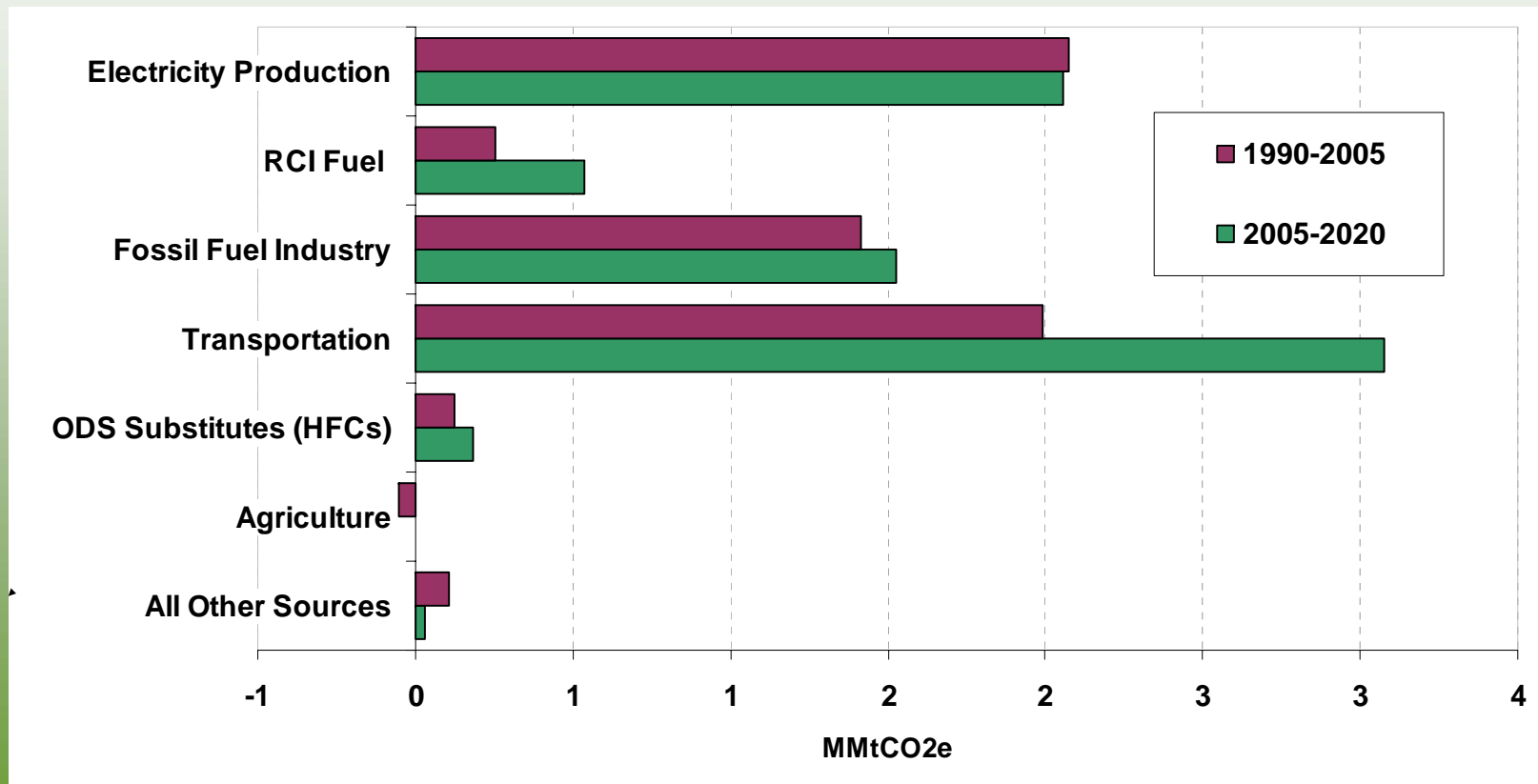
Per Capita and GSP/GDP GHG Emissions, 1990-2002



Gross Montana GHG Emissions By Sector, 1990-2020



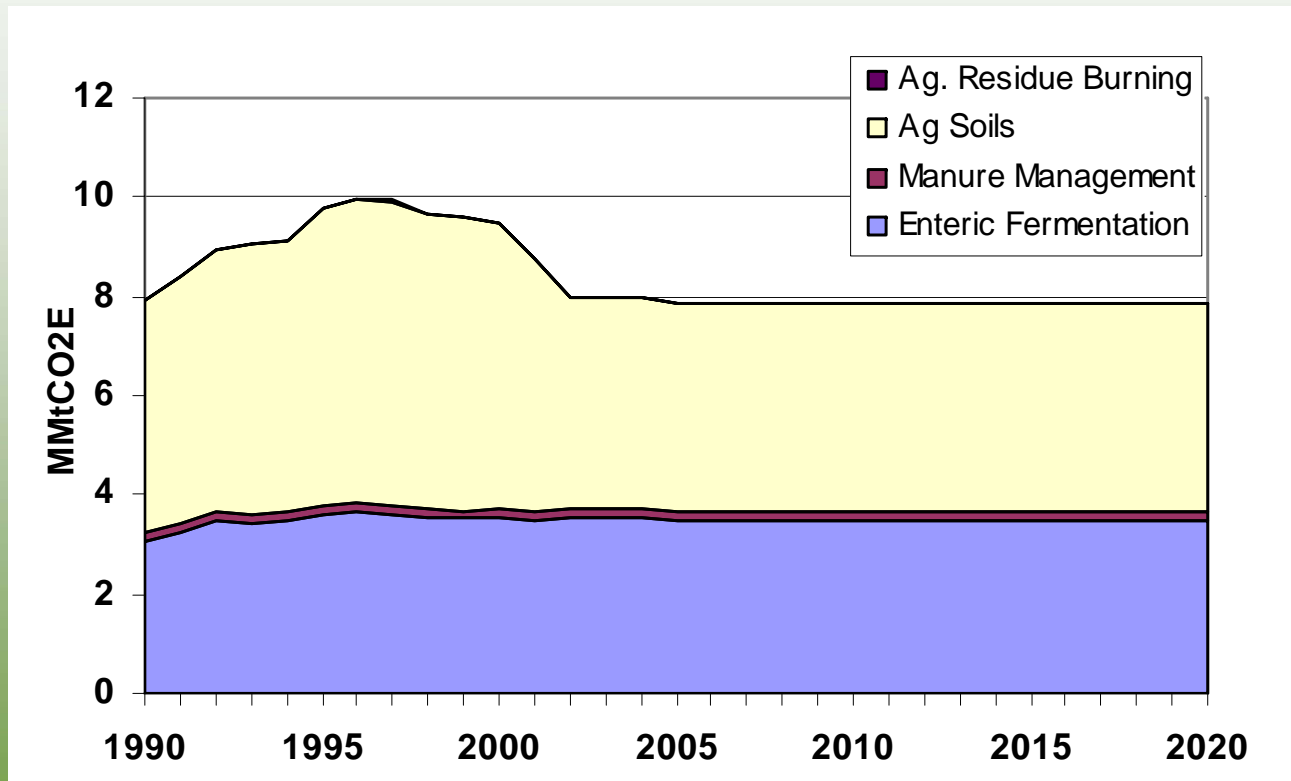
Montana Emissions Growth



Key Points

- Preliminary draft for TWG review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a compliance baseline
- Consumption v. production methods
- Role of carbon storage

Agriculture



Agriculture

- Data Sources
 - Crop acreage: USDA
 - Agricultural burning: WRAP
 - Livestock: USDA
- Methods
 - Crops: SGIT emission factors and crop acreage, SGIT fertilizer consumption
 - Livestock: SGIT emission factors and livestock populations

Agriculture

- Key Assumptions
 - No growth or significant change in crop production for the future
- Key Uncertainties
 - See key assumption above

Forestry

Carbon Pool	MMtCO₂e/yr
Live Trees	-9.0
Standing Dead Trees	-5.0
Live Understory	-1.2
Down and Dead Trees	-0.6
Forest Floor	-8.8
Soils	-11.8
Harvested Wood Products & Landfilled Forestry Waste	-13.3
	Total
	-49.7

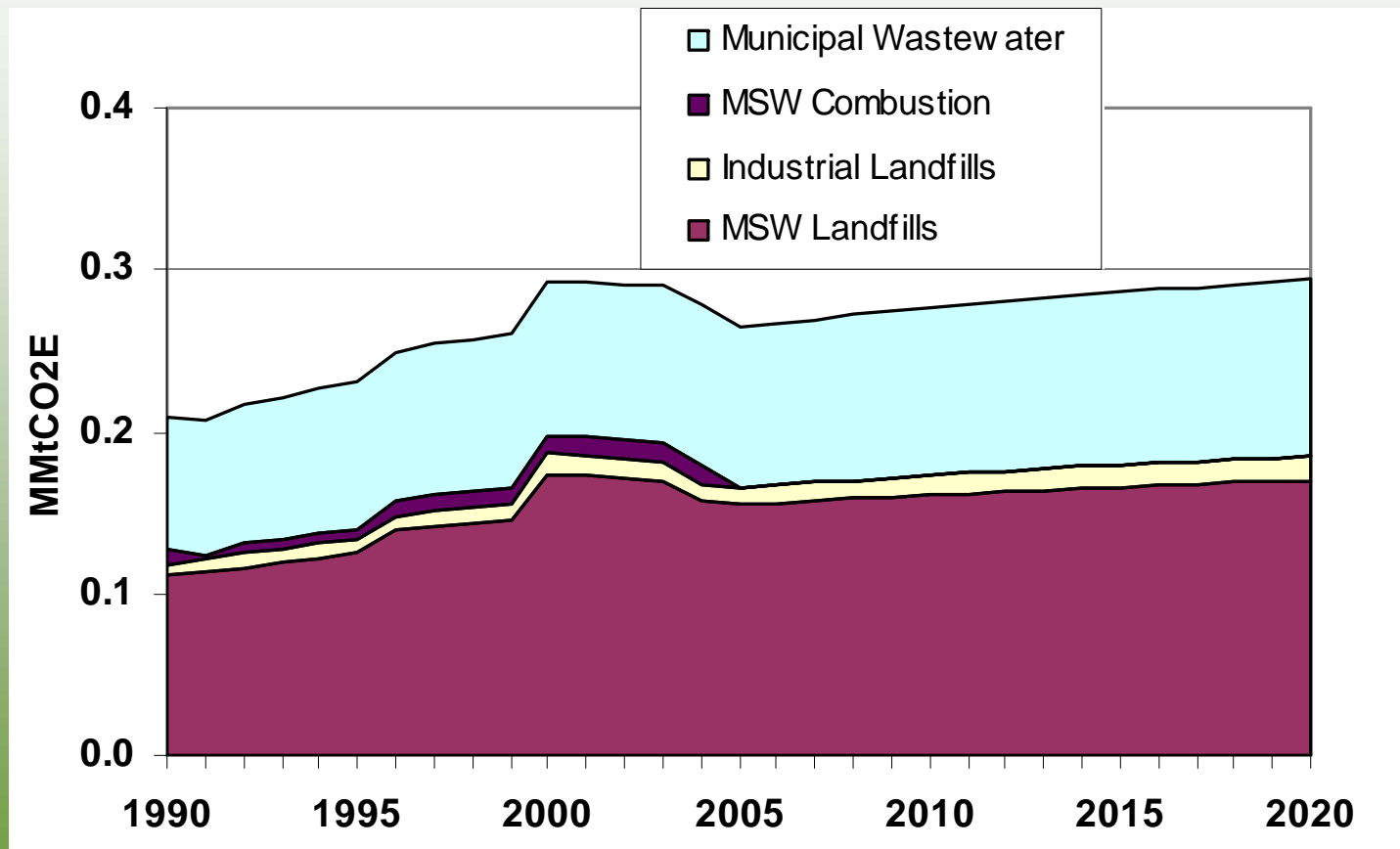
Forestry

- Data Sources
 - Forest Carbon: USFS Forest Inventory & Analysis data from 2 cycles (1988-1996; 2004)
 - Wood Products & Forestry Waste: USFS
 - Wildfire/Prescribed Burn Emissions: WRAP
- Methods
 - Forestry: USFS FORCARB2 carbon stock change model provides carbon pools for each FIA cycle
 - Flux calculated for each pool based on difference in time between FIA cycles.

Forestry

- Key Assumptions
 - 1988-2004 period representative of current and future forest productivity
- Key Uncertainties
 - Differences in methodology between first and second FIA cycle
 - Early cycles focused on timberlands, reserved lands not well covered;
 - Change in forest definition for marginal lands (10% cover to 5% cover definition)

Waste Management



Waste Management

- Data sources
 - MSW landfills: EPA Landfill Methane Outreach Program; MTDEQ
 - Municipal wastewater treatment: SGIT parameters and emission factors, state population
 - Industrial wastewater treatment: SGIT parameters & emission factors; MTDEQ flows
- Methods
 - SGIT emission factors and activity data.

Waste Management

- Key Assumptions
 - SGIT defaults for wastewater treatment are representative for MT
- Key Uncertainties
 - Need to incorporate MTDEQ data on MSW landfills and industrial wastewater treatment

Part 3

- Draft Potential GHG Mitigation Options

CCS Catalog of State Actions

- Actions undertaken or considered by a wide variety of US states
- Many actions provide GHG reductions coincidentally or as a co-benefit
- Cover all economic sectors
- Cover many implementation mechanisms

Categories of Forestry Actions

- Protect forestland (existing carbon stocks) from permanent clearing
- Restore and expand forests (expand carbon stocks)
- Improve forest regeneration and stocking (increase carbon stock densities)
- Sustainable thinning and density management of forests
 - Expand wood products carbon storage
 - Expand renewable biomass energy use
- Recycle wood products biomass waste to energy

Categories of Agriculture Actions

- Protect farmland and existing carbon stocks, biomass supplies
- Expand soil carbon storage and future carbon stocks, biomass supplies
- Expand renewable energy production
- Reduce process/waste emissions
- Increase energy recapture and reuse
- Improve animal feed efficiency
- Reduce food delivery/transportation emissions

Categories of Waste Management Actions

- Expand solid and liquid waste energy recovery
- Expand low emitting waste storage
- Expand source reduction, reuse, recycling
- Expand energy efficient processing of waste

Next TWG Call

- Agenda:
 - Discuss potential priorities for analysis of policy options
 - Review the Montana emissions inventory and projection if/as needed
- August 31, 2:00 – 3:30 p.m.



Public Input, Announcements