



**MINNESOTA**  
Climate Change  
Advisory Group



# Minnesota Climate Change Advisory Group

AFW Technical Work Group Meeting #7

October 11, 2007

Minnesota Department of Commerce  
Minnesota Pollution Control Agency  
The Center for Climate Strategies

# Agenda

- Roll Call
- Review and Approval of Previous Call Summary
- Review Feedback from MCCAG
- Finalize Goals and Begin Work on Quantification
- Continued Review of Minnesota Draft Emissions Inventory & Forecast
- Next Steps for the AFW TWG
- Agenda, Time and Date for Next Meeting
- Public Input and Announcements

# Communication Within TWG Meetings

- TWG meetings are primarily for interaction among MCCAG TWG members;
- Other participants should refrain from intervening during MCCAG discussions, until they are called upon (note new Call-In Service);
- Agendas for each call will leave time for input from State agency staff and members of the public;
- State staff with information requiring urgent input, should consult with the State liaison to the TWG (Dave Richfield), before intervening in TWG discussions.

# Stepwise Planning Process

1. Develop inventory and forecast of emissions
2. Identify a full range of possible actions
3. Identify initial priorities for analysis
4. Develop straw proposals
5. Quantify GHG reductions and costs/savings
6. Evaluate externalities, feasibility issues
7. Develop alternatives to address barriers
8. Aggregate results
9. Iterate to final agreements
10. Finalize and report recommendations

# Policy Options and Volunteer Sub-Groups

Revised Number	Preliminary Number	Preliminary Title	TWG Volunteers (lead volunteer in bold)
<b>AFW-1</b>	AFW-1	Agricultural Crop Management	<b>Andy Hart</b> , Staci Bohlen, Jim Kleinschmit, Dave Tilman, Greg Miller, Tim Gieseke
<b>AFW-2</b>	AFW-5	Land Use Management Approaches for Protection and Enrichment of Soil Carbon	Staci Bohlen, <b>Stan Ellison</b> , Will Anthony, Jim Kleinschmit, Cheryl Miller, Dave Tilman, Tim Gieseke
<b>AFW-3</b>	AFW-7	In-State Liquid Biofuels Production	Andy Hart, <b>Shalini Gupta</b> , Dave Tilman
<b>AFW-4</b>	AFW-4	Expanded Use of Biomass Feedstocks for Electricity, Heat, or Steam	Stan Ellison, Will Anthony, Shalini Gupta, <b>Greg Miller</b>
<b>AFW-5</b>	AFW-2	Production Forestry Management Programs to Enhance GHG Benefits	Cheryl Miller, Dave Zumeta
<b>AFW-6</b>	AFW-6	Forest Protection – Reduced Clearing and Conversion to Nonforest Cover	Cheryl Miller, Dave Zumeta
<b>AFW-7</b>	AFW-3	Integrated Waste Management	<b>Julie Ketchum</b> , Ted Troolin, Jim Kleinschmit
<b>AFW-8</b>	AFW-8	End of Use Waste Management Practices	Julie Ketchum, <b>Ted Troolin</b> , Shalini Gupta

# Feedback from MCCAG

- AFW-1
  - Research and incentives included in Implementation Mechanisms section
  - Reservations about level of goal and feasibility of GPS goal.
- AFW-3
  - Goal for biomass used for ethanol heat and electricity should be 80%, not 100%.
  - Some reservations regarding achievability of this goal.

# Feedback from MCCAG

- AFW-4
  - RES already exists in MN. AFW-4 options will extend beyond BAU biofuel use.
  - Thermal conversion suggested as a more efficient process than electricity generation.
  - Supply issues.
- AFW-5
  - CCS needs to change wording of sustainable harvest goal to match TWG input.

# Feedback from MCCAG

- AFW-7
  - Need goal – or language within description
  - to address source reduction
- AFW-8
  - “No methane producing materials in MN landfills” goal seen as unrealistic by one member. There is another methane reduction goal. Are both goals needed?

# New TWG Volunteer Opportunity

- Cap and Trade TWG.
- MCCAG seeking members (1-2 per TWG) from all TWGs to volunteer.
- C&T TWG will look at economy-wide cap and trade issues.

# Next Steps

- Begin quantification of options.
- Identify which options are most ready for quantification, and proceed towards next MCCAG meeting with the goal of completing 1-2 option quantifications.
- CCS takes the lead on quantification, with support from TWG sub-groups.
- TWG needs to submit input on Implementation Mechanisms, Key Uncertainties, Additional Benefits and Costs, and Feasibility Issues.

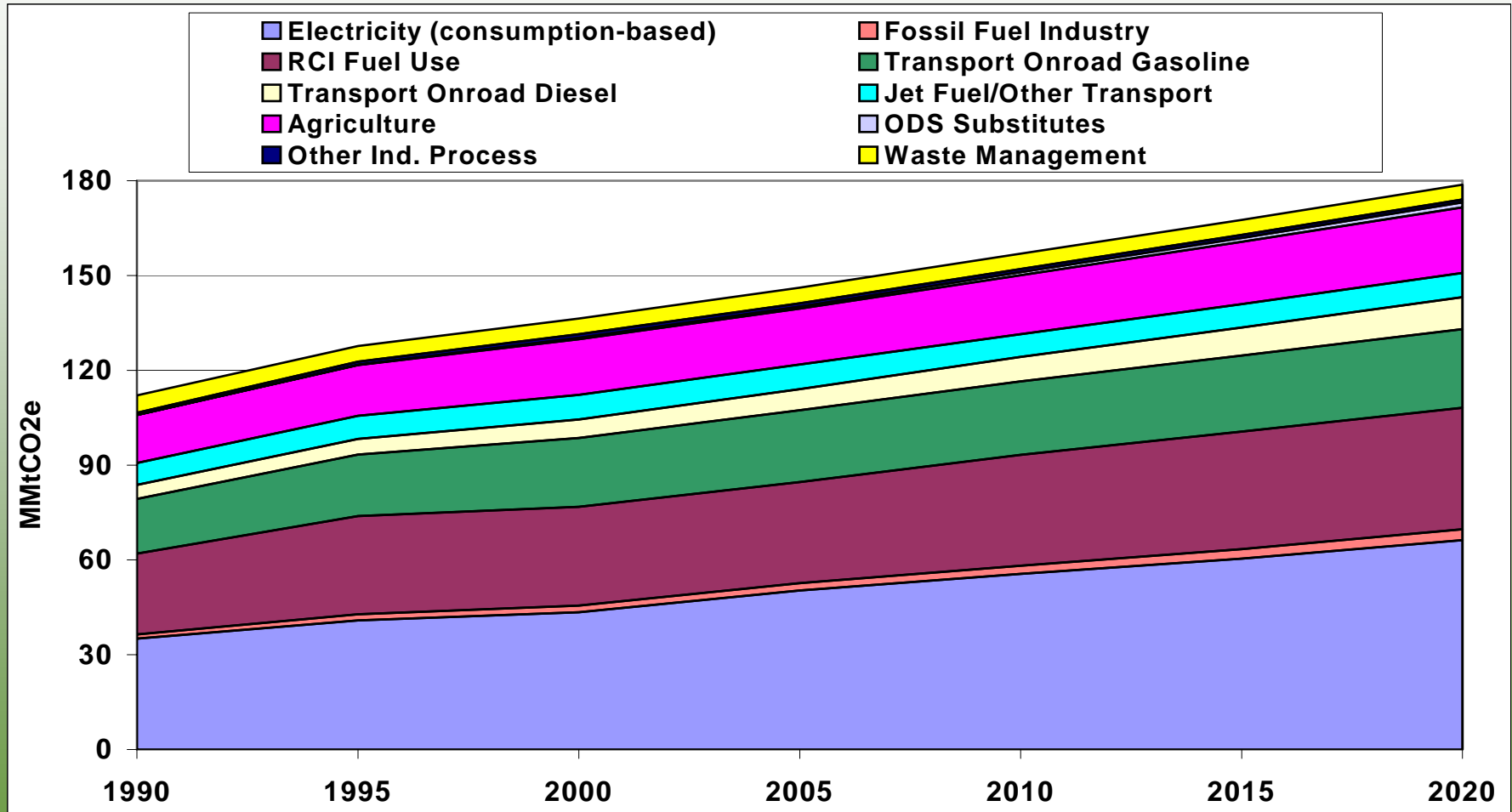
# GHG Draft Inventory and Forecast

- Review of Forestry Inventory Call
- Review of Waste Management Inventory Call

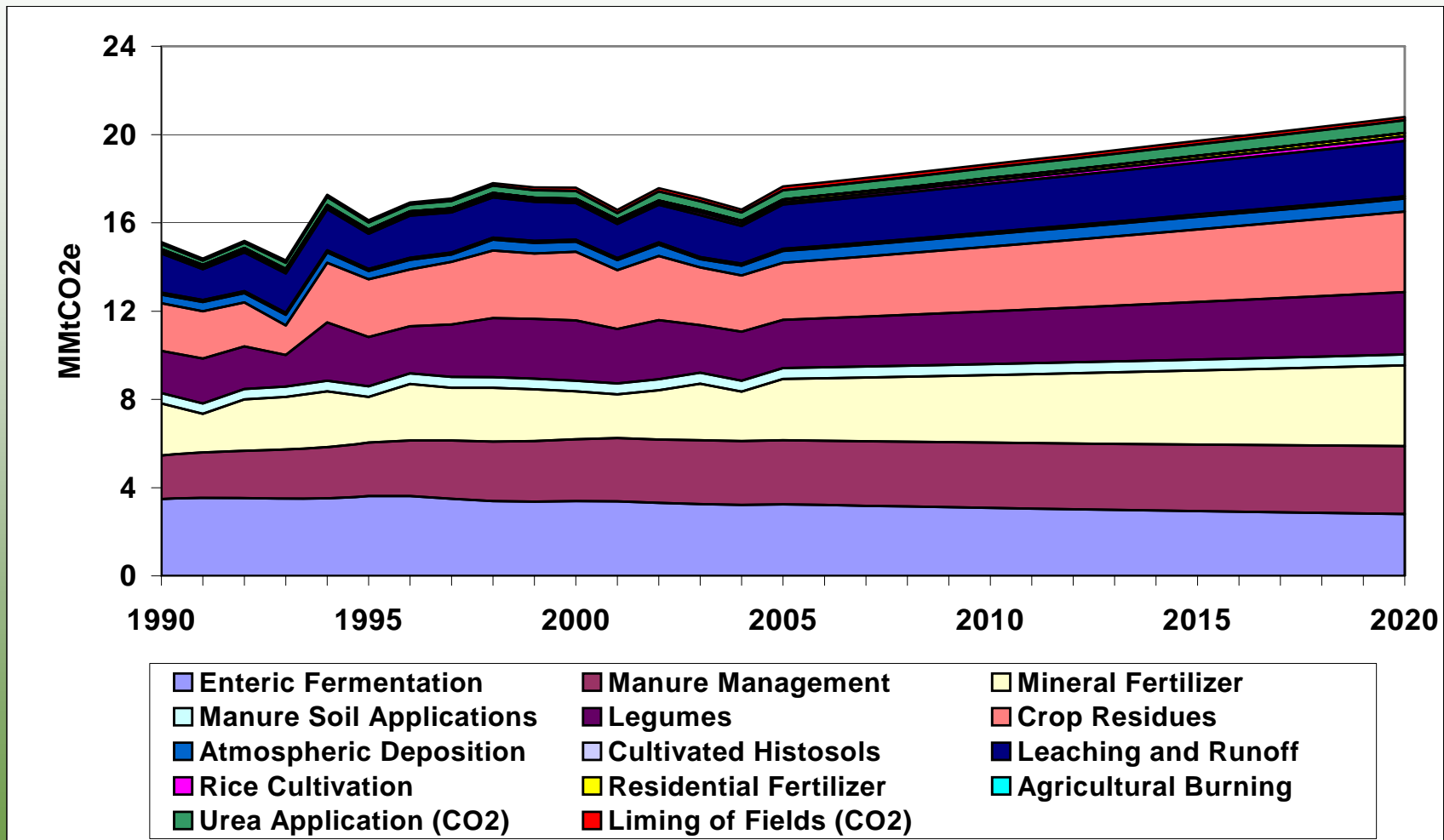
# GHG Draft Inventory & Forecast

- All TWGs need to extend forecast to at least 2025
- Matches time horizon of MN Next Generation Energy Act of 2007:
  - Per capita fossil fuel use reduced 15% by 2015
  - Renewable energy provides 25% of all energy consumed by 2025

# Gross MN GHG Emissions By Sector, 1990-2020



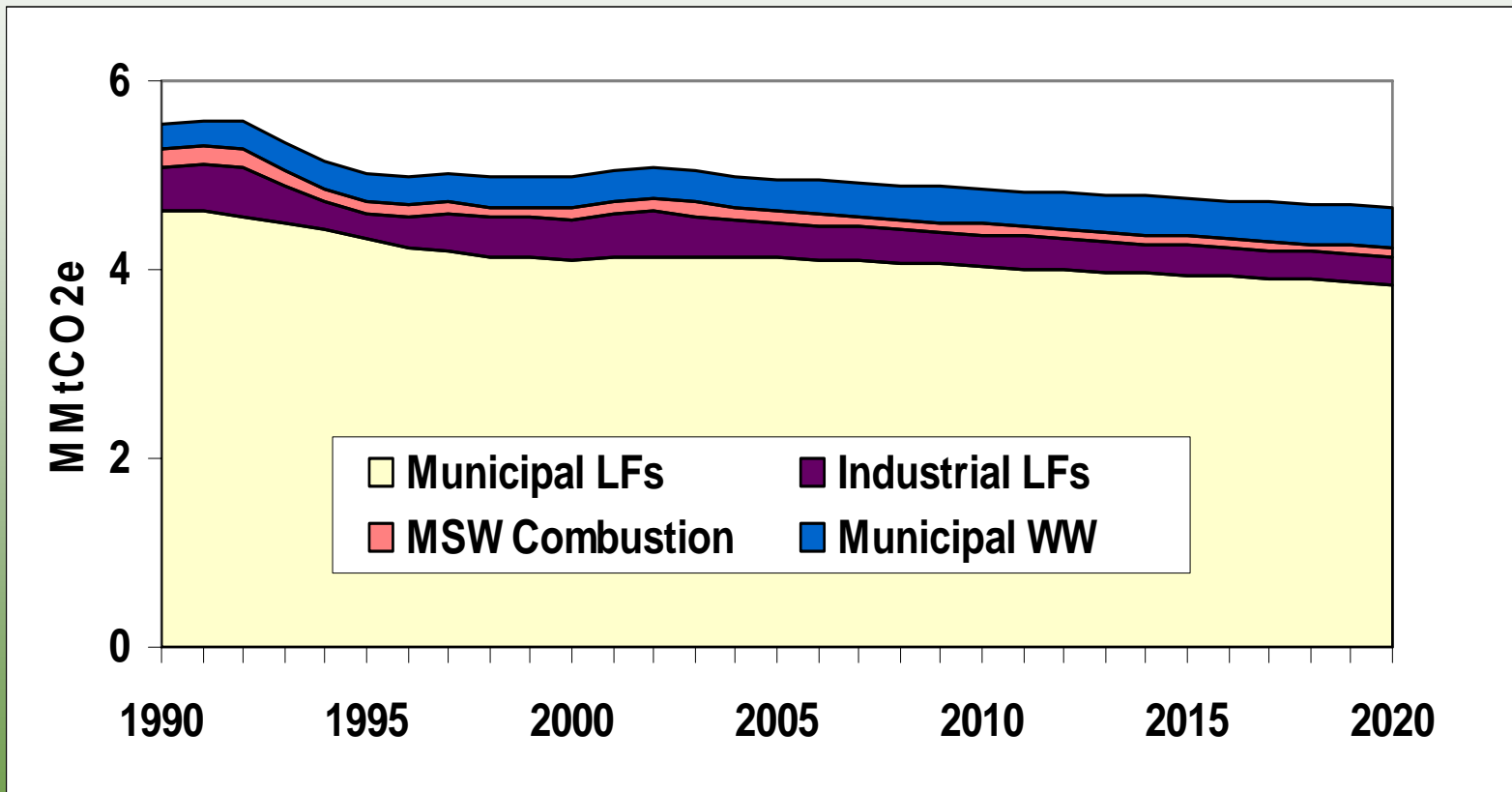
# Agriculture



# Agriculture

- Data Sources: MN PCA Inventory
- Methods
  - Agricultural Soils: Crop production data and EPA emission factors
  - Enteric Fermentation and Manure Management: livestock populations and EPA emission factors
  - Fertilizer: Fertilizer consumption and EPA emission factors
  - Agricultural Burning: SGIT and crop production data
  - Growth based on historical trends
- Key Assumptions
  - Future growth assumed to follow historical trends
- Key Uncertainties
  - Projection data

# Waste Management



# Waste Management

- Data sources
  - Landfills: EPA LandGEM Model with MN PCA inputs
  - Waste combustion: MN PCA
  - Wastewater: State population
- Methods
  - LandGEM Model estimates emissions
  - Waste combustion and Wastewater: EPA emission factors with data sources above

# Waste Management

- Key Assumptions
  - Growth Rates: based on historical emissions trends
- Key Uncertainties
  - Future controls applied to uncontrolled landfills
  - Assumption that future growth will follow historical trends
  - Industrial WW –lack of data for meat/poultry, pulp/paper, and food/vegetable processing

# Forestry

## USFS - Stock Change 1990-2003

Carbon Pool	MMtCO <sub>2</sub> e/yr (positive # net emission)
Live Trees	3.5
Standing Dead Trees	0.56
Live Understory	0.08
Down and Dead Trees	0.33
Forest Floor	1.09
Soil Organic Carbon	22
Harvested Wood Products and Landfills	-4.6
<b>Total (with/without SOC)</b>	<b>23/0.92</b>

# Forestry

## USFS - Stock Change 1990-2003

	1990	2003	Difference (2003-1990)
Forests (1,000 hectares)	6,751	6,568	-182
Timberland (1,000 hectares)	5,958	5,973	15

# Forestry

- Data Sources

- USFS carbon stock for 2 inventories (1990-2003) 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 1990-2003 time-period used to quantify flux.

# Forestry

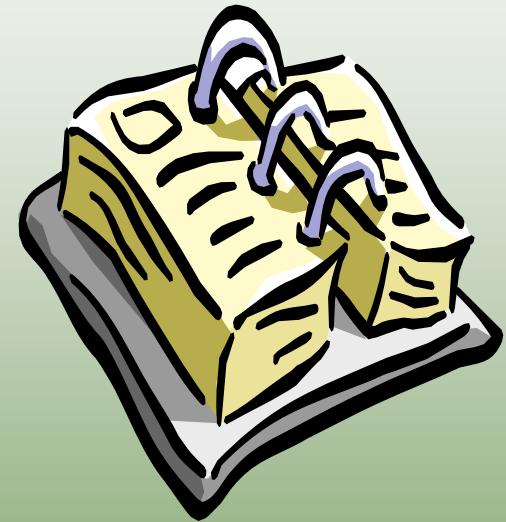
- Key Assumptions
  - 1990-2003 carbon stock trends representative of current conditions
  - No significant change in sequestration trends from 2006-2020
- Key Uncertainties
  - Effects of future development on forested acreage
  - Effects of near-term climate change on forest sequestration levels

# Next Steps

- Finalize Straw Proposals for MCCAG review
- Continued review and revision of Draft GHG Inventory & Forecast

# Next TWG Meeting

- Agenda:
  - Update on progress of option quantification
  - Continue review/revision of Minnesota GHG inventory and projection
- Time and Date: November 1, 1:00-3:00 pm



# Public Input, Announcements