



**V**ermont

*Governor's Commission on Climate Change*



# Agriculture, Forestry, and Waste Resource Management Technical Work Group Teleconference Meeting #7

April 10, 2007



# Today's Agenda

- Roll Call
- Review of previous call summary
- Review PG input on TWG straw proposals
- Discuss next steps in developing policy options
- Continued review and discussion of the Vermont emissions inventory & forecast, time permitting
- Agenda, time, and date for next meeting
- Public input and announcements

# PG Input on Straw Proposals

- AFW-4&7: PG asked about current conversion rates;
  - Address during next steps of policy development
- AFW-6: goal in 30% increase in biomass use seems low;
  - BEREC should be contacted; report due in June
- AFW-9: recycling goals should be increased
- AFW-11: investigate potential for “micro-hydro” generation during next steps
- Other issues noted by TWG members?

# AFW TWG Policy Options

<b>AFW Option No.</b>	<b>GHG Reduction Policy Option</b>	<b>TWG Volunteers</b>
1	Programs to Support Local Farming/Buy Local	<b>Debra Sachs</b> , Phil Benedict, Jennifer Jenkins
2	Agricultural Soil Carbon Management Programs	<b>Abe Collins</b> , Phil Benedict
3	Manure Management Methods to Achieve GHG Benefits	<b>Phil Benedict</b> , Abe Collins, Jennifer Jenkins
4	Preserve Open Space/Agricultural Land	<b>Elizabeth Courtney</b> , Phil Benedict
5	Forestry Programs to Enhance GHG Benefits	<b>Jennifer Jenkins</b> , Sandy Wilmot, Bill Sayre, Elizabeth Courtney
6	Increased Forest Biomass Energy Use	<b>Sandy Wilmot</b> , Bill Sayre, Debra Sachs, Netaka White, Elizabeth Courtney
7	Forest Protection – Reduced Clearing and Conversion to Nonforest Cover	<b>Sandy Wilmot</b> , Netaka White, Elizabeth Courtney
8	Expanded Use of Durable Wood Products (especially from VT sources)	<b>Bill Sayre</b> , Sandy Wilmot, Jennifer Jenkins
9	Advanced/Expanded Recycling and Composting	<b>Paula Calabrese</b> , Jennifer Jenkins
10	Programs to Reduce Waste Generation	<b>Paula Calabrese</b> , Debra Sachs
11	Waste Water Treatment - Energy Efficiency Improvements	Paula Calabrese
12	In-State Biofuels Production	<b>Netaka White</b> , Debra Sachs

# Next Steps on Straw Proposal Development

- Revise goals, where needed, to address PG concerns
- TWG volunteers begin work on:
  - Implementation mechanisms
  - Related policies/programs in place
  - Additional benefits/costs
  - Feasibility issues

# Next Steps on Straw Proposal Development (continued)

- CCS begins work on:
  - Types of GHG reductions
  - Estimated GHG reductions and costs
  - Key uncertainties

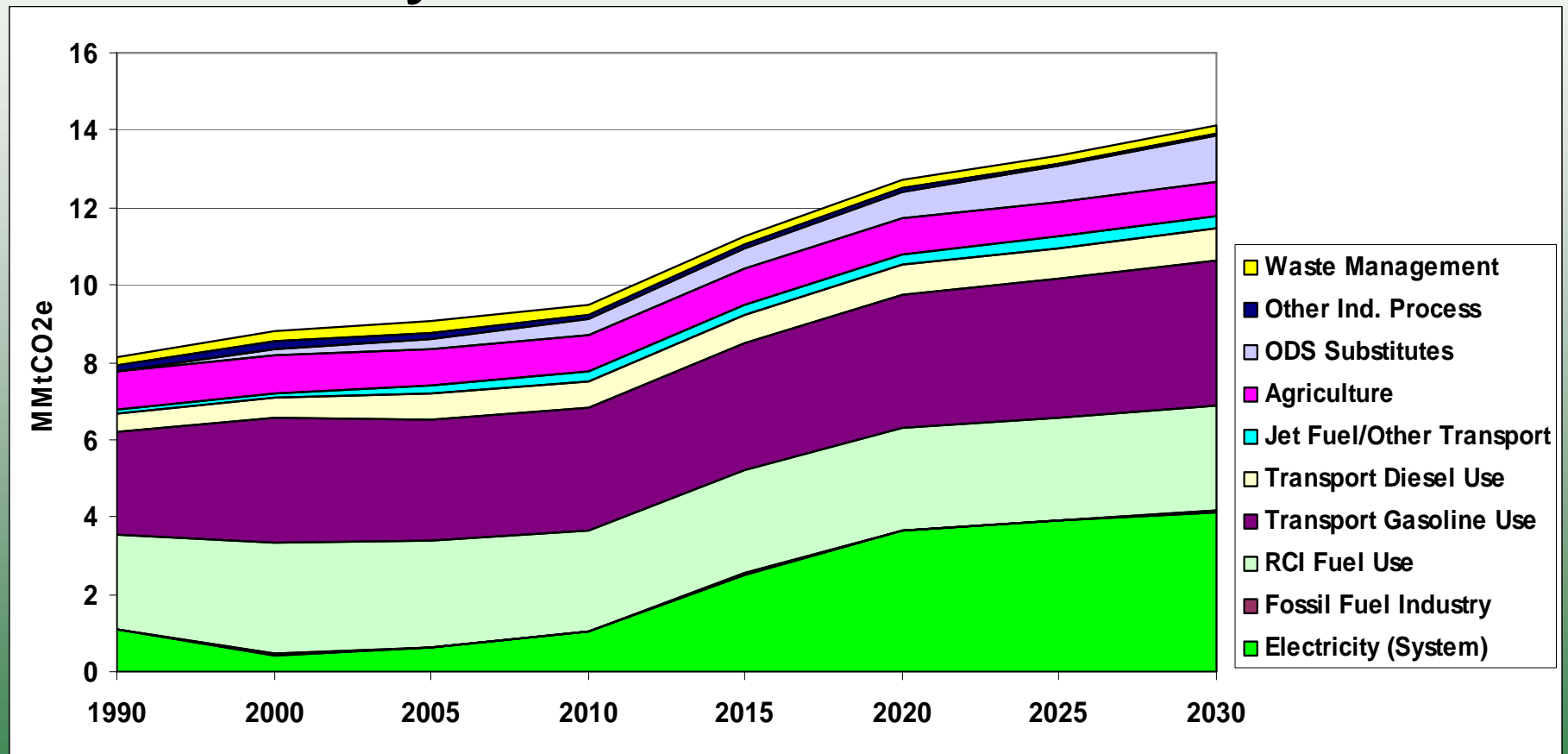
# Vermont GHG Emissions

- 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 2030
  - Check website for complete I&F Report.

# 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
  - Residential, Commercial, Industrial Fuel Use
  - Transportation
  - Agriculture and Forestry
  - Waste Resource Management
  - Industrial Processes and Other Sources

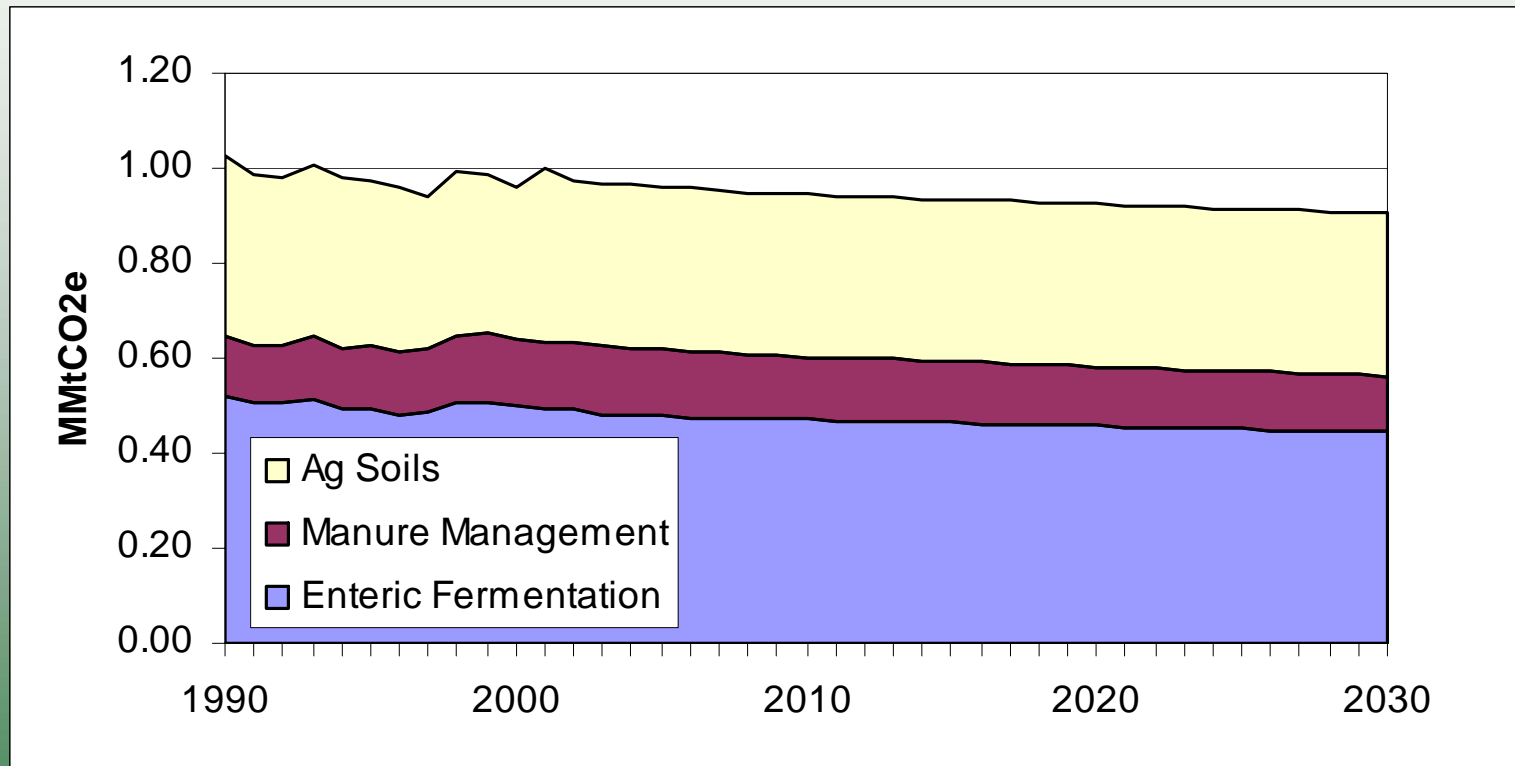
# Gross Vermont GHG Emissions By Sector, 1990-2020



# 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 terrestrial carbon storage
- Potential for GHG reductions outside of sector/state

# Agriculture – Gross Emissions



# Agriculture

- Data Sources
  - Crop acreage: USDA
  - Livestock: USDA
  - Livestock Projections: USDA
  - CCS added USDA carbon sink estimates for agricultural soils (-0.19 MMtCO<sub>2</sub>e based on 1997 data). Net ag emissions are ~0.8 MMtCO<sub>2</sub>e
- Methods
  - Crops: SGIT emission factors and crop acreage, SGIT fertilizer consumption
  - Livestock: SGIT emission factors and livestock populations
  - Dairy cattle projections adjusted to account for projected populations in Cow Power program
  - No growth assumed for Ag Soils emissions

# Agriculture

- Key Assumptions
  - No growth or significant change in crop production for the future
  - USDA national livestock projections
- Key Uncertainties
  - Projection data

# Forestry

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<b>Carbon Pool</b>	<b>MMtCO<sub>2</sub>e/yr</b>
Live Trees	-6.3
Standing Dead Trees	-0.3
Live Understory	-0.03
Down and Dead Trees	-0.4
Forest Floor	-0.5
Soils	-0.7
Harvested Wood Products	-1.4
<b>Total</b>	<b>-9.7</b>

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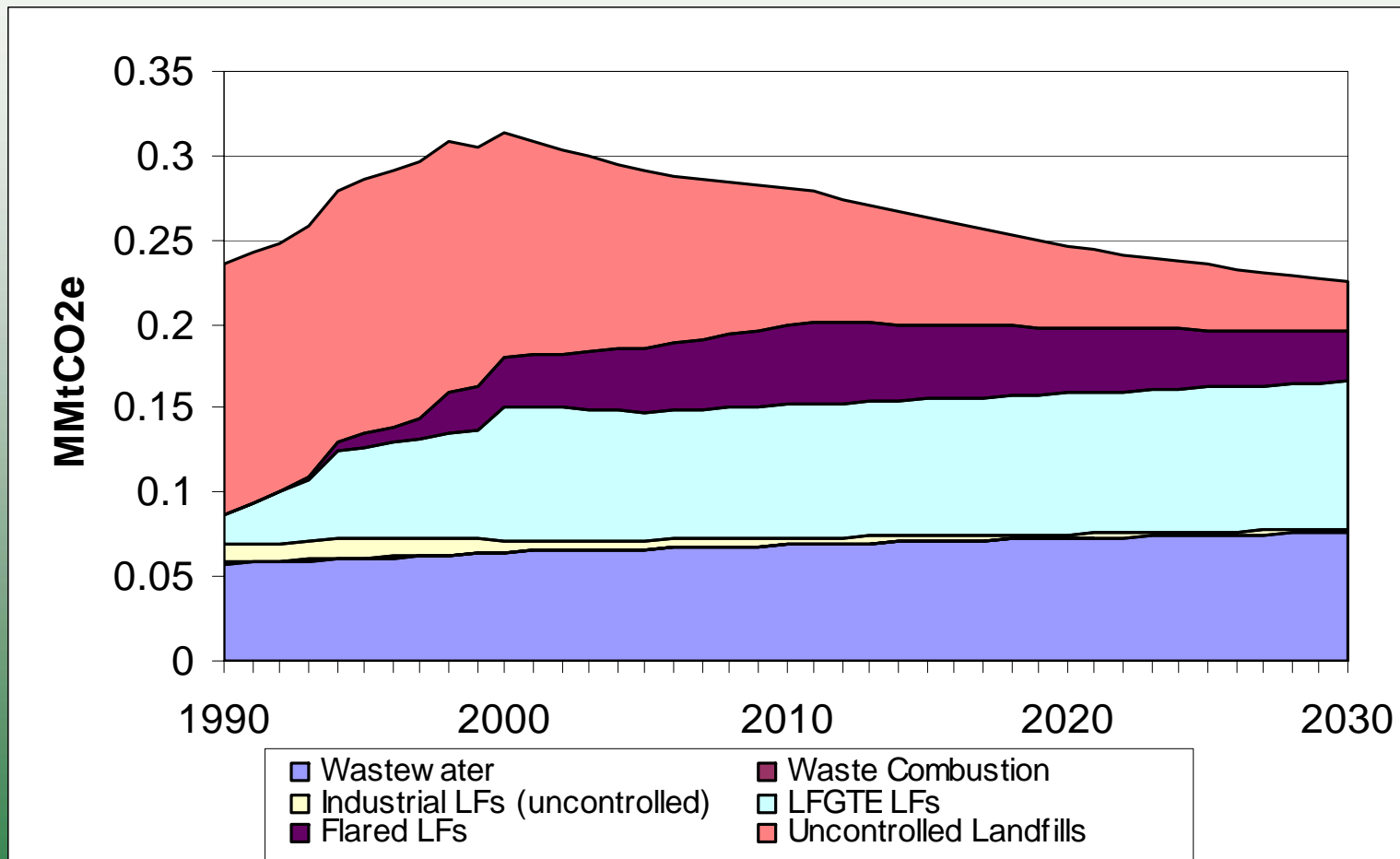
# Forestry

- Data Sources
  - USFS carbon stock change data for 3 FIA cycles (1983, 1997, 2004) based on FORCARB model
  - 2004 FIA surveys not yet complete
  - USFS also provides modeled estimates for harvested wood products
- 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
  - Carbon pool data for the 1983-1997 time-period used to quantify flux.

# Forestry

- Key Assumptions
  - 1983-1997 carbon stock change representative of current conditions
  - No significant change in sequestration from 2007-2030
- Key Uncertainties
  - Effects of future development on forested acreage
  - Effects of near term climate change on forest sequestration levels

# Waste Management



# Waste Management

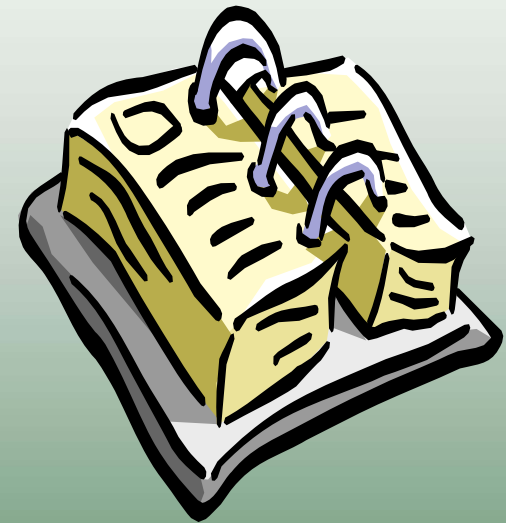
- Data sources
  - EPA Landfill Methane Outreach Program (LMOP)
  - VTDEC
- Methods
  - EPA SGIT to estimate CH<sub>4</sub> generation
  - Post-processing to account for LFG collection and control efficiencies

# Waste Management

- Key Assumptions
  - Solid Waste: future growth occurs at LFGTE sites only
  - Solid Waste: growth rate = population growth
  - Liquid Waste: no current control of CH<sub>4</sub> at any site.
- Key Uncertainties
  - See assumptions above.

# Next TWG Call

- Agenda:
  - Review progress on policy option development
  - Discuss next steps prior to May 17, PG meeting
  - Review the Vermont emissions inventory and projection, as needed
  - Date and Time: April 26, 2007 from 1 – 3 p.m.



# Public Input, Announcements