



MINNESOTA
Climate Change
Advisory Group



Minnesota Climate Change Advisory Group

Residential, Commercial, and Industrial
Technical Work Group Meeting #1

May 17, 2007

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

Welcome and Introductions

- State of Minnesota
- Minnesota Technical Work Group (TWG) Members
- Members of the Public
- Center for Climate Strategies

Agenda

- Introductions
- Purpose and Goals
- Review of MCCAG and TWG Processes
- Review of Minnesota RCI Emissions Inventory & Forecast
- Agenda, Time and Date for Next Meeting
- Public Input and Announcements

MCCAG Purpose & Goals

- Purpose
 - Achieve Governor’s “Next Generation Energy Initiative” goal of developing “a comprehensive plan to reduce Minnesota’s emissions of greenhouse gas emissions.”
- Goals (may be changed or added to by pending legislation)
 - Review and approval of a current and comprehensive inventory and forecast of greenhouse gas (GHG) emissions in Minnesota from 1990 to 2020;
 - Development of a comprehensive set of specific policy recommendations and associated analyses to reduce GHG emissions and enhance energy and economic policy in Minnesota by 2020 and beyond;
 - Development and recommendation of a set of recommended statewide GHG reduction goals and targets for implementation of these actions; and
 - Issuance of recommendations in the form of a final report to the Governor by February 1, 2008.

MCCAG Roles & Responsibilities

- MCCAG Process convened by Governor Pawlenty
- DOC and PCA oversee and coordinate process
- MCCAG makes recommendations to Governor
- **TWGs provide informal guidance to MCCAG**
- Public input and review for stakeholders
- CCS provides facilitation, technical support, final report

TWVG Roles

- Assist MCCAG
 - Identify potential state actions
 - Identify potential priorities for analysis
 - Suggest straw policy designs
 - Assist with analysis and review of options
 - Assist with development of policy alternatives
 - Assist with input to and review of MCCAG reports
 - Review and assist with the state GHG inventory and forecast

TWG Composition

- Energy Supply
 - Heat and power generation; typical locus for cap and trade or carbon tax policy
- Commercial, Industrial, and Residential
 - Energy efficiency & conservation, industrial process, waste management
- Transportation and Land-Use
 - Including vehicle efficiency, alternative fuels & demand reduction programs, development patterns
- Agriculture, Forestry and Waste
 - Land protection, forest restoration, sustainable forest management, bioenergy, sustainable wood products, waste reduction, recycling
- Cross-Cutting Issues
 - Reporting, registries, public education

Ground Rules

- Supportive of the process
- Attendance at meetings
- Equal footing
- Stay current with information
- No backsliding
- Do not represent the MCCAG or TWGs
- Make objective contributions

Timing

Date	Action
April 20, 2007	1 st MCCAG meeting
June 14, 2007	2 nd MCCAG meeting
August 2, 2007	3 rd MCCAG meeting
September 27, 2007	4 th MCCAG meeting
November 8, 2007	5 th MCCAG meeting
January 10, 2008	6 th MCCAG meeting
February 1, 2008	MCCAG Report Due
Between CCAG Meetings	2 TWG conference calls and or meetings for each TWG between MCCAG meetings

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

Building Consensus

- Comprehensive
- Stepwise
- Fact based
- Transparent
- Inclusive
- Collaborative
- Consensus driven



Coverage Of Issues



- All GHG's
- All sectors
- All potential implementation mechanisms
- State and multi-state actions
- Short and long term actions

Decision Criteria

- GHG Reduction Potential (MMTCO₂e)
- Cost or Cost Saved Per Ton GHG Removed
- Co-benefits
- Feasibility Issues

Catalog of State Actions

- Over 300 actions taken by US states across all sectors
- Existing, planned and proposed state level actions
- Wide variety of US states
- All sectors
- Wide variety of implementation mechanisms
- Includes key MN actions
- MCCAG will add new potential actions
- Starting place for identification of MCCAG priorities

Policy Design Proposals

- TWGs start with Catalog of states' actions, screen options, and recommend priorities for MN
- MCCAG identifies about 50 draft potential priority options for further development
- TWGs develop initial policy option designs (“straw proposals”)
 - Timing
 - Goals
 - Coverage
- CCS quantifies and presents for review
- MCCAG revisits list of potential priorities, as needed

Policy Option Template

- Policy Description (Concept)
- Policy Design (Goals, Timing, Coverage)
- Implementation Methods
- Related Programs and Policies (BAU)
- Estimated GHG Savings and Costs Per MMTCO_{2e}
 - Data Sources, Methods and Assumptions
 - Key Uncertainties
- Additional (non-GHG) Benefits and Costs, as Needed
- Feasibility Issues, if Needed
- Status Of Group Approval
- Level of Group Support
- Barriers to Consensus, if any

Final Report

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



Inventory Approach

- Standard US EPA and UN methodologies, guidelines, and tools
- Emphasis on transparency, consistency, and significance
- Used MN inventory for 1990-2004/2005
 - Prepared by Peter Ciborowski, MN PCA
- Consumption and production-based 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 assessment of approved policies and actions to the extent possible (e.g., Renewable Energy Standards)
- Growth assumptions from existing sources
 - State population and employment forecasts
 - US Census and Bureau of Labor & Statistics
 - US Energy Information Administration

Coverage

- Six gases per USEPA and UNFCCC guidelines
 - Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF₆)
- All major emitting sectors
 - Electricity Supply & Demand (Consumption Based)
 - Residential, Commercial, Industrial (RCI) Fuel Use and Non-fuel Use Processes
 - Transportation (onroad and nonroad)
 - Natural gas pipeline transmission & distribution
 - Agriculture, Forestry, and Waste
- Emissions expressed as CO₂ equivalent
 - 100-year global warming potentials
 - CO₂ = 1; CH₄ = 22; N₂O = 310; halogenated gases, up to 25,000

Key Points

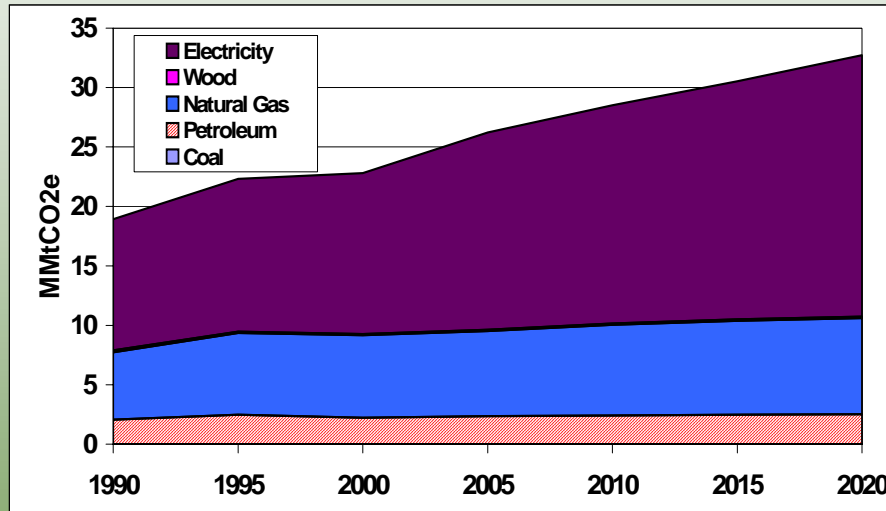
- Preliminary draft for MCCAG and TWG review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a baseline for modeling or compliance for individual options
- Consumption and Production methods
- Net and Gross methods

Key Points

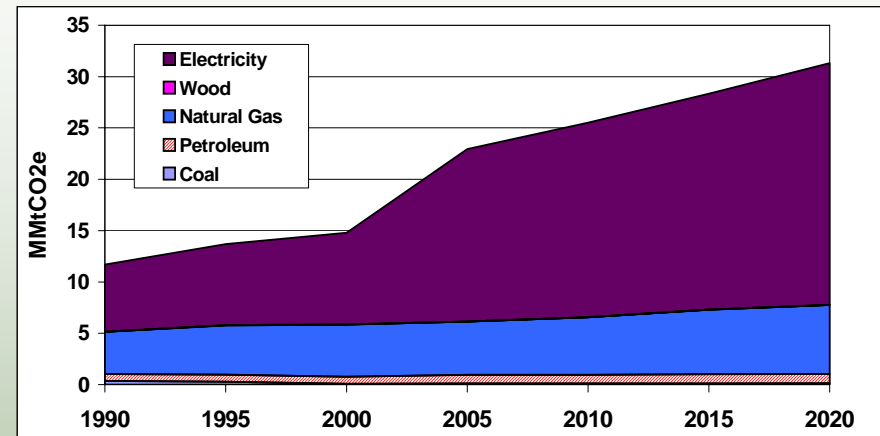
- Other Pollutants
 - MN PCA Inventory includes:
 - Carbon monoxide (CO) from combustion processes
 - CO₂ from biomass combustion
 - IPCC Guidelines –
 - Report CO and biomass CO₂ separately from six GHG pollutants
 - Good to track for multi-pollutant assessment of GHG options
 - CO and biomass CO₂ not included in I&F totals presented today

RCI

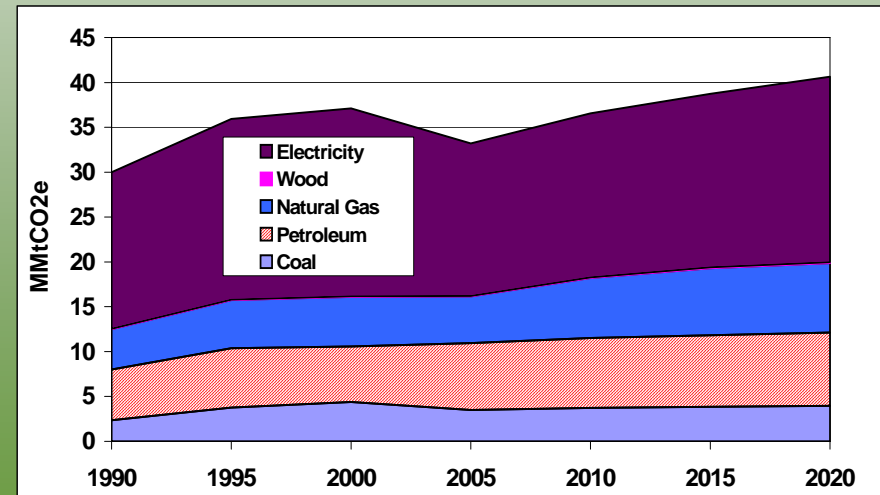
Residential Sector



Commercial Sector



Industrial Sector



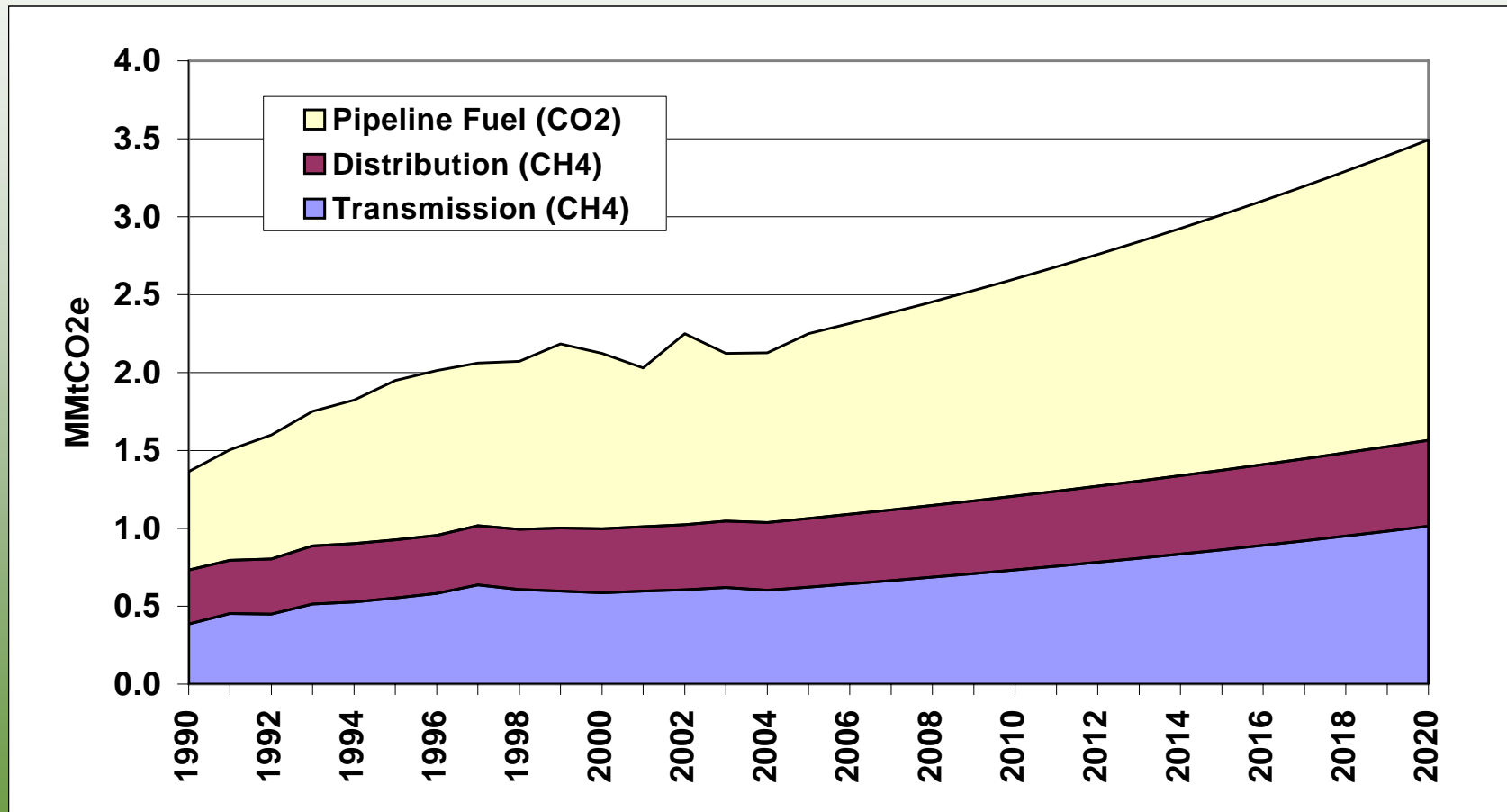
RCI

- Data Sources
 - Historical emissions - MN PCA Inventory
 - MN PCA Emission Inventory System (EIS)
 - Fuel use reports submitted to PCA
 - EIA State Energy Data (SED)
 - Natural Gas Annual
 - Many others
 - Forecast –
 - MN population annual growth rate (2005 – 2020)
 - MN employment annual growth rates (2004-2014)
 - Commercial and industrial sectors
 - EIA Annual Energy Outlook 2006 (AEO2006)
 - Projected consumption by fuel type
- Methods
 - Historic - energy consumption multiplied by emission factors
 - Forecast – annual growth rate applied to latest year of emissions

RCI

- Key Assumptions
 - Projections based on normalized regional growth projections scaled for MN population and employment growth projections
- Key Uncertainties
 - Regional projections
 - Industrial sector growth and mix
 - Extension of 10-year (2004-2014) annual employment growth rate to 2020
 - Employment trends not always best indicator of future emissions activity

Natural Gas Transmission and Distribution



Natural Gas Transmission and Distribution

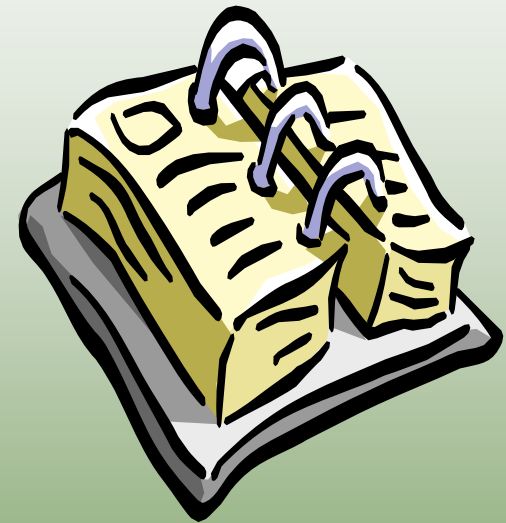
- Data sources
 - MN PCA Inventory:
 - Detailed activity data for calculating:
 - CH₄ emissions from fugitive emission leaks and vented and combusted gas
 - CO₂ emissions from compressor engines
- Methods
 - Historic - activity x emission factors
 - Forecast – annual growth rate applied to latest year of emissions

Natural Gas Transmission and Distribution

- Key Assumptions
 - Historical Emissions Growth Rates:
 - Distribution system: 1.5% annual
 - Transmission system: 3.3% annual
 - Pipeline fuel use: 3.3% annual
- Key Uncertainties
 - Emissions growth rates for:
 - Transmission and distribution pipeline systems
 - Fuel consumed by pipeline operations

Next TWG Meeting

- Agenda:
 - Add missing actions to catalog
 - Review Minnesota emissions inventory and projections
- Time and Date TBD
 - June 11, 3:30 PM to 5:00 PM



Public Input, Announcements