



# Iowa Climate Change Advisory Council

Energy Efficiency and Conservation  
Subcommittee Meeting #10

May 28, 2008

Iowa Department of Natural Resources  
The Center for Climate Strategies

# Welcome and Introductions

- Iowa DNR
- Iowa Subcommittee (SC) Members
- Members of the Public
- Center for Climate Strategies

# Agenda

1. Introductions and Roll Call
2. Approval of Summary of Call/Meeting #9 [Decision Item]
3. Review and Discuss Development of Iowa Draft Inventory and Forecast
4. Overview of Revised PODs and Initial Quantification Results
5. Agenda, Date and Time for Next Meetings [Decision Item]
6. Public Comments
7. Announcements

# Review and Approval of Call Summary 9

- Review draft meeting summary for EEC SC call #9
- Consider any corrections or additions to meeting summary
- Move to approve meeting summary with agreed upon changes

# Stepwise Planning Process

- Develop inventory and forecast of emissions
- Identify a full range of possible actions
- Identify initial priorities for analysis
- ***Develop straw proposals***
- ***Quantify GHG reductions and costs/savings***
- Evaluate externalities, feasibility issues
- Develop alternatives to address barriers
- Aggregate results
- Iterate to final agreements
- Finalize and report recommendations

# Policy Option Template

## (See Sample Policy Option Template)

- Policy Description (Concept)
- Policy Design (Goals, Timing, Parties Involved)
- *Implementation Methods*
- *Related Programs and Policies (BAU)*
- *Estimated GHG Savings and Costs Per MMTCO<sub>2</sub>e*
  - *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

# Inventory & Forecast

- Review of residential, commercial, industrial sector projections

# Inventory Approach

- Standard US Environmental Protection Agency (EPA), United Nations, Intergovernmental Panel on Climate Change (IPCC) methodologies, guidelines, and tools
- Emphasis on transparency, consistency, and significance
- Preference for Iowa 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
  - State population and employment forecasts
  - US Census and Bureau of Labor Statistics
  - US Energy Information Administration

# Coverage

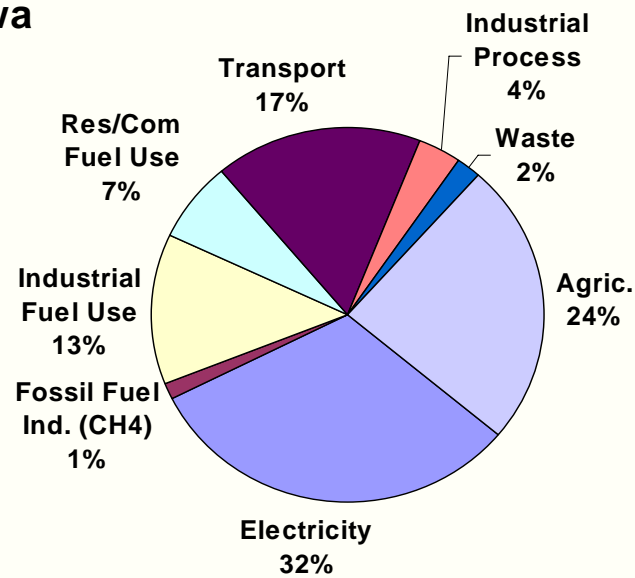
- Six gases per USEPA and UNFCCC guidelines
  - Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>)
- All major emitting sectors
  - Electricity Supply & Demand (Consumption-Based)
  - Residential, Commercial, Industrial (RCI) Fuel Use and Non-fuel Use Processes
  - Transportation (onroad and nonroad)
  - Natural gas pipeline transmission & distribution
  - Agriculture, Forestry, and Waste Management
- Emissions expressed as CO<sub>2</sub> equivalent
  - 100-year global warming potentials
    - CO<sub>2</sub> = 1; CH<sub>4</sub> = 21; N<sub>2</sub>O = 310; HFC-23 = 11,700; SF<sub>6</sub> = 23,900

# Key Points

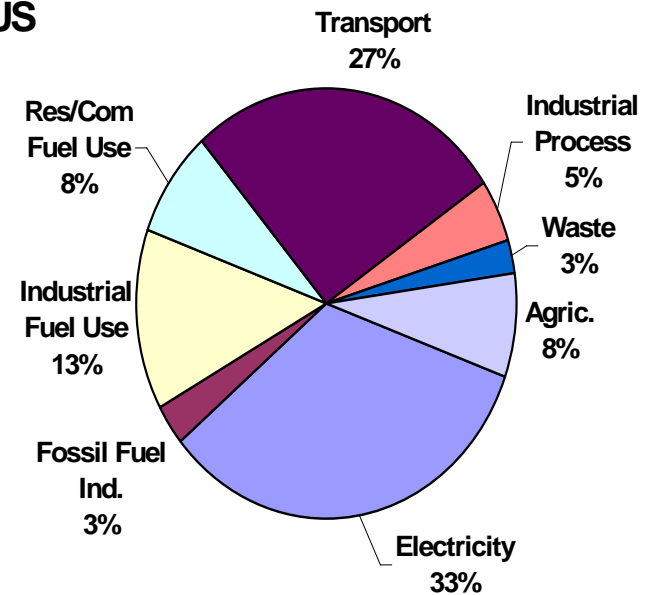
- Preliminary draft for ICCAC and SCs review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a baseline for modeling or compliance for individual options
- Consumption and Production methods
- Gross and Net methods

# Iowa & US Emissions By Sector, Year 2005

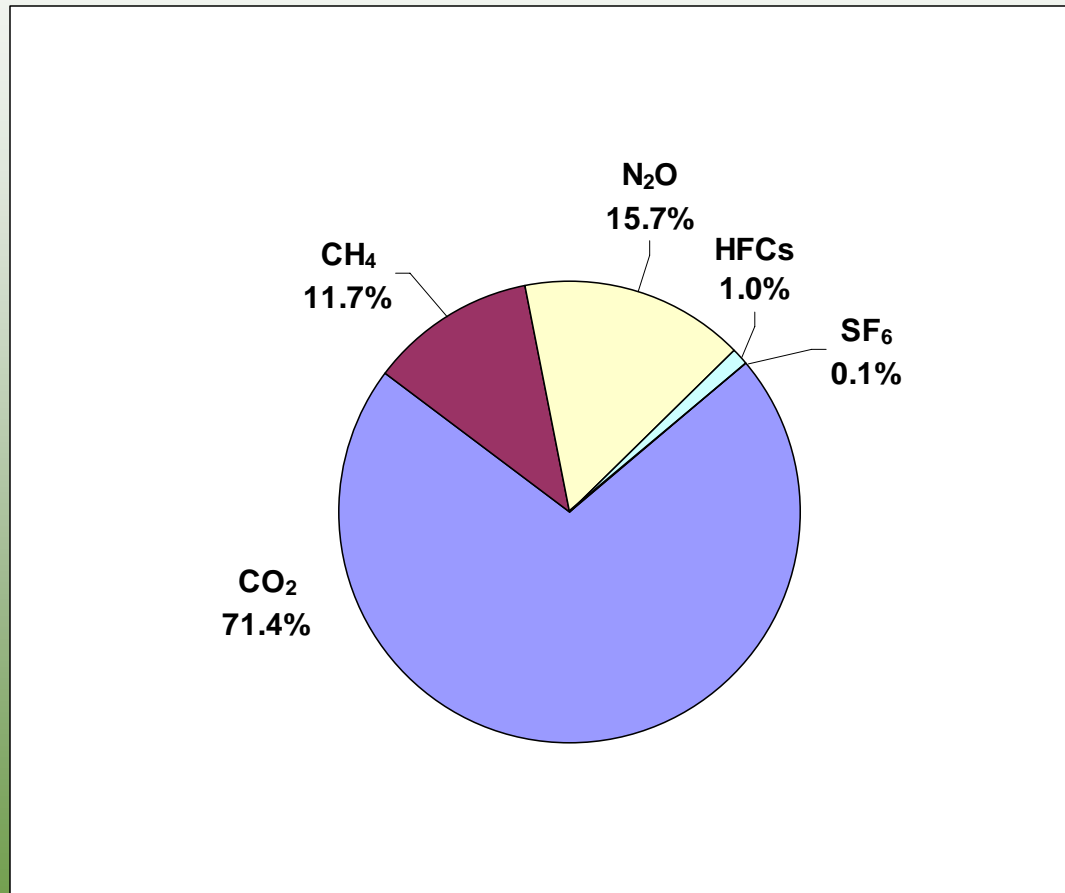
Iowa



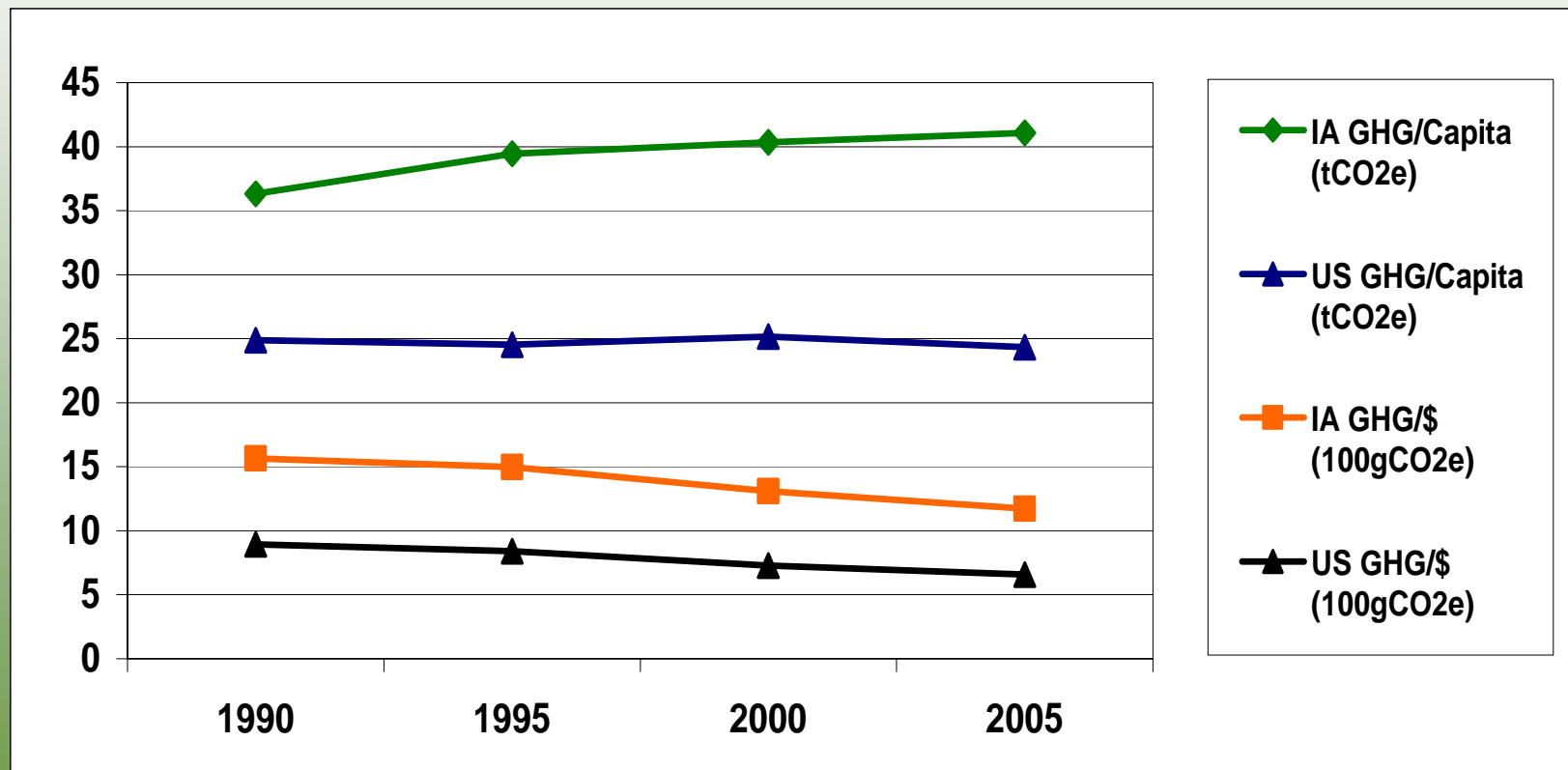
US



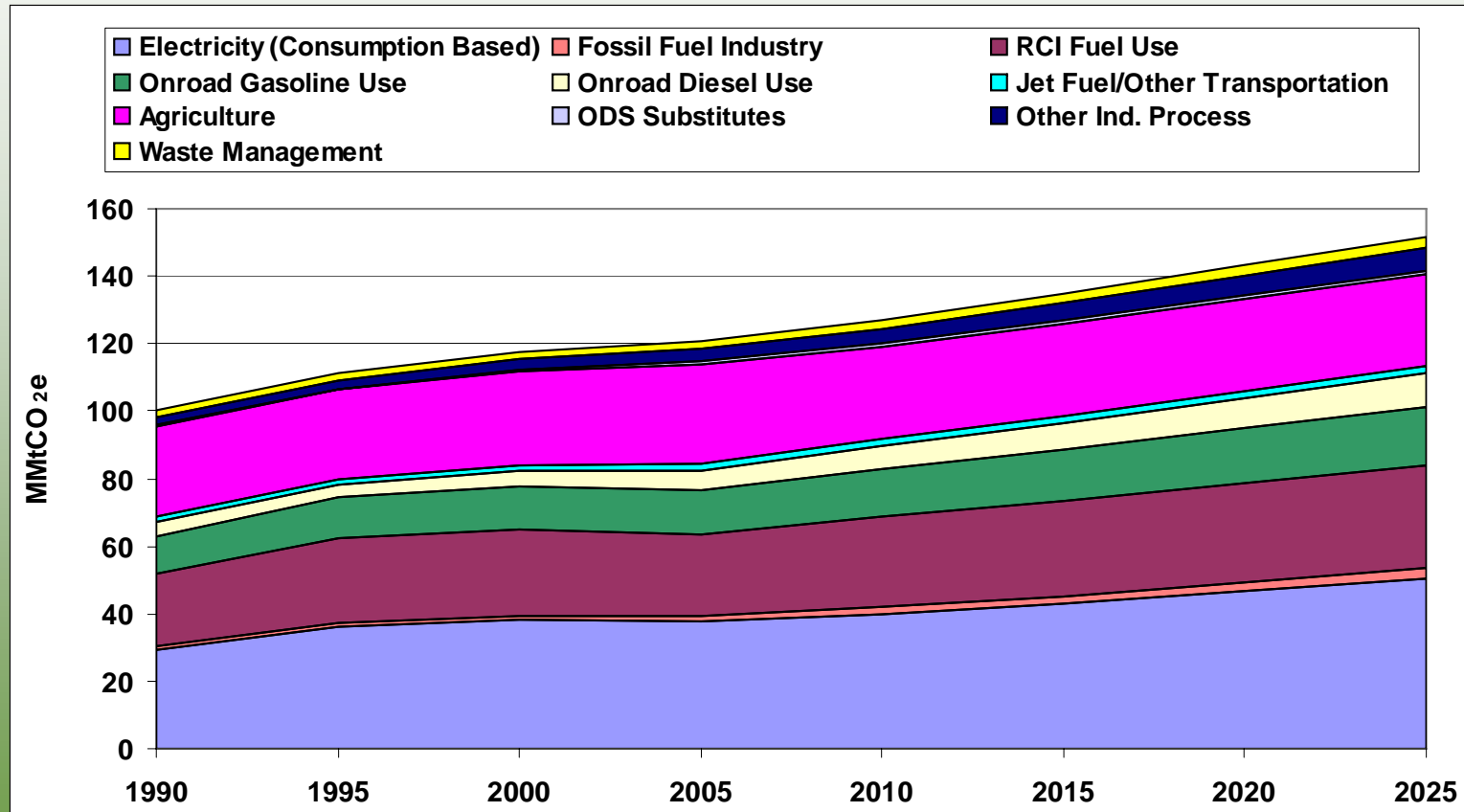
# Iowa Emissions By GHG, Year 2005 (MMtCO<sub>2</sub>e Based)



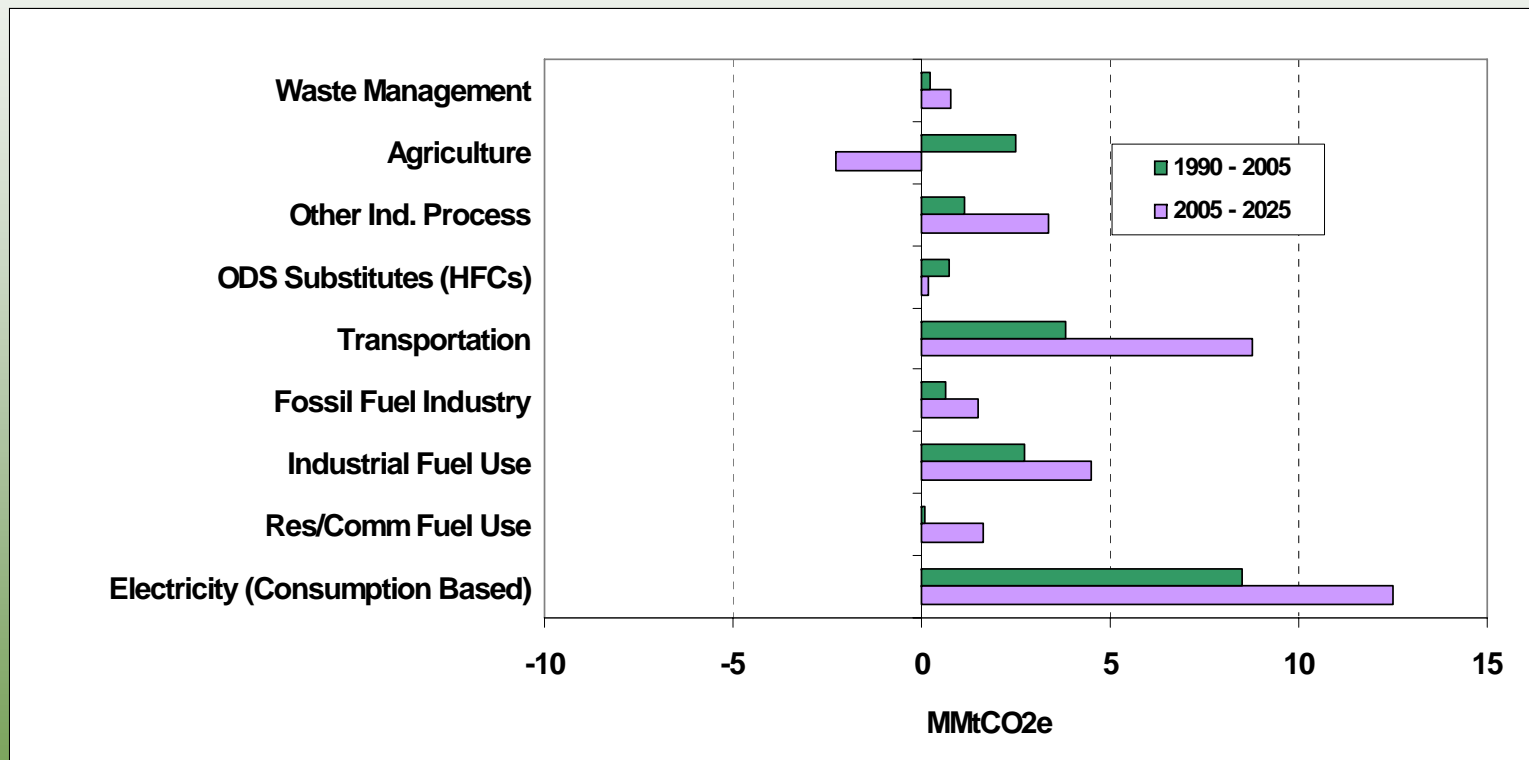
# Per Capita and GSP/GDP GHG Emissions, 1990-2005



# Gross Iowa GHG Emissions By Sector, 1990-2025

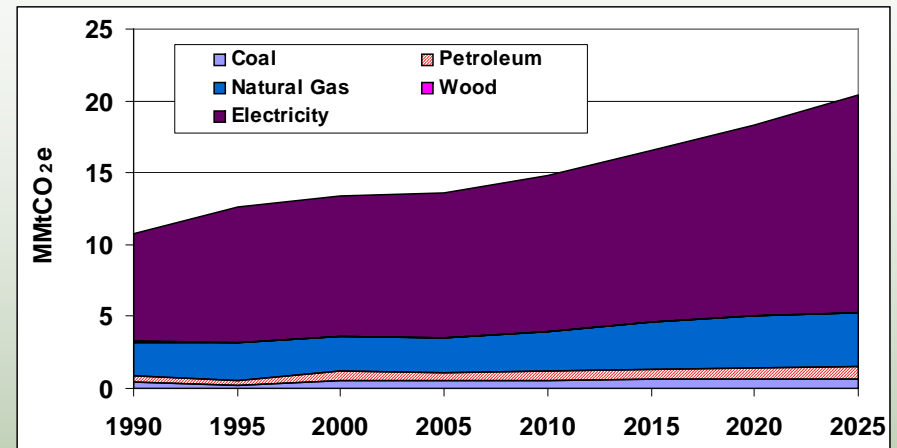


# Iowa Emissions Growth (MMtCO<sub>2</sub>e Basis)

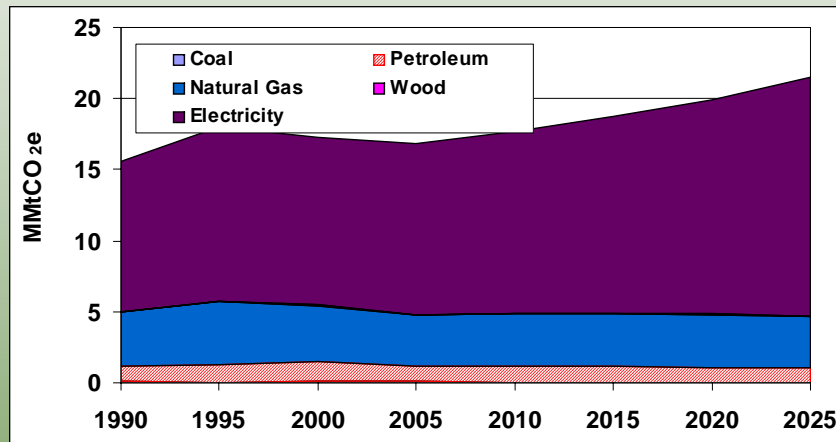


# RCI

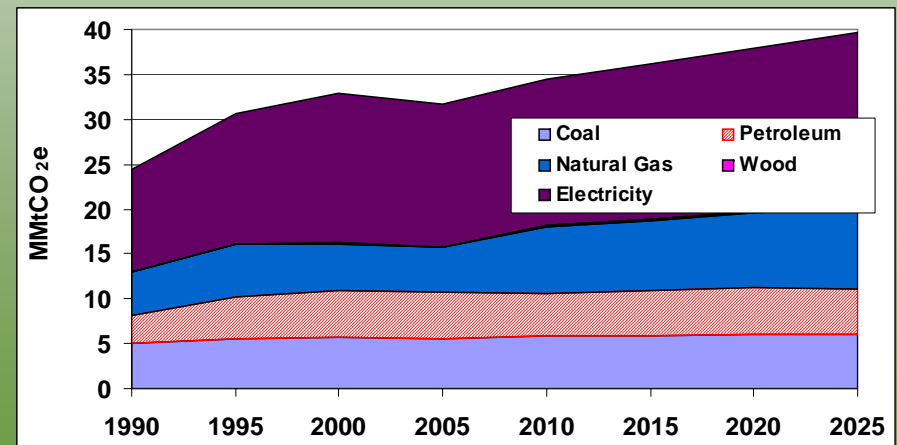
## Commercial Sector



## Residential Sector



## Industrial Sector



# RCI

- Data Sources

- Historical

- EIA State Energy Data (SED)
    - EIA Natural Gas Annual

- Forecast

- Residential – IA population annual growth rate (2005-2025)
    - Comm/industrial – EIA Annual Energy Outlook 2007 (AEO2007)
      - Projected consumption by fuel type for EIA West North Central region

- Methods

- Historic

- US EPA State Greenhouse Gas Inventory Tool (SIT)
    - Energy consumption multiplied by emission factors

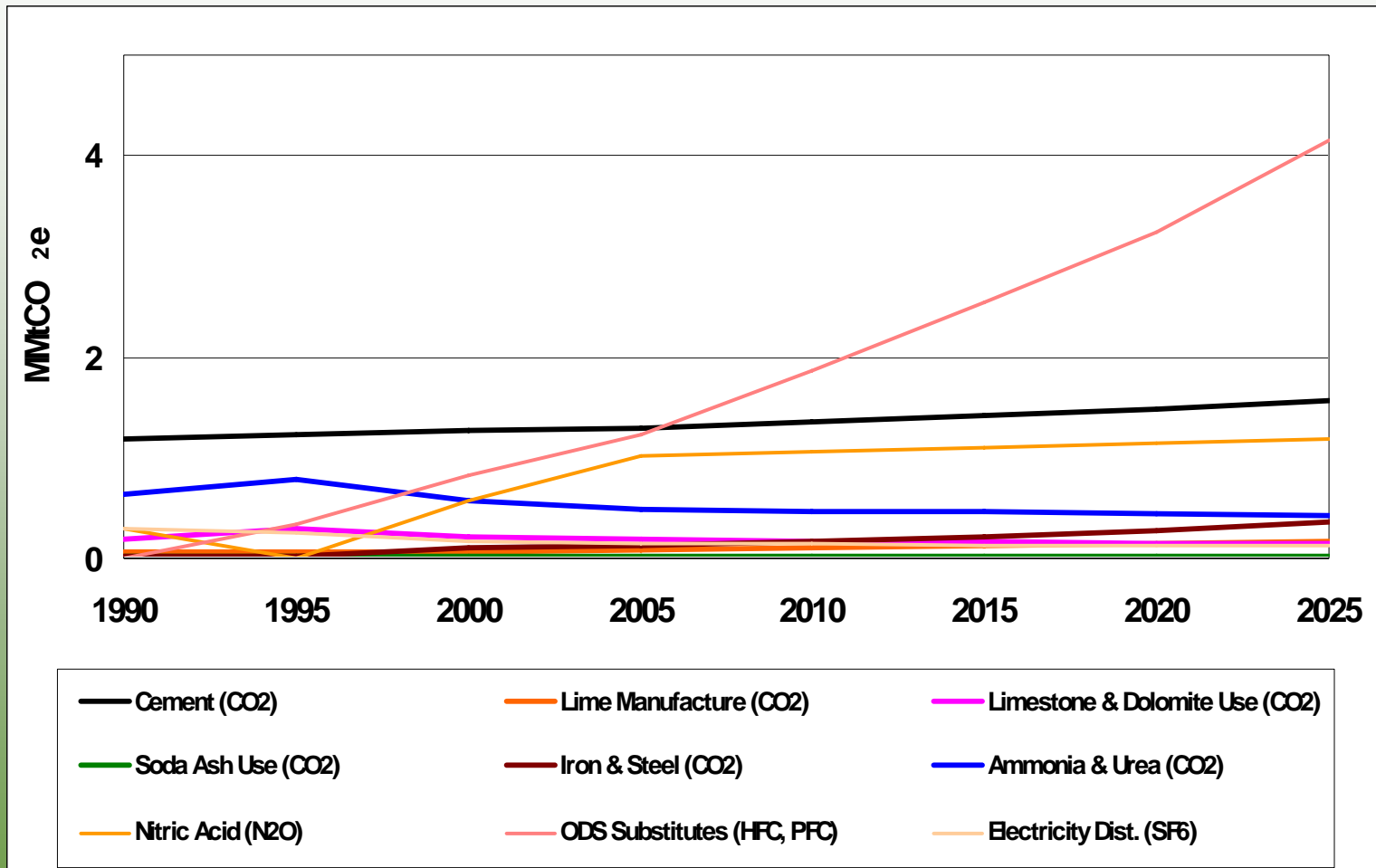
- Forecast

- Fossil fuels – annual growth rate applied to latest year of emissions
    - Electricity emissions attribution – Forecast for Mid-Continent Area Power Pool from AEO2007

# RCI

- Key Assumptions
  - Residential sector
    - Projections based on normalized regional AEO2007 growth projections of fuel use scaled for IA population
  - Commercial/Industrial
    - Projections based on regional AEO2007 growth projections of fuel use
- Key Uncertainties
  - Regional projections
  - Industrial sector growth and mix

# Industrial Process



# Industrial Process

- Data sources
  - Historic
    - Iowa DNR
      - Cement manufacture (clinker production), iron and steel production, and nitric acid production
      - Ethanol production data to be provided by Iowa DNR after 3/31/08; GHG emissions from ethanol production to be estimated from fermentation process
    - US EPA National GHG Inventory
      - Substitutes ozone-depleting substances (ODSs), electricity transmission and distribution systems
    - USGS
      - Lime manufacture, limestone and dolomite consumption, soda ash consumption, ammonia production, and urea application
  - Forecast (annual growth rates from 2005 to 2025)
    - IA employment data – cement manufacture
    - Historic trends
      - Lime manufacture, limestone/dolomite use, soda ash consumption, ammonia production, urea application, and iron and steel
    - US EPA National Inventory Forecast
      - ODS substitutes, electric distribution, nitric acid production
- Methods
  - Based on EPA SIT

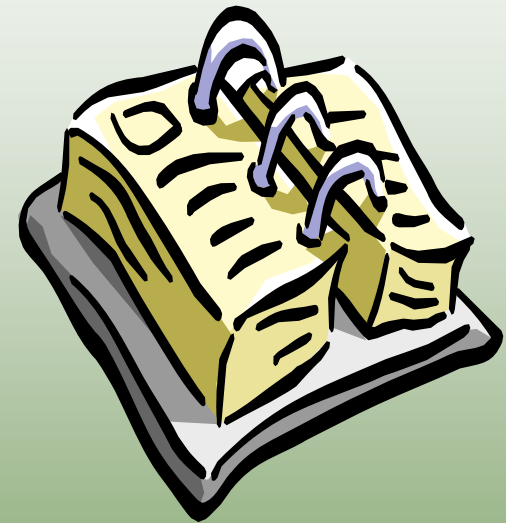
# Industrial Process

- Key Uncertainties
  - Actual production data for estimating historical emissions
  - Growth rates used to forecast emissions
    - Application of annual industrial growth rate for 2004-2014 to forecast emissions to 2025
    - Based on historic trends
  - Industry activities to reduce GHG emissions

# Revised PODs/ Initial Quantification

# Next Sub-Committee Meeting

- Agenda:
  - Review and discuss results of ICCAC meeting
  - Continue to develop PODs and revise quantification of results
- Next Calls
  - TBD



# Public Input, Announcements