



Governor's Action Team on Energy and Climate Change
State of Florida

Governor's Action Team on Energy and
Climate Change
Phase II Process

Meeting #3, May 29-30, 2008

day one

Welcome and Introductions

- Action Team
- Florida Department of Environmental Protection
- Florida Governor's Office
- TWG Members in Attendance
- Center for Climate Strategies

Agenda

Meeting Agenda for Thursday, May 29, 2008:

- 10:00 Welcome and Introductions
- 10:15 Review and Approval of Action Team Meeting #2 Summary
- 10:20 Update: Florida Legislative 2008 Session – House Bill 7135
- 11:10 Review and Discussion of Florida Inventory and Forecast
- 12:00 Lunch Break
- 12:45
 - Review and Approval of Priorities for Analysis: Overview
- 12:55
 - Consideration of Energy Supply and Demand Options
- 2:00
 - Consideration of Transportation and Land Use Options
- 3:00
 - Consideration of Agriculture, Forestry, and Waste Management Options
- 5:00 Public Input and Announcements
- 5:30 Adjourn

Agenda

Meeting Agenda for Friday, May 30, 2008:

- 8:30 Welcome and Introductions
- 8:45 ▪ Consideration of Government Policy Options
- 10:15 ▪ Briefing on Adaptation Framework, Catalog
- 11:45 Lunch Break
- 12:30 ▪ Consideration of Cap and Trade Options
- 2:00 Agenda, Time, and Date for Next Meeting
- 2:10 Public Input and Announcements
- 2:30 Adjourn

Review and Approve Action Team Meeting #2 Summary

Update:
Florida Legislative 2008 Session
– House Bill 7135

Florida Draft GHG Emissions Inventory and Forecast

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 Florida 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
 - US Census
 - US Energy Information Administration

Coverage

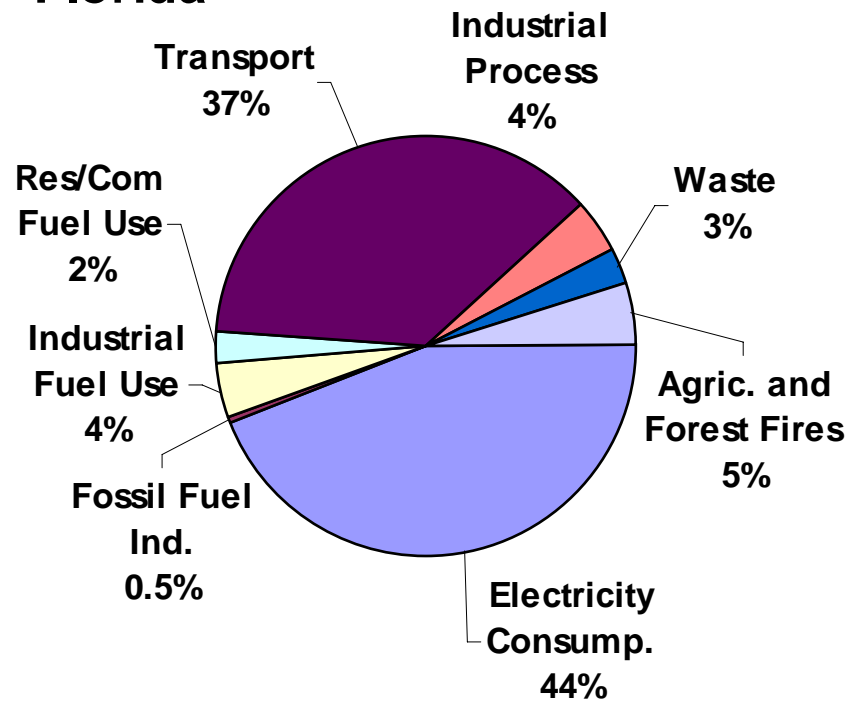
- Six gases per USEPA and UNFCCC guidelines
 - Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆)
- All major emitting sectors
 - Electricity Supply & Demand (Consumption-Based)
 - Residential, Commercial, Industrial (RCI) Fuel Use and Non-fuel Use Processes
 - Transportation (onroad and nonroad)
 - Fossil Fuel Industry
 - Agriculture, Forestry, and Waste Management
- Emissions expressed as CO₂ equivalent
 - 100-year global warming potentials
 - CO₂ = 1; CH₄ = 21; N₂O = 310; HFC-23 = 11,700; SF₆ = 23,900

Key Points

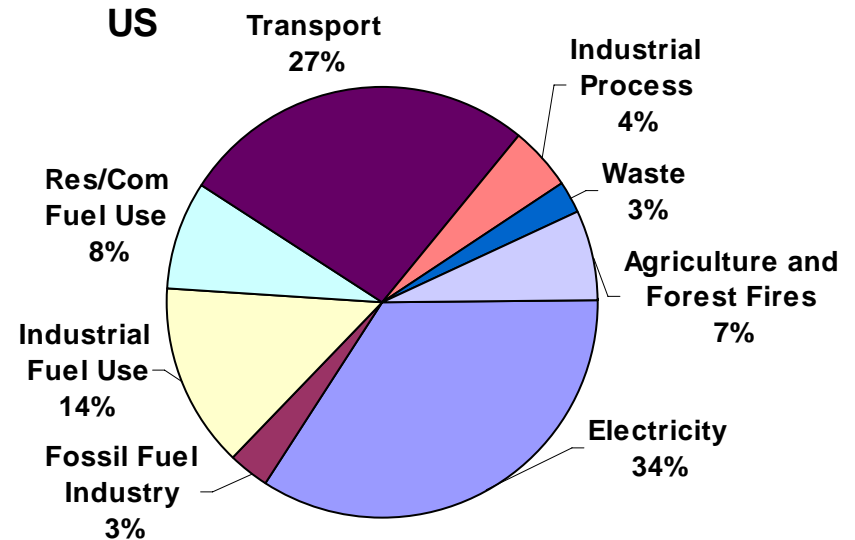
- Preliminary draft for Governor's Action Team on Energy and Climate Change and TWG; review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a baseline for modeling or compliance for individual options
- Consumption and Production methods
- Gross and Net methods

Florida & US Gross Emissions By Sector, 2005 (Consumption Based)

Florida

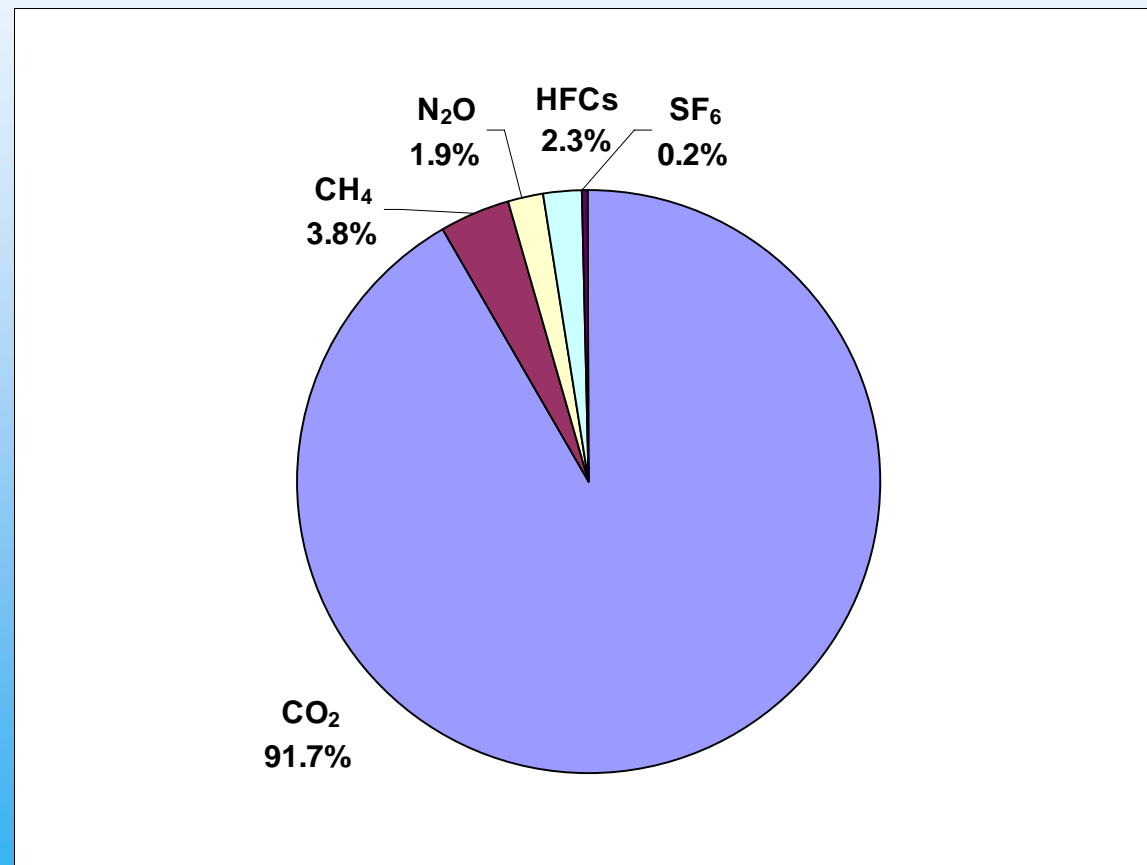


US

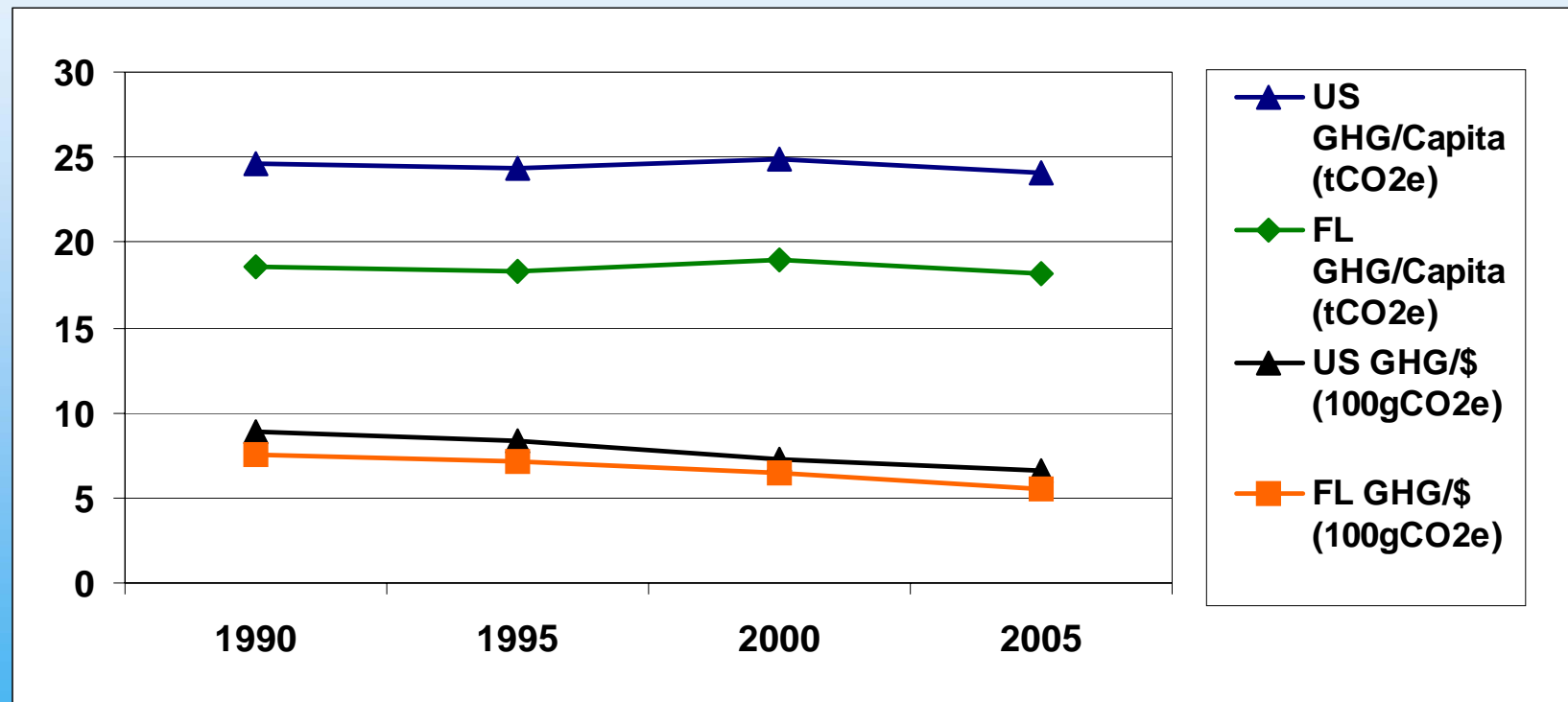


Florida Gross Emissions By GHG, 2005

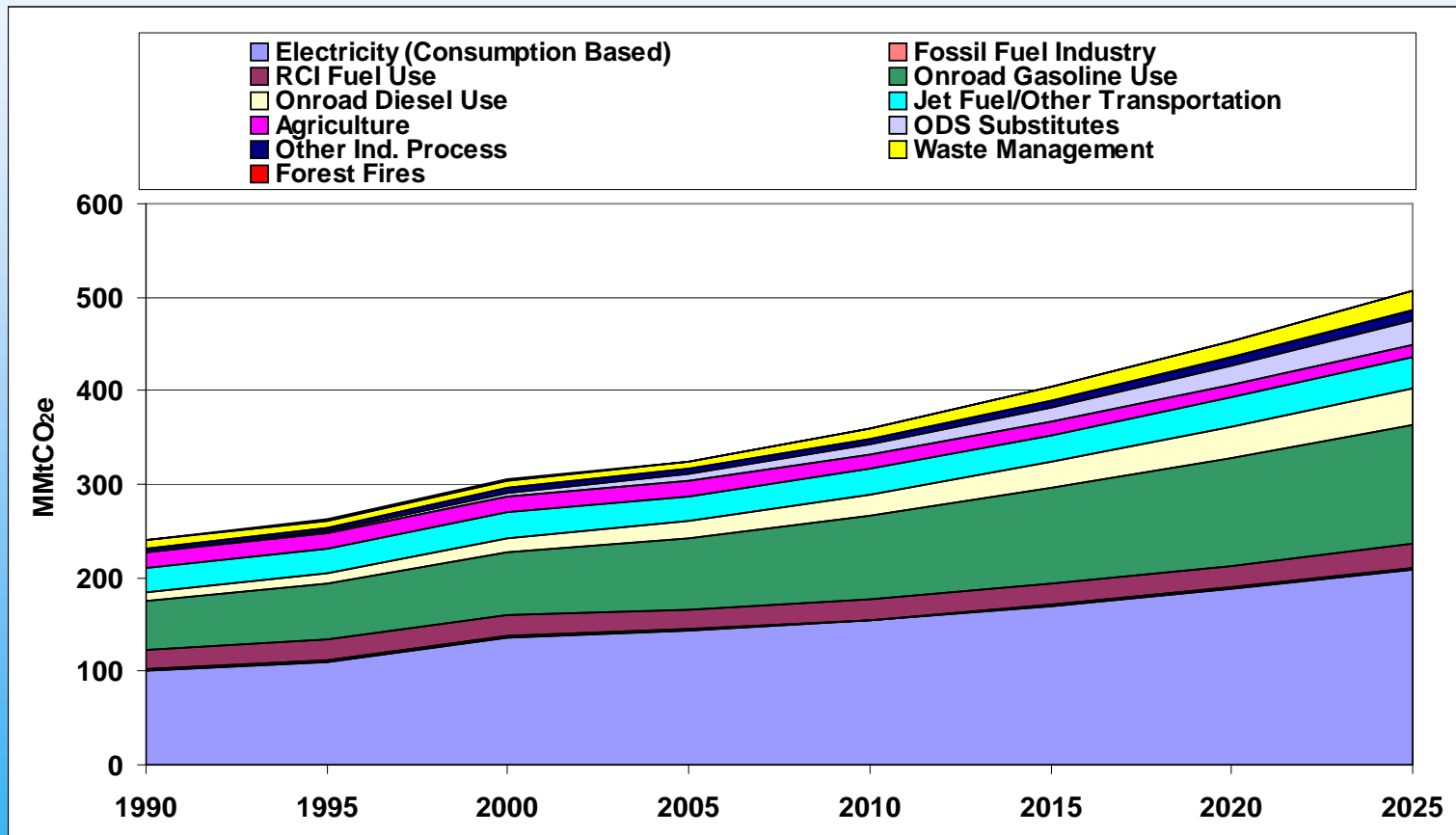
(Percentage on Consumption, MMtCO₂e Basis)



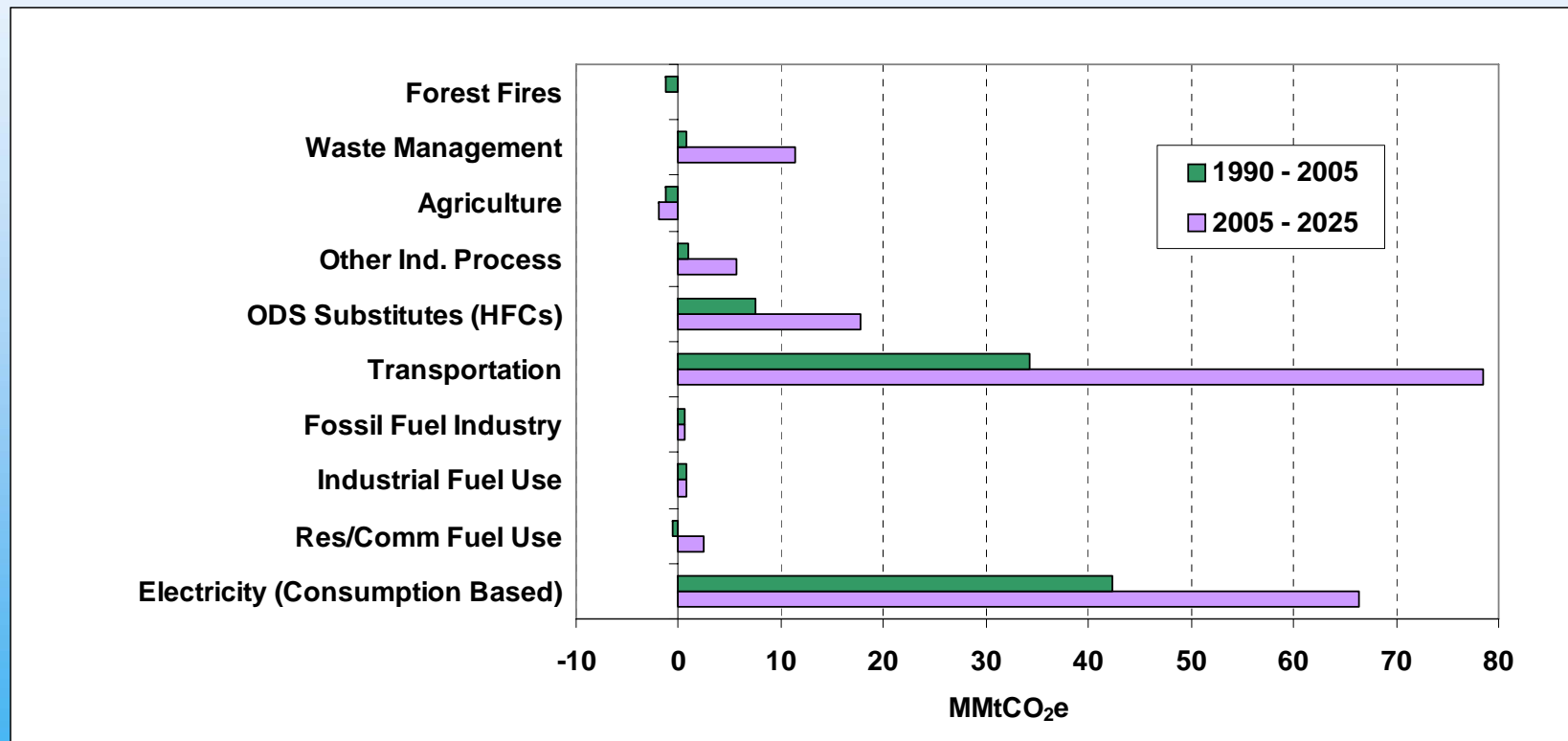
Per Capita and GSP/GDP Gross GHG Emissions, 1990-2005



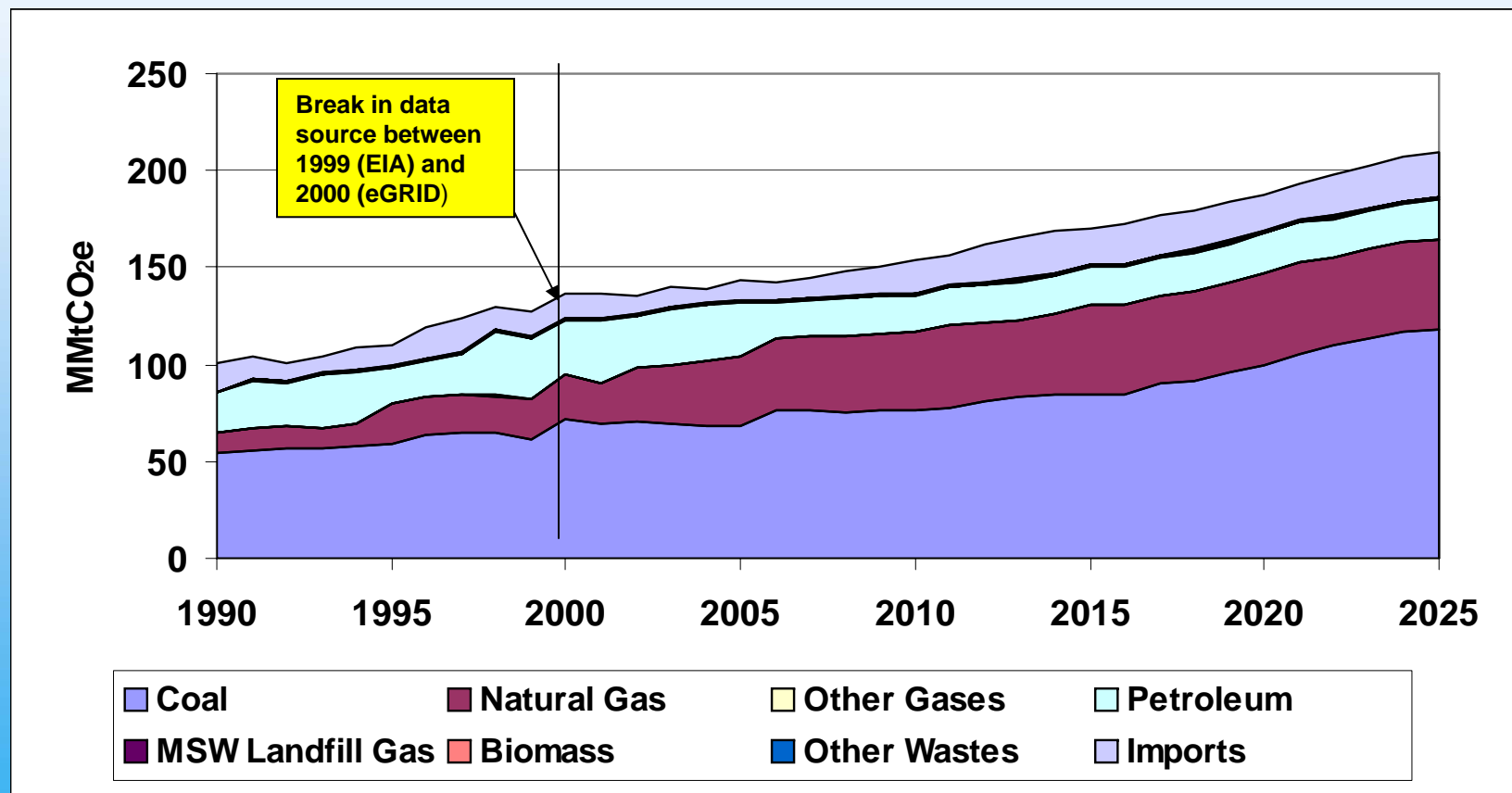
Florida Gross GHG Emissions By Sector, 1990-2025 (Consumption Based)



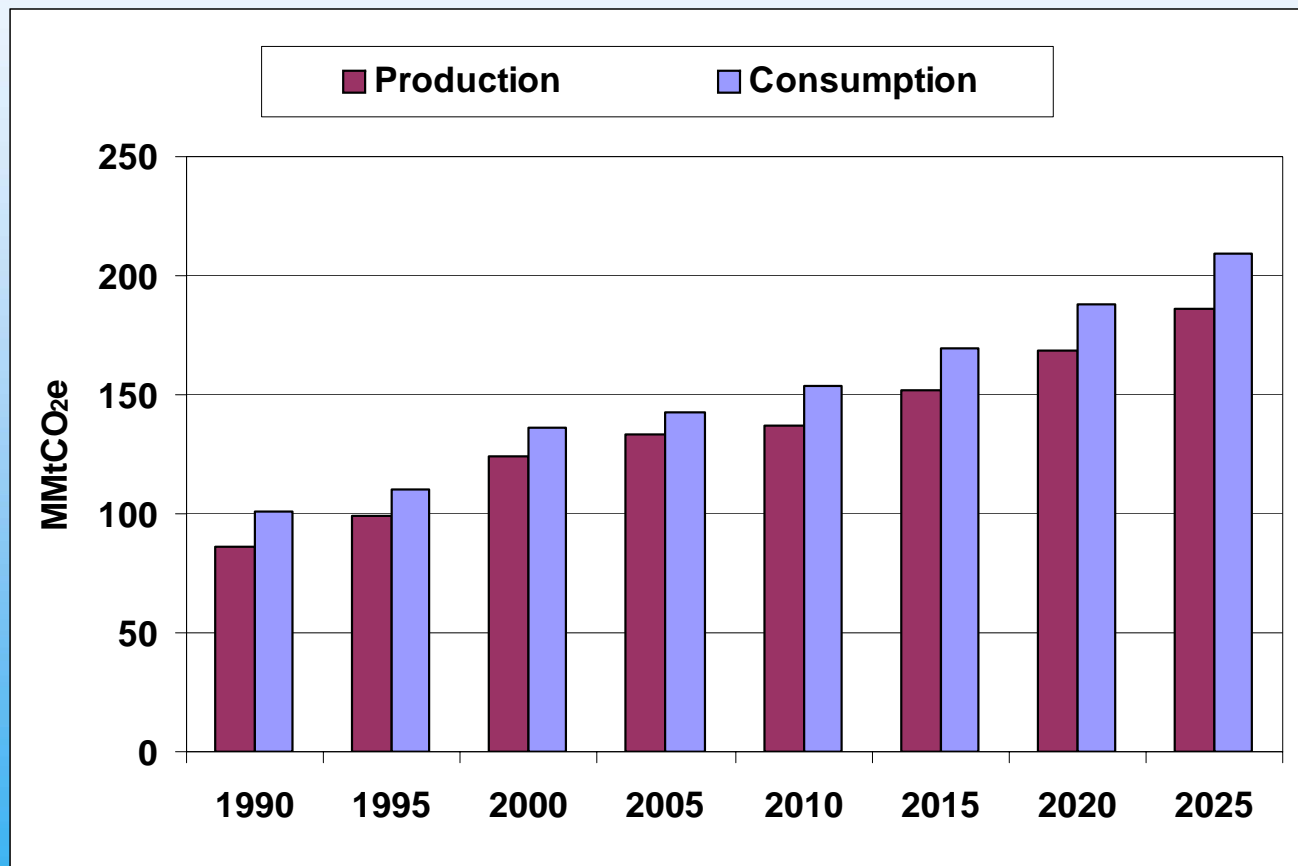
Florida Gross Emissions Growth (MMtCO₂e, Consumption Based)



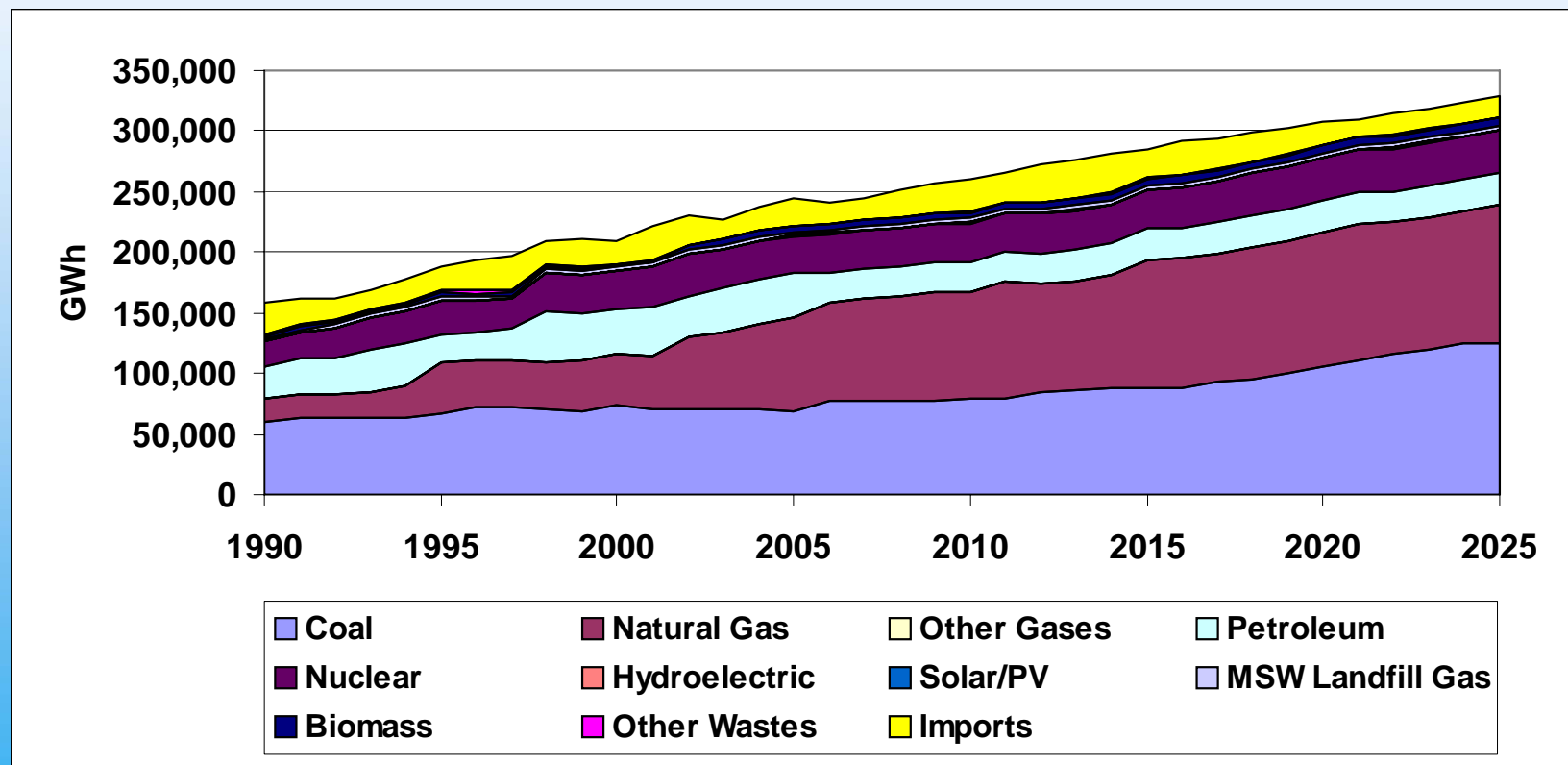
Electricity – Emissions



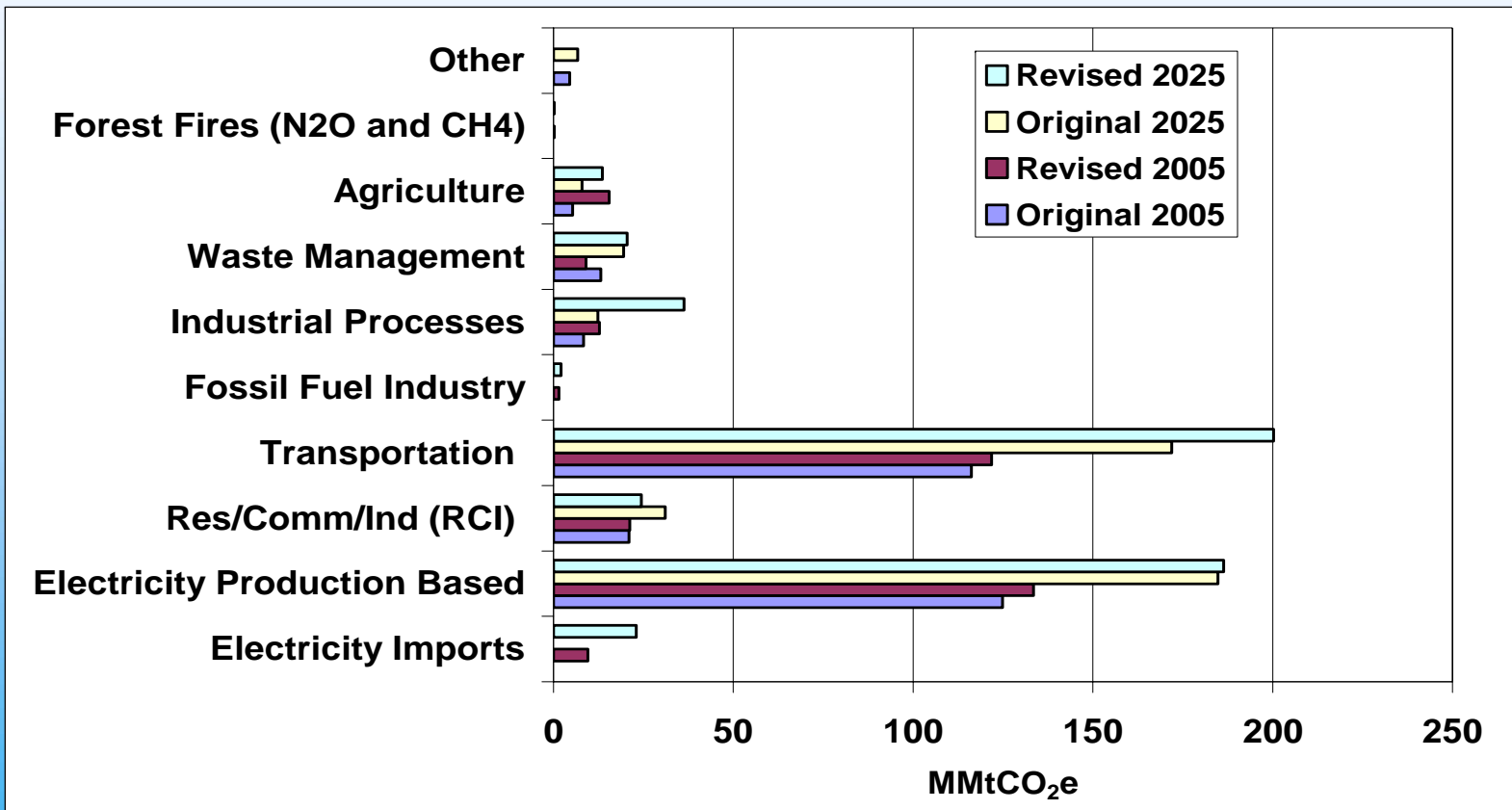
Electricity - Emissions



Electricity – Gross Generation

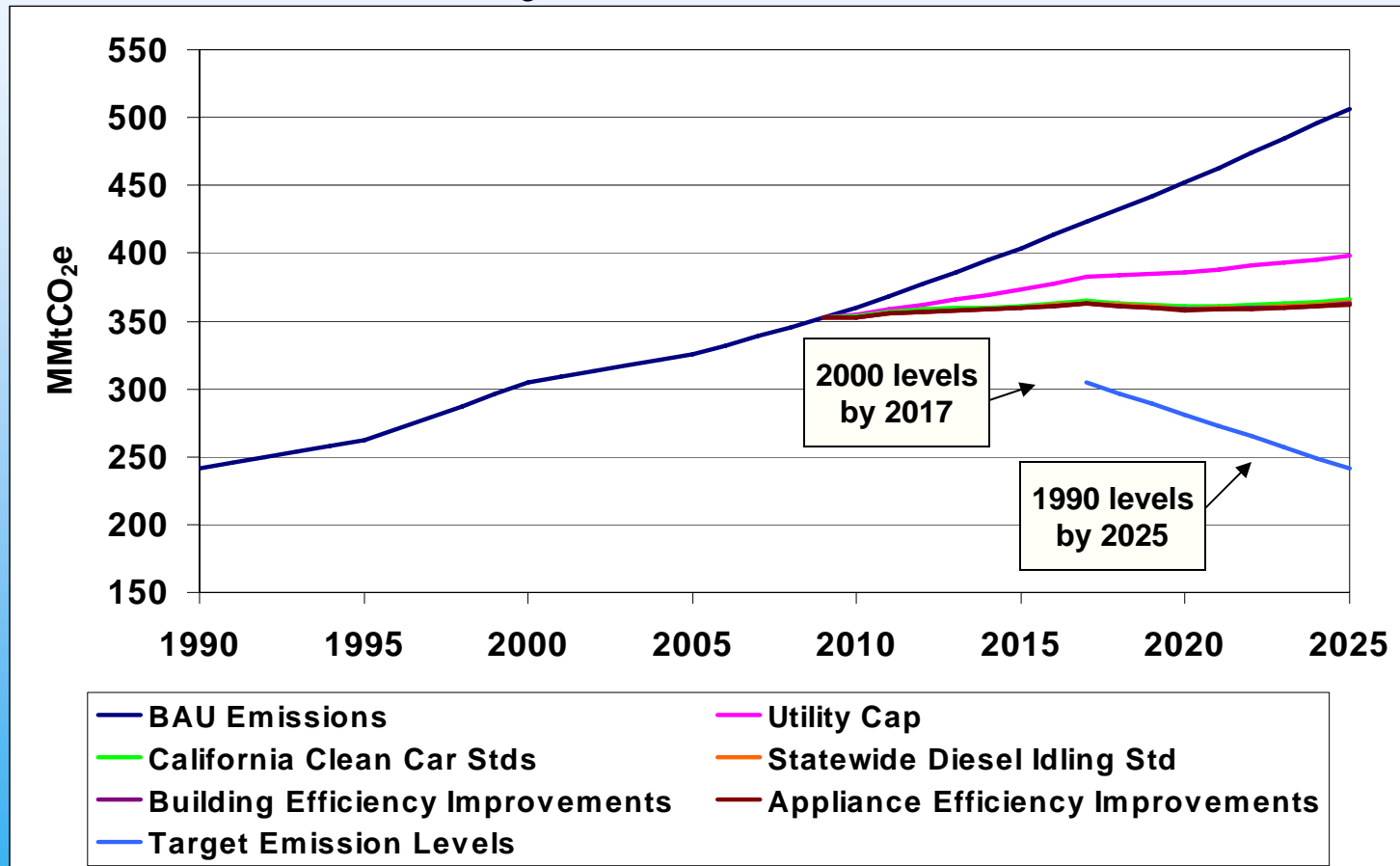


Comparison of Original and Revised Emissions for 2005 and 2025



“Original” refers to the data presented at Meeting #1 of the Florida Climate Action Team.

Recent Florida Actions – Preliminary GHG Reductions



Electricity

- Data Sources
 - Historical
 - Generation and fuel consumption for 1990-1999
 - 906/920 Monthly Time Series data (EIA)
 - Monthly Cost and Quality of Fuels for Electric Plants (EIA) – coal-type data
 - State Electricity Profile (EIA) – sales of electricity
 - Base Year 2000
 - eGRID—EPA database of CO₂e emissions from Florida power plants
 - Forecast
 - EIA/Annual Energy Outlook 2007 for Southeastern Reliability Council (SERC) and SERC/FL regions
 - Projected electricity sales and generation for 2001-2025
 - Projected trends in combustion efficiency improvement and transmission & distribution losses for 2001–2025

Electricity

- Methodology
 - Key Inputs
 - Coal quality used in FL power stations
 - Gross annual primary energy consumption by FL power stations by fuel type
 - Gross annual generation to meet FL demand
 - Multiply gross annual primary energy consumption by FL power stations by CO₂e emission factors
 - Difference between primary energy required to meet FL demand and energy generated from FL power stations assumed to be met with imports
 - Assumed to be imported from SERC region

Electricity

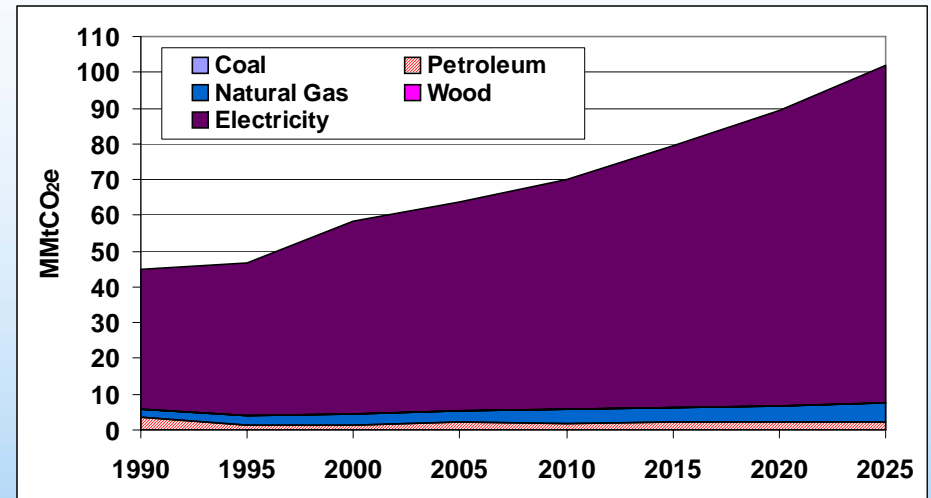
- Key Uncertainties
 - Top-down approach
 - Assumes FL electric systems evolve consistently with the surrounding SERC/FL and SERC regions
 - Does not capture all state-specific system characteristics
 - Differences in primary data sources by time period
 - eGRID data for 2000 base year; EIA data for 1990-1999
 - Source of electricity imports
 - All imports assumed to come from SERC region
 - Coal quality over time
 - Coal quality for 2000 assumed for forecast period

Recommendations from ESD TWG

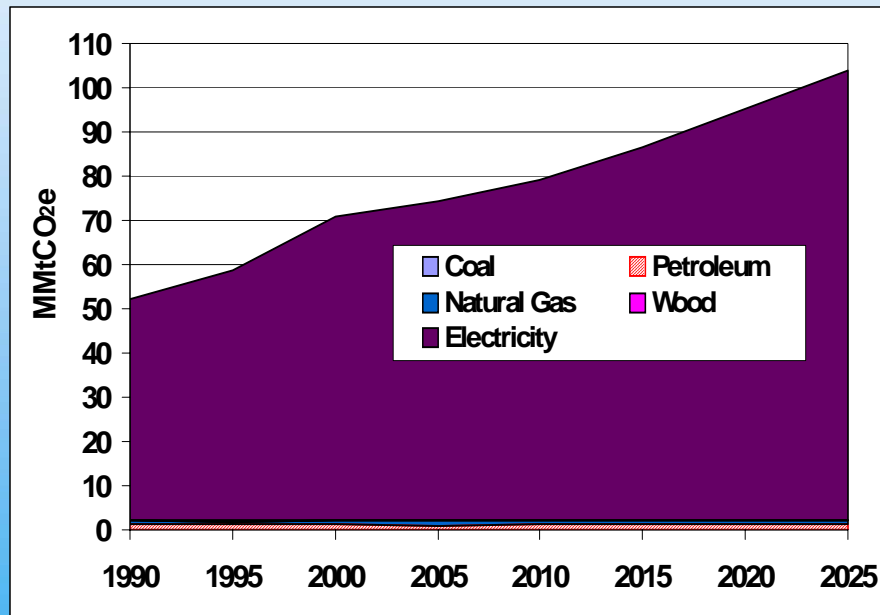
- Use Florida Annual Operating Report (AOR) data as primary data source for 1990-2007 electric utility emissions
 - Will need to account for imported electricity separately
- Use latest available Florida Reliability Coordinating Council (FRCC) 10-year plan as primary source of projected generation
 - Latest forecast shows decrease in coal use due to scrapping of several planned coal units; increase in natural gas use
 - Fuel mix may be less reliable than total projected generation
 - Decision:
 - Include emission reductions from utility emissions cap in business-as-usual (BAU) forecast or show reductions as wedge incremental to BAU

RCI

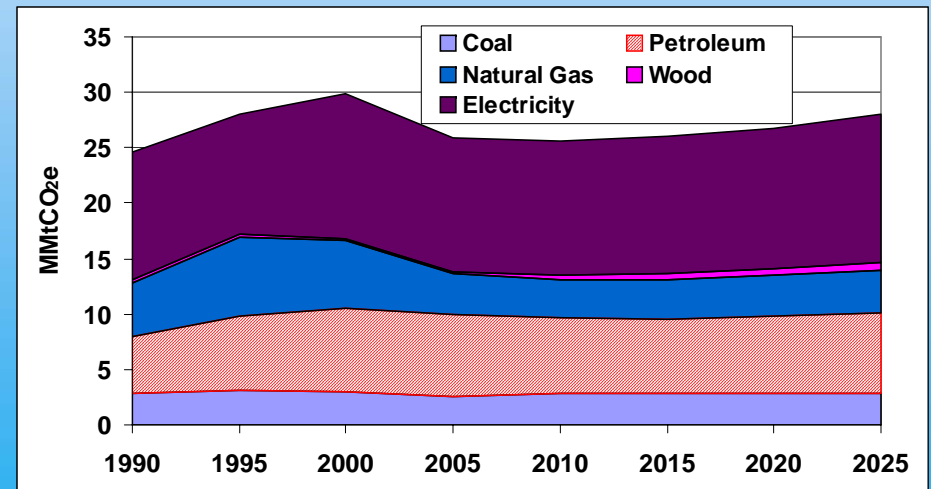
Commercial Sector



Residential Sector



Industrial Sector



RCI

- Data Sources

- Historical

- US DOE Energy Information Administration (EIA) State Energy Data (SED)

- Forecasts

- Residential – FL population annual growth rate (2005-2025)
 - Commercial/Industrial – EIA Annual Energy Outlook 2007 (AEO2007)
 - Projected fuel consumption by fuel type for EIA South Atlantic region

- Methods

- Historic

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

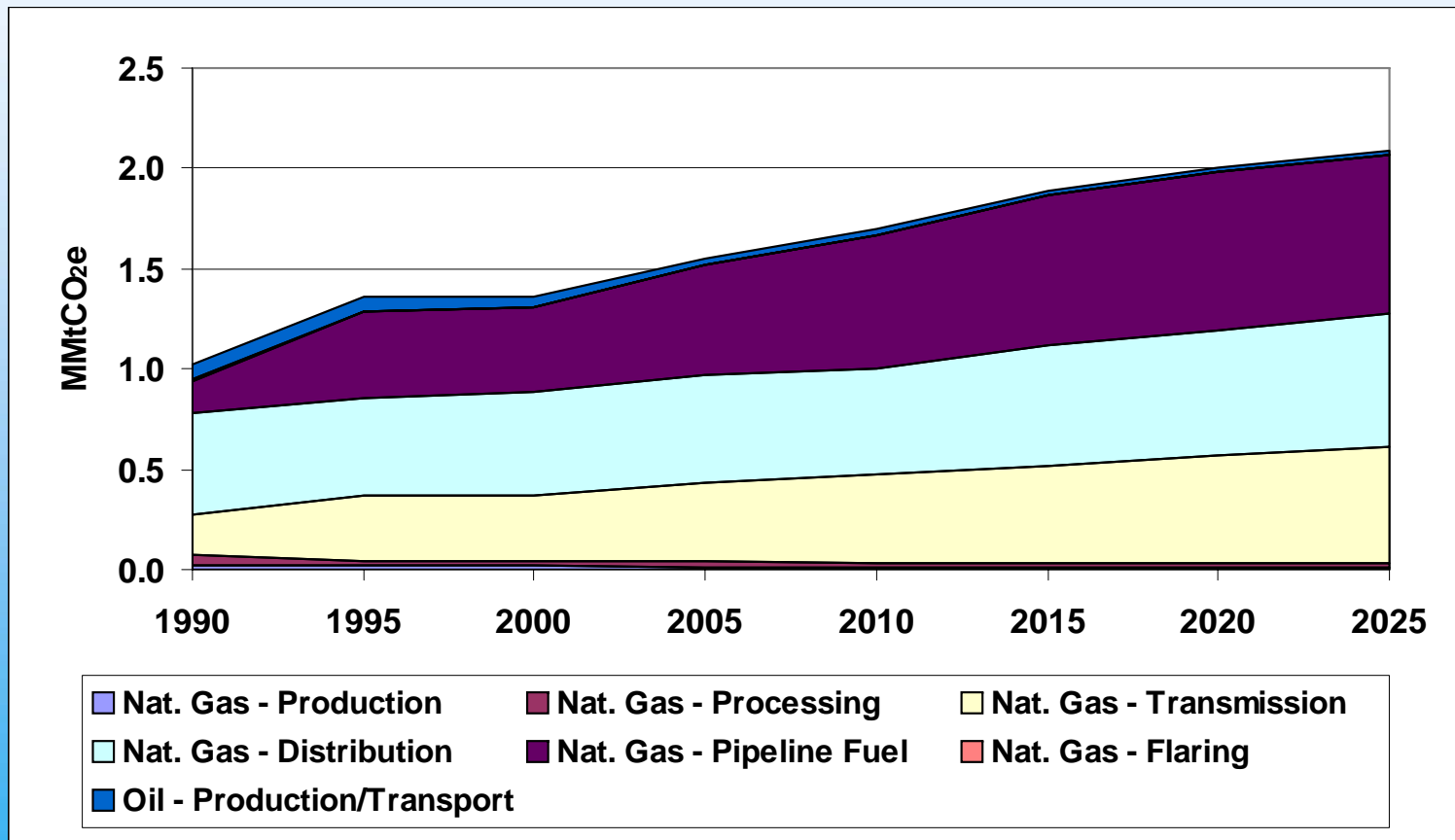
- Forecast

- Fossil fuels and wood – annual growth rate applied to latest year of emissions
 - Electricity emissions attribution – AEO2007 forecast for Southeastern Reliability Council (SERC) / FL region and SERC region (for Northwest portion of the state)

RCI

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

Fossil Fuel Industry



Fossil Fuel Industry

- Data Sources
 - Historic Natural Gas (1990-2005)
 - Production – number of FL gas wells from FL DEP database
 - Processing
 - Number of gas processing plants in FL from *Oil and Gas Journal*
 - Volume of gas flared in FL computed from volume of gas flared/vented in FL from EIA and EIIP percentage flared assumption
 - Miles of gathering pipeline
 - FL DEP data
 - Back-cast to 1990 using FL natural gas production from EIA
 - Miles of transmission/distribution pipeline and number of services
 - Office of Pipeline Safety data for gas transmission pipeline mileage
 - FL DEP data for distribution pipeline mileage and number of services
 - Compressor stations – FL Public Service Commission
 - Pipeline fuel use – EIA volume of natural gas consumed in FL pipelines

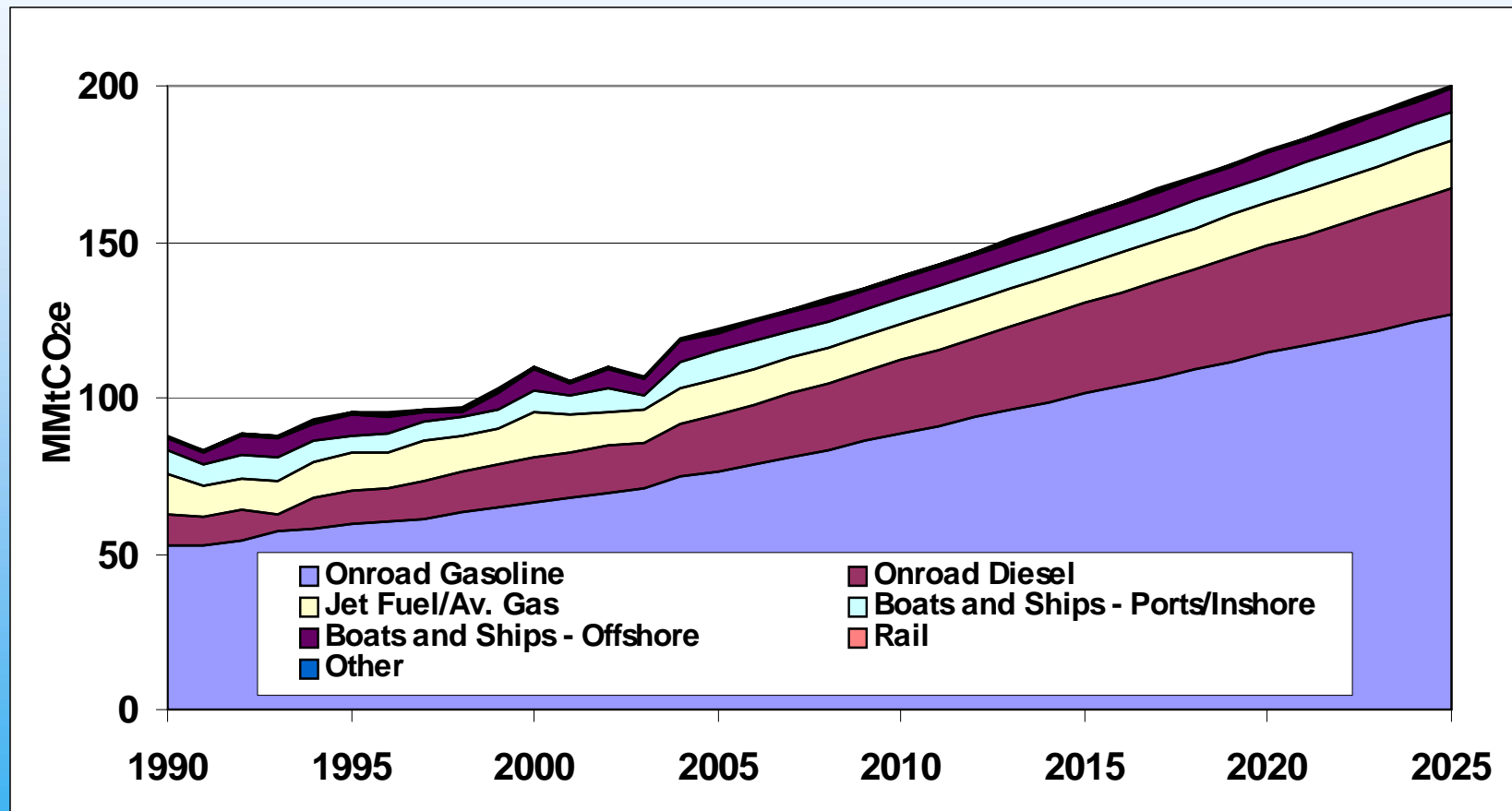
Fossil Fuel Industry

- Data Sources
 - Historic Oil (1990-2005)
 - Production – FL DEP data
 - Transport – EIIP default assumption (volume produced = volume transported)
 - Forecast (2006-2025)
 - Growth rates based on state historical emissions trends and regional *Annual Energy Outlook 2007* projections
- Methods
 - Based on EPA State Greenhouse Gas Inventory Tool (SIT)
 - Activity multiplied by emission factors

Fossil Fuel Industry

- Key Assumptions
 - For natural gas gathering/transmission/distribution pipelines—surrogates trend with emissions activity
 - Growth rates are process-specific, vary by activity
 - Used state historical trend unless Annual Energy Outlook regional forecast was in-line with historical state trend
- Key Uncertainties
 - Current levels of fugitive emissions
 - Based on industry-wide averages
 - Data limitations associated with early years of OPS pipeline data
 - Projections of future production of fossil fuels

Transportation



Transportation

- Data Sources: Onroad Vehicles
 - US DOE Energy Information Administration (EIA) State Energy Data (SED) fuel consumption for 1990-2005
 - State-level vehicle miles traveled (VMT) from Florida Dept. of Transportation (DOT) for 1990-2005
 - VMT allocated to vehicle type using Federal Highway Administration (FHWA) data on vehicle mix
 - Florida DOT VMT projection; based on linear projection of 2001-2005 historical VMT data

Transportation

- Data Sources: Other Transportation Sectors
 - Aircraft – EIA SED fuel consumption
 - Aircraft Projection –FL DOT aircraft operation projections for commercial and general aviation and Federal Aviation Administration (FAA) aircraft operations forecasts military aviation
 - Rail and Marine Gasoline – Federal Highway Administration’s (FHWA) *Highway Statistics* and EIA’s Petroleum Navigator
 - Commercial Marine – EIA national fuel consumption and freight tonnage from Waterborne Commerce Statistics Center
 - Rail/Marine Projection – based on historical growth

Transportation

- Methods
 - Inventory (1990-2005)
 - CO₂
 - State Greenhouse Gas Inventory Tool (SIT) and Fuel Consumption
 - Onroad CH₄ and N₂O
 - SIT and VMT
 - Nonroad CH₄ and N₂O
 - SIT and Fuel Consumption

Transportation

- Methods for Projections (2006-2025)
 - Onroad Gasoline and Diesel CO₂
 - VMT forecasts from FL DOT
 - VMT forecasts adjusted to account for projected fuel efficiency improvements from MOBILE6 and differences in fuel growth rates based on data from 2007 EIA Annual Energy Outlook
 - Onroad CH₄ and N₂O
 - VMT projections, as above
 - VMT allocated to vehicle type using 2007 EIA Annual Energy Outlook data
 - Aviation
 - FL DOT and FAA aircraft operations projections
 - Commercial and military operations applied to jet fuel, general aviation applied to aviation gasoline
 - Jet fuel projections adjusted to account for projected fuel efficiency improvements using 2007 EIA Annual Energy Outlook data
 - Marine/rail
 - Historical growth rates used for marine vessels
 - No growth assumed for rail

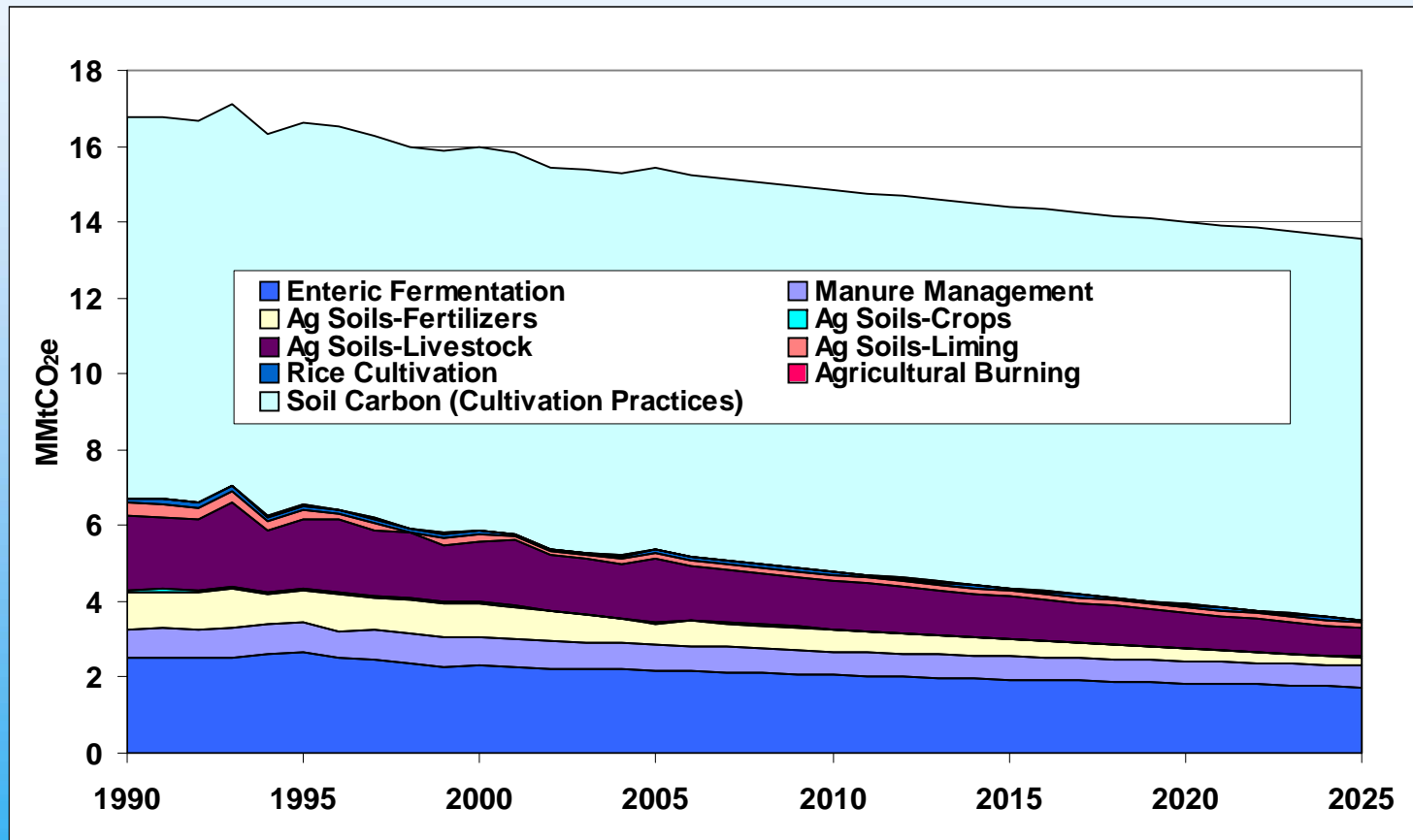
Transportation

Key Uncertainties

– Future vehicle mix –

- Based on national fleet turnover assumptions
- FL DEP awaiting Florida-specific registration data to improve inventory and forecast
 - CA LEV reductions will be revised to incorporate Florida-specific registration data

Agriculture



Agriculture

- Data Sources

- Crop Production: U.S. Department of Agriculture (USDA) National Agriculture Statistical Service (NASS)
- Livestock: USDA/NASS
- Fertilizer: FL Department of Agriculture and Consumer Services for 1998-2005; default SIT data from Fertilizer Institute for 1990-1997
- Soil Carbon from Cultivation Practices: 1997 USDA estimates

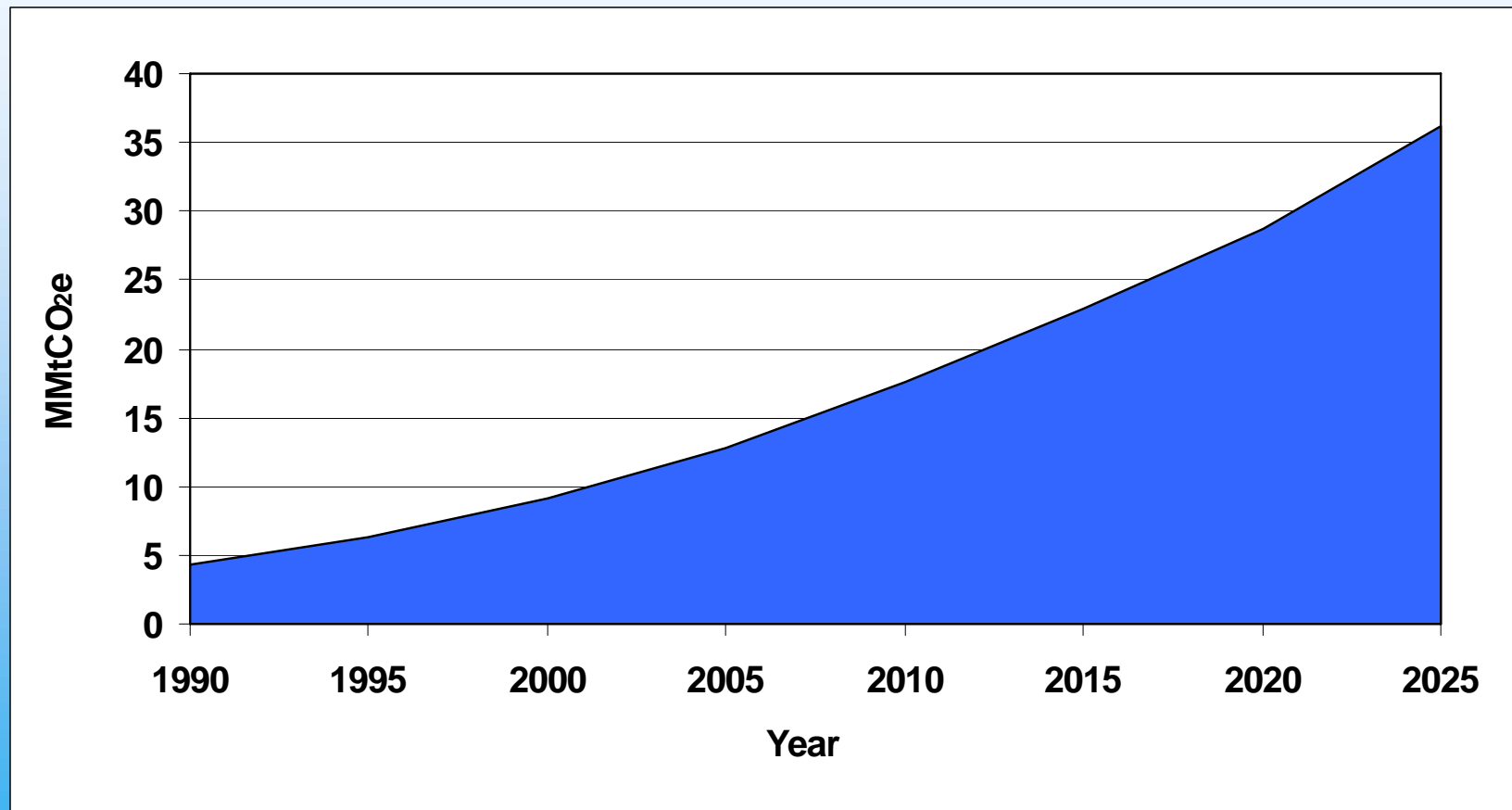
- Methods

- Crops: SIT emission factors and crop production data
- Livestock: SIT emission factors and livestock populations
- Fertilizer: SIT and FL fertilizer consumption
- Dairy cattle population projections based on Food and Agricultural Policy Research Institute (FAPRI) report
- Swine and Broiler populations held constant at 2005 levels
- All other livestock projections estimated based on linear forecasts of 1990-2005 populations
- Projections for other categories based on historical growth trends

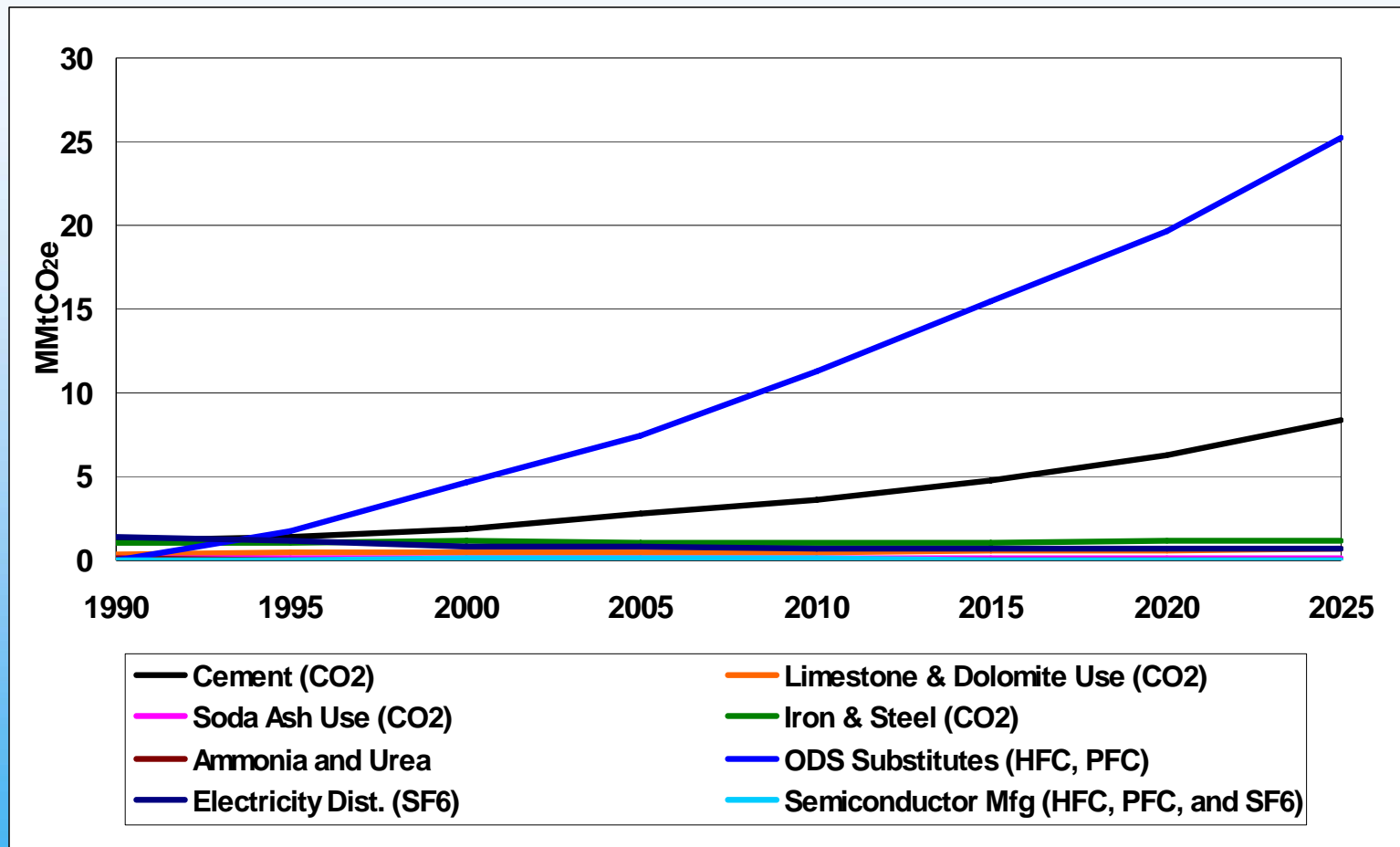
Agriculture

- Key Assumptions
 - Future growth for agricultural soils will follow historical trends
 - Livestock population growth will follow historical trends
- Key Uncertainties
 - Soil carbon from cultivation practices based on one year of data (1997)
 - Manure management emission factors derived from limited data sets
 - Livestock numbers based on point estimates for each year to represent populations that fluctuate throughout the year
 - Projection assumptions

Industrial Process



Industrial Process



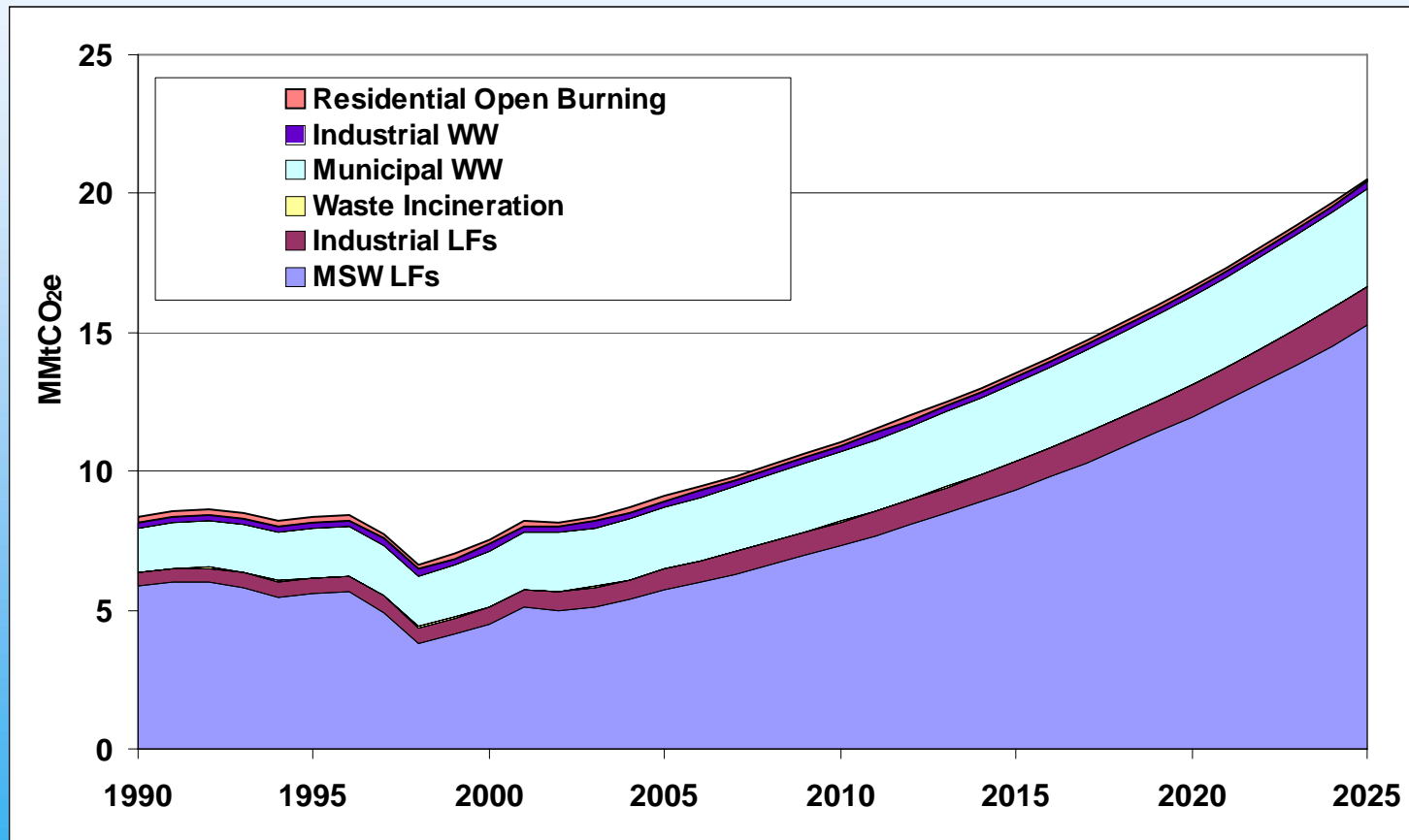
Industrial Process

- Data Sources
 - Historic
 - US EPA National GHG Inventory
 - Substitutes ozone-depleting substances (ODSs), electricity transmission and distribution systems, semiconductor manufacture
 - USGS
 - Cement and clinker production, limestone and dolomite consumption, national soda ash consumption, ammonia production, urea consumption
 - Annual Statistics Report of American Iron and Steel Institute
 - Iron and steel production data
 - Forecast (annual growth rates from 2005 to 2025)
 - Historic trends
 - Cement manufacture, soda ash consumption, ammonia production, urea consumption,
 - FL employment projections
 - Limestone/dolomite use, iron and steel production
 - US EPA national emissions projections
 - ODS substitutes, electric distribution, semiconductor manufacture

Industrial Process

- **Methods**
 - Based on EPA SIT
- **Key Uncertainties**
 - Actual production data for estimating historical emissions (instead of EPA default data)
 - Growth rates used to forecast emissions
 - Many processes based on historic trends
 - EPA forecast for large increase in use of HFCs/PFCs in cooling applications
 - Industry activities to reduce GHG emissions

Waste Management



Waste Management

- Data Sources
 - SIT default used (population-based)
 - Medical waste quantities incinerated from FL DEP
 - Open burning at rural county residential sites based on EPA's 2002 National Emissions Inventory estimate
 - SIT emissions factors and waste composition used
- Methods
 - SIT with data sources above
 - Default SIT emissions control assumptions for landfills
 - Growth based on historical emissions

Waste Management

- Key Assumptions
 - Growth Rates
 - Landfills – based on historic emissions growth (2000-2005)
 - Industrial solid waste emissions – based on SIT default assumption of 7% of municipal solid waste (MSW) emissions
 - Waste incineration growth rate based on historic data (1995-2005)
 - Industrial and Municipal wastewater – based on historic emissions growth (1990-2005)
- Key Uncertainties
 - Landfill activity based on population—landfill emplacement rates would be preferable
 - Mix of controls at landfills
 - Industrial landfills – SIT default of 7% of municipal landfills

Forestry and Land Use Emissions (MMtCO₂e)

FL Forest Pool	1987-1995 Flux (MMtCO₂e)	1995-2005 Flux (MMtCO₂e)
Live Tree	3.40	-18.51
Understory	0.26	-0.05
Standing Dead	0.10	-0.03
Down Dead	0.13	-1.38
Forest Floor	0.96	-0.80
Soil Carbon	30.57	-0.92
Harvested Wood Products	-3.89	-3.89
Totals	31.53	-25.42
Totals (excluding soil carbon)	0.96	-24.50

Forestry and Land Use Emissions (MMtCO₂e)

	1990	2000	2005	2010	2020	2025
Forested Landscape – Sink (excluding soil carbon)	-0.96	-24.50	-24.50	-24.50	-24.50	-24.50
Urban Forestry and Land Use - Sink	-14.45	-5.65	-6.23	-6.23	-6.23	-6.23
Forest Fires - Source	1.35	1.15	0.16	0.16	0.16	0.16
Sector Total	-12.14	-29.00	-30.57	-30.57	-30.57	-30.57

Note: Urban Forestry and Land Use category consists of carbon storage in urban trees, N₂O from settlement soils, and carbon storage in landfilled yard trimmings and food scraps.

Forestry

- Data Sources
 - US Forest Service (USFS) Forest Inventory and Analysis (FIA) data for Florida for 1987, 1995, and 2005
 - USFS also provides modeled estimates for harvested wood products
 - EPA SIT default data for urban forestry and land use
 - Florida Department of Agriculture & Consumer Services acres burned 1990-2005
- Methods
 - Forested Landscape: USFS Carbon Calculations Tool (CCT) to estimate carbon stocks and fluxes for 1990-2005
 - Carbon pool data for the 1987-1995 and 1995-2005 time periods were used to quantify carbon fluxes in Florida
 - Urban Forestry and Land Use, Forest fires: EPA SIT
 - Future projections were assumed to remain at 2005 levels

Forestry

- Key Assumptions
 - 1990-2005 carbon stock change representative of current and historical conditions
 - No significant change in sequestration from 2006-2025
- Key Uncertainties
 - Effects of future development on forested acreage
 - Effects of near-term climate change on forest sequestration levels
 - Methodological differences in USFS FIA surveys
 - Urban forestry and land use emissions rely on national default data instead of state-specific data

Break



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

Review and Approval of Priorities for Analysis: Overview

- Six TWGs have met by teleconference
- Reviewed the Action Team's approved catalog
- Rated policy options for GHG reduction potential and cost
- Selected proposed priority policy options for consideration by the Action Team

Energy Supply

Proposed Tier 1 Option No.	Proposed Option Name
ES-1	Technology Research & Development with Near-term Commercial Opportunities
ES-2	Technology Research & Development with Longer-term Commercial Opportunities
ES-3	Renewable Energy Incentives and Barrier Removal
ES-4	Electricity Transmission and Distribution Improvements
ES-5	Renewable and/or Environmental Portfolio Standard
ES-6	Promotion of Safe & Environmentally Sound Nuclear Power
ES-7	Integrated resource planning
ES-8	Promotion of Combined Heat and Power Systems
ES-9	Power Plant Efficiency Improvements and Repowering
ES-10	Grace Period for Replacement of Carbon-Intensive Units

Energy Demand

Proposed Tier 1 Option No.	Proposed Option Name
ED-1	Demand-Side Management/Energy Efficiency Programs, Funds, or Goals for Electricity
ED-2	Promotion and Incentives for Improved Design and Construction (e.g., LEED and “beyond LEED” green buildings) in the Private Sector
ED-3	Improved Building Codes for Energy Efficiency
ED-4	Training and Education for Builders and Contractors
ED-5	More Stringent Appliance/Equipment Efficiency Standards
ED-6	Consumer Education Programs
ED-7	Incentives to Promote Implementation of Renewable Energy Systems
ED-8	Energy Efficiency Financing & Alternative Business Models
ED-9	Rate structures and Technologies to Promote Reduced GHG Emissions
ED-10	Demand-Side Management/Energy Efficiency Programs, Funds, or Goals for Natural Gas, Propane, and Fuel Oil

Transportation and Land Use

Proposed Tier 1 Option #	Proposed Option Name
TLU-1	Develop and Expand Low-GHG and Alternative Fuels
TLU-2	Increased Fuel Economy and GHG Emissions Standards for New Vehicles
TLU-3	Smart Growth Planning
TLU-4	Improving Transportation System Management
TLU-5	Increasing Choices in Modes of Transportation
TLU-6	Factoring GHG Emissions into Transportation and Land Use Planning Processes

Agriculture, Forestry, and Waste

Proposed Tier 1 Option #	Proposed Option Name
AFW-1	Forest Retention— Reduced Conversion of Forested to Non-forested Land Uses
AFW-2	Afforestation and/or Restoration of Non-forested Lands
AFW-3	Forest Management for Carbon Sequestration
AFW-4	Land Use Management that Promotes Conversion from Annual Crops to Perennial Cover
AFW-5	Expanded Use of Forestry, Agriculture, and Waste Management Biomass Feedstocks for Electricity, Heat and Steam Production
AFW-6	Soil Carbon Management
AFW-7	Reduce the Rate of Agricultural Land and Open Space Conversion to Development
AFW-8	In-state Liquid/Gaseous Biofuels Production
AFW-9	Promotion of Bioreactor Technology (Advanced Municipal Solid Waste Management Practices)

Between Now and the Next Action Team Meeting. . .

- For each policy approved by the Action Team:
 - Draft straw language for policy option description;
 - Draft straw language for policy option design;
 - Refine and recommend policy option descriptions;
 - Refine and recommend policy option designs.
- Receive first modeling results for cap and trade program design
- Identify adaptation response priorities
- Review TWG-specific Inventory and Forecast data, methods, assumptions, with suggested revisions

Tomorrow's Agenda

Meeting Agenda for Friday, May 30, 2008:

8:30 Welcome and Introductions

8:45 ▪ Consideration of Government Policy Options

10:15 ▪ Briefing on Adaptation Framework, Catalog

11:45 Lunch Break

12:30 ▪ Consideration of Cap and Trade Options

2:00 Agenda, Time, and Date for Next Meeting

2:20 Public Input and Announcements

2:30 Adjourn

Public Input, Announcements

Adjourn, May 29, 2008.



Governor's Action Team on Energy and Climate Change
State of Florida

Governor's Action Team on Energy and
Climate Change
Phase II Process

Meeting #3, May 29-30, 2008

day two

Today's Agenda

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10:15 ▪ Briefing on Adaptation Framework, Catalog

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Government Policy and Coordination

Proposed Tier 1 Option #	Proposed Option Name
GP-1	GHG emissions targets, reporting and accountability measures
GP-2	Public awareness and education
GP-3	Inter-government and inter-sector planning coordination and assistance
GP-4	“Green” business development policies

Adaptation

- Catalogue Framework
 - Major topics on adaptation
- Policy Framing Template
 - How each topic could be analyzed
- Catalogue of Adaptation Actions
 - List of potential adaptation options
- Criteria for Examining Adaptation Options
 - Criteria that could be used to facilitate discussion

Cap and Trade

Proposed Tier 1 Option #	Proposed Option Name
C&T-1	Cap-and-Trade
C&T-4	Carbon Offset Program
C&T-5	National Program Measures
C&T-3	Market Advisory Group
C&T-2	Carbon Tax*

* Carbon Tax conditioned as follows: The TWG wishes to retain this policy not as a stand-alone proposal but as an optional complementary measure in the event the TWG determines that some economic sectors are not suitable for inclusion in the cap-and-trade program, but could be candidates for application of a carbon tax. Any consideration of a carbon tax would also be conditioned on revenue neutrality as a policy design requirement.

Next Steps for Action Team and TWGs

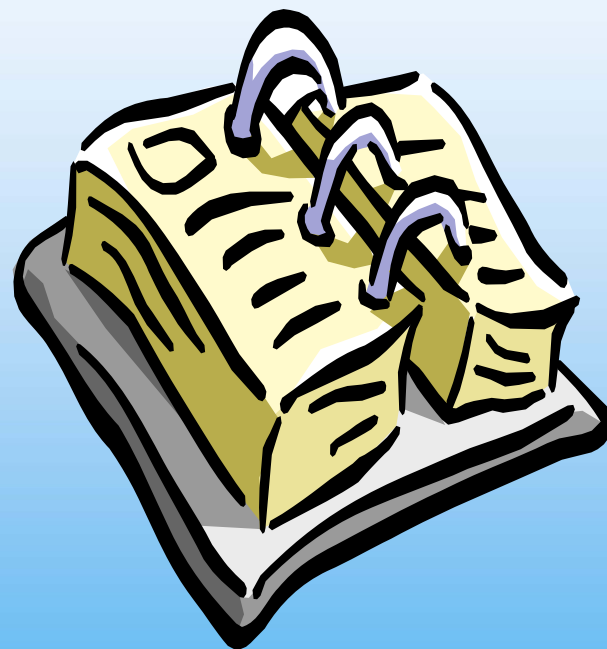
- Quantification Memo
- 2 or more TWG meetings/calls in June
- Draft and propose straw policy option descriptions and designs
- Continue Cap and Trade design and analysis
- Continue adaptation framing, priority development
- Review GHG Inventory and Forecast for Florida

Revised Timing – Action Team Meetings

Date	Location	Action
February 1, 2008	Tallahassee	1 st Action Team meeting
March 17, 2008	Tallahassee	2 nd Action Team meeting
May 29-30, 2008	Tallahassee	3rd Action Team meeting
July 9-10, 2008	Tallahassee	4 th Action Team meeting
August 6-7, 2008	Orlando	5 th Action Team meeting
August 22, 2008	St. Petersburg	6 th Action Team meeting
September 17-18, 2008	Tallahassee	7 th Action Team Meeting
September 26, 2008	Tallahassee	8 th Action Team Meeting
October 1, 2008		Phase II Final Report due
Between Action Team Meetings		TWG conference calls and meetings

Next Action Team Meeting

- Agenda:
 - Review and Approve Straw Proposed Policy Descriptions and Policy Designs from TWGs
 - Review and Approve TWG suggested updates to the FL GHG Emissions Inventory and Forecast
 - Prepare for quantification of options
- July 9-10, 2008, Tallahassee



Public Comments

May 29-30, 2008

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