

Climate Change Advisory Committee

July 13, 2009

Agenda

- Welcome and Introductions
- Presentation of Microeconomic (Work Plan) Analyses
 - Randy Strait, CCS
- Presentation of Macroeconomic Analyses to be Conducted
 - Dr. Adam Rose, USC
- Discussion of Committee Voting at July 17th Meeting
 - Joe Sherrick, DEP
- Public Comment
- Adjourn

Microeconomic Analysis

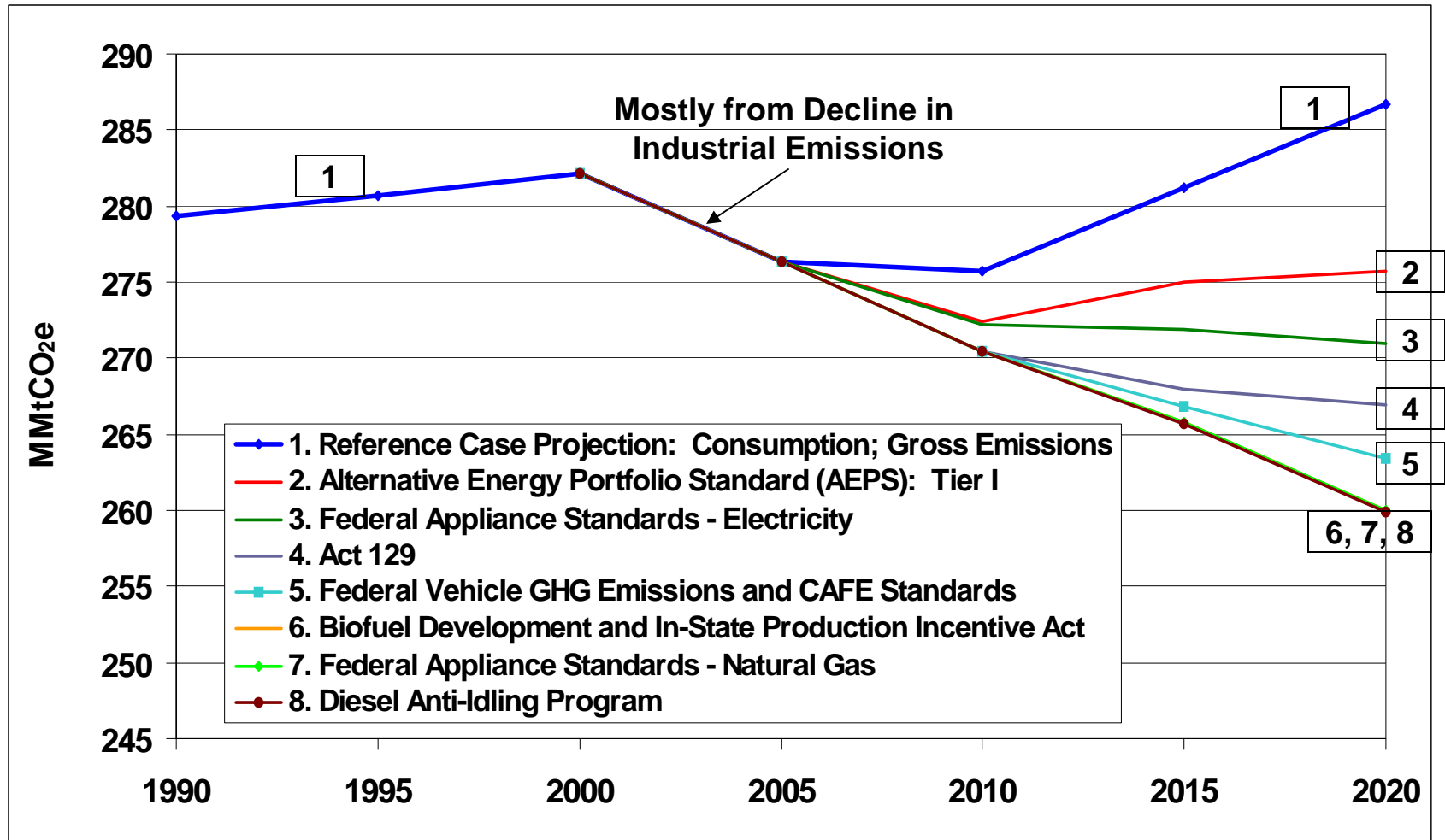
- Randy Strait, Center for Climate Strategies
 - Revised Draft Cumulative GHG Impacts Associated with Work Plans by Sector (Slide 4)
 - Recent State and Federal Actions (Slide 5)
 - Revised Draft GHG Emission Reductions Associated with Recent Actions and Work Plans on Consumption vs. Production and Gross vs. Net Emissions Basis (Slides 6 – 11)
 - Revisions to Overlap Analysis (Slides 12 – 14)
 - Graphs of Revised Draft Results for Work Plan (Bar Charts and Stepwise Marginal Cost Curves) (Slides 15-18)

PA CCAC Work Plans – Draft Results

Sector	Annual Results (2020)			Cumulative Results (2009-2020)		
	GHG Reductions (MMtCO ₂ e)	Costs (Million \$)	Cost-Effective ness (\$/tCO ₂ e)	GHG Reductions (MMtCO ₂ e)	Costs (NPV, Million \$)	Cost-Effective ness (\$/tCO ₂ e)
Res / Comm	<u>42</u>	<u>-\$482</u>	-\$11	<u>281</u>	<u>-\$3,404</u>	<u>-\$12</u>
Electricity GT&D	32	\$1,080	\$33	131	\$1,862	\$14
Industry	5.8	-\$365	-\$62	33	-\$1,072	-\$33
Waste	5.9	-\$83	-\$14	37	-\$504	-\$14
Land Use & Transportation	<u>6.6</u>	<u>-\$494</u>	<u>-\$75</u>	<u>60</u>	<u>\$2,805</u>	<u>\$47</u>
Agriculture	1.4	-\$62	-\$44	10	-\$380	-\$37
Forestry	<u>11.3</u>	<u>-\$1,376</u>	<u>-\$121</u>	<u>98</u>	<u>-\$10,177</u>	<u>-\$104</u>
Total	<u>106</u>	<u>-\$1,782</u>	<u>-\$294</u>	<u>649</u>	<u>-\$10,869</u>	<u>-\$17</u>

Note: Underlined values identify numbers that have been revised since the June 29 CCAC meeting.

GHG Reductions Associated with Recent State and Federal Actions



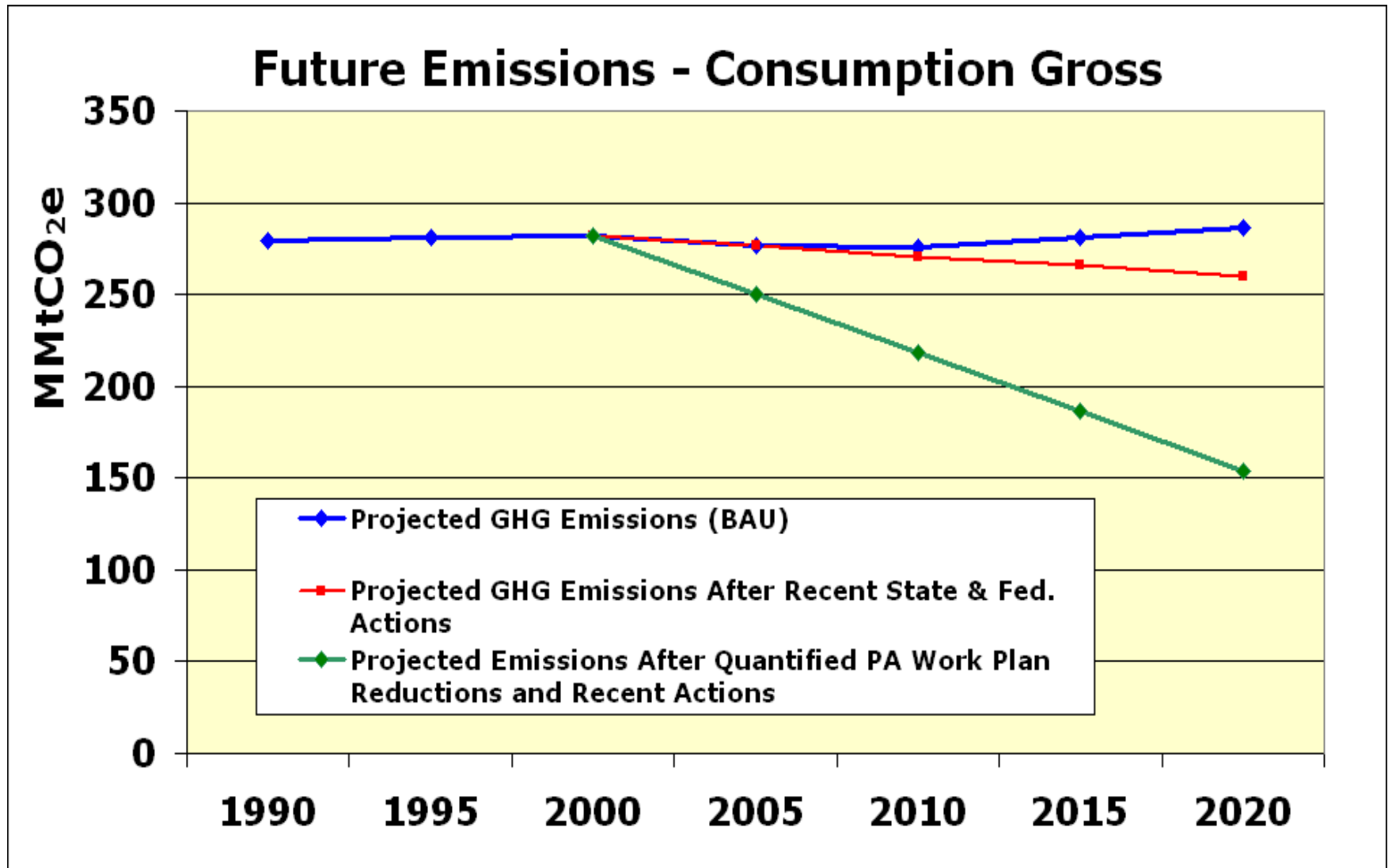
PA CCAC Work Plans – Draft Results

Consumption Basis - Gross Emissions	1990	2000	2005	2010	2015	2020
Projected GHG Emissions (BAU)	279.4	282.1	276.4	275.8	281.2	286.7
Reductions from Recent State & Fed. Actions			0.0	5.4	15.6	27.1
Projected GHG Emissions After Recent State & Fed. Actions			276.4	270.4	265.7	259.6
Total GHG Reductions from PA Work Plans						105.7
Percent Below 2000 Levels						37%
Projected Emissions After Quantified PA Work Plan Reductions and Recent Actions						154.0
Production Basis - Gross Emissions	1990	2000	2005	2010	2015	2020
Projected GHG Emissions (BAU)	308.7	314.7	310.5	308.7	316.5	324.3
Reductions from Recent State & Fed. Actions			0.0	5.4	15.6	27.1
Projected GHG Emissions After Recent State & Fed. Actions			310.5	303.3	300.9	297.3
Total GHG Reductions from PA Work Plans						105.7
Percent Below 2000 Levels						34%
Projected Emissions After Quantified PA Work Plan Reductions and Recent Actions						191.6

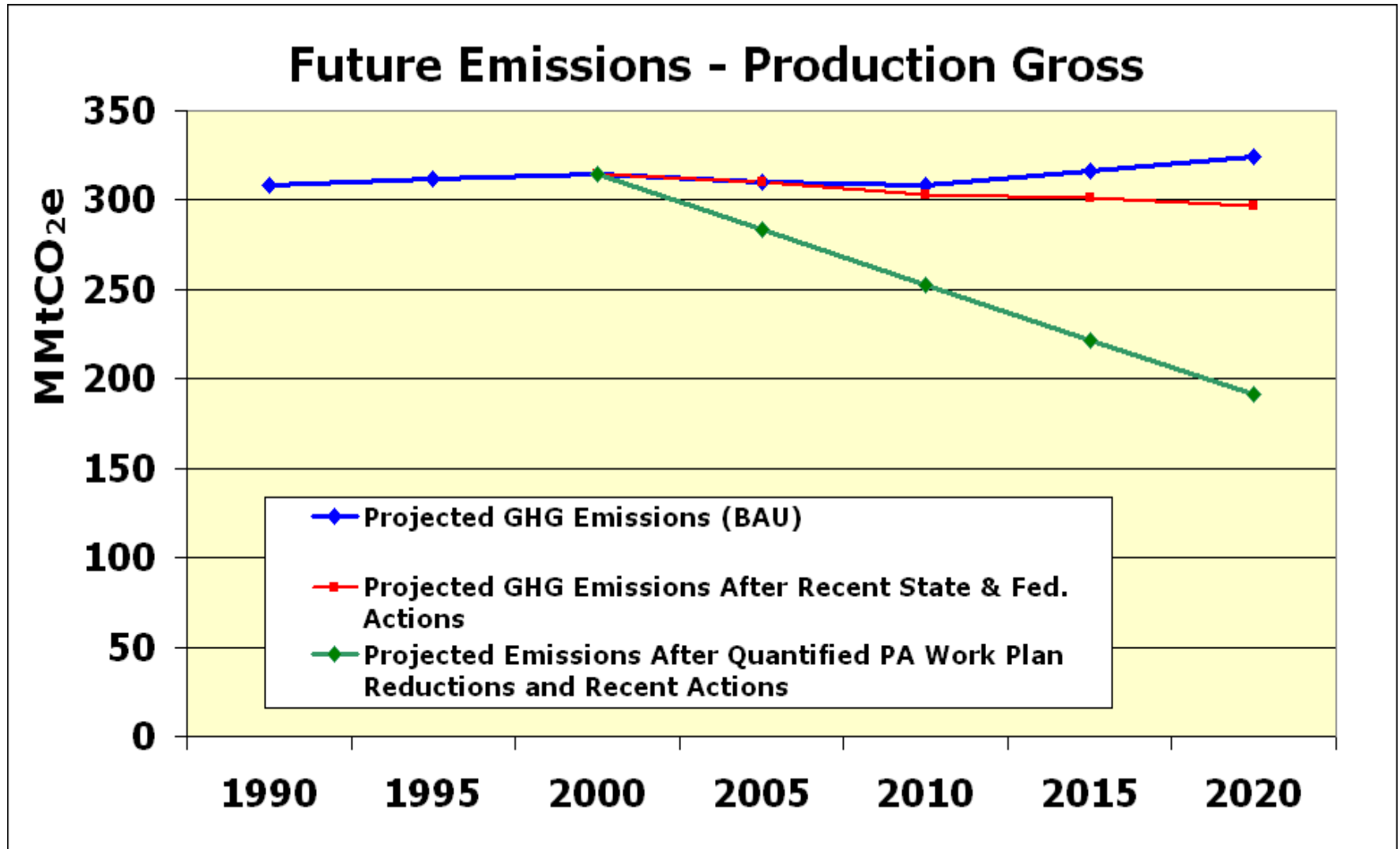
PA CCAC Work Plans – Draft Results

Consumption Basis - Net Emissions	1990	2000	2005	2010	2015	2020
Projected GHG Emissions (BAU)	249.5	260.9	255.5	255.3	261.2	267.1
Reductions from Recent State & Fed. Actions			0.0	5.4	15.6	27.1
Projected GHG Emissions After Recent State & Fed. Actions			255.5	250.0	245.7	240.0
Total GHG Reductions from PA Work Plans						105.7
Percent Below 2000 Levels						41%
Projected Emissions After Quantified PA Work Plan Reductions and Recent Actions						134.4
Production Basis - Net Emissions	1990	2000	2005	2010	2015	2020
Projected GHG Emissions (BAU)	278.8	293.4	289.6	288.3	296.5	304.8
Reductions from Recent State & Fed. Actions			0.0	5.4	15.6	27.1
Projected GHG Emissions After Recent State & Fed. Actions			289.6	282.9	280.9	277.7
Total GHG Reductions from PA Work Plans						105.7
Percent Below 2000 Levels						36%
Projected Emissions After Quantified PA Work Plan Reductions and Recent Actions						172.0

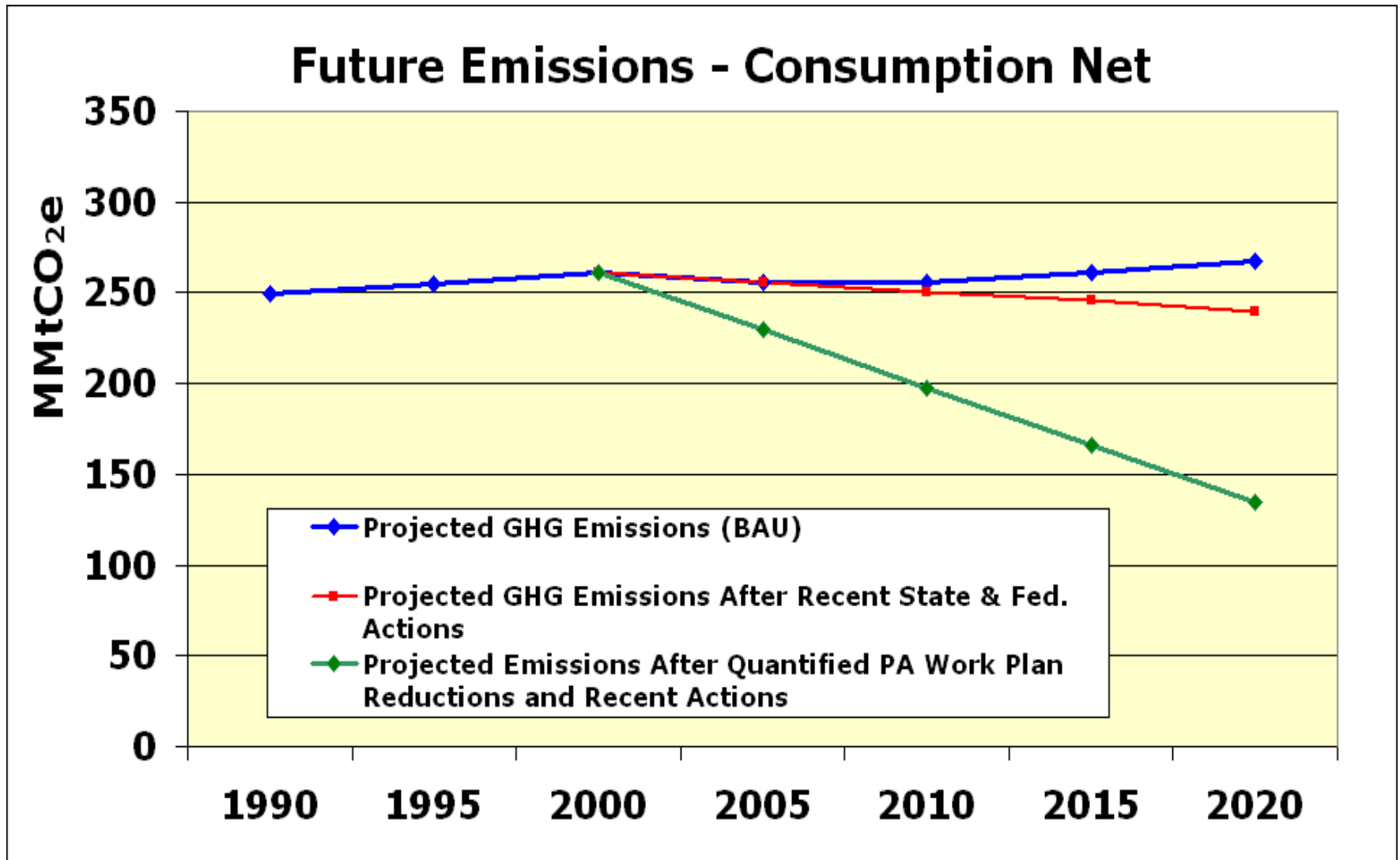
PA CCAC Work Plans – Draft Results



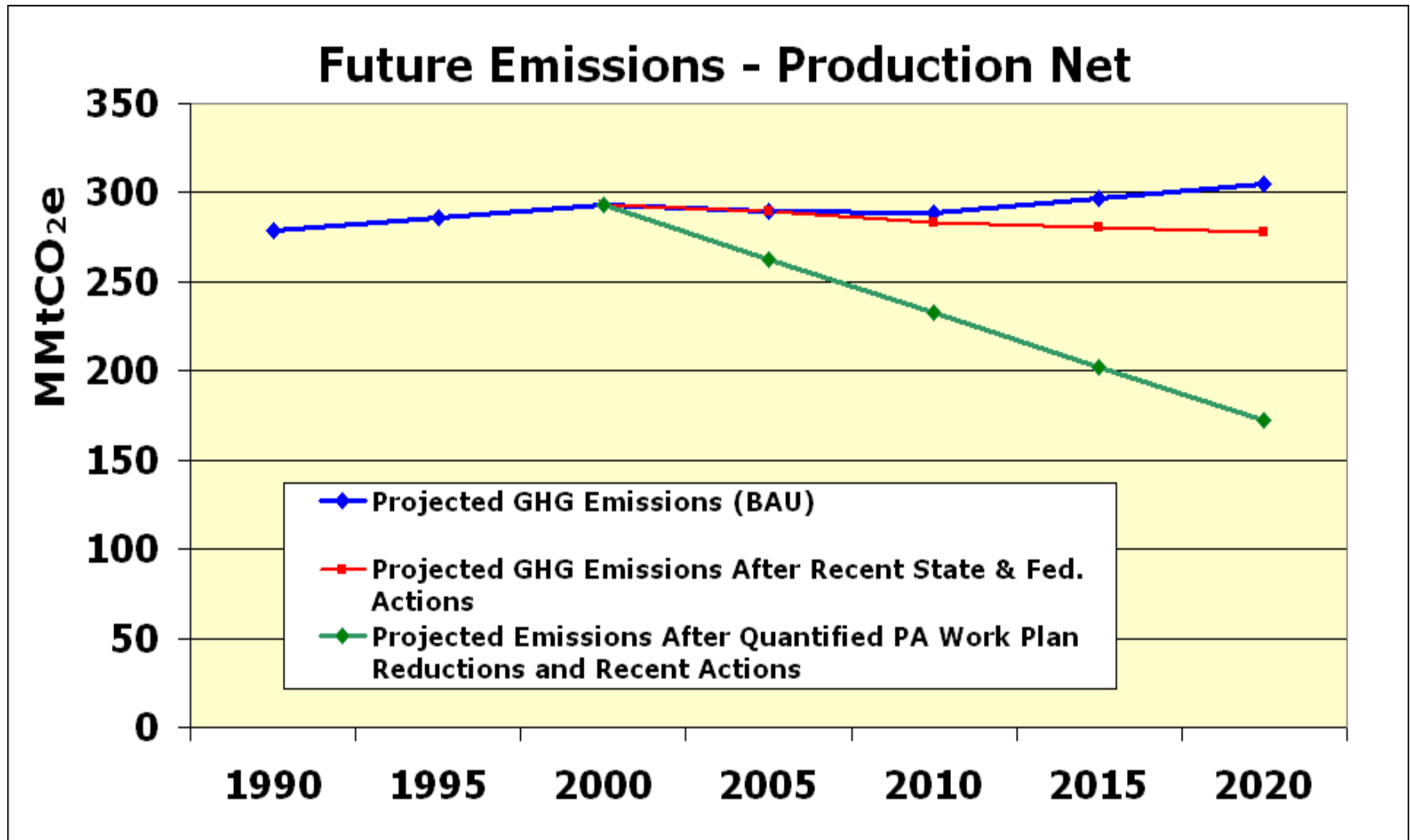
PA CCAC Work Plans – Draft Results



PA CCAC Work Plans – Draft Results



PA CCAC Work Plans – Draft Results



Overlaps Between Work Plans

Policy Option	Policy Option	Overlap Adjustment To:	Notes
Ag-2 Leading a Transition to Next Generation Biofuels	Residential-11 Conservation and Fuel switching for Heating Oil	Ag-2	All GHG savings accounted for in R11
Ag-2 Leading a Transition to Next Generation Biofuels	Transportation-2 Biofuel Development and In-State Production Incentive Act	Ag-2	All GHG savings accounted for in T2
Ag-2 Leading a Transition to Next Generation Biofuels	Forestry-8 Wood to Cellulosic Ethanol and Electricity	Ag-2	All costs quantified in Ag-2 and all GHG savings accounted for in T2 and R11
Ag-5 Manure Digester Implementation Support	Waste-5 Waste-to-Energy Digesters	Waste-5	There is sufficient manure feedstock for both workplans so no overlap was calculated
Waste-2 Statewide Recycling Initiative	Waste-1 Landfill Methane Displacement of Fossil Fuels	Waste-1	Integrated analysis performed to account for overlaps in Waste-1, Waste-2, and Waste-6. Result is 0.01 MMtCO ₂ e less GHG savings in sector. Overlap subtracted from sector total.
Waste-1 Landfill Methane Displacement of Fossil Fuels	Waste-6 Waste-to-Energy MSW	Waste-1	See above.
Waste-3 Reduced Transportation of Waste - Solid Waste Management Initiative	Waste-5 Waste-to-Energy Digesters and Waste-6 Waste-to-Energy MSW	Waste-5 and Waste-6	GHG savings for reduced transportation of waste were not specifically calculated so there is no overlap
Forestry-9 Biomass Thermal Energy Initiatives	Electricity-9 Combined Heat and Power	None	The CHP units deployed under Electricity 9 are assumed to operate on natural gas and thus there is no overlap with biomass as a fuel for Forestry-9 CHP

Overlaps Between Work Plans

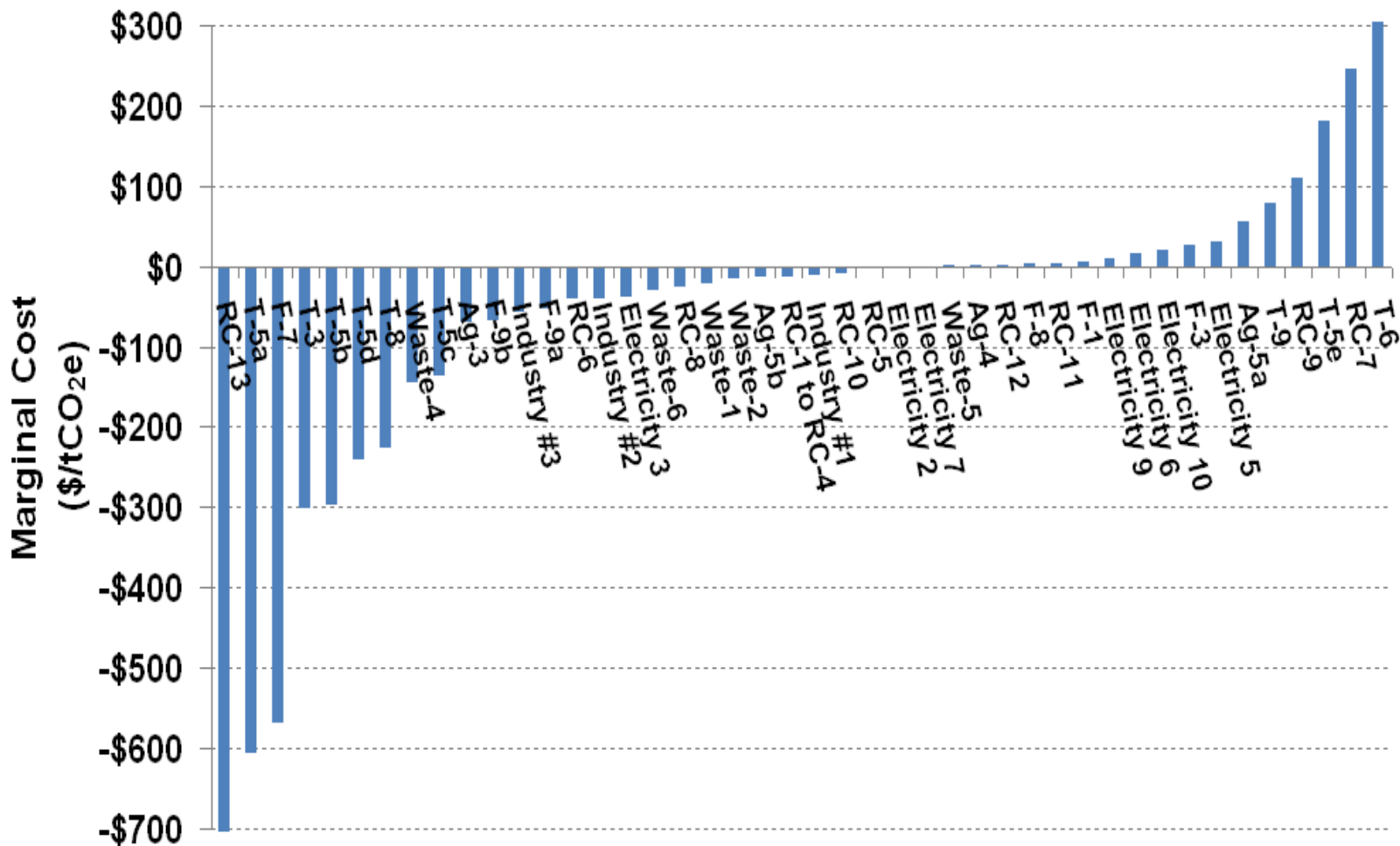
Policy Option	Policy Option	Overlap Adjustment To:	Notes
Electricity -3 Stabilized Load Growth	Electricity -2 Reduced Load growth.	Electricity -2,	Reductions from Electricity 2 are eliminated
Electricity -3 Stabilized Load Growth	Industry-2 Industrial Gas and Electricity	Electricity -3	2020 reductions of electric industrial energy efficiency are reduced by 350 GWh (10% of industrial electric efficiency reductions, 3% of total reductions under Electricity 3).
Electricity-8 RGGI	Electricity 3, Electricity-9 CHP, Electricity-6 Nuclear, Industry 2- Industrial gas and Electricity	Electricity-8 RGGI	Only "new" reductions from elements of the supply curve that are not part of an existing workplan will be included in this workplan.
Electricity -3 Stabilized Load Growth	<u>RC-12 Demand-Side Management - Electricity</u>	None	<u>None required - RC-12 GHG savings only account for impacts of education on behavior, not technology changes that are included in Electricity-3</u>
Electricity -3 Stabilized Load Growth	RC-3, RC-4: High Performance Commercial and High Performance Homes (Residential) (private) Buildings	Electricity-4	100% of residential and commercial reductions from Electricity 3 are eliminated due to overlaps
Electricity -3 Stabilized Load Growth	<u>RC-5 Commissioning and Retrocommissioning</u>	Electricity-3	All residential and commercial reductions in Electricity 3 were eliminated due to overlaps from RC-3 and RC-4. Commissioning reductions kept in RC-12.
Industry-2 Industrial Gas and Electricity	<u>RC-10 Demand Side Management - Natural Gas</u>	None	None required
Industry-2 Industrial Gas and Electricity	RC-10 Gas DSM	None	None required

Overlaps Between Work Plans

Policy Option	Policy Option	Overlap Adjustment To:	Notes
Electricity -3 Stabilized Load Growth	RC-1, RC-2: High Performance State and Local Government Buildings, Schools	None	None required
Electricity -3 Stabilized Load Growth	RC-6 <u>Re-Light Pennsylvania</u>	Electricity-3	All residential and commercial reductions in Electricity 3 were eliminated due to overlaps from RC-3 and RC-4. Lighting reductions kept in RC-6.
Electricity -3 Stabilized Load Growth	RC-7 <u>Re-Roof Pennsylvania</u>	Electricity-3	All residential and commercial reductions in Electricity 3 were eliminated due to overlaps from RC-3 and RC-4. Cool roof reductions kept in RC-7.
RC-8 <u>PA Buys EE Appliances</u>	Electricity-3 Stabilized Load Growth	Electricity-3	All residential and commercial reductions in Electricity 3 were eliminated due to overlaps from RC-3 and RC-4. Appliance reductions kept in RC-8.
RC-13 DSM water	Waste-4 and RC-13	RC-13	Account for less water requiring treatment; account for less energy required to treat a unit of water. Waste-4 focuses on improving efficiency - so quantification remains the same.
RC-1 to 4	RC-5 to 13	<u>RC-1 to RC-4</u>	<u>Report reductions from RC-1 to RC-4 as zero</u>
Forestry-9 Biomass Thermal Energy Initiatives	Electricity-9 Combined Heat and Power	None	The CHP units deployed under Electricity 9 are assumed to operate on natural gas and thus there is no overlap with biomass as a fuel for Forestry-9 CHP

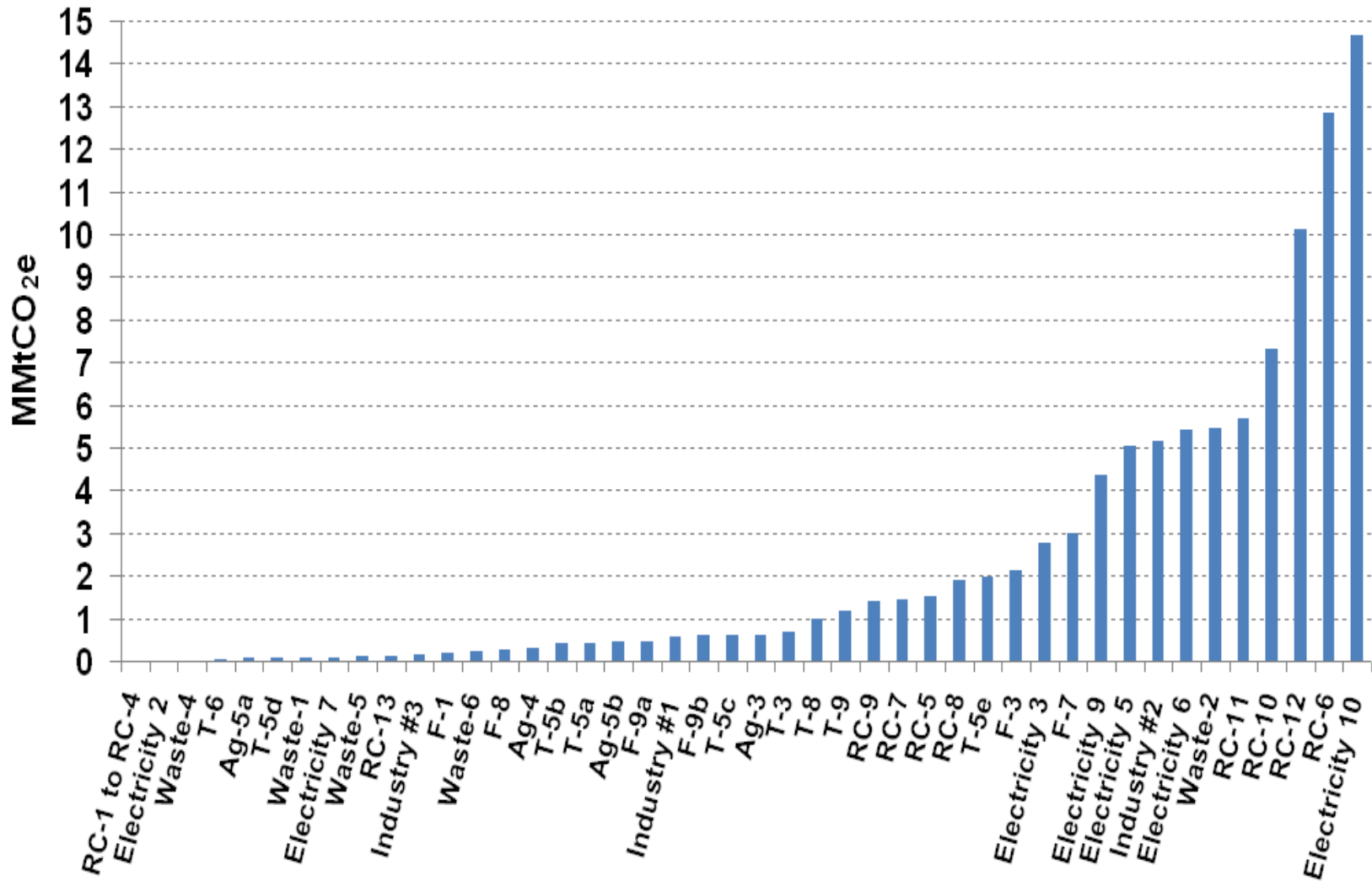
PA CCAC Work Plans – Draft Results

PA Work Plans Ranked by Cost / Cost Savings Per Ton
GHG Removed (2009-2020)

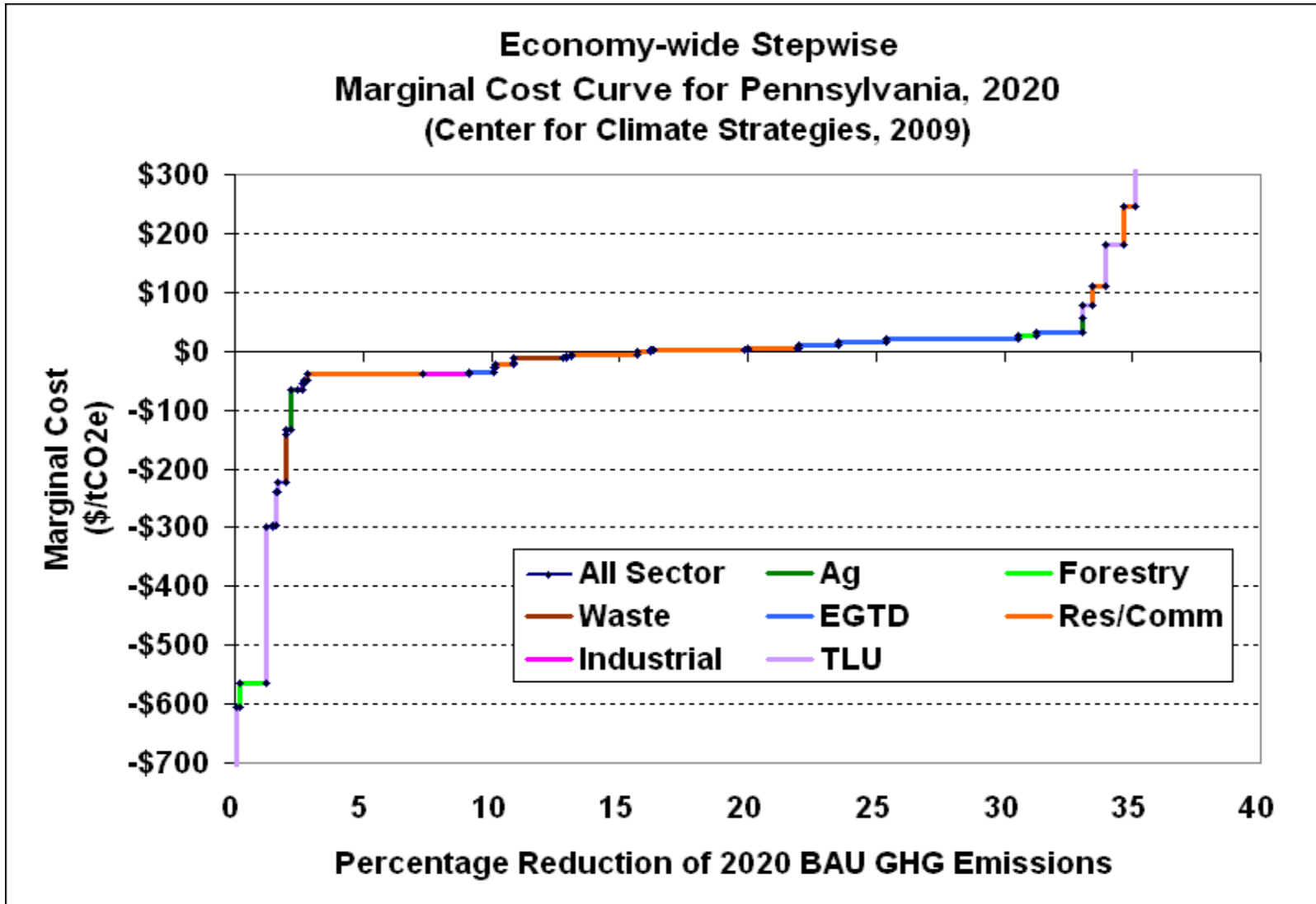


PA CCAC Work Plans – Draft Results

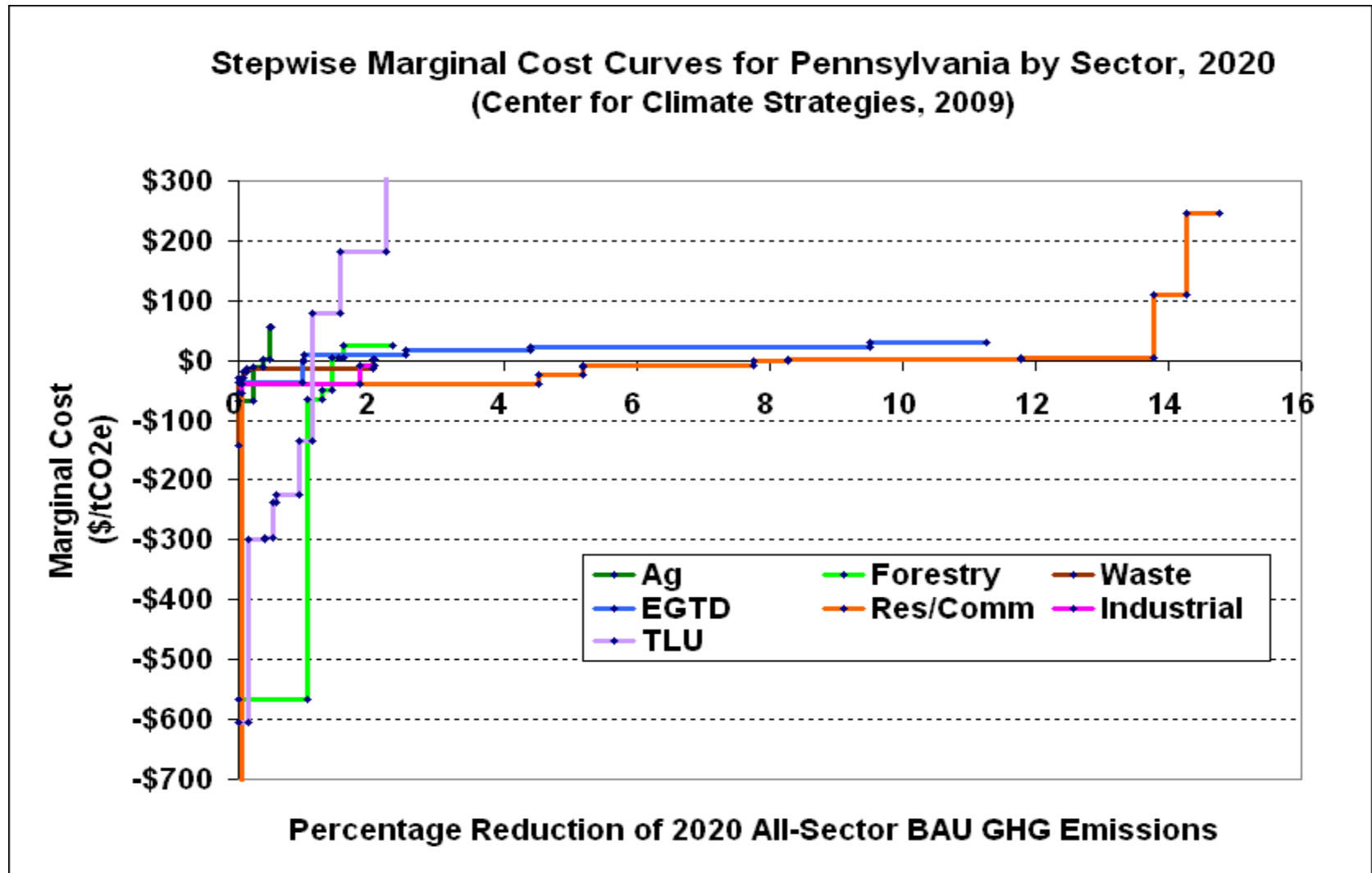
PA Work Plans Ranked by 2020 Annual GHG Reduction Potential



PA CCAC Work Plans – Draft Results



PA CCAC Work Plans – Draft Results



Macroeconomic Analysis

- Dr. Adam Rose, University of Southern California
 - Please refer to separate PowerPoint presentation

Voting Procedures for July 17

- Subcommittee by subcommittee, work plan by work plan
- Introduce each work plan
- Discussion
- DEP will record vote noting any specific comments attributable to each commentator
- Minority report option – CCAC responsibility
- Extend meeting until 5:00 PM?

Public Comment

ADJOURN