



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 #5, August 6-7, 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

Welcome from the Honorable
Richard Crotty,
Mayor of Orange County

Agenda

Meeting Agenda for Wednesday, August 6, 2008

- 10:00 Welcome and Introductions
- 10:05 Welcome from the Honorable Richard Crotty, Mayor of Orange County
- 10:10 Review and Approval of Action Team Meeting #4 Summary
- 10:15 Climate Change News – Federal, State
- 10:20
 - Review and Approval of Expanded Draft Policy Descriptions and Designs: Overview
- 10:30
 - Consideration of Adaptation Progress, Draft Policies and Goals
- 11:30 Public Comments on Adaptation
- 11:45
 - Consideration of Agriculture, Forestry, and Waste Management Expanded Policy Drafts and Initial Quantification
- 12:45 Public Comments on Agriculture, Forestry and Waste
- 1:00 Lunch Break

Agenda

Meeting Agenda for Wednesday, August 7, 2008 (continued):

- 2:00 ▪ Consideration of Government Policy Expanded Policy Drafts
- 3:00 Public Comment on Government Policy
- 4:00 ▪ Consideration of Cap and Trade Progress and Preliminary Modeling Results for Florida Joining the Western Climate Initiative
- 5:00 Public Comment on Cap and Trade
- 5:15 Public Input and Announcements
- 5:30 Adjourn

Agenda

Meeting Agenda for Thursday August 7, 2008

- 9:00 Welcome and Introductions
- 9:05 ▪ Consideration of Energy Supply and Demand Expanded Policy Drafts
- 11:00 Public Comment on Energy Supply and Demand
- 11:15 ▪ Consideration of Transportation and Land Use Expanded Policy Drafts
- 12:15 Public Comment on Transportation and Land Use
- 12:30 Agenda, Time, and Date for Next Meeting
- 12:35 General Public Input and Announcements
- 1:00 Adjourn

Review and Approve Action Team Meeting #4 Summary

Federal and State News, Updates

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 Straw Policy Descriptions and Designs: Overview

- Six TWGs have met by teleconference
- Reviewed the Action Team's approved priority policies and guidance for further development
- Drafted policy Implementation Mechanisms and Related Policies and Programs
- Started quantification of policy options

Adaptation

- ADP-1 Advancing Science Data and Analysis for Climate Change
- ADP-2 Comprehensive Planning
- ADP-3 Protection of Ecosystems and Biodiversity
- ADP-4 Water Resource Management
- ADP-5 Built Environment, Infrastructure, and Community Protection
- ADP-6 Transportation and Other Infrastructure
- ADP-7 Economic Development
- ADP-8 Insurance (Property and Casualty)
- ADP-9 Emergency Preparedness and Response (Extreme Events)
- ADP-10 Human Health Concerns
- ADP-11 Social Effects
- ADP-12 Organizing State Government for the Long Haul
- ADP-13 State Funding and Financing
- ADP-14 Coordinating with Other Regulatory and Standards Entities
- ADP-15 Public Education and Outreach

Public Comments

Agriculture, Forestry & Waste

- AFW-1 Forest Retention—Reduced Conversion of Forested to Non-forested Land Uses
- AFW-2 Afforestation and Restoration of Non-Forested Lands
- AFW-3 Forest Management for Carbon Sequestration
- AFW-4 Expanded Use of Agriculture, Forestry, and Waste Management Biomass Feedstocks for Electricity, Heat, and Steam Production
- AFW-5 Promotion of Farming Practices That Achieve GHG Benefits
- AFW-6 Reduce the Rate of Agricultural Land and Open Green Space Conversion to Development
- AFW-7 In-state Liquid/Gaseous Biofuels Production
- AFW-8 Promotion of Advanced Municipal Solid Waste Management Practices (Including Bioreactor Technology)

Agriculture, Forestry & Waste

- AFW-9 Improved Commercialization of Biomass to Energy Conversion and Bio-products Technologies
- AFW-10
 - A. Manure Digestion/Other Waste Energy Utilization
 - B. WWTP Biosolids Energy Production
 - C. Other Biomass Conversion Technologies
 - D. Bio-Products Technologies & Use
 - E. Programs to Support Local Farming/Buy Local

Public Comments

Lunch Break

Government Policy

- GP-1 Targets, Reporting, Funding and Accountability Measures
- GP-2 Public Awareness and Education
- GP-3 Inter-government Planning, Coordination, and Assistance
- GP-4 “Green” Business Development Policies
- GP-5 Introduce Core Competencies Into Professional Licensing Programs

Public Comments

Cap-and-Trade

- TWG had calls on July 18 and 29;
- Received briefing and discussion on carbon offset projects and allowance price mitigation measures;
- Agreed on purposes for the use of “allowance value”:
 - Promote energy efficiency investments
 - Mitigate impacts on ratepayers/consumers
 - Promote renewable or non-carbon technologies
 - Mitigate impacts on low-income or disadvantaged consumers or communities
 - Mitigate impacts of climate change, i.e., fund adaptation strategies
- Are prepared for the in-person meeting Friday;
- Received a briefing on the preliminary modeling results for Florida joining the Western Climate Initiative.
- Received ESD-10 Grace Period for Replacement of Carbon Intensive Units

Preliminary Cap-and-Trade Simulation of Florida Joining WCI

- Two simulations are performed:
 - Cap-and-trade among the 10 WCI Partners
 - Cap-and-trade with Florida joining WCI
- Please note these are the preliminary simulation results. They are subject to change after we obtain Florida-specific cost data and any updated data from WCI partners.

Assumptions

- Sector Coverage:
 - Electricity sector + residential/commercial fuel use + large stationary combustion sources + industrial process + fossil fuel extraction and processing + transportation fuels.
- Emission Reduction Target:
 - WCI Partners: 15% below the 2005 level in year 2020
 - Florida: Interpolation of the state's 2017 goal (to return to 2000 levels) and 2025 goal (to return to 1990 levels)
 - The above reduction targets are applied to the covered sectors
- Emission permits are assumed to be grandfathered
- Consumption-based gross emissions are used, i.e., forestry and agriculture soil sinks are excluded

Data Sources

- Emissions Inventory & Forecast for WCI Partners:
 - Williams and Roe. 2008. “Task 0 State-Provincial GHG Summaries Tech Memo 1-31-08.doc” and associated Excel workbooks (including data from Western State GHG plans and WRAP database), as updated by Partner feedback through 6-19-08.
- Emissions Inventory & Forecast for Florida:
 - Draft Florida Inventory and Forecast Analysis by CCS
- GHG Mitigation Options Data:
 - State Climate Change Action Plans

Simulation Results – Cap-and-Trade Among 10 WCI Partners

TABLE 1. EMISSION TRADING SIMULATION AMONG
WCI PARTNERS IN YEAR 2020^b

(million dollars or otherwise specified)

State	Before Trading	After Trading			Cost Saving	Permits Traded	Emission Reduction w/ Trading		Emission Reduction Goal
	Mitigation Cost	Mitigation Cost	Trading Cost	Net Cost		(million tCO ₂)	(million tCO ₂)	(percent from BAU)	(percent from BAU)
AZ	-416	396	-922	-526	110	-8.06	83.72	54.10	48.89
CA	-14,380	-17,321	2,280	-15,042	662	19.91	154.61	27.68	31.25
MT	-190	277	-798	-522	332	-6.97	16.13	48.13	27.33
NM	-279	988	-2,013	-1,026	747	-17.58	45.07	54.65	33.33
OR	1,232	104	794	898	334	6.94	17.83	22.74	31.59
UT	124	702	-685	17	107	-5.98	38.65	44.78	37.85
WA	2,905	-41	1,717	1,676	1,230	15.00	24.51	21.52	34.68
BC	-245	-25	-250	-275	30	-2.18	20.81	30.38	27.20
MB	-330	-174	-246	-420	90	-2.15	8.21	48.05	35.49
QC	-3,677	-3,818	123	-3,695	18	1.08	21.45	25.87	27.17
Total	-15,255	-18,914	0	-18,914	3,658	42.92 ^c	431.01	33.77	33.77

^a Permit Price = \$114.48/tonCO₂e.

^b Sector coverage: Electric sector (Consumption-based) + Residential/Commercial fuel use + Large stationary combustion sources + Industrial process + Fossil fuel production and processing + Transportation fuels. AFW (Agriculture, Forestry, and Waste Management) sector is excluded from the sector coverage.

^c Represents number of permits bought or sold.

Simulation Results – Cap-and-Trade with Florida Joining WCI

TABLE 2. EMISSION TRADING SIMULATION AMONG
WCI PARTNERS AND FLORIDA IN YEAR 2020^b

(million dollars or otherwise specified)

State	Before Trading	After Trading			Cost Saving	Permits Traded	Emission Reduction w/ Trading		Emission Reduction Goal
	Mitigation Cost	Mitigation Cost	Trading Cost	Net Cost		(million tCO ₂)	(million tCO ₂)	(percent from BAU)	(percent from BAU)
AZ	-416	855	-1,518	-662	246	-11.84	87.51	56.54	48.89
CA	-14,380	-16,819	2,021	-14,798	418	15.77	158.75	28.43	31.25
MT	-190	382	-1,004	-623	433	-7.84	17.00	50.71	27.33
NM	-279	1,277	-2,560	-1,282	1,004	-19.97	47.46	57.55	33.33
OR	1,232	227	758	986	246	5.92	18.85	24.04	31.59
UT	124	964	-1,043	-79	203	-8.14	40.80	47.28	37.85
WA	2,905	119	1,753	1,871	1,034	13.68	25.83	22.67	34.68
BC	-245	105	-416	-312	67	-3.25	21.88	31.94	27.20
MB	-330	-136	-316	-452	122	-2.47	8.53	49.92	35.49
QC	-3,677	-3,764	81	-3,683	6	0.63	21.90	26.41	27.17
FL	4,354	1,824	2,244	4,068	286	17.51	148.22	35.18	39.34
Total	-10,901	-14,966	0	-14,966	4,065	53.51 ^c	596.73	35.15	35.15

^a Permit Price = \$128.15/tonCO₂e. This is the price of the last permit sold, which is also equal to the price of the last ton of CO₂e mitigated (its *marginal* mitigation cost). It is the same for each state/province for a given case. The *average* mitigation cost per unit of CO₂ equivalent in the simulation differs for each state/province. For FL, for example, it is \$12.31/tonCO₂e. Please note that the average mitigation cost is related to mitigation level of a state/province, which for this case is 35.18% below the baseline level in 2020 for FL. Multiplying the average mitigation cost by the number of tons of CO₂ mitigated will equal the *total* mitigation cost for each state/province shown in the second numerical column in the table.

^b Sector coverage: Electric sector (Consumption-based) + Residential/Commercial fuel use + Large stationary combustion sources + Industrial process + Fossil fuel production and processing + Transportation fuels. AFW (Agriculture, Forestry, and Waste Management) sector is excluded from the sector coverage.

^c Represents number of permits bought or sold.

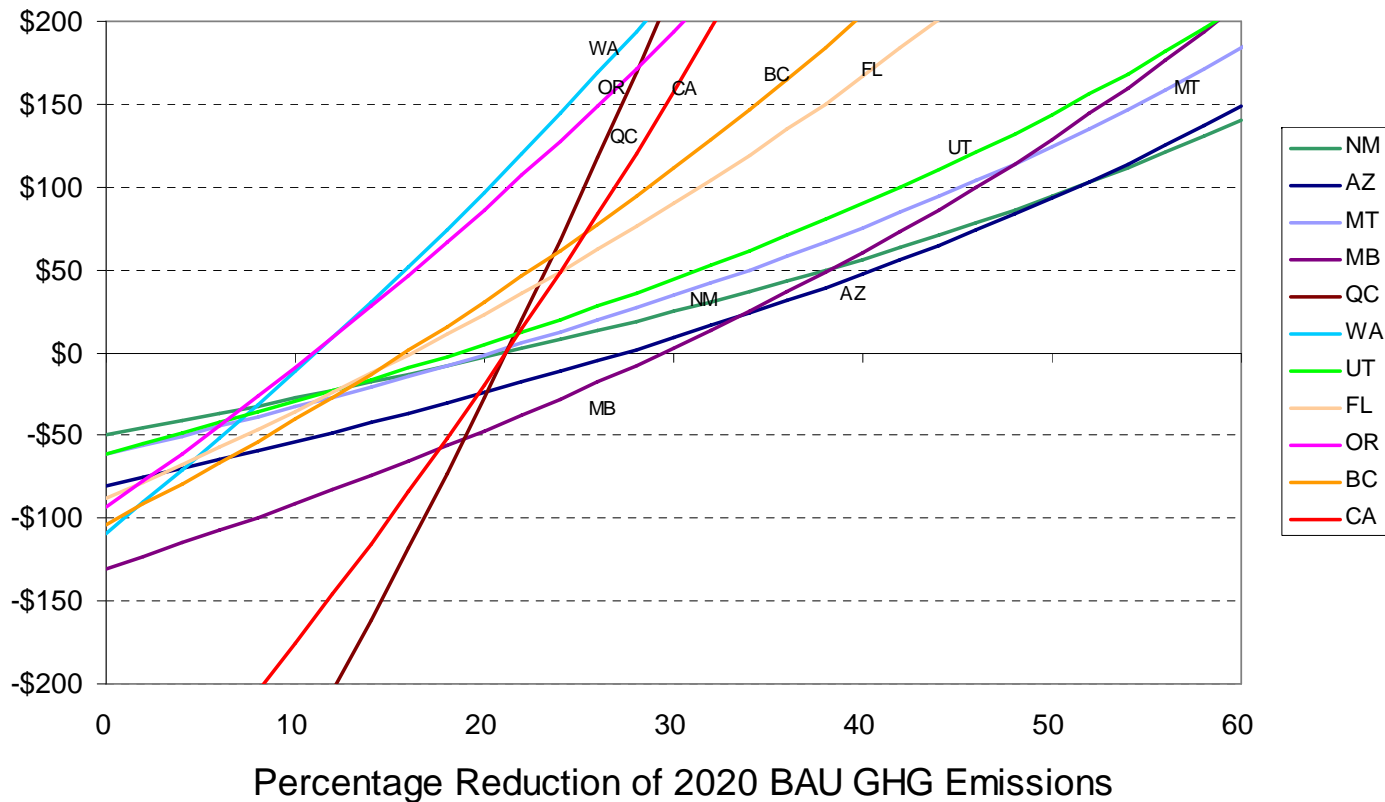
TABLE 3. DATA TABLE

State	2020 BAU Gross Emissions (Consumption-based) ^a (million tCO ₂ e)	Emissions Cap in 2020 ^b (million tCO ₂ e)	GHG Mitigation Goal in 2020 (relative to BAU emissions)	Autarkic Marginal Mitigation Cost (dollars per tCO ₂ e)
AZ	154.8	79.1	48.89%	87.6
CA	558.5	384.0	31.25%	181.5
MT	33.5	24.4	27.33%	24.3
NM	82.5	55.0	33.33%	34.7
OR	78.4	53.6	31.59%	212.7
UT	86.3	53.6	37.85%	79.6
WA	113.9	74.4	34.68%	283.7
BC	68.5	49.9	27.20%	87.5
MB	17.1	11.0	35.49%	33.5
QC	82.9	60.4	27.17%	147.4
FL	421.3	255.5	39.34%	161.2
Total	1,697.6	1,100.9	35.15%	

^a Sector coverage: Electric sector (Consumption-based) + Residential/Commercial fuel use + Large stationary combustion sources + Industrial process + Fossil fuel production and processing + Transportation fuels. AFW (Agriculture, Forestry, and Waste Management) sector is excluded from the sector coverage.

^b The cap for WCI partners is 15% below 2005 level by year 2020. 2020 cap for Florida is computed by interpolating the state's 2017 goal (to return to 2000 levels) and 2025 goal (to return to 1990 levels).

Figure 1. Fitted Marginal Cost Curves of States, 2020
(excluding AFW sector)



- Notes: 1. Marginal cost curves of AZ, CA, MT, NM, and WA are developed based on mitigation options data of these states (from state final or draft climate action plans).
2. Marginal cost curves of OR, BC, MB, QC, and FL are developed based on WA, WA, MN, CT, and SC 2020 curves, respectively. UT only has mitigation options data available for residential/commercial/industrial sector and the transportation sector. The state emission mitigation potentials and costs for the energy supply sector are approximated from New Mexico data.
3. The following assumptions are adopted when we develop the cost curve for one state based on the data from one of its adjacent states. We assume that the list of mitigation options for the adjacent state (state A) is applicable to the state without direct data (state B). Second, for state B, the estimated cost or cost savings per unit GHG removed for each option is assumed to be at the same level as that of state A. Third, the mitigation potentials of each option are assumed to be proportional to the total mitigation potential in each state; this requires that each option be adjusted by the ratio of emissions from the relevant sector of the two states. For example, if the emissions from the power sector are 50 MMtCO₂e and 100 MMtCO₂e in state A and state B, respectively, the mitigation potentials of the ES options for state A are multiplied by a factor of 2 ($100/50=2$) for application to state B.

Findings From the Preliminary Simulations

- The factors that have the greatest influence on all simulations are the absolute levels and the relative levels of the marginal mitigation cost curves. The former has the greatest influence on the potential for cost savings, while the latter has the greatest influence on the extent of permit trading across trading states/provinces, including whether each state/province is a permit buyer or seller.
- For many WCI partners, the total cost of achieving the carbon emission caps is negative. This means that compliance with the caps will result in overall cost savings. This result is due to the existence of an extensive range of cost-saving options, such as improvements in energy efficiency.

Findings From the Preliminary Simulations (cont)

- Before Florida joining WCI, the permit price of the cap-and-trade program among the 10 WCI partners is \$114.48/tCO₂e. California is the biggest permit buyer in the market, followed by Washington. New Mexico is the biggest permit seller, followed by Arizona.
- Because Florida has a marginal cost curve steeper than the WCI average level, when it joins the WCI, the permit price increases to \$128.15/tCO₂e. Florida becomes the biggest permit buyer in the market, followed by California and Washington. New Mexico and Arizona are still the biggest permit sellers.
- In both simulation cases, if we compare the net cost of each state/province after trading with the corresponding element in the column before trading, we find that all states/provinces are better off as a result of participating in trading, since all the post-trading net costs are smaller than the pre-trading costs. The cost saving amount is shown in the Cost Saving column in the result tables. Compared with the pre-trading condition, Florida can save \$286 million in 2020 by joining WCI, a cost saving of around 6.6%.

Public Comments on Cap-and-Trade

Tomorrow's Agenda

Meeting Agenda for Thursday August 7, 2008

- 9:00 Welcome and Introductions
- 9:05 ▪ Consideration of Energy Supply and Demand Expanded Policy Drafts
- 11:00 Public Comment on Energy Supply and Demand
- 11:15 ▪ Consideration of Transportation and Land Use Expanded Policy Drafts
- 12:15 Public Comment on Transportation and Land Use
- 12:30 Agenda, Time, and Date for Next Meeting
- 12:35 General Public Input and Announcements
- 1:00 Adjourn

Public Input, Announcements

Adjourn, August 6, 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 #5, August 6-7, 2008

day two

Today's Agenda

Meeting Agenda for Thursday August 7, 2008

- 9:00 Welcome and Introductions
- 9:05 ▪ Consideration of Energy Supply and Demand Expanded Policy Drafts
- 11:00 Public Comment on Energy Supply and Demand
- 11:15 ▪ Consideration of Transportation and Land Use Expanded Policy Drafts
- 12:15 Public Comment on Transportation and Land Use
- 12:30 Agenda, Time, and Date for Next Meeting
- 12:35 General Public Input and Announcements
- 1:00 Adjourn

Energy Supply & Demand

Tier 1

- ESD-3 Renewable Energy Incentives and Barrier Removal
- ESD-5 Renewable Portfolio Standard (RPS)
- ESD-6 Nuclear Power
- ESD-8 Combined Heat and Power Systems (CHP)
- ESD-9 Power Plant Efficiency Improvements
- ESD-11 Waste-to-Energy (WTE)
- ESD-12 Demand-Side Management/Energy Efficiency Programs, Funds, or Goals for Electricity
- ESD-13a Energy Efficiency for Existing Residential
- ESD-14 Improved Building Codes for Energy Efficiency
- ESD 15 Training and Education for Building Operators and Community Association Managers
- ESD-17 Consumer Education Programs
- ESD-23 Decoupling

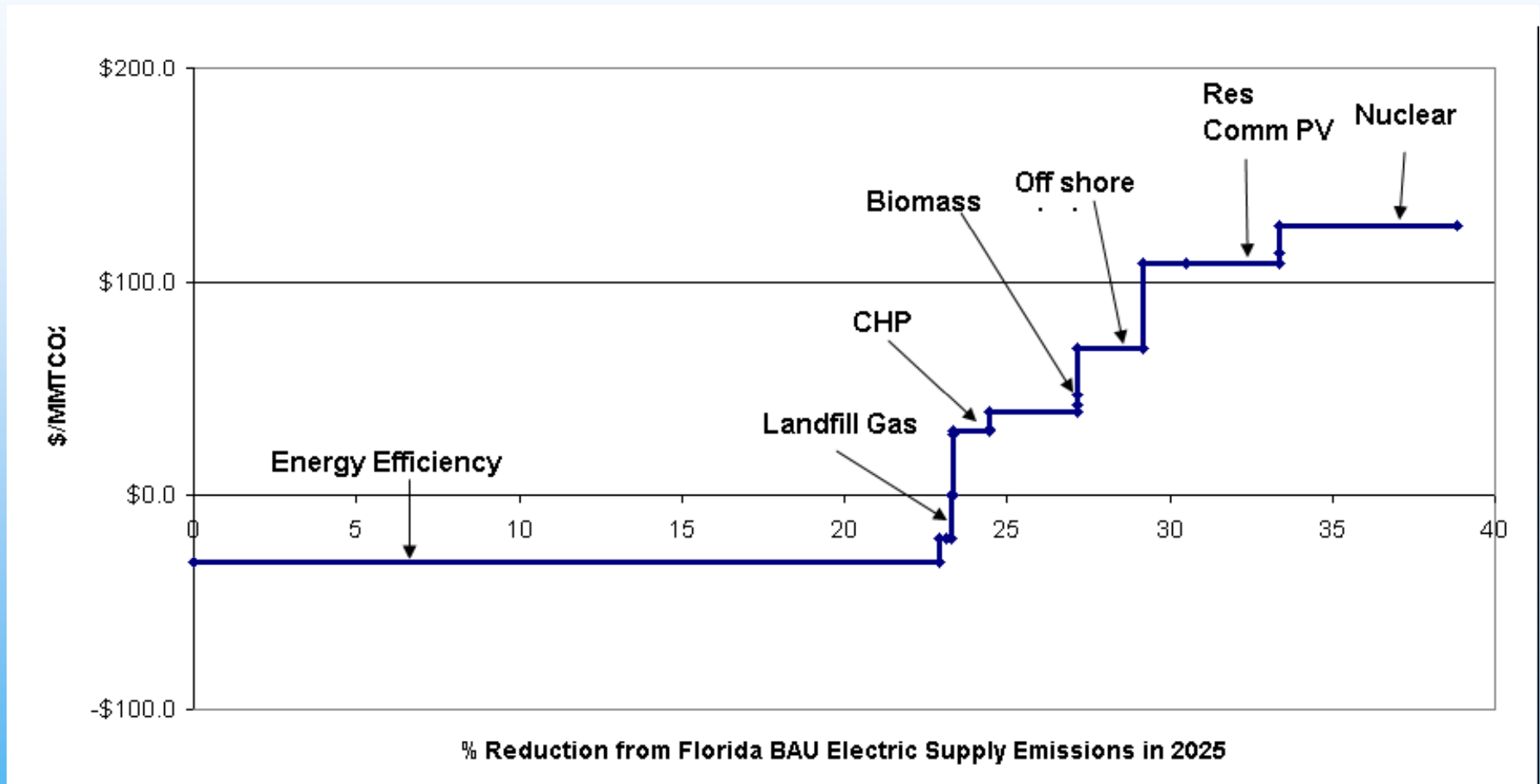
Energy Supply & Demand

Tier 2

- ESD-1 Technology Research and Development (R&D) With Commercial Opportunities
- ESD-4 Electricity Transmission and Distribution Improvements
- ESD-7 Integrated Resource Planning
- ESD-9 Power Plant Efficiency Improvements
- ESD-13b Incentives for New Residential Building Achieving High Energy Performance Standards
- ESD-16 More Stringent Appliance/Equipment Efficiency Standards
- ESD-18 Incentives to Promote Implementation of Customer-Sited Renewable Energy Systems
- ESD-21 Rate Structures and Technologies to Promote Reduced Greenhouse Gas Emissions
- ESD-22 Demand-Side Management/Energy Efficiency Programs, Funds, or Goals for Natural Gas

Public Comments

Notional Cost Curves



Key Assumptions

Avoided cost estimate: \$58/MWh – placeholder value, needs review

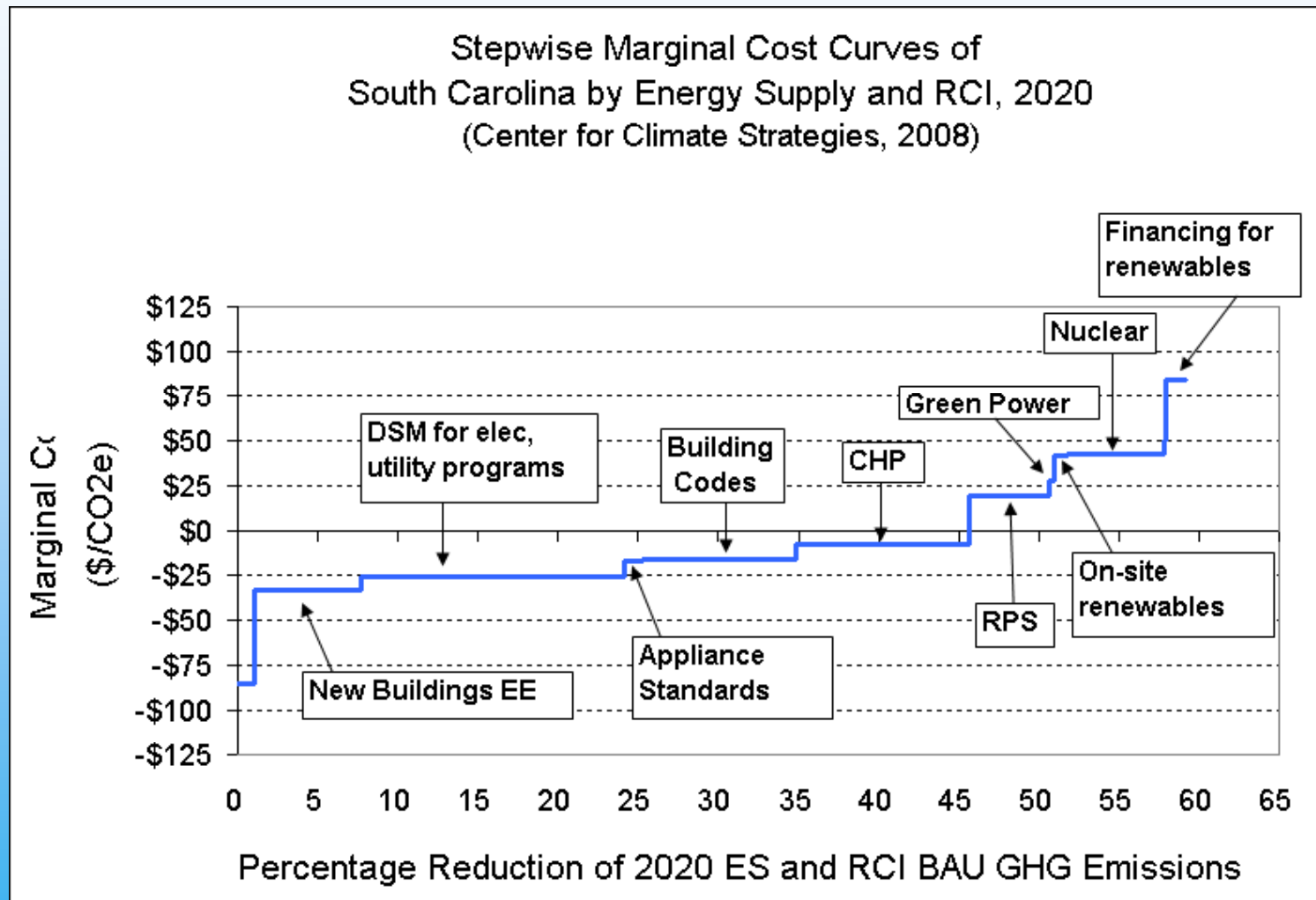
Avoided emissions from reduced electricity demand: 0.73 tons/MWh

Sources for Notional Cost Curve

Sources

- Energy efficiency: ACEEE 2007. *Potential for Energy Efficiency and Renewable Energy to meet Florida's Growing Energy Demands*
- Landfill Gas: EPA Landfill Methane Outreach Program + NC estimate of costs
- CHP: ACEEE 2007. *Potential for Energy Efficiency and Renewable Energy to meet Florida's Growing Energy Demands*
- Biomass: Biomass potential from M Welsch. *Biomass Feedstock Availability in the United States: 1999 State Level Analysis*.
<http://bioenergy.ornl.gov/resourcedata/index.html>
- Nuclear: From South Carolina estimates based on Moody's Investors Service. *New Nuclear Generation in the United States: Keeping Options Open vs. Addressing An Inevitable Necessity*, Moody's Corporate Finance, October 2007.
- Off-Shore Wind: from South Carolina estimates based on GDS Associates, Inc. and La Capra Associates, Inc 2007. *Analysis of Renewable Energy Potential in South Carolina*, prepared for Central Electric Power Cooperative Inc.
- Residential Commercial PV: ACEEE 2007. *Potential for Energy Efficiency and Renewable Energy to meet Florida's Growing Energy Demands*

SC Marginal Cost Curves

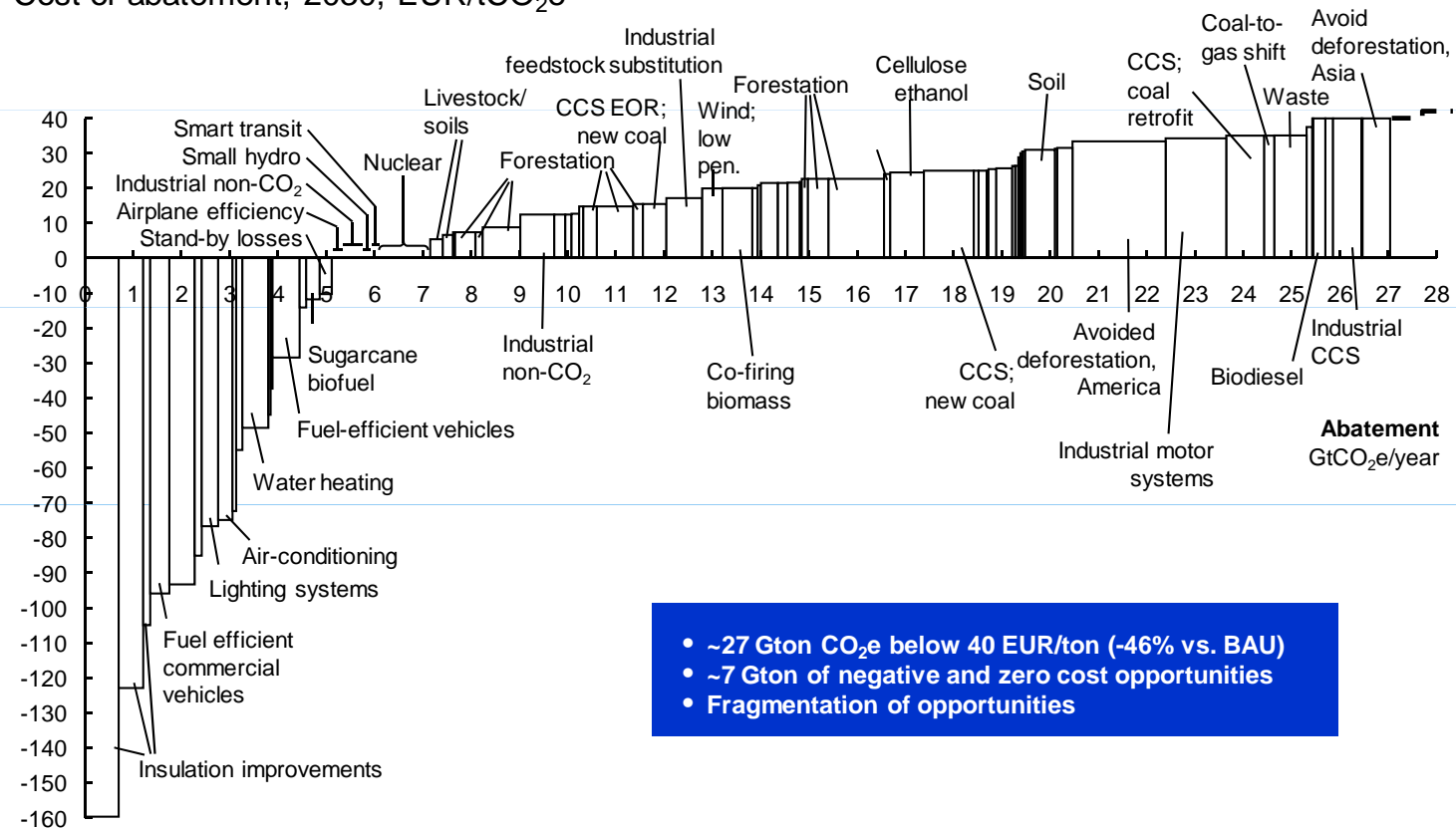


Global Supply Curve

McKinsey, 2007

An “opportunity map” was created identifying the most promising sources of GHG reduction

Cost of abatement, 2030, EUR/tCO₂e



- ~27 Gton CO₂e below 40 EUR/ton (-46% vs. BAU)
- ~7 Gton of negative and zero cost opportunities
- Fragmentation of opportunities

Source: McKinsey



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Transportation and Land Use

- TLU-1 Develop and Expand Low-GHG and Alternative Fuels
- TLU-2 Add-on Technologies for Existing Vehicles and New Vehicles
- TLU-3 Smart Growth Planning
- TLU-4 Improving Transportation System Management (TSM)
- TLU-5 Increasing Choices in Modes of Transportation
- TLU-6 Factoring GHG Emissions into Transportation and Land Use Planning Processes
- TLU-7 Incentive Programs for Increased Vehicle Fleet Efficiency
- TLU-8 Increasing Freight Movement Efficiencies

Public Comments

Next Steps for Action Team and TWGs

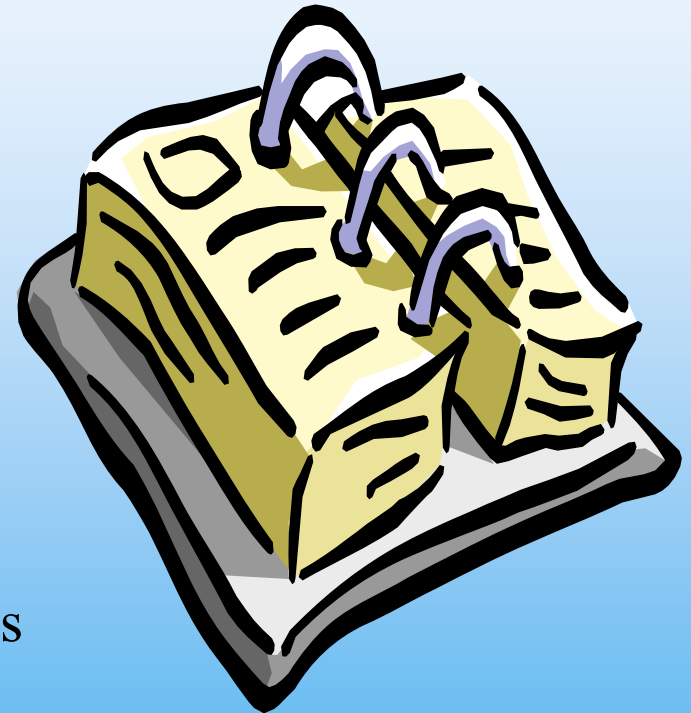
- 2 or more TWG meetings/calls in August
- Complete initial policy quantification
- Complete policy option drafts
- Prepare Cap-and-Trade program design recommendations
- Update Cap-and-Trade modeling to use Florida-specific data
- Continue adaptation policy development
- Review GHG Inventory and Forecast for Florida
- Begin drafting final report

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	3 rd Action Team meeting
July 9-10, 2008	Tallahassee	4 th Action Team meeting
August 6-7, 2008	Orlando	5th 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 additional quantification of priority policies
 - Review completed priority policy templates
 - Approve policies earning unanimous Action Team support
 - Identify barriers to consensus for policies lacking unanimous support
 - Continue to refine the FL GHG Emissions Inventory and Forecast
 - Review C&T design recommendations
- August 22, 2008, St. Petersburg



Public Comments

Adjourn, August 7, 2008