

Memo

To: Montana Climate Change Action Committee  
 From: The Center for Climate Strategies  
 CC: Montana Department of Environmental Protection  
 Subject: Preparation for the Sixth Meeting of the Montana Climate Action Committee on July 9, 2007  
 Date: July 2, 2007

At the sixth meeting of the Montana Climate Action Committee (CCAC) on July 9, 2007, the CCAC will consider final approval of 21 pending draft climate change policy options developed since the launch of the CCAC process in July 2006, including recommendation of a statewide greenhouse gas (GHG) emissions reduction goal.

A summary of the 57 completed and pending draft policy options is attached, and a detailed description of each and related background is posted to the CCAC website at: [www.mtclimatechange.us](http://www.mtclimatechange.us). Our discussion during the CCAC meeting will focus on final resolution of the 21 pending options not yet approved. Please review these documents prior to the meeting. A summary of draft policy options is attached below:

Table #	Technical Work Group	# Policy Options
1	Residential, Commercial and Industrial Pending Options List	13 total; 2 Pending
2	Energy Supply Pending Options List	13 total; 3 Pending
3	Transportation and Land Use Pending Options List	13 total; 1 Pending
4	Agriculture and Forestry Pending Options List	12 total; 8 Pending
5	Cross Cutting Issues Pending Options List	7 total; 7 Pending
<b>Total</b>		58

**Table 1.**  
**Residential Commercial and Industrial Technical Work Group**  
**Summary List of Pending Policy Options**

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007–2020			
RCII-1	Demand Side Management Programs, Efficiency Funds and Requirements (and Financial Incentives)	0.04	1.15	6.6	-\$141	-\$21	Complete
RCII-2	Market Transformation and Technology Development Programs	0.03	0.30	1.9	-\$43	-\$23	Complete
RCII-3	State Level Appliance Efficiency Standards and State Support for Improved Federal Standards	0.05	0.20	1.5	-\$55	-\$36	Complete
RCII-4	Building Energy Codes	0.03	0.25	1.6	-\$15	-\$10	Complete
RCII-5	“Beyond Code” Building Design Incentives and Mandatory Programs	0.07	0.52	3.4	-\$17	-\$5	Complete
RCII-6	Consumer Education Programs	<i>Not Quantified</i>					Complete
RCII-7	Support for Implementation of Clean Combined Heat and Power	<i>Quantified in Coordination with ES</i>					Complete
RCII-8	Support for Renewable Energy Applications	<i>Quantified in Coordination with ES</i>					Complete
RCII-9	Carbon Tax	<i>Not Quantified</i>					Pending
RCII-10	Industrial Energy Audits and Recommended Measure Implementation	0.07	0.56	3.6	-\$93	-\$26	Complete

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007-2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007-2020			
RCII-11	Low Income and Rental Housing Energy Efficiency Programs	0.05	0.75	4.7	-\$41	-\$9	Pending
RCII-12	State Lead by Example	0.03	0.31	2.0	-\$11	-\$6	Complete
RCII-13	Metering Technologies w/Opportunity for Load Management and Choice	0.01	0.03	0.2	-\$3	-\$12	Complete
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS	0.28	2.95	18.4	-\$304	-\$17	N/A
	REDUCTIONS FROM RECENT ACTIONS						
RCII-1	Expand Energy Efficiency Funds	0.30	0.79	6.5			N/A
RCII-11	Low income energy efficiency programs	0.02	0.05	0.4			N/A
	SECTOR TOTAL PLUS RECENT ACTIONS	0.59	3.79	25.3			N/A

**Table 2.**  
**Energy Supply Technical Work Group**  
**Summary List of Pending Policy Options**

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007–2020			
ES-1	Environmental Portfolio Standard (Renewables and Energy Efficiency)						Complete (subject to modification)
	Efficiency/Conservation	0.03	0.92	5.4	-\$79	-\$15	
	Renewable Energy	0.0	1.6	5.5	\$53	\$10	
ES-2	Renewable Energy Incentives (Biomass, Wind, Solar, Geothermal)	<i>Not Quantified Separately (see ES-1 and ES-4)</i>					Complete (subject to modification)
ES-3	Research and Development (R&D), Including R&D for Energy Storage and Advanced Fossil Fuel Technologies	<i>Not Quantified</i>					Complete (subject to modification)
ES-4	Incentives and Barrier Removal (Including Interconnection Rules and Net Metering Arrangements) for Combined Heat and Power (CHP) and Clean Distributed Generation (DG)						Complete (subject to modification)
	Distributed Renewables	0.03	0.10	0.8	\$16	\$21	
	Combined Heat and Power	0.3	0.7	5.0	\$81	\$16	

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007-2020			
ES-5	Incentives for Advanced Fossil Fuel Generation and Carbon Capture and Storage (CCS), Including Combined Hydrogen and Electricity Production with Carbon Sequestration	<i>Quantification in Progress</i>					Pending
	Reference Case - <i>Illustrative</i>	0	2.1	6.6	\$199	\$30	Pending
	High Fossil Scenario - <i>Illustrative</i>	0	10.9	34.5	\$1,062	\$30	Pending
ES-6	Efficiency Improvements and Repowering of Existing Plants	<i>Not Quantified</i>					Pending
ES-7	Demand-Side Management	<i>Not Quantified Separately (see ES-1 and RCII-1)</i>					Moved to RCI
ES-8/9	Market-Based Mechanisms to Establish a Price Signal for GHG Emissions (GHG Cap-and-Trade or Tax)	<i>Not Quantified</i>					Complete
ES-10	Generation Performance Standards or GHG Mitigation Requirements for New (and/or Existing) Generation Facilities, with/without GHG Offsets						Pending
	Reference Case – Compliance Mix	0.1	0.8	4.7	\$60	\$20	Pending
ES-11	Methane and CO <sub>2</sub> Reduction in Oil and Gas Operations, Including Fuel Use and Emissions Reduction in Venting and Flaring						Complete (subject to modification)
	Reference Case - <i>Illustrative</i>	0.1	0.5	3.9	Not estimated	Likely net benefit	
	High Fossil Fuel Case - <i>Illustrative</i>	0.3	0.8	6.6	Not estimated	Likely net benefit	

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007-2020			
ES-12	GHG Reduction in Refinery Operations, Including in Future Coal-to-Liquids Refineries						Complete
	Coal-to-Liquids – High Fossil Fuel Case – 20-30% lower life cycle emissions than diesel (via CCS, biomass co-firing, poly-generation)	0	9.9	35	Not estimated	Not estimated	
	Petroleum Refining - Reference Case	0.07	0.24	1.5	Not estimated	Not estimated	
	Petroleum Refining - High Fossil Case	0.09	0.38	2.2	Not estimated	Not estimated	
ES-13	CO <sub>2</sub> Capture and Storage or Reuse (CCSR) in Oil & Gas Operations, Including Refineries and Coal-to-Liquids Operations	<i>Incorporated in ES-5 and 12</i>					Complete (subject to modification)

*Note: Positive numbers for Net Present Value (NPV) and Cost-effectiveness reflect net costs. Negative numbers reflect net cost **savings**.*

**Table 3.**  
**Transportation and Land Use Technical Work Group**  
**Summary List of Pending Policy Options**

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2006–2020 (Million \$)	Cost-Effective-ness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2006–2020			
TLU-1	Light Duty Vehicle Clean Car Standards	0.000	0.946	4.919	-\$492	-\$100	Complete
TLU-2	Fuel Efficient Replacement Tires Program	0.000	0.027	0.140	-\$86	-\$90	Complete
TLU-3	Consumer Information on Vehicle Miles Per Gallon (MPG)	<i>Included in TLU-1 and TLU-2</i>					Complete
TLU-4	Financial and Market Incentives for Low GHG Vehicle Ownership and Use	<i>Included in TLU-1</i>					Complete
TLU-5	Growth and Development Bundle	0.000	0.047	0.260	< 0	< 0	Complete (subject to text updates)
TLU-6	Low Carbon Fuels	0.000	0.043	0.392	<i>Not Available</i>		Pending
TLU-7	Heavy Duty Vehicle Emissions Standards and Retrofit Incentives	0.000	0.020	0.162	\$12.8	\$79	Complete
TLU-8	Heavy-Duty Vehicle and Locomotive Idle Reduction	0.005	0.015	0.127	-\$5.6	-\$44	Complete

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2006–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2006–2020			
TLU-9	Procurement of Efficient Fleet Vehicles	<i>Included in TLU-1, TLU-11 and TLU-6 – 8</i>					Complete
TLU-10	Transportation System Management	<i>Not Quantified</i>					Complete
TLU-11	Intermodal Freight Transportation	<i>0.023</i>	<i>0.091</i>	<i>0.589</i>	<i>Not Available</i>		Complete
TLU-12	Off-Road Engines and Vehicles GHG Emissions Reductions	<i>Not Quantified</i>					Complete
TLU-13	Reduced GHG Emissions from Aviation	<i>Not Quantified</i>					Complete
	SECTOR TOTAL BEFORE ADJUSTING FOR OVERLAPS	<i>0.028</i>	<i>1.143</i>	<i>6.669</i>			Complete
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS						Complete

**Table 4.**  
**Agriculture, Forestry, and Waste Management Technical Work Group**  
**Summary List of Pending Policy Options**

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effective-ness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007–2020			
AFW-1	Agricultural Soil Carbon Management – Conservation/No-Till	0.06	0.20	1.4	0	0	Complete
	Agricultural Soil Carbon Management – Organic Farming	nq	nq	nq	nq	nq	
AFW-2	Biodiesel Production (Incentives for Feedstocks and Production Plants)	0.03	0.24	1.5	83	55	Complete
AFW-3	Ethanol Production	0.02	0.39	2.2	10	4	Pending
AFW-4	Incentives for Enhancing GHG Benefits of Conservation Provisions of Farm Bill Programs	0.5	1.6	15	181	12	Pending
AFW-5	Preserve Open Space and Working Lands – Agriculture	0.02	0.03	0.2	7	32	Pending
	Preserve Open Space and Working Lands – Forests	0.03	0.1	0.9	3	3	
AFW-7	Expanded Use of Biomass Feedstocks for Energy Use	<i>Quantified under ES/RCI</i>					Pending
AFW-8	Afforestation/Reforestation Programs – Restocking	0.09	0.5	3.4	41	12	Pending
	Afforestation/Reforestation Programs – Urban Trees	0.001	0.006	0.04	-0.1	-3	
AFW-9	Improved Management and Restoration of Existing Stands	0.05	0.2	1.3	159	120	Pending
AFW-10	Expanded Use of Wood Products for Building Materials	0.002	0.004	0	0.035	0	Pending

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007-2020 (Million \$)	Cost-Effective-ness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007-2020			
AFW-11	Programs to Promote Local Food and Fiber	0.01	0.02	0.12	5	1	Pending
AFW-12	Enhanced Solid Waste Recovery and Recycling	0.24	1.05	7.4	58	8	Complete (subject to modification of goals)
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS						
	REDUCTIONS FROM RECENT ACTIONS (table to be added below)						
	SECTOR TOTAL PLUS RECENT ACTIONS						

**Table 5.**  
**Cross-Cutting Issues Technical Work Group**  
**Summary List of Pending Policy Options**

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2010	2020	Total 2007–2020			
CC-1	GHG Inventories and Forecasts	<i>Not Quantified</i>					Pending
CC-2	State GHG Reporting	<i>Not Quantified</i>					Pending
CC-3	State GHG Registry	<i>Not Quantified</i>					Pending
CC-4	State Climate Public Education and Outreach	<i>Not Quantified</i>					Pending
CC-6	Options for State GHG Goals or Targets	<i>Not Quantified</i>					Pending
CC-7	The State’s Own GHG Emissions	<i>Not Quantified</i>					Pending

**Table 6.**  
**Reference Case Scenarios and Cumulative Emissions Reductions Estimates**

**Consumption Basis - Net Emissions**

	1990	2000	2010	2020
Projected MT GHG Emissions	-1.8	2.1	4.6	8.4
Recommended Targets				
Total GHG Reductions from CCAC			1.5	12.5
Projected Emissions After Current CCAC Reductions			3.1	-4.2

**Consumption Basis - Net Emissions - *With No Forest Soil Carbon Sink***

	1990	2000	2010	2020
Projected MT GHG Emissions	6.9	10.8	13.3	17.1
Recommended Targets				
Total GHG Reductions from CCAC			1.5	12.5
Projected Emissions After Current CCAC Reductions			11.8	4.5

**Consumption Basis - Gross Emissions**

	1990	2000	2010	2020
Projected MT GHG Emissions	32.2	36.1	38.6	42.4
Recommended Targets				
Total GHG Reductions from CCAC			1.5	12.5
Projected Emissions After Current CCAC Reductions			37.1	29.8

**Production Basis Net**

<b>Reference Case</b>	1990	2000	2010	2020
Projected MT GHG Emissions	5.2	9.7	16.1	21.2
Recommended Targets				
Total GHG Reductions from CCAC			1.5	12.5
Projected Emissions After Current CCAC Reductions			14.6	8.7

<b>High Fossil Fuel Case</b>	1990	2000	2010	2020
Projected MT GHG Emissions	5.2	9.7	17.1	41.9
Recommended Targets				
Total GHG Reductions from CCAC			1.5	31.5

Projected Emissions After Current CCAC Reductions			15.6	10.4
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**Production Basis Gross**

<b>Reference Case</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>
Projected MT GHG Emissions	39.2	43.7	50.1	55.2
Recommended Targets				
Total GHG Reductions from CCAC			1.5	12.5
Projected Emissions After Current CCAC Reductions			48.6	42.7

<b>High Fossil Fuel Case</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>
Projected MT GHG Emissions	39.2	43.7	51.1	75.9
Recommended Targets				
Total GHG Reductions from CCAC			1.5	31.5
Projected Emissions After Current CCAC Reductions			49.6	44.4