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Catalog of State-Level GHG Reduction Policy Options
Residential, Commercial, [Government, and] and Industrial

Prepared by The Center for Climate Strategies (CCS) for the Montana Climate Change Advisory Committee (CCAC) and its Scientific Advisory Panel (SAP) and Technical Work Groups (TWGs) based on actions undertaken or considered by all US states.

Key to Future Rankings of Options in the Table that Follows:

Potential Emission Reductions 1/	Potential Cost or Cost Savings 1/ 2/
High (H): At least 0.5 Million Metric Tons (MMT) carbon dioxide equivalent (CO_2e) per year by 2020 (~1% of current MT emissions)	**High (H)**: $50 per Metric Ton CO_2e ($MTCO_2e$) or above
Medium (M): From 0.1 to 0.5 MMT CO_2e per year by 2020	**Medium (M):** $5-50/$MTCO_2e$
Low (L): Less than 0.1 MMT CO_2e per year by 2020	**Low (L):** Less than $5/$MTCO_2e$
Uncertain (U): Not able to estimate at this time	**Uncertain (U):** Not able to estimate at this time

1/ Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.
2/ Costs are denoted by a positive number. Cost savings (i.e., "negative costs") are denoted by a negative number.

NOTE: October 24, 2006 - CCS has provided preliminary estimates of potential emission reductions and potential costs or cost savings for some of the options in the catalog. These estimates are based on research for Montana and for other US states and provide rough order of magnitude. These estimates are subject to review and revision by TWG members to improve the estimates based on additional information or greater specificity of the option. TWG members are encouraged to provide feedback on the estimates during the October 24, 2006 TWG call or by email to CCS facilitators.

Definition of "Priorities for Analysis":

- **High:** High priority options will be analyzed first.
- **Medium:** Medium priority options will be analyzed next, time and resources permitting.
- **Low**: Low priority options will be analyzed last, time and resources permitting.

Notation of Options: Options will be marked with an asterisk (*) at a later date to indicate options that are at least partially "base case" policies, i.e., that have been considered or undertaken at some level in Montana. This version of the catalog includes, in highlighted text, new options and revisions that were suggested during the first TWG meeting (September 5, 2006) and the second CCAC meeting (September 15, 2006).

Residential, Commercial, [Government, and] Industrial (RCI)

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost or Cost Savings	Ancillary Impacts, Feasibility Considerations	Notes
RCI-1	**ENERGY EFFICIENCY PROGRAMS, FUNDS, AND GOALS**					
1.1	Utility Demand Side Management (DSM) Programs for electricity, natural gas, propane, fuel oil		High	Cost savings/ low costs	Co-benefits include transmission/distribution system costs reduction. Significant potential overlap with many other options.	
1.2	Energy Efficiency Funds (e.g. Public Benefit Funds) administered by State agency, utility, or 3rd party (e.g. Energy Trust)		High	Cost savings/ low costs	(as above)	MT DEQ staff note that funds can be used for market transformation, demonstration, education, and R&D

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1.3	Energy Efficiency Requirements (e.g. Utility Savings Goals or Energy Portfolio Standards)		High	Cost savings/ low costs	(as above)	
1.4	Market transformation and technology development programs		Medium	Cost savings/ low costs	(as above)	
RCI-2	**APPLIANCE STANDARDS**					
2.1	Expansion of State-level Appliance Efficiency Standards		Medium	Cost Savings/ Low Cost	Feasibility enhanced by ongoing effort in nearby states	
2.2	Support for Federal-level Appliance Efficiency Standards		Low/ Medium	Cost Savings/ Low Cost	Potential overlap with previous option	
RCI-3	**BUILDINGS**					
3.1	Improved Building Codes		Medium/ High	Cost Savings/ Low Cost	Potential to also yield water savings, comfort/air quality improvements.	
3.2	Promotion and Incentives for Improved Design and Construction (e.g. LEED[1], green buildings)		Medium/ High	Cost Savings/ Low Cost	Potential overlap with previous option [co-benefits as above]	
3.3	Training and Education for		Low/ Medium	Cost Savings/	[As above]	

[1] LEED = Leadership in Energy and Environmental Design, a national building certification program.

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	Builders and Contractors (e.g. HVAC[2] sizing, duct sealing)			Low Cost		
3.4	Training of Building Code and other Officials in Energy Code Enforcement		Low/ Medium	Cost Savings/ Low Cost		
3.5	Building Commissioning and Recommissioning, including Energy Tracking and Benchmarking		Medium	Cost Savings/ Low Cost		
3.6	Energy Management Training/Training of Building Operators		Low/ Medium	Cost Savings/ Low Cost		
3.7	Increased Use of Blended Cement (substituting fly ash or other pozzolans for clinker reduces CO_2 emissions)		Low/ Medium	Cost Savings/ Low Cost	May provide modest avoided waste disposal co-benefit, depending on standard practice	
3.8	Reduction of Emissions from Diesel Engines Used in New Construction Developments		Low	Low Cost		
3.9 (new option)	Urban, town and subdivision design		Uncertain	Uncertain		Raised both during TWG and CCAG, this option is included in the Transportation and Land Use TWG; there is potential overlap.

[2] HVAC = Heating, Ventilation, and Air Conditioning

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RCI-4	**EDUCATION AND OUTREACH**					
4.1	Consumer education programs		Uncertain	Cost Savings/ Low Cost		Potential contribution difficult to estimate
4.2	Introduce in School Curriculum		Uncertain	Cost Savings/ Low Cost		(as above)
RCI-5	**PRICING AND PURCHASING**					
5.1	Green Power Purchasing		Medium/ High	Low - High		
5.2	Bulk Purchasing Programs for Energy Efficiency or other Equipment (Public or Private sector)		Low - High	Cost Savings/ Low Cost		
5.3	Net-metering policies		Low / Medium	Cost Savings/ Low Cost		
5.4	Time of Use Rates (and Smart Metering)		Low	Cost Savings/ Low Cost	Significant utility system co-benefits	
5.5 (new option)	Tiered (Increasing Block) Rates		Low / Medium	Cost Savings/ Low Cost		
RCI-6	**TECHNOLOGY-SPECIFIC POLICIES**					
6.1	Incentives for Renewable Energy Applications (Solar roofs, water heaters, etc.)		Medium/ High	Medium/ High	Programs could help to lower capital and installation costs	
6.2	Clean Combined Heat and Power (CHP)		High	Cost Savings -	Cost dependent on price of natural gas;	MT DEQ staff notes that CHP provides efficiency gains that

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				Medium Cost	interconnection an issue; utility system co-benefits.	can contribute to reducing GHG emissions on the supply side (e.g. less amounts of total fuel supplies--electricity and fuels--is needed to be supplied to the end-user.
6.3	Promotion and Tax or Other Incentives (e.g. EnergyStar, credits for solar hot water)		Low-High	Cost Savings/ Low Cost	Interaction with appliance standards, utility programs.	
6.4	Appliance Recycling/Pick-Up Programs		Low	Cost Savings/ Low Cost	Long-term impact uncertain	
6.5	White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs)		Medium	Cost Savings/ Low Cost	Results likely to vary substantially with design	
6.6	Focus on specific end-uses/technologies: air-conditioning, lighting, water heating, plug loads, networked PC management, power supplies, motors, pumps, boilers, etc. Consumer products programs, may include incentives, retailer training, marketing and		(By option, range from Low to High)	Cost Savings/ Low Cost	Interaction with appliance standards, utility programs.	MT DEQ staff note that Montana may see larger changes in air conditioning loads due to higher temperatures. An opportunity to reduce current and future building air conditioning loads (direct effect of rising temperatures) should be considered in building sectors, maybe in market transformation.

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	promotion, education, etc ,					
RCI-7	**NON-ENERGY EMISSIONS (HFCS, PFCS, SF_6, CO_2 PROCESS EMISSIONS**					
7.1	Participation in Voluntary Industry-Government Partnerships		Uncertain	Uncertain		
7.2	Process Changes/ Optimization		Uncertain	Uncertain		
7.3	Leak Reduction /Capture, Recovery and Recycling of Process Gases		Low/ Medium	Uncertain		
7.4	Use of Alternative Gases (other HFCs, hydrocarbon coolants/refrigerants, etc.)		Low/ Medium	Low-Medium		
7.5	Cement Industry: Use of Alternative Fuels		Low/ Medium	Uncertain		
RCI-8	**GHG EMISSIONS-SPECIFIC GOALS AND POLICIES**					
8.1	Support for switching to less carbon-intensive fuels (coal and oil to natural gas or biomass)		Low-Medium	Cost Savings/ Medium Cost	Cost dependent on relative fuel prices	
8.2	Industry-Specific Emissions Cap and Trade Programs		Medium/ High	Low/ Medium	Highly dependent on specification of trading systems	
8.3	Voluntary emissions targets		Uncertain	Uncertain		
8.4	Small-source Aggregation		Uncertain	Uncertain		

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8.5	Negotiated Emissions or Energy Savings Agreements		Uncertain	Uncertain		
8.6 (new option)	Carbon Tax		Low-High	Low-Medium		
RCI-9	**OTHER**					
9.1	Government Agency Requirements and Goals (including procurement)		Low-Medium	Cost Savings/ Low Cost		
9.2	Focus on specific market segments: existing homes (weatherization), new construction, apartments, low income, etc.		Medium/ High	Cost Savings/ Low Cost		See 9.8 below.
9.3	Reinvestment Fund		Uncertain	Cost Savings/ Low Cost		
9.4	Municipal Energy Management		Uncertain	Uncertain		
9.5	Focus on Small and Medium Enterprises (SMEs)		Uncertain	Uncertain		
9.6	Industrial ecology/ by-product synergy		Uncertain	Uncertain		
9.7	Industrial (and Residential/Commercial building) Audits		Medium/ High	Cost Savings/ Low Cost		CCAC discussion noted that this can also be included in category RCI-1 and others. Financing for retrofits needs

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						to be considered.
9.8 (new option)	Low-income energy efficiency programs.		Low/Medium	Cost Savings/ Low Cost		CCAC members noted importance of addressing poorly insulated mobile homes, and funding programs that provide replacement homes; Habitat for Humanity noted as one example for programs that address.
9.9 (new option)	Right of Refusal for Utility Hookups		Uncertain	Uncertain		
9.10 (new option)	Water conservation		Uncertain	Uncertain		Savings from pumping and water treatment reductions
9.11 (new option)	Incentives for individuals for reducing GHG emissions through reduction in their residential consumption (natural gas, electricity, water, garbage)		Uncertain	Uncertain		Incentives for reducing energy and water may be covered by other options (1.1 through 1.4) and 9.10