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## State Level GHG Reduction Policy Options

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.

### Tables of Policy Options:

Table	Sectors Covered
1	Residential, Commercial, Industrial (RCI)
2	Energy Supply (ES)
3	Transportation and Land Use (TLU)
4	Agriculture, Forestry and Waste Management (AFW)
5	Cross Cutting Issues - Reporting, Registries, Education (CC)

**Key to Future Rankings of Options in the Tables that Follow:**

<b>Potential Emission Reductions <u>1/</u></b>	<b>Potential Cost Effectiveness <u>1/ 2/</u></b>
<b>High (H):</b> At least 0.2 Million Metric Tons (MMT) carbon dioxide equivalent (CO <sub>2</sub> e) per year by 2020 (=>5 % of current MT 2005 gasoline emissions)	<b>High (H):</b> Less than \$5/MTCO <sub>2</sub> e
<b>Medium (M):</b> From 0.1 to 0.2 MMT CO <sub>2</sub> e per year by 2020 (2 % -5 % of current MT 2005 gasoline emissions)	<b>Medium (M):</b> \$5-50/MTCO <sub>2</sub> e
<b>Low (L):</b> Less than 0.1 MMT CO <sub>2</sub> e per year by 2020, or 1 MMT CO <sub>2</sub> e by 2050 (< 2 % of current MT 2005 gasoline emissions)	<b>Low (L):</b> \$50 per Metric Ton CO <sub>2</sub> e (MTCO <sub>2</sub> e) or above
<b>Uncertain (U):</b> Not able to estimate at this time	<b>Uncertain (U):</b> Not able to estimate at this time
<u>1/</u> Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.	
<u>2/</u> Costs are denoted by a positive number. Cost savings (i.e., “negative costs”) are denoted by a negative number.	

**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.**



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## Catalog of State-Level GHG Reduction Policy Options Transportation and Land Use

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

Potential Emission Reductions <u>1/</u>	Potential Cost Effectiveness <u>1/ 2/</u>
<b>High (H):</b> At least 0.2 Million Metric Tons (MMT) carbon dioxide equivalent (CO <sub>2</sub> e) per year by 2020 (=>5 % of current MT 2005 gasoline emissions)	<b>High (H):</b> Less than \$5/MTCO <sub>2</sub> e
<b>Medium (M):</b> From 0.1 to 0.2 MMT CO <sub>2</sub> e per year by 2020 (2 % -5 % of current MT 2005 gasoline emissions)	<b>Medium (M):</b> \$5-50/MTCO <sub>2</sub> e
<b>Low (L):</b> Less than 0.1 MMT CO <sub>2</sub> e per year by 2020, or 1 MMT CO <sub>2</sub> e by 2050 (< 2 % of current MT 2005 gasoline emissions)	<b>Low (L):</b> \$50 per Metric Ton CO <sub>2</sub> e (MTCO <sub>2</sub> e) or above
<b>Uncertain (U):</b> Not able to estimate at this time	<b>Uncertain (U):</b> 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.	

#### Definition of “Priorities for Analysis”:

- **High:** High priority options will be analyzed first.
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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.

**Table 3 - Transportation and Land Use (TLU)**

<b>Option No.</b>	<b>GHG Reduction Policy Option</b>	<b>Priority for Analysis</b>	<b>Potential GHG Emissions Reduction</b>	<b>Potential Cost Effectiveness</b>	<b>Additional Impacts, Feasibility Considerations</b>	<b>Notes</b>
<b>TLU-1</b>	<b>PASSENGER VEHICLE GHG EMISSION RATES</b>					
<b>TLU-1.1</b>	<b>VEHICLE TECHNOLOGY</b>					
1.1.1	Tailpipe GHG Emission Standards		<b>H</b>	<b>H</b>		CA, AZ, NM
1.1.2	ZEV/LEV-2 Implementation		<b>L</b>	<b>H/M</b>		
1.1.3	R&D on Low-GHG Vehicle Technology (e.g., fuel cell)		<b>L</b>	<b>U</b>		
1.1.4	Add-on Technologies (Low Friction Oil, Low-Rolling Resistance Tires)		<b>M</b>	<b>H</b>		AZ, NM
<b>TLU-1.2</b>	<b>VEHICLE OPERATION</b>					
1.2.1	Enforce Speed Limits		<b>M</b>	<b>M</b>		NM
1.2.2	Vehicle Maintenance, Driver Training		<b>L</b>	<b>U</b>		NY
1.2.3	Transportation System Management		<b>L</b>	<b>H</b>		RI
<b>TLU-1.3</b>	<b>INCENTIVES &amp; DISINCENTIVES</b>					
1.3.1	Procurement of Efficient Fleet Vehicles		<b>L</b>	<b>H/M</b>		AZ
1.3.2	Feebates (state-specific or regional)		<b>L/M</b>	<b>H</b>		CT, AZ

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost Effectiveness	Additional Impacts, Feasibility Considerations	Notes
1.3.3	CO <sub>2</sub> -based Registration Fees		L/M	H		
1.3.4	Tax Credits for Efficient Vehicles		L	H		
1.3.5	Vehicle Scrappage		L	H/M		
<b>TLU-2</b>	<b>LAND USE AND LOCATION EFFICIENCY</b>					
<b>TLU-2.1</b>	<b>GENERAL</b>					
2.1.1	Infill, Brownfield Re-development		H	H		NM, AZ
2.1.2	Transit-Oriented Development		H	H/M		NM, AZ
2.1.3	Smart Growth Planning, Modeling, Tools		H	H		NM, AZ
2.1.4	Targeted Open Space Protection		M	M		
<b>TLU-2.2</b>	<b>INCREASING LOW-GHG TRAVEL OPTIONS</b>					
2.2.1	Make Full Use of CMAQ funds		L	H		
2.2.2	Improve Transit Service (frequency, convenience, quality)		M	M		
2.2.3	Transit Marketing and Promotion		M/H	H		
2.2.4	Bike and Pedestrian Infrastructure		L	H		

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost Effectiveness	Additional Impacts, Feasibility Considerations	Notes
2.2.5	Expand Transit Infrastructure (rail, bus, BRT)		M	M		
2.2.6	HOV lanes		L	L		
2.2.7	“Fix-it-First”		L/M	H		
2.2.8	Transit Prioritization (signal prioritization, HOV lanes)		L	H/M		
2.2.9	Telecommute and Live-Near-Your-Work		L	H		
2.2.10	Car Sharing		L	H		
2.2.11	E-Commerce		L	H		
<b>TLU-2.3</b>	<b>INCENTIVES &amp; DISINCENTIVES</b>					
2.3.1	Commuter Choice/Parking Cash Out		H	H		
2.3.2	VMT Tax		H	H		
2.3.3	Pay As You Drive Insurance		H	H		AZ, NM
2.3.4	Increased Fuel Tax (w/ targeted use of revenue towards travel alternatives)		M	H		
2.3.5	Location-Efficient Mortgages		L	H		
2.3.6	Congestion Pricing (or tolls) (w/ targeted use of revenue towards travel alternatives)		L/M	H		

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost Effectiveness	Additional Impacts, Feasibility Considerations	Notes
2.3.7	Parking Pricing or Supply Restrictions		H	H		
2.3.8	Transit Repositioning		M	H		
2.3.9	Transit Pricing Incentives		M	H		
2.3.10	VMT/GHG Offset Requirements for Large Developments		L/M	H		
2.3.11	Benefits for Low GHG Vehicles (preferential parking, use of HOV lanes)		L	H		
<b>TLU-2.4</b>	<b>FUEL MEASURES</b>					
2.4.1	Low-GHG Fuel Standard (e.g., renewable)		L/M	H		AZ, NM
2.4.2	Low-GHG Fuel for State Fleets (e.g., CNG, biodiesel)		L	H		
2.4.3	Biofuel Expansion (biodiesel, CNG, LPG, cellulosic ethanol)		L/M	H		AZ, NM
2.4.4	Alternative Fuel Infrastructure Development		L	H		
<b>TLU-3</b>	<b>FREIGHT</b>					
<b>TLU-3.1</b>	<b>VEHICLE TECHNOLOGY</b>					
3.1.1	Vehicle Technology Improvements (e.g., aerodynamics)		H	U		CA, NM, AZ

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost Effectiveness	Additional Impacts, Feasibility Considerations	Notes
3.1.2	R&D on Low-GHG Vehicle Technology		L	U		
3.1.3	Low-sulfur Diesel		L	U		
3.1.4	Black Carbon Control Technologies (e.g., use of particulate traps, other complementary technologies)		U	U		
<b>TLU-3.2</b>	<b>VEHICLE OPERATION</b>					
3.2.1	Freight Logistics Improvements/GIS		L/M	H		
3.2.2	Enforce Speed Limits		M	M		NM
3.2.3	Improve Traffic Flow		L	M		
3.2.4	Increased Size & Weight of Trucks		L	H		
3.2.5	Increase the Number of Rest Areas		L	H		
3.2.6	Pre-clearance at Scale Houses		L	H		
3.2.7	Truck Stop Electrification		M	H		AZ, NM
3.2.8	Enforce Anti-Idling		M	H		AZ, NM
<b>TLU-3.3</b>	<b>INCREASING LOW-GHG TRAVEL OPTIONS</b>					
3.3.1	Intermodal Freight Initiatives		L-M	U		NM
3.3.2	Feeder Barge Container Service		L	U		
<b>TLU-3.4</b>	<b>INCENTIVES &amp; DISINCENTIVES</b>					

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost Effectiveness	Additional Impacts, Feasibility Considerations	Notes
3.4.1	Procurement of Efficient Fleet Vehicles (public, private or other)		L	H/M		AZ
3.4.2	Incentives to Retire or Improve Older Less Efficient Vehicles		L	H/M		
3.4.3	Maintenance and Driver Training		L	U		NY
3.4.4	Increased Truck Tolls or Highway User Fees		L/M	H		
<b>TLU-4</b>	<b>INTERCITY TRAVEL: AVIATION, HIGH SPEED RAIL, BUS</b>					
4.1	High-speed Rail		L/M	L		
4.2	Integrated Aviation, Rail, Bus Networks		M	M/L		
4.3	Aircraft Emissions		L	H		
4.4	Airport Ground Equipment		L	H		
<b>TLU-5</b>	<b>OFF-ROAD VEHICLES (CONSTRUCTION EQUIPMENT, OUT-BOARD MOTORS, ATVS, ETC)</b>					
5.1	Incentives for Purchase of Efficient Vehicles/Equipment		L	H/M		
5.2	Improved Operations, Operator Training		L	U		
5.3	Maintenance Improvements		L	U		
5.4	Increased Use of Alternative Fuels or Low Sulfur Diesel		L	U		

