



## Catalog of State Actions

### Forestry, Agriculture, and Waste Management Technical Work Group

A catalog of state-level, GHG-reducing actions and policy options based on actions undertaken or considered by state, local, and private actors.

#### Key to Future Rankings of Options in the Following Tables

Potential GHG Emission Reductions*	Potential Cost or Cost Savings* <sup>†</sup>
<b>High (H):</b> At least 1.0 million metric tons of carbon dioxide equivalents (MMtCO <sub>2</sub> e) per year by 2020	<b>High (H):</b> \$50 per MtCO <sub>2</sub> e or above
<b>Medium (M):</b> From 0.1 to 1.0 MMtCO <sub>2</sub> e per year by 2020	<b>Medium (M):</b> \$5–\$50/tCO <sub>2</sub> e
<b>Low (L):</b> Less than 0.1 MMtCO <sub>2</sub> e per year by 2020, or 1 MMtCO <sub>2</sub> e by 2050	<b>Low (L):</b> Less than \$5/tCO <sub>2</sub> e
<b>Uncertain (U):</b> Not able to estimate at this time	<b>Negative (Neg):</b> Net cost savings
	<b>Uncertain (U):</b> Not able to estimate at this time

\* Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.

<sup>†</sup> 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.

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Other Considerations: Jobs, Fuel Imports, Externalities, Feasibility	Priority for Analysis	Notes/Related Actions in Alaska
<b>FAW-1</b>	<b>FORESTRY—PRODUCTION OF ENERGY AND MATERIALS</b>					
1.1	Expanded Use of Forest Biomass Feedstocks for Electricity, Heat and Steam Production	H	L-M			<ul style="list-style-type: none"> <li>Golden Valley Electric Association – Sustainable Natural Alternative Power Program. Provides per-kWh incentive to small (&lt;25 kW) generators using renewable sources.</li> <li>Renewable Energy Alaska Project promotes the development of Alaska's renewable energy sources.</li> <li>Related to FAW 3.1, FAW-4.1 and FAW-9.1.</li> </ul>
1.2	In-state Liquid Biofuels Production	M-H	M-H			<ul style="list-style-type: none"> <li>Related to FAW-4.2 and FAW-9.2.</li> </ul>
1.3	Improved Energy Capture from Wood Waste Combustion	L-M	L-M			<ul style="list-style-type: none"> <li>Related to FAW-3.1</li> </ul>
1.4	Improved Commercialization of Biomass Conversion Technologies	U	M-H			
1.5	Expanded Use of New, Used, & Recycled Wood Products for Building Materials	U	U			
<b>FAW-2</b>	<b>FORESTRY—BIOMASS PROTECTION AND MANAGEMENT</b>					

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Other Considerations: Jobs, Fuel Imports, Externalities, Feasibility	Priority for Analysis	Notes/Related Actions in Alaska
2.1	Forest Protection—Reduced Clearing And Conversion to Non-forest Cover	H	L			
2.2	Urban Forestry	M-H	L-M			
2.3	Afforestation and/or Restoration of Non-forested Lands	M-H	L-M			
2.4	Forest Management for Carbon Sequestration	H	L-M			<ul style="list-style-type: none"> <li>Practices may include clearing, conversion, optimization of harvest schedules, fire and disease management, re-stocking, fertilization, density management, biomass removal, and expanded use of genetically improved species.</li> </ul>
2.5	Mitigation of Forest Carbon Sequestration Loss and Emissions Due to Wildfire	U	U			
2.6	Mitigation of Forest Loss Due to Insects/Disease	U	U			
2.7	Silviculture Improvements	U	U			
<b>FAW-3</b>	<b>FORESTRY—WOOD PRODUCTS AND WASTE</b>					
3.1	Improved Mill Waste Recovery	L	L			<ul style="list-style-type: none"> <li>Related to FAW-1.1 and FAW-1.3.</li> </ul>
3.2	Improved Logging Residue Recovery	L	L-M			

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3.3	Promotion of In-state Forestry Products	L	U			
<b>FAW-4</b>	<b>AGRICULTURE—PRODUCTION OF ENERGY AND MATERIALS</b>					
4.1	Expanded Utilization of Biomass Feedstocks for Electricity, Heat, or Steam Production	H	L-M			<ul style="list-style-type: none"> <li>Golden Valley Electric Association – Sustainable Natural Alternative Power Program. Provides per-kWh incentive to small (&lt;25 kW) generators using renewable sources.</li> <li>Renewable Energy Alaska Project promotes the development of Alaska's renewable energy sources.</li> <li>Related to FAW-1.1 and FAW-9.1.</li> </ul>
4.2	In-state Liquid Biofuels Production	H	M-H			<ul style="list-style-type: none"> <li>Related to FAW-1.2 and FAW-9.2.</li> </ul>
4.3	Manure Digesters/Other Waste Energy Utilization	M	L-M			
4.4	Improving Energy Capture from Biomass Heat	M	L-M			
4.5	Expand Production/Use of Bio-based Materials and Chemicals	U	U			
4.6	Improved Commercialization of Biomass Conversion Technologies	U	U			
<b>FAW-5</b>	<b>AGRICULTURE—LIVESTOCK</b>					

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5.1	Manure Management & Utilization	L-M	L			
5.2	Changes in Animal Feed	M	L-M			
5.3	Technology Improvements to Increase Water Conservation	U	U			
<b>FAW-6</b>	<b>AGRICULTURE—CROP PRODUCTION</b>					
6.1	Soil Carbon Management	M-H	L			
6.2	Nutrient Management	M-H	L			
6.3	Technology Improvements to Increase Efficiency	L-M	L			• Related to FAW-8.1.
6.4	Water Management	U	U			
6.5	Drainage Management	U	U			
<b>FAW-7</b>	<b>AGRICULTURE—LAND USE CHANGE</b>					
7.1	Land Use Management that Promotes Permanent Cover	H	L			
7.2	Preserve Open Space/Agricultural Land	M	M-H			
<b>FAW-8</b>	<b>AGRICULTURE—FARMING PRACTICES</b>					
8.1	Increase On-Farm Energy Production and Efficiency	M	Neg-L			• Related to FAW-6.3.
8.2	Promotion of Farming Practices that Achieve GHG Benefits	M-H	L-M			• Includes improved farming practices for greenhouses, which are significant to the AK agriculture sector.

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8.3	Programs to Support Local Farming/Buy Local	L	U			
8.4	Promotion of Urban Agriculture, Community Gardens, and Green Roofs	L	L			
<b>FAW-9</b>	<b>WASTE MANAGEMENT—WASTE MANAGEMENT STRATEGIES</b>					
9.1	Expanded Use of MSW Biomass Feedstocks for Electricity, Heat, and Steam Production	M-H	Neg-L			<ul style="list-style-type: none"> <li>• Golden Valley Electric Association – Sustainable Natural Alternative Power Program. Provides per-kWh incentive to small (&lt;25 kW) generators using renewable sources.</li> <li>• Renewable Energy Alaska Project promotes the development of Alaska's renewable energy sources.</li> <li>• The Fairbanks North Star Borough soliciting an RFP for optimizing of MSW stream.</li> <li>• Related to FAW-4.1 and FAW-9.1.</li> </ul>
9.2	In-State Liquid Biofuels Production	M-H	M-H			<ul style="list-style-type: none"> <li>• Related to FAW-1.2 and FAW-4.2.</li> </ul>

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9.3	Advanced Waste Reduction and Recycling	M-H	Neg-L			<ul style="list-style-type: none"> <li>• Four largest cities initiating new recycling programs.</li> <li>• Municipal Collection Utility (Anchorage) implementing PAYT and curbside recycling in October 2008.</li> <li>• The Fairbanks North Star Borough soliciting an RFP for optimizing of MSW stream.</li> <li>• City and borough of Juneau targeting curbside recycling program in 2009.</li> <li>• Valley community for recycling Solutions moving forward on a Community Recycling Center.</li> </ul>
9.4	Promotion of Bioreactor Technology (Advanced Municipal Solid Waste Management Practices)	M-H	L-M			<ul style="list-style-type: none"> <li>• Anchorage regional landfill completed leachate re-introduction system in 2007.</li> <li>• Related to FAW-10.4</li> </ul>

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Other Considerations: Jobs, Fuel Imports, Externalities, Feasibility	Priority for Analysis	Notes/Related Actions in Alaska
9.5	Source Reduction Strategies	H	Neg-L			<ul style="list-style-type: none"> <li>• Municipal Collection Utility (Anchorage) implementing PAYT and curbside recycling in October 2008.</li> <li>• ALPAR has an in-store plastic bag recycling, reuse, and conservation toolkit available.</li> <li>• Includes reduction in the use of plastic bags.</li> </ul>
9.6	Resource Management Contracting	L	L			
9.7	Enhanced Management of Organic Waste	L-M	M-H			
9.8	Improved Commercialization of Biomass Conversion Technologies	U	U			<ul style="list-style-type: none"> <li>• The Fairbanks North Star Borough soliciting an RFP for optimizing of MSW stream.</li> </ul>
9.9	Decrease Emissions from Waste Collection	L-M	Neg-M			
9.10	Management Strategies for Class III Landfills (<4000 residents)	L	U			
9.11	Management Strategies for Class III Landfills (<400 residents)	L	U			
<b>FAW-10</b>	<b>WASTE MANAGEMENT—LANDFILL GAS STRATEGIES</b>					
10.1	Flare Landfill Methane at non-NSPS (smaller) Sites	L-M	M-H			

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10.2	Methane and Biogas Energy Programs	M-H	L-M			
10.3	Landfill Methane Energy Programs	L-M	L			
10.4	Mixed MSW Composting	L	M-H			<ul style="list-style-type: none"> <li>Haines Sanitation has constructed an in-vessel composting system which promotes rapid aerobic decomposition of the organic portion of the waste stream.</li> </ul>
<b>FAW-11</b>	<b>WASTE MANAGEMENT—WASTEWATER MANAGEMENT ACTIVITIES</b>					
11.1	Wastewater Treatment Plant Biosolids for Energy Production	U	U			
11.2	Energy Efficiency Improvements	L-M	Neg-L			
11.3	Lower Waste Processing Needs (lower water consumption, waste production)	L	L			
11.4	Install Digesters and Turbines or Engines	L-M	M-H			
11.5	Algae and Bio-Oils	U	U			
11.6	Utilization of Biosolids as a Fertilizer Substitute	U	U			