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Catalog of State Actions Residential, Commercial, Industrial (RCI) Working 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 Tables that Follow:

Potential GHG Emission Reductions <u>1/</u>	Potential Cost or Cost Savings <u>1/ 2/</u>
High (H): At least 1.0 million metric tons (MMt) carbon dioxide equivalent (CO ₂ e) per year by 2020 (~1% of current MN emissions)	High (H): \$50 per metric ton CO ₂ e (tCO ₂ e) or above
Medium (M): From 0.1 to 1.0 MMtCO ₂ e per year by 2020	Medium (M): \$5-50/tCO ₂ e
Low (L): Less than 0.1 MMtCO ₂ e per year by 2020, or 1 MMtCO ₂ e by 2050	Low (L): Less than \$5/tCO ₂ e
Uncertain (U): Not able to estimate at this time	Negative (Neg): Net cost savings
	Uncertain (U): 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 marked in bold an asterisk (*)** indicate some of the related state actions that are approved or underway, as described further in the companion options description document. TWG members are encouraged to provide information on other relevant actions.

Residential, Commercial, and Industrial (RCI)

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Other Considerations: Jobs, Fuel Imports, Externalities, Feasibility	Priority for Analyses	Notes
RCI-1	ENERGY EFFICIENCY PROGRAMS, FUNDS, AND GOALS					
1.1	Utility Demand Side Management (DSM) Programs for electricity *(S)	H	L			Xcel's new Energy Conservation Investment Program (CIP) program for industrial customers
1.2	Utility DSM Programs for natural gas, propane, and fuel oil *(S)	H	L			Xcel's new CIP program for industrial customers
1.3	Non-utility demand-side management (munis, coops, etc.)	H	L			
1.4	Energy Efficiency Funds (e.g. Public Benefit Funds) administered by State agency, utility, or 3rd party (e.g. Energy Trust) *(S)	H	L			<u>From MN Recent Action List</u> Environmental Assistance Grants/Loans Energy Conservation Investment Loan
1.5	Regional market transformation alliance	H	L			
1.6	Reduced cost or free residential energy audits	M	L			
1.7	Reduced cost energy audits for businesses	M	L			
1.8	Low-cost loans for efficiency improvements *(S)	U	U			<u>From MN Recent Action List</u> Environmental Assistance Grants/Loans Energy Conservation Investment Loan
1.9	Saving Energy, Saving Sales Tax *(S)	U	U			From MN Recent Action List
1.10	Reduce Energy Use by	U	U			From MN Recent Action List. Increase

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	30% better than code in State Owned Buildings by 2010					the 10% target in the original catalog (to a level TBD) that State owned and financed buildings should be required to be better than Minnesota Code by 2010.
1.11	Carbon screening protocols	H	L			Draft a Carbon Policy that estimating projected cost and expense issues prior to making recommendations regarding rate structures and DSM programs to the CCAG. Methods of reducing GHGs should be considered in the adoption of any changes to the building codes
1.12	Energy efficiency assistance for industrial facilities	H	L			Strengthen the energy reduction capability and increase funding for the Minnesota Technology Assistance Project so MNTAP can more effectively assist manufacturers and industry in reducing their energy use. Methods of reducing GHGs should be considered in the adoption of any changes to the building codes
1.13	Energy efficiency mortgages	H	L			Require energy efficient mortgages in MHFA financed properties and actively encourage their use in private markets.
1.14	Energy efficiency loans/ leases	H	L			To address the problem of businesses in leased facilities, grant utilities the authority to offer energy efficiency loans tied to the building meter rather than just to the current building occupant Give utilities the option of offering EE loans tied to the building meter rather than to the occupant, as a way to encourage change in leased space.

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1.15	One-Stop CIP programs	H	L			Encourage utilities to offer full service or One-Stop CIP programs in place of traditional audit programs
1.16	Golden Carrot programs	H	L			Encourage utilities to join together to offer Golden Carrot programs for efficient technologies that otherwise would not be brought to market
1.17	Efficient propane or fuel oil use	H	L			Develop efficiency programs explicitly targeted at customers who use propane or fuel oil
1.18	Municipal/cooperative energy efficiency programs	H	L			Encourage municipal utilities and cooperatives to implement energy efficiency programs for entire communities and track the savings
1.19	Reduce costs for or implement energy modeling for all public buildings in Minnesota.	U	U			Similar to Xcel's Energy Design Assistance program
1.20	Energy use outlier program	H	L			Utilities identify high energy users (outliers in their category) and attempt actions to encourage energy reduction as well as reporting to the state for possible energy rule writing. For buildings, the utility might do this for the worst 10% of a category of builder based on kW/ft2.
RCI-2	BUILDINGS					
2.1	Improved building codes for energy efficiency and structural soundness *(S)	H	L			CIP, MPCA <u>MN Recent Actions List:</u> Residential and Commercial Building Code
2.2	Training of building code and other officials in energy code enforcement	H	L			DOC, DOLI
2.3	Building Commissioning	M	L			Metro County Energy Task Force's

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	and Recommissioning, including Energy Tracking and Benchmarking *(S)					<p>(MCETF) Alternative CIP filing. Intended to be expanded to all Counties. MPCA – SIP, B3 <u>From MN Recent Actions List</u> Green Building Program Sustainable Affordable Housing MN Housing will work closely with Commerce, Utilities and the University of Minnesota Center for Sustainable Building Research to identify what mechanisms we can put in place to track performance to identify the costs and benefits of implementing energy efficient and Green measures in affordable housing developments. Fund energy audits for buildings in the B3 Benchmark system, showing up in lower quartile Extend B3 Benchmarking system to private sector by providing access to website and technical support.</p>
2.4	Increased Use of Blended Cement (substituting fly ash or other pozzolans for clinker reduces CO ₂ emissions)	M	L			
2.5	Support for energy efficient communities planning, “smart growth”	H	L			
2.6	Promotion and Incentives for Improved Design and	M	L			<u>From MN Recent Actions List</u> Sustainable Building Guidelines for New

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	Construction (e.g. LEED ¹ , Green Globes, green buildings) *(S)					State Buildings MN Housing requires an integrated design process and a green development plan. MN Housing will adopt a Minnesota overlay of Green Communities Criteria designed for affordable housing development. LEED certification is not required.
2.7	Feebate program to encourage energy efficiency in building design	U	U			
2.8	Incentives for retrofit of existing residential buildings	U	U			
2.9	Training and Education for Builders and Contractors (e.g. HVAC ² sizing, duct sealing) *(S,L)	M	L			DOC, DOLI
2.10	Energy Management Training/Training of Building Operators *(S)	L	L			Metro County Energy Task Force's (MCETF) Alternative CIP filing. Intended to be expanded to all Counties. SIP (BOC)? MN Housing requires that an owner's manual be provided for all developments about proper use and maintenance of all building systems and information on how to maintain the green features of the site.

¹ LEED = Leadership in Energy Efficiency Design, a national building certification program.

² HVAC = Heating, Ventilation, and Air Conditioning

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2.11	MN building codes and construction policies for energy efficiency and GHG reductions.	H	L			Recommend that Minnesota formulate and adapt a building code with an emphasis on energy efficiency and environmentally sound building materials. The new building code should include new construction specifications and policies and also apply to existing building improvements and upgrades. Include energy audits for all purchase transactions with code compliance issues. State buildings could serve as the pilot project.
2.12	Upgrade existing residential building codes to consider GHG impacts.	H	L			Review residential building codes and strengthen provisions that relate to electricity use
2.13	Implement energy efficiency plans for state and local government buildings	H	L			Implement a comprehensive energy efficiency plan in government buildings using the Texas Loanstar program as a model.
2.14	LGA requirements for new construction and renovation	H	L			Require each Local Government Authority (LGA) to select guidelines to use and/or require for all new public buildings and major renovations (i.e. LEED, B3, Green Communities, Green Star, etc.).
2.15	Adopt building design standards for energy consumption	H	L			Have builders of new houses and or building test and guarantee energy consumption. The minimum would be code equivalent. This goes after the quality of construction in terms of meeting code. The design might be good, but does the design get implemented through good construction practices.
RCI-3 APPLIANCE STANDARDS						

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3.1	Expansion of State-level Appliance Efficiency Standards *(S)	M	L			MN Housing currently encourages within its' architectural design standards, Energy Star appliances as well as encouraging site specific energy savings opportunities that arise.
3.2	Support for higher federal efficiency standards *(S)	M	L			MN Housing currently encourages within its' architectural design standards, Energy Star appliances as well as encouraging site-specific energy savings opportunities that arise. MPCA – letter to feds in support
3.3	Require high-efficiency appliances in new construction and retrofits	U	U			
3.4	Adopt stringent appliance efficiency standards	M	L			Phase out of less efficient models. Require high efficiency on all new construction. Create a standard energy consumption rule for all energy consuming products and labeling should disclose that information. Similar to the energy star rating. Energy star has led the way for major market ENERGY
RCI-4	EDUCATION AND OUTREACH					
4.1	Consumer education programs *(S)	H	L			DOC, MPCA MN Housing will provide an Occupant's Manual as well as Homeowner and New Resident Orientation that explains the intent, benefits, use and maintenance of green building features in affordable housing developments.
4.2	Energy Efficiency School Curriculum	H	L			MPCA-EE
4.3	Truth in Advertising Campaign	U	U			Require all buildings to disclose energy use at time of the sale in KBTU/SF/Year,

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						like an MPG rating for cars.
4.4	In-home energy displays	H	L			
4.5	Establish State advisory committee to act as clearing house for new programs & tech developments.	U	L			Address questions such as: what controls are in place for energy efficient imports? Are they UL tested? Are there excessive amounts of mercury in any of the CFL imports? Australia has a successful such initiative assisting consumers with their energy decisions.
4.6	Targeted professional training for GHG reductions	M	L			Provide training for architects and engineers on energy efficiency and GHG reduction throughout the state of Minnesota. This would also apply to those who operate commercial structures, those who specify for new construction, those who design systems. There are lots of good information and packaged programs already available, designed to lower energy use and save money. Often the organizations with the info don't have the resources to present the info.
4.7	Provide appliance environmental impact information	M	L			public education on environmental impacts of appliances (by size and fuel type). Require this information be included on appliances prior to sale, similar to energy cost information that is currently found on appliances.
RCI-5	PRICING AND PURCHASING					
5.1	Green Power Purchasing for consumers *(S)	L	M			Xcel's Wind Source program
5.2	Net-metering for DG	M	M			

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5.3	Time of Use Rates	M	L			
5.4	Tiered (increasing block) rates for electricity and natural gas use	U	U			
5.5	Bulk Purchasing Programs for Energy Efficiency or other Equipment (Public or Private sector)	U	U			IPPAT??
5.6	Truth in energy billing	M	L			Develop a task force to a uniform utility billing format which allows customers to understand the incremental cost of energy. Engage the customer to make energy decisions. Also include information on the environmental impacts of energy use, such as GHG emissions, etc
5.7	Develop Consumption histories for potential buyers or renters	U	U			Utilities shall provide perspective new owners with two years billing history of energy use.
5.8	CO2 adder	U	U			Create a "CO2 adder" based on estimated future carbon costs and use this in the evaluation CIP programs cost effectiveness
5.9	Commercial tax incentives	U	U			Provide tax incentives for super-efficient commercial buildings and use CIP programs to provide necessary technical assistance and documentation
RCI-6	TECHNOLOGY-SPECIFIC POLICIES					
6.1	Incentives for Renewable DG (Solar roofs, water heaters, etc.) to achieve 10% in public building	M	M			MPCA, DOC, MDA Require 10% of energy used in public buildings to be renewable and provide

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	and 5% in private buildings					incentives for private buildings to use at least 5% renewables.
6.2	Incentives & resources to promote Combined Heat and Power (a.k.a. cogen)	H	L			
6.3	Efficient transformers on the customer side of the meter	U	U			
6.4	Incentives & resources for passive solar heating	U	U			
6.5	White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs) *(L)	L	L			
6.6	Focus on specific end-uses consumer products: window AC units, lighting, water heating, plug loads, networked PC management, power supplies, motors, pumps, boilers, etc.	M	L			
6.7	Passive solar heating design	U	U			
6.8	Passive solar hot water	U	U			
6.9	Appliance Recycling/Pick-Up Programs	U	U			
6.10	Technologies for space and water heating	U	U			Develop a state policy on the use of electricity technologies for space and water heating to encourage those energy technologies that result in environmental benefits relative to other options.

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6.11	Geothermal heat pumps that are at least 3.2 COP and 14.1 EER.	U	U			This is consistent with Energy Star.
RCI-7 NON-ENERGY EMISSIONS (HFCS, PFCS, SF₆, CO₂ PROCESS EMISSIONS)						
7.1	Voluntary Industry-Government Partnerships *(S)	L	L			MPCA Eco-Experience Eco-Industrial (Duluth) GB partners
7.2	Promotion & funding for Leak Reduction /Capture, Recovery and Recycling of Process Gases	H	M			
7.3	Promotion & funding for Process Changes/Optimization	M	U			MNTAP
7.4	Use of Alternative Gases (other HFCs, hydrocarbon coolants/refrigerants, etc.)	U	U			MNTAP DPE
7.5	Rulemaking for limitations on Non-Energy Emissions of high potential greenhouse gases	U	L			This rulemaking would a) address the emission on a lifetime cycle basis, b) require elimination of such gases, on a phased basis, where this can be done for no cost, c) require elimination or reduction of such gases by the use prudent managerial practices or by substitution of other substances/means at reasonable cost, and d) determine reasonable cost per ton of CO ₂ e reduction in the rule making process, taking into account the availability of alternatives, and the cost of carbon credits on viable exchanges.

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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)	M	M			
8.2	Industry-Specific Emissions Cap and Trade Programs (mandatory)	L	M			
8.3	Negotiated Emissions or Energy Savings Agreements *(S)	L	L			Peak Control Agreements are available from Xcel.
8.4	Local government program for voluntary emissions targets by businesses	L	L			ICLCI Cities efforts? Carpets?
8.5	Provide tools and information for residents, businesses, & communities to perform GHG inventories.	U	U			
8.6	Reduction in GHG emissions from tachonite production.	U	U			
RCI-9	OTHER					
9.1	Government Agency Requirements and Goals (including procurement) *(S,L)	L	L			Metropolitan Council (MC) – Env. Services goal of 15% reduction by 2010 IPPAT EO's
9.2	Reduce Energy Use by 10% in State Owned Buildings *(S)	U	U			From MN Recent Action List
9.3	State buildings carbon neutral requirement	U	U			

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9.4	Municipal Energy Management *(L)	H	L			Metro County Energy Task Force (MCETF); Rural Minnesota Energy Board (17 counties)
9.5	Statewide effort to retrofit existing buildings (residential, commercial, public, and industrial) for energy efficiency.	U	U			
9.6	Focus on specific market segments such as low-income housing, small & medium enterprises, etc. --Conservation Improvement Program Affordable Housing Pilot --MN Housing Sustainable Development Policy – Green Affordable Housing	M	L	MN Housing will work closely with Commerce, Utilities and the University of Minnesota Center for Sustainable Building Research to identify what mechanisms we can put in place to track performance to identify the costs and benefits energy efficient building components and of implementing Green criteria in affordable housing developments.		MCI Grand. With Commerce, MN Housing is developing an affordable housing energy Conservation Improvement Program Pilot. The goal of the CIP Pilot is to identify and promote energy efficient models to be used in construction and rehabilitation of new affordable and supportive housing units to improve energy conservation and assist utilities in implementation of a cost-effective low-income CIP project. Minnesota Housing encourages developments to incorporate a Minnesota overlay of Green criteria designed for affordable housing development.
9.7	Energy efficiency Reinvestment Fund	M	L			
9.8	Industrial Audits	M	L			
9.9	Focus on Industrial ecology/ by-product synergy	L	L			Eco-Indus (MPCA)
9.10	Implement strategic carbon-reducing exceptions	U	U			Elec. Consumption growth by renewable energy developers, (i.e. ethanol plants) should be exempt from the gross kWh-sales requirement for CIP or potential

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						carbon offsets.
9.11	Implement carbon-based packaging standards	H	L			Direct the MNPCA to design and implement packaging standards with a sliding fee scale for carbon intensive materials and excessive packaging (landfill [methane] and transportation expenses)
9.12	CO2 reduction-linked assistance	U	U			Require that all recipients of state economic development programs make all cost effective investments to minimize their carbon emissions