Catalog of State Actions
Residential, Commercial, and Industrial (RCI) Technical 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*	Potential Cost or Cost Savings*†
High (H): At least 1.0 million metric tons (MMt) carbon dioxide equivalent (CO_2e) per year by 2020	**High (H)**: $50 per metric ton CO_2e (tCO_2e) or above
Medium (M): From 0.1 to 1.0 $MMtCO_2e$ per year by 2020	**Medium (M):** \$5-50/tCO_2e
Low (L): Less than 0.1 $MMtCO_2e$ per year by 2020, or 1 MMtCO2e by 2050	**Low (L):** Less than \$5/tCO_2e
Uncertain (U): Not able to estimate at this time	**Negative (Neg):** Net cost savings
	Uncertain (U): 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.

†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	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
RCI-1	**ENERGY EFFICIENCY PROGRAMS, FUNDS, AND GOALS**					
1.1	Utility Demand-Side Management (DSM) for Electricity (including expansion of same)	PH-H VN-M SS-H MG-H MK-H FZ-H SL-M MM-L	PH-L VN-L SS-H MG-L MK-L FZ-L SL-U MM-L			DSM Pilot programs for electricity
1.2	Utility Demand-Side Management (DSM) for Natural Gas, Propane, and Fuel Oil	PH-H VN-M SS-H MG-H MK-H FZ-H SL-M MM-L	PH-L VN-L SS-H MG-L FZ-L SL-U MM-L			
1.3	Non-Utility Demand-Side Management (DSM) Programs for Electricity	PH-U VN-M SS-H MG-H MK-M FZ-M SL-M MM-L	PH-U VN-L SS-H MG-L FZ-L SL-U MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
1.4	Energy Efficiency Funds (e.g. public benefits funds) administered by state agency, utility, or third party (e.g. Energy Trust)	PH-H VN-M SS-M MG-H MK-H FZ-H SL-M MM-M	PH-M VN-L SS-H MG-L FZ-L SL-U MM-L			Customer Choice and Electricity Reliability Act (2000) provides funding for shut-off protection and Energy Efficiency.
1.5	Regional Market Transformation Alliance	PH-M VN-M SS-L MG-H MK-M SL-M MM-L	PH-L VN-M SS-M MG-U SL-U MM-H			
1.6	Reduced cost or free residential energy audits	PH-M VN-H SS-L MG-H MK-L FZ-L SL-M MM-M	PH-M VN-L SS-H MG-L FZ-M SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
1.7	Reduced cost energy audits for businesses	PH-M VN-L SS-M MG-H MK-L FZ-L SL-M MM-M	PH-M VN-L SS-M MG-L FZ-L SL-L MM-L			
1.8	Low-cost Loans and Rebates for Energy Efficiency improvements	PH-H VN-M SS-M MG-H MK-H FZ-H SL-L MM-L	PH-M VN-L SS-H MG-L FZ-M SL-L MM-M			The Customer Choice and Electricity Reliability Act of 2000 authorized the creation of a Low-Income and Energy Efficiency Fund, administered by the Michigan Public Service Commission. The purpose of the fund is to provide shut-off protection for low-income customers and to promote energy efficiency by all customer classes.

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
1.9	Saving energy, savings sales tax	PH-U VN-L SS-L MG-U MK-L FZ-L SL-L MM-L	PH-U VN-H SS-L MG-U FZ-M SL-L MM-H			
1.10	Reduce energy use by 10% in state owned buildings	PH-L VN-H SS-L MG-L MK-L FZ-L SL-M MM-L	PH-L VN-L SS-M MG-L FZ-L SL-L MM-L			ED 2005-06 directs MI state facilities to reduce energy use by10% by 2009; 20% by 2016; ED 2007-6 directs DMB to reduce energy expenditures by 10% vs. FY06
1.11	Other Funding Mechanisms	PH-U VN-L SS-U MG-H MK-L MM-L	PH-U VN-L SS-U MG-L MM-M			
1.12	Decoupling utility revenues	PH-M VN-H SS-U MG-H MK-M MM-L	PH-U VN-L SS-U MG-L MM-H			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
RCI-2	**BUILDINGS**					
2.1.1	Improved Building Codes for Energy Efficiency – New Construction	PH-H VN-H SS-H MG-H MK-M FZ-H SL-M MM-L	PH-L VN-L SS-M MG-L FZ-L SL-L MM-L			
2.1.2	Improved Building Codes for Energy Efficiency - Renovation	PH-H VN-H SS-H MK-L MG-H FZ-M SL-M MM-M	PH-M VN-L SS-M MG-L FZ-L SL-M MM-M			
2.2	Training of building code and other officials in energy code enforcement	PH-M VN-H SS-M MG-L MK-L SL-L MM-L	PH-L VN-M SS-L MG-L FZ-M SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
2.3	Improved Design and Construction, "Government Lead-by-example"	PH-L VN-M SS-L MG-L MK-L FZ-M SL-M MM-L	PH-L VN-M SS-M MG-L FZ-M SL-M MM-M			ED 2005-06 directs MI state facilities to reduce energy use by10% by 2009; 20% by 2016; ED 2007-6 directs DMB to reduce energy expenditures by 10% vs. FY06
2.4	Increased Use of Blended Cement (substituting fly ash or other pozzolans for clinker)	PH-U VN-M SS-U MG-U MK-L FZ-L SL-L	PH-U VN-M SS-M MG-U FZ-L SL-L			
2.5	Support for Energy Efficient Communities Planning, "Smart Growth"	PH- M VN-H SS-M MG-H MK-M FZ-M SL-M MM-L	PH-L VN-M SS-M MG-L FZ-L SL-L MM-H			Several 'Smart Growth" projects are underway in Michigan.

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
2.6	Promotion and Incentives for Improved Design and Construction (e.g. LEED, green buildings) in the Private Sector	PH-M VN-H SS-M MG-M MK-L FZ-L SL-M MM-M	PH-L VN-L SS-M MG-L FZ-L SL-L MM-M			
2.7	Feebate program to encourage energy efficiency in building design	PH-U VN-L SS-M MG-M MK-M FZ-M SL-M MM-L	PH-U VN-M SS-H MG-U FZ-L SL-L MM-M			
2.8	Incentives for retrofit of existing residential buildings	PH-H VN-L SS-M MG-M MK-H FZ-H SL-M MM-M	PH-M VN-H SS-H MG-U FZ-M SL-L MM-H			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
2.9	Training and Education for Builders and Contractors (e.g. HVAC[1] sizing, duct sealing)	PH-M VN-H SS-M MG-L MK-L FZ-L SL-L MM-L	PH-L VN-L SS-L MG-L FZ-L SL-L MM-M			
2.10	Energy Management Training/Training of Building Operators	PH-M VN-H SS-M MG-L MK-L FZ-L SL-L MM-L	PH-L VN-L SS-L MG-L SL-L MM-M			
2.11	Certification or Energy Efficiency Rating for Existing Buildings	PH-M VN-H SS-M MG-M MK-L SL-L MM-L	PH-L VN-L SS-L MG-L FZ-L SL-L MM-M			
RCI-3	**APPLIANCE STANDARDS**					

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

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
3.1	Expansion of State-level Appliance Efficiency Standards	PH-L VN-M SS-U MG-M MK-M FZ-M SL-L MM-M	PH-L VN-L SS-U MG-L FZ-L SL-L MM-M			
3.2	Support for Federal-level Appliance Efficiency Standards	PH-L VN-H SS-M MG-M MK-M FZ-H SL-L MM-L	PH-L VN-L SS-L MG-L FZ-L SL-L MM-L			
3.3	Require high-efficiency appliances in new construction and retrofits	PH-M VN-H SS-M MG-M MK-L FZ-M SL-L MM-L	PH-L VN-M SS-M MG-L FZ-L SL-L MM-L			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
3.4	Lighting efficiency	PH-H VN-H SS-M MG-H MK-H FZ-H SL-L MM-M	PH-L VN-L SS-M MG-U FZ-L SL-L MM-L			
3.5	Consumer electronics standby losses	PH-L SS-M MG-U MK-L FZ-L SL-L MM-M	PH-L SS-L MG-L FZ-L SL-L MM-L			
3.6	Water heaters	PH-M SS-M MG-H MK-L FZ-L SL-L MM-L	PH-L SS-H MG-L FZ-L SL-L MM-L			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
3.7	Decommission old refrigerators in residences	PH-H VN-L SS-M MG-M MK-L FZ-L SL-L MM-L	PH-L VN-M SS-H MG-L FZ-M SL-L MM-L			
3.8	Home Heating appliance standards and awareness	PH-M VN-H SS-M MG-H MK-L FZ-L SL-L MM-L	PH-L VN-L SS-H MG-U FZ-L SL-L MM-M			
3.9	Commercial appliances	PH-M VN-M SS-M MG-H MK-L FZ-L SL-L MM-L	PH-L VN-M SS-H MG-U FZ-L SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
3.10	Electric motors and pumps for commercial and industrial use	PH-M VN-M SS-M MG-H MK-L FZ-L SL-M MM-M	PH-L VN-M SS-H MG-U FZ-L SL-M MM-M			
RCI-4	**EDUCATION AND OUTREACH**					
4.1	Consumer Education Programs	PH-M VN-H SS-M MG-M MK-L FZ-M SL-L MM-L	PH-L VN-L SS-L MG-L FZ-L SL-L MM-H			
4.2	Energy Efficiency School Curriculum	PH-M VN-H SS-L MG-M MK-L FZ-L SL-L MM-L	PH- L VN-L SS-L MG-L FZ-L SL-L MM-H			4^{th} – 7^{th} grade state curriculum to educate re: energy choices

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
4.3	Truth in Advertising Campaign	PH- L VN-M SS-M MG-L MK-L FZ-L SL-L MM-L	PH-L VN-L SS-L MG-L FZ-L SL-L MM-H			
4.4	In-home energy displays and advanced metering	PH- M VN-M SS-L MG-H MK-L FZ-M SL-L MM-L	PH-L VN-M SS-H MG-U FZ-M MM-M			
4.5	Governor's energy conservation campaign	PH-M VN-M SS-M MG-M MK-L FZ-H SL-L MM-L	PH-L VN-L SS-L MG-L FZ-L SL-L MM-H			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
RCI-5	**PRICING AND PURCHASING**					
5.1	Green or Low-Carbon Power Purchasing for Consumers	PH-M VN-M SS-L MG-M MK-L FZ-M SL-M MM-L	PH-L VN-L SS-H MG-U FZ-M SL-M MM-L			Six utilities offer 'green power' products to customers
5.2	Net-metering for Distributed Generation	PH-H VN-H SS-M MG-H MK-L FZ-L SL-M MM-L	PH-L VN-M SS-H MG-L FZ-L SL-L MM-H			State Net Metering policy (U-15316); being studied by commission
5.3	Time of use rates	PH-M VN-H SS-L MG-M MK-L FZ-L SL-M MM-L	PH-L VN-L SS-M MG-L FZ-L SL-M MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
5.4	Tiered (increasing block) rates for electricity and natural gas use	PH-U SS-M MG-M MK-M FZ-M SL-M MM-L	PH-U SS-M MG-L FZ-L SL-M MM-M			
5.5	Bulk Purchasing Programs for Energy Efficiency or Other Equipment	PH-M VN-H SS-L MG-M MK-L FZ-L SL-L MM-M	PH-L VN-L SS-M MG-L FZ-L SL-M MM-M			
5.6	Feed-in tariff	PH-U VN-L SS-U MG-H MK-L FZ-L SL-L MM-L	PH-U VN-M SS-U MG-L FZ-L SL-L MM-H			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
RCI-6	**CUSTOMER-SITED DISTRIBUTED ENERGY AND COMBINED HEAT AND POWER**					
6.1	Incentives to Promote Implementation of Renewable Energy Systems	PH-H VN-H SS-M MG-M MK-L to M FZ-M SL-M MM-L	PH-M VN-M SS-H MG-L FZ-M SL-M MM-H			Wind Working Group Collaborative was formed by the Michigan Public Service Commission and the DLEG, Energy Office with over 50 stakeholders. This collaborative has created the Wind Siting Guidelines for small- and large-wind systems.
6.2	Incentives and Resources to Promote Combined Heat and Power (a.k.a. cogen)	PH-H VN-M SS-M MG-M MK-M FZ-L MM-L	PH-M VN-M SS-H MG-M FZ-M SL-M MM-H			
6.3	Efficient transformers on the customer side of the meter	PH-U VN-M SS-M MG-U MK-L FZ-L SL-L MM-L	PH-U VN-L SS-M MG-U FZ-M SL-M MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
6.4	Incentives for passive solar heating	PH-H VN-M SS-L MG-M MK-L FZ-L SL-L MM-L	PH-H VN-M SS-H MG-L FZ-M SL-L MM-M			
6.5	White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs)	PH-M VN-H SS-L MG-M MK-L FZ-L SL-L MM-L	PH-L VN-L SS-H MG-L FZ-M SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
6.6	Focus on specific end-uses/technologies	PH-U VN-H SS-L MG-M MK-L FZ-L SL-M MM-L	PH-U VN-L SS-H MG-U FZ-L SL-L MM-M			Michigan Renewable Energy Program (MREP) was established under Section 10r(6) of 2000 PA 141. The MREP, is charged with informing customers of the availability and value of using renewable energy generation, the potential for reduced pollution, promoting the use of existing renewable energy sources, and encouraging the development of new renewable energy facilities.
6.7	Passive solar heating design	PH-M VN-H SS-L MG-M MK-L FZ-L SL-L MM-L	PH-L VN-M SS-H MG-L FZ-L SL-L MM-L			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
6.8	Solar water heating	PH-M VN-M SS-L MG-M MK-L FZ-M SL-L MM-L	PH-M VN-M SS-H MG-L FZ-M SL-L MM-M			
6.9	Appliance Recycling/Pick-Up Programs	PH-M VN-M SS-L MG-M MK-L FZ-L SL-L MM-L	PH-M VN-M SS-H MG-L FZ-M SL-L MM-L			
RCI-7	**NON-ENERGY EMISSIONS (HFCs, PFCs, SF_6, CO_2 PROCESS EMISSIONS)**					
7.1	Voluntary Industry-Government Partnerships	PH-L VN-M SS-M MG-U MK-L FZ-L SL-M MM-L	PH-L VN-M SS-M MG-U FZ-L SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
7.2	Promotion & funding for Leak Reduction / Capture, Recovery and Recycling of Process Gases	PH-U VN-H SS-L MG-U MK-L FZ-L SL-M MM-L	PH-U VN-M SS-H MG-U FZ-L SL-M MM-M			
7.3	Promotion & funding for Process Changes/Optimization	PH-U VN-M SS-U MG-U MK-L FZ-L SL-M MM-L	PH-U VN-L SS-U MG-U FZ-L SL-M MM-M			
7.4	Use of alternative gases (other HFCs. Hydrocarbon coolants/refrigerants, etc)	PH-U VN-M SS-U MG-H MK-L FZ-L SL-M MM-L	PH-U VN-M SS-H MG-U FZ-L SL-M MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
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)	PH-H VN-H SS-H MG-M MK-M FZ-M MM-M	PH-L VN-M SS-H MG-M FZ-L SL-M MM-H			
8.2	Sector-specific emissions cap and trade program	PH-M VN-L SS-U MG-H MK-H FZ-H MM-M	PH-L VN-M SS-U MG-U FZ-M SL-M MM-H			
8.3	Negotiated Emissions or Energy Savings Agreements	PH-U VN-L SS-U MG-M MK-L FZ-L SL-M MM-L	PH-U VN-M SS-U MG-U FZ-L SL-M MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
8.4	Local government program for voluntary emissions targets by businesses	PH-L VN-H SS-U MG-L MK-L FZ-L SL-M MM-L	PH-L VN-L SS-U MG-L FZ-M SL-L MM-M			
8.5	Provide tools and information for residents, businesses and communities to perform GHG inventories	PH-L VN-H SS-U MG-M MK-L FZ-L SL-L MM-L	PH-L VN-L SS-U MG-L FZ-L SL-L MM-M			
8.6	Encourage greater use of state forests for biomass	PH-L VN-L SS-U MG-M MK-L FZ-L SL-M-H MM-L	PH-M VN-H SS-U MG-M FZ-L SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
RCI-9	**OTHER**					
9.1	Government agency requirements and goals	PH-U VN-M SS-L MG-L MK-L FZ-L SL-L MM-L	PH-U VN-M SS-M MG-L FZ-L SL-L MM-M			ED 2006-04 "Electric Conservation Measures for State Departments and Agencies"
9.2	Reduce energy use by 10% in state-owned buildings	PH-L VN-H SS-L MG-L MK-L FZ-L SL-M MM-L	PH-L VN-L SS-M MG-L FZ-L SL-L MM-M			ED 2005-06 directs MI state facilities to reduce energy use by10% by 2009; 20% by 2016; ED 2007-6 directs DMB to reduce energy expenditures by 10% vs. FY06
9.3	State building carbon neutral requirement	PH-U VN-H SS-L MG-L MK-L FZ-L SL-L MM-L	PH-U VN-M SS-H MG-L FZ-M SL-L MM-L			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
9.4	Municipal Energy Management	PH-M VN-H SS-L MG-M MK-L FZ-M SL-M MM-L	PH-L VN-M SS-M MG-U FZ-L MM-M			
9.5	Statewide effort to retrofit existing buildings (residential, commercial, public, and industrial) for energy efficiency	PH-H VN-M SS-M MG-M MK-H FZ-H SL-M MM-L	PH-M VN-H SS-M MG-U FZ-M SL-M MM-H			
9.6	Focus on specific market segments	PH-M VN-H SS-L-M MG-U MK-??? FZ-H SL-M MM-L	PH-L VN-L SS-M MG-U FZ-M SL-M MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
9.7	Energy efficiency reinvestment funds	PH-M VN-M SS-M MG-H MK-L FZ-L SL-L MM-L	PH-L VN-L SS-H MG-L FZ-M SL-L MM-H			
9.8	Industrial audits	PH-M VN-H SS-M MG-M MK-L FZ-L SL-M MM-L	PH-M VN-L SS-M MG-L FZ-M SL-L MM-L			
9.9	Focus on Industrial ecology / by-product synergy	PH-M SS-L MG-U MK-L FZ-L SL-M MM-L	PH-L SS-M MG-U FZ-L SL-L MM-M			

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	TOP 10 CHOICES	Priority for Analysis	Notes / Related Actions in MI
9.10	Local government lead-by-example	PH-U VN-H SS-L MG-M MK-L FZ-L SL-M MM-L	PH-U VN-L SS-M MG-U FZ-L SL-L MM-H			Ann Arbor is installing LED street lights to reduce energy use by 50%
9.11	Industrial process assistance	PH-L VN-M SS-M MG-M MK-M FZ-M SL-M MM-L	PH-M VN-M SS-H MG-U FZ-L SL-L MM-L			

PH = Patrick Hudson
VN = Vincent Nathan
SS = Shelly Sullivan
MG = Mike Garfield
MK = Marty Kushler
FZ = Frank Zaski
SL = Steve List
MM = Michael McNalley