

Brief Description of Catalog Items

Residential, Commercial and Industrial (RCI)

MN Technical Working Group

Note that this listing is incomplete and will be fleshed out during the TWG process; working group members are encouraged to provide input on existing policies and programs, where relevant. RCI TWG members may cross reference the option description below with the “Notes” column of the RCI Catalog of Options previously distributed for recently enacted policies and programs in Minnesota.

RCI-1 ENERGY EFFICIENCY PROGRAMS, FUNDS, AND GOALS

1.1 Utility Demand-Side Management (DSM) Programs for Electricity

This option focuses on increasing investment in electricity demand-side management programs through programs run by utilities or others, energy efficiency funds, and/or energy efficiency goals. These options are typically termed DSM activities, and may be designed to work in tandem with other strategies recommended by the CCAG that can also encourage efficiency gains.

The policy design includes two key and linked dimensions: achievable/desirable energy savings and policy/administrative mechanisms to achieve these savings. In order to implement expanded DSM programs, a number of mechanisms should be considered. Candidate mechanisms include revising existing statutes to enable utility investments in energy efficiency at the levels indicated above, to consider as potentially eligible programs that are cost-effective taking into account the valuation of for CO₂ emissions. Policy and administrative mechanisms that might be applied include regulator-verified savings targets, public benefit charges, portfolio standards, “energy trusts,” integrated resource planning, performance-based incentives, decoupling of rates and revenues, and appropriate rate treatment for efficiency. Elements that might be considered in designing this option might include:

- Implementation/administration by utility (including municipal utilities and cooperatives), state agency, or third-party actors.
- Subsidized energy audits for homeowners, businesses, industries.
- Incentives for specific technologies, potential including (but not limited to) lighting, water heating, plug loads, networked personal computer management, power supplies, motors, pumps, boilers, customer-side transformers, water use reduction, ground-source heat pumps, and others.
- Energy efficiency reinvestment funds.

This policy may be broad in focus, or it can focus on specific market segments. Complimentary policies include appliance recycling/pick-up programs. Measures supporting this option might include consumer education, performance contracting, and energy end-use surveys.

1.2 Utility Demand-Side Management (DSM) Programs for Natural Gas, Propane, and Fuel Oil

This option has most of the same attributes and options for design elements and implementation as option 1.1, but focuses on increasing investment in demand-side management programs related to the use of natural gas, propane (or liquefied petroleum gas—LPG), and fuel oil, through programs run by utilities or others, energy efficiency funds, and/or energy efficiency goals.

1.3 Non-Utility Demand-Side Management (DSM) Programs for Electricity

This option has most of the same attributes and options for design elements and implementation as option 1.1, but focuses on municipal utilities and cooperatives.

1.4 Energy Efficiency Funds (e.g., public benefits funds) administered by state agency, utility, or 3rd party (e.g., Energy Trust)

A public benefits charge (sometimes call systems benefits charge) is a fee attributed to utility customers based on their usage of energy in a given time period. With deregulation in many states, the utility commissions often lost the ability to require efficiency programs of the electric utilities. The result in many states was the development of the public benefits charge, which is a non-bypassable charge on electric bills. The funds collected are then provided to a third party to provide energy efficiency programming.

1.5 Regional Market Transformation Alliance

Market transformation alliances use voluntary efforts, typically implemented by non-utility organizations, to encourage greater uptake by consumers (residential, commercial, and industrial, as well as the professionals that service energy-using equipment) of cost-effective energy efficiency practices. A market transformation program is designed to create a situation where the bulk of the private market automatically adopts or incorporates technologies or techniques that result in improved energy efficiency. The goal of a market transformation and technology development program is to put energy efficiency technologies and practices into a position where they will be demanded by the public, chosen by builders and manufacturers, and provided by retailers and contractors. Methods of transformation can be different for each technology or technique, but often revolve around public and private review of quality and effectiveness, including partnerships between government agencies, retailers, manufacturers, and non-governmental agencies. Market transformation programs can be statewide or regional.

Market transformation also seeks to ensure sufficient supplies of technologies and practitioners to meet the subsequent increased demand for energy efficiency.

Potential elements of a market transformation program include:

- Target specific measures, such as ground-source heat pumps, solar WH/PV, or other technologies important for Minnesota.
- Support for commercialization of promising technologies.
- Bulk purchasing programs (public/private) or arrangements with retailers.

Consumer education is a significant supporting measure for market transformation programs.

1.6 Reduced cost or free residential energy audits

This option includes providing residential-sector energy technical assistance (energy audits) to identify and recommend options for reducing fossil energy and electricity use, and for reducing non-energy emissions of GHGs. A combination of incentives, expertise, and information to implement recommended options could be included in the policy to encourage residential customers to follow up on audit recommendations.

1.7 Reduced cost energy audits for businesses

This option includes providing commercial-sector energy technical assistance (energy audits) to identify and recommend options for reducing fossil energy and electricity use, and for reducing non-energy emissions of GHGs. A combination of incentives, expertise, and information to implement recommended options could be included in the policy to encourage businesses to follow up on audit recommendations.

1.8 Low-cost Loans for Energy Efficiency improvements

This option refers to revolving low-interest loan fund(s) for energy efficiency investments in distribution service areas that are not covered by existing utility programs.

1.9 Saving energy, savings sales tax

This option refers to a sales tax exemption for energy-efficient products. Such an option was implemented in MN in fall 2001. Products included are compact fluorescent light bulbs, and highly efficient electric heat pump water heaters (HPWHs), natural gas water heaters, and natural gas furnaces.

1.10 Reduce energy use by 10% in state owned buildings

Recognizing that governments should “lead by example” the option presented here provides energy use targets to improve the efficiency of energy use in State and local government buildings. This option sets energy-efficiency goals for the existing government building stock, as well as for new construction and major renovations of government buildings. Such an option is consistent with MN’s Energy Management Services Office Administration, which promotes energy efficiency in state-owned and wholly leased buildings throughout the state.

RCI-2 BUILDINGS

2.1 Improved Building Codes for Energy Efficiency

Building energy codes specify minimum energy efficiency requirements for new buildings or for existing buildings undergoing a major renovation. Given the long lifetime of most buildings, amending state and/or local building codes to include minimum energy efficiency requirements and periodically updating energy efficiency codes could provide long-term GHG savings. Implementation of building energy codes, particularly when much of the building occurs outside of urban centers, can require additional resources. Potential elements of a policy to include building codes include:

- Require high-efficiency appliances in new construction and retrofits.
- Training of building code and other officials in energy code enforcement.

Potential measures supporting this option can include consumer education, improved enforcement of building codes, training for builders and contractors, and development of a clearinghouse for information on and to provide access to software tools to calculate the impact of energy efficiency and solar technologies on building energy performance.

2.2 Training of building code and other officials in energy code enforcement”

This option refers to an education and outreach program for building inspectors to encourage incorporation in inspection protocols of energy-efficiency and greenhouse gas emissions-reduction considerations. This program could expand on the education programs currently provided in MN.

2.3 Improved Design and Construction, “Government Lead-by-example”

Recognizing that governments should “lead by example” the option presented here provides energy use targets to improve the efficiency of energy use in new and existing State and local government buildings. The proposed policy provides energy efficiency targets that are much higher than code standards for new state-funded and other government buildings. This option sets energy-efficiency goals for the existing government building stock, as well as for new construction and major renovations of government buildings. Potential elements of this policy include:

- Requiring that energy efficiency be a criterion in procurement of energy-using equipment and systems, and in the improvement in operation of buildings and other facilities
- Audits of energy performance and operations of State and other government buildings (in tandem with an audit program). Audit results could be used to target and prioritize investments in improving government building energy efficiency. (See also 10.2)
- Improvement and review of efficiency goals over time, and development of flexibility in contracting arrangements to encourage integrated energy-efficient design and construction.
- Recommendations that the infrastructure for implementation (meters, bookkeeping systems, staff, etc.) be established as soon as possible.
- State bulk-purchase of appliances and equipment with higher-than-standard energy efficiency for public facilities.
- Establishing “retained savings” policies whereby government agencies are able to retain funds saved by reducing energy bills for further energy efficiency/renewable energy investments or other uses.

Potential supporting measures for this option include raining and certification of building sector professionals and performance contracting/shared savings, but could also include surveys of government energy and water use, energy benchmarking, measurement, and tracking programs for municipal and state buildings.

2.4 Increased Use of Blended Cement (substituting fly ash or other pozzolans for clinker)

The CCAG could recommend that Minnesota promote the use of blended cement in buildings and other applications. (Substituting fly ash or other pozzolans for clinker—the chief ingredient of cement—reduces CO₂ emissions associated with clinker production from limestone.)

2.5 Support for Energy Efficient Communities Planning, "Smart Growth"

“Smart Growth” aims to create communities that are, among other attributes, livable, designed for reduced use of energy both within homes and businesses and in the transport sector, and have a reduced environmental impact relative to typical developments. Variants on the smart growth concept exist, but many call for clustering living units with easy access (often walking distance) to shops, schools, and entertainment and recreational facilities, incorporating elements of energy-efficient design and renewable energy in buildings, sharing energy facilities between buildings (for example, district heating systems), and preserving open spaces. See, for example, http://www.epa.gov/smartgrowth/about_sg.htm for additional information about Smart Growth.

2.6 Promotion and Incentives for Improved Design and Construction (e.g. LEED¹, green buildings) in the Private Sector

This policy provides incentives and targets to induce the owners and developers of new and existing buildings to improve the efficiency with which energy and other resources are used in those buildings, along with provisions for raising targets periodically and providing resources to building industry professionals to help achieve the desired building performance. This policy can include elements to encourage the improvement and review of energy use goals over time, and to encourage flexibility in contracting arrangements to encourage integrated energy- and resource efficient design and construction.

Additional potential elements of this option include:

- Target new, renovated, and/or existing buildings (retrofits).
- Set a cap on consumption of energy per unit area of floorspace for new buildings.
- Encourage building commissioning and recommissioning, including energy tracking and benchmarking.
- Provide incentives, in the form of tax credits, DSM program support, financing incentives (such as “green mortgages”), or other inducements for retrofit of existing residential and commercial buildings.
- Encourage the use of alternative and local building materials and practices.

Potential supporting measures for this option include training and certification of building professionals, consumer and primary/secondary education, performance contracting/shared savings arrangements, and setting up of a clearinghouse for information on and access to software tools to calculate the impacts of energy efficiency and solar technologies for buildings.

2.7 Feebate program to encourage energy efficiency in building design

This option refers to the set up of a “feebate” program to encourage energy efficiency in building design. The concept of a “feebate” has typically been considered as a mitigation option in the transport sector, but is essentially any government program designed to reduce energy use and pollution by levying a fee on fuel-inefficient devices/facilities and offering a rebate on fuel-efficient devices/facilities.

¹ Leadership in Energy and Environmental Design; see U.S. Green Building Council, <http://www.usgbc.org>.

2.8 Incentives for retrofit of existing residential buildings

This policy provides incentives and targets to induce the owners of existing homes to improve the efficiency with which energy and other resources are used, along with provisions for raising targets periodically. This policy can include elements to encourage the improvement and review of energy use goals over time, and target renovated, and/or existing dwellings.

2.9 Training and education for builders and contractors (e.g., HVAC sizing, duct sealing)

This option refers to an education and outreach program for building professionals to encourage incorporation of energy-efficiency and greenhouse gas emissions-reduction considerations. This program could expand on the monthly education programs currently provided in MN. Examples include:

- Start programs to train builders and contractors on proper heating and air conditioning sizing and installation.
- Mandate that State Boards of Licensing for building professionals cover knowledge of the improved building codes and building energy performance requirements reflected in various policy options in licensing exams.
- Implement code training and technical assistance for builders and architects.

2.10 Energy Management Training/Training of Building Operators

Energy Management Training provides administrative and technical training for energy managers, school officials, building operators, and others responsible for energy-efficient facility operation. This policy could include:

- Training commercial building energy managers, for example by making use of the building operator training and certification program developed in the Pacific Northwest.
- Training industrial energy and facility managers in techniques for improving the efficiency of their steam, process heat, pumping, compressed air, motors, and other systems, perhaps dovetailing with the U.S. DOE in this area.

RCI-3 APPLIANCE STANDARDS

3.1 Expansion of State-level Appliance Efficiency Standards

Appliance efficiency standards reduce the market cost of energy efficiency improvements by incorporating technological advances into base appliance models, thereby creating economies of scale. Appliance efficiency standards can be implemented at the state level for appliances not covered by federal standards, or where higher-than-federal standard efficiency requirements are appropriate.² Regional coordination for state appliance standards can be used to avoid concerns that retailers or manufacturers may (1) resist supplying equipment to one state that has advanced

² In recent years, Arizona, Oregon, and Washington, among other states, adopted state standards for several appliances; this led to the inclusion of standards for these appliances in the 2005 federal Energy bill.

standards or (2) focus sales of lower efficiency models on a state with less stringent efficiency standards.

Potential elements of an appliance efficiency standards policy include:

- Establishment and enforcement of higher-than-federal state-level appliance and equipment standards (or standards for devices not covered by federal standards).
- Joining with other states in adopting higher standards.
- Requiring high-efficiency appliances in new construction and retrofits.

Consumer education is a potential supporting measure for this option.

3.2 Support for Federal-level Appliance Efficiency Standards

This policy option involves advocating for the development and implementation of higher federal-level appliance efficiency standards.

3.3 Require high-efficiency appliances in new construction and retrofits

This policy option involves a requirement for the use of high efficiency appliances in new residential and commercial buildings, as well as in any retrofits of new residential and commercial buildings.

RCI-4 EDUCATION AND OUTREACH

4.1 Consumer Education Programs

The ultimate effectiveness of emissions reduction activities in many cases depends on providing information and education to consumers regarding the energy and GHG emissions implications of consumer choices. Public education and outreach is vital to fostering a broad awareness of climate change issues and effects (including co-benefits, such as clean air and public health) among the state's citizens. Such awareness is necessary to engage citizens in actions to reduce GHG emissions in their personal and professional lives. Public education and outreach efforts should integrate with and build upon existing outreach efforts involving climate change and related issues in the state. Ultimately, public education and outreach will be the foundation for the long-term success of all of the mitigation actions proposed by the Minnesota CCAG, as well as those that may evolve in the future.

4.2 Energy Efficiency School Curriculum

The long-term effectiveness of emissions reduction activities depends on providing information and education not only to present consumers, but to future consumers as well. This policy option involves the education of primary and secondary school students regarding the energy and GHG emissions implications of consumer and societal choices. Public education and outreach is vital to fostering a broad awareness of climate change issues and effects (including co-benefits, such as clean air and public health) among the state's young citizens. As with adult consumers, public education and outreach efforts should integrate with and build upon existing outreach efforts involving climate change and related issues in the state.

4.3 Truth in Advertising Campaign

Truth-in-advertising campaigns target advertising of energy consuming products to provide factual and accurate information regarding the GHG emission implications of the product(s).

4.4 In-home energy displays

There are a number of energy use display units that are now available to provide customers with readily accessible, real-time (or near real-time) information about their energy use. Though such units have been deployed in relatively small numbers, multiple studies and experience with prepayment programs (where the number of devices in use is more significant) demonstrate that in-home display devices can help catalyze customer energy conservation, with savings ranging from 4 to 20%. The costs of display units have been an obstacle to mass deployment. However, increased attention to demand response and advanced metering infrastructure in the U.S., and in energy conservation for emissions reductions in Canada, has spurred recent interest.

RCI-5 PRICING AND PURCHASING

5.1 Green Power Purchasing for Consumers

Green power purchasing comprises a variety of consumer-driven strategies to increase the production and delivery of low-GHG power sources, above and beyond levels achieved through Renewable Portfolio Standards and other mandatory programs.

Possible elements of green power programs include:

- A definition of what power sources qualify as green power source by a relevant authority.
- Regulatory encouragement for utilities to develop green power tariff structures.
- Implementation of regulatory requirements that power sources and emissions data be reported in consumer utility bills.
- State goals or mandates for green power purchases, or for the renewable fraction of standard purchased electricity, that would apply to all non-federal government buildings, including local government buildings, public schools, and public universities. This could also be a part of State “Lead-by-example” programs.
- Promotion by the State and/or other entities of voluntary purchasing of green power through provision of information and promotional materials.

5.2 Net-metering for Distributed Generation

This policy option involves the consideration and adoption by state regulatory authorities of rate designs, coupled with the necessary metering technology, that promote reduction in GHG emissions by encouraging consumers to install distributed generation systems—especially those based on renewable fuels—and combined heat (and or cooling) and power systems that offer the opportunity to improve the overall efficiency of fuel use.

Potential elements of this option include:

- Review existing net-metering policies, including policies that affect electricity consumers who install on-site combined heat and power or distributed generation fueled with renewable

or fossil fuels. Consider the impact of NO_x and power factor requirements on net-metering and availability of information for small customers.

- Review rate issues, including decoupling of utility revenues from sales, and consider a specific focus on the impacts of rate design on greenhouse gas emissions. This could include an exploration of the impacts of time-of-use rates on GHG emissions.
- Review and consider utility and other technical rules related to the interconnection of consumer-sited power sources to the electricity grid to assure that they offer equitable treatment of potential distributed generation hosts while providing adequate safeguards for the public and for power sector workers.

5.3 Time of use rates

Time-of-use rates typically price electricity higher at times of higher power demand, and thus better reflect the actual cost of generation. Time-of-use rates may or may not have a significant impact on total GHG emissions, but do affect on-peak power demand and thus both the need for peaking capacity and fuel for peaking plants.

5.4 Tiered (increasing block) rates for electricity and natural gas use

Tiered (increasing block) rates for electricity and natural gas use provide affordable base usage rates for consumers, but which increase with increasing consumption, hence providing a built-in rate incentive for energy conservation and energy efficiency.

5.5 Bulk Purchasing Programs for Energy Efficiency or Other Equipment

Bulk purchasing of appliances and equipment with higher-than-standard energy efficiency by public agencies, and for the organization of similar bulk-purchase programs in the private sector, is a policy option that can augment or be a part of DSM, market transformation, or State Lead-by-example programs. In this option, a government or non-governmental organization purchases large quantities of energy-efficiency products (such as high-efficiency refrigerators or office equipment, or solar water heaters) and/or services (such as home weatherization services) at a bulk price. The organization then either uses the purchased items and services internally, or sells them at an attractive price to other buyers. Bulk purchase programs can help to rapidly develop markets for energy-efficiency or low-GHG goods and services.

Potential elements of this option include:

- Municipal or State government programs, possibly including training in the use of existing bulk-purchasing tools³.
- Programs for schools.
- Private-sector programs (possibly in coordination with market transformation programs).

³ For example, the EnergyStar bulk purchasing tool—developed by the U.S. Department of Energy, in collaboration with the Department of Housing and Urban Development and the U.S. Environmental Protection Agency—is designed to make it easy to comparison shop for energy-efficient products. The tool provides a simple way to obtain bids on EnergyStar-qualified products such as appliances, compact fluorescent light bulbs, and light fixtures.

RCI-6 CUSTOMER-SITED DISTRIBUTED ENERGY AND COMBINED HEAT AND POWER

6.1 Incentives to Promote Implementation of Renewable Energy Systems

Distributed electricity generation sited at residences and commercial and industrial facilities, and powered by renewable energy sources (typically solar, but also wind, small hydroelectric power sources, or biomass or biomass-derived fuels), displaces fossil-fueled generation and avoids electricity transmission and distribution losses, thus reducing greenhouse gas emissions. This policy can also encourage consumers to switch from using fossil fuels to using renewable fuels in applications such as water, process, and space heating, as well as to supply new energy services using fuels that produce low or no GHG emissions. Increasing the use of renewable energy applications in homes, businesses, and institutions in Minnesota can be achieved through a combination of regulatory changes and financial incentives. Potential elements of this option include:

- Solar roofs (roofing materials with built-in solar photovoltaic cells, or solar PV panels erected on roofs).
- Solar water heating and solar space heating systems.
- Wind power systems, particularly for rural areas.
- Biomass-fired generation, space, or water heating systems.
- Programs targeted at specific customer sectors (residential, commercial, industrial), or specific markets within sectors.
- Tax credits, and/or utility or other incentives to lower the first cost of distributed energy systems to users. Minnesota currently offers a tax credit of 25% of the installation cost for residential or business purchase of solar heating and cooling systems. (Amounts over the annual tax credit limit of \$3,500 can be rolled over to subsequent years.)

Potential supporting measures for this option include training/certification of installers/contractors, net metering and other pricing arrangements, interconnection standards, and creation/support of markets for biomass fuels.

6.2 Incentives and Resources to Promote Combined Heat and Power (a.k.a. cogen)

Combined heat and power (CHP) systems reduce fossil fuel use and greenhouse gas emissions, both through the improved efficiency of the CHP systems, relative to separate heat and power technologies, and by avoiding transmission and distribution losses associated with moving power from central power stations that are located far away from where the electricity is used. Potential elements of this option include:

- Promotion of the use of gas-fired CHP systems
- Promotion of the use of biomass-fired CHP systems
- Creation/expansion of markets for, and incentives designed to promote implementation of, CHP units in capacities suitable for residential, commercial, and industrial users.

- Provision of tax benefits, attractive financing arrangements, and other incentives to promote CHP technologies.

Potential supporting measures for this option include training/certification of installers/contractors, net metering and other pricing arrangements, establishment of clear, and consistent interconnection standards, and creation/support of markets for biomass fuels.

6.3 Efficient transformers on the customer side of the meter

Industrial and commercial facilities served by 480-volt three-phase power from a utility typically use dry-type transformers to distribute power internally at lower voltages such as for lighting and plug power. Efficient transformers are able to produce lower losses throughout the period of usage. When combined with incentives, the electricity saved by qualified such energy efficient transformers typically has a 3-year payback period.

6.4 Incentives for passive solar heating

This option involves providing incentives for incorporating passive solar design in building construction. Passive solar heating applications represent a cost-effective means of providing heat to buildings. Passive solar applications, when included in initial building design, adds negligible costs to the overall cost of a building, yet results in reduced operational costs and reduced equipment demand. Passive solar heating is a conventional, well-understood technology that is reliable, mechanically simple, and is economically viable.

6.5 White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs)

High summer roof temperatures increase the need for more electricity for air conditioning, as well as producing black carbon from updrafts. Incentives for white roofs, rooftop gardens, and landscaping can lower electricity demand.

6.6 Focus on specific end-uses/technologies

Policies focusing on specific energy end-uses and technologies can target window AC units, lighting, water heating, plus loads, networked PC management, power supplies, motors, pumps, boilers, and others. Consumer products programs may include education, incentives, retailer training, and marketing and promotion.

6.7 Passive solar heating design

Please see option 6.4.

6.8 Passive solar hot water heating

Solar hot water systems use the sun's energy to heat water and are almost always used along with conventional water heaters. These systems use the sun's energy either to heat water directly or to heat a fluid such as antifreeze that indirectly heats the water through a heat exchanger. Solar-heated water is then stored for use as needed. A conventional water heater provides any additional heating that might be necessary. Solar hot water systems are always mounted on a south-facing roof, a south-facing outside wall, or on the ground facing south, to take greatest advantage of the sun's rays. Solar hot water systems can be either active or passive.

6.9 Appliance Recycling/Pick-Up Programs

Emissions associated with improper disposal of discarded appliances can be reduced by facilitating appliance recycling and disposal. This policy may be considered in tandem with RCI-1.1 (Demand-Side Management/Energy Efficiency Programs, Funds, or Goals for Electricity) and other policies that effect appliance turnover.

RCI-7 NON-ENERGY EMISSIONS (HFCS, PFCS, SF₆, CO₂ PROCESS EMISSIONS)

7.1 Voluntary Industry-Government Partnerships

Voluntary agreements with industries can be used to reduce the emissions of process gases that have high global warming potentials (GWP, a measure of the potential impact of different gases on climate in terms of “CO₂-equivalent”). Minnesota can implement voluntary programs and public-private partnerships, or it can provide support to programs at the local or county level.

7.2 Promotion & funding for Leak Reduction / Capture, Recovery and Recycling of Process Gases

The CCAG can recommend that the state engage in promotion and funding for leak reduction/capture, recovery and recycling of process gases with high global warming potential.

7.3 Promotion & funding for Process Changes/Optimization

Promotion and funding for process changes/optimization can be used to reduce the emissions of process gases with high global warming potential.

7.4 Use of alternative gases (other HFCs. Hydrocarbon coolants/refrigerants, etc)

A number of the energy services provided by gases uses in the RCI sectors can be met through the use of different gases. Alternatives exist for air conditioning and , refrigeration. Moving to less carbon-intensive gases/technology combinations in some end uses can be achieved through a combination of promotion and incentive programs, market creation/expansion.

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)

A number of the energy services provided by fuels use in the RCI sectors can be met through the use of different fuels. Prime examples here are water and space heating, as well as industrial process heat, which can be provided by burning coal, oil, gas, biomass, and perhaps hydrogen, or by using electricity or solar heat. Alternatives also exist for air conditioning, where absorption air conditioning units using heat from combustion of fuels or from solar heat can substitute for electric units. Moving to less carbon-intensive fuel/technology combinations in some end uses can be achieved through a combination of promotion and incentive programs, market creation/expansion (for biomass fuels or for equipment not common in the market, for example).

8.2 Industry-specific emissions cap and trade program

A cap-and-trade system is a market mechanism in which GHG emissions are limited or capped at a specified level, and capped entities can trade permits (a permit is an allowance to emit one ton

of CO₂e). In principle, trading lowers the overall costs of meeting a given emission target, as participants with lower costs of compliance can choose to over-comply and sell their additional reductions to participants for whom compliance costs are higher.

Among the important considerations with respect to a cap-and-trade program are: the sources and sectors to which it would apply (“upstream” at the fuel extraction or import level vs. “downstream” at points of fuel consumption); whether electricity is dealt with from a load-based or generation-based perspective; the level and timing of the cap; how allowances would be distributed (e.g. via grandfathering and/or auctioning) and how new market entrants would be accommodated; what, if any, offsets would be allowed; over what region the program would be implemented (e.g., nationally, regionally, etc.); which GHGs are covered; whether price caps (e.g. safety valves) are included; whether there is linkage to other trading programs; whether banking and/or borrowing among time periods is allowed; early reduction credit; what, if any, incentive opportunities may be included; use of any revenue accrued from permit auctions; and provisions for encouraging energy efficiency, if relevant. The principal example of a GHG cap-and-trade system in the US is the Northeast States’ Regional Greenhouse Gas Initiative: <http://www.rggi.org/>. For the RCI sectors, a Cap and Trade program may be considered primarily for large industrial sources of greenhouse gases (as envisioned by the option), or may include other sectors as well.

8.3 Negotiated Emissions or Energy Savings Agreements

Government agencies could work with industrial and other large users of energy (and/or of process gases that are greenhouse gases) to encourage those organizations to set emissions reduction targets. This option may be implemented through a combination of financial and other incentives, public-private partnerships and agreements, provision of information and technical assistance, and other methods.

Organizations that use large amounts of energy (electricity, gas, or other fuels) and/or are responsible for large volumes of direct greenhouse gas emissions would be encouraged to set and pursue their own emissions reduction targets. The organizations participating in such a program would typically be large industrial plants, although in some cases large commercial or governmental organizations and facilities might also participate. Reductions in greenhouse gas emissions can be achieved in the industrial sector through energy efficiency, process changes, and/or switching to the use of less carbon-intensive fuels to provide key energy services. Providing tools and information for residents, businesses, and communities to inventory GHG emissions, and to use inventory results to set reduction targets, can also be an element of this option.

8.4 Local government program for voluntary emissions targets by businesses

Local governments could work with industrial and other large users of energy in their jurisdiction to encourage those organizations to set emissions reduction targets above targets that are in effect throughout the rest of the state. This option could be implemented through a combination of financial and other incentives, public-private partnerships and agreements, provision of information and technical assistance, and other methods.

8.5 Provide tools and information for residents, businesses and communities to perform GHG inventories

Tools can be in the form of web-based calculators (of which there are many available) that walk the user through their GHG emissions, or information that can assist residents, businesses and communities to evaluate and act upon GHG inventory results.

RCI-9 OTHER

9.1 Government agency requirements and goals

Recognizing that governments should “lead by example” this option provides energy reduction provided by government agency services. This option sets energy-efficiency goals and is consistent with option 1.10.

9.2 Reduce energy use by 10% in state-owned buildings

Please see option 1.10.

9.3 State building carbon neutral requirement

Carbon neutral building incorporates the following features:

- Encourages the consideration of the overall building lifecycle for carbon neutral impacts, including siting, site preparation, construction materials and techniques, construction debris disposal
- Integrates development considerations such as transportation, water, wastewater, food and energy supply
- Points developer/builders toward overall low impact designs that use local materials to minimize embodied energy
- Includes reforestation, agriculture or other sequestration methods for offsetting any net positive emissions

9.4 Municipal Energy Management

Under this type of policy, Minnesota could initiate and provide funding for Municipal Energy Management systems, as well as audits of energy performance and operations of local government buildings. Audit results could be used to target and prioritize investments in improving government building energy efficiency.

9.5 Statewide effort to retrofit existing buildings (residential, commercial, public, and industrial) for energy efficiency

This policy provides incentives and targets to induce the owners of existing buildings to improve the efficiency with which energy and other resources are used in those buildings, along with provisions for raising targets periodically. This policy can include elements to encourage the improvement and review of energy use goals over time, and target renovated, and/or existing buildings.

9.6 Focus on specific market segments

Energy efficiency programs, funds, or goals can focus on specific market segments, such as existing homes (weatherization), new construction, apartments, low income residential, and

small and medium businesses. Targeting specific market segments can also be an effective component of a regional market transformation alliance.

9.7 Energy efficiency reinvestment funds

This policy involves the set up of a fund from which grants are made available to organizations implementing energy saving projects through internal loans from the fund. The project loan is repaid at a percentage of annual energy savings, and once it is repaid the organization continues to benefit from ongoing energy savings. As repayments are recycled back into the fund they are available for reinvestment, so create a self-sustaining pot for further energy efficiency projects.

9.8 Industrial audits

This policy option includes providing industrial-sector energy technical assistance (energy audits) to identify and recommend options for reducing fossil energy and electricity use, and for reducing non-energy emissions of GHGs. A combination of incentives, expertise, and information to implement recommended options could be included in the policy to encourage the operators of industrial-sector facilities to follow up on audit recommendations.

9.9 Focus on Industrial ecology / by-product synergy

The state can engage in outreach activities and voluntary partnerships with industry to promote implementation of industrial ecology, using innovation and systems-based analysis to reduce GHG emissions, and by-product synergy, in which waste streams from one industry or process are used as a resource to another.