



Brief Description of Catalog Items Residential, Commercial and Industrial (RCI) Technical Working Group

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 MCAC 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 for programs that are cost-effective taking into account the valuation of 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 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, 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.
- Demand-response programs, focusing on reducing peak load

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-by passable 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 Michigan.
- 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 and Rebates for Energy Efficiency improvements

This option refers to revolving low-interest loan fund(s) and rebates 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. 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. MI is already undertaking “lead by example” efforts through executive order.

1.11 Other Funding Mechanisms

This option captures potential funding mechanisms not covered elsewhere. Examples would include pay-as-you-save programs which allow the building owner to pay for the efficiency

improvement over time through their electric bill by dedicating some or all of the savings to financing the improvement. Other creative financing ideas might include modifying tools from municipalities such as tax increment financing or special benefits districts.

1.12 Decoupling utility revenues

Conventional utility rate setting tends to directly connect revenues with profits. Investor owned utilities (IOUs) therefore have a built-in incentive to maximize sales. Equally powerful is the incentive to oppose the loss of sales, including those that occur as a result of DSM activities. Decoupling utility revenues from profits in rate setting can realign incentives to encourage effective utility investment in DSM, energy efficiency and integrated resource planning and removes the incentive to maximize sales. It is important to note that these incentives only apply to IOUs and not municipal utilities and cooperatives.

Existing Actions in MI

- DSM pilot programs for electricity

RCI-2. Buildings

2.1.1 Improved Building Codes for Energy Efficiency – New Construction

Building energy codes specify minimum energy efficiency requirements for new buildings. 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 for building codes include:

- Require high-efficiency appliances in new construction.
- More stringent minimum energy efficiency requirements for building envelopes and critical components such as windows, doors, HVAC systems, water heating, lighting, etc. Consider upgrading to 2006 IECC (International Energy Conservation Code) as the new standard.
- 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, various incentives, 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.

2.1.2 Improved Building Codes for Energy Efficiency – Renovation

Building energy codes specify minimum energy efficiency requirements 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. Given the average age of the building inventory in Michigan and relatively slow growth it is believed that the best opportunity for significant GHG reductions is through upgrade and renovation of existing buildings. To minimize the risk that new requirements will discourage reinvestment in existing properties in the near-term, policies should favor incentives to encourage the achievement of high standards while more stringent mandatory standards are phased-in. Potential elements of a policy for building codes include:

- Offer financial, tax or other incentives to encourage existing building owners to achieve energy efficiency standards such as Energy Star and LEED, beyond the minimum required.
- Offer financial, tax or other incentives to encourage the use of high-efficiency appliances in retrofits.
- Require high-efficiency appliances in retrofits.
- Minimum energy efficiency requirements for renovated building envelopes and critical components such as windows, doors, HVAC systems, water heating, lighting, etc. Consider upgrading to 2006 IECC (International Energy Conservation Code) as the new standard.
- 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 designers, builders and contractors, various incentives 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.

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 training 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 MCAC could recommend that Michigan 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. This can include encouraging redevelopment of existing urban areas. 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

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

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 floor space 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. Programs such as LEED, green buildings, and Energy Star can be incorporated into this policy.

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.

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. This could also include a certification program for residential buildings (like LEED EB for commercial buildings).

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.

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.
- Provide training for non-HVAC trade subcontractors in best energy conservation practices specific to their trade (plumbers, framers, insulators, masons, etc.).

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.

2.11 Certification or Energy Efficiency Rating for Existing Buildings

There are a number of programs to certify or rate the energy performance of appliances, building components or entire new structures. If a comparable certification or rating were available for building retrofits, and if building owners were aware of and understood the full benefits of the certification, more building owners would upgrade their renovation specs to achieve the certification. The certification or rating could include a simple and widely trusted estimate of energy cost savings that would allow the owner to justify a higher renovation cost in anticipation of reduced operating costs throughout the life of the improvement.

It is proposed that a Michigan program be established to communicate the benefits of and desire for energy efficiency in existing structures among owners, remodelers, realtors and potential buyers. [The US Green Building Council has created the LEED-EB, the LEED program for existing buildings, which could help serve this purpose for commercial structures, but a similar tool scaled appropriately for residential buildings is not readily available.](#) In order to facilitate communications and common understanding, a standardized energy efficiency (EE) rating system needs to be adopted for existing buildings. Such a rating system would:

- Help owners understand what level of improvements are needed for achieve each rating level
- Help home shoppers immediately know the EE level of each property
- Help remodelers know what is required for each EE level in remodeling and upgrades
- Help realtors to better classify, price and promote higher level EE properties

By creating a common understanding of and desire for EE, the assumption is that the pace of home EE upgrades would increase.

Existing Actions in MI

- Executive Directive 2005-06, titled “Energy Efficiency in State Facilities,” directed the Michigan Department of Management and Budget to achieve energy use reductions of 10 percent by the end of 2008 and 20 percent by the end of 2015. These reductions are to be met through: implementation of energy conservation measures in State facilities; use of cleaner vehicles in State vehicle fleets; green purchasing incentives; and requiring new State buildings to achieve LEED certification.
- Energy Directive E.D. 2007-6 required the Michigan Department of Management and Budget to create a plan to reduce fiscal year 2007 state electrical and other energy expenditures by 10 percent from the fiscal year 2006 level.
- Emergency energy reduction measures due to high temperatures and corresponding high electric demand on the Midwest Independent System Operator (MISO) transmission grid were addressed through Executive Directive 2006-04 “Electric Conservation Measures for State Departments and Agencies.”
- Existing “Smart Growth” developments are under way in several Michigan communities.

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

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.

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.

3.4 Lighting efficiency

Develop programs to encourage the use of energy efficient lighting systems, such as light emitting diodes (LEDs) and compact fluorescent lamps (CFLs).

3.5 Consumer electronics standby losses

Many consumer electronic devices such as televisions, DVD players, receivers, computers, and dozens of other devices remain in a ‘standby’ state when switched ‘off’. While this is a low-power state, the device continues to consume electricity, often for no better reason than to await a restart signal from a remote control. Individually the standby power use is often small, but these devices have proliferated to the point that collectively the power consumption is now significant. Michigan could enact or encourage the federal government to enact regulations, consumer product label warnings or other measures to limit standby or “vampire” losses in numerous consumer electronic devices.

3.6 Water heaters

Next to space heating, the single largest use of energy in the home is for domestic water heating. Most residences have a choice of fuels and technologies which can substantially reduce cost, energy consumption and GHG emissions. In addition to the simple step of insulating tank-type water heaters to reduce standby losses, Michigan could develop program to encourage the use of tankless water heaters or lower-cost, lower-emissions fuels.

3.7 Decommission old refrigerators in residences

This policy proposes to create a program to encourage disposal of second and third “old” refrigerators through bounties, rebates, or free disposal. Refrigerators are substantial consumers of residential electricity and are long-lived, large, and unwieldy. In addition, at the end of their lives, they contain components that must be dismantled and recycled carefully to avoid burdening landfills and releasing chemicals that are toxic or ozone-depleting.

Fifteen years ago the MI Public Service Commission ran a series of pilot programs to examine the energy savings resulting from the removal of second operating refrigerators from MI households and to measure public response to various program marketing strategies. Overall, the pilot was able to 1) show the logistical feasibility of a Second Refrigerator Program in MI; 2) demonstrate significant electricity savings resulting from the program; and 3) suggest the potential need for additional refrigerator/appliance program concepts.

The Midwest Energy Efficiency Alliance has decommissioning of old refrigerators as part of its program. Over three years, more than 7,000 refrigerators were recycled resulting in 9.6 million kWh savings annually using a combination of newspaper advertising, bounties and no-cost pick up and recycling of the appliance. MEEA also partnered with local and national retailers to promote retailer incentives on the purchase of new ENERGY STAR qualified refrigerators.

3.8 Home Heating Appliance standards and awareness

Home heating furnaces are typically the single biggest energy consuming appliance in the home. Many of the measures proposed here address the use of fuels and the demand for energy by the building itself. This policy option encourages the retrofit or replacement of inefficient furnaces with more efficient models or technologies that reduce the use of fossil fuels, such as ground-source heat pumps. For example, MI could promote using alternative methods (geothermal, passive heating and cooling, or solar) when consumers are upgrading their furnace. (see 6.1.)

3.9 Commercial appliances

Encourage the use of specific high-efficiency appliances in commercial operations. The state could target a small number of appliance upgrade types that hold the promise of significant emission reductions (e.g. modulating hoods in restaurants.) This could be accomplished through education, financial incentives or regulatory requirements.

3.10 Electrical motors and pumps for Commercial and Industrial use

Commercial and industrial motors and pumps represent a major use of electricity within these sectors. This policy option would require the use of energy-efficient models in new facilities and provide education, information and incentives to encourage the retrofit or replacement of inefficient devices with efficient models at existing facilities. This could possibly include an old equipment decommissioning program.

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 Michigan MCAC, as well as those that may evolve in the future. Good education programs will drive consumer demand for more efficient products and greater GHG emission awareness from business and government. Potential areas for education include:

- Conservation opportunities
- Motion sensor lighting for commercial and residential uses
- Efficiencies at school facilities

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. Introducing children to concepts early can create long-term benefits.

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 and advanced metering

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. [The Federal](#)

Energy Regulatory Commission has defined advanced metering as a system that records customer consumption and possibly other data hourly or more frequently and that provides daily or more frequent transmittal of the measurements over a communication network to a central collection point.

4.5 Governor's Energy Conservation Campaign

The purpose of this program is to motivate Michigan citizens and commercial and industrial managers to reduce energy consumption – electric, heating and transportation. Most governmental efforts to reduce energy consumption center on promoting energy efficiency technology. However, voluntary energy conservation can also play a major role. Some examples:

- During the 1970's energy crisis, Jimmy Carter announced energy programs and encouraged conservation.
http://www.pbs.org/wgbh/amex/carter/filmmore/ps_energy.html
- In 2001 and 2004, Governor Schwarzenegger promoted voluntary energy conservation efforts by the public and private sector and individual citizens throughout California. Part of the campaign was *Flex Your Power*, a statewide energy efficiency marketing and outreach campaign... a partnership of California's utilities, residents, businesses, institutions, government agencies and nonprofit organizations working to save energy.
<http://www.fypower.org/about/>
- In 2006, the governor of Maine launched his Fuel-Wise Driver Campaign to “help reduce driving costs, as well as emission of pollutants causing global warming and unhealthy air.”
<http://www.maine.gov/tools/whatsnew/index.php?topic=Gov+News&id=22789&v=Article-2006>
- These outreach programs promoted voluntary energy conservation and government “leading by example” efforts and accomplishments.

A key feature of the campaign would be to ask for public commitment from citizens, and commercial and industrial managers to conserve. Research has shown that just providing energy efficiency materials usually does not result in change. Rather than ask people to make a “private” pledge and leave it at that, the program could ask people to make a “public” pledge by posting their names and commitment on a website. Also, we could provide a way for people to exhibit their commitment publicly on their own -- for example, a sticker or ribbon for their house and/or car. (A bumper sticker could read “*I am an energy-conscious citizen.*”). Suggested program points:

1. Make the initial pledge specific and readily actionable.
2. Ask participants to specify the date they will start fulfilling the commitment.
3. Provide a follow-up program which reminds people of their commitment and provides fulfillment tips, success stories, etc.

4. It takes two to four weeks to form a new habit -- it is important for participants to receive a reminder, tips and encouragement during this time.
5. Provide additional web space for recommitment (renew their vows!), bringing in new people, report their achievements, raising their eco efforts to a new level, etc.
6. At a later date, and after the eco habit is formed, research suggests you can ask for an even greater level of commitment.
7. Provide achievement levels to strive for - perhaps similar to Olympic medals – bronze, silver and gold.

Existing Actions in MI

- 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. For more information go to http://www.michigan.gov/mpsc/0,1607,7-159-16370_27289---,00.html
- Michigan offers an existing 4th through 7th grade curriculum designed to educate students on the sources, uses and environmental impacts of energy production and use.

RCI-5. Pricing and Purchasing

5.1 Green or Low Carbon Power Purchasing for Consumers

Green or low carbon 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 or low-carbon power sources by a relevant authority.
- Regulatory encouragement for utilities to develop green or low carbon 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 or low carbon 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 or low carbon power through provision of information and promotional materials.

5.2 Net-metering for Distributed Generation

This policy option involves promoting reductions 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:

- Simplify and make affordable existing net-metering policies, including policies that affect electricity consumers who install on-site combined heat and power where the increase in efficiency results in reduced emissions, and distributed generation powered by renewable resources. Consider the impact of NO_x and power factor requirements on net-metering and availability of information for small customers.
- Revise rate structures, 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 encourage the revision of 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.
- Review the existing Michigan net metering policy to identify and promote reforms like those listed above for the purpose of removing obstacles to distributed generation and renewable and encouraging greater use of these resources, including the U-15316 E-Docket before the PSC.

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).

[insert specific language from Dr. Nathan]

5.6 Feed-in tariff

Create a feed-in tariff or tariffs for renewable resources that obligate the utility to pay an incrementally higher (above market) price to the distributed generator reflecting the cost disadvantages of investing in renewable resources. There could be a single tariff for a specified set of renewable sources, or a series of tariffs individually set by renewable resource type to offset cost disadvantages.

Existing Actions in MI

- Statewide net-metering policy in effect (U-15316). A commission is currently looking at net-metering, fossil fuel plant efficiencies (generation), and fuel sources.
- Voluntary green energy programs through municipal and major utilities. According to U.S. EPA there are six utilities in Michigan that offer ‘green tag’ or other environmentally benign products at a variety of costs to customers.

RCI-6. Customer-Sited Distributed Energy and Combined Heat and Power

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.

6.1 Incentives to Promote Implementation of Renewable Energy Systems

Distributed electricity generation sited at residential, commercial and industrial buildings and powered by renewable energy sources (typically solar, but also wind, small hydroelectric power sources, or biomass or biomass-derived fuels). These installations displace fossil-fueled generation and avoid 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 Michigan 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 thermal water heating and 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.

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 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. Develop codes for green spaces on roofs, etc. to address heat-island effect.

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 Solar 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. A Michigan study concluded that 75 percent of city roofs are well-situated for solar water heating. Implementation mechanisms could include public education, training for appropriate building trades and a variety of financial and tax incentives to encourage the use of these technologies.

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"). Michigan 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 MCAC 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 **IndustrySector**-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.

8.6 Encourage greater use of state forests for biomass

The State of Michigan owns large tracts of woodlands that have significant additional potential for sustainable harvesting. Programs to encourage greater use of this resource whether for the direct purpose of providing biomass fuel or for other uses would have the effect of increasing the availability of wood for fuel use. [NOTE – this option should be coordinated with the AFW TWG].

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, Michigan 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.

9.10 Local government lead-by-example

The state can encourage or enable local governments to undertake innovative GHG reduction measures through incentives, funding, information exchange or recognition programs. An example is the City of Ann Arbor, which will be the first Michigan City to replace all its street lights with LED fixtures. The LED change over program will use half the energy and pay for itself in an estimated 4.2 years. [Insert more examples](#)

9.11 Industrial process assistance

This policy option is related to 9.8, industrial audits and 9.5, industrial buildings as well as 3,10, electrical motors and pumps for commercial and industrial processes. The concept is to carry the audit and assistance beyond the building and specific devices (pumps and motors) and examine other uses of energy or other sources of GHGs resulting from industrial processes. Energy efficiency funds could be used to provide free or low-cost technical assistance to industries and to help finance capital costs where the GHG reduction potential is substantial but the payback is insufficient to motivate an unsubsidized investment or for those entities where access to credit is an obstacle.

Existing Actions in MI

- Ann Arbor “leading by example,” and is using LED street-lights, which have a 4-year payback and 50 percent savings.