



**Residential, Commercial, and Industrial (RCI)
Technical Working Group**

Option No.	GHG Reduction Policy Option Name	GHG Reductions (MMtCO ₂ e)			Net Present Value (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)	Level of Support
		2015	2025	Total (2008–2025)			
RCI-10	Support Strong Federal Appliance Standards and Require High State Standards in the Absence of Federal Standards	0.8	1.4	15.3	-\$1,895	-\$124	Approved

RCI-10. Support Strong Federal Appliance Standards and Require High State Standards in the Absence of Federal Standards

Policy Description

Implementation of State appliance efficiency standards for appliances not covered by federal standards or where higher-than-federal standard efficiency requirements are appropriate.

Appliance efficiency standards reduce the market cost of energy efficiency improvements by incorporating technological advances into base appliance models, thereby, thereby creating economies of scale. Minnesota should adopt appliance efficiency standards at the state level not covered by federal standards. California has established appliance efficiency standards for a number of appliances not currently included in national legislation, such as consumer electronics (standby power use), and general service incandescent lamps.

The specific policy approach suggested by the RCI TWG is to

- Address existing federal appliance efficiency standards by developing a State of Minnesota Residential Appliance Efficiency Standard. (Consider adoption of the appliance efficiency standards already adopted by California.). Request that the Governor through the National Governors Association provide the leadership to seek adoption of the Minnesota Residential Appliance Efficiency Standard by the Federal Government.
- As part of a Minnesota Residential Appliance Efficiency Standard, require that all energy consuming appliances be labeled for average annual energy consumption (kilowatt-hours, or thermal units). The information provided in the label would be in addition to any existing Energy Star information that may already be provided for comparison purposes.
- Also as part of a Minnesota Residential Appliance Efficiency Standard require the development of a consumer education program on appliance efficiency. Insist that all utilities and appliance retailers in the state of Minnesota provide appliance efficiency information to their consumers/customers.
- Require high-efficiency Energy Star appliances be installed in all new residential construction and major retrofits.
- Require utilities to provide Energy Star appliance rebates where they are deemed cost-effective. (The Minnesota DOC commissioner will determine cost effectiveness in the CIP process.)
- Advocate for the adoption of a State of Minnesota Residential Appliance Upgrade Program. The program would require the seller of a home to establish an appliance escrow account for any of the major appliances within the home that are older than 15 years. The escrow account would only be made available to the home buyer for upgrading of the major appliances in the home to Energy Star-rated appliances.
- Where possible, require and/or encourage appliance manufacturers to adopt grid-friendly “smart chip” technology into their appliances that will allow utilities to communicate with “smart chip” appliances to curtail energy usage and/or respond to energy pricing changes.

Policy Design

Goals: Increase stringency of a set of appliance standards to the level of those recommended by the report: "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards",

Timing: Adopt new standards by 2009

Parties Involved: State agencies to enforce state codes and standards.

Other: Not applicable

Implementation Mechanisms

Potential implementation mechanisms and supporting activities for this mitigation option include:

- Appliance Standards promulgated by legislation or developed administratively.
- Assistance programs to help low-income consumers with purchase of appliances meeting more stringent standards, so as to reduce the higher-first-cost burden of higher-efficiency appliances on those consumers.
- Elevated energy standards for appliances and equipment purchased by public agencies.
- Work with manufacturers and consider impacts on manufacturers when setting new standards.

Related Policies/Programs in Place

The state is an ENERGY STAR Partner

Type(s) of GHG Reductions

GHG impacts are similar in nature to those noted for RCI-1 above.

Estimated GHG Reductions and Net Costs or Cost Savings

Data Sources:

- Population projections from the Minnesota State Demographic Center, <http://www.demography.state.mn.us/documents/MinnesotaPopulationProjections20052035.pdf>
- National population projections from the US Census Bureau, available at <http://www.census.gov/population/projections/SummaryTabA1.xls>
- "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards", by Steven Nadel, Andrew deLaski, Jim Kleisch, and Toru Kubo (available at <http://www.standardsasap.org/documents/a051.pdf>)
- "Clean and Diversified Energy Initiative", by Western Governor's Association Energy Efficiency Task Force Report (available at <http://www.westgov.org/wga/initiatives/cdeac/Energy%20Efficiency-full.pdf>)
- MN GHG forecast developed for this process (based on the worksheet called "Energy Use and CO2" in a spreadsheet called GHGemitsum07_Working.xls)

- Regional fuel prices from the EIA AEO2007 estimates for the West North Central region (available at <http://www.eia.doe.gov/oiaf/aeo/supplement/>)
- MN natural gas prices from the EIA (available at http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SMN_a.htm)

Quantification Methods: See Annex 1

Key Assumptions: See Annex 2

Key Uncertainties

Scaling down of results of a national study to MN conditions

Additional Benefits and Costs

Reduced local air pollution

Feasibility Issues

TBD

Status of Group Approval

Pending approval

Level of Group Support

Pending approval

Barriers to Consensus

Quantification of emission reductions and associated implementation costs

Annex 2. Key Assumptions

RCI-10. Support Strong Federal Appliance Standards and Require High State Standards in the Absence of Federal Standards

Summary of national savings from appliance standards on appliances not currently covered by federal statutes

Source: "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards", 2005, by Steven Nadel, Andrew deLaski, Jim Kleisch, and Toru Kubo, available at <http://www.standardsasap.org/documents/a051.pdf>; page v.

#	Technology	2020 savings		2030 savings		NPV (2030)	
		TWh	trillion btu	TWh	trillion btu	billion \$	Start year
1	Ceiling fan lights	18.9	197	18.9	190	13	2007
2	Commercial clothes washers	0.3	9	0.3	9	0.9	2007
3	Commercial ice-makers	0.6	7	0.6	6	0.4	2007
4	Commercial refrigerators & freezers	2.4	25	2.4	24	1.3	2010
5	Commercial unit heaters	0	39	0	55	3	2007
6	Dehumidifiers	1	10	1.1	11	0.7	2007
7	Digital cable & satellite boxes	1.4	14	1.4	14	1.2	2007
8	Digital television adapters	0.3	3	0	0	1.1	2007
9	Exit signs	1.7	18	2.9	29	1.4	2007
10	External power supplies	4.9	51	4.9	49	3.3	2007
11	Large commercial packaged AC & heat pumps	1.5	16	2.2	22	0.9	2010
12	Low-voltage dry-type transformers	3.1	32	5.4	54	2.6	2007
13	Medium-voltage dry-type transformers	2.7	28	4.7	47	2.4	2007
14	Metal halide lamp fixtures	9	93	14.4	144	7.3	2008
15	Pre-rinse spray valves	0	56	0	56	8	2007
16	Reflector lamps	3.9	40	3.9	39	2.6	2007
17	Torchiere lighting fixtures	11.8	123	11.8	119	8.4	2007
18	Traffic signals	1.3	13	1.3	13	0.6	2007
	total	64.8	774	76.2	881	59.1	

Natural gas savings

Source: "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards", 2005, by Steven Nadel, Andrew deLaski, Jim Kleisch, and Toru Kubo, available at <http://www.standardsasap.org/documents/a051.pdf>; page v.

1.03 mmbtu per MCF

	Savings - All fuels		Savings Estimate - Natural Gas					
	trillion btu		billion cubic feet		trillion btu		NG Share of total	
	2020	2030	2020	2030	2020	2030	2020	2030
Demand side			100		103	117	13%	13%
Supply side			336		346	394	45%	45%
total	774	881	436		449	511	58%	58%

Cost of electricity used for estimating economic benefits of appliance standards in the Nadel et al report

Source: "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards", 2005, by Steven Nadel, Andrew deLaski, Jim Kleisch, and Toru Kubo, available at <http://www.standardsasap.org/documents/a051.pdf>; page 64.

Sectoral shares of total residential/commercial electricity use from the MN GHG inventory and forecast called GHGemitsum07_Working.xls ("Energy Use and CO2" worksheet) prepared by R. Strait

	Cents/kWh (MN)		\$/MWh (MN)	
	2003\$	2005\$	2003\$	2005\$
Residential electricity price	7.7	8.1	77	81
Commercial electricity price	6.1	6.4	61	64
Residential sector electricity share (2005)	50.12%			
Commercial sector electricity share (2005)	49.88%			
Average	6.9	7.3	69	73

Estimate of the cost of achieving electricity savings from appliance standards

Source: "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards", 2005, by Steven Nadel, Andrew deLaski, Jim Kleisch, and Toru Kubo, available at <http://www.standardsasap.org/documents/a051.pdf>; page 42.

cost (2005\$/MWh) \$11.90

MN avoided electricity costs

Source: avoided cost calculations for this study

MN avoided cost (2005\$/MWh) \$156

Adjustment factor to apply to NPV

Source: Adjustment factor that scales the NPV by the ratio of the MN net avoided cost and the USA net avoided cost

Adjustment factor 2.39

Share of NPV associated with electricity savings

Source: estimate of the share of savings from appliance standards associated with electricity

	2020	2030
rough assumption	87%	87%