



**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-2	Improved Uniform Statewide Building Codes	0.004	0.005	0.077	-\$44	-\$576	Approved

RCI-2. Improved Uniform Statewide Building Codes

Policy Description

Building energy codes specify minimum energy efficiency requirements for new buildings or for existing buildings undergoing a renovation. Given the long lifetime of most buildings, amending state building codes to include minimum energy efficiency requirements and periodically updating energy efficiency codes will provide long-term GHG emission reductions.

The Minnesota Department of Labor and Industry (DOLI) has the responsibility of promulgating the building code in Minnesota. Where possible, the Department has approved the International Code Council's (ICC) "I" family of codes. In July of 2007, the 2006 International Residential Code (IRC) and the 2006 International Building Code (IBC) were both adopted with Minnesota specific amendments to address the Minnesota climate and building practices. Both were also adopted without their respective energy code chapters, as DOLI had been working for some time to amend Minnesota's existing energy code. DOLI decided some time ago that the 2006 IRC Chapter 11 (energy code chapter) would be adopted with Minnesota amendments.

Chapter 11 if the 2006 IRC is greatly simplified compared to past codes, and is expected to be widely accepted because of a US Department of Energy's initiated amendment. That amendment allows builders to comply using a simple "cookbook" compliance method, without needing to perform computer calculations of window, wall and other building component areas.

As a result of the high-energy efficiency requirements required by code since 2000, Minnesota leads the nation in producing energy efficient one- and two-family homes. The new residential code will not significantly increase the efficiency of one- and two-family residential buildings. However the applicability of the new code will be broadened to include townhouses, and by doing so will increase the energy efficiency of those structures.

The new Minnesota Commercial Energy code is based on ASHRAE 91.1-2004 standard, with important state amendments. The percentage increase energy efficiency is unknown at this time, but will be substantial, if stakeholders understand its importance and install components correctly so that efficiencies are realized.

A policy to implement and enforce the commercial and residential energy codes statewide should be addressed legislatively. Here are some facts about the current energy code requirements:

- Approximately 85% of Minnesota's population lives in an area where the building code (including the energy code) has been adopted and enforced.
- 39 of 87 Minnesota counties have adopted the State Building Code.
- In accordance with state law, virtually all cities with population 2,500 and above are enforcing the State Building Code, even if they are located in a county which is not enforcing the code.
- If a municipality or county chooses to enforce a building/energy code it must be the Minnesota State Building Code. A municipality may not adopt a code that is more or less stringent than the Minnesota State Building Code.

- A statewide building code requirement would affect 48 sparsely populated counties, outside of any cities in those with population 2,500 and above, that have not adopted the Minnesota State Building Code.
- While the code is not enforced statewide, homebuilders who are licensed by the state are required to build code-compliant homes regardless of location.

Additional measures to support the requirement that the building code be implemented statewide would include

- Consumer and realtor education about the importance of energy efficiency
- Improved enforcement of existing energy and mechanical codes
- Training for code officials on energy code compliance and its importance
- Training for builders, remodelers, and mechanical contractors on energy code compliance
- Development of a clearinghouse for information on how to provide access to software tools to calculate the impact of energy efficiency and solar technologies on building energy performance

Policy Design

Goals: As noted above

Timing: Recognizing that the State of Minnesota will be implementing a new commercial and residential energy code in 2008, other strategies that should be considered include:

- Implementing the energy code statewide in 2009 for all non-agriculture buildings. (Currently, agricultural buildings are exempt for building and energy code compliance)
- Updating energy codes every three years that are at least as efficient as the most recently adopted version of ICC's energy codes.
 - Three-year cycles will allow Minnesota construction and renovation to keep consistent most recent ICC national code cycles and keep the construction industry updated with new materials and methods that increase energy efficiency. The 3-year cycle will also allow policy makers to address unintended consequences to durability or structural integrity caused by well-intentioned code changes.
- Mandating education on each new energy code cycle for
 - Residential contractors seeking a Minnesota license;
 - Residential contractors renewing a Minnesota license;
 - All building code officials who perform energy efficiency or mechanical inspections; and
 - All architects registered in the State of Minnesota who approve building designs or renovations that affect energy use.
- Requiring all mechanical contractors in Minnesota to be licensed and require at least 20 hours of continuing education on energy and mechanical code requirements during every new code cycle.

- Developing an educational program for the public and realtors through Department of Commerce's Energy Information Office explaining Home Energy Rating System (HERS) scores for different types of housing.
 - Require all realtors to complete at least 1.0 hours of continuing education about HERS ratings in existing and new residential homes by 2011.

Parties Involved: Current Energy Code Rules under the Building Code were adopted on April 15, 2000 for one- and two-family residential buildings and July 20, 1999 for commercial and residential buildings other than one- and two-family. The Department of Labor and Industry predicts that the new energy codes will go into effect in late 2007, or if there is a public hearing, by mid-2008: Minnesota Rules Chapter 7670 and Minnesota Rules Chapter 7672 cover new construction and remodeling of single-family and two family homes. Builders can choose from one or the other, which has led to a lot of confusion for compliance and enforcement.

- This code will be replaced by the new Residential Energy Code, Minnesota Rules Chapter 1322.

Minnesota Rules Chapter 7674 covers multi-family new construction and remodeling buildings that are 3 stories or less.

- Townhome units with separate entryways that do not share common spaces (hallways, laundry rooms, foyers, etc) will be covered under the new Residential Energy Code, Minnesota Rules Chapter 1322.
- Multi-family buildings that do not meet the townhome requirements for Chapter 1322, will be covered under the new Commercial Energy Code, Chapter 1323.

Minnesota Rules Chapter 7676 covers all buildings except low rise residential.

- All commercial buildings that do not meet the townhome requirements for Chapter 1322, will be covered under the new Commercial Energy Code, Chapter 1323.

Minnesota Rules Chapter 7678 covers requirements for insulation manufacturer's to register uniform testing of energy efficiency and equipment manufacturer to register equipment efficiencies with the Minnesota Department of Commerce. Chapter 7678 will be repealed, as all of these requirements will be embodied in standards to be adopted by reference in Chapter 1322 or 1323.

Agricultural buildings as defined in Minnesota Statutes, section 16B.60, and subdivision 5 are exempt from the Minnesota State Building Code.

Implementation Mechanisms

Mandating the code statewide requires a statute revision by the Minnesota Legislature. The Department of Labor and Industry has developed a *Minnesota State Building Code Adoption Guide* for local jurisdictions see: http://www.doli.state.mn.us/pdf/bc_pr_code_adoption_guide_1_06update.pdf

Code revisions should be implemented by the Department of Labor and Industry using the rule making process, which allows for public input.

Related Policies/Programs in Place

Minnesota Rules Chapters 7670, 7672, 7674, 7676, and 7678. See <http://www.mncodes.org/energy.htm>

Type(s) of GHG Reductions

Reductions from avoided fossil-fuel combustion for electricity and space heating.

Estimated GHG Reductions and Net Costs or Cost Savings

Data Sources: The following sources were used in the analysis

- Average Retail Price for Bundled and Unbundled Consumers by Sector, Census Division, and State, 2005, available at: http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html
- Annual Estimates of Housing Units for the United States and States: April 1, 2000 to July 1, 2005, available at U.S. Census Bureau annual data, released at the end of every July: <http://www.census.gov/popest/housing/HU-EST2005.html>
- New Privately Owned Housing Units, Authorized Unadjusted Units for Regions, Divisions, and States, U.S Census Bureau annual data, released end of every July, available at <http://www.census.gov/const/C40/Table2/t2yu200512.txt>
- 2001 EIA Residential Energy Consumption Survey, available at <http://www.eia.doe.gov/emeu/recs/recs2001/detailcetbls.html#space>
- Ratios of new residential/commercial floor space to total floor space, from EIA, available at <http://www.eia.doe.gov/emeu/cbecs/excel/b1.xls>
- Cooling degree-days in Minnesota, available from <http://lwf.ncdc.noaa.gov/oa/documentlibrary/hcs/cdd.200501-200607.pdf>
- Heating degree-days in Minnesota, available from Department of Commerce (<http://lwf.ncdc.noaa.gov/oa/documentlibrary/hcs/hdd.200507-200607.pdf>)
- Minnesota population projection, Minnesota State Demographic Center, available from <http://www.demography.state.mn.us/documents/MinnesotaPopulationProjections20052035.pdf>
- Utility electricity sales in 2005, available from U.S Energy Information Administration at <http://www.eia.doe.gov/cneaf/electricity/page/eia826.html>
- Sectoral electricity consumption, from EIA, available from U.S. Energy Information Administration at http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html (file sales_revenue.xls)
- The Energy Efficiency Task Force Report to the Clean and Diversified Energy Advisory Committee of the Western Governors' Association: The Potential for More Efficient Electricity Use in the Western United States, January, 2006, <http://www.westgov.org/wga/initiatives/cdeac/Energy%20Efficiency-full.pdf>

Quantification Methods: See Annex 1.

Key Assumptions: See Annex 2.

Key Uncertainties

Projected economic growth rate in counties not covered by the current codes

Additional Benefits and Costs

Uniform standards; reduced air pollution

Feasibility Issues

None

Status of Group Approval

Approved

Level of Group Support

Approved

Barriers to Consensus

None

Annex 2. Key Assumptions

RCI-2. Improved Uniform Statewide Building Codes

Assumed start year for the new CIP legislation

2009

Assumption for improvement of the residential building code relative to the current residential building code in areas where the building code HAS BEEN adopted and IS BEING enforced

1

- | | |
|---|---|
| 1 | no improvement in energy efficiency (default) |
| 2 | User-defined |

Assumption for improvement of the residential building code relative to the current residential building code in areas where the building code has NOT been adopted

1

- | | | | |
|---|-------------------------------------|----|-----------|
| 1 | improvement in energy efficiency of | 3% | (default) |
| 2 | User-defined | | |

Assumption for percent of the state population covered by current residential building codes

1

- | | | | |
|---|-----------------------------------|-----|--|
| 1 | The percent of MN's population is | 85% | covered by the current building code (default) |
| 2 | User-defined | | |

Assumption for future enforcement of the residential building code

1

- | | |
|---|--------------------------|
| 1 | 100% Statewide (default) |
| 2 | User-defined |

Assumption for improvement of the commercial building code relative to the current commercial building code in areas where the building code HAS BEEN adopted and IS BEING enforced

1

- | | |
|---|---|
| 1 | no improvement in energy efficiency (default) |
| 2 | User-defined |

Assumption for improvement of the commercial building code relative to the current commercial building code in areas where the building code has NOT been adopted

1

- | | | | |
|---|-------------------------------------|----|-----------|
| 1 | improvement in energy efficiency of | 5% | (default) |
| 2 | User-defined | | |

Assumption for percent of the state commercial activity covered by current commercial building codes

1

- | | | | |
|---|------------------------------------|-----|---|
| 1 | Percent of MN's commercial sector, | 85% | is covered by the current building code (default) |
| 2 | User-defined | | |

Assumption for future enforcement of the commercial building code

1

- | | |
|---|--------------------------|
| 1 | 100% Statewide (default) |
| 2 | User-defined |

Marginal resource associated with electricity savings

1

- | | |
|---|---------------------------------------|
| 1 | coal & natural gas, prorata (default) |
| 2 | 100% coal |
| 3 | system average |

Real discount rate

1

- | | | |
|---|--------------|----|
| 1 | Use | 5% |
| 2 | User-defined | |