



**Residential, Commercial & Industrial Policy Work Group**

**Summary List of Draft Priorities for Analysis**

Option #	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Level of CAP Support
		2012	2020	Total 2007–2020			
	<b>RESIDENTIAL, COMMERCIAL &amp; INDUSTRIAL</b>						
RCI-1	Expanded DSM						TBD
RCI-2	Funding for Energy Efficiency						TBD
RCI-3	Building codes and Enforcement						TBD
RCI-4	Planning and Design						TBD
RCI-5	Resources and Funding for Building Efficiency						TBD
RCI-6	Retrofit of existing structures						TBD
RCI-7	Pricing and Purchasing						TBD
RCI-8	Renewable Energy Systems on New and Existing Buildings						TBD

	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Level of CAP Support
		2012	2020	Total 2007–2020			
RCI-9	Energy Delivery						TBD
RCI-10	Industry-Specific Programs						TBD
	<b>SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS</b>						
	<b>REDUCTIONS FROM RECENT ACTIONS (table to be added below)</b>						
	<b>SECTOR TOTAL PLUS RECENT ACTIONS</b>						

## RCI-1. Expanded DSM

### Policy Description

This option focuses on improving energy efficiency through increased investment in demand-side management programs. Energy efficiency is the lowest cost resource for reductions in electricity and natural gas use by the residential, commercial and industrial sectors. There is a long track record of cost effective energy efficiency initiatives, typically called demand side management (DSM), at the local, state and regional levels in areas around the country. There is vast potential for improving the energy efficiency of homes, appliances, businesses and industry in Colorado.

Funding for DSM and energy efficiency can be integrated into utility planning processes, supported explicitly through rate structures, make use of a “systems benefit charge” (public goods charge) as well as targeted loans, tax incentives and other mechanisms. Supportive policies to spur the development and implementation of DSM and energy efficiency programs include, integrated resource planning requirements, use of the Total Resource Cost or Societal Cost test to determine the economic feasibility of DSM programs, and convenient DSM cost recovery mechanisms.

### Policy Design

As of April 2007, a bill is working its way through the Colorado legislature which directly addresses Utility energy efficiency and has a high likelihood of passage (see attached fact sheet for Colorado HB 1037). The bill directs the Public Utilities Commission to conduct a rulemaking establishing energy savings goals.

**Goals:** Current estimates of the impact of HB 1037 would be to approximately double the DSM goals for investor owned utilities. The RCI policy should consider adopting numerically similar goals for municipal utilities and rural electric cooperatives. In many cases the starting point for these efforts will be zero.

**Timing:** Starting in 2008 and continuing for a minimum of 10 years

**Parties Involved:** HB 1037 applies only to investor owned utilities. Substantially similar policies need to be developed for municipal utilities and rural electric cooperatives.

**Other:** Not applicable.

## RCI-2. Funding for Energy Efficiency

### Policy Description

Energy Efficiency can be an expensive undertaking due to the cost of new technologies, as well as improving the efficiency of existing systems. The steps required to determine the cost to improve efficiency include an audit, design, implementation and measurement and verification. All these steps have costs, which prohibit or slow the conversion to GHG reducing efforts. Assistance with some of these costs would bring more such projects to fruition. Increased funding and larger renewable energy credits would provide a greater incentive for customers to undertake EE projects. Expanded use of Performance Contracting by all industrial and commercial customers will greatly reduce energy use and GHG emissions.

### Policy Design

#### Goals:

- Provide 0% financing for all “at risk” school districts in the state of Colorado.
- Provide funding to cover the costs audits and design for residential.
- Improve legislation on Performance Contracting and mandate its use by state facilities by some deadline.

**Timing:** New funding option offered in 2008 to school districts would produce results by 2009 and continue indefinitely. Larger REC’s in 2008 would entice new projects immediately, producing results a project completion.

**Parties Involved:** These funding options would cover all energy users.

**Other:** Not applicable.

## RCI-3. Building Codes and Enforcement

### Policy Description

Building energy codes can be an effective way to eliminate the least efficient energy approaches in new or renovated buildings. The International Energy Conservation Codes (IECC) have become a widely accepted standard. These codes are updated every three years through an exhaustive consensus process involving a large number of code officials and building experts. Many Colorado jurisdictions adopt the IECC. More will do so, if legislation recently passed by both houses of the Colorado Assembly (HB1146) is signed by the Governor as expected. Adoption of the IECC will do no good, however, if it is not enforced, and enforcement is questionable in many building jurisdictions. Building code jurisdictions need to be encouraged to enforce the IECC with training, technical support and education.

Colorado is a home rule state – incentives to local governments are more acceptable than mandates. Incentives will take the form of training and technical support for the inspectors, plan reviewer and code officials as well as education for builders and contractors. This approach can have the added benefit of educating local governments and the contractors and builders about the programs that encourage “beyond code” construction.

### Policy Design

**Goals:** Make Colorado a national leader in energy code enforcement and compliance.

**Timing:**

2007: Identify needs for training and technical support.

Estimate the costs and benefits of energy code enforcement.

Identify funding source.

2008: Secure funding.

**Parties Involved:**

**Other:** Not applicable.

## RCI-4. Planning and Design

### Policy Description

#### Planning Requirements:

Planning for energy performance standards can be implemented in government-funded building construction (including major renovations) and operation. Promotion of similar standards for use in other commercial and residential buildings will yield significant energy efficiency improvements. Specifically, this policy option includes:

- Implementation of the energy-efficiency elements of programs such as LEED™ (Leadership in Energy and Environmental Design) for New Construction (NC), Existing Buildings (EB), Homes (H, now in pilot stage), and Neighborhood Design (ND, also now in pilot stage); Built Green; and Environments For Living for residential buildings; and EPA Energy Star™ principles and/or other equivalent “green building” programs.
- Incorporation of passive solar design concepts in the earliest design stages of development plans.
- Development of Sustainability Plans for retail and other commercial development should be considered to address the social, environmental and economic costs and benefits of development.
- Sustainable Use Neighborhoods inclusive of goals for energy and resource efficiency, links to public transportation and shared community facilities should be considered.
- Financial or tax incentives for non-public and non-state public buildings (such as municipal buildings) to improve their energy performance beyond that required by existing codes.

Examples of currently in place government incentives from US states, cities and local jurisdictions include tax incentives, density bonus, expedited permit review, grants, incentives-by-request and others.

#### Policy Design

**Goals:** Green Buildings concepts incorporated into new construction and major renovations of government-owned buildings for which design begins after December 31, 2007. Achieve certification to LEED™ Silver for 100% of these buildings.

Operation of Existing Buildings owned and operated by governments to occur using LEED™ EB concepts and EPA Energy Star™ principles. This should occur by for 100% of government-owned buildings by the end of 2008.

For residential and commercial buildings, new construction and major renovations to occur using the Built Green, LEED™ NC, Environments For Living or equivalent requirements and EPA Energy Star principles. This should occur for 100% of buildings submitting permit applications after 2008.

Smart Growth concepts should be applied to all new developments submitting development plans after 2008.

Selected incentives should be identified by governmental body and implemented in accordance with the appropriate schedule for implementation of the requirements above.

**Timing:** See above

**Parties Involved:** See above

**Other:** Not applicable.

## **RCI-5. Resources and Funding for Building Efficiency**

### **Policy Description**

To Be Determined (TBD)

### **Policy Design**

**Goals:** TBD

**Timing:** TBD

**Parties Involved:** TBD

**Other:** TBD

## RCI-6 Retrofit of Existing Structures

### Policy Description

This option is designed to improve the energy efficiency of existing privately owned (e.g., non-municipal) residential, commercial and industrial buildings with a 10-year target of 50% reduction in energy use through a variety of energy-efficiency upgrades and improvements in day-to-day operations. This proposal would create incentives in the form of short-term, low- or no-interest loans from the state (paid back by energy savings) to businesses; and tax credits to homeowners and residential rental property owners to offset the initial costs and thus encourage energy-efficiency upgrades. It would also create low- or no-interest loans to energy service companies who contract with commercial and industrial clients to implement energy-savings measures.

### Policy Design

**Goals:** Dramatically improve energy efficiency of existing residential, commercial, and industrial buildings and provide financial tax incentives to businesses and homeowners to offset initial costs.

**Timing:** Begin in 2008, continuing for 5 years. Renewed every 5 years, based on satisfactory outcome.

**Parties Involved:** (1) Homeowners, (2) Commercial Sector, (3) Industrial Facilities, (4) Energy Service Companies, and (5) Rental property owners in all sectors.

**Other:** Not applicable.

## RCI-7. Pricing and Purchasing

### Policy Description

Adopt *smart metering*, combined with *time-of-use rate schedules* and *in-home displays*, to enable electricity consumers to better manage energy use.

The proposed policy would require:

- A legislatively-prescribed Colorado PUC study of a mandatory investor-owned utility program combining advanced metering infrastructure, time-of-use electricity rates, and end-user energy displays.
- Based upon the results of the study, adoption of mandatory time-of-use rates for all residential, commercial, and industrial customers.
- Installation of advanced metering infrastructure with two-way communications (smart meters).
- Installation of end-user energy displays with hourly usage, pricing, and greenhouse gas emissions display capabilities.
- Full recovery for the costs of the program through the utility ratemaking process.

The proposed policy would provide consumers with 1) pricing signals and 2) information that would allow them to make choices impacting greenhouse gas emissions and their cost of electricity. Consumers could benefit by reducing energy use and costs through conservation, particularly during peak periods.

### Policy Design

**Goals:** Reduce electricity consumption 4 – 15% beyond expected levels in 2012, including peak loads.

**Timing:** Start up in 2009, targeting 10% of industrial, commercial, and residential consumers, ramping up to 100% by 2013. Investor-owned utilities would first be subject to the requirement. The legislation could also consider whether to include cooperative and municipal utilities in the mandatory requirement, though they are not under the authority of the Colorado Public Utilities Commission.

**Parties Involved:** All industrial, commercial, and residential electricity customers in Colorado.

**Other:** Not applicable.

## RCI-8. Renewable Energy Systems on New and Existing Buildings

### Policy Description

Renewable energy can dramatically lower carbon dioxide emissions from energy production required to heat, light, cool, and otherwise power new and existing residential, commercial, and industrial buildings. Efforts to promote the installation of active and passive renewable energy systems -- such as passive solar heating and cooling, domestic solar hot water, and wind -- will complement other measures designed to achieve significant reductions in annual carbon dioxide emissions in RCI and other sectors.

This policy option will promote wider use of renewable energy on all buildings through education and financial incentives in the form of short-term low-interest loans from the state-operated revolving fund or tax credits to businesses and tax credits to homeowners and residential rental property owners. These incentives are designed to lower the initial costs and thus encourage energy-efficiency upgrades.

Systems to be included in the mix of renewable energy technologies include passive solar heating, masonry heaters, passive cooling, domestic solar hot water, solar hot water space heating, solar hot air (space heating), solar electricity, geothermal (ground-source heat pumps), air-source heat pumps, wind power, and microhydro.

Proposed tax incentives will be awarded only to individuals and businesses that have significantly reduced energy consumption prior to or concurrent with system installation.

### Policy Design

**Goals:** (1) Expand the use of renewable energy by creating tax incentives to individuals and businesses who install proven and reliable renewable energy systems on property owned or operated by them. (2) Create an educational campaign to assist individuals and businesses in understanding the renewable energy options and requirements of the program. (3) Create a complementary energy efficiency requirement that reduces energy consumption in buildings (related to the system to be installed) by 20% prior to those applying for renewable energy tax credits. (4) Provide short-term, low-interest loans from the state and/or tax credits to businesses and tax credits to homeowners and residential rental property owners to encourage energy-efficiency upgrades.

**Timing:** Start up in 2008, continuing for 5 years, with additional 5-year renewals based on success of program. Program should include periodic assessment of program performance with legislative policy adjustments, if required.

**Parties Involved:** (1) Homeowners, (2) Commercial Sector, (3) Industrial Facilities, and (4) Rental property owners in all sectors.

**Other:** Systems that qualify for tax incentives should significantly reduce energy use when combined with energy efficiency measures.

## RCI-9. Energy Delivery

### Policy Description

Combined heat and power (CHP) refers to any system that simultaneously or sequentially generates electric energy and utilizes the thermal energy that is normally wasted. Western Governors Association analysis shows that CHP is an affordable, efficient, clean, and reliable piece of the puzzle for meeting the Western region's energy needs while substantially reducing carbon emissions. CHP is sometimes called "recycled energy" because the same energy is used twice. The recovered thermal energy can be used for space heating, hot water, steam, air conditioning, water cooling, product drying, or for nearly any other thermal energy need. The end result is significantly more efficient than generating electric and thermal energy separately. In fact, many CHP systems are capable an overall efficiency of over 80 percent – double that of conventional systems.

In addition to tremendous efficiency gain, increased adoption of CHP in the West would save literally billions in new capital investment, reduce power costs, reduce security vulnerabilities, improve reliability and power quality, avoid transmission losses, reduce water used by power plants, cut fossil fuel use, cut greenhouse gas emissions, and cut other pollutants. Combined heat and power, using proven and affordable technologies, significantly improves every key outcome from power generation.

### Policy Design

**Goals:** Ease regulatory barriers to CHP, increase its competitive position, increase its standing as a significant carbon mitigation measure, offset CHP's reduced economic position versus coal and gas, enhance CHP adoption and retention by private producers (e.g., hospitals, universities, etc), facilitate CHP hybridization with emerging solar thermal technologies, ease transmission and distribution infrastructure constraints.

**Timing:** Executive Order, policy analysis, and PUC action to commence ASAP.

**Parties Involved:** Governors Office, State Environmental and Energy Offices, DOE, and PUC. TBD

**Other:** Not applicable.

## RCI-10. Industry-Specific Programs

### Policy Description

#### Introduction

This option represents several policy areas, tied together by the potential to improve business impacts while reducing harmful emissions. Industry-specific emissions trading may affect business' costs for emission controls; small and medium sized sources in the aggregate could potentially represent significant volumes of emissions that may be more cost-effectively controlled as a class; capturing the benefits of Industrial Ecology (e.g., waste to energy) may be recognized initially on a local basis with potential opportunities for scale-up; and focusing on one of the most at-risk market segments, the skiing industry, will help our state take care of its specific economic strengths.

**Emissions Trading:** Industrial sector greenhouse gas (GHG) emissions trading systems, with mandatory "caps" or voluntary emissions targets, are a means of limiting overall emissions while providing firms with choices as to how emissions limits will be achieved. Emissions cap and trade programs and/or voluntary emissions targets are options that have been considered within the European emissions trading system, and have been proposed for inclusion in national legislation. Voluntary commitments have also been adopted within the US and internationally, exemplified by the US Climate Leaders program.

**Small and Medium Enterprise and Small Source Aggregation:** The volume of carbon dioxide emissions from the combination of sources in the commercial/ industrial small and medium business sectors may be significant. At the Fort Collins Area Chamber of Commerce, 80% of member businesses have less than 10 employees. Although any given business' greenhouse gas emissions is relatively miniscule, the Chamber is in the process of going Climate Neutral (the nation's first) and supports the local Climate Wise program for voluntary greenhouse gas emissions from some large, but mainly small and medium enterprises. Sharing of costs and information among small businesses could substantially reduce barriers to participation in GHG mitigation activities.

**Industrial Ecology:** An industrial ecology (IE) perspective provides tools for understanding the environmental impacts of a community's industry, commerce, infrastructure, and household behavior as a whole system. IE builds common ground for addressing industry's needs in the transition to sustainable communities. The goal is to support business competitiveness and job creation through strategies that also improve environmental protection and quality of life in all dimensions.

**Focus on Specific Market Segments:** One of Colorado's most at-risk industry segments is the skiing industry. Total emissions from ski resorts in aggregate may not be significant, but the opportunity for public education on the topic is huge given the skier visits each year and the greater general public interest of preserving the environment that

is enjoyed and promoted by this industry. A policy option that is dedicated to helping ski resorts implement global climate protection strategies would help Colorado focus on an economic strength that has wide general appeal.

## Policy Design

**Goals:** Emissions trading is expected to be most effective if done regionally. Colorado should participate or lead this effort.

Industrial Ecology goals will be defined to solve a waste-specific issue based on byproducts generated. Working with the support experts from groups such as the Department of Energy's Industrial Technologies Program (ITP) or Colorado State University's Industrial Assessment Center to resolve the technological concerns is recommended as a goal.

Using an Environmental Management System (EMS) to facilitate Small and Medium Enterprise (SMEs) is a good way to assure continuous improvements occur. Implementation and proper system evaluation is needed in accordance with a plan-do-check-act cycle. Certification under ISO 14001, or recognition through Colorado Department of Public Health and Environment's (CDPHE's) Environmental Leadership Program could be a goal for the EMS aspect; and stretching to reach CDPHE's Platinum Level certification for a Sustainability Management Plan (SMS) that includes climate protection goals is even better.

Focusing on specific market segments, like Colorado's skiing industry, is recommended as a policy goal. This has Colorado business-specific implications but also has general appeal that could reach many individuals and engender some passion to preserve not only the industry but the natural environment that supports it.

**Timing:** The regional trading system will require several months and possibly more than a year. The involvement of multiple states and agencies will require significant coordination time.

The opportunities for Industrial Ecology will be addressed as they are identified. Timing for resolution will be dependent on complexity and opportunities available for generation and use of the energy generated.

Implementation of a suitable Environmental Management System (EMS) or Sustainability Management System (SMS) for the Small and Medium Businesses will require 6-12 months depending on the complexity of the participating entities. The technology for these systems is currently available, but adaptation to the business requires formation of teams, identification of significant impacts, establishment of goals and tracking mechanisms to measure progress, development of management plans that result in achieving the goals and designing mechanisms to adjust the system for continuous improvements.

The option to focus on the skiing industry is immediately available by supporting the National Ski Areas Association's Sustainable Slopes program and Keep Winter Cool campaigns.

**Parties Involved:** The Department of Energy (DOE), Colorado Department of Public Health and Environment, Colorado Governor's Office of Energy Conservation and Management (OECM), Colorado State University, Fort Collins Chamber of Commerce, Boulder County, the National Ski Areas Association, and municipalities are all potential participants. In addition, the regional emissions trading scheme will involve other states and possibly some private entities to assist in implementation and design.

**Other:** Companies that generate a waste suitable for energy generation or as a raw material for another process under the Industrial Ecology (IE) category will be potential participants.