



**Cross-Cutting Issues Policy Work Group  
Summary List of Draft Priorities for Analysis**

Option #	Mitigation 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>CROSS CUTTING ISSUES</b>						
CC-1	GHG Inventories and Forecasting						TBD
CC-2	Statewide GHG Reporting						TBD
CC-3	Statewide GHG Registry						TBD
CC-4	Statewide GHG Reduction Goals and Targets						TBD
CC-5	State's Own GHG Reductions (Lead-by-Example)						TBD
CC-6	Comprehensive Local Government Climate Action Plans						TBD
CC-7	Public Education and Outreach						TBD
CC-8	Tax and Cap Policies						TBD

	Mitigation 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			
CC-9	Funding for Implementation of Climate Action Panel Recommendations						TBD
CC-10	Adaptation and Vulnerability						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>						

## CC-1. GHG Inventories and Forecasts

### Policy Description

Greenhouse gas (GHG) emissions inventories and forecasts are essential for understanding the magnitude of all emission sources and sinks (both anthropogenic and natural), the relative contribution of various types of emission sources and sinks to total emissions, and the factors that affect trends over time. Inventories and forecasts help to inform state leaders and the public on statewide trends, opportunities for mitigating emissions or enhancing sinks, and verifying GHG reductions associated with implementation of action plan initiatives. Responsibility for preparing GHG inventories and sinks often resides with the environmental agency, which typically has the expertise needed to systematically compile information on GHG sources and sinks using established methods and data sources. Inventory and forecast efforts should be ongoing over time, reflecting improvements to the accuracy and completeness of data collected.

### Policy Design

The CC PWG recommends that the state institute a formal GHG inventory and forecast function within the DPHE, to be assisted by other state agencies as needed.

**Goals:** Develop a periodic, consistent, and complete inventory of emission sources and sinks and an accompanying forecast of future GHG emissions in at least 5 and 10 year increments out to and including 2030 (and eventually beyond). The GHG forecast should reflect projected growth as well as the implementation of scheduled mitigation options, and should, through differences year-to-year, provide a basis for documenting and illuminating trends in state GHG emissions.

Inventory all natural and man-made emissions generated within the boundaries of the state (i.e., a production-based inventory approach) as well as emissions associated with energy imported and consumed in the state (i.e., a consumption-based inventory approach).

**Timing:** This function should be implemented as soon as possible as allowed by current funding and enhanced over time.

**Parties Involved:** All GHG emission sources and sinks (both anthropogenic and natural) should be included in the inventory and forecast.

**Other:** Not applicable.

## CC-2. State Greenhouse Gas Reporting

### Policy Description

GHG reporting reflects the measurement and reporting of GHG emissions to support tracking and management of emissions. GHG reporting can help sources identify emission reduction opportunities and reduce risks associated with possible future GHG mandates by moving “up the learning curve.” Tracking and reporting of GHG emissions can also help in the construction of periodic state GHG inventories. GHG reporting is typically a precursor for sources to participate in GHG reduction programs, opportunities for recognition, and a GHG emission reduction registry, as well as to secure “baseline protection” (i.e., credit for early reductions). Further, collaboration with other states in the development of a GHG reporting program could influence the development of GHG reporting practices throughout the region and nation and build consistency and reciprocity with other state or regional GHG reporting programs.

### Policy Design

The CC PWG recommends that the state develop GHG reporting requirements and opportunities for its sources. Key elements are noted below.

- Subject to consistently rigorous quantification, reporting should be applicable to all sources (e.g., combustion, processes, vehicles, etc.), using common sense regarding de minimis emissions. In order to encourage GHG mitigation activities from all quarters, reporting should not be constrained to particular sectors, sources, or approaches.
- GHG reporting requirements should be phased in by sectors as rigorous, standardized quantification protocols, base data, and tools become available, and as responsible parties become clear. Entities should be allowed to report GHG emissions voluntarily before mandatory reporting applies to them; and the state, municipalities, and other jurisdictions should be allowed to report emissions associated with their own activities and any programs they may implement.
- The goal should be reporting of “organization-wide emissions within the state” but with greatest possible detail by facility, in order to facilitate baseline protection.
- Reporting should occur annually on a calendar-year basis for all six traditional GHGs and, to the extent possible, for black carbon.
- Reporting of direct emissions<sup>1</sup> should be required; reporting of emissions associated with purchased power and heat<sup>2</sup> should be phased in, and voluntary reporting of other indirect emissions<sup>3</sup> should be allowed.

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<sup>1</sup> Defined as “Scope 1” emissions in the *GHG Protocol*.

<sup>2</sup> Defined as “Scope 2” emissions in the *GHG Protocol*.

<sup>3</sup> Defined as “Scope 3” emissions in the *GHG Protocol*.

- Every effort should be made to maximize consistency with federal, regional, and other states' GHG reporting programs.
- GHG emissions reports should be verified through self-certification and DPHE spot-checks; to qualify for future registry purposes, reports should undergo third-party verification.
- Project-based emissions reporting should be allowed, when properly identified as such and quantified with equally rigorous consistency.
- The reporting program should provide for appropriate public transparency of reported emissions.

**Goals:** Implementation of a state GHG Reporting Program as early as possible.

**Timing:** As soon as possible, preferably by 2008.

**Parties Involved:** As universal as possible.

**Other:** Not applicable.

### CC-3. State Greenhouse Gas Registry

#### Policy Description

A GHG registry enables measurement and recording of GHG emissions reductions in a central repository. It includes a “transaction ledger” capacity to support tracking, management, and “ownership” of emission reductions as well as to encourage GHG reductions, to enable potential recognition, baseline protection, and/or the crediting of actions by implementing programs and parties in relation to possible emissions reduction goals. The GHG registry provides a mechanism for regional, multi-state, and cross-border cooperation. Subject to appropriately rigorous quantification, GHG registration should not be constrained to particular sectors, sources, or approaches; it should encourage GHG mitigation activities from all quarters.

#### Policy Design

Generally, the PWG recommendation calls for Colorado to participate in a national or regional GHG registry such as the developing multi-state Climate Registry, or if this is not possible, the development of a state GHG registry with adequate quality verification, project-level reporting capability, and operating costs borne primarily by participants.

Recommendations for key registry design characteristics build off the GHG Reporting policy option (CC-2). Key elements include:

- Geographic applicability at least at the statewide level and as broadly (i.e., regionally or nationally) as possible.
- Allowing sources to start as far back chronologically as good data exists, as affirmed by third-party verification, and allowing registration of project-based reductions or “offsets” that are equally rigorously quantified.
- Incorporating adequate safeguards to ensure that reductions aren’t double-counted by multiple registry participants; providing appropriate transparency; and allowing the state to be a valid participant for reductions associated with its programs, direct activities, or efforts.
- Striving for maximum consistency with other state, regional, and/or national efforts; creating the greatest flexibility as GHG mitigation approaches evolve; and providing guidance to assist participants.

**Goals:** Implementation of a Colorado GHG Registry Program as early as possible.

**Timing:** As soon as possible after GHG reporting is operating.

**Parties Involved:** Probably overseen by Colorado DPHE; costs shared by participants benefiting from the registry.

**Other:** Not applicable.

## CC-4. Statewide GHG Reduction Goals and Targets

### Policy Description

The overarching purpose of the CAP stakeholder effort is to develop recommendations for actions that can be taken in Colorado to reduce the state's contribution and vulnerability to a changed climate. Following the development, review, and approval of a current and comprehensive inventory and forecast of Colorado GHG emissions from 1990 to 2020, statewide GHG emissions reduction goals and/or targets for future time periods should be established and implemented. The GHG reduction goals or targets recommended by the CAP should be consistent with the parallel goal of an efficient, robust Colorado economy. Within this framework, a statewide goal or target can provide vision and direction, as well as a basis for implementation of CAP policy recommendations and regular periodic assessments of progress toward reaching the statewide goal.

### Policy Design

**Goals:** Reduce statewide GHG emissions by \_\_\_% from \_\_\_ levels by 20\_\_ [or \_\_\_% per year from 20\_\_ through 20\_\_].

**Timing:** TBD

**Parties Involved:** TBD

**Other:** Not applicable.

## CC-5. State's Own GHG Reductions (Lead-by-Example)

### Policy Description

State government is responsible for providing a multitude of services for the public that are delivered through diverse operations and result in wide-ranging GHG emission activities. State government can take the lead in demonstrating that reductions in GHG emissions can be achieved by analyzing its current operations, identifying significant GHG sources, and implementing changes in technology, procedures, behavior, operations, and services provided. The state can also encourage and/or incentivize reductions by others in a variety of ways.

### Policy Design

The state should establish GHG reduction targets for its own GHG emissions. The establishment of broad-ranging goals for reducing the State of Colorado's own GHG emissions will be helpful in both setting an example and building expectations, but actual reductions will typically be realized at the individual agency level. Disaggregating the state's own GHG emissions to the agency level and requiring annual agency-specific reports on GHG reduction progress can be an effective way to measure and manage the state's progress in reducing its GHG emissions. State agencies would first need to develop agency-specific GHG emissions inventory data. This will become the baseline data for ongoing emission reduction activities and measurement, which will be summarized in annual reports by each agency. Agency reports will be aggregated into a summary report reflecting state GHG emissions. A multi-agency group should oversee the ongoing climate efforts of state agencies, review their performance, and provide direction, guidance, resources, shared approaches, and recognition to agencies and employees working to reduce the state's GHG emissions.

**Goals:** Reduce GHG emissions from Colorado state operations by \_\_\_\_% from \_\_\_\_ levels by 20\_\_.

**Timing:** The state's efforts to lead-by-example in reducing its own GHG emissions should start immediately. The first annual report by agencies will necessarily reflect initial agency-level inventories. The second annual report should reflect initial progress in reducing GHG emissions as agencies begin to plan and implement operational changes. Future annual reports should show further progress in reducing agency GHG reductions.

**Parties Involved:** Coverage should include all operations of all state agencies.

**Other:** Not applicable.

## CC-6. Comprehensive Local Government Climate Action Plans

### Policy Description

Colorado is blessed with not only a spectacular environment and comfortable climate, but also with an unusual degree of energy- and climate-related expertise and interest possessed by its citizens. In several locales, this expertise has manifested itself in the development and adoption of local and county government climate change actions and action plans. The state could help spread the successful actions and efforts of some local jurisdictions broadly to others through several means, such as workshops and conferences, a website clearinghouse, education and outreach to public and municipal officials, recognizing local government GHG emission reduction achievements, etc.

### Policy Design

Under development.

**Goals:** TBD

**Timing:** TBD

**Parties Involved:** TBD

**Other:** Not applicable.

## CC-7. Public Education and Outreach

### Policy Description

Public education and outreach can provide significant GHG emission reduction through direct individual action, as well as broad public support for other GHG emissions reduction programs, policies, or goals. 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. 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 the mitigation actions proposed by the CAP as well as those which may evolve in the future.

### Policy Design

The PWG recommends that the State lead by example in its own education and outreach activities by establishing a pro-active public education and outreach capability, and using it to target education and outreach activities to at least five specific audiences:

- Policymakers (legislators, regulators, executive branch, agencies) – because implementation of climate actions hinges on policymakers' approval.
- Younger Generations – by integrating climate change into educational curricula, post-secondary degree programs, and professional licensing programs.
- Community Leaders & Community-Based Organizations (e.g., institutions, municipalities, service clubs, social & affinity groups, non-governmental organizations, etc.) – in order to recognize leadership; share success stories and role models; and expand climate involvement and participation within civic society.
- General Public – to increase awareness and engage citizens in climate actions in their personal and professional lives.
- Industrial and Economic Sectors – in order to recognize leadership; share success stories and role models; and expand climate involvement and participation within the business community.

Specific public education and outreach suggestions are provided in an accompanying attachment.

**Goals:** Not applicable.

**Timing:** Public education and outreach efforts should commence as rapidly as possible.

**Parties Involved:** Probably coordinated largely by Colorado DPHE, but involving many parties.

**Other:** Not applicable.

## CC-8. Tax and Cap Policies

### Policy Description

Tax and cap policies (typically considered as carbon taxes and cap-and-trade programs respectively) can be among the most economically effective means to reduce GHG emissions. By internalizing costs that are currently not assessed (i.e., are “externalized” as pollution), such policies create financial incentives for entities to reduce their emissions. Under tax and cap policies, reducing emissions reduces costs.

A carbon tax would be relatively simple and easy to implement and would apply to all sectors. Utilities would pay it based on their smokestack emissions and pass the cost to consumers in their monthly electric bill. Individuals would pay it when they fill up cars with gasoline. A carbon tax would also encourage efficiency improvement in all sectors. A carbon tax does not necessarily mean a net increase in the cost of living, because revenues could be “recycled” to reduce other, currently assessed taxes.

Cap-and-trade programs typically establish an upper limit on emissions (the “cap”), usually lower than current emissions, which creates the drive for reductions. These programs also established “allowances” or “rights to emit” which are allocated or auctioned to covered sources. Sources need to match their emissions to the amount of allowances that they hold, but can trade allowances freely among themselves. The result is that sources which find it least expensive to reduce emissions “overcomply” (i.e., have more allowances than they need) and can sell allowances to other sources for which making reductions are more expensive. This dynamic encourages sources to pioneer innovative ways to make reductions, so they will need fewer allowances and may even be able to profit by selling allowances. The broader the universe of sources (e.g., types of sources covered, geographical region covered, etc.), the more likely it is that cost differences will be found, thereby reducing the overall cost of the program.

### Policy Design

The CC PWG will not quantify potential reductions from either of these approaches, but will follow the identification and characterization of these policy options in other PWGs and may make recommendations to the CAP as necessary to ensure that these policies are considered in its final report.

**Goals:** TBD

**Timing:** TBD

**Parties Involved:** TBD

**Other:** Not applicable.

## CC-9. Funding for Implementation of CAP Recommendations

### Policy Description

The intent of this policy option is to encourage and facilitate the involvement of funding and investment sources, business interests, and entrepreneurs in pursuing business opportunities associated with GHG reductions and global warming solutions as quickly and as significantly as possible. The creation of a clearinghouse-like entity may make it possible to match technology developers and other climate solution entrepreneurs with necessary financing more effectively and expeditiously. As a result, Colorado's ability to identify and secure early business opportunities associated with climate change may be enhanced, increasing its global competitive advantage and job creation within the state.

Potential funding sources include philanthropic organizations, high net worth individuals, or others interested in supporting innovative, environmentally effective market solutions. Recognizing that fortunes are likely to be made in the "new energy economy," for-profit investors, pension funds, mutual funds, and/or venture capitalists may be looking to fund similar business opportunities. Although technology entrepreneurs are often cited as offering potential global warming solutions, equally progressive solutions may lie in the fields of law, accounting, marketing, production, and even government relations and lobbying. The objective of this policy option is to leverage Colorado's specific talents for global warming solutions into securing the business opportunities and market advantages that well-supported "early bird" efforts are likely to reap in a carbon-constrained world.

### Policy Design

**Goals:** TBD

**Timing:** TBD

**Parties Involved:** TBD

**Other:** Not applicable.

## CC-10. Adaptation and Vulnerability

### Policy Description

Because of the build-up in the atmosphere of long-lived GHGs that already has occurred, Colorado will experience the effects of climate change for years to come, even if immediate action is taken to reduce future GHG emissions. As such, it is essential that the state develop a strategy to manage and adapt to the projected impacts of ongoing climate change, particularly where the state is most vulnerable, e.g., water supply issues.

### Policy Design

While taking action to reduce GHG emissions in Colorado, the state also should explore, develop, and implement a state climate change adaptation strategy that: identifies the potential near-term and short-term impacts of climate change scenarios affecting the State, outlines steps that should be taken to respond to those impacts, and coordinates these steps with response plans and efforts that are underway or may be contemplated at other agencies or organizations or through other initiatives.

A comprehensive state climate change adaptation strategy should include time- and program-based goals, characterization of the potential risks and costs of inaction, and the potential costs, benefits, and co-benefits associated with specific policy and program actions and time periods.

The state should consider appointing a task force or advisory group to develop recommendations for the state adaptation strategy. Moreover, the state should direct state agencies and other appropriate institutions to identify and characterize potential current and future climate-related risks in Colorado — risks to human, natural and economic systems, including water resources, temperature sensitive populations and systems, energy systems, transportation systems, vital infrastructure and public facilities, and natural lands (such as forests and farmland).

Adaptation measures that also help mitigate GHG emissions should be given priority in the state climate change adaptation strategy, particularly water conservation and efficiency, forest and agriculture conservation and management, energy production and use, facility siting and management, infrastructure development, and efficient transportation and land use systems. These actions should be linked to implementation of other specific recommendations of this CAP to the greatest extent possible.

Finally, the state's climate change adaptation strategy should be reviewed and updated on a regular basis.

**Goals:** Not applicable.

**Timing:** Public education and outreach efforts should commence as rapidly as possible.

**Parties Involved:** Probably overseen largely by Colorado DPHE, but involving many parties.

**Other:** Not applicable.