



**DRAFT MEETING SUMMARY  
COLORADO CLIMATE ACTION PANEL  
Meeting #2**

Boulder, Colorado  
February 15, 2007

**Attendance:**

Climate Action Panel (CAP) Members:

- Dr. Susan Avery
- Dr. Joe Broz (Co-chair)
- Mel Coleman, Jr.
- Tom Compton
- Chris Crosby
- Judy Dorsey
- Michael Dowling
- Dr. Tony Frank
- Jack Ihle (alternate for Frank Prager)
- Eric Kuhn (Co-chair)
- Dr. Chuck Kutscher
- Laurie Mathews
- Brian Moeck
- John Nielsen
- Bruce Oreck
- Dianna Orf (alternate for Stuart Sanderson)
- Barbara Roberts (alternate for Dan Grossman)
- Mark Ruzzin
- Stuart Sanderson
- Jennifer Schaufele (alternate for Nancy Sharpe)
- Auden Schendler
- Nancy Sharpe
- Brad Udall (alternate for Dr. Susan Avery)
- Randy Udall
- Chris Williams
- Stan Zemler

Governmental agency liaisons: Jill Cooper (Colorado Department of Public Health and Environment)

Rocky Mountain Climate Organization: Stephen Saunders, Tom Easley, Sue Damour, Charlie Montgomery

Center for Climate Strategies: Katie Bickel, Ken Colburn, Karl Hausker, Ezra Hausman, Lewison Lem, Randy Strait, Marianne Tyrrell, Tim Woolf, Chris Yates (in person). Alison Bailey, Alison Jamison (via speakerphone)

Public: Vickie Card, Jim DiLeo, Veva McCaig, Tom Weis, Phyllis Woodford

Background Documents: (all posted at [www.coloradoclimate.org](http://www.coloradoclimate.org))

- Notice and Agenda
- Power Point Presentation
- Draft Colorado GHG Inventory and Reference Case Projections, 1990-2020
- Revised Catalogs of State Actions
  - Agriculture, Forestry, and Waste Management
  - Energy Supply
  - Residential, Commercial, and Industrial
  - Transportation and Land Use
  - Cross-Cutting Issues

### **Discussions and conclusions:**

#### **1. Welcome, Introductions, and Review of Agenda**

- Stephen Saunders, President of the Rocky Mountain Climate Organization, called the meeting to order and welcomed the panel members and members of the public. The attendees went around the room with self-introductions. Mr. Saunders noted that the following persons had been added to the panel since the initial panel meeting: Brad Boyce of Oso Energy; Mel Coleman, Jr., of Coleman Natural Food; Chris Williams of Encana Oil and Gas (USA); Michael Bowman of 25x'25, replacing Tracee Bentley; and John Nielsen of Western Resource Advocates, replacing Jim Martin.
- The Mayor of Boulder, Mark Ruzzin, also gave welcoming remarks. Boulder hopes to be a model city for climate change. Boulder has been on the forefront in addressing greenhouse gas (GHG) emissions. The city has committed to reducing its GHG emissions to 7% below 1990 levels by 2012, and has adopted and funded implementation of a Climate Action Plan to meet this goal. It has also adopted a carbon tax to raise funds for its plan. Boulder citizens are extremely excited about this effort, but also acknowledge the challenges associated with implementing an action plan.
- Ken Colburn reviewed the agenda. No comments or updates were made.

#### **2. Review and Approval of CAP #1 Meeting Summary**

Mr. Saunders asked for and received approval of the CAP #1 Meeting Summary without any comments or objections.

### 3. Review and Discussion of the Draft Colorado GHG Inventory and Forecast

Randy Strait and Katie Bickel presented the results of the draft GHG inventory and forecast for Colorado. CAP members asked clarifying questions and noted potential areas for improvement. Mr. Strait noted that this is a preliminary draft inventory and forecast and that the Policy Work Groups (PWGs) will further evaluate the draft inventory and forecast and provide recommendations for improvements (e.g., new data sources and modified assumptions) to the CAP for approval. The inventory and forecast will be revised to reflect revisions approved by the CAP. The following provides a brief summary of key points and clarifications requested by the CAP.

- Emissions Growth: The preliminary forecast suggests Colorado's gross GHG emissions will increase by about 80% from 1990 to 2020. From 2005 levels, gross GHG emissions are estimated to increase by about 33% in 2020. The highest emitting sectors are electricity supply (consumption basis); transportation; and residential, commercial, and industrial (RCI) fuel use. The emissions growth is largely driven by population and employment trends. Colorado's emissions growth is projected to be high relative to the US average; however, it is lower than other states (e.g., AZ, NM).
- Clarifications:
  - Slides 5 through 9 in the PowerPoint presentation are based on gross GHG emissions, emissions sinks associated with forest management are not included in these slides.
  - A CAP member asked if the uncertainty in the inventory and forecast estimates are primarily associated with random or systematic errors? CCS responded that the uncertainties with the estimates may be associated with either one or both types of errors depending on the sector and the data sources used. The sector-specific appendices in the draft inventory and forecast report include a section on "Key Uncertainties" to assist the PWGs and CAP in understanding the sources of uncertainty associated with the inventory and forecast for each sector.
  - Slide 7 of the PowerPoint shows gross GHG emissions per Gross State Product (GSP) declining similar to the trend with US gross GHG emissions per Gross Domestic Product (GDP) from 1990 through 2004. These metrics indicate that the state (and national) economy is expanding at a faster rate than GHG emissions, which is a positive trend.
  - Energy Supply Sector: CCS responded to questions about the fuel mix assumptions used to develop the inventory and forecast. A CAP member noted that the assumptions on the amount of electricity generated by wind may be a little low and will be happy to provide information to the CAP and PWG to improve the wind generation estimates for this sector.

- RCI Fuel Use Sectors: A question was asked if energy efficiency trends are included in the forecast? CCS responded that the forecast is based on regional projections for the Mountain region prepared by the Energy Information Administration (EIA) of the US Department of Energy. The EIA projections do include assumptions on improvements in energy efficiency. However, the EIA projections are regional and may not fully capture the effects of energy efficiency actions undertaken in Colorado.

CCS noted that the EIA regional projections included a significant increase in industrial coal consumption, beginning in year 2011, based on an EIA modeling assumption that it will be economical for new plants to locate near coal mines to convert coal to distillate fuel. CCS noted that it did not include this assumption in the forecast for industrial coal consumption in Colorado because the forecast reflects a “business-as-usual” scenario against which the emission reductions associated with policy options can be quantified. It is uncertain if the coal-to-liquids plants will be built in Colorado and, therefore, this EIA forecast assumption was not included in the baseline GHG emissions forecast for Colorado.

- Fossil Fuel Production: A question was asked if the emissions for this sector are all methane emissions? CCS responded that methane is the only pollutant for which emissions are included in the inventory and forecast for this sector at this point. There may be some CO<sub>2</sub> emissions released during oil and gas extraction; however, information could not be identified to quantify the CO<sub>2</sub> emissions.
- Transportation Sector: The international bunker fuels data are included in the EIA’s jet fuel consumption estimates used to prepare the inventory for Colorado. This fuel consumption associated with international air flights should not be included in the state inventory (because much of it is actually consumed out of state); however, data were not available to subtract this consumption from total jet fuel estimates. This approach has also been used for the inventories for other western states because there is not a good method for estimating the amount of emissions associated with the combustion of aviation fuel within a state’s air space.

CCS responded to questions about how the forecast in vehicle miles traveled (VMT) was prepared resulting in an overall annual growth rate of 2.1% per year from 2005 through 2020. CCS obtained VMT projections data from the three major metropolitan planning organizations in Colorado as well as the Colorado Department of Transportation.

- Waste Management Sector: A CAP member noted that they have good, site-specific data to support development of GHG emissions estimates for the solid waste sector. CCS responded that this will be very helpful in refining the estimates for this sector. The CAP member should coordinate with the PWG for the agriculture, forestry and waste sectors in using the data to develop recommendations to the CAP for improving the inventory and forecast for the solid waste sector.

- EIA Regional Projections: A question was asked if the EIA regional projections are realistic? CCS responded that the EIA regional projections are the best data we had for preparing the preliminary forecast for Colorado. If CAP and/or PWG members are aware of state projections, or if there are data that show that the EIA regional projections do not reflect Colorado's situation, it would be very helpful if the members would work with the sector-specific PWGs in evaluating the data to determine if it can be used to improve the forecast.
- Forestry Sector: A CAP member noted that the methods applied to estimate net emissions sinks for the forestry sector do not match trends they have observed associated with the loss of forest lands in the state. CCS noted that the estimates included in the inventory and forecast are based on US Forest Service data that estimate carbon flux associated with carbon stocks for two inventory years (1983/1984-2005) based on FORCARB2 model. This is the best data available when the preliminary inventory for Colorado was prepared. It was agreed that the assumptions used to develop the inventory and forecast need further review and possible revisions by the CAP and PWG.

A member asked how emissions associated with wildfires were counted in the inventory and forecast. CCS responded that the CO<sub>2</sub> losses are accounted for in the carbon-stock change method for the forestry sector. However, emissions associated with nitrous oxide and methane are included in the inventory and forecast consistent with US EPA and Intergovernmental Panel on Climate Change guidelines.

Mr. Colburn reviewed future steps of the inventory development. At each CAP meeting, CCS will update the draft inventory and forecast as a result of PWG recommendations as approved by the CAP. The inventory and forecast will be part of final report and is a building block for final goals. The CAP will approve a final draft of the inventory and forecast at some point in the process (approximately CAP Meetings #4 or #5). Comments and recommendation from the CAP should go to the PWG CCS facilitators.

#### **4. Review and additions to the Catalog of States Actions**

The catalog of over 200 policy options for mitigating GHG emissions was then described and reviewed. Mr. Colburn noted that the PWGs had met yesterday and some had expanded the list of policy options on their catalog. The CAP may also add or consolidate policy options during today's meeting. Mr. Colburn noted that the initial draft catalog provided to the CAP and PWGs represent a compilation of policy options that had been identified through other state processes. As requested by the CAP, policy options considered by Arizona, New Mexico, and Montana are identified in the "Notes" column of the catalog. Mr. Colburn also referred the CAP to the file that provided a brief description of policy options on the catalog.

The goal for today's meeting is to ensure that the catalog of policy options for each PWG is comprehensive and includes policy options important to the State of Colorado. During today's meeting, CCS' facilitators for each PWG will review the policy options in the catalog provided in hard copy to the CAP, and will note policy options that each PWG added during its meeting yesterday. The CAP will then discuss and provide comments on the catalog for each PWG. The catalog for each PWG will serve as the starting point for identifying priority policy options for achieving Colorado's emission reduction goals.

a. Residential, Commercial, and Industrial (RCI) - CCS' Ezra Hausman reviewed the 44 policy options on the draft catalog, and an additional 21 options that the PWG added to the catalog during its meeting yesterday. Mr. Hausman noted that the catalog will be updated to include the input from the PWG. Mr. Hausman then reviewed the major RCI option areas, and noted that the RCI PWG recommended expanding efficiency policies to municipalities and coops. He noted that the PWG added options to the catalog for improving building codes both for new structures and retrofitting existing structures. CCS' Tim Woolf explained how feebates work. Mr. Hausman conveyed that the PWG focused on various types of incentives to consumers and various savings techniques, and emphasized the importance of consumer education. The PWG also considered various renewable energy techniques and identified that, among others, passive solar should be further explored for Colorado. The PWG also identified the need to educate the public about the need to do specific inventories.

The CAP approved (without any objections) the catalog of RCI policy options.

b. Energy Supply (ES) - CCS' Mr. Hausman reviewed each of the 38 policy options on the draft catalog, and an additional 26 options that the PWG added to the catalog during its meeting yesterday. Mr. Hausman noted that the catalog will be updated to include the input from the PWG. He noted that PWG members expressed concern about the analysis of carbon benefits associated with renewable energy—such as ensuring that the emissions associated with producing corn-based ethanol are taken into account.

One area of potential interest is small hydropower systems, including opportunities for hydropower on existing water delivery infrastructure. Options for exploiting this resource would include incentives and working to get them regulated at the state level, instead of federal.

A number of transmission-related issues have been raised, including the need for transmission planning the supports development of renewable resources, the need for greater efficiency in transmission resources to reduce losses, and the benefits of distributed generation (DG) systems for reliability and for reducing losses. One likely option for DG is combined heat and power at Universities, etc. It was noted that barriers still exist for net metering, and that these hinder the economics and development of renewable resources and DG.

Several PWG members voiced an interest in IGCC technology, which generates energy by burning coal with a high level of efficiency and low emissions, and may facilitate the capture and storage of CO<sub>2</sub> in the future. However, these plants may have a higher cost, so there may be a

risk of the PUC disallowing cost recovery. Also, eventual storage would require CO<sub>2</sub> pipelines to deliver the waste gas to sequestration sites.

Other promising options may include waste heat recovery from existing and new power plants, improvements in electricity storage to accommodate intermittent resources (wind and solar), etc.

There was a discussion of the cost of cap and trade and carbon tax as emissions policies, with some members suggesting that the cost of these policies is high, while others argued that they are the lowest cost options by definition. A representative from the coal industry said that the cost for their industry would be high, that the damage to this industry as well as increased cost of these programs would have a large impact on the state economy. The issue was left unresolved.

One area considered by the ES PWG was Oil and Gas Operations – specifically, members voiced an interest in capturing methane from coal operations, but said that this has been blocked by licensing restraints and federal/state jurisdictional issues.

The CAP approved (without any objections) the catalog of ES policy options.

c. Agriculture, Forestry, and Waste (AFW) – CCS’ Katie Bickel reviewed the 59 policy options on the draft catalog (20 options for agriculture, 27 for forestry, and 12 for waste management), and four additional options recommended by the PWG as a result of the February 14<sup>th</sup> PWG meeting.

The CAP supported four new options that came out of the February 14<sup>th</sup> PWG meeting: Strategic Agricultural Land Use Management, Prevent Conversion of Grassland to Cropland; Reduction in On-Farm Energy Use; and Prevent Landfilling of Unprocessed Organic Material. In addition, they added the following new options to the catalog: Application of Biochar to Soils (under section AFW-3); Undertake a Resource Assessment for Potential Biomass Energy Production in CO (under section AFW-8), unless this already exists, in which case it should inform policy development; and Develop Opportunities for Agriculture and Forestry Offsets. The CAP made a number of clarifying comments, for example: hydro-powered irrigation equipment should fall under the new option on Reduction in On-Farm Energy Use; ethanol options should include both forest and agriculture biomass; manure management includes application as well as storage and handling methods; there is a need for education and funding on organic farming and training on strategic use of fertilizers; there is concern that ethanol (and other bioenergy feedstocks) will increase demand for corn and will promote conversion of land into conventional crop production; and open space policies may have some conflicts with wind farms in terms of transmission lines.

The CAP approved (without any objections) the catalog of AFW policy options with the addition of seven new options listed above (including four PWG recommendations and three new options from the PWG).

d. Transportation and Land Use (TLU) – CCS’ Karl Hausker reviewed the 50 policy options on the draft catalog, and noted revisions to some of the options based on comments received from the PWG meeting yesterday. Dr. Hausker responded to questions on some of the options after leading the CAP through the catalog.

The CAP approved (without any objections) the catalog of TLU policy options.

e. Cross Cutting (CC) – CCS’ Ken Colburn reviewed each of the seven policy options on the draft catalog and noted the suboptions that existed for some of the policy options. A CAP member noted that “cap and trade” should be considered since it is a mechanism for mitigating GHG emissions that can be applied to several types of emission sources, not just to electricity supply sources, for example. Colburn noted that the policy options addressed by the CC PWG are not generally quantified. If an option is to be quantified, then it is referred to one of the other PWGs. A PWG member also noted that tax policies and market-based mechanisms such as “cap and trade” can be designed to cover the entire economy rather than be focused on particular sectors. For example, a CO<sub>2</sub> tax or hybrid tax incentives or disincentives for poor practices should be considered. It was also noted that the education and outreach policy option should go beyond the local or state level to the regional, national, or international levels.

The CAP approved (without any objections) the catalog of CC policy options with the following revisions:

- Under Public Education and Outreach (CC-7) / Industrial & Economic Sectors (CC-7.6), added a suboption to include “Audiences outside Colorado” (CC-7.6.7).
- Under Tax Policies (CC-8), changed the title to “Tax and Cap Policies” and added a suboption for “Cap and Trade” (CC-8.2).

## **5. Discussion of Water and Climate Vulnerability Issues**

Mr. Saunders noted that the CAP is focused on developing policy options for mitigating GHG emissions. Issues associated with the State of Colorado adapting to and managing risks associated with the effects of climate change (e.g., water supply, heat waves, impacts on wildlife) will be addressed by a separate process that is currently under development by the RMCO. Mr. Saunders asked for volunteers to participate on a subgroup to begin addressing water management issues. Additional volunteers with substantial expertise are being recruited to participate in the subgroup. RMCO will also ask the CAP members for their advice on how best to address adapting to and managing climate risks that Colorado is likely to face during CAP meeting #3.

## **6. Next Steps of PWGs and CAP**

Mr. Colburn reviewed the next steps in the process, wherein the PWGs next effort will be to select and recommend to the CAP priority policy options for further analysis. The PWGs will identify the top 10 to 12 policy options to recommend to the CAP for further analysis. A balloting procedure (to be explained by the PWG facilitators) will be used by the PWGs to determine priority policy options. The PWGs may prepare recommendations for consolidating policy options.

## **7. Agenda, Time and Date for Next Meeting**

The agenda for the next CAP meeting will be for the CAP to review (1) review the PWGs' suggested priorities for analysis of policy options; (2) review the PWGs' suggested updates to the draft Colorado emissions inventory and forecast; and (3) discuss policy design issues and next steps for policy options.

CAP members were reminded that the next meeting will be held on Thursday, May 3, 2007. RMCO staff will inform the CAP members of the time and location of the next meeting.

## **8. Public Input and Announcements.**

Members of the public were invited to make comments and raise questions, but there were none.

The meeting was adjourned.