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To: New Mexico Climate Change Advisory Group (CCAG)  
From: The Center for Climate Strategies (CCS)  
CC: New Mexico Environment Department (NMED)  
Re: Follow Up Issues From Second CCAG Meeting  
Date: January 11, 2006

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At the second CCAG meeting on October 19 members raised questions on a number of policy development issues and concepts, including requests for further information on three specific issues:

1. The availability of “after the fact” data on the economic impact of implementing state level greenhouse gas (GHG) mitigation plans;
2. The need for considering human and social values in evaluation of options, and potential methods for doing so in the CCAG process; and
3. Clarification on the impact of production versus consumption based approaches to state GHG accounting, and options for addressing these issues within the CCAG process.

In response CCS has prepared this memo with follow up information for the group to review as background for subsequent technical work group (TWG) and CCAG discussions as needed.

### 1. Economic Impacts of Implementing State Level GHG Mitigation Plans

Because a limited number of state GHG plans have been completed in the US and are currently entering implementation, “after the fact” (ex post) data on the economic impact of these plans is not available. “Before the fact” (ex ante) economic estimates suggest that their net costs are likely to be relatively low (*see listing of state plans and related economic assessments posted for the third meeting of the CCAG*).<sup>1</sup> We are aware of one study that has compared state macro economic performance across states with varying levels of carbon control policies, conducted under U.S. EPA contract by Abt Associates (*this document posted for the third meeting of the CCAG*)<sup>2</sup> This study documents the so-

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<sup>1</sup> <http://www.nmclimatechange.us/ewebeditpro/items/O117F7691.pdf>

<sup>2</sup> <http://www.nmclimatechange.us/ewebeditpro/items/O117F7683.pdf>

called “upward spiral” of likely better macro economic performance of states with stronger GHG reduction polices in comparison to lower economic performance in states with weaker GHG reduction policies. Evaluation of corporate GHG reduction efforts by The Climate Group<sup>3</sup> documented cost savings, competitive gains, and lower GHG emissions, and reinforces the Abt study’s conclusions.

In addition, there is substantial ex post economic information deriving from implementation of federal pollution control programs, including the Clean Air Act. A number of good examples were provided by Resources for the Future of Washington, DC ([www.rff.org](http://www.rff.org)) in the form of Congressional testimony in response to regulatory reform debates in Congress from 1995-1997. Summary statements by Dr. Paul Portney, RFF Director, were based on evaluations of many independent and peer-reviewed analyses of the cost of regulatory compliance of federal environmental laws. They concluded that the cost of implementing pollution reduction programs, broadly speaking, did not harm US competitiveness. Studies generally concluded that real costs of implementation, on average, were lower than estimated costs before implementation and that real benefits were higher than initial benefit estimates. Finally, studies suggested that the next generation of environmental protection is likely to be more expensive than the last, as many low cost control options have already been implemented.

Many individual actions, notably those with a history of implementation well before the development of GHG plans, have been analyzed *ex post*. Examples include energy efficiency policies, such as appliance standards and demand-side management programs, and some renewable energy policies, as well. If these are of interest, CCS can make additional studies available.

## 2. Potential Methods for Consideration of Human and Social Values in Evaluation of Options

As noted in discussions at the last CCAG meeting, decision criteria for ultimate selection and design of recommendations by the CCAG includes the consideration of costs, benefits, ancillary impacts, and feasibility issues. These include quantification of human impacts and social values through economic tools and other means. In November, Governor Bill Richardson signed the Environmental Justice Executive Order.<sup>4</sup> This Executive Order requires cabinet level agencies to utilize available environmental and public health data when making certain decisions and to involve affected communities in these decisions.

In addition, CCS is providing an example of an analytical tool that can be used to evaluate on commonly raised social issue: the potential for disproportionate impacts of GHG policy on households with different income levels. This study of the potential impact of a carbon tax on the Susquehanna Basin (including parts of Pennsylvania,

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<sup>3</sup> <http://www.theclimategroup.org/index.php?pid=373>

<sup>4</sup> [http://www.governor.state.nm.us/orders/2005/EO\\_2005\\_056.pdf](http://www.governor.state.nm.us/orders/2005/EO_2005_056.pdf)

Delaware, Maryland and Virginia) by Adam Rose of Penn State University and and Gbadebo Oladosu of Oak Ridge National Lab found that a hypothetical carbon tax would disproportionately affect higher household income brackets due to the positive effect of income on energy use and intensity (*this document posted for the third meeting of the CCAG*).<sup>5</sup> This type of tool could be used to evaluate economic impacts of climate policies in New Mexico as they affect different types of households.

### 3. Production Versus Consumption Based Approaches to State GHG Accounting

Several members at the last CCAG meeting noted the need for clarification on GHG accounting issues related to production versus consumption based approaches, and their impact on the CCAG decision making process related to the statewide inventory and forecast, the quantification of potential policy recommendations, and the design of reporting and or registry systems. CCS has prepared a detailed explanation of these issues (below).

Our summary conclusion is that the draft statewide inventory and forecast can be finalized based on a series of revisions suggested by TWG's to the CCAG, and that refinement of GHG accounting systems for New Mexico should be considered as specific policy options and related monitoring, reporting and verification (MRV) systems are contemplated in the remainder of the process. Following more specific evaluations of policy and implementation need, the CCAG can suggest future refinements to statewide inventories and forecasts. These findings are provided in the discussion below.

#### Background on state GHG accounting uses

Within the context of statewide climate change mitigation action planning processes, GHG emissions inventories and forecasts provide vital information regarding the scope, magnitude and dynamics of emissions resulting from state level activities over designated historical and future periods. As such, they serve as a diagnostic tool to support the identification of potentially meaningful action areas, as well as a basis for calculation of the emissions impacts of specific actions or sector-based strategies. They also provide a starting point for emissions MRV programs to support implementation of actions.

When prepared for a planning process, statewide inventories and forecasts typically aim to be comprehensive at a state-wide level and rely on readily available data and calculation methods. As such, they can differ from GHG inventories and estimates used to establish baselines for compliance or crediting programs; these figures are often estimated at the sector or entity level and may require significant further analytical effort and documentation.

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<sup>5</sup> <http://www.nmclimatechange.us/ewebeditpro/items/O117F7681.pdf>

In the past decade, a number of US states have developed (or are developing) statewide climate change action plans that require initial statewide GHG inventories and forecasts for guidance purposes. To date, none have established binding statewide targets and timetables that employ a statewide baseline for compliance purposes. As a result, statewide inventory and forecast estimates have not been structured as compliance tools. Compliance efforts have been reserved for individual policies and measures contained in broader statewide plans. The development of associated quantification and MRV systems follows the development of specific policies and programs.

In the process of formulating initial emissions inventories and forecasts for planning, states have used a set of generally accepted principles and guidelines that typically include:

- Consistency across sectors, gases, time periods and jurisdictions
- Flexibility to address the preference for best available state level data
- Prioritization of the most significant sources of emissions in terms of measurement detail and complexity
- Presentation of alternate metrics for consideration and understanding
- Focus on state level activities that directly generate or reduce GHG emissions, generally interpreted to be “consumption” based activities
- Transparency of data sources, methods, assumptions and uncertainties

Stepwise GHG mitigation action planning processes involve three separate, sequential steps, including development of statewide emissions inventories and forecasts. Essential steps include:

- 1) Drafting of and revisions to a preliminary statewide emissions inventory and forecast;
- 2) Identification of mitigation policy options and the quantification of their emissions impacts and costs; and,
- 3) Design of implementation programs for specific policy options, including MRV systems.

These steps are interrelated and sequential, and should follow a generally consistent framework. In other words, the quantification of emissions impacts for a policy option (step 2) should be based on the data and assumptions used for the inventory and forecast (step 1). However, because these steps are sequential, further information may be revealed in the analysis of a specific policy options that was not available or too detailed to be considered in the development of the initial inventory and forecast. In such cases, potential inconsistencies need to be clearly flagged, and the inventory and or reference case forecast can be updated at a later stage.

One type of data inconsistency that can arise is related to the location of emissions reductions caused by actions taken within a state. For example, increasing solid waste recycling is often considered a GHG mitigation option, its principal GHG benefits being a net reduction in fossil fuel used for the extraction and processing of virgin materials

(steel, aluminum, glass, etc.). The physical location of these emissions can be difficult to determine, and often lies outside state boundaries. These out of state emissions sources may not be included in the initial statewide emissions inventory, but the emissions reductions associated with recycling efforts can still be estimated using EPA and other tools.

This type of more detailed quantification issue is typically considered during structuring of a full life cycle analysis of GHG impacts (step 2 of the overall process). During this stage it is important to understand *to the extent feasible* the full emissions impacts of each option, even if some emissions impacts occur outside state boundaries. As result, GHG planning processes typically tolerate different boundaries for the analysis of policy impacts for the statewide inventory at stage 1 than are deployed at stages 2 and 3. Analysis at later stages in the planning process should be generally consistent with fundamental assumptions and data used for the inventory and forecast, and clearly note the need for data consistency across state lines where needed.

Implementation programs (Step 3), in particular, may involve somewhat different accounting systems for emissions and emission reductions for other reasons, depending on their contexts. For instance, some policies may necessitate the use of full life cycle analysis where indirect impacts are very significant (e.g. as in the case of solid waste recycling, where a principal emissions impact is the reduced need for, and emissions from, primary material extraction and processing). Another example is the quantification steps that may be needed to address overlap or interaction between individual policies in the market place (dynamic equilibrium supply and demand effects).

Statewide inventories and reference case forecasts should provide a general accounting system that guides the analysis and design of individual policies and programs with relatively comprehensive and consistent approaches that guard against double counting or exclusion of impacts across sectors. But the general methods used in statewide emissions inventories and forecasts should not substitute for more detailed analysis and/or measurement needed in later stages of program design and implementation.

Key emissions accounting principles that should be considered in quantifying policy options or designing reporting systems should include:

- Clear delineation of the boundaries of the activity that leads to the emissions reduction
- Clear definition of the time period(s) of policy implementation and GHG impacts
- Clear understanding of all positive and negative GHG impacts
- Clear understanding of ability and means by which an activity may be influenced at a state level, regardless of the location of the emissions reduction
- Avoidance of double counting or exclusion of emissions impacts
- General consistency with emissions accounting systems to be used in neighboring jurisdictions where mutual recognition, joint actions or joint impacts are involved

## Status of New Mexico Inventory and Forecast Issues

CCS followed these principles and guidelines in formulating the draft New Mexico inventory and forecast of statewide emissions, and has worked with technical work groups (TWGs) and the CCAG to revise specific measurements as needed to finalize GHG estimates. Presently all TWGs have approved the sector specific data sources, methods and assumptions associated with the statewide GHG inventory and forecast, although the Energy Supply and Residential, Commercial and Industrial TWGs have inquired about alternatives associated with production and consumption based estimates as a part of finalizing the inventory.

This production and consumption issue has arisen in other states. The production-based approach focuses on the emissions-producing activities in the state, regardless of their ultimate destination. For example, considerable GHG emissions are produced in the state from the generation of electricity and the production of natural gas destined for use in other states that would be counted as New Mexico emissions under a production based system. Under a consumption-based system, these energy exports are counted in states where energy is consumed, and imported energy into New Mexico is counted as it is consumed within the state. The consumption-based approach focuses on the emissions associated with electricity and natural gas consumption activity within the state boundary, and or the provision of other energy-intensive products that are consumed within the State. The pros and cons of these approaches are described in the draft inventory and projection (*this document posted for the third meeting of the CCAG*).<sup>6</sup>

The current statewide inventory and reference case forecast report provides estimates of:

- 1) Production basis GHG emissions, i.e., those associated with the emitting (or sequestering) activities located in New Mexico (including all electricity generation and fossil fuel production regardless of its ultimate destination); and
- 2) Consumption basis GHG emissions, i.e., the netting out of emissions associated with electricity and fossil fuel produced in state but exported to other states.

A more detailed consumption-basis analysis might also consider the effect of imports and exports of other emissions-intensive products, such as construction materials (wood, steel, cement). However, such an assessment would require considerable additional analytical effort and can be addressed as required by specific policy options are identified and developed (such as expanded use of “green products” with lower than average embedded energy from production). Furthermore, it is unclear how such estimates might be made consistent with inventories in other states, so a range of quantification options may need to be considered based on potentially different accounting systems.

In the case of electricity, there is already an established precedent for accounting for emissions on a consumption basis (California inventory; other West Coast states). In

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<sup>6</sup> <http://www.nmclimatechange.us/ewebeditpro/items/O117F6527.pdf>. See pp. 9-11 (equivalent to pp. 13-15 in Adobe numbering).

comparison, for emissions from fossil fuel production (distinct from final use and combustion), New Mexico may be the first state with high levels of oil and gas production to consider a consumption-based approach and be guided by the needs of proposed policies and programs. The current New Mexico statewide inventory and forecast provides the possibility for adopting a number of alternative accounting approaches for future quantification and reporting schemes related to energy and fuel production, including:

- 1) Production only
- 2) Above, but considering electricity generation emissions on a consumption basis
- 3) Above, but also considering fossil fuel production emissions on a consumption basis

The choice among the three options can occur at any point during the CCAG process or thereafter.

The consideration of policy options and implementation systems does not require any additional modification of the current statewide inventory and forecast. To the extent that production versus consumption or other measurement issues are important to these steps, they can be considered in the next phases of the process. Going forward, the CCAG and TWGs have the freedom to consider policy options that can be demonstrated to have a direct and or indirect impact on reducing GHG emissions in New Mexico, and to identify appropriate quantification systems to support their analysis and implementation.