



Energy Supply / RCI Policy Work Groups

Assessment of Cumulative Impacts

In addition to estimating the impacts of each individual policy option considered by the Policy Work Groups, we have estimated the *combined* impacts of all of the policies in each sector if all were implemented together. This involves eliminating any overlaps in coverage that would occur to avoid double-counting of impacts. We have also evaluated and quantified any overlaps between the RCI and ES sectors to establish an assessment of the cumulative impacts of all policy options in these two sectors.

The methodology applied to perform these assessments is as follows.

RCI

In order to assess the cumulative emissions reductions for the policies in the RCI sector, it is necessary to consider any overlaps among the policies that affect similar types of energy use. Specifically, some policies (such as RCI-1) are defined by their usage reduction goals, while others are defined by addressing a specific type of energy use. In these cases it is important to consider whether addressing the specific energy use would add to the overall reductions, or just be subsumed into the more general reduction goal.

In order to address this issue, we used two approaches to determining whether a policy option would have an incremental impact over and above the more general DSM goals. First, we asked whether the policy had a specific funding mechanism that would set it apart from other measures to reduce energy use. Then, we asked whether the sector addressed by the measure was covered under a more general goal.

Impact of RCI-5¹

The issue is somewhat complicated by the presence of two independent overarching policies to address DSM: RCI-1, general economy-wide DSM defined by specific reduction targets, and RCI-5, which involves increasing block rates set to generate revenue to support DSM. As written, RCI-5 is more aggressive than RCI-1, so that total DSM activity would be defined by the funding available through this and other DSM policies. However, if RCI-5 were not implemented but all other policies were, then the

¹ Note that two versions of RCI-5 were considered, RCI-5a and RCI-5b, with the less aggressive version, RCI-5b, being considered as part of the cumulative analysis.

question would become which other policies would be subsumed into the emissions reduction goal of RCI-1 and which would somehow not be incorporated into the goal.

This dynamic is illustrated in the table below:

Scenario	Dominant DSM policy driver	Other policies incremental if...	Other policies overlap if...
With RCI 5	Funding associated with increasing block rates	<ul style="list-style-type: none"> • Have incremental funding source (RCI 2, 4, 6) • Address energy use not addressed by RCI-5 (RCI-9, 10) 	Have no incremental funding source (RCI-1, 7)
Without RCI-5	General DSM goal in % reduction per year	<ul style="list-style-type: none"> • Impact on sector exceeds that of RCI-1 goal • Non-DSM related (RCI-9) 	DSM measures that can be used to meet RCI-1 goal

Cumulative impact with RCI-5

Assuming RCI-5 is included, the impacts of each RCI policy will be as follows.

Policy	Interaction	Notes
RCI-1	Electricity component overlaps with RCI-5; gas component is incremental	Goals of RCI-1 would be more than met by RCI-5
RCI-2	Incremental	Has dedicated funding source (dedicated revolving fund)
RCI-3		
RCI-4	Incremental	Has dedicated funding source (tax breaks on incremental cost)
RCI-5	Incremental	
RCI-6	Incremental	Has dedicated funding source (dedicated revolving fund)
RCI-7	Overlap	May be funded with RCI-5 funds
RCI-8	Not quantified	
RCI-9	Incremental	Not a DSM program
RCI-10	Incremental	Self-funded program, much of impact is on industrial

		sector & non-electric use.
RCI-11	Overlaps	Weaker version of RCI-5

Policies which affect natural gas demand

RCI-5 does not target natural gas use, so emissions associated with this energy source must be treated separately. In this case the demand reduction goal in RCI -1 exceeds the sum of all of the demand reductions that would be attained by the other measures considered, as demonstrated in the following table:

	Policy Option	GHG Reductions (MMtCO ₂ e)		
		2012	2020	Total 2007-2020
Option #	RESIDENTIAL, COMMERCIAL & INDUSTRIAL			
RCI-1 gas only	Expanded Demand Side Management	0.3	1.9	9.7
RCI-2 gas only	Energy Efficiency in Buildings Owned by State and Local Governments	0.0	0.1	0.6
RCI-4 gas only	Planning and Design	0.2	0.4	3.7
RCI-6 gas only	Retrofitting Existing Buildings for Energy Efficiency	0.1	0.3	1.7

Thus the cumulative gas savings depends on the specific policy design for RCI-1. If it is simply a goal for total demand reduction, the other policies affecting gas use would be subsumed into the overall goal and would have no incremental impact on emissions. On the other hand, RCI-1 could be specified to be incremental to the other policies and could have a dedicated funding stream that would be used on other measures such as rebates for energy efficient appliances, home energy audits, and other measures that would mitigate natural gas use.

Under either assumption, policy RCI-9 which are not oriented to DSM would have an incremental effect on gas demand.

Cumulative impact without RCI-5

If RCI-5 is *not* included, the cumulative impacts of the RCI policy options may be significantly reduced. In this case, as developed by the RCI PWG, RCI-1 would be satisfied if electricity and natural gas demand is reduced by the specified amount, even if those reductions are achieved by means other than utility-operated demand side management programs. This is similar to the dynamics for natural gas demand discussed above.) Thus only measures which in their cumulative impact exceeded the RCI-1 goals, or which did not target electricity and gas demand, would have any incremental impact on greenhouse gas emissions. In this case the total emissions reduction would be comprised of RCI-1, part of RCI-4, RCI-9, and some components of RCI-10.

Based on these assumptions, the cumulative totals for RCI-5 (adjusting for overlaps) would be (in MMT CO₂e, without adjustments for recent actions):

Scenario	2012	2020	2007-2020
With RCI-5	4.3	15	91
Without RCI-5	2.4	12	64

Energy Supply

The dominant policy option for promoting renewable energy resource development is ES-2, mandated renewable portfolio standards. Because this is an aggressive target, it is reasonable to assume that if this policy is adopted then any other renewable energy policy (e.g., ES-11, small hydro and other small renewables) would simply be a means of achieving these goals and would not actually add to the total amount of renewable energy generated in the state.

Additional benefits would come from the CHP component of ES-6 (but not from the DG component,) from efficiency improvements at existing fossil generators (ES-13) and from reduction of losses from oil and gas operations (ES-14). ES-15, emissions standards for new baseload generation, would have no incremental effect because no new baseload generation would be needed in the state during the study period. No cost has been estimated for achieving the goals in ES-13, but it is assumed that a 2% improvement in efficiency translates into a 2% reduction in CO₂ emissions from these plants.

Combined RCI and Energy Supply

The primary interaction between RCI and Energy Supply policies is that the RCI policies decrease overall electricity demand, thereby reducing the impact of Renewable Portfolio Standards (RPS) programs which are designed to serve a certain percentage of electricity sales from renewable sources. The combined impact of the RCI policies is a 20% reduction in overall electricity demand. This reduction in demand would also decrease the impact of improved efficiency for existing power plants as these plants would be producing less power. Finally, the CHP component of ES-6 is less aggressive than the CHP policy under RCI-9, so the ES policy option is assumed to have no incremental impact.

Interaction of Energy Supply Options with Other Sectors

The policy options in the Energy Supply sector may overlap with those in other sectors if the options in other sectors enhance the availability of renewable energy. In Colorado, policy AFW-10 is a landfill methane energy program which would count towards the renewable portfolio standards in ES-2. However, much of the benefit of the AFW initiative is the conversion of methane, a gas with a high global warming potential, to CO₂, which has a lower one. In the cumulative analysis report the impact of AFW-10 was reduced about 20% to account for this overlap.

Reductions from Recent Actions

Recent actions on the state level have, in some cases, already moved Colorado closer to the goals of the policies proposed through this process. In the RCI sector, two developments have moved demand reduction efforts forward beyond the level represented in the baseline Inventory and Forecast. These are HB 07-1037, which sets DSM goals statewide, and an ongoing effort of Xcel energy to expand DSM as part of a settlement agreement. However, there is some overlap between these two, as Xcel's actions are more than sufficient to meet their requirements under HB 1037. We have calculated the combined impact of these bills, taking the overlap into account, and applied it as a "reduction from recent actions" to the cumulative impact of the RCI policy proposals.