



Energy Supply / RCI Policy Work Groups

Assessment of Cumulative Impacts

Energy Supply

Three renewable energy policy options were quantitatively analyzed in the Energy Supply sector: ES-2, ES-6, and ES-11.¹ For the combined impact of these policies, the RPS proposal (ES-2) is the dominant proposal in terms of overall impact on greenhouse gas (GHG) emissions. The renewable distributed generation (DG) in ES-6 and the use of small hydropower resources in ES-11 would not add to the overall reduction in GHG emissions because they would not change the total renewable energy requirement in ES-2. However, combining ES-11 with ES-2 does have an impact on the cost of GHG emissions reduction because it forces greater use of more expensive renewables in order to reach the goal.

The CHP component of ES-6 would not overlap with other policies and must be added to the combined impact. Similarly, ES-14, reducing emissions associated with Oil and Gas operations, does not overlap and must be considered. ES-15 applies primarily to new power plants in the state. However, under the aggressive renewable requirements of ES-2 there is no need for additional fossil capacity in the state, so this policy option would not come into effect during the study period. Thus the combined impact can be calculated as follows:

Energy Supply Policy	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007-2020 (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
	2012	2020	Total 2007-2020		
ES-1 cost-adjusted for ES-11 hydro	3	8	58	821	
CHP component of ES-6	0.2	0.4	4	25	
ES-13	TBD	TBD	TBD	TBD	
ES-14	0.8	3	16	12	
TOTAL (excluding ES-13)	4	11	77	858	11

¹ Quantitative results for ES-5, “Public Benefit Charge Funds” focused on renewable energy resources, are pending but are not anticipated to substantially affect the results of this cumulative impact assessment.

The potential impacts of policies that were not quantitatively analyzed, policies ES-1, 2a, 3, 4, 7, 9, 10, and 12, were not included in the cumulative analysis for ES.

RCI

The assessment of the cumulative impacts across the RCI policies was addressed by sector, considering how each sector would be impacted by the range of policy options and where overlaps occurred. The only exception to this approach was for policy RCI-9 (Energy Delivery/CHP), which has no overlaps with other policies and was considered separately. The impacts of RCI-9 were added to the total after the cumulative impacts by sector were tallied. As policies 3, 8, and 10 were not quantitatively analyzed, the potential impacts of these policies were not included in the cumulative analysis for RCI.

Residential sector: Energy use and CO₂ emissions in the Residential sector would be affected by policies 1, 4, 5 and 7. However, the Residential component of RCI – 5 overlaps and exceeds the impact of the Residential component of RCI – 1 and RCI – 4, all three of which are concerned with DSM. However, RCI – 5 also includes price elasticity effects from the increasing block rate structure, and generates funding levels far in excess of those contemplated in the other policies. Finally, RCI – 5 covers all of the buildings in the sector (new and existing structures), making it more comprehensive than RCI – 4, which only addresses only new structures.

RCI – 7 (Pricing and Purchasing, including on-site, real-time meters) was assumed not to affect the cumulative impact analysis because this would likely become a component of the energy efficiency programs funded by RCI-5 if the two policies were implemented together. Although RCI-7 is less cost effective than RCI-5 (or RCI-1) when analyzed on its own, it seems reasonable to assume that real-time metering would be a more cost-effective approach to demand reduction if implemented in concert with other measures that gave consumers and businesses more technologies and opportunities to respond to real-time process. Thus the Residential component of RCI – 5 was considered to be representative of the cumulative impacts of all of policies that addressed the Residential sector.

Commercial sector: Energy use and CO₂ emissions in the Commercial sector would be affected by policies 1, 4, 5, 6, and 7. (Policies that specifically addressed Commercial buildings that are government-owned were considered separately and are discussed in the following section.) As with the Residential sector, the Commercial component of RCI – 5 overlaps and exceeds the Commercial component of RCI – 1 and RCI – 6 because all three policies are concerned with DSM but RCI-5 is the most aggressive. Covering all of the buildings in the sector (new and existing structures), RCI-5 is more comprehensive than RCI – 4, which is focused on new structures. RCI – 7 (Pricing and Purchasing, including on-site, real-time meters) was assumed to become a component of the energy efficiency programs funded by RCI-5 if the two policies were implemented together. Thus the Commercial component of RCI – 5 was considered to be representative of the cumulative impacts of all of policies that addressed the Commercial sector.

Government sector: Components of policies RCI-2, 4, and 5 specifically target governmental energy use and CO₂ emissions. The “Commercial” sector of RCI-5

includes government buildings, and thus much of the avoided emissions in this sector would be achieved through the funding sources provided through this policy initiative. However, RCI-2 contains specific mandates which may go beyond the efficiencies implicit in RCI-5 for these facilities. Thus we find it reasonable to include one-half of the impacts from RCI-2 in addition to the impacts already counted for RCI-5 to represent the Government sector. RCI – 4, which only addresses new and renovated structures, is assumed to be superseded by RCI-2 and RCI-5, which affect both new and existing structures.

Industrial sector: Energy use and CO₂ emissions in the Industrial sector would be affected by policies 1, 6, and 7. The Industrial component of RCI – 1 overlaps with the Industrial component of RCI – 6 because both policies involve DSM. However, RCI – 1 covers both new and existing structures, while RCI – 6 addresses only existing structures. Thus we base our combined Industrial sector emissions reduction potential and costs on RCI-1.

However, it seems reasonable to assume that industrial users would be particularly well-suited to take advantage of opportunities presented by the real-time rates and smart metering presented by RCI-7. Thus we have assumed an additional 10% savings for this sector, along with a cost component associated with the advanced metering infrastructure.

RCI Cumulative Results: Once the Residential, Commercial, Government, and Industrial impacts as calculated above were summed, the impacts of RCI – 9 were added in. A summary of the components of this calculation follows.

RCI Sector & Methodology	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007-2020 (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
	2012	2020	Total 2007-2020		
Residential					
100% of the Residential Component of RCI – 5	1.5	5.9	34.6	-984	
Commercial					
100% of the Commercial Component of RCI – 5	3.4	11.1	67.9	-1,931	
Government					
50% of RCI – 2	0.1	0.2	1.9	-69	
Industrial					
100% of the Industrial Component of RCI – 1	0.6	1.6	13.9	-508	
10% add on (for industrial component of RCI-7)	0.1	0.2	1.4	-1	
Across Residential/Commercial/Govt/Industrial					
100% of RCI – 9	0.9	2.7	18.2	67	
TOTAL	6.6	21.9	137.9	-3,427	-25

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. Thus the combined impact of all ES and RCI policies can be calculated as follows:

Source of Reduction	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007-2020 (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
	2012	2020	Total 2007-2020		
Combined impact of RCI policies	6.6	21.9	137.9	-3,427	
80% of Combined impact of ES policies	3	7	49	677	
ES-14	0.8	3	16	12	
TOTAL	10	32	203	-2,738	-13