

Opportunities for Energy Efficiency to Reduce Carbon Emissions in Colorado February 6, 2015

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In preparation for the February 6, 2015 Policy Roundtable on Energy Efficiency and Economic Development, this report summarizes key points about EPA's proposed rule to limit carbon pollution from existing power plants, its impact on Colorado, and existing energy-efficiency policies in Colorado that can help the state comply with the rule.

EPA's Proposed Rule

In June 2014, EPA proposed a rule, the [Clean Power Plan](#), to reduce carbon dioxide emissions from existing power plants. The rule aims to cut emissions 30 percent from 2005 levels by 2030, with an interim target of 25 percent on average between 2020 and 2029. To account for regional differences in power generation and electricity consumption, EPA proposed different emission reduction targets for each state. The public comment period has already closed and EPA is expected to finalize the rule this summer. Once the rule is finalized, states will have one year to develop a plan that meets the standard.

Colorado's Proposed Emissions Target

EPA's proposed rule calls for Colorado to reduce carbon dioxide emissions by 35.4 percent by 2030. This level may change in the final rule. For the proposed rule, EPA based Colorado's target on cuts through the following measures:

- A 5.4 percent reduction through increased efficiency of coal plants
- A 16.7 percent reduction through increased use of low-emitting natural gas combined cycle plants more where excess capacity is available
- A 6.5 percent reduction through the use of more zero-emitting power sources such as renewables and nuclear, and
- A 6.7 percent reduction through energy-efficiency improvements to reduce electricity demand.¹

A state has a great deal of flexibility in developing its compliance plan, and may choose these or other carbon-reduction strategies. A state could select a different balance among the approaches than EPA used to set the proposed emission reduction target. Last May, state air, energy, and utility commission officials [recommended](#) to EPA that "energy efficiency should be an integral, creditable part of state and tribal plans to be developed in response to EPA Clean Air Act Section 111(d) emission guidelines for carbon dioxide (CO₂) emissions from existing power plants." As suggested by the states, the rule allows energy efficiency to be used as a compliance mechanism, thus creating the opportunity for states to incorporate energy efficiency in their plans.

Opportunities for Energy Efficiency to Assist with Compliance, Save Consumers Money, and Create Jobs in Colorado

Analysis from the American Council for an Energy-Efficient Economy (ACEEE) shows considerable opportunities for energy efficiency to help meet Colorado's proposed target. ACEEE analyzed the potential for a suite of four energy-efficiency policies that states could use to help comply with the Clean Power Plan. Those approaches included:

1. Implement an energy-efficiency savings target,
2. Enact national model building codes,
3. Construct combined heat and power systems, and
4. Adopt efficiency standards for products/equipment.

The ACEEE report found that using only these four energy-efficiency measures Colorado could:

- Reduce its emissions 24 percent below 2012 levels – achieving 80 percent of the proposed state target through energy efficiency alone;
- Create 4,900 net new jobs by 2020 and 10,200 jobs by 2030;
- Avoid \$1.4 billion in state consumer electricity costs between 2016 and 2030; and
- Achieve net savings (i.e. electricity savings minus investment costs) for Colorado electricity consumers of \$500 million in 2030 and \$3.4 billion between 2016 and 2030.²

Energy Efficiency, Employment, and Colorado

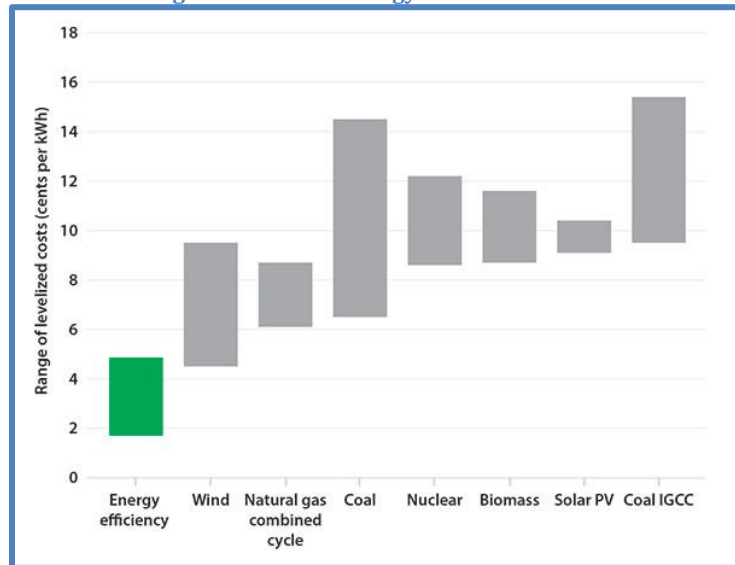
The economic benefits of energy-efficiency initiatives are vast. Decreased energy consumption can save energy end-users millions of dollars in reduced bills each year. In Colorado alone, the energy-efficiency industry already provides over 14,000 jobs and creates more than \$1 billion in local economic development.³

In 2002, the Southwest Energy Efficiency Project found a “high efficiency scenario” resulted in a net addition of 12,200 jobs, a \$280-million increase in earnings, and a \$100-million increase in state domestic product by 2020.⁴ In this scenario, the region's commercial sector also experienced 37 percent energy savings compared to Business as Usual. In 2006, the Metro Denver Economic Development Corporation considered a scenario where energy-efficiency measures were installed in half of Denver's existing buildings and 80 percent of new buildings over 20 years. Under this scenario, a \$600-million investment would produce \$1.9 billion in energy savings, \$300 million in statewide earnings growth, and create 12,000 jobs by 2026.⁵ Both in Denver and in Colorado at large, energy efficiency is a high-value proposition.

Energy Efficiency Is a Low-Cost Source of Power Generation

When compared to other strategies for reducing carbon pollution, energy efficiency is by far the lowest-cost clean-energy resource. Figure 1 shows the cost of energy efficiency relative to supply-side resources.⁶ At an average of 2.8 cents per kilowatt hour, energy efficiency costs approximately one-half to one-third of alternative new electric-generation resources. This makes energy efficiency a smart economic choice to reduce emissions.

FIGURE 1: Range of Levelized Energy Costs



Colorado Is Already Leading the Way on Energy Efficiency

Colorado already supports progressive energy-efficiency policies. Colorado tied for thirteenth place in ACEEE's most recent state energy-efficiency scorecard, placing it squarely in the top quartile.⁷ Both the public and private sectors in Colorado are leading the way in energy-efficiency programs. The Colorado state government has instituted financial incentives for energy-efficient investments, including an Energy Star Mortgage Program for energy-efficient homes and the Green Colorado Credit Reserve for commercial energy-efficiency loans. In the past decade, the state government has led by example by mandating LEED-standard 20 percent energy-consumption reductions in state facilities and similar reductions (25 percent) in the fuel usage of government vehicle fleets. In 2013, the school board instituted strict standards, cutting energy and water consumption in Colorado schools by one-third.⁸

Colorado is host to numerous public- and privately funded energy-research institutions. The National Renewable Energy Laboratories in Golden collaborates with research teams from surrounding Colorado universities on energy-efficiency projects. The Center for Renewable Energy Economic Development (CREED) collaborates with and supports the formation of clean-tech companies throughout Colorado, tying together the state's scientific, civil society and entrepreneurial communities.⁹

Colorado's private sector has also taken ownership of the state's energy-efficiency goals. Working with Colorado's Public Utilities Commission, the state's two investor-owned utility companies, Xcel Energy and Black Hills Energy, implemented demand-side management (DSM) programs to support energy-efficiency investments by their customers. To help individual customers conserve energy, the programs provide education, technical assistance, rebates on

energy-efficient products, and free installation of efficiency measures in low-income households. Between 2009 and 2013, the two investor-owned utilities spent \$330 million on energy-efficiency programs, avoiding 1.1-million tons of CO₂ emissions and saving their customers \$950 million in the process. These programs proved very cost-effective, with an overall benefit-cost ratio of over 2:1 and 91 percent of net financial benefits passed on to the customer.¹⁰ Figure 2 provides annual program statistics for 2009 through 2013.¹¹

FIGURE 2: Impacts of Electric Utility Energy-Efficiency (DSM) Programs, 2009-2013

Utility	2009	2010	2011	2012	2013	Total
Xcel - DSM Spending (M \$)	43.9	54.7	63.8	79.4	75.3	317.1
Black Hills - DSM Spending (M \$)	1.4	2.5	3.2	3.5	4.5	15.1
Xcel - Electricity Savings (GWh/yr)	220	252	312	401	384	1,569
Black Hills - Electricity Savings (GWh/yr)	5	17	19	20	21	82
Xcel - Net Economic Benefits (M \$)	206	210	178	170	160	924
Black Hills - Net Economic Benefits (M \$)	2	4	5	7	10	28
Xcel - Benefit-Cost Ratio	4.1	3.3	2.8	2.4	1.7	N/A
Black Hills - Benefit-Cost Ratio	2.3	1.6	1.8	1.8	2.3	N/A

Denver's Energy-Efficiency Story

Denver is a hub of activity and innovation for Colorado and the region as a whole, and it is home to one of the region's most promising energy-efficiency success stories: The Denver 2030 District. The Denver 2030 District is an interdisciplinary public-private-nonprofit collaborative working to create a groundbreaking high-performance building district in downtown Denver. Planners, property managers and tenants within the District voluntarily and jointly implement innovative plans to dramatically reduce energy and water consumption, while increasing competitiveness in the business environment and owners' returns on investment.

Formed as part of the national 2030 Challenge for Planning, all of the District's new and renovated buildings have a goal of immediately reducing their energy use by 60 percent below the national average. Similar standards apply for transportation fuel efficiency and water consumption, with more modest standards for existing buildings. Reduction targets for participating buildings increase every 5 years until 2030, leading to eventual carbon neutrality

for new buildings and 50-percent reductions in energy and water usage for existing buildings. Denver's innovative 2030 District is exemplary of the state's high standards for energy efficiency. The District's economic success is a testament to the benefits of efficiency.

Conclusion

As Colorado looks ahead to develop a plan to reduce carbon emissions under the Clean Power Plan, energy efficiency should play a key role in helping the state achieve this target. The state already has a strong history of progressive energy-efficiency policies and studies show that the state can achieve significant economic benefits by expanding these policies and incorporating them into Colorado's compliance plan—reducing emissions and creating economic opportunity.

¹ Center for Climate and Energy Solutions (C2ES), "Proposed State Emission Rate Targets" <http://www.c2es.org/federal/executive/epa/carbon-pollution-standards-map>. Further information on how EPA set the proposed targets and the targets for each may be found at <http://www.vox.com/2014/6/4/5779052/how-to-figure-out-which-states-get-hit-hardest-by-obamas-climate-rule>.

² ACEEE, Sara Hayes et al., April 2014, "Change Is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution"

<http://www.aceee.org/sites/default/files/publications/researchreports/e1401.pdf>

³ Energy Efficiency Business Council (EEBC), 2014, "State of the State 2014" <http://tinyurl.com/StateoftheState2014> (accessed Feb. 4, 2015).

⁴ Southwest Energy Efficiency Project, Nov. 2002, "The New Mother Lode: the Potential for More Efficient Electricity Use in the Southwest," Hewlett Foundation Energy Series Report, p ES-10.

http://www.swenergy.org/publications/nml/New_Mother_Lode-Executive_Summary.pdf (accessed Dec. 8, 2014).

⁵ Metro Denver Economic Development Corporation, June 2006, "Energy Efficiency: Economic Opportunities for Metro Denver Companies," p II. <http://designorconstruct.com/wp-content/uploads/2010/07/Colorado-Energy-Coalition-Efficiency-Report.pdf> (accessed Dec. 8, 2014).

⁶ ACEEE, *supra* note 6, p. 3.

⁷ ACEEE, "State and Local Policy Database: Colorado," <http://database.aceee.org/state/colorado> (accessed Dec. 5, 2014)

⁸ *Ibid.*

⁹ *Ibid.*

¹⁰ Southwest Energy Efficiency Project, "Utility Energy Efficiency Programs in Colorado: a Success Story," http://www.swenergy.org/publications/factsheets/CO_DSM_factsheet_Apr2014.pdf (accessed Dec. 5, 2014)

¹¹ Utility data are from annual DSM reports submitted by the utilities to the Colorado Public Utilities Commission. Electricity sales are at the generator level.