COLORADO

ENVIRONMENTAL ENTREPRENEURS®

eebc Energy Efficiency Business Coalition

PLUGGED INTO EFFICIENCY: SAVING MONEY, CREATING JOBS AND DRIVING ECONOMIC GROWTH THROUGH ENERGY EFFICIENCY

Colorado has a prime opportunity to save businesses and consumers billions by investing in energy efficiency, the cheapest and easiest way to help meet the state's energy demand.

Energy efficiency is a sensible solution to help cut energy waste and reduce the need to generate electricity from expensive, dirty power plants that spew pollution into the air. There's now a policy that can help put that solution into place — creating jobs, driving economic growth, and saving Colorado businesses and consumers billions along the way.

Scaling up efficiency to help meet Colorado's Clean Power Plan target could save **$4.8 billion** and support the creation of nearly **7,000 jobs** over the next 10 years.

Under the federal Clean Power Plan, Colorado must reduce carbon emissions from existing power plants by about 24–28 percent by 2030, from 2012 levels.[1] One of the quickest, most cost-effective ways to do that is by making Colorado's office buildings, homes, schools, and other buildings — as well as Colorado's utilities — more efficient.

Scaling up efficiency to help meet Colorado's Clean Power Plan target could save $4.8 billion — money that can be reinvested into the state's economy — and support the creation of nearly 7,000 jobs over the next 10 years.[2]

Maximizing energy efficiency will be a big step toward addressing climate change, which is costing Coloradans in other ways. In 2012, Colorado taxpayers paid an estimated $1.5 billion in federal taxes to help clean up climate-related weather events in 2012.[3] In spring of 2015, 75 percent of the state was facing conditions of abnormally dry to severe drought — conditions that will worsen with climate change and affect the state's agriculture industry.[4]

Smarter use of energy reduces the demand from existing power plants — and therefore, reduces carbon emissions that drive climate change. Based on continuation of existing policies, Colorado is in a strong position to comply with the Clean Power Plan. Ramping energy efficiency savings over the next 10 years up to 2 percent of utility sales per year would ensure Colorado can surpass the interim and final Clean Power Plan emissions limits.[5]

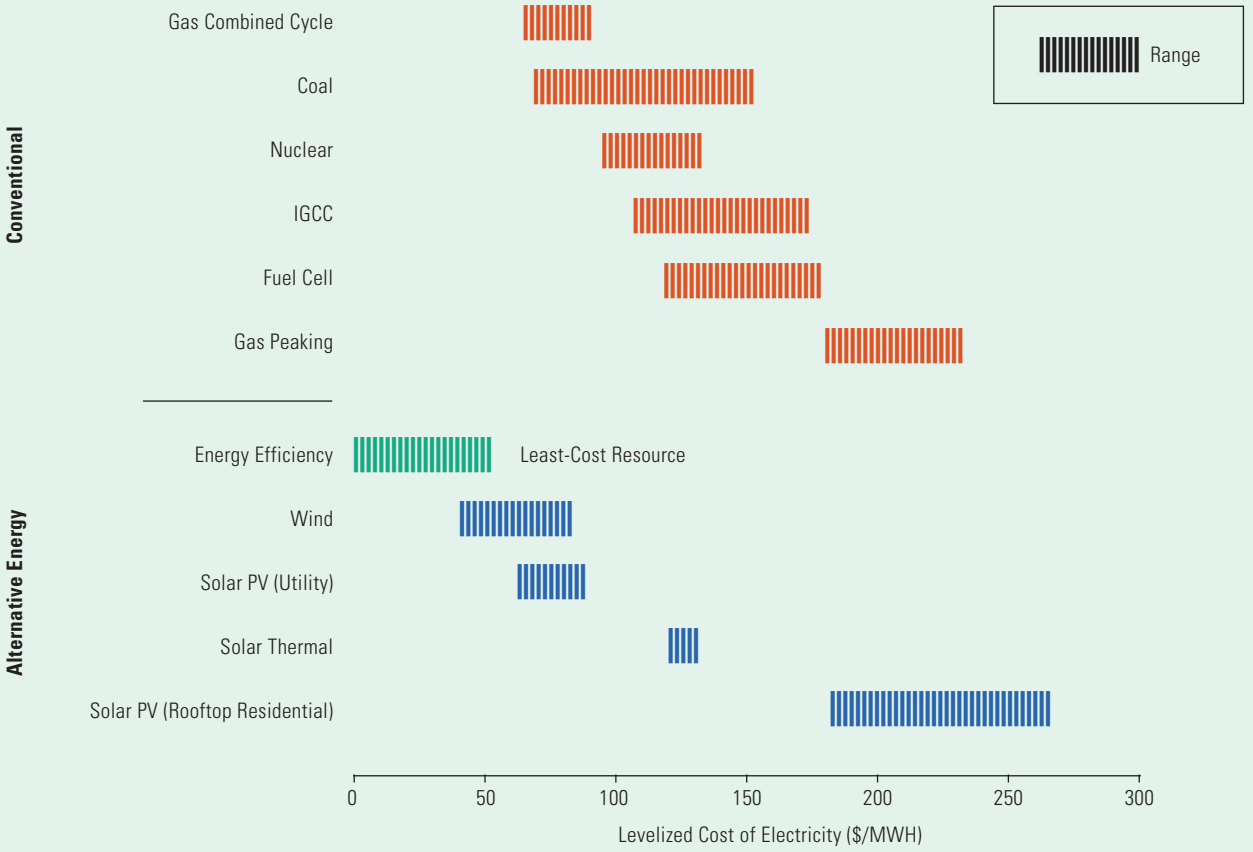
Colorado can ramp up efficiency efforts to help meet the Clean Power Plan by:

- Escalating energy-savings goals for investor-owned utilities, establishing energy-savings goals for electric cooperatives and municipal utilities, and ensuring all utility investments continue to increase accordingly;
- Updating statewide minimum building energy codes for all jurisdictions with energy codes;
- Ensuring that all utilities are not financially penalized when they ramp up investments in energy efficiency programs for their customers.

Efficiency: The Cheapest Way

As shown in Figure 1, efficiency is the most cost-effective way to meet energy demand and reduce customers' electricity bills. It costs less to save a unit of energy than it does to generate it because it is cheaper than buying more expensive resources like coal, building new power plants, or running inefficient, old ones (Figure 1 compares total lifetime costs, including first investment costs and lifetime fuel costs):

Figure 1. Efficiency is the Cheapest Way to Meet Colorado's Energy Needs



Source: Lazard Estimates 2014

Energy efficiency also supports the local economy. Investments in efficiency create jobs in the construction industry for workers who weatherize and upgrade existing buildings. It creates jobs for HVAC and efficient lighting system designers, manufacturers, and installers. It creates jobs in research and development at places like the National Renewable Energy Laboratory in Golden.

In addition to this direct job creation, efficiency creates jobs indirectly. When Coloradans save money on their electric bills, those savings are freed up to spend and reinvest in the local economy.

An EEBC survey estimates that Colorado's energy efficiency industry has created more than 14,000 jobs throughout the state since 2007.[6]

Colorado's Energy Efficiency Progress

Colorado utility efficiency programs, such as weatherization and rebates for higher-efficiency appliances, have helped customers finance upgrades that cut energy waste in homes and businesses. In fact, since 2009, Xcel Energy's and Black Hills Energy's energy efficiency programs have cumulatively saved 6.2 percent and 4.5 percent of their electricity sales, respectively,[7] or enough energy to power more than 217,000 Coloradan homes for a year.[8] Colorado is ranked 14th among states for its utility programs[9] — while this is great progress, the state's utilities have room for improvement and could save hundreds of millions of dollars for households and businesses by increasing energy efficiency investments, particularly by rural electric cooperatives.

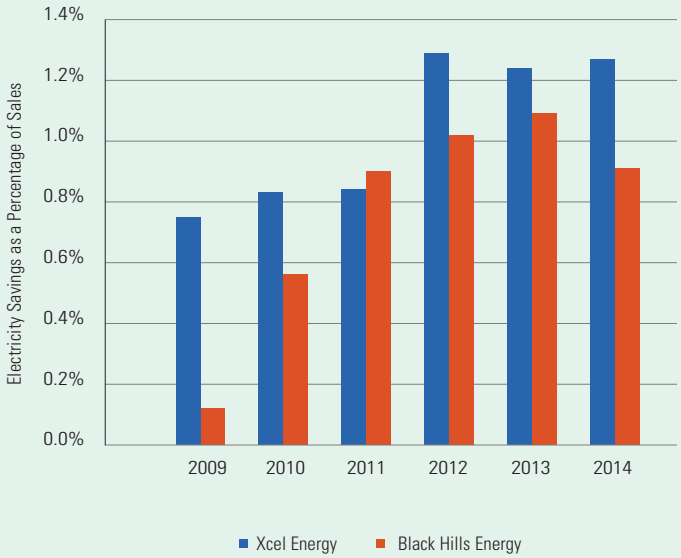
Investor-owned Utilities

Colorado's investor-owned electric utilities — Public Service of Colorado, a subsidiary of Xcel Energy, which serves approximately 1.4 million customers, and Black Hills Energy serving almost 100,000 customers — together serve approximately 58 percent of the state's electricity demand. Following the Colorado Public Utilities Commission (PUC) establishment of energy-savings goals and performance-based incentives for Xcel and Black Hills in 2008 and 2009,[10] their customers have saved more than $1 billion, even after accounting for efficiency program costs: **for every $1 invested in efficiency programs, customers will save nearly $3 on their electric bills.**[11]

A common way to benchmark utility energy efficiency achievements for utilities of all sizes is to examine annual energy savings as a percent of electricity sales: An energy efficiency effort that saves customers an amount equal to 1 percent of the utility's energy sales for that year is considered moderate, while 2 percent is excellent.

As shown in Figure 2, Xcel increased its annual efficiency savings from 0.75 percent of sales in 2009 to 1.27 percent in 2014, and Black Hills Energy reached 1.1 percent in 2013 before dropping back to 0.9 percent in 2014.[12] From 2009 through 2014, Xcel and Black Hills also cut their peak demands by nearly 7 percent and 4 percent, respectively.[13] These efficiency savings also avoided nearly 1.3 million metric tons of carbon pollution, equivalent to the pollution of more than 270,000 cars.[14]

Figure 2.
Investor-owned Utilities' Annual Electricity Savings as a Percent of Sales (2009–2014)



Overall, Xcel and Black Hills have made good progress on energy efficiency, and demonstrated the availability and cost-effectiveness of the resource in Colorado. Improving the regulatory framework to ensure efficiency is consistent with the business models of all utilities should enable even deeper, longer term savings for their customers.

Municipal Utilities and Electric Cooperatives

In addition to the investor-owned utilities, Colorado has 29 municipal utilities serving approximately 16 percent of the state's load and 26 electrical cooperatives providing the remaining 26 percent of load. Together these utilities serve nearly half of Colorado's load (42 percent).

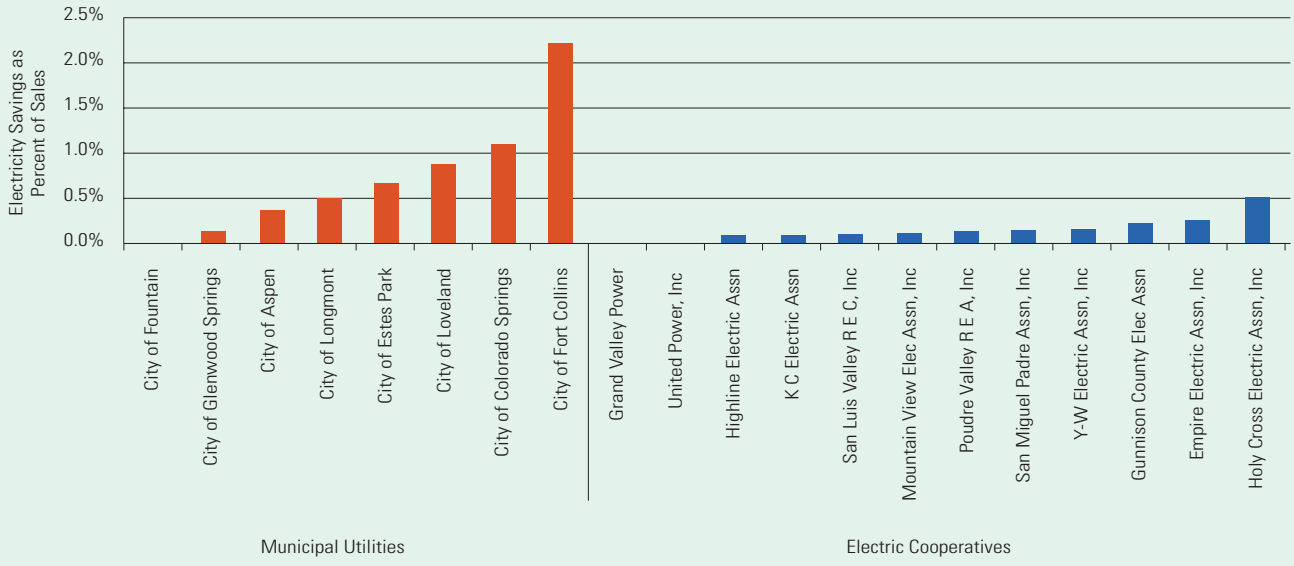
Thanks to efficiency programs from 2009 through 2013, the municipal utilities and electric cooperatives saved enough electricity to power 33,000 Colorado homes for a year,[15] while avoiding nearly 200,000 metric tons of carbon dioxide pollution, equivalent to the annual emissions of more than 40,000 cars.[16] In 2013, municipal utilities that reported efficiency savings (not all did) collectively saved an average of 1.17 percent of sales. Electric cooperatives that reported savings only saved an average of 0.18 percent.[17]

As shown in Figure 3, noteworthy achievements among municipal utilities include Fort Collins and Colorado Springs, which achieved savings that were 2.2 percent of sales and 1.1 percent of sales, respectively. Electric cooperatives have a huge opportunity to scale up efficiency savings as all but one cooperative reported savings equal to less than 0.5 percent of sales in 2013.

Building Energy Codes

Building energy codes specify requirements or minimum efficiency levels for all types of building elements, including walls, windows, lighting, and water heaters. Cutting energy waste makes buildings more comfortable,

Figure 3. Municipal Utilities and Electric Cooperatives' Electricity Savings as a Percent of Sales (2013)



lowers utility bills, and can play an important role in meeting the Clean Power Plan's carbon emissions reduction targets.

Although Colorado does not have a statewide building energy code, many cities and 53 of the state's 64 counties have led the way by adopting some level of building energy code, with an estimated 90 percent of new construction taking place in jurisdictions that have adopted the 2009 International Energy Conservation Code (IECC) or better, according to SWEEP.[18] Numerous cities and counties have now adopted the stricter 2012 IECC, and in May 2015, Denver was in the process of adopting the 2015 IECC.[19] In 2007, Colorado adopted a law (House Bill 07–1146) that required local jurisdictions with building codes to adopt an energy code at least as stringent as the 2003 IECC.

Saving Energy in Colorado's Largest City: Denver's Progress with Energy Efficiency

Denver is working on a number of initiatives and projects to help cut energy waste through efficiency:

- The City Energy Project, a national initiative to create healthier and more prosperous cities by improving the energy efficiency of buildings, is working with the city of Denver to cut energy use in large commercial and multi-family buildings, which is responsible for 57 percent Denver's climate-warming carbon emissions.
- Denver is working to adopt the 2015 International Energy Conservation Code, the most stringent IECC thus far.
- Denver will be one of the first communities in Colorado to utilize the state's commercial property-assessed clean energy program, or CPACE, which gives commercial property owners access to loans for energy efficiency projects.

CITY ENERGY
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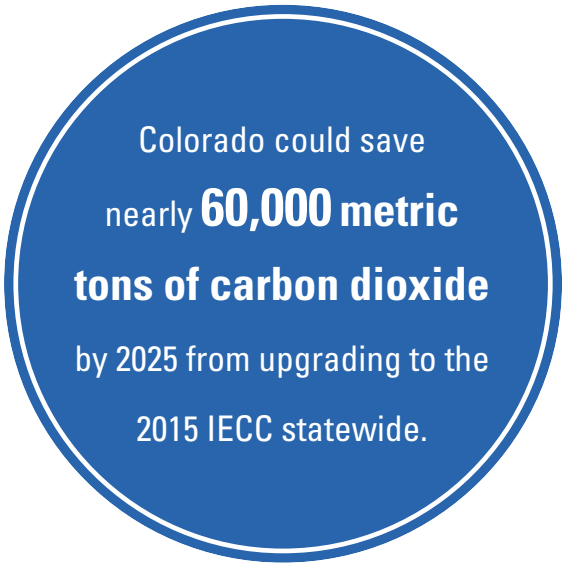
Recommendations to Ramp up Colorado's Energy Efficiency Savings

Colorado has made significant progress in achieving efficiency savings, but much more can be done to help meet the Clean Power Plan targets and save customers money.

Establish energy-savings goals for all utilities

A 2007 law requires the Colorado PUC to establish energy-savings goals for the investor-owned utilities,[20] which helped Xcel and Black Hills scale up efficiency savings. However, the municipal utilities and electric cooperatives are not PUC-regulated and do not have to meet annual efficiency targets nor do they set such goals in most cases. Every utility should be required to meet escalating annual efficiency goals, ramping up to saving at least 1 percent of sales each year in the near term, and toward savings of 2 percent of sales each year over the next several years. Numerous utilities in the state (big and small) have already demonstrated that this progress is possible. Increasing investments in efficiency, for example by investing in Conservation Voltage Reduction (CVR) in the distribution grid as well as new technologies such as LED lighting in all sectors (including streetlighting), can help utilities meet their escalating goals. All utilities should do their part to increase energy savings, save customers money, and help meet the Clean Power Plan emissions targets in the most cost-effective manner.



Advance building energy codes

Even though most local governments and counties in Colorado have building energy codes, they vary in stringency and some have none. All local jurisdictions should follow the lead of Denver and upgrade to the 2015 International Energy Conservation Code, which includes the Home Energy Rating System Index option that offers flexibility to builders and deeper energy savings.[21] The legislature should also update HB 07-1146, which established a floor on local energy codes in jurisdictions with building codes. The law should be updated to require 2015 IECC and require jurisdictions continue to update the code to meet future IECC codes, so long as those codes are cost-effective. Colorado could save nearly 60,000 metric tons of carbon dioxide by 2025 from upgrading to the 2015 IECC statewide.[22]

Implement decoupling to remove the disincentive for energy efficiency

Under traditional regulation, utility revenues are based on the amount of kilowatt-hours they sell. If they sell more than predicted when rates were set, they keep the excess profits. But they may not recover all of their approved fixed-costs if sales are lower than expected, which can create a disincentive to maximize the amount of savings that customers realize through utility-sponsored energy efficiency programs.

"Decoupling" removes this disincentive by breaking the link between fixed-cost recovery and sales and ensures utilities recover no more and no less than their authorized fixed costs. Through periodic adjustments — as either bill surcharges or refunds — regulators ensure utilities recover all prudent expenses while protecting customers from paying too much for service.[23] This removes utility risk in investing in energy efficiency as recovery of fixed costs is guaranteed.

Currently, Colorado's electric utilities all face a regulatory link between electricity sales and fixed cost recovery, and thus may have some reluctance to implement all cost-effective energy efficiency resources. We recommend regulators and boards approve decoupling for all of Colorado's electric utilities, ensuring that a statewide ramp up in efficiency investments will not affect the financial stability of the state's utilities. Adopting decoupling is complementary to and not in conflict with the performance-based incentive policy now in place for the investor-owned utilities.[24]

CONCLUSION

Colorado has made good strides in improving energy efficiency in recent years, but additional efficiency savings can and should be realized to save businesses and consumers money, create new jobs, and to address the costly effects of climate change.

Energy efficiency can play an important role in helping Colorado design a cost-effective plan to reduce carbon emissions in response to EPA's Clean Power Plan standards while lowering customers' bills, creating jobs, and supporting the local economy. Colorado should build on its current set of cost-effective energy efficiency policies and programs, and make energy efficiency the cornerstone of its CPP implementation plan.

Endnotes

[1] The percentage varies depending on whether Colorado opts to include new sources in its cap. EPA, "Clean Power Plan: State at a Glance — Colorado," last updated August 3, 2015, http://www.epa.gov/airquality/cpptoolbox/colorado.pdf.

[2] Howard Geller, SWEEP, "The $20 Billion Bonanza: Best Practice Electric Utility Energy Efficiency Programs and their Benefits for the Southwest," October 2012, available at http://www.swenergy.org/Data/Sites/1/media/documents/publications/20BBonanza/SWEEP-ColoradoFactSheet.pdf.

[3] NRDC, "Colorado's Clean Energy Future," March 2015, http://www.nrdc.org/globalwarming/files/clean-power-plan-state-options-CO.pdf.

[4] Colorado Water Conservation Board, "April 2015 Drought Update," April 2015, http://cwcbweblink.state.co.us/WebLink/ElectronicFile.aspx?docid=195212&searchid=0db08e42-af76-44ec-8aa3-f3ff194b7e42&&dbid=0.

[5] Based on analysis from the MJ Bradley Clean Power Plan Compliance Tool, May 2015.

[6] Energy Efficiency Business Coalition (EEBC), "Colorado Energy Efficiency State of the State," 2012, p. 8, http://www.eebco.org/Resources/Documents/Research%20and%20Studies/EEBC-State%20of%20the%20State%20Report%20Final.pdf.

[7] Xcel Energy, Public Service of Colorado, Demand-Side Management Annual Status Report: Electric and Natural Gas, 2009-2014 annual reports. Black Hills Energy — Colorado Electric Utility Company, LP, Annual Status Report: Energy Efficiency Programs, 2009-2014 annual reports. From 2009 through 2014, Xcel saved a total of 1,904 GWh and Black Hills saved a total of 90 GWh of electricity at the generator level (Xcel and Black Hills Annual Reports). Assuming 7% losses, these savings are equal to 1,771 GWh and 84 GWh, respectively, at the customer level. In 2014, Xcel's electricity sales were 28,676 GWh and Black Hills' electricity sales were 1,818 GWh (EIA Form 861). Therefore, from 2009-2014, Xcel saved over 6% of sales and Black Hills saved over 4%.

[8] Xcel and Black Hills saved a total of 1,855 GWh at the customer level from 2009-2014. Average electricity consumption for a Colorado home is 8,544 kWh per year: EIA, "2013 Average Monthly Bill – Residential," Average monthly consumption for Colorado multiplied by 12 months per year, http://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf. 1,855 GWh/8,544 kWh/home/year = 217,111 homes.

[9] Scoring for utility and public benefits programs and policies. American Council for an Energy-Efficient Economy, "The 2014 State Energy Efficiency Scorecard," Table 8, p. 23, October 2014, http://aceee.org/state-policy/scorecard.

[10] SWEEP, "Utility Energy Efficiency Programs in Colorado: A Success Story."

[11] TRC Benefits for both Xcel and Black Hills from 2009 through 2014 totaled $2,178,513,532, and TRC Costs totaled $838,732,851. This results in TRC Net Benefits of $1,339,780,681 and a TRC Ratio of 2.60. TRC data found in Xcel's and Black Hills' Annual Demand-Side Management Reports for 2009-2014.

[12] Divided annual electricity savings by annual electric sales. Annual efficiency savings found in Xcel's and Black Hills' Annual Demand-side Management Reports for 2009 through 2014. Sales data found in EIA, Form 861, "Retail Sales," 2009–2014, http://www.eia.gov/electricity/data/eia861/.

[13] Divided 2009–2014 total peak demand savings by 2013 summer peak demand for each utility (2014 peak demand information not yet available). Annual efficiency peak demand savings found in Xcel's and Black Hills' Annual Demand-side Management Reports for 2009 through 2014. Summer peak demand data found in EIA, Form 861, "Operational Data," 2013, http://www.eia.gov/electricity/data/eia861/.

[14] Assumes carbon intensity of electricity in Colorado is 1,540 lbs/MWh, an average between coal and natural gas-fired power plants. Calculated pollution equivalent from passenger vehicles from EPA, "Greenhouse Gas Equivalencies Calculator," http://www.epa.gov/cleanenergy/energy-resources/calculator.html.

[15] Colorado's municipal utilities and electric cooperatives that reported their efficiency savings to EIA saved 285 GWh from 2009-2013. EIA, Form 861, "Energy Efficiency," 2009-2013, http://www.eia.gov/electricity/data/eia861/. Average electricity consumption for a Colorado home is 8,544 kWh per year.

[16] Assumes carbon intensity of electricity in Colorado is 1,540 lbs/MWh. Calculated pollution equivalent from passenger vehicles from EPA, "Greenhouse Gas Equivalencies Calculator."

[17] Divided annual electricity savings by annual electric sales. Data found in EIA, Form 861, "Energy Efficiency" and "Retail Sales," 2009–2013, http://www.eia.gov/electricity/data/eia861/.

[18] SWEEP estimates that 25% of new construction in Colorado is taking place in local jurisdictions that have adopted the 2012 IECC.

[19] Colorado Department of Local Affairs, "Status of Colorado Energy Codes," 2009 IECC Adoption Status, https://dola.colorado.gov/geo/ecMap2009.jsf, and 2012 IECC Adoption Status, https://dola.colorado.gov/geo/ecMap2012.jsf;jsessionid=4f9bbd22bbf3d0108e743c32fdf5.

[20] SWEEP, "Utility Energy Efficiency Programs in Colorado: A Success Story."

[21] Meg Waltner, "Efficiency Wins Big in Atlantic City, Homeowners Will Benefit," October 10, 2013, http://switchboard.nrdc.org/blogs/mwaltner/efficiency_wins_big_in_atlantic_city_homeowners_will_benefit.html

[22] SWEEP analysis on building codes. Analysis showed estimated savings of 83 GWh by 2025 for upgrading from the 2012 IECC to 2015 IECC statewide. Savings would be even larger for jurisdictions that do not meet the 2012 IECC already.

[23] Lisa Xue and Dylan Sullivan, "Southern California municipal utilities innovate with decoupling," April 11, 2014, http://switchboard.nrdc.org/blogs/dsullivan/southern_california_municipal.html.

[24] Xcel and Black Hills earn a performance-based incentive if they meet or exceed the energy savings goals established by the PUC.