

**Economic Impact Analysis
of Boulder County, Colorado
EnergySmart Programs**

Summary Report

Prepared for

Boulder County Commissioners' Office
Sustainability Office

By

Marshall Goldberg
MRG & Associates

September 2013

Purpose

This study was undertaken to analyze Boulder County's *EnergySmart* program and document the local economic impacts that occurred as a result. The analysis reviewed project upgrade costs, including homeowner, business and commercial property owner investments, county and utility rebates, Elevations Energy Loans and estimated energy bill savings to better understand how spending on energy efficiency upgrades and renewable energy benefits residents, business and the local economy. Local impacts on jobs, worker earnings¹ and output² – the quantity of goods and services produced in Boulder County, were evaluated, both for the short-term installation period as well as annually, on an ongoing basis.³

Program Description

The *EnergySmart* program provides energy advising and financial assistance to households and businesses in all Boulder County communities, including the cities of Boulder, Lafayette, Longmont and Louisville, the towns of Erie, Jamestown, Lyons, Nederland, Superior and Ward, and unincorporated Boulder County. *EnergySmart* helps residents and businesses identify, prioritize, and implement energy efficiency projects. The program provides a variety of services including rebates, loans, step-by-step energy advising, personalized energy assessments, assistance with finding and working with contractors, technical assistance, and project monitoring and verification.

Boulder County, in collaboration with the City of Boulder Local Environmental Action Division, City of Longmont and Boulder County Public Health, designed the *EnergySmart* program to increase awareness of potential energy savings and to address the barriers that residents and businesses face when considering energy efficiency projects. In addition to addressing these barriers, program goals include:

- Increasing energy efficiency investment in Boulder County
- Creating jobs and stimulating local economic growth
- Advancing energy independence through energy upgrades
- Leveraging federal seed funding to generate at least a 5:1 match in energy efficiency retrofits
- Reaching 3,000 businesses and 10,000 households by June 2013, representing about 26% of business sites and 8% of households in Boulder County

The program was formally launched on January 25, 2011. *EnergySmart* is currently funded by the American Recovery and Reinvestment Act (ARRA) through the U.S. Department of Energy's BetterBuildings Neighborhood Program (BBNP) grant, combined with contributions from the City of Boulder's Climate Action Plan (CAP) tax and the City of Longmont.

¹ Earnings include wages and salaries and employer paid benefits.

² Output is a measure of overall economic activity and thus refers to all sales of goods and services, including production, distribution and consumption.

³ A companion report assesses the statewide benefits of these programs in Boulder County and five other counties in Colorado.

Economic Impact Analysis

The economic tool used to analyze the impacts of Boulder County's *EnergySmart* program is called an input-output (I-O) model. In this instance, the I-O model, designed specifically to analyze Boulder County expenditures on upgrades⁴ and energy efficiency measures eligible for rebates and loans, was used to identify spending patterns and interactions between all sectors of the County's economy.⁵ For example, the model shows how homeowner spending on attic insulation or high efficiency windows can create business for contractors and vendors, and others in the supply chain, including wholesalers and manufacturers. To the extent these upgrades are installed by Boulder County contractors or are purchased from local manufacturers or retail or wholesale vendors, there is additional benefit to the local economy.

When residents and businesses pay their utility bills, most of the money leaves Boulder County to purchase fuels, maintain power plants, and support utility operations throughout Colorado and in other areas. When residents and businesses achieve savings on their utility bills they are able to spend some of the savings purchasing other goods and services, on business upgrades, loan repayments and investments in the local economy.

Key findings of the Boulder County *EnergySmart* program analysis indicate that:⁶

The *EnergySmart* program is helping create and support jobs throughout Boulder County.

- Although less than half of total program spending on residential and commercial energy upgrades, remodels and quick installs was spent in Boulder County,⁷ this spending supported almost 90 full-time equivalent (FTE)⁸ jobs throughout Boulder County during the upgrade period.⁹ These jobs include work for electrical and window contractors, insulation installers, HVAC contractors, workers at wholesale and retail suppliers (e.g., lumber yards, hardware stores, etc.), as well as jobs at grocery stores, restaurants, clothing stores and other businesses where workers spend their paychecks and businesses purchase goods and services.

⁴ In some instances, non-energy related improvements (e.g., a home remodel) were undertaken in conjunction with energy improvements. In these instances, since there was no data available to separate the expenditures, the analysis included all spending.

⁵ For a more detailed discussion of the methodology used to analyze program impacts see the Appendix.

⁶ For more detailed results see tables in the Appendix to this report.

⁷ The remainder of the program spending (including payments to contractors and suppliers) occurred primarily in the Denver metro area and other areas of Colorado.

⁸ Full-time equivalent (FTE) jobs refer to one person (or the equivalent) being employed full time (40 hours per week for 52 weeks) for one year, a total of 2,080 hours. For example, two persons, each working half time for a full year equal 1 FTE job; or 2 persons, each working full time for six months equal 1 FTE job. As a result, the actual total number of people working (part time and or full time) during the installation period may be significantly greater than the FTE number noted.

⁹ Jobs created or supported during the upgrade period are considered short term jobs since they only reflect spending that occurs during the installation period and do not continue beyond this period.

- These 90 jobs are the equivalent of just under 1 percent of the number of persons currently unemployed (9,233) in Boulder County, enough to reduce the County's unemployment rate by .05 percent.¹⁰
- Residential upgrade spending accounted for over 60 of the full time equivalent jobs (almost 70 percent) supported throughout Boulder County during the upgrade period.
- Business and commercial property owner upgrade spending accounted for 25 of the full time equivalent jobs (almost 30 percent) supported throughout Boulder County during the upgrade period.

The *EnergySmart* program increased worker income in Boulder County.

- Total program spending in Boulder County was responsible for over \$6.5 million in worker earnings¹¹ for the just under 90 full time equivalent jobs supported during the upgrade period.
- Residential upgrade spending accounted for \$5.2 million of the worker earnings (approximately 80 percent) during the upgrade period.
- Business and commercial property owner upgrade spending accounted for just over \$1.3 million (approximately 20 percent) of the worker earnings during the upgrade period.¹²

The *EnergySmart* program stimulated overall economic activity throughout Boulder County.

- Total program spending in Boulder County was responsible for adding almost \$13.8 million in the production of goods and services to the County's economy during the upgrade period.
- Residential spending accounted for \$9.9 million in the production of goods and services to the County's economy during the upgrade period.
- Business and commercial property owner spending accounted for 3.9 million in production of goods and services to the County's economy during the upgrade period.
- Total spending on efficiency and upgrade measures in Boulder County generated over \$98,000 in local sales tax.

The *EnergySmart* program is reducing electricity and gas usage and providing significant utility bill saving for Boulder County residents and businesses.

- Reductions in energy usage will save program participants over \$2.1 million on their electricity and gas utility bills during the first year measures are in place.¹³
- Residents saved an average of just under \$150 each in the first year on their utility bills due to installation of efficiency upgrades.

¹⁰ According to the Colorado LMI Gateway, in May 2013, Boulder County's unemployment rate was 5.1 percent (actually 5.06 percent). See <http://www.colmigateway.com/>. Adding the equivalent of 87 FTE jobs to the number of employed persons would result in a decline in the unemployment rate to 5.01 percent.

¹¹ Worker earnings include wages, salaries and worker paid benefits (health insurance, social security, retirement, workers compensation, Medicare, etc.)

¹² This is due in part to the large percentage (approximately 65 percent) of work completed by contractors outside Boulder County and the fact that earnings represent a smaller share of total project expenditures for commercial projects.

¹³ Utility bill savings are based on average electric and natural gas costs in Colorado in 2012. If utility rates continue to rise, the resulting bill savings and related impacts will increase as well.

- Business and commercial property owners saved an average of just over \$1,000 each in the first year on their utility bills due to installation of efficiency upgrades.
- Utility bill savings will continue for the full 20-30 year lifetime of the installations.

Spending of utility bill savings support permanent jobs in Boulder County and will continue to benefit local businesses for years to come.

- Estimated utility bill savings will support 11 full time equivalent jobs throughout Boulder County each year for the next 20 to 30 years. These jobs are in all areas of the economy. They include jobs at retail stores (clothing, grocery, appliance, hardware, lumber, and car dealers, among others), service providers (restaurants, hotels, auto repair, appliance repair, landscapers, real estate and finance, among others), as well as in wholesale and manufacturing sectors.
- Estimated utility bill savings support over \$0.3 million in worker earnings each year for the 11 full time equivalent jobs in Boulder County.
- Eleven jobs is the equivalent of adding one new business to Boulder County.¹⁴
- Estimated energy bill savings contribute \$0.6 million annually to the County's economy in the production of goods and services.¹⁵

***EnergySmart* program and utility rebates leveraged substantial private investments.**

- For each \$1 of rebate provided, on average, another \$4.29 in private investment by residents and businesses in Boulder County was spent on efficiency and related upgrades, a total of \$5.29 in spending.
- Each \$1 million of program rebates (county and utility) supported an average of just under 22 FTE jobs during the upgrade period and an average of just under 3 FTE ongoing jobs throughout Boulder County.¹⁶
- In 5 years, the sum of all annual residential and commercial utility bill savings will be almost 3 times as much as the amount initially paid in rebates.
- In 10 years, the sum of all annual residential and commercial utility bill savings will be over 5 times as much as the amount initially paid in rebates.
- In 20 years, the sum of all annual residential and commercial utility bill savings will be more than 10 times as much as the amount initially paid in rebates.
- For each \$1 spent on *EnergySmart* upgrades by program participants, just under half was spent in Boulder County, benefitting local contractors, suppliers and the county as a whole.

¹⁴ According to the US Census Bureau, in 2011 the average private nonfarm establishment (business) in Boulder County had just over 11 employees. See <http://quickfacts.census.gov/qfd/states/08/08013.html>.

¹⁵ The contribution to the County's economy is less than the actual total energy bill savings because only a portion of the actual spending of the savings occurs in Boulder County.

¹⁶ These jobs do not account for public sector jobs associated with actual program administration.

Appendix

1. Methodology

To capture the full economic impacts of the *EnergySmart* programs in Boulder County, the economic analysis evaluates all program spending on energy-efficiency measures, renewable energy technologies and other related upgrades that occurred in Boulder County.¹⁷ This includes work completed by in-county contractors, do-it-yourself (DIY) projects, county and utility quick installs¹⁸, equipment tune-ups and measures covered under the *Elevations* energy loans program since November 2010.

The actual expenditures for each measure were first grouped by measure or upgrade type and then sorted by contractor location. This provided the basis for separating expenditures that occurred in Boulder County from those that occurred outside of the county. Spending attributed to out-of-county contractors and suppliers was treated as a monetary leakage since the expenditures are spent outside of Boulder County. This spending does not benefit Boulder County contractors, suppliers or other businesses and therefore is not included in the analysis.

The analysis was completed using a Boulder County specific input-output (I-O) model in which the Boulder County expenditures are matched with appropriate Boulder County industry multipliers.¹⁹ The model analyzes three separate effects (i.e., direct, indirect and induced) for each expenditure. The sum of these three effects includes all changes in consumer and business spending during the actual installation of efficiency measures and yields the total effect from a single expenditure.²⁰

1. The direct effect refers to the on site or immediate effect produced by expenditures. In the case of installing energy efficiency upgrades in a home, the direct effect is the on site expenditures and jobs of the construction or trade contractors hired to carry out the work.
2. The indirect effect refers to the increase in economic activity that occurs when a contractor or vendor receives payment for goods or services delivered and he or she is able to pay others who support the businesses. This includes the equipment manufacturer or wholesaler who provides the products (solar panels, insulation, heating system, windows, etc.). It also includes the bank that provides financing to the

¹⁷ All program project cost and savings data was provided by Boulder County Commissioners' Office, Sustainability Dept., June 2013.

¹⁸ Cost and staffing data for residential Quick Installs was provided by Audrey Cole, Controller for Populus, LLC, in June 2013. According to Ms. Cole, equipment/measures installed by Populus (CFLs, faucet aerators, showerheads, etc.) were obtained from suppliers outside of Boulder County. Utility and commercial Quick Installs cost and staffing data was unavailable, and thus not included in this analysis. Equipment purchases are assumed to be from suppliers outside of Boulder County.

¹⁹ In this study we adapted industry multipliers and expenditure ratios derived from the IMPLAN V3 software using 2011 Boulder County data (the most current available at the time the analysis was done). See Minnesota IMPLAN Group, Hudson, WI, www.implan.com.

²⁰ For a more complete description of the methodology employed in this analysis, see a similar Boulder County study by MRG & Associates undertaken for the National Renewable Energy Laboratory in 2010. *Economic Impacts from the Boulder County Climate Smart Loan Program, Using Property Assessed Clean Energy Financing, 2011.*

contractor, the vendor's accountant, and the building owner where the contractor maintains its local offices, and so on.

3. The induced effect results from the spending of worker earnings associated with direct and indirect spending related to energy efficiency expenditures. This includes spending on food, clothing, housing, transportation, recreation, and other goods and services that workers typically spend their paychecks on.

In this analysis, the installation-related impacts are based on projects completed during a two and a half-year period beginning in November 2010 and running into mid April 2013.²¹ The analysis is based on *EnergySmart* program data which includes \$12.8 million in residential upgrades and \$8.3 million in business and commercial property upgrades; a total of \$21.1 million in spending.²² Typically, a very high percentage (85 to 90 percent) of construction related projects, including energy efficiency and renewables, are completed by local contractors and supplied by local vendors (wholesale and retail). However, given the proximity of Boulder County to the Denver metro area, the analysis found that slightly less than half of the total (approximately 49 percent), a total of just over \$10 million, was spent directly within Boulder County. This included payments to Boulder County contractors and equipment and materials suppliers.

In addition to the actual spending on upgrades, the analysis also includes spending of utility bill savings.²³ The spending of utility bill savings is ongoing, that is, the efficiency measures and upgrades continue to reduce energy use and utility bills. The analysis assumes residents and businesses have the same or similar level of utility bill savings each year for the life of the measures, typically 20 to 30 years. When residents and businesses pay their utility bills, most of the money leaves Boulder County to purchase fuels, maintain power plants, and support utility operations throughout Colorado and in other areas. When residents and businesses achieve savings on their utility bills they are able to spend some of the savings purchasing other goods and services, on business upgrades, loan repayments and investments in the local economy.

The ongoing job impacts from these utility bill savings are derived in the same manner as the upgrade investments – matching expenditures with industry specific multipliers, both for consumer and business spending and with the utility sector. The impacts are in large part from the difference between jobs that would have been created or supported within the utility and fuel supply sectors, if the utilities received the additional revenues, and jobs that are supported in Boulder County by the spending of utility bill savings on goods and services in Boulder economy. For purposes of estimating current and future energy bill savings, the analysis assumes energy prices remain at 2012 levels. To the extent energy prices rise in the future, the savings will be even larger.

²¹ Officially, the Boulder County *EnergySmart* program was launched in January 2011, however, the county ran a pilot program starting several months earlier.

²² The analysis does not include costs associated with Boulder County's administration of the program or spending on initial project assessments.

²³ Energy bill savings are based on Deemed savings for electricity (kWh) and gas (therms) for each measure, applied to utility rates of \$0.088 per kWh and \$0.903 per therm. For a more complete description of the methodology employed in this analysis, see a similar Boulder County study by MRG & Associates undertaken for the National Renewable Energy Laboratory in 2010. *Economic Impacts from the Boulder County Climate Smart Loan Program, Using Property Assessed Clean Energy Financing*. 2011.

2. All Projects Summary Data and Impacts

Table A-1 Boulder County EnergySmart Program – All Projects Data Summary

Measure	Total Project Cost/Investment	Boulder County Project Cost/Investment	Percent of Total in Boulder County	Total Rebates	Estimated Annual Utility Bill Savings
HVAC	\$8,562,995	\$4,772,535	55.7%	\$1,213,534	\$234,554
Lighting	\$3,909,846	\$996,709	25.5%	\$854,637	\$1,050,013
Insulation	\$3,753,852	\$2,828,051	75.3%	\$1,238,379	\$445,882
Doors and Windows	\$2,622,535	\$442,144	16.9%	\$363,964	\$116,993
Solar Electric	\$1,283,285	\$747,008	58.2%	\$129,101	\$43,966
Appliances and other DIY	\$667,982	\$240,679	36.0%	\$114,950	\$36,071
Solar Hot Water	\$244,428	\$235,433	96.3%	\$59,408	\$3,047
Office Equipment	\$10,634	\$0	0.0%	\$3,051	\$5,165
Quick Installs	na	na	na	na	\$212,578
Total	\$21,055,556	\$10,262,559	48.7%	\$3,977,024	\$2,148,269

Notes:

All dollar values are 2012 dollars. Includes residential and commercial projects.

Boulder County Project Cost/Investment refers to the project expenditures spent in Boulder County.

Totals may not add up due to independent rounding.

Table A-2 Boulder County EnergySmart Program – All Projects Economic Impacts Summary Upgrade/Installation Phase

Measure	Jobs	Earnings	Output	Sales Tax
HVAC	31	\$2,783,762	\$6,263,066	\$54,896
Insulation	29	\$2,374,707	\$3,993,250	\$13,370
Lighting	10	\$471,652	\$1,329,286	\$9,405
Solar Electric	6	\$325,887	\$948,388	\$9,191
Doors and Windows	4	\$243,151	\$586,610	\$4,573
Appliances and other DIY	4	\$152,914	\$357,480	\$4,488
Solar Hot Water	2	\$110,759	\$302,937	\$2,632
Quick Installs	1	\$50,095	na	na
Office Equipment	0	\$0	\$0	\$0
Total	87	\$6,512,925	\$13,781,016	\$98,554

Notes:

All dollar values are 2012 dollars. Impacts are based on analysis of residential and commercial projects completed during Nov. 2010 and April 2013, and include work done by local (in County) contractors and purchases from local suppliers (retail and wholesale).

Jobs are full-time equivalent (FTE) for 1 year. Earnings are wages, salaries and benefits. Output is economic activity (production of goods and services). Upgrade/Installation Phase impacts are short term (i.e., they are not ongoing). Sales tax refers to county sales tax only. Totals may not add up due to independent rounding.

**Table A-3 Boulder County EnergySmart Program – All Projects Economic Impacts Summary
Annual Utility Bill Saving - Ongoing**

Measure	Jobs	Earnings	Output
Lighting	6	\$162,922	\$303,170
Insulation	2	\$69,184	\$128,739
HVAC	1	\$36,394	\$67,723
Quick Installs	1	\$32,984	\$61,378
Doors and Windows	1	\$18,153	\$33,779
Solar Electric	0	\$6,822	\$12,694
Appliances and other DIY	0	\$5,588	\$10,399
Office Equipment	0	\$801	\$1,491
Solar Hot Water	0	\$473	\$880
Total	11	\$333,320	\$620,253

Notes:

All dollar values are 2012 dollars. Impacts are based on analysis of estimated utility bill savings for residential and commercial projects completed during Nov. 2010 and April 2013. Jobs are full-time equivalent (FTE) for 1 year. Earnings are wages, salaries and benefits. Output is economic activity (production of goods and services) . Totals may not add up due to independent rounding.

3. Residential Projects Data and Economic Impacts

Table A-4 Boulder County EnergySmart Program - Residential Projects Data

Measure	Total Project Cost/Investment	Boulder County Project Cost/Investment	Percent of Total in Boulder County	Total Rebates	Estimated Annual Utility Bill Savings
HVAC	\$5,110,648	\$3,527,994	69.0%	\$564,091	\$94,724
Insulation	\$3,489,553	\$2,575,156	73.8%	\$1,195,004	\$440,941
Doors and Windows	\$2,434,581	\$325,931	13.4%	\$309,457	\$107,086
Solar Electric	\$923,004	\$551,628	59.8%	\$119,101	\$39,258
Appliances and other DIY	\$667,982	\$240,679	36.0%	\$114,950	\$36,071
Solar Hot Water	\$128,641	\$119,646	93.0%	\$18,715	\$1,301
Quick Installs	na	na	na	na	\$160,595
Total	\$12,754,410	\$7,341,035	57.6%	\$2,321,318	\$879,976

Notes:

All dollar values are 2012 dollars.

Boulder County Project Cost/Investment refers to the project expenditures spent in Boulder County.

Totals may not add up due to independent rounding.

Table A-5 Boulder County EnergySmart Program – Residential Projects Economic Impacts Upgrade/Installation Phase

Measure	Jobs	Earnings	Output	Sales Tax
Insulation	26	\$2,233,314	\$3,638,786	\$12,174
HVAC	23	\$2,246,519	\$4,649,339	\$40,222
Solar Electric	4	\$250,188	\$695,966	\$7,042
Appliances and other DIY	4	\$152,914	\$357,480	\$4,488
Doors and Windows	3	\$192,066	\$432,906	\$3,371
Solar Hot Water	1	\$65,105	\$154,625	\$1,337
Quick Installs	1	\$50,095	na	na
Total	62	\$5,190,200	\$9,929,101	\$68,634

Notes:

All dollar values are 2012 dollars.

Impacts are based on analysis of projects completed during Nov. 2010 and April 2013, and include work done by local (in County) contractors and purchases from local suppliers (retail and wholesale). Jobs are full-time equivalent (FTE) for 1 year.

Earnings are wages, salaries and benefits. Output is economic activity (production of goods and services). Upgrade/Installation Phase impacts are short term (i.e., they are not ongoing). Sales tax refers to county sales tax only. Totals may not add up due to independent rounding.

**Table A-6 Boulder County EnergySmart Program – Residential Projects Economic Impacts
Annual Utility Bill Saving - Ongoing**

Measure	Jobs	Earnings	Output
Insulation	2	\$68,417	\$127,313
Quick Installs	1	\$24,918	\$46,369
Doors and Windows	1	\$16,616	\$30,919
HVAC	1	\$14,698	\$27,350
Solar Electric	0	\$6,091	\$11,335
Appliances and other DIY	0	\$5,588	\$10,399
Solar Hot Water	0	\$202	\$376
Total	5	\$136,530	\$254,059

Notes:

All dollar values are 2012 dollars.

Impacts are based on analysis of estimated utility bill savings for projects completed during Nov. 2010 and April 2013.

Jobs are full-time equivalent (FTE) for 1 year. Earnings are wages, salaries and benefits. Output is economic activity (production of goods and services). Totals may not add up due to independent rounding.

4. Commercial Projects Data and Economic Impacts

Table A-7 Boulder County EnergySmart Program - Commercial Projects Data

Measure	Total Project Cost/Investment	Boulder County Project Cost/Investment	Percent of Total in Boulder County	Total Rebates	Estimated Annual Utility Bill Savings
Lighting	\$3,909,846	\$996,709	25.5%	\$854,637	\$1,050,013
HVAC	\$3,452,347	\$1,244,541	36.0%	\$649,442	\$139,830
Solar Electric	\$360,280	\$195,380	54.2%	\$10,000	\$4,707
Insulation	\$264,298	\$252,895	95.7%	\$43,375	\$4,941
Windows	\$187,954	\$116,213	61.8%	\$54,507	\$9,907
Solar Hot Water	\$115,787	\$115,787	100.0%	\$40,694	\$1,746
Office Equipment	\$10,634	\$0	0.0%	\$3,051	\$5,165
Quick Installs	na	na	na	na	\$51,983
Total	\$8,301,146	\$2,921,524	35.2%	\$1,655,706	\$1,268,293

Notes:
 All dollar values are 2012 dollars.
 Boulder County Project Cost/Investment refers to the project expenditures spent in Boulder County.
 Totals may not add up due to independent rounding.

Table A-8 Boulder County EnergySmart Program – Commercial Projects Economic Impacts Upgrade/Installation Phase

Measure	Jobs	Earnings	Output	Sales Tax
Lighting	10	\$471,652	\$1,329,286	\$9,405
HVAC	9	\$537,243	\$1,613,727	\$14,674
Insulation	3	\$141,392	\$354,464	\$1,196
Solar Electric	2	\$75,699	\$252,422	\$2,149
Windows	1	\$51,085	\$153,703	\$1,202
Solar Hot Water	1	\$45,654	\$148,312	\$1,294
Office Equipment	0	\$0	\$0	\$0
Quick Installs	na	na	na	na
Total	25	\$1,322,724	\$3,851,915	\$29,920

Notes:
 All dollar values are 2012 dollars. Impacts are based on analysis of projects completed during Nov. 2010 and April 2013, and include work done by local (in County) contractors and purchases from local suppliers (retail and wholesale). Jobs are full-time equivalent (FTE) for 1 year. Earnings are wages, salaries and benefits. Output is economic activity (production of goods and services). Upgrade/Installation Phase impacts are short term (i.e., they are not ongoing). Sales tax refers to county sales tax only. Totals may not add up due to independent rounding.

**Table A-9 Boulder County EnergySmart Program – Commercial Projects Economic Impacts
Annual Utility Bill Saving - Ongoing**

Measure	Jobs	Earnings	Output
Lighting	6	\$162,922	\$303,170
HVAC	1	\$21,696	\$40,373
Quick Installs	0	\$8,066	\$15,009
Windows	0	\$1,537	\$2,860
Office Equipment	0	\$801	\$1,491
Insulation	0	\$767	\$1,427
Solar Electric	0	\$730	\$1,359
Solar Hot Water	0	\$271	\$504
Total	7	\$196,790	\$366,194

Notes:

All dollar values are 2012 dollars.

Impacts are based on analysis of estimated utility bill savings for projects completed during Nov. 2010 and April 2013.

Jobs are full-time equivalent (FTE) for 1 year. Earnings are wages, salaries and benefits. Output is economic activity (production of goods and services). Totals may not add up due to independent rounding.

5. All Projects Metrics Summary

**Table A-10 Boulder County EnergySmart Program – All Projects Metrics Summary
Upgrade/Installation Phase**

Measure	Jobs/\$Million Rebate	\$Earnings/\$Rebate	\$Output/\$Rebate	Total \$Investment/\$Rebate	\$Sales Tax/\$Rebate
Solar Electric	44.4	\$2.52	\$7.35	\$9.94	\$0.07
Appliances and other DIY	38.1	\$1.33	\$3.11	\$5.81	\$0.04
Solar Hot Water	32.4	\$1.86	\$5.10	\$4.11	\$0.04
HVAC	25.8	\$2.29	\$5.16	\$7.06	\$0.05
Insulation	23.3	\$1.92	\$3.22	\$3.03	\$0.01
Lighting	11.3	\$0.55	\$1.56	\$4.57	\$0.01
Doors and Windows	10.8	\$0.67	\$1.61	\$7.21	\$0.01
Office Equipment	0.0	\$0.00	\$0.00	\$3.49	\$0.00
Quick Installs	na	na	na	na	na
Average	21.8	\$1.64	\$3.47	\$5.29	\$0.02

Notes:

All dollar values are 2012 dollars.

Metrics are based on residential and commercial project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metric indicates the relationship between the item (jobs, earnings, etc.) and dollars of rebates provided. For example, for solar electric, Jobs/\$Million rebates indicates that each \$1 million of rebates supported 44.4 jobs, based on the current Boulder County EnergySmart program economic impact analysis. Similarly, for each dollar of rebates provided for solar electric, \$9.94 of total investment (project spending) occurred. Totals may not add up due to independent rounding.

**Table A-11 Boulder County EnergySmart Program - All Projects Metrics Summary
Upgrade/Installation Phase**

Measure	Rebate \$ Spent/Job	Rebate \$ Spent/\$Earnings	Rebate \$ Spent/\$Output	Rebate \$ Spent/\$Investment
Solar Electric	\$21,780	\$0.39	\$0.13	\$0.10
Appliances and other DIY	\$25,361	\$0.72	\$0.30	\$0.17
Solar Hot Water	\$29,824	\$0.52	\$0.19	\$0.24
HVAC	\$37,554	\$0.43	\$0.19	\$0.14
Insulation	\$41,562	\$0.51	\$0.30	\$0.33
Doors and Windows	\$94,346	\$1.44	\$0.59	\$0.14
Lighting	\$100,330	\$1.71	\$0.61	\$0.22
Office Equipment	na	na	na	na
Quick Installs	na	na	na	na
Average	\$45,169	\$0.60	\$0.28	\$0.19

Notes:

All dollar values are 2012 dollars.

Metrics are based on residential and commercial project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metric indicates the relationship between each rebate dollar provided and the item (jobs, earnings, etc.) supported. For example, for solar electric, Rebate\$ Spent/Job indicates that \$21,780 of rebates was provided for each job supported. Similarly, \$0.10 of rebates was provided for each dollar of investment (project spending). Totals may not add up due to independent rounding.

**Table A-12 Boulder County EnergySmart Program – All Projects Metrics Summary
Annual Utility Bill Saving - Ongoing**

Measure	Jobs/\$Million Rebate	\$Earnings/\$Rebate	\$Output/\$Rebate	\$Annual Utility Bill Savings/\$Rebate
Office Equipment	9.0	\$0.26	\$0.49	\$1.69
Lighting	6.5	\$0.19	\$0.35	\$1.23
Insulation	1.9	\$0.06	\$0.10	\$0.36
Solar Electric	1.8	\$0.05	\$0.10	\$0.34
Appliances and other DIY	1.7	\$0.05	\$0.09	\$0.31
Doors and Windows	1.7	\$0.05	\$0.09	\$0.32
HVAC	1.0	\$0.03	\$0.06	\$0.19
Solar Hot Water	0.3	\$0.01	\$0.01	\$0.05
Quick Installs	na	na	na	na
Average	2.9	\$0.08	\$0.16	\$0.54

Notes:

All dollar values are 2012 dollars.

Metrics are based on residential and commercial project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metric indicates the relationship between the item (jobs, earnings, etc.) and dollars of rebates provided. For example, for office equipment, Jobs/\$Million rebates indicates that each \$1 million of rebates supported 9.0 ongoing jobs, based on the current Boulder County *EnergySmart* program economic impact analysis of estimated utility bill savings. Similarly, for each dollar of rebates provided for office equipment, \$1.69 of annual utility bill savings occurred. Totals may not add up due to independent rounding.

**Table A-13 Boulder County EnergySmart Program – All Projects Metrics Summary
Rebate Payback - Ratio of Utility Bill Savings to Rebate Cost**

Measure	5 Years	10 Years	20 Years
Office Equipment	8.5	16.9	33.9
Lighting	6.1	12.3	24.6
Insulation	1.8	3.6	7.2
Solar Electric	1.7	3.4	6.8
Doors and Windows	1.6	3.2	6.4
Appliances and other DIY	1.6	3.1	6.3
HVAC	1.0	1.9	3.9
Solar Hot Water	0.3	0.5	1.0
Quick Installs	na	na	na
Average	2.7	5.4	10.8

Notes:

All dollar values are 2012 dollars.

A value of 1.0 indicates combined annual utility bill savings equal the initial rebate amount.

Metrics are based on residential and commercial project data and the sum total of all annual estimated utility bill savings for the number of years noted. Totals may not add up due to independent rounding.

6. Residential Projects Metrics

Table A-14 Boulder County EnergySmart Program - Residential Project Metrics Upgrade/Installation Phase

Measure	Jobs/\$Million Rebate	\$Earnings/\$Rebate	\$Output/\$Rebate	\$Investment/\$Rebate	Total	\$Sales Tax/\$Rebate
Solar Hot Water	50.6	\$3.48	\$8.26	\$6.87	\$6.87	\$0.07
HVAC	40.3	\$3.98	\$8.24	\$9.06	\$9.06	\$0.07
Appliances and other DIY	38.1	\$1.33	\$3.11	\$5.81	\$5.81	\$0.04
Solar Electric	34.5	\$2.10	\$5.84	\$7.75	\$7.75	\$0.06
Insulation	21.8	\$1.87	\$3.04	\$2.92	\$2.92	\$0.01
Doors and Windows	9.2	\$0.62	\$1.40	\$7.87	\$7.87	\$0.01
Quick Installs	na	na	na	na	na	na
Average	26.8	\$2.24	\$4.28	\$5.49	\$5.49	\$0.03

Notes:

All dollar values are 2012 dollars.

Metrics are based on residential project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metric indicates the relationship between the item (jobs, earnings, etc.) and dollars of rebates provided. For example, for solar hot water, Jobs/\$Million rebates indicates that each \$1 million of rebates supported 50.6 jobs, based on the current Boulder County EnergySmart program economic impact analysis. Similarly, for each dollar of rebates provided for solar hot water, \$6.87 of total investment (project spending) occurred. Totals may not add up due to independent rounding.

**Table A-15 Boulder County EnergySmart Program - Residential Projects Metrics Summary
Upgrade/Installation Phase**

Measure	Rebate \$ Spent/Job	Rebate \$ Spent/\$Earnings	Rebate \$ Spent/\$Output	Rebate \$ Spent/\$Investment
Solar Hot Water	\$19,205	\$0.28	\$0.12	\$0.15
HVAC	\$24,210	\$0.25	\$0.12	\$0.11
Appliances and other DIY	\$25,361	\$0.72	\$0.30	\$0.17
Solar Electric	\$28,174	\$0.47	\$0.17	\$0.13
Insulation	\$44,229	\$0.52	\$0.31	\$0.34
Doors and Windows	\$105,390	\$1.57	\$0.69	\$0.13
Quick Installs	na	na	na	na
Average	\$36,215	\$0.44	\$0.23	\$0.18

Notes:

All dollar values are 2012 dollars.

Metrics are based on residential and commercial project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metric indicates the relationship between each rebate dollar spent and the item (jobs, earnings, etc.) supported. For example, for solar hot water, Rebate\$ Spent/Job indicates \$19,205 of rebates was provided for each job supported. Similarly, \$0.15 of rebates was provided for each dollar of investment (project spending). Totals may not add up due to independent rounding.

**Table A-16 Boulder County EnergySmart Program - Residential Projects Metrics Summary
Annual Utility Bill Saving - Ongoing**

Measure	Jobs/\$Million Rebate	\$Earnings/\$Rebate	\$Output/\$Rebate	\$Annual Utility Bill Savings/\$Rebate
Insulation	2.0	\$0.06	\$0.11	\$0.37
Doors and Windows	1.8	\$0.05	\$0.10	\$0.35
Appliances and other DIY	1.7	\$0.05	\$0.09	\$0.31
Solar Electric	1.7	\$0.05	\$0.10	\$0.33
HVAC	0.9	\$0.03	\$0.05	\$0.17
Solar Hot Water	0.4	\$0.01	\$0.02	\$0.07
Quick Installs	na	na	na	na
Average	2.0	\$0.06	\$0.11	\$0.38

Notes:

All dollar values are 2012 dollars.

Metrics are based on residential project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metric indicates the relationship between the item (jobs, earnings, etc.) and dollars of rebates provided. For example, for insulation, Jobs/\$Million rebates indicates that each \$1 million of rebates supported 2.0 jobs, based on the current Boulder County *EnergySmart* program economic impact analysis of estimated utility bill savings. Similarly, for each dollar of rebates provided for insulation, \$0.37 of annual utility bill savings occurred. Totals may not add up due to independent rounding.

**Table A-17 Boulder County EnergySmart Program - Residential Projects Metrics Summary
Rebate Payback - Ratio of Utility Bill Savings to Rebate Cost**

Measure	5 Years	10 Years	20 Years
Insulation	1.8	3.7	7.4
Doors and Windows	1.7	3.5	6.9
Solar Electric	1.6	3.3	6.6
Appliances and other DIY	1.6	3.1	6.3
HVAC	0.8	1.7	3.4
Solar Hot Water	0.3	0.7	1.4
Quick Installs	na	na	na
Average	1.9	3.8	7.6

Notes:

All dollar values are 2012 dollars.

A value of 1.0 indicates combined annual utility bill savings equal the initial rebate amount. Metrics are based on residential project data and the sum total of all annual estimated utility bill savings for the number of years noted. Totals may not add up due to independent rounding.

7. Commercial Projects Metrics

**Table A-18 Boulder County EnergySmart Program - Commercial Projects Metrics Summary
Upgrade/Installation Phase**

Measure	Jobs/\$Million Rebate	\$Earnings/\$Rebate	\$Output/\$Rebate	Total \$Investment/\$Rebate	\$Sales Tax/\$Rebate
Solar Electric	161.5	\$7.57	\$25.24	\$36.03	\$0.21
Insulation	64.7	\$3.26	\$8.17	\$6.09	\$0.03
Solar Hot Water	24.0	\$1.12	\$3.64	\$2.85	\$0.03
Windows	19.6	\$0.94	\$2.82	\$3.45	\$0.02
HVAC	13.2	\$0.83	\$2.48	\$5.32	\$0.02
Lighting	11.3	\$0.55	\$1.56	\$4.57	\$0.01
Office Equipment	0.0	\$0.00	\$0.00	\$3.49	\$0.00
Quick Installs	na	na	na	na	na
Average	14.9	\$0.80	\$2.33	\$5.01	\$0.02

Notes:

All dollar values are 2012 dollars.

Metrics are based on commercial project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. This metric indicates the relationship between the item (jobs, earnings, etc.) and dollars of rebates provided. For example, for solar electric, Jobs/\$Million rebates indicates that each \$1 million of rebates supported 161.5 jobs, based on the current Boulder County *EnergySmart* program economic impact analysis. Similarly, for each dollar of rebates provided for solar electric, \$36.03 of total investment (project spending) occurred. Totals may not add up due to independent rounding.

**Table A-19 Boulder County EnergySmart Program – Commercial Projects Metrics Summary
Upgrade/Installation Phase**

Measure	Rebate \$ Spent/Job	Rebate \$ Spent/\$Earnings	Rebate \$ Spent/\$Output	Rebate \$ Spent/\$Investment
Solar Electric	\$5,882	\$0.13	\$0.04	\$0.03
Insulation	\$15,617	\$0.29	\$0.11	\$0.16
Solar Hot Water	\$39,993	\$0.86	\$0.26	\$0.35
Doors and Windows	\$59,154	\$1.00	\$0.34	\$0.29
HVAC	\$72,050	\$1.16	\$0.39	\$0.19
Lighting	\$100,330	\$1.71	\$0.61	\$0.22
Office Equipment	na	na	na	\$0.29
Quick Installs	na	na	na	na
Average	\$69,136	\$1.19	\$0.41	\$0.20

Notes:

All dollar values are 2012 dollars. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. Metrics are based on commercial project data and economic impacts. This metric indicates the relationship between each rebate dollar spent and the item (jobs, earnings, etc.) supported. For example, for solar electric, Rebate\$ Spent/Job indicates \$5,882 of rebates was provided for each job supported. Similarly, \$0.03 of rebates was provided for each dollar of investment (project spending). Totals may not add up due to independent rounding.

**Table A-20 Boulder County EnergySmart Program - Commercial Project Metrics Summary
Annual Utility Bill Saving - Ongoing**

Measure	Jobs/\$Million Rebate	\$Earnings/\$Rebate	\$Output/\$Rebate	\$Annual Utility Bill Savings/\$Rebate
Office Equipment	9.0	\$0.26	\$0.49	\$1.69
Lighting	6.5	\$0.19	\$0.35	\$1.23
Solar Electric	2.5	\$0.07	\$0.14	\$0.47
HVAC	1.1	\$0.03	\$0.06	\$0.22
Windows	1.0	\$0.03	\$0.05	\$0.18
Insulation	0.6	\$0.02	\$0.03	\$0.11
Solar Hot Water	0.2	\$0.01	\$0.01	\$0.04
Quick Installs	na	na	na	na
Average	4.1	\$0.12	\$0.22	\$0.77

Notes:

All dollar values are 2012 dollars.

Metrics are based on commercial project data and economic impacts. They do not necessarily imply a direct cause and effect, but rather a correlation based on the results of the impact analysis. This metric indicates the relationship between the item (jobs, earnings, etc.) and dollars of rebates provided. For example, for office equipment, Jobs/\$Million rebates indicates that each \$1 million of rebates supported 9.0 jobs, based on the current Boulder County *EnergySmart* program economic impact analysis of estimated utility bill savings. Similarly, for each dollar of rebates provided for office equipment, \$1.69 of annual utility bill savings occurred. Totals may not add up due to independent rounding.

**Table A-21 Boulder County EnergySmart Program - Commercial Projects Metrics Summary
Rebate Payback - Ratio of Utility Bill Savings to Rebate Cost**

Measure	5 Years	10 Years	20 Years
Office Equipment	8.5	16.9	33.9
Appliances and other DIY	6.1	12.3	24.6
Solar Electric	2.4	4.7	9.4
HVAC	1.1	2.2	4.3
Windows	0.9	1.8	3.6
Insulation	0.6	1.1	2.3
Solar Hot Water	0.2	0.4	0.9
Quick Installs	na	na	na
Average	3.8	7.7	15.3

Notes:

All dollar values are 2012 dollars.

A value of 1.0 indicates combined annual utility bill savings equal the initial rebate amount. Metrics are based on commercial project data and the sum total of all annual estimated utility bill savings for the number of years noted. Totals may not add up due to independent rounding.