

STAFF REPORT

TO: Summit County Council
FROM: Lisa Yoder, Sustainability Program Manager
DATE: March 24, 2016
SUBJECT: Annual Sustainability Report



County Council Meeting: March 30, 2016

The Council's vision and strategic goals have informed three formally adopted plans that guide Summit County's sustainability efforts:

- (1) The **2014-2016 Sustainability Plan** was adopted by the Council on March 19, 2014 and was developed to build on the successes and unfinished goals in the 2011-2013 Sustainability Plan.
- (2) The **2014-2016 Plan for Energy Efficiency Cost Savings and Emissions Reduction** was adopted by the Council in May of 2014 and provides a step-by-step plan to reduce the net energy consumption of county facilities by 10% and achieve a greenhouse gas emissions reduction of 25% below 2013 levels by 2016.
- (3) The **Summit County Climate Action Plan** was adopted by Council in August of 2015 and seeks to provide a strategic implementation plan to achieve a newly established countywide greenhouse gas emissions reduction goal of 15% below 2015 levels by 2030.

This staff report provides the Council with: (1) an update on the implementation and results of each of the aforementioned plans, (2) presents the actions planned for 2016, and (3) discusses the projected results of those actions in the context of the targets and goals set forth in the 3 plans.

EXECUTIVE SUMMARY

Summit County is well on track to achieve its short and long term sustainability goals. Annual greenhouse gas reduction targets are being met, positioning the county towards achieving its longer term emissions reduction goals. At the same time, the increased focus on energy conservation measures is supporting movement towards meeting overarching energy efficiency goals in county facilities and operations. Projects continue to be developed, updated, and implemented by staff, and in partnership with internal departments, local governments, community organizations, utility providers, and residents, all of which are contributing towards the achievement of these goals and supporting the county's ability to build a more sustainable future and help improve resiliency to climate change.

This report is divided by headings according to the strategic goals outlined in the Sustainability Plan. Each heading marked with an earth icon indicates that the action is a component of the Climate Action Plan. Achievements, progress made and course corrections specific to each strategic goal are described under each heading, and each section concludes with a summary of proposed actions going forward.

REDUCE CARBON DIOXIDE EQUIVALENT (CO₂e) EMISSIONS OF COUNTY OPERATIONS



Annual quantification of emissions from County operations reveals that we exceeded the goal to reduce emissions 13% below business as usual by the end of 2014. County emissions increased slightly but are still trending downward (from a high of 7,984 MTCO₂e in 2011 to 7,691 MTCO₂e in 2015) in accordance with the Council’s commitment to reduce emissions from county operations. (See Table 1.0)

Table 1.0 – Emissions Trend of County Operations

	2010	2011	2012	2013	2014	2015
Actual emissions	7,920	7,984	7,854	7,845	7,650	7,691
Business as Usual (BAU)	8,315	8,565	8,822	9,086	9,359	9,640
GOAL: 13% Below BAU	7,234	7,451	7,675	7,905	8,142	8,386

While overall County emissions are generally trending downward, emissions vary by sector as shown in Table 2.0 below. The data confirms that capital investments in energy efficiency improvements and solar PV installations continue to reduce net emissions associated with building energy consumption. (Details about specific capital investments related to the energy efficiency of county buildings will be provided in the next section.)

Emissions trended upward in 2015 in three sectors of the greenhouse gas inventory: antennae and TV responders, employee commute, and bus transit. However, emissions from the antennae and TV responders sector are expected to demonstrate a decline of approximately 50 MTCO₂e in 2016 as a result of the implementation of energy efficiency measures that are currently underway. The emissions associated with employee commute appear to trend along with the number of county employees; increases in the county employee population mean more commuters and, consequently, higher commuting emissions. Similarly, bus transit emissions correlate to usage patterns such that expansions in bus services and resulting increases in annual mileage result in higher transit emissions.

Two sectors – Streetlights and Signs and the Vehicle Fleet – show no clear trend. Staff will be looking further into the data to distinguish anomalies from contributing factors and assessing the feasibility of addressing them. It is important to note that many factors play into the final emissions totals, most notably weather and market conditions. Further discussion about the extent that weather patterns, economic conditions, and other uncontrollable variables impact emissions will be discussed throughout this report.

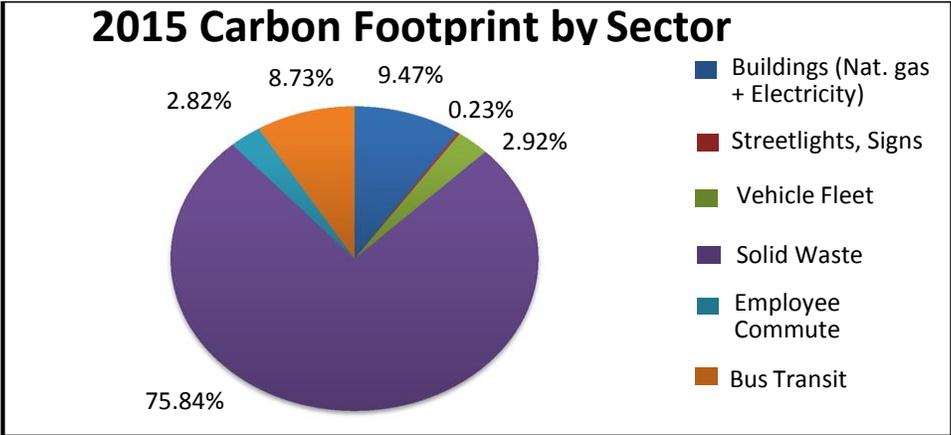
Table 2.0 – County Facilities and Operations Emissions by Sector

EMISSIONS BY SECTOR	2010 MTCO ₂ e	2013 MTCO ₂ e	2014 MTCO ₂ e	2015 MTCO ₂ e
Electricity-Major Building	2281.4	2191.3	1964.8	1813.7
Electricity-Minor Buildings, grounds	71.6	66.1	68.4	66.5
Antennae/TV Responders	207.3	271.8	273.5	276.9
Streetlights and Signs	48.4	88.3	78.4	71.9
Total Electricity Emissions	2608.70	2617.51	2385.11	2228.98
Natural Gas - buildings	975.4	879.3	862.8	856.9
Vehicle Fleet	1066.9	861.0	855.7	928.2
Employee Commute	813.8	792.5	842.0	897.4
Bus Transit	2455.1	2694.5	2704.3	2779.4
TOTAL CO₂e EMISSIONS	7919.9	7844.8	7649.9	7691.3

Quantifying emissions is complicated by the fact that data is sourced from multiple vendors and records with varying formats, is sometimes incomplete or erroneous, and sometimes shows discrepancies from year to year, all of which compromise the quality and reliability of the data and the ability to accurately portray the emissions picture. Added to these challenges, the nature of quantifying emissions is never an exact science; many assumptions are built into the methodology to help streamline the data collection process for organizations and help them calculate the most accurate emissions picture as possible, but it is important to recognize that greenhouse gas emissions quantification is inherently imperfect. That said, a primary function of the new part time sustainability specialist will be to work with the various vendors and data sources to ensure that data is as complete and consistent as possible and that processes are developed and institutionalized which support best practices for long term greenhouse gas inventory data collection.

This will also help to ensure that our analysis is precise and maintains its validity for comparison. Research into updated versions or other potential mainstream greenhouse gas quantification tools that could further simplify the emissions calculation process (and help the county measure itself against other regions of similar demographics) will also be explored going forward. The justification for the current emissions quantification system has been its ability to enable a continuum of comparison, beginning in 2009 (and some level of comparison going back to 2005). Any change in the methodology that we might pursue going forward will need to be accounted for, so as to preserve the reliability and integrity of the analysis. Also, a reevaluation of the scope of the emissions boundaries will need to be conducted and consideration given to those aspects of the inventory that have been calculated but not quantified in the total emissions. For example, the decision was made back in 2009 and the years following to exclude landfill emissions from the total reported emissions. The reason for this is unknown but the assumption is that it may have been because these emissions were such a large part of the total emissions pie, but also a part that has historically been very difficult to impact due to the correlation with uncontrollable market factors (e.g. volatility of market prices for recyclable goods) and disposal rate of goods that fluctuate with the economy. This reporting gap will have to be rectified going forward because when landfill emissions are included in the analysis the total emissions increase dramatically, up to 28,121 MTCO₂e. While a large portion of the County’s emissions, it is important to note that solid waste emissions contribute only 1% of the countywide emissions.

Chart 1.0 County Carbon Footprint by Sector



The target of reducing emissions from county facilities and operations (other than landfill) is being met and is on track. A new goal was established in the 2014-2016 Plan for Energy Efficiency Cost Savings and Emissions Reduction and adopted by Council in May of 2014. It seeks to reduce the energy consumption of county facilities by 10% and achieve a greenhouse gas emissions reduction of 25% below 2013 level by 2016. Significant capital investment is required to accomplish this goal, as outlined in the proposed cost savings and emissions reduction table below (see Table 3.0).

Table 3.0 – Proposed Cost Savings and CO2e Emissions Reduction (2014-2016)

EE Measures Proposed/Underway	Year	Projected Annual Cost Savings ¹	Estimated Net Installed Cost ²	Projected Simple Payback (years)	Projected Annual CO2e Reduction (MT)
1. EE Upgrades to JC and CH	2014	\$ 40,000	\$360,000	9.0	272 MT
2. Solar on Justice Center	2015	\$ 9,905	\$196,000	19.8	74 MT
3. 10% decrease overall energy usage	2015, 2016	\$43,220	\$1,000,000 ³	23.0	1,088 MT
TOTAL		\$93,125	\$1,556,000	17.2 avg	1,434 MT

Steps one and two of the Energy Efficiency Cost Savings and Emissions Reduction Plan were completed as planned: The energy efficiency upgrades and LED lighting retrofit on the Justice Center in 2014 and 2015 reduced electricity consumption as projected and were completed prior to installing the solar PV system. Due to these efficiency upgrades and the fact that the solar (Photovoltaic or PV) system was sized to meet the electricity demand pre-upgrades, it has been able to meet a greater portion of the total electricity demand than initially projected, offsetting as much as 25% of net electricity consumption. A complete cost savings and emissions reduction analysis will be conducted after one full year of solar power generation and presented in the next annual Sustainability report.

Table 4.0 – Actual Energy Efficiency Measures Implemented (2014-2016)

EE Measures Completed/Underway	Year	Approx. Annual Savings ⁴	Actual Net Installed Cost ⁵	Projected Simple Payback (years)	Projected Annual CO2e Reduction (MT)
1. EE Upgrade and LED retrofit to JC	2014	\$ 13,200	\$285,800	21.7	138 MT
2. Solar on Justice Center	2015	\$ 22,915	\$370,810	16.2	226 MT
3. 10% decrease overall energy usage:					
LED upgrade to CH	2015	\$5,985	\$54,800	9.2	35MT
LED upgrade to SS Ambulance	2015	\$530	\$2,060	3.9	.15 MT
EE upgrade to Quarry Mntn.	2016	\$3,350	\$3,350	1.0	50 MT
TOTAL		\$45,980	\$716,820	10.4 avg	449 MT

¹ Based on projected electricity and natural gas rates during first full year of implementation

² Net installed cost to County after utility rebates and grants

³ Estimated implementation cost of EE measures required to attain 10% reduction based on the average cost of EE measures implemented to date.

⁴ Approx. annual savings determined by Rocky Mountain Power lighting audits and ETC Groups EE Measure Review. Full year cost reduction not yet realized – Installations completed end of 2015.

⁵ Net installed cost to County after utility rebates and grants

To accomplish the emissions reduction goal specific to major county buildings (decrease overall electricity and natural gas usage in county facilities by 10%) a capital investment of approximately \$1,000,000 in energy efficiency improvements is required over calendar years 2015 and 2016. However, that goal will not be met by the end of 2016 because the energy efficiency improvements proposed in the capital budget were not funded. Nonetheless, energy efficiency and emissions reduction remain high strategic priorities.

Annual benchmarking toward that CO2 emissions reduction goal continues but it should be noted that the analysis is extremely time-consuming and has revealed numerous inconsistencies in the data provided by third parties, most notably the two fuel suppliers. Given the complexity of the analysis, the numerous data sources required, and the evolution of new models, staff intends to research and evaluate improved methods to conduct this analysis going forward. Recognizing that cost/benefit analysis and performance analytics are the primary tools for selecting alternative products, methods and capital investments to reduce emissions, the part-time sustainability staff coming on board in spring 2016 will be tasked with researching and establishing an improved method to use going forward as well as establishing a system that accounts for installation cost, incentives, utility cost reduction, associated emissions reduction and quantifiable benefits from specific energy projects.

Action Going Forward:

Further analysis of emissions data will identify sectors where increasing trends can be reversed through behavior changes and those that will require capital investment. Specifically, energy usage by employees in County buildings and employee commute are behavioral patterns that can be altered with education and employee engagement strategies, for example that reward and incentivize alternative transportation and occupant energy use reduction. Specific programs and platforms that can address the employee engagement aspect of energy and other resource reduction are currently under review. Capital investments to County facilities proposed in the 2016 Capital budget will be refined and re-submitted for consideration in the 2017 budget. Collaboration with the Director of Regional Transportation Planning is also underway to implement strategies to reduce emissions from employee commuting. Emission reduction strategies relating to the landfill are being managed by the Landfill Superintendent and supported by the County's partnership with Recycle Utah, and include diversion of recyclable materials and the exploration of food waste composting.

INTENSIFY ENERGY EFFICIENCY IN EXISTING COUNTY FACILITIES



The energy efficiency of County buildings is increasing as result of capital investment in the energy efficiency upgrades mentioned above and Mike Crystal's (Facilities Manager) attention to maintenance and operations. Progress is being made toward the goal of reducing the energy consumption of county facilities by 10% by the end of 2016. Between 2014 and 2015 electricity usage decreased by 8% and natural gas usage decreased by 4%. Staff expects to achieve the 10% reduction goal by the end of 2016 because the energy efficiency upgrades completed at the end of 2015 will have been in effect for a full year by that time and their savings will be able to be accurately captured.

A metric used to express a building's energy use as a function of its size or other characteristics is Energy Use Intensity, or EUI. A summary of the cumulative EUI of all major buildings is provided in Table 5.0.

Table 5.0 – EUI Summary (Major Buildings)

Cumulative Electricity EUI				
2010	2012	2013	2014	2015
130.44	127.78	129.37	117.59	112.69
Cumulative Natural Gas EUI				
2010	2012	2013	2014	2015
0.8063	0.742	0.7252	0.7398	0.6813

The EUI trend is decreasing for both electricity and natural gas. This decrease in EUI directly corresponds to the decreasing emissions from buildings shown in Table 2.0. Comparing the EUI of all County buildings in which energy efficiency measures and solar PV systems are installed, EUI is generally decreasing as shown in the Table 6.0.

Table 6.0 – EUI – Buildings with EE Upgrades and/or Solar PV

	2012	2013	2014	2015
Public Health	12.32	11.81	7.97	7.31
Justice Center	38.05	38.83	38.05	38.83
County Courthouse	21.32	21.25	19.02	19.51

Table 6.0 demonstrates the effect on EUI of the solar Photovoltaic (PV) projects undertaken in the last few years. For example, the solar PV system was installed on the public health building in October 2013. In its first full year of solar generated power (2014) it achieved approximately a 30% decrease in its EUI. That is, the solar installation was able to reduce 30% of its energy per square foot per year. A similar reduction is expected for the Justice Center in 2016 following its first full year of solar generation.

Another Sustainability goal is to reduce utility costs to the County. Utility costs do not necessarily align accordingly due to several uncontrollable factors. The most significant impact on utility consumption is weather and climate. Hot summers increase cooling loads that then drive up electricity usage. Likewise, cold winters increase heating costs. Volatility in natural gas prices, steadily increasing electricity rates, and occupant energy behavior all greatly impact energy usage. Furthermore, this analysis does not account for other variables and unknowns such as fluctuations in hours of building operation, numbers of employees, and changing plug loads of occupants’ personal and required electronic equipment. However, Table 7.0 is provided to illustrate utility usage and cost in relation to heating degree days (HDD) and cooling degree days (CDD).

Table 7.0 – Expenditures on Natural Gas and Electricity

	2010	2012	2013	2014	2015
Natural Gas (\$)	\$ 120,479	\$ 115,667	\$ 110,851	\$ 117,556	\$ 120,378
Electricity (\$)	\$ 248,108	\$ 262,234	\$ 293,790	\$ 275,919	\$ 270,025
Total (\$)	\$ 368,587	\$ 377,901	\$ 404,641	\$ 393,475	\$ 390,403
HDD	130	302	248	72	76
CDD	8124	7209	8434	8157	7831

The County’s (solar) PV systems contribute to stabilizing electricity costs over time and greatly reduce CO2e emissions. Value added to the solar installation on the Justice Center (the County’s largest energy consumer) was accomplished by increasing the size of system. Originally planned as a 74 KW system, the system was value engineered and expanded to cover the roofs of the entire complex.

Table 8.0 – County-owned Solar PV Installations

Solar System Size	Approx. Annual kWh Generation	Annual CO2e Emissions Not Emitted	Approx. Annual Utility Cost Reduction ⁶	% of electricity from Solar PV
4.3 kW	6,022	4.2 MT	\$422	90-95%
74 kW	101,700	70.1 MT	\$14,000	30-35%
220 kW	325,000	224.0 MT	\$22,750	22-28%

A utility bill importing system has been obtained to eliminate repetitive data entry and possible errors. The new part time Sustainability Specialist will be trained to utilize the utility tracking software to establish benchmarks that monitor the effectiveness of efficiency measures installed, to provide verification of energy savings, flag anomalies in billing for further investigation, provide a spreadsheet of utility bills for upload to Accounts Payable, and normalize energy usage for weather, among other responsibilities, many of which have been discussed.

To ensure that the County is on optimal rate schedules with the utilities, Discovery Energy was employed in September 2015 to evaluate county utility bills and identify opportunities to change rate schedules. The analysis came up with positive results and no significant recommendations with regard to rate schedule changes. Planned retrofits that reduced natural gas usage at the Justice Center did result in a rate schedule change, but Questar believes it will cost less.⁷

To assist in reducing the cost of energy efficiency upgrades and solar PV installations, staff continues to identify outside funding sources. 13% of the cost of the capital improvements between 2014 and 2016 were funded by grants and rebates.

Action Going Forward:

A new construction building policy is currently being developed for the purpose of bidding, budgeting, and building consistently high performance buildings for long-term maintenance and cost reduction, emissions reduction and increased occupancy comfort that can be attributable to increased worker productivity. Water efficiency standards are being considered as well.

Building energy efficiency improvements have been systematically prioritized to tackle the largest energy consumers first. Energy audits and analysis are underway to identify future improvements and areas of strategic prioritization. However, there is only so much that mechanical systems and technology can do. Energy usage can vary between the exact same buildings as much as 50% due occupant energy usage habits. Staff has evaluated a web-based sustainability employee engagement platform that utilizes education and gaming/competition to help organizations track and conserve measurable resources

⁶ Estimated electricity cost reduction calculated at \$.07/kWh for year 2015 only. Does not account for escalating electricity cost or variations in weather and solar generation.

⁷ Mary Jane Allen, Questar Gas Account and Community Relations, Letter to County 3/16/2015

(energy, water, etc.) to reduce the organization’s bottom line and environmental impact. Staff is exploring the cost/benefit of implementing such a system that will benefit not only the County by reducing utility costs but also inspire energy efficiency of County employees at the workplace and at home. This online platform being used by Salt Lake City and the University of Utah to engage employees and students, staff and faculty through education and action to reduce energy and other resource use.

The system is able to track energy, cost and emissions reduction and display them in a real-time dashboard. For example, the County could customize its request through the platform to encourage employees to turn off computer monitors at end of work day and employees would earn points for committing to the desired behavior. The dashboard shows reductions and proves that the education is translating to action and results.

RAISE FUEL EFFICIENCY & REDUCE TAILPIPE EMISSIONS OF COUNTY FLEET 

The overall fuel economy of the fleet improved in 2015. However total emissions from the County fleet increased in direct correlation with number of vehicle miles traveled. As shown in Table 9.0, fuel economy, emissions, and vehicle miles traveled fluctuate from year to year.

Table 9.0 County Fleet Efficiency and Emissions

	2010	2011	2012	2013	2014	2015
Vehicle Miles Traveled	2,887,881	2,472,801	2,610,691	2,005,278	2,384,009	2,363,620
Fuel economy (MPG)	12.3	11.2	12.3	10.5	12.3	11.4
Total Fleet Emissions (MT)	1066.9	1013.2	958.8	861.0	855.7	928.2

There are several potential contributing factors: weather/climate, the economy, increases in county employees and expansion of county workload, and the location of projects (primarily road projects and building inspections). During strong economic years, increased development countywide increases mileage of inspections, and depending on where the houses are being built, affects mileage as well. The distance between road projects affects both diesel and unleaded fuel usage. Weather and climactic variations tend to balance the amount of unleaded and diesel fuel usage: heavy snow years require more diesel fuel consumption for snowplowing. On the other hand, warm winter weather allows for continued public works projects throughout the winter and pickup truck usage replaces snowplowing, resulting in decreased diesel fuel consumption and increased unleaded fuel consumption. Heavy snow years and increased diesel fuel consumption have a significant impact on the overall fuel economy of the fleet and fleet emissions. Additionally, the number of employees (289 in 2014 – 308 in 2015) may correlate to increased fleet vehicle usage although that level of detail has not been analyzed for this report.

The County Fleet Review Committee continues its work to “right-size” the fleet through examination of the existing fleet composition, use of vehicles and maintenance costs. A refined vehicle acquisition policy incorporates maintenance records and requires a comprehensive evaluation of costs to operate, age of vehicle, etc. and other factors that establish a vehicle’s eligibility for replacement rather than departmental requests. The new policy provides pre-determined alternative vehicle option types and a procedural flow that ensures adherence to the Council goal and emissions reduction strategy, resulting in a right- sizing of vehicles that are purchased. Alternative fuel vehicles, electric vehicles, and hybrid vehicles will be identified and costs provided to departments to assist in budget preparation.

The number of CNG vehicles increased from three (3) in 2014 to six (6) in 2015 with three (3) on order in 2016. At this point, we are unable to quantify fuel cost savings and tailpipe emission reductions directly attributable to the fleet vehicles fueled by compressed natural gas (CNG). We do know that 1,200 gallons of gasoline were displaced by CNG in 2014 and that number increased to 4,400 gallons in 2015. The emissions associated with the combustion of 4,400 gge of CNG is 32% lower than gasoline, resulting in 12.5MT less CO2 emissions. While gasoline prices have decreased dramatically since 2015, the difference in price per gallon of gasoline and CNG has varied from as little as 20 cents per gallon to \$2.00 per gallon. Increasing the number of CNG vehicles in the fleet will continue to help decrease emissions and reduce fuel costs.

So far, estimates for the cost of installing a mid-size CNG refueling system at Public Works have proven cost-prohibitive. However, new information regarding federal tax credits issuable to municipalities, labor cost savings of approx. \$5,000/year and utilizing the natural gas supply line to the building suggests that natural gas for vehicles would cost approximately \$.50/gge. While gasoline prices are low at the pump now, trends over time reflect volatility that could be greatly reduced by on-site natural gas refueling. Staff will present updated cost analysis for consideration in the 2017 capital budget.

Staff has conducted no further investigation into alternatives to diesel powered transit buses and is leaving that to the regional transportation planning efforts underway. Transit emissions are expected to increase as transit routes expand and ridership increases. Conversely, tailpipe emissions from vehicles are expected to decrease as new CAFÉ and fuel standards apply beginning in 2017 and endeavors to provide residents that get them out of their cars pay off.

Compiling this report revealed shortcomings inherent in the multiple vendors, sources and types of data analysis required. Public Works instituted a new vehicle maintenance and fuel usage software in 2015, but integration of that information with sustainability analysis will require further work to obtain accurate information and better inform future efforts to improve fuel efficiency.

Action Going Forward:

Increase coordination with Public Works and fuel providers to obtain and maintain consistent, accurate data analysis of fuel efficiency and tailpipe emission reductions.

AMPLIFY THE USE OF RENEWABLE ENERGY COUNTYWIDE



The amount of solar installed in Summit County more than doubled between 2014 and 2015 (from 464 kW to 932 kW). A similar increase in market demand for solar is expected in 2016. The highly successful Summit Community Solar program administered in 2013 is being replicated and launched as Mountain Town Community Solar on March 28, 2016.

A contract has been executed between the County and the non-profit group Utah Clean Energy to administer Mountain Town Community Solar in partnership with Summit Community Power Works. A community led volunteer committee issued a RFP and selected solar contractor Alpenglow to install a goal of 1 MW of solar PV systems on 200 rooftops at a 20% discount below the national average of \$3.50/kW. Participants in the program will be able to purchase rooftop solar in the range of \$2.85 -

\$3.05/kW, another 10% lower than the discounted price offered during the 2013 program. A volunteer Public Education and Outreach committee will be marketing the campaign throughout Summit and Wasatch counties from April through September with all installations slated for completion by December 2016. The program is also offering a commercial option for businesses to install solar.

Community-led marketing of the 2013 community solar program increased interest and installations countywide: the amount of solar PV installed *outside* community solar program (293 kW) was nearly the same as the amount installed by participants *in* the program (315 kW). Similar results are expected this year as the public education and outreach activities promoting Mountain Town Community Solar get underway in April.

In addition to the financial benefits to residents of installing solar are the environmental and air quality benefits. The projected amount of solar energy to be installed through Mountain Town Community Solar is expected to prevent nearly 65 million pounds of carbon dioxide emissions from being emitted into the atmosphere and prevent approximately 130 million gallons of water from being used for cooling thermoelectric power plants. These numbers translate into enough avoided carbon dioxide emissions to approximate the amount of carbon sequestered by more than 23,000 acres of forest.⁸

Additional contributions made toward the long-term adoption of renewable energy include, but are not limited to, the following:

- Council support for adoption of solar access laws to prevent future Homeowner Associations from restricting access to renewable energy equipment appropriately sited on the property. The Community Development department is taking the proposal to the Snyderville Basin Planning Commission for consideration and expected adoption in 2016.
- The County Building Department continues to be a flagship for the ease with which solar PV permits are approved: as many as 7 properly prepared applications have been approved by the building department in a single day.
- Continuation of the solar PV building fee waiver through 2016 coincides with Mountain Town Community Solar and Summit Community Power Work's vie for the \$5M Georgetown University Energy Prize.

Staff continues to work closely with Rocky Mountain Power to ensure that installers are aware of net metering requirements and specific power line circuits that will present cost-prohibitive limits to homeowners installing solar. Staff continues to monitor public service commission and legislative action related to net metering to keep Council informed of impacts to the adoption of renewable energy.

Subscriber Solar was developed Rocky Mountain Power in response to the County's request to make solar PV generated electricity available to residents. Staff will promote Subscriber Solar as an option for those homes and businesses that cannot participate in the Mountain Community Solar Program.

Subscriber solar is being considered as a mechanism to reduce emissions associated with the electricity used by county facilities and operations. As presented to Council on Feb. 17, 2016, 100% subscription on certain meters would slightly reduce electricity cost and avoid 25 MT CO₂e emissions annually⁹. Staff

⁸ Metrics provided by Utah Clean Energy, extrapolated from 2013 data and projected to 1 MW solar PV installed.

⁹ Calculation uses the Emissions and Generation Resource Integrated Database (eGRID) U.S. annual non-base load CO₂ output emission rate to convert reduction of kilowatt-hours into avoided units of carbon dioxide emissions at a rate of .138 MT for (181) 200 kWh blocks. <http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

will analyze the cost of supplying 10% and 100% of *all* of the County's electricity with renewable energy when the subscription period opens in April 2016 and follow up with a report to Council.

Staff has been working with Council Member Roger Armstrong to explore options for making clean and renewable energy more readily available to Summit County residents including the feasibility of Community Choice Aggregation (CCA). Summit County has been collaborating with Salt Lake City, Park City, and Salt Lake County toward the launch of a feasibility study that will provide the information necessary to determine further steps toward the implementation of renewable and sustainable energy strategies in the near term, either jointly or separately.

Action Going Forward:

Staff will continue to promote the use of renewable energy as the single most effective way to reduce greenhouse gas emissions. Staff will expand efforts to work with businesses and municipalities to help them increase adoption of renewable energy. Staff will explore opportunities to expand incentives that promote all forms of renewable energy with increased attention to wind power.

Staff will explore a possible recommendation to waive renewable energy building permit fees and extend them to solar thermal, geothermal, wind energy, or future technologies that minimize the use of fossil fuels and reduce greenhouse gas emissions.

FOSTER RESIDENTIAL AND COMMERCIAL ENERGY EFFICIENCY COUNTYWIDE



Efforts to implement the Be Wise, Energize residential energy efficiency loan program to reduce greenhouse gas emissions countywide and assist homeowners in making energy efficiency upgrades to their homes was discontinued when a favorable interest could not be provided to homeowners. Resources were shifted from a County-sponsored program to a market-based partnership with Summit Community Power Works (SCPW) for continued promotion of residential energy efficiency and weatherization. A Services Agreement with SCPW is now in place to continue the Council's objective to increase residential energy efficiency and reduce greenhouse gas emissions.

Summit Community Power Works has become a rallying point for countywide awareness of the need to increase energy efficiency. SCPW is currently in 5th place in the Georgetown University Energy Prize competition to win \$5M for reduction of residential and municipal energy usage. SCPW has a high probability of winning the prize due to the sustainable, replicable, and innovative programming that is contributing to favorable results across the multiple socio-economic groups within Summit County.

Utilizing aggregated meter data provided by Rocky Mountain Power and Questar to Georgetown University, countywide residential electricity usage has decreased approximately 7% during the 36 month period of the competition (from January 2013 to December 2015). During the same time period, residential of natural gas usage has decreased approximately 13%. The equivalent annual emissions decrease associated with this reduction in electricity is estimated to be 3,400 MTCO₂e and 10,000 MTCO₂e for the natural gas reduction.¹⁰ Confirmation of the greenhouse gas emissions over time will occur during the countywide greenhouse gas emissions inventory scheduled to be updated every five years as part of the Climate Action Plan.

¹⁰ Emissions reduction analysis provided by Cherniak Environmental, Inc. (3/23/2016).

It is important to note that this energy data is not normalized for weather and its accuracy is under review. Nonetheless, despite an increase in the number of residential meters as population increases, residential energy usage is trending downward due to the cooperative efforts of staff, SCPW, Park City Municipal, businesses, and residents who have contributed to this countywide effort.

SCPW has documented that more than 11,500 LED bulbs have replaced incandescent bulbs in households throughout the County, equating to approx. 460 MT of annual emissions reduction.¹¹ The actual number of LED bulbs installed is estimated to be significantly higher due to the level of participation indicated by “Switch Stories” shared on SCPW’s Facebook and other public education and outreach efforts. For example, Habitat for Humanity distributed over 200 bulbs to low income and elderly residents in partnership with SCPW and their AmeriCorps volunteers.

SCPW sponsored a bulk purchase program and sold 150 EcoBee smart thermostats at a discounted price to both residential and commercial customers. The manufacturer’s literature indicates that EcoBee smart thermostats can reduce a home’s heating and air conditioning usage by as much as 23%. The CO₂e emissions avoided by the installation of 150 EcoBee smart thermostats is estimated to be 800 MT annually¹². The program ran during the month of February, 2016, and has plans to run again in the fall of 2016. More sales are expected as a result of incorporating the lessons learned from the first run and the ongoing public education and outreach being conducted by SCPW, staff, and community partners.

As suggested by municipal leaders, senior citizens were interviewed to determine if there is a need for assistance with residential energy efficiency improvements. Staff met with three separate groups and found that those living solely on social security or other limited fixed incomes experience the greatest challenge to afford and maintain comfortable temperatures in older, inefficient homes, particularly as utility costs rise. Staff discussed low-cost and no-cost improvements that could be made to homes and provided 100 LED bulbs to those who participated in their research. Exploration continues about whether County government is an appropriate mechanism to deliver such assistance. And if so, what resources would be required and how would they be distributed equitably to those in need.

SCPW developed science and math-based curriculum (related to energy usage and LED bulbs) that aligns with educational core requirements for each grade K-12. The “LED Switch” campaign was pioneered in the South Summit School District by retired Science teacher and SCPW volunteer, Kerry Lambert. Mr. Lambert and Mary Christa Smith, SCPW Program Manager, conducted numerous school presentations. The campaign inspired classroom competitions that engaged teachers, students, and school boards to switch to LED bulbs at home and throughout the school districts. Recycle Utah partnered with staff and SCPW to educate another 7,000 students regarding the cost and environmental benefit of LED lightbulbs over conventional incandescent bulbs and other simple ways that students can help at home to reduce energy consumption.

¹¹ Assumptions: LEDs are standard 60 watt equivalents operated 2 hours per day, 360 days per year. LEDs assumed to use 1/7th the energy per hour compared to incandescent bulb.

¹² Emissions reduction analysis provided by Cherniak Environmental, Inc. (3/21/2016).

Action Going Forward:

While SCPW's partnerships with HOAs, businesses, and non-profits continues to increase residential and municipal energy efficiency, staff is working with realtors, architects, and home builders in collaboration with Community Development staff and SCPW to encourage above code construction—the second most effective way to decrease greenhouse gas emissions. PCCAPS students have been enlisted to research and develop informational materials about the cost benefits of energy efficient homes. These materials will be distributed throughout the real estate and construction industries to help drive demand for energy efficiency in residential and commercial markets.

ESTABLISH A COMPREHENSIVE COUNTYWIDE CLIMATE ACTION PLAN



To realize Council's goals to "reduce greenhouse gas emissions (GHG) and impacts on climate change, as well as to plan for an economically vibrant, environmentally healthy and socially responsible future," staff enlisted the Brendle Group to assist in developing a Climate Action Plan.¹³ A comprehensive climate action planning effort was conducted that engaged a range of stakeholders from the community, related professions, and municipal governments who convened to define the strategies most reasonable for our community to carry out. The resultant Climate Action Plan incorporates the immediate emissions reduction strategies from the 2014-2016 Sustainability Plan and the 2014-2016 Energy Efficiency Cost Savings and Emissions Reduction plans that are well underway, producing verifiable results. The potential benefits and costs of funding the emissions reduction strategies were calculated, prioritized and budgeted for implementation in 2016, as evidenced by this report.

As part of that process, phase II of a countywide GHG reduction study was conducted and revealed that the county's overall emissions are trending downward, and are already reduced by 6% since 2010. To mark progress and continue the downward trend, a new countywide GHG emissions reduction target was set: 15% below 2015 levels by 2030 with 5 year benchmarking and reporting intervals. The path to reach that target is outlined in the *Playbook for Implementation* attached as Appendix A.

As stated in the Climate Action Plan, staff's role in ensuring the Plan's success includes (1) positioning Summit County to lead by example, (2) overseeing the implementation of various initiatives, (3) providing tools for community success (e.g., education, training, and financial mechanisms), and (4) forging and maintaining partnerships with other communities and organizations.

One important new partnership was formed in 2015 by joining the Utah Climate Action Network to leverage the efforts of multiple local governments, agencies, businesses and non-profit organizations that are all invested in reducing the impacts of climate change on a regional level that includes Summit County.

Another example of community engagement was staff's collaboration with PCCAPS students interested in climate change. Jessica DiCaprio, Paige Castro and Sienna Leger Redel (all juniors at Park City High School) conducted research and presented their weather data findings to Council on January 6, 2015. Their conclusion was that the Wasatch Area has warmed 2.5 degrees since 1950.

¹³ Summit County Climate Action Plan, July 2015, p. 1

Action Going Forward:

Continue actions defined in the 2014-2016 Sustainability Plan that align with the Climate Action Plan and implement the strategies identified in the Climate Action Plan.

Engage Summit County residents, businesses, visitors, and partners to take collective action towards reducing the County's impact on complex global environmental issues while maximizing the County's economic, environmental and community benefits.

INFLUENCE THE MAINTENANCE OF AIR AND WATER QUALITY

Staff participated in the development of wood burning stoves and fireplaces ordinance adopted in 2015; and provided background information in support of amendments to the anti-idling ordinance to keep it consistent throughout the County and Park City.

As directed, staff has reduced participation in activities that fall under the Department of Health's air and water quality initiatives and shifted focus on sustainability issues not addressed by other departments. Although no longer directly involved in certain water advisory committees, staff continues to mobilize community partnerships and champion emissions reduction strategies outlined in the 2014-2016 Sustainability Plan and the Climate Action Plan that contribute to air and water quality.

The Department of Public Health has increased air quality monitoring. To supplement that effort in 2016, staff will promote PurpleAir.org, a comprehensive air monitoring program for the public, by the public in 2016. Purple Air is a grassroots effort to improve air quality monitoring with the hope of understanding the nature and source of the pollution in more detail and drawing more attention and awareness to it.

Staff facilitated execution of the Utah Rivers Council's Rain Harvest program, which resulted in residents' purchasing 145 rain barrels to re-use rain water and help decrease water usage for lawns and gardens. A successful initiative evidenced by immediate sell-out of the available rain barrels, Utah Rivers Council is requesting County support for a repeat of the program in 2016.

Staff is engaged in the community, supporting Recycle Utah to promote recycling, household hazardous waste drop-off events, water conservation and energy efficiency education in schools, and Idle-Free school zones.

Action Going Forward:

Implement strategies outlined in the Climate Action Plan that help to maintain air quality. Continue to encourage maintenance of water quality and water conservation through partnerships that help ensure that water supplies remain safe, clean, and reliable.

INCORPORATE SUSTAINABILITY MEASURES IN LAND MANAGEMENT

Staff provides input related to sustainability measures in land management to the Community Development Department, such as LED lighting recommendations, wind resources development

locations, and examples of natural resource plans. However, in 2015, staff's time has been re-directed to public lands issues in Summit County as identified below:

- Public Lands Initiative – Staff supported Council to convene the Public Lands/Wilderness Advisory Group and track its activities, draft and submit Summit County's proposal for inclusion in Congressman Bishop's Public Lands Initiative (PLI). Staff has been working closely with Council and the Representative Bishop's staff to review and edit draft legislation and monitor progress of the PLI.
- In response to Council's request, staff is representing the County as a Cooperating Agency on two USFS NEPA actions:
 - Environmental Impact Statement of High Uintas Wilderness Domestic Sheep analysis that will examine the effects of domestic sheep grazing on 10 allotments in northeast Utah and Southwest Wyoming. Staff is conducting research and writing a specialist report on the historic and present economic and social impacts of sheep grazing in Summit County. The report will be submitted to the USFS in June 2016 for inclusion in the draft EIS that is scheduled to be published for public comment in February 2017.
 - The Revised Land and Resource Management Plan for the Ashley National Forest – As stated in the MOU between the County and the USFS, staff will represent the County in "this collaboration with U.S. Forest Service to foster a productive partnership that results in positive land management decisions for all parties; to assure consistency in process and outcomes among all parties; and to assure regular, consistent communication intended to build positive working relationships, maximize trust, minimize misunderstanding and potential conflicts, and produce actions that result in better conclusions for the County and its communities, thereby enhancing community support for those actions."
- Staff continues to keep Council abreast of other USFS actions and coordinates, researches and provides comments as requested. The most recent comment drafted by staff was in response to the Environmental Assessment of the Platte Petroleum Project proposed by the Burnett Oil Company to conduct test drilling in the Uinta-Cache National Forest.

Coordination with transportation planning has been limited although recent work with the Director of Transportation Planning is in progress to survey employees commuting routes for the purpose of increasing employee carpooling and reducing vehicle emissions.

Staff has not had time to research the environmental impacts or provide policy guidance related to heated driveways, large open gas flames, energy efficient night-sky lighting technologies as listed in the Sustainability Plan. However, these topics are incorporated into sustainability endeavors directly or indirectly as related to energy efficiency, open space and public lands management.

Following acceptance of an invitation from Salt Lake County Mayor Ben McAdams, staff became actively engaged and represented Summit County's interests on the Environmental Committee of Mountain Accord. During that time, staff compiled records of open space and protected lands in Summit County; contributed to the criteria developed to assess the environmental condition and impacts within the Wasatch Mountains; reviewed environmental assessment tools; helped draft and edit the RFP to secure development of an Environmental Assessment Dashboard to track and compare existing with future conditions.

Staff convenes, tracks and participates in the activities of the Basin Open Space Advisory Committee (BOSAC). With voter approval of a \$25 million Open Space, Recreation, and Trails Bond (November 2014) and pending availability of County funds to acquire open space, staff and BOSAC members reviewed and revised the Evaluation Criteria for the Acquisition of Open Space in 2015. The tool was then used to evaluate parcels and provide Council with BOSAC's recommended open space acquisitions. Staff ensures that BOSAC remains attentive to protection of wildlife habitat and wildlife corridors to balance the development of recreational opportunities on designated open space. The committee has suspended meetings pending direction from Council.

Staff maintains stewardship of existing county-owned open space property. Two soil remediation projects were completed on Miss Billies/Koleman open space parcel to prevent repeated wash outs of Basin Recreation's trails on the property. Staff recommended and facilitated an amendment to the easement and relocation of the garden to adjoin Basin Recreation property and align with their recreational activities. The move eliminated reoccurring problems with water supply, patron access, easement violations and steady complaints about garden shed interrupting open space view shed.

Engagement in the Morgan Summit Area Resource Management (MSARM) local working group endeavors to protect sage grouse populations and increase habitat. Council helped fund a 3-year study to inform the protection of the species and enhancement of habitat in Summit and Morgan counties. A progress report on the results of the study will be presented to Council in 2016.

ACTIONS PLANNED FOR 2016

As illustrated in this report, quantification of sustainability outcomes requires extensive analysis. While much information has been provided to report the County's sustainability achievements, the measurement and verification needs some improvement to be able to differentiate between variables in the data that can be addressed by policy, by technology, or by behavioral changes. The part-time Sustainability Specialist being hired in spring 2016 will be primarily responsible to refine the analytics of the sustainability actions and expenditures. More precise quantification is necessary to verify that the County is getting the outcomes predicted from the investments made.

Staff will complete the objectives in the 2014-2016 Sustainability Plan and increase implementation of the Climate Action Plan, recognizing that the Climate Action Plan incorporates actions underway as outlined in the Sustainability Plan. Staff expects to shift resources from those activities written in the 2014- 2016 Sustainability Plan that are being carried out by other departments to focus on implementation of the Climate Action Plan.

In keeping with the goal to reduce greenhouse gas emissions, staff will conduct a comprehensive solar study to evaluate the capacity of all of the County-owned properties for solar PV installations (rooftop and ground-mount). The study will determine the long-term economic impact and emissions reduction to be realized by maximizing the use of renewable energy. Staff anticipates issuing a Request for Proposals to obtain a firm to conduct the study in the spring of 2016. Pending the outcome of the study, funds may be included in the 2017 capital budget for consideration and approval by Council.

Finally, staff anticipates winning the Georgetown University Energy Prize of \$5M. The prize money will be used to establish an endowment that supports long-term programming to continue reducing energy usage and decreasing GHG emissions from the built environment.

CONCLUSION

This report illustrates how Summit County is positioning itself as a leader in sustainability and climate action. Summit County's sustainability achievements are notable, covering a wide range of activities that support multiple Council objectives and result in long-lasting positive social, economic and environmental impacts. With continued support of Council, County staff, partners in the community and residents, staff fully expects the following results to be achieved by the end of 2016:

- The new goal to reduce CO₂e emissions from County operations will be achieved.
- Verifiable cost-effective energy efficiency improvements, lighting upgrades and solar installations.
- Quantifiable increase in overall fuel efficiency, fuel cost decrease and reduction of tailpipe emissions from County fleet vehicles.
- Continued increase in the amount of renewable energy installed countywide.
- Substantiated decrease in residential and commercial energy usage countywide.
- Engaged Summit County residents, municipalities, and business partners participating in greenhouse gas reduction through implementation of the Climate Action Plan.

Playbook for Implementation

Immediate Initiatives

- LED Lighting Program
- Community Choice Aggregation Exploration (CCA)
- County Code Updates
- County Solar Photovoltaic System Project (Justice Center)
- County Website Energy Updates
- Regional Climate Network Participation
- Residential Outreach Campaign

Near-term Initiatives

- Bulk Purchasing Solar Program
- County Compressed Natural Gas Refueling Station
- County Resource Management Plan Development
- County Sustainability Plan 2017 Update
- Energy Reporting Tool Outreach Campaign
- Lodging Property Energy Outreach Campaign
- Programmable Thermostat Bulk Purchasing & Incentives (Smart Controls) Program
- Residential and Institutional Weatherization and Retrofit Program
- Second Homeowner Energy Outreach Campaign
- Smart Metering Technology Pilot Discussions
- Technical Assistance Program or Certification Program for Above Code Construction

Long-term Initiatives

- Agriculture and Large Land Owner Energy Outreach Campaign
- Business Energy Outreach Campaign
- Commercial Recycling Program Expansion
- Commercial/Industrial/Institutional Energy Advisor Coaching and Programming
- County Compost Facility Development
- Electric Vehicle Infrastructure Development
- Nitrogen Fertilizer Optimization Program Exploration
- Outdoor Heating and Snowmelt System Resource Guide
- Outdoor Heating Notification System

Ongoing

- Bicycle and Pedestrian Improvement Plan Coordination
- County Facility Lighting and Efficiency Upgrades
- County Fleet Vehicle Investments
- Regional Transit Expansion Coordination