

BUTTE COUNTY SUSTAINABILITY WORK TEAM

SUSTAINABILITY, ENERGY EFFICIENCY AND COST EFFECTIVENESS IN COUNTY OPERATIONS

Sustainability (noun): social, economic and environmental practices that meet the needs of the present without compromising the ability of future generations to meet their needs.

Energy Efficient: Percentage of total energy input to a machine or equipment that is consumed in useful work and not wasted as useless heat; using the same amount of energy to do the same task, but increasing the output through a new or better method or technique; using less energy for the same amount of output.

Cost Effective (adjective): producing good results without costing a lot of money; economical: using money, resources, etc. carefully; used to describe a product that is not expensive to own and use.

BACKGROUND

Butte County has a role in addressing sustainability as an organization that is a user of resources and one of the largest businesses in the County. In August 2011, a number of department head work teams were formed to consider countywide issues and solutions. One of the work teams created was the Sustainability Work Team and this report is the culmination of the Work Team's efforts to capture where the County currently stands with sustainable, energy efficient and cost effective practices, and to recommend future actions that will help the County improve its operations in those same areas. The report begins with ***a statement of scope***, and then for specified categories it ***defines the issue***, provides ***baseline data*** where available, references ***legal requirements*** where applicable, discusses ***overall concepts for improvement***, identifies ***impediments to success***, provides information on ***accomplishments to date***, and lists ***action items*** that the County might consider for the future.

SCOPE

The report evaluates the County's internal information and practices in the following five areas from a sustainable, energy efficient and cost effectiveness perspective and makes recommendations for standards, policies, practices and education as appropriate and necessary.

- Energy Usage (Electricity and Natural Gas)
- Water Usage
- Vehicle Usage
- Climate Change
- Solid Waste and Recycling

Energy Usage (Electricity and Natural Gas)



Define the Issue

Real property assets are a key component of the infrastructure necessary to carry out the services, activities and programs that the County of Butte provides to its citizens and visitors. The County of Butte is entrusted with managing the entirety of this asset inventory in a way that maximizes the public benefits without unnecessary expense.

The County of Butte owns or leases over 1 million square feet of real property assets spread across more than 130 buildings and spanning over 300 acres. While opinions vary in regards to the importance of sustainable energy use in County facilities, all seem to agree that energy conservation and the use of alternative energy sources is important if it means reduced facilities costs for the County. The average overall County cost for electric and gas over the past five years is approximately \$1.9 million per year or almost \$10 million for the five-year period.

One method used to reduce energy costs is energy conservation. However, few County-owned buildings have separate utility meters and most of the County facilities are aging and may not be energy efficient to begin with. Without feedback regarding cost savings, staff at all levels will not aggressively take personal action to reduce energy usage. Another method used in reducing energy costs is through developing alternative energy sources. Butte County's climate lends itself to alternative and renewable energy sources, such as solar and hydro.

Baseline Data

In an effort to determine if progress is being made, baseline data establishes a starting point for the measurement of success. The amount paid for gas and electricity fluctuates for a variety of reasons and is equal to *Quantity Used * Rate*.

- For Electricity, usage is measured in Kilowatt Hours (Kwh) per square foot.
- For Natural Gas, usage is measure in British Thermal Units (BTU's) per square foot.

As noted above, few County-owned facilities offer individual metering of utilities. Those that can be tracked are broken down into two categories: facilities located on the Oroville Government Center Campus and other key County owned facilities with individual meters.

Table 1 indicates the energy usage - Kwh per square foot per year for electricity and Therms per square foot per year for gas - in the past three years for each of the two categories:

**Table 1
Energy Usage in County-Owned Facilities
2009-2011**

	Electricity				Gas			
	2009 Kwh/SF	2010 Kwh/SF	2011 Kwh/SF	Increase/ (Decrease)	2009 Therm/SF	2010 Therm/SF	2011 Therm/SF	Increase/ (Decrease)
Oroville Government Center Facilities	7.63	7.87	8.08	5.94%	0.35	0.36	0.39	12.38%
Other Key County Owned Facilities	9.60	9.66	9.78	1.88%	0.31	0.34	0.34	8.11%

Legal Requirements

Title 24 of the California Energy Code

Assembly Bill (AB) 32 – California Global Warming Solutions Act

AB 32, passed in September of 2006, focuses on the reduction of green house gas emissions.

Assembly Bill 1103 – Benchmarking Data Disclosure

AB 1103, passed in October of 2007, requires the disclosure of energy benchmarking data in leasing, financing or selling government facilities.

Impediments to Success

- Lack of funding - while some activities can be implemented without significant costs, others may require some *seed money* or other long term financing to be considered viable in reducing long term costs.
- Lack of expertise in certain technical, legal and financial aspects of sustainable energy use.
- Many buildings that are an integral part of the success of the County are aging and lack any method of tracking energy use.
- Difficulty in demonstrating to employees the affect personal behavior has on the use and cost of energy.

Overall Concepts of Improvements

Improvements related to sustainable energy typically fall into two categories:

- **Energy Conservation**

Improvements centered on the conservation of energy use, regardless of the source of energy, are intended to establish habits that result in lower energy use and lower energy costs. Success

in this area requires *buy-in* from everyone and regular updates on progress. In addition, when replacement of building components that use energy is necessary, a cost/benefit analysis of using highly efficient components should be completed.

- **Alternative Energy Sources**

Improvements centered on the use of alternative energy sources with a lower per unit cost can lower energy costs even if usage remains constant. Success in this area requires careful cost/benefit analysis and often requires a variety of funding mechanisms to implement.

Accomplishments to Date

- Installed a solar energy system in 2004, which at the time was the 5th largest solar energy system in the United States. The County's system was built to produce 997 kilowatts alternating current (AC) or 1.18 megawatts direct current (DC). The system contains a total of 6,360 solar panels. The project was funded through a PG&E rebate, a California Energy Commission loan, and a Butte County Investment Pool loan, with the payment on the loans equal to the amount of money saved in utilities.
- Developed a Landfill Gas-to-Energy project at the Neal Road Recycling and Waste Facility to produce renewable energy from landfill gas.
- On-going adjustments of Environmental Management Systems (EMS) in an effort to improve efficiency in various buildings.
- Engaged LPA, Inc. to complete an energy audit of County facilities.

Action Items

The General Plan 2030 Action Plan includes a number of action items for improving the County's energy savings in its operations and can be found at

http://www.buttegeneralplan.net/products/2010-10-26_GP_Adopted/default.asp

Specific actions recommended by the Work Team include:

- **Establish an Energy Conservation Program**

- **Peak Day PG&E Pricing**

- In December of 2012, the County will be given the opportunity to opt in to the new PG&E program titled Peak Day Pricing, the next step in a series of steps that PG&E is expected to implement in coming years. The purpose of the program is to provide organizations that conserve energy with a lower billing rate. While the program is designed to reduce energy costs, signing up for the program and then failing to meet objectives may result in higher energy prices than if the County does not opt in.

Operating under the Peak Day Pricing program, the County will be alerted to *trigger days* in which electrical demand exceeds supply. If the County is able to conserve energy use on those days, overall pricing will be significantly reduced. However, if the County is unable to conserve energy, a premium will be paid. Operating in the current model, and choosing not to come under Peak Day Pricing, the County on average will pay higher energy costs than if operating under Peak Day Pricing.

Success under the Peak Day Pricing program requires the attention of all employees of the County. The County must have the willingness to conserve energy, plans established to provide reasonable comfort with less energy use on trigger days and the technical ability to manage usage through energy management systems (EMS).

Existing Solar Equipment Maintenance

The solar array system that was installed did not include monitoring and management components found in more contemporary installation. Further, the system lacked provision for maintenance and failure of inverters are starting to affect the ability of the system to work properly. General Services is working towards implementing a routine maintenance program for the system and will be seeking expertise and working with the Finance Office to weigh costs of adding monitoring and management components to the system against the anticipated benefits.

Departmental Education

Presenting departments, when data is available, with energy usage can be helpful in reducing overall energy costs. Goals established relative to Peak Day Pricing must be communicated and some organizations have been successful in running contests to see which departments can conserve the most energy.

- **Establish New Construction and Major Remodel Energy Sustainability Construction Guidelines**

Design Guidelines

The County has retained LPA, Inc. to assist in the development of design guidelines for the Oroville Government Campus. The County may choose to adopt sustainable energy guidelines recommended by the County team working with LPA.

Amend the General Plan to clarify goals

The General Plan defines the use of LEED – Silver quality or equivalent in construction projects. Further revisions of the General Plan will allow more consistency between the costs and benefits associated with design and construction centered on energy and environmental conservation principles.

- **Establish a Technical Finance Team**

Many energy providers, including PG&E, offer on-bill financing. The theory behind the concept is that new energy sources such as solar are installed that will reduce the monthly

expenditure and the difference between the original cost and the lowered cost is used to finance the installation. Once paid off, the savings stay with the County.

Any sustainable energy project should include a cost/benefit analysis. While implementing sustainable energy use may offer some intangible benefits, the focus must be on reducing cost. In addition, the County should evaluate the Public Private Partnership (3P Model) from a financial point of view. Successful programs will require expertise from a variety of County departments and possibly consultants to develop models that are both technically and financially feasible.

- **Utilize Sierra Nevada Energy Watch**

The County lacks technical expertise in many aspects of energy conservation and alternative energy sources. Many of the proximate counties engage the services of The Sierra Nevada Energy Watch, a collaborative effort between PG&E and the Sierra Business Council that focus on providing innovative energy efficient solutions to local government. This organization has helped other counties identify energy conservation and alternative source projects, develop financial models to aid in feasibility studies and in the development of solicitations for services that can benefit the County. This organization offers both free and fee services.

Once the Technical Finance team is established, The Sierra Nevada Energy Watch can be engaged to evaluate how the County might utilize their resources.

- **Implement a Pilot Building**

Before seemingly superior conservation efforts are implemented across the County, many should be tested to see if results are as reported. In addition, as construction methods and materials change, often with reported energy related conservation claims, it may benefit the County to test energy conservation components in one building before incurring cost to implement them elsewhere.

A common approach to any type of improvement includes developing plans, implementing the plan and then checking results. The County may wish to select a specific building, such as 25 County Center Drive, that can be used to test results used in re-construction projects.

- **Identify Feasible Alternative Energies**

Utilize experience within the organization, as well as outside experts, to identify and evaluate alternative energy opportunities in new and existing facility retrofit projects.

Water Usage



Define the Issue

Water conservation is the most cost-effective and environmentally sound way to reduce the demand for water, extending fresh water supplies further into the future and reducing cost. A second benefit of water conservation is that it in turn saves energy that is necessary for pumping, treating, and moving water. Any water management plan will need clear information on how the County uses water in its facilities and grounds from the time it is pumped (delivered) into the facility through disposal of the water.

As one of the largest employers in Butte County, with over 2,000 employees occupying over one-million square feet of building space, the County can make a difference. The majority of County water demands are consistent with standard business office operations. Some County facilities include large landscapes or twenty-four hour housing facilities. The housing facilities often include clothes washing and food preparation facilities. Opportunities exist to improve the efficiency of meeting the water demands for County operations. In doing so, the County can reduce costs, sustain water resources and provide a way to demonstrate viable water conservation practices.

Baseline Data

Establishing baseline data on the County's water demand is complex. County facilities, many serviced from shared meters, are serviced by seven water districts. Other facilities are serviced by unmetered wells and some facilities are leased to the County with water charges imbedded in Common Area Maintenance fees with little detail. Water usage tracked by month can also be misleading due to significant increases in water consumption in summer months compared to winter months. The most common measurement of water is by cubic foot. From August 1, 2011, through January 31, 2012, water usage from the seven service providers averaged 97,228 cubic feet, or approximately 727,264 gallons per month, with an average monthly cost of approximately \$14,500.

Legal Requirements

Title 40 of the Federal Regulations

The California Water Code Sections 1 through 26

Title 23 (Water) of the California Code of Regulations

Title 27 (Environmental) of the California Code of Regulations

Impediments to Success

- Limited resources to conduct specific facility assessments and the ability to implement best practices and devices.
- Changing habits, practices and culture. Getting individuals and in some cases operational units to modify practices may be difficult and will take time.
- Advancing “passive engineering” solutions (i.e., devices) has not proven to be as cost-effective as expected, based upon the County’s past experiences.

Overall Concepts of Improvements

Water conservation can be achieved in County facilities through an assessment of facility specific water demands, an inventory of current practices and implementation of best management practices. The result would be a reduction in water usage and cost. The concept is consistent with the Butte County General Plan 2030 Action Item W-A4.2 which states, “Identify appropriate water use efficiency best management practices.”

Some best management practices the County may want to consider if benefits outweigh the costs include:

- Information and education programs for employees
- Distribution system audits, leak detection and repair
- Consider increasing the conversation of water efficient landscaping and building fixtures, as a project, instead of only when repairs are necessary
- Evaluate High-Water-Using processes, such as commercial kitchen equipment and laundry equipment to identify potential opportunities to improve

Accomplishments to Date

- **The 2010 Library Water Conservation Pilot Project.** In the spring of 2010, under the sponsorship of the California Water Service Company, an independent water audit was conducted at the Butte County Library branches in Chico and Oroville. The water audit looked at water use inside as well as the landscape outside. The audit identified steps that could be taken to reduce water demand in a cost effective manner. Upgrading water fixtures and landscape irrigation were identified as opportunities to reduce water use at the Chico and Oroville facilities. Actions included, converting toilets that were 1.6 gallon per flush to 0.5 gallon per flush, installing 1 gallon per hour aerators in restroom sinks, installing 1.5 gallon per hour aerators in break room sinks, installing weather based irrigation controllers and performing an irrigation audit to improve the efficiency of irrigation practices. The effort lead to the

identification and fixing of water leaks. The water savings cannot be determined until the County has compiled data for a couple of years since major leaks were fixed.

- **Repairs/Replacements.** Repairs to fixtures and faucets, as well as landscaping components, are completed using contemporary water saving devices whenever possible. In addition to using flow control devices on all toilet replacements in the past several years, landscaping in several facilities has been changed to low flow drip systems and drought tolerant plants.

Action Items

Action items related to water efficiency and conservation can also be found in the County's General Plan 2030 Action Plan located at http://www.buttegeneralplan.net/products/2010-10-26_GP_Adopted/default.asp.

The Work Team recommends that the County, at a minimum, take the following steps:

- Implement cost effective, water-use efficient practices and devices.
- Consider selecting key County facilities to participate in a water conservation evaluation including audit, improvement plans and estimated versus actual water savings measurements.

Vehicle Usage



Define the Issue

Transportation is a key function necessary to provide County services to the residents of Butte County. Transportation is also a key element in the County's efforts to be more sustainable. Transportation costs continue to rise as the oil market adjusts to growth in places like China as well as the instability of the mid-east oil producers. Lowering the County's use of fuel will help both the local environment as well as the County's budget.

As of July 1, 2011, the County of Butte had 2,117 employees who used 680 County-owned vehicles to provide services to the residents of Butte County. In addition, some employees use their personal vehicles for County business and may claim mileage reimbursement for that use, while others utilize the County's contract for rental cars.

Baseline Data

Table 2
County-owned Vehicles
Gallons of fuel per year (fiscal year)
FY 2008-09 – 2010-11

	2008-09	2009-10	2010-11
Total Gallons	471,733.82	410,247.00	395,592.00
Total \$	\$1,525,076.82	\$1,028,001.23	\$1,074,745.94
Price per Gallon (avg)	\$3.23	\$2.51	\$2.72

Table 3
Number of Vehicles as of July 1st
and Average Gallons per Vehicle
FY 2008-09 – 2010-11

	2008-09	2009-10	2010-11
Number of Vehicles	690	656	680
Avg Gallons/Vehicle	683.67	625.38	581.73

Table 4
Number of Employees as of July 1st
FY 2006-07 – 2010-11
(as reflected in each FY Adopted Budget)

	2006-07	2007-08	2008-09	2009-10	2010-11
# of Employees	2,281	2,219	2,064	2,094	2,117

Table 5
Utilization of Rental Cars
2009-2011

	2009	2010	2011
Vehicle Days	159	169	91
Vehicle Miles	18,310	17,629	9,468

Impediments to Success

- Lack of accurate and complete data on vehicle usage. At the present time the County does not have the ability to determine each vehicle’s actual fuel usage per mile, due to inconsistent or inaccurate reporting of vehicle mileage when fueling as well as the use of commercial credit cards to fuel various vehicles. In addition, travel on County business takes place not only in County-owned vehicles, but also in private vehicles and rental vehicles, making data collection that much more complex.
- Reducing vehicle travel by allowing employees to telecommute or work from alternative locations, which can at times be in direct conflict with the necessity to maintain accountability to management and the public.

Overall Concepts of Improvements

Reduce gallons of gas per vehicle, vehicles per employee and/or mileage per employee.

Accomplishments to Date

- Fleet Services is presently providing each department an annual report on their vehicles, mileage, and maintenance costs, to allow the departments to better manage their vehicles.
- Some departments have purchased hybrid vehicles to reduce gas usage.

Action Items

The General Plan 2030 Action Plan provides action items regarding increasing efficiencies in the use of County vehicles. To view the Action Plan, go to http://www.buttegeneralplan.net/products/2010-10-26_GP_Adopted/default.asp

Specific actions recommended by the Work Team include:

- Consider installing GPS tracking systems on County vehicles to provide the County detailed information on vehicle usage and mileage to better manage our fleet of vehicles.
- Survey employees to determine if people are reducing vehicle travel.
- Consider centralized fleet services instead of all departments having their own vehicles.
- Promote participating in webcast and teleconferencing to reduce travel demands.

Climate Change



Define the Issue

Climate change refers to any distinct change in measures of climate lasting for a long period of time. In other words, climate change means major changes in temperature, rainfall, snow, or wind patterns lasting for decades or longer. Climate change may result from:

- Natural factors, such as changes in the Sun's energy or slow changes in the Earth's orbit around the Sun.
- Natural processes within the climate system (e.g., changes in ocean circulation).
- Human activities that change the atmosphere's make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.).

The California Energy Commission released *The Future is Now: An Update on Climate Change Science Impacts and Response Options for California* in May 2009. The report documents the impacts that climate change could have in California, and is intended to achieve the following goals:

- Synthesize existing knowledge with new scientific findings.
- Dispel any lingering doubts about the human influence on the observed changes in the climate and the natural environment.
- Underscore the increasingly urgent need for a dual approach to managing California's climate change risks, in which GHG emissions are reduced to minimize and slow down global warming, and adaptation plans are prepared to deal with the impacts that are already underway and unavoidable.

Butte County has completed an initial evaluation of potential climate change impacts on the County as part of the General Plan 2030 Environmental Impact Report. This analysis concluded that climate change will have a myriad of negative impacts on the County, including:

- Increased air pollution formation.
- Increased frequency and intensity of heat-waves.
- Increased wildfires.
- Decreased snowpack.
- Increased flood risk from intense rainfall events.

In addition, the Report found that the County can expect significant agricultural impacts, such as:

- Crop yield changes.

- Changes in crop types and cultivars.
- New or expanded weed invasions.
- New or expanded pest invasions.
- Increased animal vulnerability to disease.
- Decreased animal production.

Both rice and almonds, two of the most important crops produced in Butte County, are expected to be adversely impacted by climate change. Similarly, timber producing areas in the county will be increasingly at risk of wildfire and pest damage.

Baseline Data

Butte County is currently implementing the ideas and policies established in General Plan 2030 to address the one aspect of climate change that is under human control – greenhouse gas emissions (GHG). To this end, General Plan 2030 identified a community-driven and collaboratively-created Climate Action Plan (CAP) as a key Action Item to take within one year of General Plan adoption, which occurred in October 2010. The CAP is critical to taking the County’s commitment to sustainability to the next level by establishing a quantifiable GHG emissions reduction target and monitoring the County’s progress towards agreed-upon outcomes.

Efforts to reduce GHG emissions can benefit Butte County’s economy. By using energy more efficiently, harnessing renewable energy to power our buildings, enhancing access to sustainable transportation modes, and recycling our waste, we can keep dollars in our local economy, create new green jobs and improve community quality of life. Additionally these measures position the County to be more fiscally sound as traditional forms of energy become less available and more expensive to purchase.

The same principles and approaches that will be developed through the CAP can apply to County operations. Actions to reduce the contribution of GHG emissions from Butte County operations must be taken as a matter of leadership and legal compliance.

Legal Requirements

Assembly Bill 32 – Global Warming Solutions Act

In 2006, the Governor of California signed Assembly Bill (AB) 32, codified under the Global Warming Solutions Act. The Act requires that California cap its GHG emissions at 1990 levels by 2020. This legislation requires the California Air Resource Board (CARB) to establish a program for statewide GHG emissions reporting, as well as monitoring and enforcement of that program.

Assembly Bill 811 – Contractual Assessments: Energy Efficiency Improvements

California passed AB 811 in September 2008. AB 811 works to assist cities and counties with retrofitting residential and commercial properties by providing low interest loans for energy efficient retrofit projects.

Senate Bill 375 – Sustainable Communities and Climate Protection Act of 2008

Senate Bill (SB) 375, in support of the goals of AB 32, calls for the automobile and light truck industry to produce reduced emission vehicles and requires metropolitan planning organizations (MPOs) to prepare sustainable communities strategies, which will demonstrate how a region will meet CARB's GHG reduction targets by reducing the amount of vehicle miles traveled. The Butte County Association of Governments will be responsible for preparing the sustainable communities strategy for Butte County.

Impediments to Success

- The County does not have information regarding its current GHG emissions from operations, which will make it difficult to determine if future actions are effective.
- There may be costs associated with reducing GHG emissions from County operations, which will have to compete for limited resources.
- There is an overall lack of internal agreement on, and understanding of, the issue.
- People are creatures of habit; it will take time and education to change those habits.

Overall Concepts of Improvements

- Reduction of *greenhouse gas emissions* from County operations.

Accomplishments to Date

- Installation of a landfill gas collection and control system at the Neal Road Recycling and Waste Facility in 2004 – 2006 to control fugitive GHG emissions.
- Development of a Landfill Gas-to-Energy project at the Neal Road Waste and Recycling Facility to produce renewable energy from landfill gas that is typically “flared”.
- Comprehensive update to the General Plan completed in 2010 including substantial goals policies and action programs addressing climate change and greenhouse gases, with the adoption of an updated Zoning Ordinance planned for fall of 2012.
- Sub-grantee and partner with the Butte County Association of Governments for the *Coordinated Development of the 2012 Regional Transportation Plan (RTP), Sustainable Communities Strategy (SCS), and Regional Housing Needs Allocation (RHNA) for the Butte County Area* grant program.

- Pursuing the creation of a contractual assessment program similar to AB 811/PACE for commercial property owners to install renewable energy systems.

Action Items

The County's General Plan 2030 Action Plan includes detailed action items related to reducing the County's carbon footprint. The first step the County will need to take is to calculate emissions from County operations, which will be part of the County's required CAP. Based upon the findings in the CAP, the County will identify economically viable options for reducing the County's emissions.

Examples of specific Action Items include:

- Update the County program to replace County fleet vehicles with the lowest emission technology vehicles, wherever possible.
- Consider a motor vehicle emissions budget for County vehicles, including a plan to reduce motor vehicle emissions.
- Upgrade methane capture systems at the Recycling and Waste Facility.

For further details on the Action Plan, follow the link:

http://www.buttegeneralplan.net/products/2010-10-26_GP_Adopted/default.asp

Solid Waste and Recycling



Define the Issue

“One man’s trash is another man’s treasure”. Increasingly, items that are discarded every day are of value if properly handled. However, if improperly handled, the cost to separate items exceeds any potential value that can be derived by recycling later in the process. In some situations, it is possible to derive revenue from discarding items that are sought by others, thereby reducing the overall cost of waste removal.

It is not enough to simply process waste in a way to reduce cost; when it is financially feasible and appropriate, it is also important to use recycled products and products that can easily be recycled. Additionally, it is important to reduce overall material consumption where possible and reuse materials when practicable to lessen the overall impact on the environment.

While on the surface reducing waste and improving recycling appears very simple, it can be a complex issue in that it requires people to change their habits. It is difficult for many to see what affect using proper products and discarding waste properly has on cost. A primary example is the use of personal desktop printers. These devices generate, per page, far more waste in terms of ink cartridges and electricity than the common area central convenience printers/copiers.

Baseline Data

Waste includes trash and recycling, each placed into different receptacles. When picked up, the containers are not weighed nor are they visually inspected to determine how many cubic yards are actually being hauled. In addition, since vendors service other clients, waste removed from the County departments (County) is mingled with waste picked up from other sources. Therefore, an entirely accurate measurement of waste generated by the County is not possible.

Assuming that the containers ordered by the various County departments are sized properly, waste management data suggests that, on average, each canister is 75% full when hauled and that each cubic yard of waste weighs approximately 85 pounds. By applying these assumptions to the known sizes and quantities of containers used by the County, it is possible to estimate the amount of waste hauled. The key is to continually decrease the percentage of trash, and increase the percentage of recycling, as a percent of the entire amount of waste removed.

In addition to a vendor hauling waste for the County, the County also utilizes shredding firms that recycle all of the shredding generated by the County. Cardboard is also recycled. Although some facilities leased to the County haul County waste and such waste is not measured, overall, the County waste, by percentage of trash versus recycling measured monthly, is as follows:

**Table 6
County Waste and Recycling
March 2011 – March 2012**

	<u>Pounds</u>	<u>Percent</u>
Non-Recycled Waste	37,655	42.65%
Recycled Waste	50,640	57.35%
Bins	21,675	
Shredding	23,355	
Cardboard	5,610	
Total	88,295	100.00%

In addition to monitoring the ratio of trash compared with recycling, that together make up waste, it is important to measure how the County uses recycled products. At present, approximately 83% of the paper used by the County for printing is not recycled product and the 17% that is recycled costs the County approximately 15% more than the non-recycled product. When considering procurement of paper products, several terms become part of the equation in determining the best overall price of products and services the County requires. Vendors that provide *just-in-time* delivery schedules in conjunction with quantity discounts and scheduled shipments typically have the highest prices for recycled products, based upon the County’s review of proposals to provide services over time. Increasing the use of recycled goods can, in some cases, significantly increase the overall cost of goods delivered.

Legal Requirements

California Public Resources Code - Division 30 (Waste Management)

Title 14, Natural Resources - Division 7, California Integrated Waste Management Board

California Health and Safety Code

California Public Utilities Code

Impediments to Success

- The cost necessary to accurately measure tonnage of waste removed is excessive. While this can make measuring success difficult, by keeping constant the assumptions that are used as noted above in the baseline section, success can be measured.
- Perhaps the most difficult roadblock in improving the ratio of recycling compared to trash is the difficulty in changing human behavior.

Overall Concepts of Improvements

- Educate County staff on best practices.
- Develop a system of measurement for each department and develop friendly competition with rewards

Accomplishments to Date

In terms of reducing the amount of waste generated:

- Many County forms are offered on the intranet and can be sent via email.
- Contracts are scanned into a consolidated repository for use by multiple departments.
- Increased use of electronic media for items such as Public Project Construction Solicitations.
- In recent years that has been a shift away from desk top printers to the use of central printers that are less wasteful; there is more to do in this area.
- Electronic distribution of various County newsletters, fact sheets and other materials.
- The Butte County Board of Supervisors and various commissions have reduced the amount of paper by electronically distributing agendas and related materials. The Planning Commission is completely paperless and the Water Commission is approximately 50% paperless compared to the past.

In terms of using recycled products:

- Although not adopted yet, the new Contracts/Procurement Policies and Procedures includes language regarding evaluating the use of recycled products when purchasing to determine if a cost effective recycled product may be appropriate.

In terms of handling waste:

- Sort bins have been placed in County owned facilities, and some facilities leased to the County, to enable staff to easily sort trash separately from items that can be recycled.

Action Items

The General Plan 2030 Action Plan includes action items related to waste and recycling. You can find the Action Plan at http://www.buttegeneralplan.net/products/2010-10-26_GP_Adopted/default.asp.

The Work Team recommends that the County consider the following ideas.

In terms of reducing the use of wasteful products:

- Consider a focused and aggressive effort to eliminate all but the most essential desk top printers.
- Focus on continued improvements in Electronic Data Control including contract routing that is currently done with hardcopy paper or setting printer defaults to print double-sided.
- Consider resurrecting the program originally implemented in 2005/2006 where recognition awards were given to individuals exhibiting good waste management practices. Positive reinforcement is one of the best ways to reach and train employees.

In terms of increasing the ratio of recycling compared to trash in the overall mix of waste:

- Evaluate methods to analyze the waste stream of the jail, specifically, to determine if alternative uses for waste can be utilized and/or other methods of sorting waste can be economically feasible that will reduce the overall cost of waste removal.
- Formalize the installation of recycling containers in facilities leased to the County.
- Evaluate shifting Janitorial duties to include removing recycling, but not trash. This is the reverse of current practice. However, this must be carefully evaluated to insure that sorting waste does not simply shift to janitorial staff thereby increasing janitorial costs, or that trash will remain leaving unsanitary conditions.
- Consider composting restroom waste of which 98% consists of paper towels. Restroom waste makes up the bulk of County office waste.

CONCLUSION

This report regarding sustainability, energy efficiency and cost effectiveness in County operations is a snapshot in time. In order for the County to improve its efforts in these areas, departments will need to regularly review their operations to determine if their actions are working. A key focus will be education of County staff so that daily decisions can incorporate sustainable practices. Exhibit A, attached, provides some best practices for employees and departments to consider.

Over time, policies and programs will be brought to the Board of Supervisors to address improving the County's practices in areas such as energy efficiency, water conservation, vehicle usage and recycling.


WORK TEAM MEMBERS

Mike Crump, Public Works Director
Paul Gosselin, Water and Resource Conservation Director
Grant Hunsicker, General Services Director
Shari McCracken, Deputy Administrative Officer
Tim Snellings, Development Services Director


EXHIBIT A

BEST PRACTICES FOR SUSTAINABILITY, ENERGY EFFICIENCY AND COST EFFECTIVENESS IN COUNTY OPERATIONS AND EMPLOYEE PRACTICES


Climate Change

GOAL	BEST PRACTICES
<p>Reduce greenhouse gas emissions from County operations.</p> 	<ul style="list-style-type: none"> Utilize public transportation, carpooling, biking, telecommuting and other innovative ways to reduce greenhouse gas emissions. Consider fuel efficiency when purchasing new vehicles. Consider alternatives, such as hybrid and electric, when purchasing new vehicles. Increase use of alternative and lower carbon fuels in the County fleet. Walk, instead of driving, when feasible. Further reduce methane emissions at the Recycling and Waste Facility.


Energy Usage (Electricity and Natural Gas)

GOAL	BEST PRACTICES
<p>Increase energy conservation efforts.</p> 	<ul style="list-style-type: none"> Always activate the <i>power management features</i> on your computer and monitor. Unplug laptop power cords when not in use. Turn off all equipment at the end of the day. Turn off all lights at the end of the day. Use <i>ENERGY STAR</i> qualified office equipment when feasible. Consider Peak Day Pricing program through PG&E and allow flexibility in employee dress when extremely cold or hot weather is predicted. Adhere to County sustainability guidelines and Green Building Codes. Utilize Sierra Nevada Energy Watch to identify energy efficiency solutions.
<p>Consider alternative energy sources.</p>	<ul style="list-style-type: none"> Utilize Sierra Nevada Energy Watch to identify potential uses of alternative energy sources. Identify feasible alternative energies. Improve energy production from existing alternative energy sources.


Water Usage

GOAL	BEST PRACTICES
<p>Increase water conservation efforts.</p> 	<ul style="list-style-type: none"> Improve leak detection efforts. Utilize water efficient landscaping and building fixtures. Evaluate functions with high water usage, such as commercial kitchens, laboratories, and laundry facilities. All newly installed toilets and urinals should meet current water-efficient design standards. Eliminate single-pass cooling and use cooling towers where feasible. Utilize the most efficient and feasible system for activities such as vehicle washing.
<p>Consider alternate water sources.</p>	<ul style="list-style-type: none"> Identify water uses that can be met with recycled or non-potable water sources.

Vehicle Usage

GOAL	BEST PRACTICES
<p>Reduce gallons of gas per vehicle and/or vehicles per employee.</p> 	<ul style="list-style-type: none"> • Identify underutilized vehicles and vehicles with high maintenance costs and get rid of them. • Consider automated fuel management systems and GPS management systems to track, monitor and manage fuel inventory, fuel dispensing and accounting and billing. • Utilize fixed-price fuel contracts for fleets. • Consider County fleet services in place of individual department vehicles. • Participate in webcasts, teleconferencing and other opportunities that reduce the need to travel.

Solid Waste and Recycling

GOAL	BEST PRACTICES
<p>Reduce, reuse and recycle.</p> 	<ul style="list-style-type: none"> • Recycle paper, bottles and plastic. • Make sure recycling containers are available and easily accessible. • Only print it if you need to – print double-sided when possible. • Produce compost, mulch energy and fuels from organic waste stream and utilize in landscaping and water conservation efforts. • Consider purchasing items that contain post consumer recycled content. • Post forms on-line and on the intranet, instead of printing, where feasible. • Store records electronically instead of in paper form, where allowed by law. • Consider awards for the best <i>waste managers</i> in your department. • Consider subscribing to newspapers and publications on-line instead of receiving paper copies.