BENCHMARKING SAN LUIS OBISPO COUNTY'S MUNICIPAL ENERGY USE:
AN AUDIT IMPLEMENTATION PLAN

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ABSTRACT

Benchmarking San Luis Obispo County's Municipal Energy Use: An Audit Implementation Plan

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As energy cost and climate change become increasingly prevalent concerns in the planning world, more and more jurisdictions are creating energy efficiency and climate action plans. As of 2011, over 120 cities and counties around the United States had already completed climate action plans (Boswell, Greve, & Seale, 2012, p. 24). A major factor in reducing energy use, and subsequently greenhouse gas emissions, is in making buildings more energy efficient. According to the EPA, buildings account for 36 percent of overall energy use in the United States (U.S. Environmental Protection Agency, 2013).

Although many of these plans set target energy reduction levels for buildings, the process for actually meeting these goal levels is often disorganized, cost-prohibited, and behind schedule. In order to meet energy reduction goals, a jurisdiction must first establish a system for tracking and monitoring energy use, pinpointing areas in needs of improvements, and sharing this information with decision makers. Energy Star's Portfolio Manager benchmarking system provides a tool for public workers and building managers to meet these needs.

The County of San Luis Obispo's climate action and energy reduction plan, titled the EnergyWise Plan (2011), sets a goal for the County's municipal buildings to reduce their energy use by 20 percent from 2006 levels by the year 2020 (pg. 171). This report uses the Portfolio Manager Tool to analyze the current energy use of the County's municipal buildings, pinpointing the areas most in need of further examination in order to meet the EnergyWise Plan's goal. The report concludes with an audit and retrofit implementation plan for the County's top energy users, as well as a set of recommendations to improve the County's overall energy use which include:

1. Organization and collaboration between departments should be encouraged, in order to more efficiently share data.
2. Yearly reports should be produced as a measure of progress towards meeting 2020 reduction levels.
3. Efforts should be focused on audits and retrofits of the twelve selected buildings first, followed by analysis and audits in the remaining County buildings.
4. The Public Protection Department's energy use levels should be monitored and improved when feasible.
5. Those buildings that are Energy Star qualified should apply for certification.
6. The County should continue to seek funding sources for implementing audits and retrofits.

Keywords: benchmarking, Portfolio Manager, energy audit

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1. INTRODUCTION

The County of San Luis Obispo's EnergyWise Plan (2011) is a planning document that strategizes methods for reducing greenhouse gas emissions and energy usage. The document focuses on both countywide operations as well as government operations. Within government operations, the Plan identifies energy reduction in municipal buildings as a major factor in its progress. The EnergyWise Plan requires that County operations reduce their greenhouse gas emissions by 15% by the year 2020. In order to reach this goal, several areas of focus are listed, one of which is named "Energy Efficiency and Conservation." The goal of this focus area is to "Reduce energy use in existing County facilities 20% by 2020" (p. 171). This refers to the 2006 energy use levels, as listed in the document's inventory data. This goal lists several supporting actions, which require that Heating, Ventilation, and Air Conditioning (HVAC) and lighting retrofits be completed in buildings as identified by energy audits (p. 256).

PLANNING PROBLEM

In order to efficiently conduct the energy audits and retrofits mentioned in the EnergyWise Plan's implementation measures, the County should be able to prioritize those facilities that are most in need of attention. The plan provides an inventory of 2006 energy use data and greenhouse gas emissions, however no system of continued energy use analysis and management has previously been established. Although the General Services Department has privately monitored individual facilities' energy use levels, a well-publicized, in-depth analysis of energy use, efficiency, and sourcing did not exist prior to this report. Due to the limited budget and time frame for meeting the 2020 goals, audit and retrofit efforts should be pinpointed based on strategic energy use research and analysis. A comprehensive assessment of municipal energy use is an essential tool for successfully implementing the EnergyWise Plan's goal of reducing energy use in county owned facilities 20% by the year 2020. Additionally, the study should provide a simplified method for the County to continue to monitor and analyze its energy use.

PLANNING SOLUTION

Using Energy Star's energy benchmarking tool called Portfolio Manager (U.S. Environmental Protection Agency, 2013b), the attached document was prepared for the County of San Luis Obispo's Planning and Building Department as an implementation aid to the EnergyWise Plan's energy use goals for municipal buildings. The intention of this report is to promote understanding of current energy-use practices while pinpointing areas for audits and subsequent retrofit improvements. The Portfolio Manager tool also continuously updates energy use data, providing the county with a long-term tool for monitoring energy use and organizing correlating data. The following goals summarize this more specifically:

- To provide information on current energy use and efficiency in the County's municipal facilities.
- To prioritize implementation action and budget planning for audits and retrofits of the County's municipal facilities.
- To establish a simplified tool for the County of San Luis Obispo's Energy Watch Partnership to continue monitoring and improving energy usage in the County's municipal facilities to meet the 2011 EnergyWise Plan's goal of decreasing energy use in County-owned-and-operated buildings 20% from 2006 levels by the year 2020.

THE REPORT

The report is divided into four major sections. The first section, the Literature Review, provides background information on current energy planning and policy in the building sector from a federal, state, and local perspective. The County of San Luis Obispo's local policies and the relationship to the EnergyWise Plan are also reviewed. Next, implementation of current energy plans and policies is discussed, focusing on the obstacles of implementation, the selected implementation tool, as well as current uses of the benchmarking tool, Portfolio Manager. The purpose of this section is to introduce related policies, discuss the potential challenges in their implementation, and to suggest Portfolio Manager as an appropriate method for resolving these challenges.

The second section, titled Methodology, provides a detailed explanation of the Portfolio Manager tool and its functions. It explains significant measurements and energy rating criteria used in the report.

Next, the data collection process is summarized, including interviews with related partnerships practicing benchmarking, collection of building characteristics and metering information, and collection of utility information. Criteria used in the report's ranking and selection processes is explained. Finally, the selection, analysis, and audit prioritization of twelve of the County's municipal buildings is reviewed.

The third section consists of the report's findings, the suggested next steps, and a conclusion and reflection on the Portfolio Manager tool and the benchmarking process. The findings section includes results on a countywide level, on a departmental level, as well as on an individual facilities level. The next steps section suggests further action, based on the report's findings and results. Finally, the conclusion section reviews the process and provides feedback for the County of San Luis Obispo, other planning practitioners, as well as the managers of the Portfolio Manager tool.

The fourth section is the work product that was produced for the County of San Luis Obispo's Planning Department, and is titled, "San Luis Obispo County: Benchmarking in Energy Star's Portfolio Manager." This section provides an in-depth analysis at a countywide, departmental, and individual building context. Readers can refer to this section for a more detailed explanation of the information provided in the findings section.

2. CURRENT PRACTICES

Energy planning has become common practice at a national, state, and local level. Within the realm of energy planning, energy efficiency in buildings is one of the most important components. Although California and its jurisdictions have established many policies, plans, and programs for reducing energy use in buildings, actually implementing these policies through the audit and retrofitting process has proven to be a challenge. Time, money, and organization are major roadblocks. Energy benchmarking is an implementation tactic that allows municipalities to pinpoint and strategically plan for their building-focused energy goals. The EPA's benchmarking tool, Portfolio Manager, is being utilized throughout the state at various Energy Watch Partnerships (collaborations between government, utilities, and non-profit organizations) to monitor and track local buildings. By using this tool, the County of San Luis Obispo plans to target its least efficient municipal buildings and effectively audit and retrofit areas most in need of improvement. In prioritizing the retrofits of municipal buildings, the County hopes to set a precedent for privately owned buildings (County of San Luis Obispo Department of Planning and Building, 2010, p. 135), spearheading a countywide energy movement.

PLANNING FOR ENERGY EFFICIENCY

As energy cost and climate change become greater topics of concern, energy efficiency and climate action plans have become increasingly prevalent in the field of urban planning. According to the book, "Local Climate Action Planning", at the beginning of 2011, over 120 cities and counties had already completed Climate Action Plans (Boswell, Greve, & Seale, 2012, p. 24). Many of these plans claim to be comprehensive and cover both climate action planning as well as energy efficiency, such as San Luis Obispo County's 2011 EnergyWise Plan. A typical climate action plan includes energy use as a major factor for planning for emissions reduction. According to Boswell, Greve, and Seale, "Measures that improve energy reduce GHG emissions" (2012, p. 135). While emissions reduction is very important to climate-related goals, reducing energy in itself comes with the benefits of less cost, less pollution, and less dependency on finite, non-renewable resources. Energy efficient buildings and construction also offer potential economic growth opportunities" (Boswell, Greve, & Seale, 2012, p. 137).

Buildings and Energy Efficiency

According to the EPA, buildings account for 36 percent of total energy use in the United States, (U.S. Environmental Protection Agency, 2013a) making them a major component of energy use in every community in the Country. According to Boswell, Greve, & Seale (2011), “In many cases, considerable energy savings can be achieved through retrofitting existing buildings” (p. 137). Reducing energy use in buildings is an essential chapter in climate action and energy plans, which can be achieved with an estimate of existing energy use (p. 138).

POLICIES AND PLANS

On a local, regional, and national level, government jurisdictions have recognized the importance of energy efficiency in buildings to achieving success in their planning goals. Policies and plans have been created in an effort to set energy reduction measures, enforce green building practices, and reduce energy use as a whole.

National Policies

Nationally, the Department of Energy works to provide states and localities with assistance in achieving their energy reduction goals. The major job of the Department of Energy is to provide financial support through grants, as well as to set standards for energy efficiency. In 2009, the American Recovery and Reinvestment Act was passed, in order to provide grants to jurisdictions for meeting their energy reduction goals. These grants, called Energy Efficiency and Community Block Grants, were dispersed based on a commitment from communities to follow provisions set forth in the national non-residential energy standards, called ASHRAE. ASHRAE is a nationally recognized building standard by the American Society of Heating, Refrigerating, and Air Conditioning Engineers, which provides design guidelines for non-residential buildings to meet a minimum set of energy requirements (The Alliance to Save Energy, 2011).

State Policies

Two California State policies that guide new and existing building energy standards have recently been implemented. These are Title 24 and AB758. Title 24 is a set of energy efficiency standards, created by the California Energy Commission in 2008 for both residential and non-residential buildings. A set of 2013 standards were recently released, and will go into effect in 2014. Title 24 standards are focused on new construction developments, while AB758 focuses on improving energy use in existing buildings. This is a multi-layered process, which centers on energy ratings and assessments, public outreach, energy alliances between private and public partnerships, and benchmarking. (California Energy Commission, 2013) Both policies represent the State's commitment to energy efficiency progress.

Additionally, the California Public Utilities Commission adopted the Long Term Energy Efficiency Strategic Plan in 2008, a statewide plan that sets goals and strategies for energy savings, advising private sector, public sector, and utility actions. Implementation strategies incorporate the State's other energy policies, pinpointing AB1103, which focuses on benchmarking of non-residential buildings (California Public Utilities Commission, 2008). AB1103 will be explained more thoroughly in the implementation portion of this section.

Local policies

The County of San Luis Obispo has recently adopted several plans and programs for achieving energy efficiency in local buildings. Each of these plans are consistent with one another, cross-referencing shared goals and strategies.

EnergyWise Plan

The County of San Luis Obispo's EnergyWise Plan (2011) specifies strategies for reducing GHG emissions and increasing energy efficiency. More specifically, this plan sets a goal of reducing energy use in existing County facilities by 20% by the year 2020 (p. 171). The plan calls for energy audits, followed by retrofits in existing county facilities (p. 256). The first step, an energy audit, means an assessment of

each individual building's energy use and efficiency. The EnergyWise plan was funded with an Energy Efficiency and Conservation Block Grant (p. 31).

Open Space and Conservation Element

The County of San Luis Obispo's Open Space and Conservation Element of its General Plan (2010) calls for County facilities to become models for energy efficiency in their operations and maintenance. According to the Open Space and Conservation Element, County facilities should "demonstrate to County residents and businesses the benefits of energy efficiency and conservation" (p. 135). Ideally, implementation of energy efficiency measures in buildings will start with County-owned-and-operated facilities. Likewise, the Open Space and Conservation Element (2010) sets the same goal as the EnergyWise Plan, calling for a 20% energy use reduction in County facilities (p. 135).

Green Building Ordinance

In 2012, the County of San Luis Obispo adopted the Green Building Ordinance, which provides guidelines for building and modifying residential and non-residential buildings in an energy efficient manner. The Code is a companion piece to the Cal Green codes, adopted in 2011, and provides more specific requirements. In regards to existing buildings, the Green Building Code requires that new construction projects with a value of \$10,000 or greater follow a checklist of specific green building standards, submitted during the permit process (County of San Luis Obispo Department of Planning and Building, 2012).

IMPLEMENTING ENERGY PLANS

OBSTACLES

"Insufficient information, insufficient finance for efficiency improvement, split incentives, users' lifestyle choices and multiple decision makers all hamper buildings' efficient performance."

- (Laustsen, 2008, p. 16)

Although energy plans and climate action plans have become a mainstream concept in planning, actual implementation methods and techniques are still being established. Many of these plans end with a “next steps” section, designating suggested actions for actually carrying out goals set in the plan. In order to actually see the plan through, however, information must be constantly updated and monitored and progress must be tracked. According to Stephen Wheeler (2008), who conducted a study tracking the progress of current climate action plans and their included components, very few jurisdictions with climate action plans have implemented any kind of progress or evaluation of goals set in these plans. Often, this is due to a lack of funding and a lack of a sense of urgency. One of Wheeler’s key recommendations for improving the climate action plan process is to continue monitoring progress after a plan has been completed (p. 486). A long-term planning program that monitors, reviews, and revises policies as needed is essential to meeting goals set in these plans (p. 488). While municipal building energy efficiency is only one component of a climate action plan, it is an essential component in the successful implementation of the San Luis Obispo EnergyWise Plan as well as other similar plans. Creating a monitoring program, identifying funding mechanisms, and actually performing audits and retrofits on municipal buildings are the most imperative steps to seeing implementation through.

METHODS

In the building sector, ratings systems are one way for building owners and government workers to gage progress in achieving energy planning goals. By monitoring and charting building energy use as well as comparing energy use to national standards, planners can better understand areas for improvement in their public facilities sector while evaluating their specific municipality’s progress from a comparative standpoint. According to the County of San Luis Obispo’s Open Space and Conservation Element of its General Plan (2010), the County must continue monitoring and reporting the energy use for all County buildings and facilities, as well as audit County facilities in order to detect areas for energy efficiency improvement (pg. 136). If followed, this goal will act as a stepping-stone towards achieving the greatest possible energy efficiency. Likewise, energy rating and monitoring systems can help to achieve energy efficiency goals on a local, state, and national level (U.S. Environmental Protection Agency, 2013b).

Benchmarking

Benchmarking is one way for buildings to achieve a rating and monitoring system. The EPA's Portfolio Manager tool is a widely recognized benchmarking tool that allows building owners and local jurisdictions to track their building's energy use and efficiency while comparing it to similar buildings and national median standards. Certain buildings scoring better than 75 percent of their category are awarded Energy Star Certification. This tool requires that users locate basic building characteristics, such as age, number of workers, square footage, and utility account numbers. The program then allows users to collaborate with their local utility provider to automatically upload monthly energy use data (U.S. Environmental Protection Agency, 2013b). This essentially provides jurisdictions with the first step of the auditing process, a way to pinpoint and prioritize areas of improvement and further study. Most of the plans and policies discussed in the previous section list benchmarking as a strategy for implementation.

Current practices in benchmarking

Nationally, over 260,000 buildings have been benchmarked with Portfolio Manager, totaling over 28 billion square feet of building space. The program has been designated by the Institute for Sustainable Energy as the most appropriate standard for municipal government to manage and track their buildings' energy use (Leahy, 2013, p. 2). Pacific Gas and Electric Company calls Portfolio Manager the standardized benchmarking tool in California (Pacific Gas and Electric Company, 2013, p. 4). Figure 1 illustrates the number of square feet benchmarked each year in the United States with Energy Star Portfolio Manager.

Figure 1: Annual Square Feet Benchmarked with Portfolio Manager

Note: Only buildings that can receive a 1-100 energy performance score are included in the data from 2001 to 2008. Beginning in 2009, buildings for which there is not yet a 1-100 score available were included in the count of total buildings benchmarked.

(Leahy, 2013, p. 2)

In 2007, the California Energy Commission introduced Assembly Bill 1103. This Bill is titled the Nonresidential Building Energy Use Disclosure Program, and requires, first, that all non-residential buildings use Energy Star's Portfolio Manager energy monitoring program to benchmark energy use before sale, lease, or financing. Additionally, utility companies are required to provide at least the most recent twelve months of energy use data to building owners for tracking and monitoring purposes. The bill states that these regulations will help to achieve the California Energy Commission's mission to increase energy efficiency throughout the State. Additionally, this bill is cross-referenced in AB758, The Comprehensive Energy Efficiency Program for Existing Buildings, stating that AB1103 is a valuable strategy for achieving energy efficiency in existing buildings (California Energy Commission, 2013).

Energy Watch

The San Luis Obispo County Energy Watch Program is a collaborative effort between the County of San Luis Obispo and participating municipalities, Pacific Gas and Electric Company, Southern California Gas Company, and the Economic Vitality Corporation. Energy Watch Partnerships were created by the California Public Utilities Commission as a part of the Long Term Energy Efficiency Strategic Plan. One of the major responsibilities of these partnerships is to help local municipalities achieve goals set forth in the Plan, which includes the benchmarking of municipal facilities (California Public Utilities Commission, 2010, p. 1).

The Energy Watch mission is to

- Provide residents, businesses and local government with information on improving energy efficiency of buildings and facilities
- Provide training related to specific energy efficiency measures and practices
- Directly install energy efficient equipment in local government facilities and businesses (San Luis Obispo County Energy Watch, 2012).

More specifically, in San Luis Obispo, Energy Watch helps with the implementation of local and regional energy policies. The scope of work includes energy monitoring and audit implementation in private sector and public sector buildings throughout the County and in individual cities (San Luis Obispo County Energy Watch, 2012). While the San Luis Obispo County Energy Watch has a target goal of benchmarking energy use in each of the seven included jurisdictions, the attached document is the first complete report, setting a template for individual city reports to follow.

Benchmarking in other Municipalities

A number of individual cities and jurisdictions are using benchmarking as a preliminary step in implementing their energy planning and climate action planning goals. Within the last year, both the City of Sunnyvale and the City of New York have released benchmarking reports on their municipal facilities, which refer to energy benchmarking as an implementation component in achieving their local climate action and energy plans. The City of New York's climate action blueprint, entitled, *Plan NYC*, uses

benchmarking to help the City track opportunities for GHG reductions in municipal buildings, monitor the progress of buildings' energy efficiency over time, and link communication and action between the planning department, facility staff and city budget counsels (Mayor's Office of Long Term Planning and Sustainability, 2012, p. 2) Likewise, the City of Sunnyvale's benchmarking report sites one of its key goals as "make the case for energy efficiency activities with clear, concise reports that complement and align with City Climate Action Plan development" (Iyer & Lynch, 2012, p. 2). Benchmarking is being used to further the goals and progress of various climate action and energy plans around the Country.

Other Energy Watch partnerships throughout California are in the process of benchmarking both public and private facilities. Energy Watch Partnerships meet regularly to collaborate on benchmarking reports and collectively plan for future energy initiatives. The following provides a brief description of each partnership's progress in the benchmarking process.

Silicon Valley Energy Watch

This partnership has completed a benchmarking report for the City of Sunnyvale's municipal facilities, which divides data by building type and departmental sector. The report also provides a set of next steps, based on data results. Additionally, Silicon Valley Energy Watch is in the process of completing a benchmarking report for the City of San Jose, which provides an overview of individual building energy use, focusing on Energy Efficiency and Community Block Grant projects and their illustrated effects on building energy efficiency. The organization is simultaneously working to benchmark municipal buildings for the other cities within its jurisdiction.

San Joaquin (Valley Innovative) Energy Watch

This partnership has already completed benchmarking for most of the municipal buildings within its jurisdiction and is now focusing on implementation tactics and programs to progress into the audit and retrofit process. Valley Innovative Energy Watch is using its benchmarking reports and data to identify buildings most in need of audits and locate appropriate funding. Additionally, this particular partnership is

interested in adding water usage data to the benchmarking process. Currently, water usage benchmarking is not as organized of a process as energy benchmarking, and is still becoming streamlined.

Kern County Energy Watch

This partnership is currently working to produce reports for the cities within its jurisdiction. The partnership is offering a stipend to those cities willing to participate.

San Francisco Energy Watch

Due to the vast number of buildings in the San Francisco area, those with greater size are prioritized. Currently, buildings over 10,000 square feet are benchmarked annually and are required to complete energy audits every five years. One of the biggest challenges in the Bay Area is in benchmarking complex buildings with multiple space types. Many building owners do not understand how to match meters with building space types, making tracking and monitoring of energy usage difficult. Additionally, SF Energy Watch has acknowledged that the Energy Star scoring system may not necessarily be the best fit for all of its buildings, and that a more specialized system of scoring may be useful.

Association of Monterey Bay Area Governments (AMBAG) Energy Watch

So far, 220 municipal facilities have been benchmarked in Monterey and Santa Cruz Counties. AMBAG Energy Watch releases quarterly report updates to each city within its jurisdiction. Currently, this partnership is primarily focused on audits and retrofits, using benchmarking data as a starting point for the process. Particular difficulties occur with benchmarking pools and water treatment facilities, as techniques for these space types are still being established.

Sierra Nevada Energy Watch

This partnership uses benchmarking on a case-by-case basis. Some municipal facilities have already been benchmarked by specific request. The program also offers audits when requested.

Santa Barbara County Energy Watch

This partnership hopes to integrate benchmarking with its Climate Action Plan inventory process, making GHG emission measurements a major component in analysis. SBC Energy Watch recently partnered with San Luis Obispo County Energy Watch for help with benchmarking cities within its jurisdiction.

Redwood Coast Energy Watch

Located in Humboldt County, this partnership prioritizes benchmarking of all municipal buildings in each of the cities within its jurisdiction. The greatest benchmarking challenge that the partnership faces is in identifying owners versus leasers. (Various Local Partnerships, 2012).

Collaboration between Energy Watch partnerships is extremely valuable in the benchmarking and energy planning process. Continuation of these efforts will allow Energy Watch partnerships to display a statewide commitment toward reducing energy use through the benchmarking process.

CONCLUSION

Although energy plans and policies have become standard practice, energy planning is a complex and sometimes disorganized process. State, federal, and local organizations have separate plans, all which relate and overlap one another. While the plans already exist, implementation is the next stage of the process. Benchmarking of energy use is one particular method for plan implementation and has recently been more widely recognized as a necessary step forward. California's Energy Watch Partnerships, as well as various cities throughout the Country, have begun using benchmarking as a tool for reaching their energy planning goals. Though benchmarking is a relatively new process with a small base of knowledge, successfully benchmarking and conducting audits on San Luis Obispo County's municipal buildings will contribute to the credibility of Portfolio Manager's importance as an implementation tool. As more jurisdictions participate in the process, benchmarking can become a standardized tool, further streamlining the practice of energy planning and implementation.

3. METHODOLOGY

PORTFOLIO MANAGER

San Luis Obispo County's Energy Watch program has collaborated with SoCal Gas, PG&E, and the County's Planning and General Service Departments to complete the task of monitoring and analyzing energy use and energy trends in each County-owned-and-operated building. The U.S. Environmental Protection Agency's Portfolio Manager Tool was used to organize and monitor this process. Portfolio Manager uses metering data from electric and gas companies, as well as facility characteristics, such as gross square footage, building age, building type, hours of operation and number of staff, to determine facility energy efficiency compared with other similar building types on a national scale, rated from 1-100. Weatherization factors are also taken into account. Building types eligible for ratings include Bank, Courthouse, Data Center, Hospital, Hotel, House of Worship, K-12 School, Medical Office, Municipal Wastewater Treatment Plant, Office, Residence Hall, Retail Store, Senior Care Facility, Supermarket and Warehouse. These buildings must also have a gross floor area of 5,000 square feet or more to qualify for a rating.

Non-Ratable Buildings and Energy Use Measurements

Buildings that do not qualify for an Energy Star rating can use another type of energy efficiency measurement called energy use intensity (EUI). EUI measures a site's energy intensity (kBtu/Sq.Ft) over the most recent 12-month period of utility data. Portfolio Manager provides national median source EUI in similar building types as a measurement of achievement in non-ratable buildings. Because the majority of San Luis Obispo County's municipal buildings are not eligible for ratings, this report focuses on building EUIs as a measure of progress, while providing ratings for those buildings that qualify (U.S. Environmental Protection Agency, 2013b).

INTERVIEWS

Throughout the process of benchmarking San Luis Obispo County's Energy Use, other Energy Watch Partnerships were a valuable source of information. Partnerships that had completed benchmarking reports gave advice on the process of data collection, technical difficulties, as well as the different tools available from Portfolio Manager. The Silicon Valley Energy Watch team was especially influential, as they provided a report template from which this report has been loosely based. Additionally, a phone conference between all local Energy Watch teams was used to summarize progress and current projects in benchmarking, seen in the Current Practices section.

DATA COLLECTION

Data was collected with the help of San Luis Obispo County General Services, Pacific Gas and Electric Company, Southern California Gas Company, and individual building workers and department managers. The Utilities Manager, David Clew, at San Luis Obispo County General Services, first provided a list of all municipal facilities. With this list, a list of all current utilities accounts was also provided. With this information, buildings and their utility accounts were listed on a spreadsheet, providing space for more detailed building characteristics.

Portfolio Manager requires that some specific building characteristics also be included. The General Services Architectural Manager supplied a list of building construction dates for each identified building. Utilities Manager David Clew supplied "gross floor area" and "% of buildings heated and cooled" in most buildings. Finally, data for the "workers on main shift," "number of computers," "%heated" and "%cooled" categories were all obtained by contacting individual building managers and department sectors.

DATA ANALYSIS

Once the buildings and their utility accounts and characteristics had been uploaded into the Portfolio Manager program, data on annual usage, energy use intensity, annual cost, natural gas and electric

use, and greenhouse gas emissions was provided in spreadsheet format. This information was used to create charts and visuals, in order to better analyze the data and create a readable document.

Prioritization of Buildings

Individual buildings were ordered and selected for further analysis based on their ranking in a number of different categories. These categories are site EUI, source EUI, current site energy, current source energy, GHG emissions, cost, and percentage of increase in energy use since 2006. Those buildings with high ranking in multiple categories were considered most imperative for analysis. Twelve buildings were chosen based on this prioritization system.

Prioritization of Audits

In order to create an audit implementation chart, a prioritization system was created. The twelve selected buildings were ranked based on level of urgency. Recommended actions include retrofit, high-priority audit, and low-priority audit. In order to categorize suggested action in each building, a number of factors were reviewed. These include whether or not energy had increased or decreased from 2006 levels, the amount of cost-savings associated with meeting EnergyWise goals, the amount of overall energy used, as well as the building's ability to gain Energy Star certification. In the Government Center, retrofits are recommended for immediate implementation, as a recently completed energy audit by Abraxas Energy Consulting provides suggestions for immediate retrofit actions (Abraxas Energy Consulting, 2012).

4. FINDINGS

The benchmarking report highlights several important areas in County operations that can be targeted for energy savings improvements. Likewise, many of the County's buildings and their operations should be applauded for their exemplary energy use. The results are categorized in three ways: overall operational use, departmental energy use, and individual facility energy use.

OVERALL ENERGY USE

Overall, 77 percent of the County's facilities are performing better than the national median, according to Portfolio Manager's database. However, a significant percentage of County facilities are not currently on track to meet the EnergyWise Plan's 2020 goal of reducing energy use 20% from 2006 levels. Only 54% of facilities have decreased in energy use, while 46% have increased their energy use since 2006.

DEPARTMENTAL ENERGY USE

Four of the six of the County's budgeting departments have decreased their energy use since 2006 levels. Additionally, the Community Services, Health & Human Services, and Internal Support departments use a proportionally lower share of County energy use than the amount of gross floor area that they occupy. The Public Protection and Fiscal & Administrative departments use proportionally more energy than their total gross floor areas. Both departments use more energy than their 2006 measurements. Additionally, 35% of the Public Protection Department's buildings are less energy efficient than their national median counterparts.

INDIVIDUAL BUILDING ENERGY USE

Ten of the County's buildings already qualify for Energy Star Certification and can begin the application process. However, the top energy users consume a majority of the County's overall energy use. The twelve selected buildings should be audited immediately, according to the prioritization chart found in the attached work product.

5. IMPLEMENTATION PLAN & NEXT STEPS

Based on the report's results, it is recommended that the following actions be taken by the County of San Luis Obispo Planning Department:

- Organization and collaboration between departments should be encouraged, in order to more efficiently share data.
- Yearly reports should be produced as a measure of progress towards meeting the EnergyWise Plan's 2020 reduction levels.
- Efforts should be focused on audits and retrofits of the twelve selected buildings first, followed by analysis and audits in the remaining County buildings.
- The Public Protection Department's energy use levels should be monitored and improved when feasible.
- Those buildings that are Energy Star qualified should apply for certification.
- The County should continue to seek funding sources for implementing audits and retrofits.

The Audit Implementation Plan for the twelve selected buildings, as well as an action plan for the above recommendations are included in the attached work product.

6. LESSONS LEARNED

The attached report proves that benchmarking can provide a valuable next step for an energy or climate action plan. Portfolio Manager allows the user to analyze and better understand how their buildings perform and compare to other similar building types. By taking advantage of range of data that the program provides, benchmarking offers a long-term implementation tool in the audit and retrofit planning process.

Other municipalities can use this report as a basis for their own implementation planning efforts. Benchmarking has proven to be a useful tool for government coordination with local climate action and energy plans. Additionally, according to AB1103, benchmarking will be legally mandated in California for non-residential buildings before being sold or leased, starting in July 2013. This report can be used to gain insight and inspiration for this mandatory process. Additionally, it should be noted that in order to successfully use benchmarking as an organizational tool, cross-departmental coordination and communication is key.

Finally, as benchmarking continues to gain popularity, the Portfolio Manager tool will become easier and more accessible for those unfamiliar with the process. Though energy benchmarking is a new concept, users continue to provide Energy Star with valuable feedback and suggestions. In June 2013, Portfolio Manager will undergo a construction period, improving its usability and functionality according to the suggestions its current users and the Energy Watch Partnerships.

As more reports are produced and more municipalities begin participating, the benchmarking process will hopefully become increasingly streamlined and organized. In the future, Energy Watch Partnerships and other similar organizations should continue coordinating efforts to successfully implement energy plans around the Country. This report serves as a tool for this process.

SOURCES

- Abraxas Energy Consulting. (2012). *PG&E Large Integrated Audit Report*. San Luis Obispo: Pacific Gas & Electric Company.
- Boswell, M., Greve, A., & Seale, T. (2012). *Local Climate Action Planning*. Washington, DC: Island Press.
- California Energy Commission. (2013). *Building Energy Efficiency Program*. Retrieved April 5, 2013, from California Energy Commission: <http://www.energy.ca.gov/title24>
- California Public Utilities Commission. (2008). *California Long Term Energy Efficiency Strategic Plan*. San Francisco: California Public Utilities Commission.
- California Public Utilities Commission. (2010, July). *Fact Sheet: Energy Efficiency Government Partnership Programs (2010-2012)*. Retrieved April 5, 2013, from <http://www.cpuc.ca.gov/NR/rdonlyres/E29398ED-75C5-406E-AAA4-350C49284ACD/0/EE5GovernmentPartnershipProgram0710.pdf>
- County of San Luis Obispo Department of Planning and Building. (2010). *County of San Luis Obispo General Plan: Conservation and Open Space Element*. San Luis Obispo: County of San Luis Obispo.
- County of San Luis Obispo Department of Planning and Building. (2011). *EnergyWise Plan*. San Luis Obispo: County of San Luis Obispo.
- County of San Luis Obispo Department of Planning and Building. (2012). *Green Building Ordinance*. San Luis Obispo: County of San Luis Obispo.
- Iyer, P., & Lynch, D. (2012). *City of Sunnyvale: Benchmarking in Energy Star Portfolio Manager*. Sunnyvale: Silicon Valley Energy Watch.
- Laustsen, J. (2008). *Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings*. International Energy Agency. Paris: OECD/IEA.
- Leahy, W. (2013, March 7). Written Testimony of William Leahy. *Institute for Sustainable Energy at Eastern Connecticut State University*. Willimantic, Connecticut, United States of America: Institute for Sustainable Energy.
- Mayor's Office of Long Term Planning and Sustainability. (2012). *New York City Local Law 84 Benchmarking Report*. Plan NYC. New York: Plan NYC.
- Pacific Gas and Electric Company. (2013, April). *California Energy Disclosure and Benchmarking Requirements*. San Francisco.
- San Luis Obispo County Energy Watch. (2012). Retrieved September 20, 2012, from San Luis Obispo County Energy Watch: <http://www.sloenergywatch.com>
- The Alliance to Save Energy. (2011). *Building Energy Codes Fact Sheet*. Retrieved April 5, 2013, from The Alliance to Save Energy: www.ase.org/resources/building-energy-codes-fact-sheet
- U.S. Department of Energy. (2013, May 9). *Building Technologies Office*. Retrieved Jan 20, 2013, from Energy Efficiency & Renewable Energy: <http://www1.ere.energy.gov/buildings>

- U.S. Environmental Protection Agency. (2013a, March 25). *EPA Green Buildings*. Retrieved March 10, 2013, from United States Environmental Protection Agency: <http://www.epa.gov/oaintrnt/projects/>
- U.S. Environmental Protection Agency. (2013b). *Portfolio Manager Overview*. Retrieved September 20, 2013, from Energy Star: <http://www.energystar.gov/benchmark>
- Various Local Partnerships, E. W. (2012, December 5). Energy Watch Collaborative Meeting. (E. Pfafflin, Interviewer)
- Wheeler, S. M. (2008). State and Municipal Climate Change Plans: The First Generation. *Journal of the American Planning Association* , 74 (4), 481-496.

APPENDIX

2013

San Luis Obispo County

BENCHMARKING IN ENERGY STAR'S PORTFOLIO MANAGER

Prepared by Liz Pfafflin

May 2013

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Goals

- To provide information on current energy use and efficiency in the County's municipal buildings.
- To prioritize action for audits in the County's municipal buildings.
- To establish a simplified tool for the County of San Luis Obispo's Energy Watch Partnership to continue monitoring and improving energy usage in municipal buildings to meet the 2011 EnergyWise Plan's goal of decreasing energy use in County municipal buildings 20% from 2006 levels by the year 2020.

Policies

The County of San Luis Obispo's EnergyWise Plan (2011) specifies strategies for reducing GHG emissions and increasing energy efficiency. More specifically, this plan sets a goal of reducing energy use in existing County facilities by 20% by the year 2020. The plan calls for energy audits, followed by retrofits in existing county facilities (pg. 171). The first step, an energy audit, means an assessment of each individual building's energy use and efficiency.

The County of San Luis Obispo's Open Space and Conservation Element of its General Plan (2010) calls for County facilities to become models for energy efficiency in their operation and maintenance. According to the Open Space and Conservation Element, County facilities should "demonstrate to County residents and businesses the benefits of energy efficiency and conservation" (pg. 135). Ideally, implementation of energy efficiency measures in buildings will start with County-owned-and-operated facilities.

San Luis Obispo County Energy Watch

San Luis Obispo County Energy Watch is a collaboration between the County of San Luis Obispo and participating municipalities, Pacific Gas and Electric Company, Southern California Gas Company, and the Economic Vitality Corporation.

The Energy Watch mission is to

- Provide residents, businesses and local government with information on improving energy efficiency of buildings and facilities.
- Provide training related to specific energy efficiency measures and practices.
- Directly install energy efficient equipment in local government facilities and businesses.

Energy Star Portfolio Manager

San Luis Obispo County's Energy Watch program has collaborated with SoCal Gas, PG&E, and the County's Planning and General Service Departments to complete the task of monitoring and analyzing energy use and energy trends in each of the County's municipal facilities. The U.S. Environmental Protection Agency's Portfolio Manager Tool was used to organize and monitor this process. Portfolio Manager uses metering data from electric and gas companies, as well as facility characteristics, such as gross square footage, building age, building type, local weather, hours of operation and number of staff, to determine facility energy-efficiency compared with other similar building types on a national scale, rated from 1-100. Building types eligible for ratings include Bank, Courthouse, Data Center, Hospital, Hotel, House of Worship, K-12 School, Medical Office, Municipal Wastewater Treatment Plant, Office, Residence Hall, Retail Store, Senior Care Facility, Supermarket and Warehouse. These buildings must also have a gross floor area of 5,000 sq. ft. or more to qualify for a rating.

Non-Ratable Buildings and Energy Use Measurements

Buildings that do not qualify for an Energy Star rating can use another type of energy-efficiency measurement called energy use intensity (EUI). EUIs measure a site's energy intensity (kBtu/Sq. Ft.) over the most recent 12-month period of utility data. Portfolio Manager provides national median source EUI in similar building types as a measurement of achievement in non-ratable buildings. Because the majority of San Luis Obispo County's municipal buildings are not eligible for ratings, this report focuses on building EUIs as a measure of progress, while providing ratings for those buildings that qualify (U.S. Environmental Protection Agency, 2013).

Report Specifications

The intent of this report is first, to provide information on the current status of energy usage in the County's municipal buildings, and secondly, to suggest an implementation plan for conducting energy audits in those buildings with the greatest need for energy improvements. Using data gathered from Portfolio Manager, this report pinpoints twelve buildings in need of full energy audits and subsequent retrofit planning.

Building types analyzed in this report include libraries, police stations, government offices, warehouses and maintenance, medical offices, airports, courthouses, and community and social services. Due to time constraints, wastewater plants and outdoor facilities, such as parks, swimming pools, and parking garages are not included at this time. CalFire stations, about half of which are owned by the State of California, are also not included in this report. The Rio Caledonia Adobe has also not been included, as it is a historic site with minimal lighting and operating hours.

Data Collection and Improvements

Collection

Data was collected with the help of San Luis Obispo County General Services, Pacific Gas and Electric Company, Southern California Gas Company, and individual building workers and department managers. A list of all municipal facilities was first provided by the Utilities Manager, David Clew at San Luis Obispo County General Services. With this list, a list of all current utilities accounts was also provided. With this information, buildings and their utility accounts were listed on a spreadsheet, providing space for more detailed building characteristics. The spreadsheet format is shown in Figure 1, providing example data on the Air Pollution Control District Office in San Luis Obispo.

The General Services Architectural Manager supplied a list of building construction dates for each identified building. "gross floor area" and "% of buildings heated and cooled" were supplied by Utilities Manager David Clew for most buildings. Finally, data for the "workers on main shift," "number of computers," "%heated" and "%cooled" categories were all obtained by contacting individual building managers and department sectors.

Figure 1: Data Collection Spreadsheet

Service Acct #	Meter #	Facility Name	Address	City	Year Built	Space Type	DEFINE SPACE	Gross Floor Area	Weekly Operating Hours	Workers on Main Shift	# Computers	% Heated	% Cooled	Meter Name (enter as Service Acct #)	Energy Type	Utility
1054159494	12080970	APCD Offices	3433 Roberto Court	San Luis Obispo	1995-97	Office	government office	8512	45	24	20	100	100	1054159494	Gas	SoCal Gas
5801465005	1009465742	APCD Offices	3433 Roberto Court	San Luis Obispo		Office	government office							5801465005	Electric	PG&E
5801465005	483768	APCD Offices	3433 Roberto Court	San Luis Obispo		Office	government office							5801465005	Electric	PG&E
5843132068		APCD Offices	3433 Roberto Court	San Luis Obispo		Office	government office							5843132068	Electric	PG&E
5884799350	NEM	APCD Offices	3433 Roberto Court	San Luis Obispo		Office	government office							5884799350	Electric	PG&E
7176413281		APCD Offices	3433 Roberto Court	San Luis Obispo		Office	government office							7176413281	Electric	PG&E

Improvements

This report provides a general overview of energy use in San Luis Obispo County, however, there are several areas in the data collection and maintenance process that could improve the accuracy of information in future updates. In order to achieve these measures, however, a countywide effort to collect and better organize information will be necessary. The following are areas of improvement in the Energy Watch program's data collection tactics.

Connect individual meters with spaces. Although meter data is provided at a building-specific level, more accuracy could be achieved if buildings were further divided by space (if applicable). Many buildings may only contain one distinct area, and therefore use the same meter throughout the entire grounds. After speaking with San Luis Obispo General Services and other neighboring Energy Watch partnerships, it was concluded that most buildings and jurisdictions do not have the information to connect individual meters with separate internal spaces. While total energy use in each building is not impacted, Energy Star Scores could vary, depending on this data. An effort to track this data may improve the accuracy of future Energy Watch reports.

Provide comprehensive employee count. While collecting data for the category "number of workers on main shift," there is no apparent employee count for individual buildings. Only an employee count by department is available from General Services. A comprehensive list of employees in each building would be helpful for future benchmarking updates.

Simplify analysis of airport data. Benchmarking energy use in airports is a complex process, with many non-building meters that must be accounted for. In this report, terminals, maintenance buildings, and hangars were inputted like buildings, while other energy sources, such as runway lights, sign lights, and wind cones were designated in the "other category," and listed at 0 square footage. While all energy use is accounted for, there may be a more accurate way to account for lighting and utility use at a non-building level.

Input buildings that do not have a full year of data. A few buildings in this study do not currently have a full year of meter data, and cannot yet be accounted for. This is due to new construction or new utility accounts. These buildings include:

- Animal Services- baseline 3/16/12
- PA-125- Behavioral Health- baseline Summer 2012
- PO-16- Sheriff Report office- SoCal Gas baseline 12/13/2011
- PRE21- Social Services- Pacific Gas and Electric and SoCal Gas baseline Jan/Feb 2012
- PT124- Sheriff's Office- baseline August 2012
- PB26- Social Services- baseline July 2012

Obtain official year of construction for each building. Although construction dates of most buildings are known, General Services does not have data on the following buildings, which have been leased from previous owners:

- PRE-21 Social Services
- PA-35 Social Services
- PB-08 Social Services
- PB-18 Social Services
- PO-15 Social Services
- PT-86 Social Services
- PA125- Health
- PA37- Mental Health
- PB16- Health
- PB19- Assessor/ Clerk/ Planning
- PO16- Sheriff Report Office
- PP48- Sheriff Substation
- PT122- San Luis Auto Repair Smog Service
- PT123- Health
- PT124- Sheriff Office

These buildings were given a default construction date of 2000, in order to account for them in this report. Earlier or later start dates could impact Energy Star scores, when applicable.

Obtain official square footage measurements for each building. While a majority of data in the “gross floor area” category was provided by General Services, a small percentage of buildings have unknown areas. The areas of these buildings were calculated using Google Earth’s measurement tool, and may only be approximations of actual measurements. Different gross floor areas could affect Energy Star rating, energy use intensity score, and other categories that measure by floor area.

Include 6 year energy summary by obtaining SoCal Gas data from 2006-2009. While PG&E provides historic data from 2006 and onwards, SoCal Gas provides data from 2010 and onwards. With this additional data, long-term trends in energy use could be better analyzed.

Words and Terms

The following words and terms appear frequently in this report and are commonly used in Energy Star’s benchmarking program. They are defined as follow on The EPA’s website, EnergyStar.gov.

Energy Use Intensity (EUI)

EUI is a unit of measurement that describes a building’s energy use. EUI represents the energy consumed by a building relative to its size. This is calculated by dividing the total amount of energy consumed by a building in one year (kBtu) by the building’s total floor area (square feet).

Site Energy vs Source Energy

Site energy represents just the amount of energy being used at the building site. This refers to the energy documented by meter data. Average site EUIs are provided by the benchmarking program, and are the basis of comparison in this report. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, thereby enabling a complete assessment of energy-efficiency in a building (U.S. Environmental Protection Agency, 2013).

Energy Use by Type

Between September 2011 and September 2012, County municipal site electricity and natural gas usage totaled 66,877,649 kBtu. Figure 2 shows division of electricity and natural gas use.

Electricity use, provided by Pacific Gas and Electric Company, composes a slight majority of energy use in the County at 56%. Natural Gas use, provided by SoCal Gas Company, totals 44% of overall energy use.

Overall Energy Efficiency

National Median Site Energy Use Intensity is provided by Portfolio Manager and uses building type and size to compare each building entered with those of a similar scale and use, according to national energy use data. This data is gathered from the Commercial Building Energy Consumption Survey (CBECS), 2003, provided by the Dept. of Energy's Energy Information Administration (EIA). 77% of San Luis Obispo County's buildings are performing more efficiently than their average counterpart, 15% of buildings are performing worse, while the remaining 8% do not yet have adequate data to determine their performance. This is illustrated in Figure 3.

Meeting the 2020 Reduction Goal

As mentioned, the 2011 EnergyWise Plan sets a goal of reducing 2006 energy use levels by 20% by the year 2020. 2006 measurements were compared with the most recent data (calendar year 2012) and then used to monitor changes in energy use in those buildings with comprehensive data between 2006 and 2012. Buildings not included were built after 2006, became County-owned after 2006, or changed metering accounts within the last year. Figure 4 illustrates the results of this study, showing an energy use decrease in 54% of buildings and an energy use increase in 46% of buildings.

Figure 2: Percent of County Municipal Site Energy Use by Utility Type (kBtu), 2012

Figure 3: County Building Site Energy Use Intensity Compared to National Median, 2012

Figure 4: Status of Site Energy Use in County Buildings Since 2006 EnergyWise Plan Data, 2012

Since 2010, a dramatic increase in overall energy use is evident. Figure 5 shows change in overall annual energy use in 2010, 2011, and 2012, compared to 2006 levels. Unfortunately, 2007, 2008, and 2009 data are not available, as natural gas data was not provided. 2010 data shows levels close to those documented in 2006, while a sharp increase in energy use occurred in 2011. 2012 annual energy use was slightly lower than 2011 levels. This study includes only buildings that were documented in the 2006 EnergyWise plan studies.

Figure 5: Annual Energy Use Over Time (2006 EnergyWise Plan Buildings)

Energy Use by Department

In order to prioritize budgeting action for energy improvements, it is important to examine energy use in different departmental sectors. Figure 6, from the County of San Luis Obispo’s 2012-2013 budget, provides an overview of how budgeting is organized in the County’s governmental structure.

This budgeting structure is used to organize the buildings in this report into the 6 major categories: Land Based, Public Protection, Health & Human Services, Community Services, Fiscal & Administrative, and Internal Support. The Government Center building is a combination of both Land Based and Internal Support, however, a large portion of the building’s space can be classified as Internal Support. Therefore, it is included in the Internal Support category in this particular report.

Figure 6: County of San Luis Obispo Organization and Budgeting Structure

County of San Luis Obispo, 2012, pg. 42)

Figure 7 shows the proportion of total square footage of all buildings in each of these departmental sectors, while Figure 8 shows the proportion of energy used in each departmental sector. This contrast reveals areas where departmental sectors use more energy than their building footprint might suggest. Public Protection, for example, accounts for about 18% of the overall square footage in municipal buildings, however, it uses 40% of overall energy. Health and Human services is noticeably efficient, accounting for 33% of overall square footage, but using only 20% of overall energy.

Departments using proportionally more energy than their total square footage:

- Public Protection
- Fiscal & Administrative

Departments using proportionally less energy than their total square footage:

- Community Services
- Health & Human Services
- Internal Support

Figure 7: Division of Government Agencies by Square Footage

Figure 8: Portion of Total Energy Use by Department, 2012

Overall Site EUI for each department can be calculated by dividing the total gross square footage by the total energy use, illustrated in Figure 9.

Departmental EUIs can be compared to the National Median Site EUIs used by Portfolio Manager as a frame of reference. Land Based, Fiscal & Administrative, & Internal Support can largely be classified as office uses, for which the median score is varied depending on size and characteristics. Public protection received an average site EUI OF 146, while the national median Site EUI in similar buildings is 82. Health & Human Services can be mainly classified as Outpatient & Health Care. This category averaged an EUI score of 39, while the national median is 62. Finally, Community Services is composed predominantly of libraries and averaged an EUI score of 37, while the median library EUI score is 92.

Figure 9: Energy Use Intensity by Government Department (kBtu/sq ft)

Government Agency	Site EUI
Land Based	75
Public Protection	146
Health & Human Services	39
Community Services	37
Fiscal & Administrative	77
Internal Support	15

Figure 10: National Median Site EUIs Used by Portfolio Manager

2003 CBECS ¹ National Median Source Energy Use and Performance Comparisons by Building Type			
Building Use Description ²	Median Source EUI ³ (kBtu/Sqft)	Average Percent (%) Electric Use	Median Site EUI (kBtu/Sqft)
Education	144	63%	58
K-12 School	Use EPA's Target Finder / Portfolio Manager		
College/University (campus level)	244	63%	104
Food Sales	570	86%	193
Grocery Store/Food Market	Use EPA's Target Finder / Portfolio Manager		
Convenience store (with or without gas station)	657	90%	228
Food Service	575	59%	267
Restaurant/Cafeteria	434	53%	207
Fast Food	1170	64%	418
Inpatient Health Care (Hospital)	Use EPA's Target Finder / Portfolio Manager		
Lodging	163	61%	72
Dormitory/Fraternity/Sorority	Use EPA's Target Finder / Portfolio Manager		
Hotel/Motel/Inn	Use EPA's Target Finder / Portfolio Manager		
Mall (Strip and Enclosed)	247	71%	94
Nursing/Assisted Living	Use EPA's Target Finder / Portfolio Manager		
Office	Use EPA's Target Finder / Portfolio Manager		
Outpatient and Health Care	163	72%	62
Clinic/Other Outpatient Health	194	76%	67
Medical Office	Use EPA's Target Finder / Portfolio Manager		
Public Assembly	89	57%	42
Entertainment/Culture	94	63%	46
Library	246	59%	92
Recreation	100	55%	39
Social/Meeting	71	57%	43
Public Order and Safety	161	57%	82
Fire/Police Station	146	56%	82
Service (Vehicle Repair/Service, Postal Service)	96	63%	45
Storage/Shipping/Non-Refrigerated Warehouse	28	56%	10
Non-Refrigerated Warehouse/Distribution Center	Use EPA's Target Finder / Portfolio Manager		
Refrigerated Warehouse	Use EPA's Target Finder / Portfolio Manager		
Religious Worship	Use EPA's Target Finder / Portfolio Manager		
Retail (non-Mall Stores, Vehicle Dealerships)	139	67%	53
Other ⁴	127	56%	70

Source: U.S. Environmental Protection Agency, 2013

Within each department, individual buildings can also be compared to National Median Site EUIs. Although the number of buildings in each department is not proportionate, this provides an overview of general performance in each budgeting sector. One important department to note is Public Protection. Proportionally, this sector uses almost twice as much energy as its total facility square footage. About 65% of its buildings are performing better than the median, while about 35% of its buildings are performing worse than the median. It should be noted that the Land-Based and Fiscal & Administrative sectors are each composed of only two buildings.

Figure 11: Performance of County Buildings Compared to National Median Site EUI by Department, 2012

Annual energy use in each department from 2010 to 2012 is illustrated in Figures 12 through 17, with a 2006 baseline. This determines how energy use has fluctuated by department, following 2006 reduction goals. One important factor to note is that only those buildings that have been owned and operated by the County since 2006 are included in this study. Newly built or purchased buildings are not accounted for.

Four of the six departments currently use less energy in remaining buildings than was used in 2006. The Public Protection and Fiscal & Administrative departments currently use more energy than in 2006, with Public Protection reaching a documented high usage level during 2012. Although the Internal Support and Land-Based departments currently use less than 2006 levels, energy use continues to increase, and threatens to match previous highs. Health and Human Services shows a major decrease in energy use, while Community Services appears to have plateaued at a favorable rate of energy use between 2011 and 2012.

Figure 12: Annual Energy Performance of Land-Based Department Buildings Compared with 2006 EnergyWise Results

Figure 13: Annual Energy Performance of Public Protection Department Buildings Compared with 2006 EnergyWise Results

Figure 14: Annual Energy Performance of Health & Human Services Department Buildings Compared with 2006 EnergyWise Results

Figure 15: Annual Energy Performance of Community Services Department Buildings Compared with 2006 EnergyWise Results

Figure 16: Annual Energy Performance of Fiscal & Administrative Department Buildings Compared with 2006 EnergyWise Results

Figure 17: Annual Energy Performance of Internal Support Department Buildings Compared with 2006 EnergyWise Results

Energy Use by Building

Building Types

Municipal buildings in San Luis Obispo County include several different building types, as shown in Figure 18. The most common of these types is office buildings. Public order and safety also compose a large percent of building types. More specifically, public order and safety buildings can include sheriff stations, animal control, and jail and probation centers. Medical offices also compose a substantial portion of buildings owned by the county. The social/meeting category refers to public event centers, such as the South County Regional Center and the Veteran's Hall.

Although there is a range of building types, according to Portfolio Manager's standards, most of these types would fall into the "other" category, meaning they are not yet eligible for ratings.

Overall, most building types use less energy than the proportion of square footage that they occupy. Public order and safety buildings are the only building type that use substantially more energy than their proportion of the building footprint, as illustrated in Figure 19. A few buildings are not included in this study, as they were built or purchased by the County within the last year, or have switched energy accounts within the last year.

Figure 18: San Luis Obispo County Building Type by Square Footage

Figure 20: San Luis Obispo County Energy Use by Building Type, 2012

Energy Use by Building

Energy Use Rankings

The following section is meant to identify those buildings that can be targeted as the least efficient energy users, according to a number of different categories. The purpose of this exercise is to plan for implementation of audits and retrofits in buildings most in need of energy improvements.

Figure 21: Top Energy Consumers by Current Total Site Energy, 2012

Facility Name	Current Total Site Energy Use (kBtu)
Government Center	18986017
Main Jail & Female Jail	15078342
Sheriff-Honor Farm	5637877
Health Campus	4319478
SLO County Airport	2659855
Social Services	2501559
Juvenile Services	2116636
Public Health Laboratory	1284343
Child Support Services	825807
Environmental Health Service	731188
Social Services PA-35	690951
Probation SLO	672613
Sheriff-Detectives Building	663314
Library- AG	564233
Library- Atascadero	538551

Figure 22: Top Energy Consumers by Current Total Source Energy, 2012

Facility Name	Current Total Source Energy Use (kBtu)
Government Center	50589502
Main Jail & Female Jail	27672855
Health Campus	10453850
Sheriff-Honor Farm	9009882
SLO County Airport	8031946
Social Services	7231506
Juvenile Services	4750155
Public Health Laboratory	2854718
Child Support Services	2309160
Sheriff-Detectives Building	1867327
Environmental Health Service	1756997
Social Services PA-35	1738550
Library- San Luis Obispo	1645555
Probation SLO	1634949
Library- AG	1523808

In both total site and source energy measurements, the top 5 highest consumers remain consistent. The Government Center ranks first on both lists, followed by the Main Jail & Female Jail. The Health Campus, Sheriff-Honor Farm, and SLO County Airport all rank in the top 5 on both site and source energy totals.

Figure 23: Top Energy Consumers by Current Site Energy Intensity, 2012

Facility Name	Current Total Site Energy Use Intensity (kBtu/Sq. Ft.)
Main Jail & Female Jail	321
Sheriff-Honor Farm	162
Public Health Laboratory	109
SLO County Airport	104
Ag Commission	94
Juvenile Services	93
Sheriff Substation	81
Government Center	77
Library- Atascadero	77
Sheriff-Detectives Building	70
Child Support Services	67
Sheriff Substation- Los Osos	67
Social Services PT-86	63
PO-16 Sheriff Report Office	60
Agricultural Commissioner	57

Figure 24: Top Energy Consumers by Current Source Energy Intensity, 2012

Facility Name	Current Total Source Energy Use Intensity (kBtu/ Sq. Ft.)
Main Jail & Female Jail	590
SLO County Airport	315
Sheriff-Honor Farm	259
Public Health Laboratory	242
Juvenile Services	209
Government Center	206
Sheriff-Detectives Building	198
Child Support Services	187
Sheriff Substation	172
Ag Commission	159
Sheriff Substation- Los Osos	158
Library- Atascadero	157
PA37 Mental Health	155
Library- Nipomo	146
Social Services PB-08	142

Energy Use by Building

According to both site and source energy intensity rankings, the Main Jail & Female Jail has the highest intensity in both categories. The Sheriff Honor Farm, SLO County Airport, Juvenile Services, and Public Health Laboratory also rank in the top energy intensities in both categories.

The top 5 greenhouse gas emissions contributors are identical to the top five energy consumers by current total site energy. Overall, these buildings use the most energy and produce the most greenhouse gas emissions. It should also be noted, however, that all five of these buildings rank in the top ten largest buildings by total square footage.

Figure 25: Top GHG Emissions Contributors, 2012

Facility Name	Current Total GHG Emissions (MtCO ₂ e)
Government Center	1514
Main Jail & Female Jail	997
Sheriff-Honor Farm	351
Health Campus	327
SLO County Airport	228
Social Services	209
Juvenile Services	154
Public Health Laboratory	93
Child Support Services	68
Environmental Health Service	55
Sheriff-Detectives Building	55
Social Services PA-35	53
Probation SLO	51
Library- AG	45
Library- San Luis Obispo	45

Figure 26: Highest Energy Cost per Square Foot, 2012

Facility Name	Total Energy Cost per Sq. Ft. (US Dollars (\$))
Main Jail & Female Jail	5.57
SLO County Airport	4.14
Public Health Laboratory	3.31
Child Support Services	2.9
Social Services PB-08	2.76
Sheriff-Detectives Building	2.72
PA37 Mental Health	2.66
Government Center	2.51
Sheriff-Honor Farm	2.48
Sheriff Substation	2.38
Library- Atascadero	2.36
Sheriff Substation- Los Osos	2.31
Juvenile Services	2.28
Library- Nipomo	2.26
PRE21- Social Services	2.18

The top energy costs per square foot fluctuate from previous data. Main Jail & Female Jail, the SLO County Airport, Public Health Laboratory, and Child Support Services have the highest energy cost per square foot. Social Services PB-08 and Mental Health have relatively high energy costs compared with their overall energy use. Reasons for the high cost of operation of these two buildings should be further investigated.

Figure 27: Buildings with a 20% or Greater Increase in Energy Use Since 2006

Facility Name	% Change
Child Support Services	341%
Ag Commission	103%
Public Health- Grover Beach	92%
S County Regional Center	72%
Government Center	47%
Social Services PT-86	46%
Maintenance Building 1200	33%
Grand Jury	33%
Sheriff Substation- Los Osos	32%
Health Campus	31%
Sheriff-Detectives Building	25%

Figure 27 includes the County's municipal buildings that have increased energy use by 20% or more since the 2006 EnergyWise Plan's data results. Child Support Services and the Agricultural Commission Building have both more than doubled their energy use in this time frame. Public Health- Grover Beach and the South County Regional Center do not have high total energy use or EUI scores, however, their energy uses have increased by 92% and 72% since 2006. Monitoring of the buildings on this list is imperative to achieving energy efficiency goal levels.

Energy Use by Building

Energy Rating System

The following table prioritizes buildings most in need of further energy use analysis. This is done by scoring each building according to its ranking in each category, as seen in Figures 12 through 18. Those buildings with top scores in multiple categories are most in need of further study. Selected buildings are highlighted in darker blue.

Figure 28: Energy Rating Matrix

Building Name	Source EUI	Site EUI	Current Site Energy	Current Source Energy	GHG	Cost	Increase in Energy Use since 2006	Energy Star Rating
Ag Commission	10	5					2	
Agricultural Commissioner		15						
Child Support Services	8	11	9	9	9	4	1	52
Environmental Health Service			10	11	10			93
Government Center	6	8	1	1	1	8	5	80
Grand Jury							8	
Health Campus			4	3	4		10	81
Juvenile Services	5	6	7	7	7	13		
Library- AG			14	15	14			
Library- Atascadero	12	9	15			11		
Library- Nipomo	14					14		
Library- San Luis Obispo				13	15			
Library- Santa Margarita								
Main Jail & Female Jail	1	1	2	2	2	1		
Maintenance Building 1200							7	
PA37 Mental Health	13					7		
PO-16 Sheriff Report Office		14						
PRE21-Social Services						15		84
Probation SLO			12	14	13			
Public Health- Grover Beach							3	
Public Health Laboratory	4	3	8	8	8	3		
Public Health Paso Robles								
S County Regional Center							4	
Sheriff- Detectives Building	7	10	13	10	11	6	11	
Sheriff- Honor Farm	3	2	3	4	3	9		
Sheriff Substation	9	7				10		
Sheriff Substation- Los Osos	11	12				12	9	
SLO County Airport	2	4	5	5	5	2		
Social Services			6	6	6			93
Social Services PA-35			11	12	12			96
Social Services PB-08	15					5		
Social Services PT-86		13					6	

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Agricultural Commission Analysis

Ag Commission (PAC05)
810 W Branch St
Arroyo Grande, CA 93420

Source: County of San Luis Obispo Website, 2013

Figure 29: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
EECBG HVAC Upgrade	30-Sep-11	5,979.00	340	\$1,492.00		EECBG
Cool Roof	03-Mar-03	640.00		\$115.00	\$468.00	Project

Source: County of San Luis Obispo General Services, 2013

Figure 30: Total Site Energy Use Over Time

Figure 31: Electricity Use Over Time

Figure 32: Natural Gas Use Over Time

Figure 33: Total Energy Cost per Square Foot

*As data is displayed at an annual rate, marking one full year of usage data at each data, the results of a project are not fully visible until one year after the project's implementation date. Green dashes represent project installation dates, while red dashes represent one year after a project's installation.

The Agricultural Commission was built in 1995 and is used primarily for farming regulations and representation of farming interests. It has a floor area of 2,880 square feet.

Current Stats

- 10th highest source EUI
- 5th highest site EUI
- 2nd greatest increase in energy use since 2006 (103%)
- Does not qualify for an Energy Star rating

Previous Projects

Two previous energy upgrades have been performed here, including a Heating, Ventilation, and Air Conditioning (HVAC) system upgrade in September 2011, funded by the Energy Efficiency and Conservation Block Grant Program (EECBG), and a cool roof, installed in March 2003. The HVAC upgrade is estimated to have saved significant amounts of gas and electricity. The installation dates of the HVAC upgrade can be seen at the usage graphs on the previous page. Prior to the HVAC'S installation, energy use appears to have increased significantly in 2011. Energy use after the HVAC system upgrade shows a steep drop in electricity use and a slight overall decrease.

Patterns

Overall energy use increased steeply around late 2011, showing signs of decrease about a year after completion of the HVAC upgrade.

Electricity use reached a peak in early 2009, decreasing until early 2011 and then increasing again. One full year of data after the HVAC upgrade shows a dramatic decrease in electricity use.

Natural Gas Use sharply increased near early 2011, peaking at October 2012 and then decreasing after one year of HVAC upgrade data.

Next Steps

Further investigation should be conducted to determine what types of use occurred after 2006 to contribute to the 103% overall increase in energy use. Early 2011 exhibits a sharp increase in use, which may pinpoint this change.

Cost-Savings Analysis

In Order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 270,901 kBtu to 113,600 kBtu. This is a 58% overall reduction in energy usage from current levels. This reduction would save the facility \$3,429 in energy costs annually.

Child Support Services Analysis

Child Support Services (CSS) 1200 Monterey St San Luis Obispo, CA 93401

Source: County of San Luis Obispo Website, 2013

Figure 34: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
Upgrade hallway and courtyard lighting		5,900.00			\$944.00	
Upgrade parking lot lighting		27,727.00		\$7,700.00	\$1,800.00	
Upgrade 78.5% boiler		100.00	276		\$282.00	
Install occupancy sensors in conference rooms		300.00			\$48.00	
Insulate hot water pipes on electric water heater		50.00			\$8.00	

Source: County of San Luis Obispo General Services, 2013

Figure 35: Total Site Energy Use Over Time

Figure 36: Electricity Use Over Time

Figure 37: Natural Gas Use Over Time

Figure 38: Total Energy Cost per Square Foot

Intro

The Child Support Services facility is primarily used for financial, medical, and legal family support services. It was built in 2002 and has a floor area of 12,350 square feet.

Current Stats

- 8th highest source EUI
- 11th highest site EUI
- 9th highest total site energy use
- 9th highest total source energy use
- 9th highest GHG emissions
- 4th highest cost
- GREATEST increase in energy use since 2006 (341%)
- Energy Star rating of 52

Previous Projects

Several projects have been previously conducted at this building, however, exact dates of these projects are not available. Projects appear to be mainly in lighting and water-heating. Further investigation into these project dates could be useful for a more detailed analysis.

According to PG&E, garage lighting was previously burnout and rundown, and was recently replaced with a more efficient model. The change from non-existent parking garage lighting to a new lighting system could account for the dramatic spike in energy usage.

Patterns

Overall energy use appears to hit a low around April 2011, after which it increased until around August 2012 and then began a gradual decrease.

Electricity use sharply increased from early 2009 to around October 2009, at which point it rapidly decreased until mid 2011 and then began another sharp incline. Around August of 2012, electricity use began a gradual decrease.

Gas use reached a low usage level in April of 2011 and then began sharply increasing to a high in early 2012. Gas use began a gradual decrease until November 2012 at which point it began increasing, once more.

Next Steps

This building's sharp increase in overall energy use since 2006 should be examined to determine what practices can be attributed to this change. Additionally, the period of time leading up to the energy use high in August 2012 should be examined. This may be attributed to the change of lighting in the parking garage.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 825,807 kBtu to 151,200 kBtu. This is an 82% overall reduction in energy usage from current levels. This reduction would save the facility \$29,389 in energy costs annually. This would result in an Energy Star rating of 100.

Government Center Analysis

Government Center (PTB00) 1050 Monterey St San Luis Obispo, CA 93401

Figure 39: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
EECBG Replace CRAC units on fourth floor	30-Sep-12	70,080.00	700	\$10,609.00	\$0.00	EECBG
Install bi level lighting in stairwells		10,000.00				
provide sub meters for each building						
Install intercoolers for cogeneration plant		22,760.00				Project
T12/T8 mag/elec ballasts in hallways		35.00			\$474.00	Project
Place security lighting on motion sensors		577,729.00		\$80,000.00	\$28,886.00	
Cogeneration improvements						
EECBG Upgrade parking lot lighting	31-Mar-12	27,450.00		\$4,941.00	\$1,373.00	EECBG
T12/T8 mag/elec ballasts	16-May-01	128,575.00		\$18,000.00	\$8,100.00	Project
Install Cogeneration System	04-Jan-02	1,568,400.00	-23567	\$180,191.00	\$502,000.00	Project
Install VFDs	06-Feb-03	37,500.00		\$6,000.00		Project
Variable Speed Drive	10-Jun-03	17,520.00		\$3,150.00	\$672.00	Project
Seal windows	01-Mar-05					
T24 Design Changes	27-Jun-05	360,247.00		\$64,845.00	\$72,760.00	Project
Occupancy Sensors in conference rooms	02-Oct-07	1,350.00		\$243.00	\$440.00	CWEWCF
PG&E Energy Audit	12-Jun-12					
Reduce hot water temperatures	10-Jul-12					
Reduce hours of operation of booster pumps		16,848.00		\$2,359.00		Project
Upgrade elevator #5	11-Jun-09

Source: County of San Luis Obispo Website, 2013

Source: County of San Luis Obispo General Services, 2013

Figure 40: Total Site Energy Use Over Time

Figure 41: Electricity Use Over Time

Figure 42: Natural Gas Use Over Time

Figure 43: Total Energy Cost per Square Foot

Government Center Analysis

Intro

The Government Center has gone through nearly a century of construction, with the original courthouse built in the 1920s. The most recent construction occurred in 2005. The Government Center is the largest building in the County at 245,309 square feet. It is used to house the County's government workers, courthouses, and meeting rooms.

Current Stats

- 6th highest source EUI
- 8th highest site EUI
- HIGHEST total site energy use
- HIGHEST total source energy use
- HIGHEST GHG emissions
- 8th highest cost
- 5th highest overall increase in energy use since 2006 (47%)

Previous Projects

Many energy projects have been conducted at the Government Center, including a parking lot lighting retrofit project and a computer room air conditioning (CRAC) retrofit. Overall energy usage shows a slight decrease in use since the installation of both of these projects. A recent energy audit was conducted at the Government Center by Pacific Gas and Electric Company and Abraxas Energy Consulting. The study finds and recommends that the following high priority measures be taken immediately:

- "Implement chilled water reset
- Optimize AHU <air handling unit> economizers of New Government Center and New Courthouse
- Install occupancy sensors to control lighting in New Courthouse, Old Courthouse, and Courthouse Annex

- Replace 150 ton chiller with SMARDT chiller "(Abraxas Energy Consulting, 2012, pg. 2)

Patterns

Overall energy use has steadily increased since early 2011, peaking around March 2012 and beginning a slow decline.

Electricity use hit a low usage level in mid 2009 and began a slow incline through early 2011. Electricity use has leveled out within the last year and a half.

Natural gas use slowly increased until around March 2011 and is currently in a gradual decline.

Next Steps

The recent energy audit conducted by Abraxas Energy Consulting is a good starting point for understanding this facility's energy use patterns. Energy efficiency will improve with the proposed implementation steps. This building should be continuously monitored for energy improvement opportunities, as it is one of the most significant users in the County.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 18,986,017 kBtu to 10,480,000 kBtu. This is a 45% overall reduction in energy usage from current levels. This reduction would save the facility \$276,617 in energy costs annually. This would result in an Energy Star rating of

Health Campus Analysis

Health Campus (PTF66) 2180 Johnson Ave San Luis Obispo, CA 93401

Generated with Google Earth

Figure 44: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Saving	Rebate \$	Funding Source
Replace HVAC for pharmacy		1,583.00			\$369.00	Project
Cool Roof					\$873.00	Project
Upgraded 25 T AC to higher EER		61,118.00		\$11,001.00	\$2,250.00	Project
AC changeout		500.00		\$90.00	\$912.00	Project
Retrofit campus buildings-Aircon		86,322.00		\$13,639.00		Project
8' T12 to T8 conversion		140.00		\$25.00		SLOEWP
hardwired switch to lamp						SLOEWP
install motion sensors (8)						SLOEWP
Upgrade HVAC (Health campus annex)		1,000.00		\$180.00		Project

Source: County of San Luis Obispo General Services, 2013

Figure 45: Total Site Energy Use Over Time

Figure 46: Electricity Use Over Time

Figure 47: Natural Gas Use Over Time

Figure 48: Total Energy Cost per Square Foot

Intro

The Health Campus was built in 1927 and has a floor area of 116,337 square feet. It is primarily an outpatient facility, used for mental health.

Current Stats

- 4th highest total site energy use
- 3rd highest total source energy use
- 4th highest GHG emissions
- 10th greatest increase in energy use since 2006 (31%)
- Energy Star Rating of 82

Previous Projects

A number of energy improvements have been conducted here, with a focus on electricity rather than natural gas. Project dates are not well documented, however. In 2005, a private consulting firm called Aircon conducted a retrofit at this facility.

Patterns

Overall energy usage has decreased since 2010, nearly leveling out around June of 2012.

Electricity use sharply declined in early 2009 and has continued to increase since then.

Gas use has steadily declined since early 2011.

Next Steps

Aircon's energy audit should be assessed for usage details. This facility's energy use increase since the 2006 study should also be investigated. The increase appears to be attributed largely to electricity usage, rather than natural gas. Specific energy uses occurring in late 2009 and onward should be investigated, as well.

Overall, this facility has a good Energy Star rating. Due to its large size, it appears to use more energy than other buildings, but does not necessarily do so inefficiently.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 4,319,478 kBtu to 2,617,600 kBtu. This is a 39% overall reduction in energy usage from current levels. This reduction would save the facility \$53,547 in energy costs annually. This would result in an Energy Star rating of 95.

Juvenile Services Analysis

Juvenile Services (PIC35)
1065 Kansas Ave
San Luis Obispo, CA 93401

Source: County of San Luis Obispo Website, 2013

Figure 49: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
Install Vending Miser		1,514.00			\$213.00	CWEWCF
Construct JSC addition						
Replace HVAC units		0.00	0	\$0.00	\$0.00	
Upgrade HVAC on modular building		1,269.00			\$162.00	Project
General energy retrofits		0.00	0	\$0.00	\$0.00	
Replace Exhaust fans						
Replace 9 175 w MH with 9 90w LED at rear yards	07-Mar-12	3,863.00		\$613.00		Project

Source: County of San Luis Obispo General Services, 2013

Figure 50: Total Site Energy Use Over Time

Figure 51: Electricity Use Over Time

Figure 52: Natural Gas Use Over Time

Figure 53: Total Energy Cost per Square Foot

Juvenile Services Analysis

Intro

The Juvenile Services facility was built in 1979 and has a total floor area of 22,783 square feet. This building represents the County's juvenile justice system and provides services in prevention, intervention, supervision, and incarceration.

Current Stats

- 5th highest source EUI
- 6th highest site EUI
- 7th highest total site energy
- 7th highest total source energy
- 7th highest GHG emissions
- 13th highest cost
- Does not qualify for an Energy Star Rating

18% decrease in energy use since 2006 EnergyWise Plan data results

Previous Projects

Several electricity-focused energy projects have been conducted here. A lighting replacement project was done in March of 2012. Overall site energy use appears to have decreased since the project's completion.

Patterns

General energy use appears to have increased since 2010, with occasional dips in use. From October 2012, energy use at the site appears to be declining.

After a high in late 2008, electricity use began to decrease until early 2011. Since then, it has been slowly increasing.

Natural gas use has fluctuated dramatically since late 2010. Natural gas use peaked around April 2011 and has decreased since then, reaching an all time low since December 2010.

Next Steps

Further studies should examine activities that occurred in late 2011, attributing to a dramatic energy use increase.

This building's overall energy use has decreased by 18% since 2006, nearly meeting its target levels. Thus, other buildings should be prioritized for further analysis first.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 2,141,665 kBtu to 2,120,800 kBtu. This is a 1% overall reduction in energy usage from current levels. This reduction would save the facility \$524 in energy costs annually.

Main Jail & Female Jail Analysis

Main Jail & Female Jail (PIC20)

1585 Kansas Ave

San Luis Obispo, CA 93401

Generated with Google Earth

Figure 54: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
Upgrade Sallyport lighting to T8		2,084.00		\$375.00		CWEWCF
Replace main jail boiler						
Reduce hours of operation of cell lights		4,700.00		\$846.00		Sheriff
Construct women's jail addition						
Replace main jail mechanical room & pumps						Project
EECBG Lighting Upgrade	31-Mar-12	50,779.00		\$10,942.00	\$2,539.00	EECBG
Install CO2 sensor to control exhaust fans		9,000.00		\$1,620.00		CWEWCF
Upgrade exterior lighting on west jail		2,500.00		\$450.00		Project
Provide Delta controls for energy management						
Replace women's jail HVAC						
Change rooftop boiler insulate piping	18-Nov-03		44	\$40.00	\$800.00	Project
Install Air-conditioning in computer closet	01-Sep-06					
T12/T8 mag/elect ballasts	19-Oct-07	124,116.00		\$22,341.00	\$3,918.00	Project

Source: County of San Luis Obispo General Services, 2013

Figure 55: Total Site Energy Use Over Time

Figure 56: Electricity Use Over Time

Figure 57: Natural Gas Use Over Time

Figure 58: Total Energy Cost per Square Foot

Main Jail & Female Jail Analysis

Intro

The Main Jail & Female Jail was built in 1970 and has an overall floor area of 46,925 square feet. It is used for incarceration of criminals.

Current Stats

- HIGHEST source EUI
- HIGHEST site EUI
- 2nd highest total site energy
- 2nd highest total source energy
- 2nd highest GHG emissions
- HIGHEST cost
- Does not qualify for an Energy Star Rating

4% increase in energy use since 2006 EnergyWise Plan data results

Previous Projects

Several energy upgrade projects have been completed here, centering on electricity savings. Many of these projects do not have documented implementation dates or occurred many years ago. An EECBG lighting upgrade was completed in March 2012. No significant changes are visible yet.

Patterns

Overall energy use has steadily increased since late 2010.

Electricity use decreased until March 2012 and then began increasing.

Natural gas use has steadily increased since late 2010.

Next Steps

This building's extremely high EUI scores should be examined. Additionally, activities that took place around March 2012, at the time of the electricity use increase, should be examined.

One reason for the facility's extremely high usage levels may be due to its full-time operation status. As the facility is a detention center for criminals, it is operated 24 hours a day, consistently using energy.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 15,022,035 kBtu to 11,523,200 kBtu. This is a 23% overall reduction in energy usage from current levels. This reduction would save the facility \$59,926 in energy costs annually.

Public Health Laboratory(PTO66) 2191 Johnson Ave San Luis Obispo, CA 93401

Figure 59: Previous Energy Upgrades

Generated with Google Earth

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
60w inc to CFL (5)		611.00		\$110.00		SLOEWP
2-60w to CFL (10)		1,222.00		\$220.00		SLOEWP
Exit Sign		175.00		\$32.00		SLOEWP
Occupancy Sensors (23)						SLOEWP
Upgrade HVAC & Exhaust						
CWEWC - upgrade ext lighting to LED		5,159.00		\$929.00	\$258.00	CWEWCF
EECBG Lighting Upgrade	31-Mar-12			\$811.00		EECBG
Replace windows		561.00		\$101.00	\$135.00	Project

Source: County of San Luis Obispo General Services, 2013

Figure 60: Total Site Energy Use Over Time

Figure 61: Electricity Use Over Time

Figure 62: Natural Gas Use Over Time

Figure 63: Total Energy Cost per Square Foot

Intro

The Public Health Laboratory was built in 1951 and has a total floor area of 11,806 square feet. Its main use is in providing clinical and environmental testing to support programs of the Health Agency as well as hospitals, clinics, physicians, private businesses, citizens, and local, state and federal authorities.

Current Stats

- 4th highest source EUI
- 3rd highest site EUI
- 8th highest total site energy
- 8th highest total source energy
- 8th highest GHG emissions
- 3rd highest cost
- Does not qualify for an Energy Star Rating

10% decrease in energy use since 2006 EnergyWise Plan data results

Previous Projects

Several energy improvement projects have been conducted at this facility, however, none have documented implementation dates except an EECBG funded lighting retrofit performed in March 2012. Electricity use, gas use, and overall energy use have decreased since the project.

Patterns

Since late 2010, overall energy use has reached an all-time low at the facility. A steady decrease in use began in late 2011.

Electricity use has been steadily declining since late 2008.

Natural gas use has followed an almost identical pattern to overall energy use, currently reaching an all-time low since 2010, after a steady decrease since late 2011.

Next Steps

Implementation dates on other retrofit actions can help determine how the building's previous energy efficiency repairs have decreased its overall energy use. As this building is already making progress toward meeting the EnergyWise Plan's goal levels, it should not be prioritized first for audits. Although the building has a high overall use and a high energy use intensity rating, its energy efficiency is improving over time.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 1,284,343 kBtu to 1,211,200 kBtu. This is a 6% overall reduction in energy usage from current levels. This reduction would save the facility \$2,342 in energy costs annually.

Sheriff-Detectives Building Analysis

Sheriff- Detectives Building (PIC05)
1545 Kansas Ave
San Luis Obispo, CA 93401

Generated with Google Earth

Figure 64: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
Exit Sign		175.00		\$32.00		SLOEWP
Upgrade windows		1,101.00	72	\$270.00		Project
EECBG HVAC	22-Jun-11	10,057.00	170	\$3,331.00		EECBG
Occupancy Sensors (16)						SLOEWP
T12/T8 mag/elec ballasts		11,619.00			\$1,708.00	Project
Replace building HVAC		3,000.00	60	\$1,100.00		Project
60w inc to CFL (5)		468.00		\$84.00		SLOEWP

Source: County of San Luis Obispo General Services, 2013

Figure 65: Total Site Energy Use Over Time

Figure 66: Electricity Use Over Time

Figure 67: Natural Gas Use Over Time

Figure 68: Total Energy Cost per Square Foot

Intro

The Sheriff-Detectives Building was built in 1950 and has a total floor area of 9,450 square feet. It is the main sheriff's office in the County.

Current Stats

- 7th highest source EUI
- 10th highest site EUI
- 13th highest total site energy
- 10th highest total source energy
- 11th highest GHG emissions
- 6th highest cost
- 11th greatest increase in energy use since 2006 (25%)
- Does not qualify for an Energy Star Rating

Previous Projects

Several energy-saving projects have been implemented at this facility, for both natural gas and electricity reduction. An EECBG funded HVAC upgrade was completed in June 2011. Electricity use and overall energy use have increased, despite the HVAC upgrade. Natural gas use has decreased since the upgrade.

Patterns

Overall energy use has gradually increased since late 2010.

Electricity use is at an all-time high since late 2008, reaching a low in mid 2011, and then gradually increasing.

Natural gas use has reached an all-time low point since late 2010, after a steady decline began in late 2011.

Next Steps

This site should be analyzed for energy use changes since 2006. Despite numerous upgrades, it has increased its energy use by 25% since 2006 levels were inventoried.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 666,941 kBtu to 428,000 kBtu. This is a 36% overall reduction in energy usage from current levels. This reduction would save the facility \$9,233 in energy costs annually.

Sheriff- Honor Farm Analysis

Sheriff- Honor Farm (PIC31)
885 Oklahoma Ave
San Luis Obispo, CA 93401

Generated with Google Earth

Figure 69: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
EECBG Lighting Upgrade	31-Mar-12	92,478.00		\$17,198.00	\$4,624.00	EECBG
Install timeclock to control lighting		657.00		\$119.00	\$144.00	CWEWCF
Replaced EXIT signs with LED		2,365.00		\$426.00		CWEWCF
Install solar hot water/PV system for laundry		25,400.00	2960	\$8,868.00		
Upgraded lighting to CFL		250.00		\$45.00		CWEWCF
EECBG HVAC	11-Jun-10	63,871.00	4600	\$12,251.00	\$0.00	EECBG
Install setback thermostat	15-Nov-02	300.00	30	\$85.00	\$48.00	CWEWCF
Install Vending Miser	26-Nov-02	2,500.00		\$450.00	\$180.00	
Replace electric booster heater with gas	21-Aug-03	7,500.00		\$2,190.00	\$1,200.00	CWEWCF
Replace washers	01-Jul-06					

Source: County of San Luis Obispo General Services, 2013

Figure 70: Total Site Energy Use Over Time

Figure 71: Electricity Use Over Time

Figure 72: Natural Gas Use Over Time

Figure 73: Total Energy Cost per Square Foot

Sheriff- Honor Farm Analysis

Intro

The Sheriff-Honor Farm facility was built in 1975 and has a floor area of 34,807 square feet. It is mainly used for incarceration purposes and operates 24 hours a day.

Current Stats

- 3rd highest source EUI
- 2nd highest site EUI
- 3rd highest total site energy
- 4th highest total source energy
- 3rd highest GHG emissions
- 9th highest cost
- Does not qualify for an Energy Star Rating

8% decrease in energy use since 2006 EnergyWise Plan data results

Previous Projects

This facility has undergone many energy upgrade projects, dating as far back as 2002. Recent projects include an EECBG funded lighting retrofit in March 2012 and an EECBG HVAC upgrade in June 2012. Both electricity and natural gas use have decreased since the installation of both of these upgrades. The lighting retrofit is estimated to save 92,478 kWh annually and the HVAC Upgrade saves around 63,871 kWh of electricity and 4,600 therms of gas annually.

Patterns

Overall energy use has continued to decrease since late 2010.

Electricity use shows a similar pattern, leveling out from late 2008 through mid 2010, and then decreasing more dramatically.

Natural gas use appears to have decreased through early 2012 and is presently leveling out.

Next Steps

This facility's EUI score is very high, but could be attributed to its full-time operating hours. The facility has continued to decrease its energy use since 2006, and is on track towards meeting EnergyWise Plan goals. The building could be inspected for further energy efficiency opportunities.

Cost-Savings Analysis

In Order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 5,716,633 kBtu to 4,968,800 kBtu. This is a 13% overall reduction in energy usage from current levels. This reduction would save the facility \$11,323 in energy costs annually.

Sheriff Substation (PWA06)

356 N Main St
Templeton, CA

Generated with Google Earth

Figure 74: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
Construct Sheriff Station						
Install solar sign light	18-Apr-12	656.00		\$118.00		CWEWCF

Source: County of San Luis Obispo General Services, 2013

Figure 75: Total Site Energy Use Over Time

Figure 76: Electricity Use Over Time

Figure 77: Natural Gas Use Over Time

Figure 78: Total Energy Cost per Square Foot

Intro

This facility was built in 2004 and has a total floor area of 6,385 square feet. It is primarily used as a sheriff depot station.

Current Stats

- 9th highest source EUI
- 7th highest site EUI
- 10th highest cost
- Does not qualify for an Energy Star Rating

Unknown change in energy use since 2006 EnergyWise Plan data results

Previous Projects

A solar-powered sign was installed at the site in April of 2012. Since the project's construction date, overall energy use has decreased, while electricity use continues to increase. After one year of installation, results may be more visible.

Patterns

Overall site energy use appears unpredictable, with no stable patterns. Current levels are similar to 2010 levels.

Electricity use declined through 2009 and then began its present increase.

Natural gas use has decreased since 2010 and remains in a gradual decline.

Next Steps

For a fairly small site, this facility has a significantly high EUI. Like the other public protection facilities, this facility's continuous hours of operation could be a partial factor in its high EUI score. As the facility was not included in the 2006 EnergyWise Plan's results, there is no basis for comparison with the Plan's data.

Sheriff Substation (PEN15) 2099 10th St Los Osos, CA

Generated with Google Earth

Figure 79: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Savings	Rebate \$	Funding Source
Upgrade HVAC to high SEER unit	01-Apr-06	2,063.00		\$371.00		Project

Source: County of San Luis Obispo General Services, 2013

Figure 80: Total Site Energy Use Over Time

Figure 81: Electricity Use Over Time

Figure 82: Natural Gas Use Over Time

Figure 83: Total Energy Cost per Square Foot

Intro

This building was constructed in 1996 and has a total floor area of 3,200 square feet. It is used as a sheriff's office and depot station.

Current Stats

- 11th highest source EUI
- 12th highest site EUI
- 12th highest cost
- 9th greatest increase in energy use since 2006 (32%)
- Does not qualify for an Energy Star Rating

Previous Projects

This facility's HVAC system was upgraded in 2006, and the project was estimated to save 2,063 kWh/ year.

Patterns

Overall energy use has decreased since 2010.

Electricity use is higher than 2008 levels, but is currently decreasing.

Natural gas use has decreased since 2010.

Next Steps

Further analysis should focus on the building's 32% increase in energy use since 2006, which appears to be predominantly electricity-based. The building's continuous operating hours may be attributed to its high EUI score.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 228,924 kBtu to 151,200 kBtu. This is a 34% overall reduction in energy usage from current levels. This reduction would save the facility \$2,598 in energy costs annually.

SLO County Airport (PTN 10 & PTN 11)

895 Airport Dr

San Luis Obispo, CA 93401

Generated with Google Earth

Figure84: Previous Energy Upgrades

Project Description	PDate	Elec Saved	Gas Saved	Energy Saving	Rebate \$	Funding Source
Airport	Construct Rental Car Facility					
Airport Terminal	Replace roof & HVAC					

Source: County of San Luis Obispo General Services, 2013

Figure 85: Total Site Energy Use Over Time

Figure 86: Electricity Use Over Time

Figure 87: Natural Gas Use Over Time

Figure 88: Total Energy Cost per Square Foot

Intro

The San Luis Obispo County Airport was constructed in 1980 and has a gross floor area of 25,532 square feet. It is the only major airport in the County of San Luis Obispo and provides flights to San Francisco, Los Angeles, and Phoenix.

Current Stats

- 2nd highest source EUI
- 4th highest site EUI
- 5th highest current site energy
- 5th highest current source energy
- 5th highest GHG emissions
- 2nd highest cost

6% decrease in energy use since 2006 EnergyWise Plan data results

Previous Projects

The airport has previously undergone one energy efficiency project, which is not dated. This was a roof and HVAC system replacement.

Patterns

Overall energy use has not dramatically increased since 2010, and has actually decreased since 2006 data results. Current levels are slightly higher than 2010 levels.

Electricity use has dramatically decreased since 2008, reaching an all-time low within this time frame.

Natural gas use has increased since 2010, but appears to currently be gradually decreasing.

Next Steps

Site visits should concentrate on minimizing the airport's extremely high energy use expenses. As lighting is a big part of airport operations, it may be beneficial to investigate funding sources for a lighting upgrade. It should also be noted that the airport's site and source EUI scores may be altered by the significant amount of outdoor lighting around the runway and drive-up entrance.

Cost-Savings Analysis

In order to meet 2020 reduction levels, this facility will need to reduce its 2012 annual energy use from 2,659,855 kBtu to 2,346,400 kBtu. This is a 12% overall reduction in energy usage from current levels. This reduction would save the facility \$12,687 in energy costs annually.

Financial Benefits in Meeting the 2020 EnergyWise Plan Goals

Figure 89 provides a summary of cost reduction in each of the selected buildings with the assumption that 2020 target reduction goals are met. This was calculated by determining 20% reductions from energy levels in the EnergyWise Plan’s appendix. The 2012 energy levels, generated in Portfolio Manager were then used to determine the amount of reduction from current levels needed to meet target levels. The % reduction was plugged into a system, offered by Portfolio Manager, which then determined the amount of energy cost savings per year, as well as a target rating.

Overall savings for meeting target levels in just these 11 buildings (The Templeton Sheriff Substation is not evaluated here) will total \$461,615. This provides a snapshot of the cost-benefits of meeting EnergyWise goals. If reduction levels were met in all of the County’s facilities, even more money would be saved.

Budgeting Tools for Energy Improvements

EECBG
San Luis Obispo County was awarded an Energy Efficiency and Conservation Block Grant in 2009 by the Department of Energy. This grant was used for many of the audit and retrofit projects listed in this report, however, it has been depleted.

The General Fund
The County’s General Fund may be used for energy efficiency projects with very high monetary payoffs. This fund is limited, and therefore cost-concerned.

Public Facility Fees
New developments are charged a fee, which contributes to this fund. The fund generates about \$1 million a year and is used for General Government, Law Enforcement, Fire Protection, Libraries, and Parks.

Other Grants
Grants are a major source of funding for most energy efficiency projects. Depending on the type of building and the project, different grants are available. A list of grants in each department category can be found in the County’s Capital Improvement Plan.

Figure 89: 2020 Reduction Goal Cost-Savings

Building Name	2006 Energy Use	20% of 2006 Energy Use	Targeted Energy Use	2012 Energy Use	Target %	% Reduction	Energy Cost Savings (\$/year)	Target Rating
Ag Commission	142000	28400	113600	270,901	42%	58%	\$3,429	98
Child Support Services	189000	37800	151200	825,807	18%	82%	\$29,389	100
Government Center	13100000	2620000	10480000	18,986,017	55%	45%	\$276,617	99
Health Campus	3272000	654400	2617600	4,319,478	61%	39%	\$53,547	95
Juvenile Services	2651000	530200	2120800	2,141,665	99%	1%	\$524	n/a
Main Jail & Female Jail	14404000	2880800	11523200	15,022,235	77%	23%	\$59,926	n/a
Public Health Laboratory	1514000	302800	1211200	1,284,343	94%	6%	\$2,342	n/a
Sheriff-Detectives Building	535000	107000	428000	666,941	64%	36%	\$9,233	n/a
Sheriff-Honor Farm	6211000	1242200	4968800	5,716,633	87%	13%	\$11,323	n/a
Sheriff Substation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sheriff Substation- Los Osos	189000	37800	151200	228,924	66%	34%	\$2,598	n/a
SLO County Airport	2933000	586600	2346400	2,659,855	88%	12%	\$12,687	n/a
TOTAL REDUCTION SAVINGS/YEAR							\$461,615	

Energy Watch Partnership
The Energy Watch Partnership has a certain amount of funding allocated for conducting energy audits. Energy Watch paired with Abraxas Energy Consulting to conduct the recent Government Center Audit, as well as an audit at the Air Pollution Control District Building.

(County of San Luis Obispo, 2012)

While most evaluated facilities do not meet criteria for receiving an Energy Star rating, those that received a rating are shown in Figure 90. The facilities highlighted in darker blue are eligible to qualify for Energy Star Certification and should be commended for their outstanding energy use.

The average Energy Star rating for these 13 buildings is an 84, which is very efficient. Buildings receiving perfect scores should be analyzed for possible on-site energy infrastructure. For example, a recent energy audit at the APCD office revealed that this facility is partially powered by solar panels, contributing to its very high score. The Atascadero Hospital and Maintenance Building 1200 should also be investigated for highly efficient infrastructure.

Figure 90: Facilities receiving Energy Star Ratings

Facility Name	Energy Star Rating
APCD Offices	100
Child Support Services	52
Environmental Health Service	93
General Services	93
Government Center	80
Health Campus	81
Hospital- Atascadero	100
Longbranch Building	60
Maintenance Building 1200	100
PRE-21 Social Services	84
Social Services	93
PA-35 Social Services	96
PO-15 Social Services	74

Applying for the Energy Star

In order to qualify for Energy Star Certification, a facility must earn a score of 75 or higher, meaning that the building performs more efficiently than 75% or more of its peers, nationwide. The building must also fit into one of the rateable building types, as previously mentioned.

Once a building has been scored at 75 or higher, a professional engineer or registered architect must verify the building's eligibility.

- 1) Application documents from Portfolio Manager must be completed. These documents are the Statement of Energy Performance, the Data Checklist, and the Letter of Agreement (LOA). This is done on the Portfolio Manager website.
- 2) Have a licensed engineer or architect sign and stamp the Statement of Energy Performance and sign and complete the Data Checklist. Have the Primary Contact listed on the Statement of Energy Performance sign the letter of Agreement.
- 3) Submit the three documents to
ENERGY STAR Certification for Buildings
c/o The Cadmus Group, Inc.
1555 Wilson Boulevard, Suite 300
Arlington, VA 22209

Overall Energy Use

Achievements

The County of San Luis Obispo is performing statistically better than the National Median, with 77% of its buildings performing more efficiently than the median EUI score.

Areas of Improvement

The County's buildings are not currently on track to meet the EnergyWise Plan's goal of decreasing energy use in municipal facilities 20% from 2006 levels by the year 2020. 54% of facilities have decreased in energy use since 2006, while 46% have increased. A dramatic increase from 2006 levels was seen in 2011.

Departmental Energy Use

Achievements

The Community Services, Health & Human Services, and Internal Support Departments use proportionally less of the County's overall energy use than the sum of their buildings' square footage suggests.

All three of these departments, along with the Land Based Department have lower overall energy usage than their 2006 levels.

Areas of Improvement

The County's Public Protection Department currently uses 40% of the County's overall energy use, while its building footprint occupies only 18% of total square footage. 35% of its buildings are performing less efficiently than the national median EUI score in this category.

The County's Fiscal & Administrative Department currently uses 29% of the County's overall energy use, while its building footprint occupies 25% of County building total square footage.

Both departments are using more energy overall than in 2006.

Buildings

Achievements

Ten of the County's buildings already qualify for Energy Star Certification.

Areas of Improvement

The buildings identified for individual study consume a large portion of the County's Energy Use. Energy efficiency improvements of these buildings are imperative to meeting the EnergyWise 2020 goals.

Based on analysis of the twelve selected buildings, audit and retrofit recommendations are listed. Retrofits can be implemented first, followed by high-priority audits and then low-priority audits. Facilities were given recommendations based on whether or not energy use had increased or decreased since 2006, the amount of cost-savings associated with meeting EnergyWise Goals, the amount of overall energy used, as well as the building's eligibility to become Energy Star certified.

Figure 91: Audit Implementation Plan

Building Name	Recommendation	Reasoning
Government Center	Retrofit	This building was recently audited and was recommended for specific retrofits. It is the highest energy user in the County and has increased 47% in energy use since 2006. If EnergyWise goals were met, this building would save \$276,617 annually. Recommended retrofits should be implemented and regular audits should be conducted here.
Child Support Services	High-Priority Audit	This building has increased 341% in energy use since 2006 and ranks high in all categories. If EnergyWise goals were met, this building would save \$29,389 annually. It is also eligible to qualify for an Energy Star certification.
Health Campus	High-Priority Audit	Although this building is relatively efficient and has an Energy Star rating of 82, it is one of the highest overall energy users and has increased 31% in overall energy use since 2006. If EnergyWise goals were met, this building would save \$53,547 annually.
Mail Jail & Female Jail	High-Priority Audit	This building has the highest cost and highest EUI scores, as well as the 2nd highest total energy use scores. It has increased 3% in energy use since 2006. If EnergyWise goals were met, this building would save \$59,926 annually.
Sheriff-Detectives Building	High-Priority Audit	This building ranks high in all categories and has increased 25% in energy use since 2006. If EnergyWise goals were met, this building would save \$9,233 annually.
SLO County Airport	High-Priority Audit	This building has the 2nd highest cost and high ratings in all categories. It has an abundance of lighting that should be audited for retrofit opportunities. Although it has decreased its energy use by 6% since 2006, a 12% reduction from current levels would meet the EnergyWise goals and save \$12,687 annually.
Agricultural Commission	Low-Priority Audit	Although this building has increased 103% in energy use since 2006, it does not rank as one of the top energy users. If EnergyWise goals were met, this building would save \$3,429 annually, which is relatively low.
Juvenile Services	Low-Priority Audit	Although this building ranks high in all categories, it has decreased its energy use 18% since 2006. It has already undergone several retrofits which appear to have saved energy. Only a 1% reduction in energy use is needed to meet EnergyWise goals.
Public Health	Low-Priority Audit	Although this building has the 3rd highest annual energy cost and ranks highly in other categories, it has decreased in energy use 10% since 2006. An additional 6% reduction from current energy levels would save \$2,342 annually, meeting EnergyWise goals.
Sheriff-Honor Farm	Low-Priority Audit	This building ranks high in all categories, but has decreased its energy use by 8% since 2006. Many retrofits have already been implemented here, contributing to this savings. If EnergyWise goals were met, the building would save \$11,323 annually.
Sheriff Substation- Templeton	Low-Priority Audit	This building has the 10th highest cost and high EUI scores, but is not one of the County's top energy users. Due to the lack of background information, it cannot be related to EnergyWise goals.
Sheriff Substation- Los Osos	Low-Priority Audit	Although this building has the 12th highest cost and 11th highest EUI scores, it is not one of the County's top energy users. The building has increased its energy use by 32% since 2006, and should eventually be audited. If EnergyWise goals were met, \$2,598 would be saved annually.

Recommended Actions

The following actions are recommended, based on the results of this report.

- Organization and collaboration between departments should be encouraged, in order to more efficiently share data.
- Yearly reports should be produced as a measure of progress towards meeting 2020 reduction levels.
- Efforts should be focused on audits and retrofits of the twelve selected buildings first, followed by analysis and audits in the remaining County buildings.
- The Public Protection Department's energy use levels should be monitored and improved when feasible.
- Those buildings that are Energy Star qualified should apply for certification.
- The County should continue to seek funding sources for implementing audits and retrofits.

Figure 92 provides an implementation plan for these actions, complete with their level of priority, suggested time frame, as well as departments and contacts in charge of each measure.

Figure 92: Recommended Actions Implementation Plan

Recommended Action	Priority	Timeframe	Responsible Department	Contact
Conduct audits and retrofits of the twelve selected buildings	High	Near-term	Energy Watch and PG&E	Trevor Keith and Steve Spratt
Monitor and seek improvements to the Public Protection Department's energy use levels	High	Near-term	Energy Watch and PG&E	Trevor Keith and Steve Spratt
Seek additional funding sources for implementing audits and retrofits	High	Ongoing	Energy Watch	Trevor Keith
Encourage greater organization and collaboration between departments	Medium	Ongoing	Planning, Public Works, and General Services	Department Heads
Produce yearly reports as a measure of progress towards meeting 2020 reduction levels	Medium	Ongoing	Energy Watch	Trevor Keith
Further analyze and audit the remaining County buildings	Medium	Mid-term	Energy Watch and PG&E	Trevor Keith
Apply for Energy Star Certification in qualified buildings	Low	Immediate	General Services	Building Managers

Figure 93: Implementation Time Frame

Numeric Time Frame	General Time Frame
Continual	Ongoing
This Year	Immediate
1-5 Years	Near-Term
5-10 Years	Mid-Term
10+ Years	Long-Term

Facility Name	Total Floor Space (Sq. Ft.)	2012 Energy Cost (US Dollars (\$))	2012 Site Energy Intensity (kBtu/Sq. Ft.)	2012 GHG Emissions	2012 Total Site Energy Use (kBtu)	2011 Total Site Energy Use	2010 Total Site Energy Use	2012 Electricity Use (kWh)	2011 Electricity Use (kWh)	2010 Electricity Use (kWh)	2012 Natural Gas Use (therms)	2011 Natural Gas Use (therms)	2010 Natural Gas Use (therms)	Change in Site Energy Use from 2006-2012
3518-3556 El Camino Real Drug and Alcohol Services	4807	\$ 7,103.23	42.6	14.35	204898.3	210982.1	203406.8	26865.3	26996.7	29260.7	1132.3	1188.7	1035.7	12%
APCD Offices	8512	\$ 5,850.53	18.4	11.79	156406.3	173167.5	168959.3	16194.9	21388	25886.2	1011.5	1001.9	806.4	-2%
Ag Commission	2880	\$ 6,015.55	94.1	17.28	270901.4	188317.4	125602.1	22283.3	22816.1	20628.3	1948.7	1104.7	552.2	103%
Agricultural Commissioner	2935	\$ 4,779.73	57.2	11.46	167927.6	183129.2	182803	19659.6	22433.7	19022.9	1008.5	1065.9	1179	-59%
Animal Services	13499	\$ 20,621.10	N/A	N/A	N/A	1024068.6	1117586.9	N/A	0	0	N/A	10240.7	11175.9	N/A
Child Support Services	12350	\$ 35,839.93	66.9	67.66	825807.2	802480.9	732431.9	184636	175881.6	154922.4	1958.3	2023.7	2038.4	341%
El Chorro Maintenance	1857	\$ 2,724.56	40.3	5.57	74890.6	69929.6	82109.1	12325.5	12683.7	12522.2	328.4	266.5	393.8	-26%
Environmental Health Service	21037	\$ 24,303.20	34.8	55.18	731188.2	694197	718248.2	126722.8	131147.3	143474.8	2988.1	2467.2	2287.1	3%
General Services	9010	\$ 16,393.90	31.7	24.6	286040	298897.2	327978.6	73009	78699.4	90138.1	369.3	303.8	204.3	18%
Government Center	245309	\$ 614,704.70	77.4	1514.42	18986016.9	19675927.4	16761081.3	3925390.7	3978108.2	3745178.5	55925.8	61026.2	39825.3	47%
Grand Jury	1996	\$ 2,384.21	41.5	5.59	82883.9	85634.6	78777.3	9159.9	11147.6	9732.7	516.3	476	455.7	33%
Health Campus	116337	\$ 137,299.01	37.1	327.21	4319478.2	4477320.9	4752841.3	758125.2	736081.5	704618.6	17327.5	19658.1	23486.8	31%
Hospital- Atascadero	20054	\$ 15,591.28	24.5	34.73	491465.7	562452.2	684475.8	66801.2	84685.3	91387.8	2635.4	2735.1	3726.6	-43%
Info Services/ Communication	2214	\$ 4,343.40	55.1	8.99	121964.9	136026.4	133045.2	19478.9	20119.6	18529.8	555	673.8	698.2	-3%
Juvenile Services	22783	\$ 51,967.35	92.9	154.22	2116635.7	2126232.2	2050556.6	323891.8	312139.6	295871.3	10115.2	10612.1	10410.4	-18%
Kimball Building	17167	\$ 10,128.91	23.6	26.14	405917.9	313032.2	304504.9	35352.7	44494.5	50725.5	2852.9	1612.2	1314.3	-25%
Library- AG	12000	\$ 22,420.36	47	45.34	564232.5	529890.8	527384.7	119260	125493.6	133849.5	1573.2	1017.1	706.9	0%
Library- Atascadero	7000	\$ 16,497.65	76.9	37.46	538551.1	549838.7	535567.6	68579.4	61392.7	61564.9	3045.6	3403.7	3255.1	5%
Library- Cambria (new)	5800	\$ 680.79	1.5	0.79	8683.7	8143.9	8557.8	2545.1	2386.8	2508.2	N/A	N/A	N/A	
Library- Creston	900	\$ 1,450.36	28.1	2.3	25323.4	25218.7	23523.6	7421.9	7391.2	6894.4	N/A	N/A	N/A	14%
Library- Los Osos	3976	\$ 5,859.99	34.8	11.25	138304.8	131296	128872	30255.2	31837.9	31178.1	350.7	226.6	224.9	12%
Library- Morro Bay	6550	\$ 8,782.45	30.5	16.62	199930.8	203557.3	196392.6	46598.3	44775	43655.5	409.4	507.9	474.4	5%
Library- Nipomo	4415	\$ 9,971.20	51.2	18.74	225880.4	232304.5	217333.9	52318	51255.8	51099.9	473.7	574.2	429.8	6%
Library- San Luis Obispo	23000	\$ 24,349.79	21.4	44.76	492681	527190.8	520474.5	144396.5	154510.8	152542.4	N/A	N/A	N/A	0%
Library- San Miguel	775	\$ 918.34	19.6	1.38	15157.4	14951.8	15731	4442.4	4382.1	4610.5	N/A	N/A	N/A	-4%
Library- Santa Margarita	900	\$ 1,815.35	56.9	3.66	51206.7	53792.8	52595.4	7260.4	7507.4	7594.7	264.3	281.8	266.8	-5%
Library-Cambria	2331	\$ 3,105.57	31.9	5.87	74471.7	75923.6	72520.6	14865.7	14819.6	15161.1	237.5	253.6	207.9	-24%
Longbranch Building	7442	\$ 13,656.68	52.5	29.34	390555.4	354015.4	355635.5	66607.3	57899.3	56340.6	1632.9	1564.6	1634	N/A
Main Jail & Female Jail	46925	\$ 261,298.01	321.3	997.37	15078342.3	14662067.8	13731650.9	1519205.3	1450543.4	1457955.8	98948.1	97128.1	87571.1	4%

Facility Name	Total Floor Space (Sq. Ft.)	2012 Energy Cost (US Dollars (\$))	2012 Site Energy Intensity (kBtu/Sq. Ft.)	2012 GHG Emissions	2012 Total Site Energy Use (kBtu)	2011 Total Site Energy Use	2010 Total Site Energy Use	2012 Electricity Use (kWh)	2011 Electricity Use (kWh)	2010 Electricity Use (kWh)	2012 Natural Gas Use (therms)	2011 Natural Gas Use (therms)	2010 Natural Gas Use (therms)	Change in Site Energy Use from 2006-2012
Maintenance Building 1200	50121	\$ 7,956.51	5.4	18.91	268312	290598.2	227984.3	36050.3	37055	35998.2	1453.1	1641.7	1051.6	33%
Morro Bay Clinic	2803	\$ 2,517.20	25.6	5.13	71883.4	95074.9	105521.4	10154.9	12755.9	12303.5	372.3	515.5	635.4	-27%
NC Fleet Maintenance	1764	\$ 2,032.53	22	3.53	38850.4	37673.8	51736.8	11386.4	11041.6	15163.2	N/A	N/A	N/A	N/A
Oceano Airport	43004	\$ 13,522.23	6.6	23.52	283172.9	275300.6	259369.8	65835.9	61252	56842.9	585.4	663.1	654.2	-19%
PA125- Behavioral Health	19873	\$ 3,459.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PA37 Mental Health	4263	\$ 11,357.32	50.6	18.61	215702.9	172452.5	N/A	55539.3	45220.8	N/A	262	181.6	N/A	N/A
PB19- Assessor/ Clerk/ Planning	4650	\$ 7,646.71	43.4	14.83	201585.6	202530.1	168683.4	31975	31710.3	24128.3	924.9	943.3	863.6	-1%
PO-16 Sheriff Report Office	400	\$ 773.14	60	1.51	24006.4	N/A	N/A	1846.2	N/A	N/A	177.1	N/A	N/A	N/A
PRE21- Social Services	10405	\$ 22,649.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PT123- Health	1435	\$ 1,939.57	23.7	3.08	33953.1	313.1	N/A	9951.1	91.8	N/A	N/A	N/A	N/A	N/A
Probation SLO	14402	\$ 24,261.23	46.7	51.07	672612.7	645178.7	640378.1	118961.8	114514.3	116661.5	2667.2	2544.6	2423.3	9%
Public Health Laboratory	11806	\$ 39,025.97	108.8	93.13	1284342.7	1435857.6	1351161.8	193004.3	200827.9	200287.4	6258.1	7506.3	6677.8	-10%
Public Health- Grover Beach	4843	\$ 6,985.84	41.2	14.92	199740.3	199527.9	198870.8	33383.9	32414.2	32500.5	858.3	889.3	879.8	92%
Public Health- Paso Robles	4391	\$ 8,944.31	54.5	18.09	239163.1	260772.2	255629.3	41780.7	48885.2	49928.3	966.1	939.8	852.7	-12%
S County Regional Center	10677	\$ 4,632.78	16.2	11.56	173260.7	185409.5	214060.3	18264.5	27069.2	41778.1	1109.4	930.5	715.1	72%
SLO County Airport	25532	\$ 105,723.30	104.2	227.68	2659855.4	2776937	2658886.6	670663	695915.6	697166.4	3715.5	4024.7	2801.5	-6%
San Luis Auto Repair Smog Service	2400	\$ 359.32	1.1	0.24	2611.1	N/A	N/A	765.3	N/A	N/A	N/A	N/A	N/A	N/A
Sheriff Substation	6385	\$ 15,225.05	81	36.62	517491.2	516465.6	525835.7	70720	64940.7	60823.4	2761.9	2948.9	3183.1	N/A
Sheriff Substation- Los Osos	3200	\$ 7,402.84	66.9	15.99	214114.3	278181.2	260384.2	35757.1	39468.7	33935.8	921.1	1435.1	1446	32%
Sheriff Substation- Oceano	7760	\$ 11,168.42	41.8	24.41	324263.9	355951	361665.2	55734.2	59747.6	59758.5	1341	1520.9	1577.7	-20%
Sheriff's Office PT124	2435	\$ 1,241.99	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sheriff-Detectives Building	9450	\$ 25,673.36	70.2	54.55	663313.7	648364.5	602771.6	149908	131184	129328.7	1518.3	2007.6	1615	25%
Sheriff-EOC Building	14160	\$ 19,097.25	26	33.51	368819.1	410945.4	418877.8	108094.7	120441.2	122766.1	N/A	N/A	N/A	-11%
Sheriff-Honor Farm	34807	\$ 86,494.92	162	350.96	5637876.6	5851841.3	6315305.7	397129.1	432847.8	482431.6	42828.7	43749.6	46692.5	-8%
Sheriff-Storage PIC07	7136	\$ 3,307.31	9.9	5.92	70942.9	79307.2	70184.2	16673.5	18979	16922	140.5	145.5	124.5	-20%
Social Services	57498	\$ 95,670.11	43.5	208.83	2501559.1	2345540.8	2286257.7	589537.5	564187.5	559477.3	4900.6	4205.3	3773.2	-35%
Social Services PA-35	19728	\$ 25,002.27	35	53.43	690951	700034.8	816181.6	129749.7	131982.3	141377.7	2482.5	2497.1	3338	-7%
Social Services PB-08	4901	\$ 13,515.85	51.9	20.58	254187.3	261207.4	264133	54919.5	49029.7	53128.1	668	939.2	828.6	-11%
Social Services PB-18	931	\$ 1,138.20	51	2.9	47451.6	39548.6	43245.7	2920.4	2473.7	2239.5	374.9	311.1	356	-21%
Social Services PB26	1000	\$ 369.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Social Services PO-15	8924	\$ 18,263.15	52.2	35.89	465712.7	481116.4	491536.2	86525.4	81482.1	96197.7	1704.9	2031	1633.1	N/A
Social Services PT-86	4533	\$ 8,248.97	62.7	19.69	284357.8	374104.6	271521	35469.4	38126.1	33814.7	1633.4	2440.2	1561.5	46%
Veteran's Building	28124	\$ 15,121.06	15.7	33.14	440547.3	393393.9	416251	75488.5	65589.9	67016.3	1829.8	1696	1875.9	-17%

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Abraxas Energy Consulting. (2012). *PG&E Large Integrated Audit Report*. San Luis Obispo: Pacific Gas & Electric Company.

County of San Luis Obispo. (2012). *Infrastructure and Facilities Capital Improvement Plan*. San Luis Obispo: County of San Luis Obispo.

County of San Luis Obispo. (2012). *Proposed Budget*. San Luis Obispo: County of San Luis Obispo.

County of San Luis Obispo Department of Planning and Building. (2010). *County of San Luis Obispo General Plan: Conservation and Open Space Element*. San Luis Obispo: County of San Luis Obispo.

County of San Luis Obispo Department of Planning and Building. (2011). *EnergyWise Plan*. San Luis Obispo: County of San Luis Obispo.

County of San Luis Obispo General Services. (2013). *Cost Savings- Rebates- Energy- Maintenance*. San Luis Obispo: County of San Luis Obispo.

U.S. Environmental Protection Agency. (2013). *Portfolio Manager Overview*. Retrieved September 20, 2013, from Energy Star: <http://www.energystar.gov/benchmark>