County of Ventura
General Services Agency
Maintenance Division

2010-2011 Energy Action Plan
April 2010

Policy

This Energy Action Plan is relevant to all General Services Agency (GSA) maintained buildings. GSA shall strive to:

1. Minimize the energy intensity in GSA maintained buildings through the identification and implementation of energy efficiency projects;

2. Ensure that projects whose primary purpose may not be energy savings, such as upgrades to the HVAC, electrical or water fixtures consider reducing energy use and maximizing operational efficiency during the design phase;

3. Reduce the use of electricity, natural gas and water by a minimum of 15% over the next five years through targeted energy projects, management of building operating schedules, use of peak shifting operating strategies, management of utility rate structures and the installation of low flow water fixtures. Minimize project costs by taking advantage of available utility incentives;

4. Pursue United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building certification and/or the Environmental Protection Agency's ENERGY STAR certification for appropriate GSA maintained buildings;

5. Influence employee behavioral changes through an education program consisting of articles in the GSA newsletter and other publications, targeted emails, seminars, information kiosks and responding to employee concerns about energy use.

Implementation

The following Energy Action Plan (EAP) is designed to implement the Energy Action Policy defined above. The actions in the EAP will be implemented by GSA staff, GSA contractors and County employees. The County's CEO office, Agency Directors and GSA Management continue to provide leadership and financial support for the EAP implementation.

Programs and projects identified below will require near term investment of resources to reduce utility expenditures over the long term. Measures to reduce energy consumption are financially and environmentally prudent. Developing a culture of striving for energy efficiency in operating and maintaining GSA buildings will benefit both the County and the residents of Ventura County. Savings resulting from these actions will continue to

accumulate annually as more efficient approaches to building operation are developed and implemented.

The State of California has implemented a regulation to control greenhouse gas (GHG) emissions. The Ventura County Board of Supervisors has requested that County government reduce GHG emissions from County operations. Actions included in the GSA EAP not only improve the energy efficiency but also reduce the GHG footprint of GSA maintained buildings.

Energy Conservation Projects

GSA is responsible for maintaining approximately 3,500,000 square feet of buildings with a range of tenants including County Administration; Courts Administration and Court Rooms; Probation Administration and Detention; Sheriff's Administration and Detention; Fire Administration and Fire Stations; and Human Services.

Specific projects identified for Fiscal Year 2010-2011 include the following:

System-wide Projects

1. Monitor Equipment Operations and Schedules

Operation of the HVAC and lighting in the Government Center and in most of the larger GSA maintained buildings is controlled by a computerized energy management system (EMS.) The software allows the setting of operating times for the operation of the HVAC equipment and the lighting system in those buildings. The EMS also allows building operation to be automatically adjusted based on temperatures within the occupied space, outside air temperature and other HVAC system parameters. Operational programming within the EMS for each building will be reviewed at least annually to ensure the sequence of operation controls the building in the most energy efficient manner consistent with the occupancy of the building.

2. Energy Management System (EMS) in County Buildings

Many of the County's larger buildings are controlled by an EMS. These systems are nearing the end of their useful life. Maintenance of these systems can be problematic and many times compatible parts are no longer available. GSA is transitioning to a new web-based EMS manufactured by Andover. There is a significant operational benefit if all appropriate County buildings are controlled by the new EMS. Commonality of programming from building to building will ensure maintenance personnel and maintenance contractors understand and can utilize the EMS to efficiently control County buildings. Where appropriate, GSA will ensure that HVAC and lighting retrofit projects include the use of the Andover EMS to provide control of the new equipment.

3. Program Management of HVAC Contractors

Routine HVAC maintenance at GSA maintained buildings is subcontracted to EMCOR Services. GSA maintenance personnel oversee the operation of the building, the work of the contractor and deal with building occupants concerning issues related to building operation. EMCOR is responsible for all routine HVAC maintenance activities including filter replacement. GSA will develop metrics to assist maintenance personnel in ensuring building operating systems and equipment are being properly maintained and are operating at peak efficiencies. Five percent of maintained equipment will be audited annually.

4. Building tune-up and Retro-commissioning

Designing a new HVAC or lighting system for a building is only the first step in improving the operational efficiency of a building. Once designed and constructed, the operation of the new system must be audited to ensure the system is operating as designed, is meeting the needs of the occupants and is meeting the efficiency targets identified during design. GSA requires the designer of a building upgrade to develop a commissioning plan to ensure proper system operation once installation is complete and operation has begun. For older buildings, GSA will audit and develop commissioning surveys to ensure buildings are operating as efficiently as possible in support of the GSA goal to reduce energy use by a minimum of 15% over the next five year. Conducting these surveys will also give GSA personnel the opportunity to identify upgrades that should be considered for future implementation.

5. Benchmarking Utility Expenditures

GSA Accounting pays the utility bills for GSA maintained buildings. As they are paid, utility bills are logged into a database for tracking. In addition, the Government Center, the County's largest energy user, has County owned sub-meters on individual buildings to better understand the energy usage patterns within the Government Center. GSA has purchased a Utility Management System (UMS) which will easily allow usage trends to be identified in specific buildings as well as comparing energy intensity, such as energy per square foot or energy per employee, between buildings. GSA will also utilize external databases such as the US EPA ENERGY STAR Portfolio program to benchmark the energy use patterns of County buildings against similar buildings within the ENERGY STAR database. By comparing the energy intensity of GSA maintained buildings with external benchmarks, specific conservation efforts can be identified and prioritized. The UMS will also allow GSA to receive utility bills electronically eliminating the current use of receiving paper utility bills each month.

6. Refrigerants

During recent upgrades to the air conditioning systems at the Vanguard Building, East Valley Sheriff's Station, Camarillo Animal Regulation and Royal Avenue Building, GSA incorporated the use of more efficient and environmentally friendly refrigerants, R-134A

and R-410A. These refrigerants are less harmful to the ozone because they have a lower ozone depletion potential than the products that were previous contained in the systems at these buildings. In addition, GSA is replacing refrigerators that have reached the end of their useful life with energy efficient refrigerators that utilize environmentally friendly refrigerants.

7. Solar Photo Voltaic Systems

GSA will work with other County Agencies and consultants to identify buildings that may benefit from the installation of solar photo voltaic systems. Each identified opportunity will be examined to better understand the benefits of installing a solar system. For buildings where a solar installation has potential, GSA will develop a Request for Proposal to collect contractor input to more fully quantify the financial benefit of installing a solar photo voltaic system.

8. Restroom water reduction

GSA will continue to install low flow water closets, urinals and faucets in restrooms in GSA maintained buildings. Specifically targeted for replacement in the near term will be all water closets using 3.5 or more gallons per flush and all urinals using 1.5 or more gallons per flush. Waterless urinals will be installed where practical.

Building Specific Energy Conservation Projects

1. Lighting retrofits and upgrades

The County has an ongoing need to replace lamps with more efficient alternatives. This can be done on a one-by-one basis or by the process of group re-lamping or group retrofits. Due to the availability of Federal stimulus funding, GSA has identified a significant number of lighting retrofit projects to be accomplished during calendar years 2010 and 2011. Interior lighting will be upgraded to the most efficient T8, T5 and compact fluorescent lighting. Occupancy sensors and LED task lighting will be installed where appropriate. External lighting will include the installation of T5 High Output, induction, compact fluorescent fixtures or LED lighting and occupancy sensors where appropriate.

The buildings or portions of buildings that are to be retrofitted include:

646 County Square Drive
669 County Square Drive
Hall of Administration
Hall of Justice
2220 Gonzales Road
Animal Regulation
Work Furlough, Eubanks Drive

Work Furlough, Willis Drive
Ojai Police Station
Fire Department Headquarters
Fire Department Training Center
Fire Stations #23, #37, #42, #50, #51, #53
Sheriff's Academy, Camarillo
Simi Valley Mental Health
Todd Road Jail
Todd Road Jail, Exterior
Fire Communications Center
Fire Station Exteriors

2. East County Court House, Phase 1

The building's HVAC thermal energy storage system and controls are over 20 years old and are near the end of their useful life. GSA is designing a retrofit to the central chiller plant that will more efficiently respond to the load within the building and provide needed redundancy. The project includes controlling the HVAC central plant and lighting with a new Andover EMS.

3. Todd Road Jail, Master Plan

The facilities HVAC systems and controls have operated twenty-four hours a day since the building was occupied in 1995 and are nearing the end of their useful life. GSA is developing a Master Plan to guide in the upgrading of the Todd Road Jail HVAC and control systems. The Master Plan will identify the most energy efficient approach to providing heating and air conditioning to the facility and will identify a series of projects to implement the goals of the Master Plan.

4. Pretrial Detention Facility Commissioning and Implementation

GSA will conduct a retro-commissioning audit of the PTDF HVAC, controls, air and cooling water distribution systems. This audit will identify operational changes that can reduce the building operating costs while still satisfying the needs of the occupants.

5. Telephone Road Building, USGBC LEED Green Building Certification, 2011

During calendar year 2010 and 2011 GSA will apply through the United States Green Building Council (USGBC) Green Building Operations and Maintenance certification for the Telephone Road building. As part of the Leadership in Energy and Environmental Design (LEED) certification process GSA will work to improve the indoor environment; create a more energy efficient building; lower operating costs; educate occupants about how they can help to reduce, reuse and recycle and use the knowledge gained to certify other County buildings.

6. ECCH, HVAC Upgrade Phase 2

Following the chiller plant upgrade identified above, Phase 2 will focus on improving the efficiency of the interior air distribution system and will integrate interior controls into the existing Andover EMS.

7. Juvenile Justice Center, Energy Efficient Chiller

GSA is designing a new energy efficient chiller for this facility. The new chiller will be sized to more efficiently supply the cooling water required during the lower load periods of the year. An additional benefit of the new chiller will be to provide needed redundancy to support the building. The new systems will be controlled through the existing Andover EMS.

8. Solar Photo Voltaic System for Todd Road Jail

GSA is evaluating a proposal to provide electrical energy to the Todd Road Jail from a solar photo voltaic field to be built on leased land adjacent to the Jail. GSA will evaluate the proposal with the appropriate County agencies and the utility companies to determine if the project is feasible and in the County's best interest.

9. Natural Gas Supply for Todd Road Jail

Limoneira Corporation, a company with lemon and avocado orchards in Santa Paula has a contract with Occidental Petroleum to operate an oil field on the Limoneira property. As part of the oil field operation, natural gas extracted from the oil wells is flared or burned off. Limoneira has offered to evaluate the possibility of providing that gas to the County for use at the Todd Road Jail. Limoneira is investigating the quality of the natural gas; the viability of storing the gas; and the legal issues concerning transporting and selling the gas to the County.

Recently Completed Projects

GSA completed the following HVAC upgrades in 2009 and to-date in 2010: East Valley Sheriff's Station; Camarillo Animal Regulation; Royal Avenue Building; variable Todd Road Jail Cooling Tower variable frequency drives and premium efficiency motors; and PTDF variable frequency drives. These projects resulted in a savings of 124,000 kWh and a decrease of 89 tons of greenhouse gas annually.

1. East Valley Sheriff's Station

GSA replaced twenty-one package air conditioning units which were at the end of their useful life, with new, energy efficient units utilizing environmentally friendly refrigerant. In addition, the ductwork was cleaned and modified, as necessary, to more efficiently

serve rooms that had been modified by use or by size since the building was constructed. A new web-based Andover EMS was installed to replace the existing, obsolete control system and system commissioning was completed.

2. Camarillo Animal Shelter

GSA replaced six package air conditioning units which were at the end of their useful life, with new, energy efficient units utilizing environmentally friendly refrigerant. The new package units were integrated into the web-based Andover EMS.

3. Royal Avenue

GSA replaced six package air conditioning units which were at the end of their useful life, with new, energy efficient units utilizing environmentally friendly refrigerant. The new package units were integrated into the web-based Andover EMS.

4. Vanguard Building USGBC LEED Green Building Certification. June 2010

In March, 2010, GSA submitted the application to the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) for Existing Buildings (EB) Green Building certification for the Vanguard Building. The application was submitted at a Silver level and the application process should be complete by June, 2010.

The Vanguard Building and its systems were over 20 years old and scheduled for replacement and upgrade. GSA felt that this was the right time to pursue USGBC LEED-EB Green Building Certification. The results are an improved indoor environment; a more energy efficient building; lower operating costs; occupants know how they can help to reduce, reuse and recycle and we will use the knowledge gained to certify the Telephone Road Building and other County buildings.

The Vanguard Building earned an ENERGY STAR score of 81 from the Environmental Protection Agency and Department of Energy as of January, 2010. This is an increase of 15 points over the January, 2009 ENERGY STAR score of 66. The upgrades to the building have reduced energy costs by approximately $44,000 annually.

5. Hall of Administration, All Variable Speed Central Plant Control System

GSA installed a "Hartman Loop" control system for the Hall of Administration central chiller plant. The “Hartman Loop” is a proprietary computer-controlled operating system that integrates and optimizes the performance of the chillers, the chilled and condenser water pumps and the cooling tower providing the chilled water used to cool the Hall of Administration. Installation of this system has resulted in a decrease of building operational electrical energy by 197,000 kWh and a decrease of 141 tons of greenhouse gas annually.

6. Solar Photo-Voltaic System

GSA completed a power purchase agreement that resulted in the installation of solar photovoltaic systems on GSA's Vanguard Building, the Saticoy GSA Building and the Saticoy PWA Building. The systems became operational in March 2010. The three systems will generate 742,469 kWh annually resulting in a decrease of 514 tons of greenhouse gas annually compared to power plant generated electricity.

7. Various Lighting Upgrades

GSA uses the latest, economical, technology when upgrading building interior and exterior lighting. Examples include retrofitting lighting to high performance, low energy, T-8 lamps and ballasts; installing T-5 high output lamps in parking lots that use dual levels controlled by motion sensors; and utilizing LED desk top task lights in office remodels. Lighting retrofits completed in 2009 and to-date in 2010 have included: Juvenile Justice Center Gymnasium Lighting; PTDF interior lighting upgrades; Vanguard Building Parking Lot; Hall of Justice stairways and basement; Telephone Road Building Parking Lot; 2220 Gonzales Road, Portions of the Second Floor Lighting; and multiple Fire Stations. These energy conservation measures will result in a decrease of building operational electrical energy of 728,000 kWh annually which is an equivalent decrease of 522 tons of greenhouse gas annually.

8. Vanguard Building, Low Flow Water Fixtures

GSA installed low flow water fixtures, replacing water closets that were rated at 3.5 gallons per flush and urinals that were rated at 1.5 gallons per flush. The actual reduction in water amounted to 30 HCF per month which is equivalent to 3,000 cubic feet or 22,440 gallons per month.

9. Hall of Administration, Waterless Urinals

GSA has installed waterless urinals in several restrooms in the Hall of Administration. Compared with standard urinals, the waterless urinals can save between 20,000-40,000 gallons of water per year, each.