



**Alabama State Buildings Energy Conservation Initiative**

**Executive Order Number 25  
Fiscal Year 2013 Annual Report**

**April 1, 2014**

**Prepared for:**

**Governor Robert Bentley**

**Prepared by:**

**Alabama Department of Economic and Community Affairs  
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**Jim Byard, Jr.  
Director**

OFFICE OF THE GOVERNOR

**ROBERT BENTLEY**  
GOVERNOR



**STATE OF ALABAMA**

April 1, 2014

ALABAMA DEPARTMENT OF ECONOMIC  
AND COMMUNITY AFFAIRS

**JIM BYARD, JR.**  
DIRECTOR

The Honorable Robert Bentley  
Governor of Alabama  
State Capitol  
Montgomery, Alabama 36130

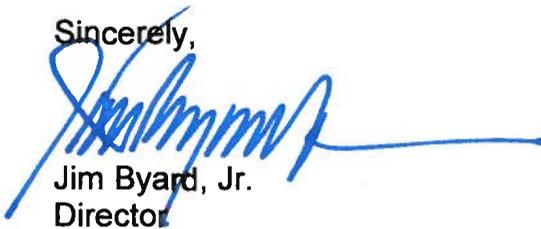
Dear Governor Bentley:

I am pleased to issue the second report for the Alabama State Buildings Energy Conservation Initiative. Executive Order Number 25, you signed requiring State departments and agencies to reduce their energy consumption by thirty percent by Fiscal Year 2015 relative to Fiscal Year 2005, is having a major impact on saving the state money.

Within the first two years State departments and agencies have saved \$7.4 million, 37 percent above the projected goal of \$5.4 million. During Fiscal Year 2013, State departments and agencies saved \$4,167,834, two Universities saved \$397,895, and one Institution saved \$67,061. This represents a total of \$4,632,790 in annual energy savings.

ADECA is committed to ensuring the goals of your Executive Order are carried out.

Sincerely,



Jim Byard, Jr.  
Director

JB/TLA/sf

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## **Introduction**

ADECA and the Alabama Department of Finance have partnered in the State Buildings Energy Efficiency Program to promote saving energy in state buildings. Using building management practices and energy-efficient technologies, the State can save energy and water while reducing waste and pollution. These measures can lead to significant long-term cost savings for State government.

Executive Order Number 25 (EO 25) was signed November 15, 2011, and issued December 28, 2011 by Governor Robert Bentley. All State departments and agencies shall reduce energy consumption by Fiscal Year 2015, as the State works to implement energy-efficient practices and reduce wasteful and inefficient uses of energy. Under EO 25, all State agencies and departments are to designate an Energy Officer to study, investigate and recommend energy saving procedures and practices for their agency. Agencies must reduce energy consumption by 30 percent by 2015, relative to 2005 levels.

EO 25 also requires all State departments and agencies to use the U.S. Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager Program for benchmarking. It also created an increase in the need for training as agency participation increased from the appointment of new Energy Officers.

## Program Performance Summary

There are 23 State agencies utilizing EPA's ENERGY STAR Portfolio Manager with 820 properties. Included is Postsecondary Education (Alabama Community College System) with 27 campuses and 529 properties, two Universities and one Institution with 82 properties. The following chart reflects agencies reporting the percent change from the Base Year of 2005, and the reductions towards meeting the EO 25 goal of a 30 percent reduction in energy consumption by FY 2015. During FY 2013, State agencies saved an estimated \$4,167,834, the two Universities saved \$397,895, and the Institution saved \$67,061, for a total of \$4,632,790 in annual energy savings. The State agencies savings for the first two years reporting is \$7.4 million, 37 percent above the goal of \$5.4 million projected for EO 25 by FY 2015.

**The following represents Energy Data submitted for FY 2013**

Reporting Agencies		----- FY 2013 -----		
Agency/Institution Name	Total Floor Space (Sq. Ft.)	Annual Energy Cost	% Chg from Base Year	2013 Est. Cost Saved/Avoided
ABC Board Central Office Hqs & Warehouse	174,610	\$152,800	-14.1	-\$25,056
Corrections Department	2,980,363	\$7,901,168	-11.8	-\$964,143
Emergency Management Agency	35,000	\$153,342	-46.5	-\$92,367
Environmental Management	195,222	\$486,663	-24.0	-\$153,962
Finance Department	1,833,076	\$3,423,854	-7.6	-\$286,946
Forestry Commission	29,936	\$34,583	-40.0	-\$23,043
Geological Survey/Oil and Gas Board	95,967	\$101,607	-4.2	-\$2,826
Mental Health	435,996	\$1,143,143	-53.3	-\$1,305,401
Military Department (State Operated Facilities)	1,213,229	\$2,837,749	-6.2	-\$186,108
Pardons and Paroles	73,517	\$174,384	-27.7	-\$66,815
Postsecondary Education (ACCS)	6,841,948	\$12,519,261	N/A	-\$843,723
Public Health	942,041	\$2,170,123	-3.2	-\$148,859
Public Television	47,268	\$153,342	-7.6	-\$12,626
Real Estate Commission	16,681	\$37,557	10.3	N/A
Supreme Court	265,017	\$506,415	-10.0	-\$55,959
Alabama Institute for Deaf & Blind	556,758	\$368,690	-15.4	-\$67,061
Athens State University	393,817	\$517,380	-21.8	-\$144,525
University of Montevallo	1,045,799	\$1,379,832	-15.5	-\$253,370
<b>TOTALS for FY 2013:</b>	<b>17,176,245</b>	<b>\$34,061,893</b>		<b>-\$4,632,790</b>

Notes:

1. Current Energy Period Ending Date is the last 12 months of complete utility data in Portfolio Manager.
2. Base Year of FY 2005 is not complete for all facilities and % Chg from Base Year for those facilities reflects the first complete 12 months of data after October 2004.

## **STATE OF ALABAMA - AGENCY REPORTS**

### **Alabama Alcoholic Beverage Control Board**

- Replaced 360 high bay 250 watt high pressure sodium lamps with 360 112 watt LED high bay lamps in the warehouse. Also replaced 62 two-lamp F96/T12 lamps to four-lamp F32/T8 lamps and 34 four-lamp F34/T12 lamps to two-lamp F28/T12 lamps in the warehouse. Installation will reduce power usage by 30 percent for lighting the warehouse.
- Plans for replacing 23 natural gas high bay unit heaters, which were installed in 1982 in the warehouse, with high efficiency unit heaters and installing High Volume Low Speed (HVLS) fans that will reduce energy usage by 25 percent.

### **Alabama Department of Conservation and Natural Resources**

- The Marine Resources Division constructed a new office and laboratory at the Claude Peteet Mariculture Center. The project included a new 8,430 square foot administrative building and a 22,927 square foot laboratory building. The facilities were constructed using LEED and ENERGY STAR compliance standards.
- The State Lands Division has installed insulation in several facilities and continues to enforce energy conservation measures in all facilities.
- The Wildlife and Freshwater Fisheries Division closed one division office and continues to enforce energy conservation measures in all facilities.
- The State Parks Division has upgraded lighting and installed energy-efficient toilets and urinals. Air Conditioning units in cottages and cabins have been replaced with energy-efficient heat pumps.

### **Alabama Department of Corrections (ADOC)**

- Implemented two energy performance contracts totaling over \$95 million in project costs. Over 480 ECM's (energy conservation measures) were installed at 34 ADOC facilities statewide. ECM's included lighting upgrades, personal computer power management, programmable thermostats, occupancy sensors, ozone laundries, and water conservation equipment. Also two "green" energy projects involving solar voltaic and solar radiation and upgrades to an existing biomass boiler were completed in 2013.
- Hired a maintenance technician to inspect installed ECM's at all ADOC facilities and ensure they continue to function as designed.

- A Request for Proposals (RFP) for a third Energy Performance Contract was recently issued (October 29, 2013). Exterior and interior lighting are anticipated as the primary areas to be addressed.
- Ten propane hybrid 15-passenger vans were purchased as a pilot project aimed at reducing operational costs at one work release facility. Due to the price of propane on State contract and the high number of miles work release vans accumulate annually, it is anticipated that conversion costs will be recovered within one year and vehicle costs will be recovered in 3-4 years.

### **Alabama Emergency Management Agency**

- Heating, Ventilation and Air Conditioning (HVAC) improvements, lighting and energy management controls were completed. The renovated building has reduced energy consumption by 52.1 percent since FY 2005. The new facility has reduced energy consumption by 31.3 percent since constructed in FY 2008.

### **Alabama Department of Environmental Management (ADEM)**

- ADEM continues to require compliance with their Energy Conservation guidance memorandum. They worked with the HVAC controls vendor to optimize settings in the Central Laboratory and to ensure accurate outdoor temperature readings on the Environmental Building HVAC system.

### **Alabama Department of Finance**

- The Alabama Department of Finance implemented low-cost/no-cost measures and conducted general audits towards achieving the goal of Executive Order 25. Lighting retrofits to the Lurleen B. Wallace Office Building was completed during FY 2012 providing a 4.9 percent decrease in energy consumption for FY 2013. The building's automatic controls upgrades reduced energy consumption 26.9 percent below that of FY 2005.

### **Alabama Forestry Commission**

- Major renovations to the previously-existing air handling systems were performed. Continued lighting renovations to switch to T-8 fixtures and reduced the number of fixtures. A computer-controlled HVAC system was also installed.

### **Geological Survey of Alabama/State Oil & Gas Board**

- Low-cost/no-cost measures implemented include the use of compact fluorescent lighting and occupancy sensors. An energy education program was implemented with staff concerning turning lights and computers off when offices are vacant. In addition, staff was encouraged to use window blinds during summer months to reduce solar heat gain.

Installed T8 ballasts and lights in previous T12 fluorescent fixtures as T12 ballasts failed and installed T8 fixtures in new installations.

- The baseline year ends August 30, 2010, due to accounting, billing, and metering changes. There was a decrease in Source EUI of 18.9 percent resulting in a utility cost reduction of 24.5 percent for Walter B. Jones Hall. Mary Harmon Bryant Hall, of which 75 percent of the building is shared with The University of Alabama, increased its Source EUI by 6.1 percent although energy cost was down 7.7 percent. Energy use is allocated by a fixed percentage.

### **Military Department**

- Established a four day work week with 10 hours per day. The hours were fixed for occupied status for HVAC operation from 7:00 AM to 5:00 PM.
- Energy audits were conducted at four Armed Forces Reserve Center (AFRC) sites: Haleyville AFRC, Decatur AFRC, Fort McClellan AFRC, and Birmingham AFRC on Oxmoor Road. This represents 7.3 percent of the total area for facilities in the state.
- An energy reduction of 6.2 percent was accomplished for FY 2013 compared to FY 2005. This reduction was accomplished with additional operational requirements and the addition of new facilities.

### **Alabama Board of Pardons and Paroles**

- Energy conservation low-cost/no-cost measures initiated include installing energy-efficient lighting, water savers on shower heads, cleaning all air conditioning coils, repairing water leaks and reducing water consumption in toilets.
- Energy-efficient controls and seals were installed on freezers and coolers.
- All existing heating and cooling units were upgraded to automatic digital controls.
- The Board worked with Ingenuity, Inc. to obtain an electric rate reduction with Alabama Power Company for the Thomasville LIFE Tech Facility.

### **Alabama Department of Public Health**

- A reduction in office staff due to budgeting restrictions has impacted the ability to implement all of the energy conservation measures that were planned. The Department anticipates the input of data into the new Portfolio Manager will be less labor intensive in the future, and they will be able to redirect available resources to evaluation of data and reduction of energy usage. Using data from Portfolio Manager, they will also prioritize buildings with the highest Energy Use Intensity for further study. Programmable thermostats, light sensors, and defined temperature settings have been implemented in many facilities.

## **Alabama Public Television**

- Low-cost/no-cost measures included the procurement of energy compliant replacement products, and the replacement of a 10-ton 20 year old air-conditioning unit with a high efficiency unit at the Montgomery site.
- The Montgomery site is also on a Standby Generator Program with Alabama Power Company, providing a \$692 monthly reduction (\$8,304 annually) in utility cost.

## **Postsecondary Education**

- Postsecondary began in FY 2012 to involve all of the Alabama Community College System (ACCS) in efforts to achieve the goals of EO 25. Each institution appointed an Energy Officer for implementation and administration of the respective institution's online Portfolio Manager Program. All Energy Officers and Program Managers along with principal staff attended the training offered by ADECA and EPA.
- Several campus-wide energy audits were conducted to determine energy reduction measures. The following were typical actions taken:

Bevill State Community College - The HVAC systems in existing buildings have been furnished with state-of-the-art building automation, and were more amenable to energy reduction efforts. These efforts in reducing the energy use involved innovative system programming and monitoring of all Building Automation System (BAS) occupied schedules. Programs were instituted that scheduled classroom HVAC operations only when each individual classroom or office was occupied. Energy reduction from Base Year levels was 28.5 percent.

Calhoun Community College entered into an agreement with EnerNOC, an energy management service provider, for participation in TVA's Demand Response program whereby they will reduce power usage by 40 percent. They have developed and implemented a "shed" program that reduces energy consumption with minimal impact to comfort levels in facilities. The campus received Platinum LEED Certification for the Alabama Clean Energy Technology Center renovations. They replaced outdated HVAC equipment including Variable Air Volume units, controls and systems in many of the older buildings. A major overhaul of the Research Park Campus air handlers was also accomplished. The energy reduction from Base Year levels was 25.5 percent.

Jefferson State Community College instituted rate reduction changes with Alabama Power Company resulting in savings of \$76,696.

Gadsden State Community College has utilized Performance Contracting for energy conservation projects resulting in an energy reduction from Base Year levels of 19.6 percent.

## **Alabama Institute for Deaf and Blind (AIDB)**

- AIDB began an energy-conservation program in late 2008 with Project Green, a biodiesel initiative. ADECA also assisted with funding projects for: replacement of 8,224 T12 lights with T8 lights within the Alabama School for the Blind (ASB), Alabama School for the Deaf (ASD) and Helen Keller School (HKS); replacement of HVAC units within ASB, ASD and HKS instructional buildings; replacement of two dormitory air handling/condensing units; and, the replacement of a condensing unit and boiler with four electric heat pumps at HKS. AIDB has achieved a 23 percent reduction in electric/gas usage.
- A Performance Contract is being used to replace a 1981 20-ton Trane condensing unit, with an estimated 6 SEER rating along with a 2010 Rapak boiler system, with four 3-ton Mitsubishi Electric Multi-Indoor Inverter Heat Pump Systems within HKS's Anne Sullivan Learning Center.
- The new units have a 15-18 SEER rating depending upon use for a savings of \$5,867.00 annually.
- Low-cost/no-cost measures included replacing cafeteria and dormitory appliances with ENERGY STAR appliances.

## **University of Montevallo**

- Replaced an HVAC system in the main dormitory resulting in a large decrease in energy BTU load on the central plant. Replaced the 100 year old windows in the main dormitory with more energy-efficient units. Replaced 600 feet of underground condensate lines with new insulated lines resulting in a significant increase of returned condensate.
- Continued upgrading lighting systems and worked with the Student Government Association to produce a campus wide energy plan that was presented to student and faculty groups.

## Trainings & Recommended Low-cost/No-cost Energy Conservation Measures

The ADECA - Energy Division provided technical assistance and training to State departments and agencies. Through workshops, webinars and conferences, the Energy Officers were trained in no cost energy efficiency practices, Portfolio Manager Data maintenance and reporting, as well as Commercial Building Auditing and Building Automation for energy efficiency. Representatives from 26 State agencies, departments and institutions have attended the five workshops.

<b>2013 Training Workshops:</b>	May 7	Alabama Energy Services Coalition Meeting – Performance Contracting in Alabama
	June 11	Energy Officer Training - EPA Portfolio Manager - Resources available to aid in achieving EO 25 goals
	June 26	Energy Performance Contracting Presentation for Small Drinking Water Systems
	July 25	Energy Efficiency - “Building Automation for Energy Efficient Buildings”
	August 22	Energy Efficiency - “Energy Management Best Practices”

<b>Recommended Low-cost/No-cost Energy Conservation Measures</b>	<ul style="list-style-type: none"> <li>• Ensuring energy use reduction during peak demand periods to both save energy and costs</li> <li>• Reviewing and verifying that energy bills are correct and billed at the most advantageous rate for which the agency/facility/department is entitled</li> <li>• Ensuring lighting systems are turned off during non-operating hours</li> <li>• Conversion to more energy-efficient lighting systems and bulbs as existing systems and bulbs reach the end of their life cycles</li> <li>• Maximize use of natural lighting consistent with temperature control</li> <li>• Replacement of conventional light switches with motion-sensor switches</li> <li>• Replacement of incandescent lights in exit signs with LED fixtures</li> <li>• Removal or reduction of all other non-essential lighting</li> <li>• Setting standards/ensuring HVAC systems operate at appropriate levels at all times, to include reduced levels during non-operating hours</li> <li>• Use of Building Automation System (BAS) and Automated Temperature Control (ATC) systems; set operating schedules to coincide with work day/work week</li> <li>• Ensuring preventive maintenance of HVAC systems to include cleaning/filter replacement</li> <li>• Ensuring all equipment powered by electricity is turned off when not in use</li> <li>• Temperature reduction for hot water heaters in all facilities except where operational needs require a specific water temperature</li> <li>• Prohibition of personal space heaters except in areas where central HVAC systems cannot provide adequate heat under objective standards</li> <li>• Improved insulation of windows, doors, walls, roofs, floors, and sealing of ductwork</li> <li>• Ensuring employees are educated/trained in energy conservation methods as applicable to their duties and responsibilities</li> </ul>
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## Acronyms & Definitions

ASHRAE	American Society of Heating, Refrigeration & Air-Conditioning Engineers
A/C	Air Conditioning
BAS	Building Automation System
FY 2005 Base Year	The selection of FY 2005 as the Base Year was established on U.S. Environmental Protection Agency documents for energy reduction opportunities in buildings and established standards for benchmarking energy performance.
Benchmarking	Benchmarking involves measuring and rating a building by comparing it to a standard. Some owners and managers collect energy data for their entire portfolio of buildings, calculate the EUI, which is energy consumed per square foot, and then choose a baseline as the year with the highest consumption.
BTU	British Thermal Unit - a common unit of measure for natural gas use and heat output.
ECI	Energy Cost Index - a unit of measurement that describes a building's energy cost as dollar cost per square foot.
ECM	Energy Conservation Measure
Energy Efficiency	Energy Efficiency is defined as using less energy to provide the same level of energy service.
Energy Performance Contracting	Energy Performance Contracting is offered by Energy Service Companies as a practical and economical way for public sector entities to obtain and finance needed capital energy projects for their facilities. Essentially, it is the acquisition of comprehensive energy improvements and services provided by qualified Energy Service Companies where the energy and cost savings achieved by the installed energy project are guaranteed and cover all project costs, including financing, over a specified contract term.
Energy Reduction	Energy Reduction is defined as the change in a building's EUI for two periods.
ENERGY STAR Portfolio Manager	ENERGY STAR Portfolio Manager allows you to track energy and water use trends as compared with the costs of these resources. It allows you to compare cost savings across buildings and shows the calculated cost savings for a specific project. Portfolio Manager will generate a Statement

	of Energy Performance for each building summarizing energy information and building characteristics such as site and source intensity.
EUI	Energy Use Intensity - a unit of measurement that describes a building's energy use. EUI represents the energy consumed by a building relative to its size and values are presented in kBtu/ft <sup>2</sup> .
HVAC	Heating, Ventilation and Air Conditioning
HVLS	High Volume Low Speed
kBtu	One thousand BTUs
LED	Light-Emitting Diode
LEED	Leadership in Energy and Environmental Design
MMBtu	One million BTUs
Retrocommissioning	Retrocommissioning is a systematic and documented process for identifying low-cost/no-cost improvements that can boost the efficiency and performance of an existing building.
RFP	Request for Proposals