Annual Performance Review for Fiscal Year 2011
for
State Agencies and Selected Institutions of Higher Education
Regarding the Implementation of
Act 1494 of 2009

By the
Arkansas Energy Office
Arkansas Economic Development Commission

According to Act 1494 of 2009 (Act), "…. the Arkansas Energy Office and each institution of higher education shall report to the co-chairs of the Legislative Council its:

(1) Findings under this section; and
(2) Recommended changes, if any."

According to the Performance Review — A report is required which includes the following:

(1) An identification of the costs of implementing energy efficient and water-efficient building standards in the design and construction of a major facility or major renovation;
(2) An identification of the operating savings attributable to the implementation of energy-efficient and water-efficient building standards, including without limitation savings in energy, water, utility, and maintenance costs;
(3) An identification of any impact on employee productivity from the application of the standards under this subchapter; and
(4) An evaluation of the effectiveness of the application of the standards under this subchapter.

This report is for all participating State Agencies and Institutions of Higher Education reporting through the AEO. The following report is submitted on the activities related to the fiscal year 2011:

Overview

The Arkansas Energy Office (AEO) has worked with State Agencies and Institutions of Higher Education to implement Act 1494 of 2009 *Energy Efficiency and Natural Resource Conservation in Public Buildings*. This Act was passed on the premise that public buildings can be built, renovated and operated using sustainable, energy-efficient practices and technologies that save money, reduce negative environmental impacts and improve employee performance. The AEO developed the Rules for the act and has begun the implementation process using Energy Star Portfolio Manager (ESPM) to monitor compliance. The Department of Higher Education has participated actively with state agencies in implementation of Chapter 4 "Sustainable Building Design for a Major Facility or Major Renovation", but has left implementation of Chapter 6 "State Buildings Energy Management Program" to the institutions. Funding of the work for the AEO program expires March 31, 2012.

The following amendments were made to the Act during the 2011 Legislative Session:

- Delete the role of the AEO to administer an operations and maintenance program for state facilities.
- Clarify that the AEO will implement plans to the extent funds are available.
- Change audit requirement from the Arkansas Energy Office to the State Agencies for facilities they own.
- Require State Agencies to audit all building by June 30, 2015 and report findings to AEO.
- Change the reporting deadline for annual energy costs and usage to October 31.

Important Dates and Milestones

- April 14, 2009 – Act 1494 signed into law
- December 1, 2010 – First report due to the Legislative Council
- January 1, 2011 – Rules for Act 1494 became effective
- February 23, 2011 – First loan for energy efficiency projects using Act 1494 criteria
- April 28, 2011- First Advisory Committee meeting
- October 31, 2011 – First report due using Energy Star Portfolio Manager
- December 1, 2011-Second report due to the Legislative Council
- June 30, 2014 – 20% reduction target deadline
- June 30, 2017 – 30% reduction target deadline

1) Costs of implementing energy efficient and water-efficient building standards in the design and construction of a major facility or major renovation

a) **Finding:** The costs incurred to implement the standards required by the Act included:
   i. Administrative costs for AEO, Agencies, and Higher Education to implement the Act.
   ii. Training costs for Design Engineers and Architects on the new design requirements of the Act.
   iii. Training of Higher Education and State Agencies in the use of Energy Star Portfolio Manager Software to track energy usage and costs.
   iv. Costs to implement the new design requirements for major facilities and major renovations.

v. Costs to track energy usage and costs by State Agencies and Higher Education
vi. The cost of training of Higher Education and State Agencies on development and use of Strategic Energy Planning.
vii. Development of a basic Energy Manager training course for State Agencies and Higher Education.
viii. The cost of an Energy Manger to train larger State Agencies and Higher Education

b) **Finding:** AEO costs to implement the rules have included the following:

i. Manning costs for AEO to implement the Act, approximately **$65,000**. Funding for this position will end March 30, 2012.
ii. Contract costs for the Cadmus Group to assist with ESPM **$600,000**. Cadmus has reviewed the baseline energy usage and cost data created by each agency in ESPM. They also conducted training classes to teach agencies and institutions of higher education how to develop, maintain and report data from ESPM. Under a separate contract they presented classes on Energy Management. Funding for this work will end March 30, 2012.
iii. A contract was let with the U.S. Green Building Council for **$25,000** to train Design Engineers and Architects on the forthcoming commercial Arkansas Energy Code and application of ASHRAE 90.1 2007 to projects for State Agencies and Higher Education.

c) **Finding:** The University of Arkansas performed a study for this year to determine costs and payback between the current Arkansas Energy Code for commercial buildings (standard ASHRAE 90.1 of 2001) and the new 2007 standard. These costs were then used to determine the payback for the new design requirements in 15 different types of new commercial building construction. The results did show in all building types there is **a simple payback no more than 6 years**. Four of the building types had payback of less than a year. Act 1494 has a requirement for the design to be 10% more efficient than the 2007 standard so the payback will be a little longer.

2) Operating savings attributable to the implementation of energy-efficient and water-efficient building standards, including without limitation savings in energy, water, utility, and maintenance costs.

d) Finding: There are two projects that may qualify for the new design requirements, but are not developed enough to determine savings. These projects are in the developmental stages and will be tracked by Arkansas Energy Office.

i. **Project #: 6931201**
Agency: Pulaski Technical College
Project Name: Fine & Performing Arts / Humanities Center

ii. **Project #: 6931202**
Agency: Pulaski Technical College
Project Name: Culinary Arts & Hospitality Center, NLR, AR

e) **Finding:** There were 5 agencies/institutions that submitted 7 energy efficiency projects and requested loans from the Arkansas Building Authority Revolving Loan Fund. Each of these projects estimated the energy savings and payback period for the projects. A summary of these projects is listed below:

i. **Agency: UAMS- Upgrade the central energy plant for the campus, equipment only.**
   a. Cost $3 million
   b. Projected Savings
      - 325,021 MBtu/yr
      - 6.4 year simple payback

ii. **Agency: Arkansas State Police- Reroof the headquarters, upgrade controls and work on an energy recovery unit.**
   a. Cost $2 million
   b. Projected Savings
      - 4,866 MBtu/yr
      - 32.3 year simple payback

iii. **Agency: Arkansas Oil and Gas Commission- Renovate the El Dorado facility.**
   a. Cost $.6 million
   b. Projected Savings
      - 1,112 MBtu/yr
      - 27.9 year simple payback

iv. **Agency: SAU – Install new windows and work on the central heating and cooling systems.**
   a. Cost $1.6 million
   b. Window Replacement Projected Savings
      - 93,481 MBtu/yr
      - 16 year simple payback
   c. Central Cooling Projected Savings
      - 77,324 MBtu/yr
      - 10 year simple payback
   d. Central Heating Projected Savings
      - 83,356 MBtu/yr
      - 8 year simple payback

v. **Agency: UALR – $2.0 million to replace lights; work on central plant and controls.**
   a. Cost $1.6 million
   b. Window Replacement Projected Savings
      - 264,134 MBtu/yr
      - 7 year simple payback

3) Impact on employee productivity from the application of these standards under this subchapter;

f) Finding: The AEO is working with the Public Service Commission on metrics for measuring the impact of energy efficiency programs on consumers/employees. AEO is a member of Energy Efficiency Arkansas (EEA), a consortium with the investor owned utilities of Arkansas, Public Service Commission and other interested parties.

g) Recommendation: Use the work by EEA to develop cost estimates for a contract for Act 1494 evaluation and submit a budget item to the Legislature for consideration in the 2013 Legislative session.

4) Evaluation of the effectiveness of the application of the standards under this subchapter.

h) Finding: An Advisory Committee was appointed and is working well to assist in the implementation and monitoring of the Rules for Act 1494. The composition of this committee includes engineers, architects, state agencies, and higher education.

i) Finding: Chapter 4 of the Rules for this Act, "Sustainable Public Building Standards for a Major Facility or a Major Renovation" was implemented January 1, 2011. A Certification of Compliance by the Architect/Design Professional is required on all major project designs.

j) Finding: A Certification Checklist was developed to assist Design Engineers/Architects show Agency/Institution compliance with the Act. The Arkansas Building Authority (ABA) is helping AEO to implement and monitor this process.

k) Finding: Chapter 6 of the Rules for this Act, "State Building Energy Management Program" requires each State Agency to appoint an Energy Manager and report usage energy usage and costs to AEO. Thirty- four of 132 of the State Agencies have been targeted by AEO to start reporting because they pay utility bills directly. A summary of agency participation is listed below:

i.	Agencies covered by Act 1494,	132
ii.	Agencies submitting Strategic Energy Plans,	52

iii.	Agencies appointing Energy Managers,	52
iv.	Agencies required to report because they pay utility bills,	34
v.	Energy Star Portfolio Manager accounts	
vi.	Reporting baseline energy usage and costs,	23
vii.	Agencies reporting FY2009 energy usage and costs,	23
viii.	Agencies reporting FY2010 energy usage and costs,	23
ix.	Agencies reporting FY2011 energy usage and costs,	21

l) **Recommendations:** Continue to work with the 34 agencies paying utility bills to get energy usage and costs for each fiscal year under the Act.

m) **Recommendations:** Begin to work with the 98 agencies not paying utility bills to include their development of a Strategic Energy Plan and tracking of energy usage and costs as required by the Act.

n) **Finding:** Chapter 6 "State Building Energy Management Program" defines the programs AEO will develop to monitor and reduce energy consumption and costs by state agencies. There are six major requirements in this chapter. Progress has been made in each area. This progress is summarized below:

Strategic Energy Plans

o) **Finding:** Each state agency is now required to develop a Strategic Energy Plan. This year 25 agencies updated these plans. Twelve Higher Education institutions have filed plans as well. Some have filed because it is a requisite to participate in the new ABA Revolving Loan Fund (RLF) or they are following AEO Rules.

p) **Recommendation: The AEO and Arkansas Energy Efficient State Government Working Group need to review and comment on these plans.**

q) **Finding:** Requiring a plan for the rest of the state agencies was postponed due to manpower limitations. About 100 smaller state agencies will be required to have a plan and a template will be provided to simplify compliance by these agencies. This will be targeted for the last half of calendar year 2012.

r) **Recommendation: Engage the Arkansas Energy Efficient State Government Working Group in expanding StEPS to the other agencies.**

Agency Baseline Development using EPA's Energy Star Portfolio Manager (ESPM)

s) **Finding:** The first data call for ESPM data was due October 31, 2011.

i. **The agencies below submitted information by the October 31 and are included in the summary data. Their individual progress is noted in Table 1 and more comprehensive information is available in the complete report by the Cadmus Group for State Agencies and Higher Education.**

Table 1: Agencies meeting the reporting deadline and Percent Energy Use Change based on EUI.

Department or Commission Percent change as of end of FY 2010	% Change as of FY2010
Military Department, Arkansas National Guard	-16.3
Department of Information Systems * submetered	-16.0
Environmental Quality, Department of	-12.1
Educational Television Network	-11.9
Finance and Administration, Department of	-11.8
Building Authority	-11.5
Engineers and Professional Surveyors	-11.3
Workforce Services, Department	-8.1
Heritage Commission	-7.6
Oil and Gas Commission	-6.4
Geological Survey Commission	-5.9
Real Estate Commission	-4.6
Contractors Licensing Board	-2.3
Law Enforcement Standards and Training, Arkansas Commission on	-1.0
State Police	0.2
Highway and Transportation, Department of	4.1
Education, Department of	5.6
Emergency Management, Department of	15.0
Bank Department	16.1
Plant Board	16.1
Career Education, Department of	20.1
Correction, Department of	29.7
Veteran's Affairs, Department of	32.7

ii. Together the twenty two agencies listed above had a **net increase** of about 10% in energy consumption through fiscal year 2010 over the baseline of fiscal year 2008 as shown in Table 2. This data represents a time period where the programs to implement Act 1494 were still being developed. Construction already planned did not necessarily meet Act 1494 criteria because design had begun before the effective date of the Act.

iii. In Fiscal Year 2008, the Agencies reported a weather-normalized energy use intensity of 121.5 kBtu/sq. ft. In Fiscal Years 2009 and 2010, total Agency energy use per gross square foot saw weather-normalized increases of 131.7 kBtu and 123.9 kBtu, respectively, compared to the 2008 baseline. See details above in Table 2.

Table 2: Annual State-wide Weather-Normalized Total Energy Use per Square Foot as Compared to Total Energy Use per Square Foot

Year	Number of Buildings and Campuses	Total Floor Space (sq. ft.)	Site Energy Use per Square Foot (kBtu/sq. ft.)	Site Energy Use Percent Change from Baseline (%)	Weather Normalized Site Energy Use per Square Foot (kBtu/sq. ft.)	Weather Normalized Percent Change from Baseline (%)
2008	487	14,390,723	117.8	0.00%	121.5	0.00%
2009	484	12,674,552	128.9	9.43%	131.7	8.43%
2010	496	14,534,351	129.3	9.78%	123.9	2.02%

iv. In Fiscal Year 2008, Agencies reported a total baseline energy use, normalized for changes in weather, of 1.748 billion kBtu. In Fiscal Year 2009, weather-normalized total State energy use decreased by 4.5% from the baseline period. The State showed an increase from baseline of 1.43% in 2010 compared to the 2008 total baseline energy use. See details in Table 3.

Table 3: Statewide Weather-Normalized Annual Total Energy Use and Weather-Normalized Percent Change from Baseline

Year	Number of Buildings and Campuses	Total Floor Area (sq. ft.)	Weather Normalized Current Total Site Energy Use (kBtu)	Weather Normalized Percent Change from Baseline (%)	Annual Energy Cost (US Dollars ($)
2008	487	14,390,723	1,748,378,656	0.00%	21,440,545
2009	484	12,674,552	1,669,654,521	-4.50%	24,335171
2010	496	14,534,351	1,773,382,949	1.43%	23,590,726

v. Of the subset of 33 agencies highlighted in this report, 26 submitted some form of reporting data. Of those 26, there were 23 official reports with data complete enough to be included in this report. Based on these 23 reports in 2010, the 496 buildings and campuses owned or leased by the state encompassed 14.53 million square feet. Table 4 provides the aggregate square footage and number of buildings and campuses for agencies for all reported years. Based on estimates from 2008 reported square footage and 2008 benchmarked data in Portfolio Manager for agencies that did not report, the square footage from the 23 represents approximately 52.6% of the overall square footage across all 33 agencies.

Table 4: Square Footage and Building Statistics of Reporting Agencies

	2008	2009	2010
Number of Buildings and Campuses Reported	487	484	496
Total Floor Area Reported (sq. ft.)	14,390,723	12,674,552*	14,534,351

*Changes in total square footage in 2009 were due to the timing of the closures and opening of facilities by the Military Department.

vi. Twelve agencies were required to report, but did not meet the reporting deadline, however they are still working to develop baseline data. This report will be revised once these agency reports have been received. The agencies are as follows:

Table 5. Agencies not included	Reason
Community Correction, Department of	Submitted report
Crime Laboratory	No ESPM shared accounts
Disability Determination for Social Security	Ready to include in report
Forestry Commission	Ready to include in report
Health, Department of	Finish by end of November
Human Services, Department of	Submitted report
Liquefied Gas Petroleum Board	ESPM work not finished
Lottery Commission	No ESPM shared accounts
Parks and Tourism	Should finish by end of December
School for the Blind, Arkansas	No ESPM shared accounts
School for the Deaf, Arkansas	No ESPM shared accounts
War Memorial Stadium Commission	ESPM work not finished
Worker's Compensation Commission	Ready to include in report

vii. Below is a summary of the progress of each agency in their benchmarking and tracking of energy usage and costs using ESPM according to the Cadmus Group.

Agency/Institution	Agency or Higher Ed?	Known Facilities or Campuses	% of Known Facilities that are Complete				Date of Last Contact
			Baseline Year (7/2007 - 6/2008)	2009 Year (7/2008 - 6/2009)	2010 Year (7/2009 - 6/2010)	2011 Year (7/2010 - 6/2011)	
Agriculture Department, Arkansas	Agency	80	88%	91%	86%	3%	5-Oct
Bank Department	Agency	2	100%	100%	100%	100%	21-Oct
Building Authority, Arkansas	Agency	15	100%	100%	93%	100%	10-Oct
Career Education, Arkansas Department of	Agency	14	100%	100%	100%	100%	14-Oct
Community Correction, Arkansas Department of	Agency	49	82%	88%	82%	73%	31-Oct
Contractor's Licensing Board	Agency	1	100%	100%	100%	100%	20-Oct
Correction, Arkansas Department of	Agency	36	100%	100%	100%	6%	10-Oct
Education, Arkansas Department of	Agency	3	100%	100%	100%	100%	18-Oct
Educational Television Network, Arkansas	Agency	19	100%	100%	100%	100%	27-Oct
Emergency Management, Arkansas Department of	Agency	3	100%	100%	100%	100%	18-Oct
Engineers and Pro. Surveyors, AR Board of Licensure for Pro.	Agency	1	100%	100%	100%	100%	31-Oct
Environmental Quality, Arkansas Department of	Agency	6	100%	100%	100%	17%	31-Oct
Finance and Administration, Arkansas Department of	Agency	115	95%	95%	95%	95%	21-Oct
Game and Fish Commission, Arkansas	Agency	18	0%	0%	6%	0%	3-Oct
Geological Survey, Arkansas	Agency	2	100%	100%	100%	100%	14-Oct
Health, Arkansas Department of	Agency	2	100%	100%	100%	100%	27-Oct
Heritage, Department of Arkansas	Agency	15	100%	100%	100%	100%	20-Oct
Highway and Transportation Department, Arkansas	Agency	248	54%	57%	57%	54%	12-Oct
Human Services, Arkansas Department of	Agency	145	88%	89%	90%	92%	20-Oct
Information Systems, Arkansas Department of	Agency	2	100%	100%	100%	100%	20-Oct
Law Enforcement Standards and Training, Arkansas Commission on	Agency	2	100%	100%	100%	100%	30-Sep
Military Department, Arkansas National Guard	Agency	70	100%	100%	100%	100%	12-Oct
Oil and Gas Commission	Agency	2	100%	100%	100%	100%	21-Oct
Parks and Tourism, Arkansas Department of	Agency	591	75%	85%	73%	4%	19-Oct
Real Estate Commission, Arkansas	Agency	1	100%	100%	100%	100%	30-Sep
School for the Blind, Arkansas	Agency	1	0%	0%	0%	0%	4-Oct
School for the Deaf, Arkansas	Agency	1	0%	0%	0%	0%	13-Oct
State Police, Arkansas	Agency	158	66%	67%	15%	15%	25-Oct
Veteran Affairs, Arkansas Department of	Agency	4	100%	100%	100%	100%	30-Sep
Workers' Compensation Commission, Arkansas	Agency	2	100%	100%	100%	100%	18-Oct
Workforce Services, Arkansas Department of	Agency	38	100%	100%	100%	100%	18-Oct
		1646	77%	81%	72%	40%	

Note: War Memorial Stadium and Liquefied Gas and Petroleum Board began benchmarking after October 31, 2011 and are not included in Table 3 above. School for the Deaf and School for the Blind do not have a Portfolio Manager account that is shared with AEO. Game and Fish is not required to participate as a Constitutional Office, but they have been working as they can to get started. DF&A is complete, but needs to remove some unmetered building from their profile. State Police has 90 transmitter sites still being developed in ESPM, causing their numbers to be low.

Life Cycle Cost Analysis (LCCA)

t) **Finding:** LCCA is now used with all state agencies and institutions participating in the ABA RLF in 2011.

u) **Finding:** LCCA is being taught in the Energy Manager Training curriculum developed this year by AEO.

Energy Efficient Procurement Practices

v) **Finding:** AEO is working with DF&A and State Agencies in the development and use of Energy Saving Performance Contracts to fund energy efficiency projects. Currently there is still apprehension among the state agencies on the use of this contracting mechanism.

Building Performance – Energy Audits

w) **Finding:** Energy Audits need to be performed on a regular basis on state facilities. Act 1494 was amended in 2011 requiring state agencies to perform energy audits on all facilities every five years. AEO will review the finding of the audits. AEO still will perform audits as funds are available in the future. AEO will also encourage state agencies to participate in the ABA revolving loan fund to make improvements based on the audits. Energy Auditing has been included in the Energy Manager Class. A Certified Auditing class is schedules for the first quarter of 2012.

Energy Training

x) **Finding:** Three Units of training were completed to implement ESPM. The Cadmus Group provided the training both on-site and online in 27 sessions. There were a total of 240 attendees from 34 state agencies . Also, there were 57 attendees representing 35 higher education institutions who completed this training.

General Comments

y) **Finding:** Some larger agencies and many of the smaller agencies are not covered in this report because they do not pay utility bills directly, but pay them indirectly in the lease agreements with the building owner. Their energy costs and usage are not being included in the ESPM work.

z) **Recommendation:** Request ABA to include in the wording of the lease a requirement that building owners establish and maintain current ESPM accounts to qualify for state contracts for use of their facilities by State Agencies.

aa) **Recommendation:** Require State Agencies to review the Energy Use Intensity (EUI) of a facility before signing lease agreements with third party owners.

bb) **Finding:** A significant exception to agencies leasing and not reporting is the Department of Information Systems, who participated in ESPM because they had installed sub meters for the data center. By virtualizing servers and other work DIS has been able to **reduce consumption** by 18% in 2010 over the baseline.

Department or Commission .	**Percent usage change as of end of FY 2010**
Department of Information Systems	-18.0

cc) **Recommendation:** In order to achieve a more complete data set representative of all agencies, boards, and commissions covered by Act 1494 in coming years, currently non-reporting agencies will need to focus on gathering and submitting historical information and all agencies will need to continue monthly updates of utility information to their Portfolio Manager accounts.

Higher Education Institutions not Self Reporting

The Department of Higher Education has placed requirements on institutions to comply with Act 1494. Institutions have freedom to develop their own programs depending upon their size. Many institutions are participating with AEO to develop and manage energy for their campuses. AEO is providing education and technical support for the institutions. There are 25 two year colleges and 10 universities trying to replicate the work of AEO for their institutions. Below is a roll up of the institutions providing AEO data.

For the 2011 reporting period, a total of 10 institutions completed Act 1494 Compliance Reports. As indicated in Table 1, out of these 10 reports, 4 institutions reported complete, verified data from 2008 through 2011. They were University of Arkansas for Medical Sciences, Southeast Arkansas College, Southern Arkansas University Tech, Camden and Pulaski Technical College. Two additional institutions, Henderson State University and South Arkansas Community College, reported verified data for some years. Henderson State University submitted verified data through 2009 and South Arkansas Community College has verified data for 2008, 2009, and 2011. Both institutions have verified data for the baseline year. These institutions have not been added to the state level summary tables and graphs as their data would distort the totals for the years in which they were included.

Table 1: Higher Education Institutions

Institutions	
Institutions benchmarking with ENERGY STAR Portfolio Manager accounts	20
Reporting completed FY 2008 Baseline Data	6
Reporting completed FY 2009 Data	6
Reporting completed FY 2010 Data	4
Reporting completed FY 2011 Data	5

As shown in Table 2. Institutions collectively reported a **percent reduction** in total energy consumption per gross square foot (EUI) of 18.02% from 2008 to 2011.

Table 2: Higher Education Institutions Energy Use Report

Overall percent change in energy use from the baseline year of FY2008 for reporting institutions (EUI)	
2009	-8.31%
2010	-15.02%
2011	-18.02%

Complete data was available in Portfolio Manager from 4 higher education institutions as of October 31, 2011 and shown in Table 3. Henderson State University and South Arkansas Community College were not included in the data below.

Table 3: Square Footage and Building Statistics of Reporting Institutions

	2008	2009	2010	2011
Number of Buildings and Campuses Reported	44	53	61	63
Total Floor Area Reported (sq. ft.)	3,719,692	4,254,851	5,191,038	5,217,832

For Fiscal Year 2008, institutions collectively reported a total energy consumption per gross square foot (EUI) of 250.3 kBtu/sq. ft. In the Fiscal Years 2009, 2010, and 2011, total State EUI was 229.5 kBtu/sq. ft, 212.7kBtu/sq. ft, and 205.1 kBtu/sq. ft, respectively. Reductions were seen in Fiscal Years 2009, 2010, and 2011 compared to the baseline year. See details below in Table 5.

Table 5: Year over Year Total Energy Use per Square Foot

Year	Number of Institutions Reporting	Total Floor Space (sq. Ft.)	Average Site Energy Use per Square Foot (kBtu/sq. Ft.)	Percent Change from Baseline for Average Site Use per Square Foot (%)	Annual Energy Cost (US Dollars ($)	Percent Change from Baseline for Annual Energy Cost (%)
2008	4	3,719,692	250.3	0%	12,068,503	0%
2009	4	4,254,851	229.5	-8.31%	13,761,057	14.02%
2010	4	5,191,038	212.7	-15.02%	13,684,932	13.39%

In Fiscal Year 2008, institutions reported a weather-normalized energy use intensity of 254.3 kBtu/sq. ft. In Fiscal Years 2009, 2010, and 2011, total institution energy use per gross square foot saw weather-normalized reductions of 235.4 kBtu, 204.7 kBtu, and 205.6 kBtu, respectively, over the 2008 baseline. See details below in Table 6.

Table 6: Annual State-wide Weather-Normalized Energy Use per Square Foot

Year	Number of Institutions Reporting	Total Floor Space (sq. Ft.)	Average Site Energy Use per Square Foot (kBtu/sq. Ft.))	Site Energy Use Percent Change from Baseline (%)	Weather Normalized Site Energy Use per Square Foot (kBtu/sq. Ft.)	Weather Normalized Percent Change from Baseline (%)
2008	4	3,719,692	250.3	0%	254.3	0%
2009	4	4,254,851	229.5	-8.31%	235.4	-7.43%
2010	4	5,191,038	212.7	-15.02%	204.7	-19.50%
2011	4	5,217,832	205.1	-18.09%	205.6	-19.15%

In Fiscal Year 2008, institutions reported a total baseline energy use, normalized for changes in weather, of 945 million kBtu. In Fiscal Years 2009, 2010, and 2011, total institutional energy use saw increases of 5.88%, 12.35%, and 13.42% respectively over the 2008 total baseline energy use. See details below in Table 7.

Table 7: State-wide Weather-normalized Annual Total Energy Use and Weather-normalized Percent Change from Baseline

Year	Number of Campuses	Total Floor Area (sq. ft.)	Weather Normalized Current Total Site Energy (kBtu)	Weather Normalized Percent Change from Baseline (%)	Annual Energy Cost (US Dollars ($)
2008	4	3,719,692	945,982,178	0%	12,068,503
2009	4	4,254,851	1,001,629,707	5.88%	13,761,057
2010	4	5,191,038	1,062,787,475	12.35%	13,684,932
2011	4	5,217,832	1,072,931,553	13.42%	11,931,388

Appendix

Definitions

- **Act 1494** was signed into law on April 14, 2009 by Arkansas Governor Mike Beebe. Act 1494 promotes the conservation of energy and natural resources in buildings owned by the State or by institutions of higher education.
- **ENERGY STAR** is a voluntary government-backed program administered by the U.S. Environmental Protection Agency (EPA). ENERGY STAR was started by EPA in 1992 as a market-based partnership to reduce greenhouse gas emissions through energy efficiency. Through the program, EPA helps businesses and organizations save money and protect the environment through superior energy performance. The ENERGY STAR is recognized by more than 80% of U.S. households.
- **MBtu** is a unit of measurement representing one million British Thermal Units.
- **Portfolio Manager** is an interactive energy management tool that allows for the tracking and assessment of energy and water consumption across an entire portfolio of buildings in a secure online environment.
- **Site energy** is the amount of heat and electricity consumed by a building as reflected in utility bills.
- **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.
- **Weatherized** metrics take into account the effects that varying weather conditions can have on a facility's energy usage. For example, let us say that you examine the usage of a facility through the winter and determine that heating energy usage is too high, so you install more energy-efficient heating systems in the spring. The next winter, temperatures are much lower than they were the previous winter, but your usage matches the patterns of the previous winter. With a non-weatherized metric, you might assume that your new heaters did not perform better than your old heaters. However, once you account for this winter's colder temperatures, you can see that you received more heating this winter for the same amount of energy as last winter.
- **Energy Use Intensity (EUI) vs. Total Energy**: Energy Use Intensity (or EUI, measured in kBtu/sq. ft.) is a metric that determines energy consumption relative to the size of a building. For example, let us compare two buildings: One 20,000 sq. ft. building and one 100,000 sq. ft. building. Let us assume that over a given time period, each building consumes 100,000 kBtu of energy. The total energy consumed for each building is the same (100,000 kBtu), but the EUI for the smaller building is five times the EUI of the larger building, as it used the same amount of energy with only one-fifth of the floor space. Assuming that both buildings have similar space uses, this would help us identify that the smaller building is a much better target for energy reduction efforts, as its usage is abnormally high compared to its peer.

Please contact Ed Ellis with the Arkansas Energy Office with questions regarding this report at eellis@arkansasedc.com or 501-682-7694.