

Our Mission

Energy costs are an enormous expense for our nation's cities; energy is often one of the largest line items in a city's budget. In order to significantly reduce these costs and improve energy efficiency, the City of Harrison is participating in the Entergy Arkansas CitySmart Program. The no-cost program will assist in identifying energy efficiency opportunities in our buildings, and help us to:

Improve Learning Environments

Reduce Energy Expenditures

Boost the Local Economy (through upgrade projects)

Enhance Community Relations

The program provides technical and financial assistance for efficiency upgrades. Whether we retrofit an existing building or incorporate energy-efficiency technologies into new construction, we will identify and implement cost-effective projects that will allow us to use energy more efficiently. In addition, the CitySmart Program will help us form a long-term strategy to address rising energy costs. As part of our participation and with assistance from the program, we have prepared this Energy Master Plan to outline where we are today and what steps we will undertake to improve the efficiency of our buildings in 2013 and beyond.

Strategies for Improvement

- ✓ By adopting certain energy management best practices, we can mobilize and coordinate our efforts toward reducing energy costs
- ✓ By adhering to the listed efficiency strategies, we can minimize the life-cycle cost associated with our energy-consuming equipment

Commitment

The Energy Master Plan is an adaptable, evolving document. It is a starting point for consensus and uniform action, which will ensure that all appropriate departments and parties are informed of and involved in our plans. Because it will adapt to changing needs and new information, it will never be "final" or concrete; however, approval of this plan will allow us to plan effectively and efficiently in terms of funding, personnel availability, and other restraints.

Project Implementation

- ✓ Entergy Arkansas will pay us cash incentives for incorporating energy efficiency into equipment replacement/installation (e.g., lighting, HVAC) at our facilities by November 30 of the program year (date all projects must also be post inspected by).
- ✓ Outlined below are the incentive levels that are supported by the CitySmart Program.

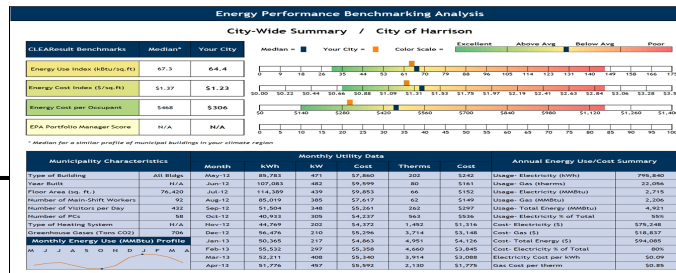
Current Building Benchmark Assessment

Based on the utility bills and building information we provided, the CitySmart Program compared our energy use to other like facilities in Arkansas and the U.S. The benchmarking process revealed that our city buildings are performing above average overall, meaning we are using less energy per square foot than similar users in our same climate region. More detailed assessments of each individual building can be found in the Benchmarking Report Appendix.

- ✓ Our city is spending 14 cents per square foot less than cities in our same weather region, which saves us approximately \$10,669 in annual energy costs
- ✓ By reducing our current electricity consumption by 5 percent, we could save another estimated \$3,581 in annual utility bills at the buildings included in the benchmarking analysis.

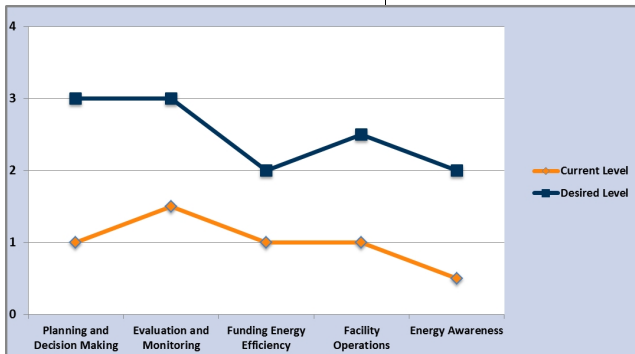
Energy Management Assessment

In addition to facility our energy management



CitySmart Scorecard

performance benchmarking, methods were also



benchmarked against recognized “best practices” in the following key focus areas: Planning and Decision Making, Evaluation and Monitoring, Funding Energy Efficiency, Facility Operations, and Energy Awareness. The below chart summarizes the outcome of the workshop *Energy Performance Best Practices CitySmart Scorecards*. The orange line represents our current level of achievement and the blue line represents our desired level. Strengths in each category, along with specific short and long term strategies to help us achieve our desired levels in each category, are identified in the appendix.

Set Goals

The goal of implementing the Energy Master Plan is to avoid spending more money on energy than necessary. We attempted to quantify the “bottom-line effect” of improving the energy performance of our buildings. For the 16 buildings that we included in the benchmarking analysis, the chart below estimates how much reducing our electricity consumption would save us on electricity utility bills.

Annual Electricity Consumption (kWh)	Percent Reduction	Electricity Saved (kWh)	Our City's Blended Rate	Annual Electricity Bill Savings
795,840	10%	79,584	\$0.09	\$7,163
	20%	159,168		\$14,325
	30%	238,752		\$21,488

Create Action Plan

In benchmarking our procedures against recognized “best practices,” we confirmed a number of areas in which we want to improve our energy management methods. The appendix provides a complete breakdown of short- and long-term steps toward improving energy management in each focus area. However, the table below identifies the highest priority “next steps” for the City of Harrison:

Focus Area	Target Audience	Priority Item
Energy Awareness/ Planning & Decision Making	Management, Facility Personnel	Form an Energy Management Committee that meets quarterly to discuss energy efficiency progress and obstacles, prioritize efforts, identify projects and review usage reports for our facilities.
Evaluation Assessment & Monitoring/ Energy Awareness	Management, Facility Personnel	Track energy usage (kWh), demand (kW), and therms along with costs and report quarterly to department heads and council members. Compare energy usage to prior month along with same month year to year comparison (i.e. January 2012 to January 2013).

By continuing to refine our energy management practices at all organizational levels, we will ensure that we are getting the most out of our existing equipment and facilities. We will also position ourselves to identify, evaluate, and move forward with new energy efficiency investments on shorter timelines.

New construction, outdated and/or failing equipment, renovations and routine change-outs all present opportunities for increasing energy efficiency in our buildings. Unfortunately, many potential efficiency opportunities are left unrealized or delayed considerably. When less efficient equipment is installed or left in place, we incur higher utility costs over the life of the equipment. By taking the “life-cycle cost” and “cost of delaying efficiency” into consideration during our project evaluations, we will equip ourselves to make sound financial decisions.

Working with the CitySmart Program, we have identified the strategies listed below for achieving energy efficiency. We will evaluate the feasibility of each strategy separately, and consider incorporating into written guidelines or minimum specifications for energy-consuming equipment. By having our own target design specifications, we will ensure that energy efficiency is always a consideration in our buildings.

Measure	Energy Efficiency Strategy
Lighting	25% improvement over the lighting power density (LPD) guidelines put forth by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 2004

Measure	Energy Efficiency Strategy
	30-40 foot-candles in office settings, per the guidelines of the Illumination Engineering Society of North America (IESNA) Lighting Handbook, 10 th Edition
	High-performance T8 lamps w/ premium efficiency ballasts in hallways, offices
	High-bay fluorescents (T5, T8) in bay areas, multi-purpose rooms, and other applicable areas
	Automatic lighting controls (occupancy sensors, automatics daylight controls, time clock controls) and adjustable lighting level strategies (Bi-level switching)
HVAC	System size closely matches the actual building loads, thus increasing operating efficiency, reducing operating costs, and extending equipment service life
	Improvement over minimum equipment efficiencies specified in ASHRAE 90.1 2004
	Usage of demand control ventilation
Roofing	ENERGY STAR®-labeled Cool Roof materials
	Increased insulation value on roofing systems
Window	Thermo pane, low-emissivity glass, thermal break frames

Operation and Maintenance

Attention to operation and maintenance provides the most rapid means of reducing consumption and costs in most buildings. Not only do correct procedures aid in the proper utilization of the facility's equipment (heating, cooling, ventilation, etc.) and the energy involved, but they also help to increase the longevity and maintain the attractiveness of the building itself. We have identified the O&M strategies listed below to help us achieve our energy efficiency goals.

O&M Opportunities	
Off-Hour	<ul style="list-style-type: none"> • First round savings when building is unoccupied • After-hours, Weekends, Holidays
Computers & Office Equipment	<ul style="list-style-type: none"> • Computers • Monitors • Printers • Scanners
Unnecessary Lighting	<ul style="list-style-type: none"> • Offices • Common areas • Display • Exterior
HVAC Systems	<ul style="list-style-type: none"> • Photocell maintenance • Temperature Settings • System Scheduling • Ventilation • Sensor Locations • Obstructions to airflow • System maintenance
Exhaust Fans	<ul style="list-style-type: none"> • Meeting Rooms, Bathrooms, Maintenance Closets • Off at night

O&M Opportunities	
Door & Window Operation	• Blinds closed at night
	• Close doors and windows
	• Weather-stripping
Water Usage	• Drips and Leaks
	• Temperatures
	• Aerators

Recognizing Achievements

In addition to joining the CitySmart Program sponsored by Entergy Arkansas, we have already taken a number of steps to reduce our city's energy use:

- ✓ Our Mayor and Council members are engaged in and driving our city's efforts to

Endorsement

Although we will seek approval of individual projects and expenditures separately, we request a review and endorsement of this plan. This will ensure that our facilities personnel have a clear understanding of the input, concerns, and support of the Executive Administrative Team.

The following people contributed to this plan:

Kathryn Catlin, Waste Water Systems
Manager Luke Feighert, Finance
Director
Patrick Hunter, Assistant to the Mayor
 Wade Phillips, Public Works
Director

Prepared and Submitted by:

_____ Date _____

Wade Phillips, Public Works Director

Endorsed by:

Planning and Decision-Making

We understand that inefficiency is often the result of low priority for building and operating high-performance buildings. We strive to place more importance on our planning regarding new building design, energy reduction projects in existing buildings, and our daily operational activities that impact energy performance. In addition, we seek to ensure our city is focused on the management of energy use and cost.

Existing Strengths

- Our city has prioritized the need to improve energy efficiency and reduce costs
- Our senior managers, and facilities staff view energy costs as a manageable/controllable expense
- We have management support to identify and install energy efficiency-improvements quickly (if justified)
- We have identified additional energy improvement opportunities, but not yet implemented them

Short-term Action Items

- Develop a written energy action plan for the next 1-5 years that includes performance goals, benchmarks, and other metrics regarding energy use and costs

Long-term Action Items

- Have a regular review of goals, plans, and successes to date compared to the plan
- Establish a written energy policy or mission statement that will help remind staff, building occupants and community members that energy management is a priority for our city
- Identify a management level energy champion who will help drive energy efficiency improvements in our organization

Evaluation, Assessment, and Monitoring

We need to establish a baseline and maintain ongoing benchmarks on how our buildings perform so we can determine the value of making improvements. This will allow us to recommend priorities for building improvements in an environment of limited resources (funding & staff).

Existing Strengths

- We know: 1) the energy operating cost of each building, 2) how each building ranks by various energy performance metrics, 3) how each building compares both within and outside our portfolio of buildings
- We have prioritized facilities with the highest energy use for assessment and improvement

Short-term Action Items

- **PRIORITY ACTION ITEM:** Track energy usage (kWh), demand (kW), and therms along with costs and report quarterly to department heads and council members. Compare energy usage to prior month along with same month year to year comparison (i.e. January 2012 to January 2013).
- Evaluate the building performance benchmarking reports from the CitySmart Program that compare our buildings to others in Arkansas and across the U.S.
- Monitor daily or monthly energy use to look for variations from the normal energy use, and then analyze and resolve the causes of those variations
- Conduct building "walk-through" opportunity-assessment surveys to identify energy saving opportunities in our facilities

Long-term Action Items

- Revisit the Energy Performance Best Practices CitySmart Scorecards annually to evaluate and identify additional actions our city can take to improve our energy performance
- Conduct inventory surveys to list all energy-using equipment in our facilities
- Conduct an investment-grade audit in a facility when necessary
- Evaluate the connection between building energy efficiency and building usability (examples: comfort, indoor air quality, lighting levels, noise)

Funding Energy Efficiency

Finding funds to improve existing buildings is always a challenge. Energy reduction projects, however, are often cost-effective and can even be self-funding. Nevertheless, we also understand that many funding or financing options for energy projects may have a level of complexity or risk not ideally suited for our organization.

Existing Strengths

- We have established a list of potential vendors to provide energy-related assessments, products, and services

Short-term Action Items

- Take full advantage of the available incentive dollars through the CitySmart Program to make our energy improvement projects even more cost effective
- Establish a budget line item or a defined process for budgeting energy efficiency improvement expenditures
- Calculate and compare the cost of not doing the project (e.g. maintaining the status quo) when evaluating the value of energy-efficiency projects. Devise a strategy to implement most cost effective projects as soon as possible.

Long-term Action Items

- Investigate other funding options beyond using Board approved capital budgets (such as grants, loans, performance contracts, lease purchase agreements, etc.)
- Establish a strategic plan for budgeting energy efficiency improvements for the next 2 5 years
- Establish criteria and/or authority for approving improvement projects such as less than a year payback, or up to a specified dollar limit



Facility Operations

Given the importance, complexity, and cost of energy utilization in our organization, we strive to have management policies and procedures that promote effective energy management.

Existing Strengths

- Our contractors provide us with written performance specifications and operating and maintenance procedures/manuals for all major energy-using systems (example: boilers, chillers)

Short-term Action Items

- Specify that lighting levels be at 30 - 40 foot-candles for retrofits and new construction to ensure that rooms are not over lit
- Strive to purchase higher efficiency (15 or 16+ SEER) A/C equipment when replacing existing units
- Develop written design guidelines and minimum efficiency specifications for energy-consuming equipment for new construction, renovations and improvement projects
- Commission new equipment and facilities with testing and verification of performance at startup preferably by a third party
- Perform "retro-commission" of older & high-operating cost systems over last few years

Long-term Action Items

- Consider adopting the following operating practices: 1) Establish HVAC set points to "lock out" thermostats, 2) Charge for personal use refrigerators, microwaves, etc.v 3) Use software to turn off computers not in use
- Research additional opportunities for improving energy performance, such as installing LED signs, ENERGY STAR roofs, increased levels of insulation, occupancy sensors, more effective control systems, solar film for windows, solar water heating systems for large domestic hot water loads, and solar panels for electricity
- Establish written guidelines that outline operating rules (such as building usage, operating hours, personal refrigerators/heaters and plug loads), and enforce them regularly

Energy Awareness

Energy costs are a significant expenditure and some portion is a controllable cost. To successfully manage energy costs all members of an organization need to be aware of how their behavior affects energy cost and usage. The facilities department/energy manager needs to communicate, train and recognize success regularly and effectively with all staff members and building occupants.

Existing Strengths

- We have a list of energy-efficiency improvements completed at our organization within the last five years

Short-term Action Items

- **PRIORITY ACTION ITEM:** Form an Energy Management Committee that meets quarterly to discuss energy efficiency progress and obstacles, prioritize efforts, identify projects and review usage reports for our facilities.
- Make energy reports available to all staff members. Consider posting summaries on a website.
- Establish an Energy Awareness Program that includes all staff members.
- Identify ways that we can increase the amount of time that our facilities or energy management personnel have to focus on improving buildings' energy performance

Long-term Action Items

- Create clearly defined job performance criteria and accountability regarding energy management for all staff involved
- Provide training and conference opportunities related to energy management for our facilities management personnel and staff
- Provide recognition and/or incentives for exemplary energy performance for personnel (awards, prizes)