



KEEPS Model Energy Management Action Plan

The KEEPS Model Energy Management Action Plan supports Toolkit 4: Create an Energy Management Action Plan, of the KEEPS Training System. The objective of this toolkit is to develop a detailed action plan for ensuring your district's energy performance goal is met. Unlike the energy policy, the action plan is regularly updated, typically on an annual basis, to reflect recent achievements, changes in performance, and shifting priorities.

Before beginning Toolkit 4, your district should have completed the following:

- adopted a school board approved energy policy (Step 1);
- developed a district energy team (Step 1);
- assessed behavioral and building performance (Step 2); and
- established a SMART performance goal and supporting objectives (Step 3).

While the scope and scale of your action plan depends on your district's needs, the following Model Action Plan offers best practices for creating a robust and well organized energy management action plan. To download a template to assist you with writing your action plan, please see the KEEPS Energy Management Action Plan TEMPLATE. The KEEPS Energy Management Action Plan TEMPLATE, and other resources associated with Toolkit 4, can be downloaded from the KEEPS Toolkit Library at www.kppc.org/keeps.

Table of Contents

- I. Executive Summary
- II. District Profile
 - a. Contact Information
 - b. Background
 - c. Facility Baseline
 - i. Building Envelope and Structures
 - ii. HVAC
 - iii. Lighting
 - iv. Sources of Energy
- III. Energy Policy
- IV. District Energy Committee
- V. Goals/Objectives
- VI. Energy Consumption and Cost
- VII. Education, Awareness and Behavior
- VIII. Facility Procedures/Operations and Maintenance (O&M)
- IX. Facility Planning, New Construction & Renovation
- X. Water Conservation
- XI. Renewable Energy
- XII. Environmentally Preferable Purchasing (EPP)
- XIII. Other
- XIV. Energy Management Project and Actions
- XV. Appendices

List of Tables

Table 1: Key District Contacts

Table 2: District Survey

Table 3: Fiscal Year 2011 Energy Committee Members Roles/Responsibilities

Table 4: Energy Consumption and Cost

Table 5: Vacation Period Shutdown Schedule

List of Appendices

Appendix A: District Energy Management Policy

Appendix B: Rate Review and Utility Bill Analysis¹

Appendix C: District Energy Committee Communication Plan

Appendix D: Sample Building Request Form

Appendix E: Sample O&M Checklist

Appendix F: Sample Energy Conservation Checklist

Appendix G: Sample Common Area Checklist

Appendix H: Vacation Shutdown Checklist

Appendix I: Sample Building Operating Plan

Appendix J: Sample Idling Policy

Appendix K: Energy Management Projects and Actions

¹ For more information on conducting a Utility Bill Analysis, please see Toolkit 2B in the KEEPS Training System, which is available online at: www.kppc.org/keeps.

[School District Name]
Energy Management Action Plan
Fiscal Year [2011]

I. Executive Summary

[District Name] is committed to improving district-wide energy performance. The following Energy Management Action Plan details key strategies to reduce energy consumption and save money. This plan outlines district procedures and guiding principles that relate to the energy performance of the [District Name] buildings, including education and awareness, temperature, lighting, plug-load, new construction, water conservation, renewable energy, and green purchasing.

The current version of the plan was developed in collaboration with the District Energy Committee led by [Joe B. Hall]. This plan will be reviewed on an annual basis by the energy committee with the next review scheduled for [June 2011].

[District Name] is working in partnership with [ENERGY STAR, the Kentucky Energy Efficiency Program for Schools (KEEPS), National Energy Education Development Project (NEED), Kentucky Green and Healthy Schools (KYGHS), Kentucky School Boards Association, etc....] to broaden our energy initiatives and maximize our opportunities for improving our energy performance.

[Briefly summarize policy, baseline consumption information, and key points, including objectives, etc.]

II. District Profile

a. Contact Information

District Name:

Board of Education Address:

Table 1: Key District Contacts

Name	Title	Phone
Denny Crum	Superintendent	(XXX) XXX-XXXX
Joe B. Hall	Energy Manager/Facilities Director	(XXX) XXX-XXXX

Table 2: District Survey

Age range of Buildings:		# of Computers:	
Combined square footage:		# of Walk-in Refrigerators/Freezer Units:	
# of Elementary Schools:		Percent of floor area that is cooled in 10% increments:	
# of Middle/High Schools:		Percent of floor area that is heated in 10% increments:	
# of Administrative Buildings:		# of Employees:	
# of Students:			

b. Background [Optional]

[Insert descriptive text of information in tables, including total number of buildings, students, employees, as well as total square footage of occupied buildings for district. Also include information on occupied hours and seasonal variances, i.e. academic year vs. summer vacation]

c. Facility Baseline [Insert Baseline Assessment/Audit Information]

i. Building Envelope and Structures

1. ABC High School:
2. ABC Middle School:
3. ABC Elementary School:

ii. HVAC

1. ABC High School:
2. ABC Middle School:
3. ABC Elementary School:

iii. Lighting

1. ABC High School:
2. ABC Middle School:
3. ABC Elementary School:

iv. Sources of Energy [Utility Providers]

1. ABC High School:
2. ABC Middle School:
3. ABC Elementary School:

III. Energy Policy

On [DATE], the [District Name] Board of Education adopted [KSBA Energy Management Policy Facilities 05.23 referencing KRS 160.325] an Energy Management Policy **[Appendix A: District Energy Policy]**, further demonstrating our district's commitment to improving energy performance and reducing operating costs. The [District Name] Energy Management Policy supported the formation of a district-level Energy Committee to develop and implement an Energy Management Action Plan.

IV. District Energy Committee

[District Name] established a district-level Energy Committee to develop an energy management program and create and implement an Energy Management Action Plan. The district level team is comprised of the following individuals:

[List Energy Committee Members Name, Department/Title and Role/Responsibility]

Table 3: Fiscal Year 2011 Energy Committee Members Roles/Responsibilities

Name	Department/Title	Role/Responsibility
Denny Crum	Superintendent	Champion
Joe B. Hall	Energy Coordinator	Team Leader

The District Energy Committee meets [frequency of meetings, i.e. weekly, monthly, quarterly, etc] on the [date and time of meeting] at the [location of meeting]. [Make a note of where meeting minutes are posted, and any other relevant information regarding activities and policies/procedures of the team.]

V. Performance Goal and Supporting Objectives

The following energy-related goal and objectives were defined by the District Energy Committee:

[Insert appropriate district-level goal and objectives, examples include the following:

Performance Goal:

- Reduce district wide energy consumption [XX]% by [INSERT DATE] utilizing ENERGY STAR's Portfolio Manager to track, monitor and verify progress.

Objective(s):

- Track, monitor and report district progress, and identify trends and opportunities for savings;
- Create a sense of responsibility among students, teachers, staff, administrators, parents and community members;

- Operate at optimal efficiency and avoid unnecessary costs associated with reactive maintenance practices and procedures;
- Reduce future energy costs in new facility construction and renovation whenever feasible;
- Conserve water resources where possible;
- Increase the use of renewable energy and educate our students, teachers, staff, and community on the economic and environmental benefits of diversifying our energy portfolio; and
- Reduce our district's overall environmental impact and provide a healthier and safer educational environment.

VI. Energy Consumption and Cost

Tracking utility consumption and cost is critical to our district's energy management program. By tracking utility consumption we can establish an energy performance baseline, monitor and track progress in real-time, identify trends and opportunities for improvement, target facilities for follow up and monitor excessive variations. All of which, will assist our district in meeting our goal of [INSERT quantitative energy performance goal].

Objective: To track, monitor and report district progress, and identify trends and opportunities for savings, the district energy committee will establish a program for collecting and analyzing monthly energy consumption.

The following section details key strategies and identifies action items for achieving this objective:

a. Develop system for tracking monthly utility bills

[KEEPS has developed a free tracking tool designed to assist districts in tracking monthly utility consumption and cost information². [District Name] will utilize this free tracking tool [or describe other tracking method/program for district]. The Finance Director will provide the Energy Manager/Coordinator with copies of utility bills on the [Date] of every month. The Energy Manager/Coordinator will report progress and trends to the Energy Committee at the following energy committee meeting.]

b. Determine baseline

A baseline year is the starting point for evaluating the school district's energy management efforts. The evaluation is a comparison of energy consumption in future years to the consumption in the baseline year. The Energy Committee defined [District Name]'s baseline year as Fiscal Year 2010 (July 2009 – June 2010). [District Name] enrolled in the Kentucky Energy Efficiency Program for Schools (KEEPS) in [Month/Date/Year]. Through a partnership with KEEPS, our district established a system for tracking utility consumption and cost, so as to ensure that utility information from FY2010 was both complete and easily

² KEEPS Utility Tracking Tool can be downloaded from the KEEPS website at: www.kppc.org/keeps. You can also obtain a copy from your Regional Coordinator. Please visit our website for more information on Regional Coordinators and areas they cover.

accessible. See Section VI.a. for more information on Monthly Utility Tracking. Billed consumption and cost data were recorded in the KEEPS Utility Tracking Tool and used to develop **Table 4: Energy Consumption and Cost**.

- c. Establish projected consumption and cost data

Projected consumption and cost data is based on the [percent reduction] goal outlined in Section V and the current utility rate for each energy type.

*As detailed in Section II.c.iv, the major sources of energy at [District Name] include [e.g. electricity, natural gas, propane, fuel oil, coal]. **Table 4** outlines energy consumption and cost for each of these energy sources for baseline, current and future years.*

Table 4: Energy Consumption and Cost

Baseline	
Year	2010 (July 2009 – June 2010)
Total square footage	
Total Consumption of Electricity (kWh)	
Total Cost of Electricity (\$)	
Total Consumption of Natural Gas (UNIT)	
Total Cost of Natural Gas (\$)	
Total Consumption of Propane (UNIT)	
Current	
Year	2011 (July 2010 – June 2011)
Total square footage	
Total Consumption of Electricity (kWh)	
Total Cost of Electricity (\$)	
Total Consumption of Natural Gas (UNIT)	
Total Cost of Natural Gas (\$)	
Total Consumption of Propane (UNIT)	
Projected	
Year	2012 (July 2011 – June 2012)
Total square footage	
Total Consumption of Electricity (kWh)	
Total Cost of Electricity (\$)	
Total Consumption of Natural Gas (UNIT)	
Total Cost of Natural	

Gas (\$)	
Total Consumption of Propane (UNIT)	

d. Conduct annual rate review and utility bill analysis

On [Date], a rate review and utility bill analysis was completed by [KEEPS, Utility Company, Energy Manager/Coordinator, or other]. The results of the analysis [insert results of analysis]. [The complete rate and utility bill analysis is attached in **Appendix B**].

An annual rate review will be scheduled with utility representatives by the [Finance Director, Energy Manager/Coordinator, or other designee] each [Month].

e. Report monthly consumption data to district stakeholders

The [district energy manager/coordinator or designee] will track, monitor and report to district administrators, including the superintendent and school principals, the monthly change in consumption and cost of utilities for each school and administrative building compared to the baseline year of [2010].³

f. Obtain and analyze load profiles

The district energy manager/coordinator will analyze the power demand patterns of the highest energy-consuming schools in our district and look for load-shedding and/or load shifting opportunities. A load profile can be requested from our utility company. The highest energy-consuming schools will be identified using ENERGY STAR's Portfolio Manager program.

g. Benchmark facilities using ENERGY STAR's Portfolio Manager

Many tools are available to help benchmark individual schools and facilities within school districts, including ENERGY STAR Portfolio Manager (PM), a free program available online at: www.energystar.gov. Benchmarking will allow our district to identify and prioritize energy efficiency measures based upon energy consumption patterns in each of our schools. By using PM, we may also be eligible to apply for ENERGY STAR's building labeling program.⁴

VII. Education, Awareness, and Behaviors

³ KEEPS has developed a Report Card to assist districts with tracking, monitoring and reporting energy consumption per building on a monthly basis compared to a designated baseline year. For more information, please visit: www.kppc.org/keeps or contact your KEEPS Regional Coordinator.

⁴ KEEPS Toolkit 1:D Becoming an ENERGY STAR partner provides more information on the ENERGY STAR for buildings labeling program: https://louisville.edu/kppc/keeps/KEEPS_Training_System/step-one/step-one-make-a-commitment.html#toolkit-1d-become-an

Education and awareness are an important part of the long-term success of [District Name]'s energy program. The district energy committee recognizes that energy is a controllable operating expense.

Objective: To help create a sense of responsibility among students, teachers, staff, administrators, parents and community members, the district energy committee will establish an Energy Awareness Program.

The following key strategies and action items will assist our district in establishing a robust and sustainable Energy Awareness Program:

- a. Develop and implement a district-wide energy committee communication strategy

[Insert information on District Energy Committee Communication Strategy] [Copy of District Energy Committee Communication strategy is attached in **Appendix C**]

- b. Establish school energy teams

Each school will establish a school-level energy team comprised of the following individuals:

- Principal
- Head custodian
- Food service representative
- Teacher
- Parent
- Student(s)

The school energy teams will meet monthly on a designated day/time/location. The school energy teams will assist the district energy team in implementing a district-wide energy awareness and behavior program. Roles and responsibilities include the following: [conduct school behavior assessment; establish school energy clubs; support efforts to create a district energy mascot; and incorporate energy education into the classroom.]

- c. Conduct facility behavior assessment⁵

[X] baseline behavioral assessment(s) were completed on [INSERT DATE] at X school buildings by the District Energy Committee. The assessments yielded the following results:

[Insert results of behavioral assessment, i.e. number of computers, printers, copiers on/off, HVAC system on/off, lights on/off, doors/windows open/closed, etc.]

⁵ KEEPS has developed a facility behavioral assessment tool – the Energy Checklist – to assist districts with developing a baseline and benchmarking behavioral changes. For more information, please visit: www.kppc.org/keeps or contact your Regional Coordinator.

d. Establish school energy clubs⁶

Each school will establish a student based energy [or environmental/green] club by [DATE]. School energy clubs will lead school-level energy projects, including educating and creating awareness among both internal and external stakeholders.

e. Create a district energy mascot⁷

The district energy committee will host a design competition among all students to create a district energy mascot. The winner of the competition will receive [recognition from the board of education, gift certificate to a local restaurant, pizza party, ice cream party, t-shirt, etc.] from [the district school board, local business, etc.].

f. Develop, print and post light switch stickers⁸

The district energy committee will develop, print and post stickers on light switches throughout school buildings to remind students, faculty and staff to turn off lights when leaving classrooms, restrooms, custodial closets, etc.

g. Institute district-wide energy curriculum

As part of our district's commitment to education and fostering a green and healthy environment for our children, each school will map out their participation in both Kentucky Green and Healthy Schools (KGHS) and the National Energy Education Development (NEED) project.

i. **Kentucky Green and Healthy Schools⁹** program began in 2007. It is a joint project of the Kentucky Environmental Education Council and the Kentucky Department of Education.

The program was designed with the following goals in mind:

- a) Increase environmental awareness and action in communities, schools, and individual students and teachers.
- b) Increase student empowerment by giving them the tools to make changes at their schools that will benefit both the environment and student health.
- c) Increase student engagement by offering teachers the tools they need to complete hands-on, inquiry-based investigations and projects with their students.

⁶ The National Energy Education Development Project (NEED) provides lesson plans, student activities, and other resources to assist schools in developing school level energy teams. For more information, please visit: www.need.org.

⁷ For examples of school district energy mascots, please visit: www.kppc.org/keeps.

⁸ For examples of light switch stickers: www.awarenessideas.com

⁹ For more information on Kentucky Green and Healthy Schools: www.greenschools.ky.gov

In the KGHS program, students implement projects to improve the health, safety or sustainability of their schools in the following nine categories: Energy, Green Spaces, Hazardous Chemicals, Health & Safety, Indoor Air Quality, Instructional Leadership, Solid Waste, Transportation and Water Quality.

Each school will take steps to join the KGHS program by [DATE].

Participating schools are eligible to apply for grant funding (up to \$800) for projects that save energy at the school or in the school community. The funds must be used to purchase materials for physical improvements, including, but not limited to, the following: window tinting film, shade trees, CFL light bulbs, vending machine misers, bike racks, recycling containers, etc.

Student energy clubs will develop projects and apply for funds through KGHS Energy Saving Project funding¹⁰.

- ii. **Kentucky NEED¹¹** is the state affiliate of the National Energy Education Development (NEED) Project, a nonprofit education association, dedicated since 1980, to equipping students and teachers with a realistic understanding of the scientific, economic and environmental impacts of energy. Kentucky NEED takes a holistic approach to energy, providing core content-aligned curriculum for students, professional development for teachers and energy management programs for school operations and maintenance staff.

NEED teaches the science of energy and provides objective information about energy sources—their use and impact on the environment, economy, and society. NEED educates teachers, students, families, and the general public about energy consumption, efficiency and conservation and provides tools to help educators, energy managers, and consumers use energy wisely. NEED believes in the power of a Kids Teaching Kids approach to an expanded knowledge of energy. Students learn about energy by teaching their peers and their parents.

Each school will encourage teachers to incorporate resources from the NEED project into classroom curriculum. When offered schools will support teacher participation in NEED training, conferences and workshops.

The district energy committee will develop a system for tracking school participation in both KGHS and KY NEED.

- h. Develop and institute a district-wide energy efficiency/awareness training program

¹⁰ KGHS Energy Saving Project funding is available until all the funds are spent. For more information on the status of the funding program, please visit: <http://www.greenschools.ky.gov/resources/>

¹¹ For more information on Kentucky NEED: www.need.org

The long-term success and sustainability of our district's energy management program requires engagement, involvement, and buy-in from all of our stakeholders. To ensure continued savings and cost avoidance, the district energy committee will develop a district-wide energy efficiency training program to educate faculty, staff, students and community members on the district's commitment to energy efficiency.

- i. Faculty and Staff will receive annual energy efficiency/awareness training through professional development days. The superintendent will work with the district energy committee to ensure the content and quality of the training. The superintendent will also incorporate energy efficiency as an agenda topic for the district's opening day program.
- ii. All members of the student body will receive energy efficiency/awareness training through school assemblies. Each school will incorporate energy efficiency and awareness into all school-level assemblies. In addition, the school level energy team and energy clubs will establish an annual energy awareness week in October.
- iii. Community members, parents, local businesses, and external stakeholders will be reached through the following activities:
 1. Athletic events: the district will seek opportunities to share information with the public through half-time announcements, posters/signage, etc. at all district athletic events.
 2. District Conservation Fair: the district energy committee will sponsor an annual district conservation fair to highlight the projects and activities of the school energy teams and clubs.
 3. Fall Festival(s): the district energy committee will seek opportunities to provide information on energy efficiency and district energy related projects to the public at a local fall festival.

VIII. Facility Procedures/Operations and Maintenance (O&M)

Effective O&M is one of the most cost-effective methods for ensuring reliability, safety, and energy efficiency of the district's mechanical systems. The U.S. Department of Energy defines operations and maintenance as "all scheduled and unscheduled actions for preventing equipment failure or decline with the goal of increasing efficiency, reliability, and safety."

Objective: To operate at optimal efficiency and avoid unnecessary costs associated with reactive maintenance practices, the [District Name] Energy Committee will establish district facility procedures and O&M strategies related to building temperature, off-schedule events, heating and cooling, preventative maintenance, lighting, building envelope, plug-load, food services, water heating, common areas, vacation shut-downs, and transportation.

The following section details these procedures:

- a. Establish building temperature set points

Instituting clear guidelines for thermostat settings during both warmer and cooler months allows faculty, staff, students and other building users, including parents, to dress appropriately. Education and awareness are an important part of the long-term success of [District Name]'s energy program. Strategies for outreach, education and awareness are outlined in more detail in Section [VII] of this plan. [[District Name] energy communication can be found in **Appendix C**].

During occupied building hours¹², thermostats will be set as follows:

- i. Summer Occupied Hours: [74 – 76 degrees Fahrenheit]¹³
- ii. Winter Occupied Hours: [68 – 70 degrees Fahrenheit]

During vacation periods (winter/summer break and long weekends), the thermostats will be set as follows:

- iii. Summer Months: [80 – 85 degrees Fahrenheit]¹⁴
- iv. Winter Months: [55 – 60 degrees Fahrenheit]

- b. Install programmable thermostats or building automation system (if applicable)

Significant savings can be realized by setting back the HVAC during unoccupied hours. Studies have shown average savings of 1% (of the annual heating and cooling cost) per degree setback for 8 hours/day.¹⁵

To better realize the benefits of temperature setbacks, the district will install programmable thermostats, or a building automation system, and modify thermostat settings at the following facilities:

[List buildings that do not have programmable thermostats – prioritize installation if necessary].

- c. Determine procedures for off-schedule events

Classes, meetings, and other school activities should be scheduled to minimize energy use. Evening activities should be concentrated in the fewest areas possible, and where appropriate, the areas used should be those that already have a late night temperature setback in place.

To ensure comfort and accountability during after school, or off-schedule, events, the following procedures have been instituted by the District Energy Committee:

- Off-schedule requests will be submitted in writing at least [10] days in advance to the School Principal for approval and then filed with the

¹² Occupied hours are referenced in Section II.b.

¹³ Occupied temperature settings are based on best practices of Kentucky School Districts; however, individual districts should take into consideration what is appropriate for each school building.

¹⁴ KEEPS Energy Conservation Shutdown Checklist: <https://louisville.edu/kppc/files/keeps/step-4/Energy%20Conservation%20Shut%20Down%20Checklist%20KPS11-1009.pdf>

¹⁵ http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12720

[Energy Coordinator/Director of Facilities/Buildings and Grounds] to ensure facility needs are met. Information requested includes, building name, date of request, date of event, time/duration of event, and space requested. **[Appendix D: Sample Building Request Form]**

- Participants in off-schedule events are asked to follow energy conservation procedures upon event completion. **[Appendix E: Sample Energy Conservation Checklist]**

d. Establish guidelines for HVAC systems

i. Switchover from Heating to Cooling and Cooling to Heating

Maintenance personnel perform required changeover from heating to air-conditioning in the spring, and from air-conditioning to heating in the fall. Because of the varying equipment installed throughout the district, buildings must be changed over individually.

Maintenance performs the changeover on the basis of priorities established to:

1. provide comfort to students, faculty, and staff
2. maintain required temperatures to protect equipment, and
3. serve the greatest number of individuals and activities.

Switchover from Heating to Cooling

Air conditioning may not begin until outside temperature has reached [75 °F] for three consecutive days. Temperature projections are also considered. The wide swings in temperature during the spring and the difficulty in switching between heating and cooling make this policy necessary. Special problems or hardships with this policy should be addressed to the Director of Buildings and Grounds.

Switchover from Cooling to Heating

Heating may not begin until the high outside air temperature has dropped below at least [55 °F] for three consecutive days. Temperature projections are also considered. The wide swings in temperature during the fall of the year have made this policy necessary. Special problems or hardships with this policy should be addressed to the Director of Buildings and Grounds.

e. Develop and implement a district-wide preventative maintenance program

[Insert information about existing O&M program and/or objective to develop a preventative maintenance program – controls, filters, belts, etc.] The district Energy Committee will establish a preventative maintenance program for mechanical equipment and associated controls

to increase and maintain equipment efficiency, and therefore control energy consumption and cost. **[Appendix F: Sample O&M Checklist]**¹⁶

- f. Establish guidelines for indoor, outdoor and decorative lighting

[Examples of best practices include the following:

Interior lighting will be fluorescent, whenever possible. New energy-saving fixtures, lamps and ballasts will be used to replace existing less efficient lighting whenever economically feasible and appropriate.

Exterior lighting will be turned off except when necessary for security or extracurricular activities. [Insert time of day if necessary.] To facilitate this process, 365-day time clocks will be installed for any outside lights not on a Building Automation System (BAS). These time clocks will be programmed for the academic year.

Decorative lighting (string lights, floor lamps, etc.) shall be kept to a minimum. Lighting levels recommended by the most recent edition of the IES (Illuminating Engineering Society) Lighting Handbook shall be used as guidelines.

Occupancy/motion sensors will be installed, where it makes economic sense, to reduce and/or turn off lights in unoccupied, vacated areas. Manually turning off lights; however, is an effective energy conservation measure, with no additional cost.

Day-lighting controls will be installed, if economically feasible, to adjust lighting levels as appropriate.

Task lighting, such as desk lamps, is recommended to reduce overall ambient lighting levels. Teachers are encouraged to use task lighting at the end of the day after the students have left instead of the overhead fluorescent lighting. Compact fluorescent bulbs should be used in desk lamps.

Gymnasium Lighting will be upgraded to fluorescent fixtures (high bays or compact fluorescent fixtures).

Exit Signs will be lit with LED lights, which use 3 Watts of energy and have an expected lamp life of 25 years.

In addition to these guidelines, the following lighting upgrades will be completed during this fiscal year:

[Insert appropriate information, if applicable]

¹⁶ U.S. Green Building Council O&M Manual (NEED REFERENCE)

g. Develop and implement procedures for building envelope

Keeping doors and windows closed can result in 1 to 2 percent savings in energy consumption.¹⁷ If a window is open, for example, conditioned air is wasted by venting to the outside. To reduce unnecessary energy waste, the following best practices will be implemented:

[Best practices include the following:

- Windows and doors will be kept closed during the heating season and during the summer in those areas that have mechanical cooling;
- Gym exhaust fans will be turned off when the air conditioning unit serving that area is operating; and
- Every member of the school district will be responsible for closing windows, turning off office equipment when not in use, and shutting off the lights when leaving a room. Reminder check lists posted by exit doors will be used to prompt building occupants to do their part to conserve energy. **[Appendix E: Sample Energy Conservation Checklist]**

[While many energy saving building projects may have a longer payback, bundling items with other quick-payback projects may give an acceptable return on the project package. Potential building envelope projects requiring capital investment include the following:

- Installing window films;
- Solar tube daylighting;
- New insulation;
- Air duct sealing/insulation;
- Cool roof technology; and
- Outside air dampers]

h. Establish procedures for plug-load management

1. Computers/Monitors/Printers/Copiers/Fax-machines

[Consider the following:

- PC Power settings;
- PC security patch management;
- Vending machine power controls and de-lamping;
- Power strips;
- ENERGY STAR rated appliances/electronics;
- Shut-down schedule.]

[Best Practices, include the following:

- Computer monitors and CPUs should be set to enter “sleep mode” after X minutes of inactivity;

¹⁷ U.S. Green Building Council (www.usgbc.org)

- Computers should be turned off when school will be out for extended periods such as Fall Break, Christmas Break, Spring Break and Summer Break.]

2. Refrigerators, coffee pots and other appliances

[Describe policy/procedures for use of refrigerators, coffee pots, and other appliances.

Consider the following examples of policies regarding personal appliances;

- Faculty and staff share refrigerators and coffee pots so as to reduce the number of personal food appliances in the district.
- All personal food appliances must be ENERGY STAR certified.
- Faculty and staff who prefer their own appliances reimburse the school district for the operating cost, using the estimated operating costs as a guideline.
- Refrigerators are cleaned out and unplugged over extended breaks.]

3. Space Heaters

Whether they are purchased by the school district or personal property, two issues affect the use of space heaters in buildings — fire safety and energy efficiency. All space heaters used must be approved for fire safety, as classified by the National Fire Protection Association. No liquid fueled space heaters (e.g., kerosene heaters) shall be used in any office or classroom. Some electric space heaters also pose an unacceptable fire hazard and must be unplugged when not in use

All space heaters must meet the following four specifications: Heaters must

1. be UL approved,
2. have elements that are protected from contact,
3. be tilt-proof (when tipped over, heater goes off), and
4. be thermostat-controlled.

The issue of energy efficiency is also important because electric space heaters are a very costly means of heating. If a member of the school district feels that a space heater is necessary for adequate warmth, this may indicate that the central heating system needs repair. Maintenance should be consulted if the central heating system is incapable of meeting comfort requirements. Maintenance should also be contacted if a space heater is to be used to offset excessive air conditioning. Excessive cooling of a space below the summertime Temperature Guidelines should be reported to Maintenance so that air-conditioning levels can be adjusted.

i. Establish procedures for food services

[Consider establishing and implementing procedures for the following:

1. Exhaust Fans

Exhaust hoods can be an energy penalty in three ways: the energy cost of the fan motor, the energy cost of exhausting conditioned air, and the energy cost of pre-conditioning the make-up air.

2. Refrigerators

a. Summer Procedures

It is recommended to unplug the refrigerators during the summer break which accounts for 20% of the school year. If some food items must remain, it is recommended to consolidate into one unit and unplug the remaining empty units.

3. Water

a. Low flow spray nozzles

- i. Kitchen dishwashing pre rinse spray nozzles will be replaced with (FSTC certified) low flow nozzles (less than 1.6 gpm)

b. Dishwashing equipment

- i. Upon replacement, purchase ENERGY STAR equipment and consider a gas booster heater if the school is charged for demand (kW)
- ii. Temperature Settings
 - 1. Set temperatures as low as the local health department allows.

4. Vending Machines

A vending machine sensor uses passive infrared technology to determine if the area surrounding the machine is occupied. If the room is unoccupied for 15 minutes the compressor and lights will power down. The unit will monitor the room temperature and re-power the vending machine every 1.5 to 3 hours, so the beverage temperature stays within a predetermined range. If a potential customer approaches the machine, the unit will power up immediately. Savings can range from \$45 to \$145 a year, depending on the location of the vending machine.

Vending machine sensors will be installed on vending machines throughout the district.

5. Other appliances

a. Checklist]

i. Implement water heating set points and guidelines for management

- a. Water heating accounts for [X%] of the energy used at [District Name]. Energy is wasted if the water heater temperatures are set higher than appropriate for end use. The expected life of a water heater is 10 to 15 years.

To reduce water heating inefficiency and increase the lifetime of our equipment, the following procedures will be established:

1. Routine inspection practices to identify leaks and check burners, gauges and pumps.
2. Periodic flushing (one to two times a year) of the water heater to remove sediments from the system and increase heat transfer efficiency.
3. Vacation shutdown program to reduce unnecessary heating so of water during extended vacation periods.
4. Water heaters will be set to as low as the local health department permits. ENERGY STAR recommends a water temperature of 120 F for general use.

j. Develop and implement checklist for common areas

Each school will assign responsibility for decreasing energy consumption in common areas, including hallways, multi-purpose rooms, cafeterias, auditoriums, restrooms, gymnasiums, locker rooms, meeting areas, stages and storage rooms. Schedules can be annual or rotating, but must be established and accompanied with a common area checklist **[Appendix H: Sample Common Area Checklist]**

k. Develop and implement vacation shutdown program

Long summer breaks, along with shorter fall/winter/spring breaks and long weekends, present opportunities to shut down equipment such as computers, vending machines, refrigerators, water heaters, water fountains, exterior lighting, kitchen equipment and computer labs. Other plug loads, like small appliances and electronics, should also be unplugged when not in use. Many appliances and electronics continue to use energy even when they are “off”.

The following vacation period shut down schedule has been adopted by the [District Name] Energy Committee:

Table 5: Vacation Period Shutdown Schedule

Vacation Period Shutdown Schedule				
	Long Weekends	Winter	Spring	Summer
Thermostats – heat:	by season	50-55	off	off
Thermostats – cool:	by season	off	off	80-85
Computers	x	x	x	x
Vending Machines	x	x	x	x

Refrigerators		x		x
Electric Water Heaters	x	x	x	x
Water Fountains				x
Exterior Lighting	x	x	x	x
Kitchen Equipment	x	x	x	x
Computer Lab	x	x	x	x
Other plug loads	x	x	x	x

*See **Appendix H** for individual fall/winter/spring/summer shutdown checklists.

l. Create building operating plan for all district facilities

The district energy committee will develop and implement a district-wide building operating plan. This plan will summarize by space, the general operating requirements developed in this action plan, such as cooling season temperature, heating season temperature, humidity levels, lighting levels, etc. [**Appendix I: Sample Building Operating Plan**]

m. Establish transportation fuel conservation procedures

The district energy committee, in collaboration with the Director of Transportation, and the School Board, will implement a program to assist our district in conserving transportation fuels, and protecting the health of our children.

The district will:

- i. Adopt a district-wide idling policy¹⁸ [**Appendix J: Sample Idling Policy**];
- ii. Develop routes that maximize fuel efficiency;
- iii. Establish vehicle maintenance procedures/policies; and
- iv. Explore alternative vehicle technologies, including diesel-electric hybrid buses.

IX. Facility Planning, New Construction & Renovation

According to the U.S. Department of Energy, “the country’s least energy efficient schools use nearly four times as much energy per square foot as the most energy efficient schools.”

Objective: To reduce future energy costs in new facility construction and renovation whenever feasible.

The following strategies/actions will be adopted to assist [District Name] with meeting this objective:

a. Develop design standards

¹⁸ Sample Idle Reduction Policy: http://www.epa.gov/cleanschoolbus/idling_policy.htm; School Bus Idle Reduction Strategies: http://www.afdc.energy.gov/afdc/vehicles/idle_reduction_bus.html; Clean School Bus USA National Idle Reduction Campaign: <http://www.epa.gov/cleanschoolbus/antiidling.htm>

[District Name] energy committee will develop district guidelines for energy efficient green design. These guidelines will apply to all new construction and renovation projects.

Examples of green design standards that the district energy committee will consider, including the following:

- i. U.S. Department of Energy's EnergySmart Schools and Energy Design Guidelines for High Performance Schools¹⁹;
- ii. U.S. Green Building Councils LEED standards²⁰;
- iii. design to achieve ENERGY STAR²¹;
- iv. ASHRAE Advanced Energy Design Guides (AEDG)²²; and
- v. Kentucky Green and Health Schools Design Manual²³.

b. Earn the ENERGY STAR building label

Buildings achieving a rating of 75 or higher using ENERGY STAR's Portfolio Manager and professionally verified to meet current indoor environment standards are eligible to apply for the ENERGY STAR buildings label. [District Name] will benchmark all school buildings in our district and set goals to achieve ENERGY STAR building labels where feasible on new and existing facilities.

c. Ensure energy efficiency improvements are a priority criteria in the facility planning process

Capital intensive energy efficiency improvements and upgrades must be incorporated into the facility planning process to receive funding. Building energy assessments, energy audits and overall energy intensity ratings will be provided to the facility planning team to help identify and prioritize district facility improvements.

X. Water Conservation

[District Name] uses [X gallons a day/year]. In addition to using water for our heating and cooling systems, our restrooms, drinking water faucets, locker rooms, cafeteria, kitchen, laboratories and outdoor playing fields and lawns all contribute to the amount of water that our district consumes.

¹⁹ <http://www1.eere.energy.gov/buildings/energysmartschools/>

²⁰ <http://www.greenschoolbuildings.org/Homepage.aspx>

²¹ http://www.energystar.gov/index.cfm?c=cbd_guidebook.cbd_guidebook_energy_design_1

²² <http://www.ashrae.org/technology/page/938>

²³ <http://www.greenschools.ky.gov/NR/rdonlyres/6C0916C6-6D22-4D54-AC8A-EB481530A14D/0/GuidlinesForBuildingAGreenSchool20080714.pdf>

Objective: To conserve water resources where possible, and thereby reduce energy consumption and help protect our nation's clean water.

The following strategies/actions will be adopted to assist [District Name] with meeting this objective:

[Consider incorporating some of the following best practices:

- Install low-flow pre-rinse spray nozzle in kitchen;
- Install water aerators and automatic shut-off devices on faucets.
- Use low-flow shower heads and timer shut-off devices to reduce water use during showers (install toilet dams on older models).
- Maximize the use of natural vegetation and establish smaller lawns
- Cluster plants that require extra care together to minimize time and save water.
- When mowing your lawn areas and playing fields, set the mower blades to 2-3 inches high. Longer grass shades the soil improving moisture retention, has more leaf surface to take in sunlight, allowing it to grow thicker and develop a deeper root system. This helps grass survive drought, tolerate insect damage and fend off disease.
- Only water the lawn when necessary. Over-watering is wasteful, encourages fungal growth and disease, and results in the growth of shallow, compacted root systems that are more susceptible to drought and foot traffic. If an automatic lawn irrigation system is used, be sure it has been properly installed, is programmed to deliver the appropriate amount and rate of water, and has rain shut-off capability.
- Apply mulch around shrubs and flower beds to reduce evaporation, promote plant growth and control weeds.
- Add compost or an organic matter to soil as necessary, to improve soil conditions and water retention.
- Always use a broom to clean walkways, driveways, and entrances rather than hosing off these areas.
- Replace toilets with WaterSenseSM certified low-flow toilets when scheduled to be replaced.]²⁴

XI. Renewable Energy

Currently, the Commonwealth relies on renewable resources for less than three percent of its electricity generation²⁵. Kentucky established a goal to triple the state's renewable energy generation by 2025.

²⁴ http://www.epa.gov/region01/eco/drinkwater/water_conservation_schools.html

²⁵ Intelligent Energy Choices for Kentucky's Future, Executive Summary, page vi.

Objective: To increase the use of renewable energy and educate our students, teachers, staff, and community on the economic and environmental benefits of diversifying our energy portfolio.

[District Name] will implement the following strategies/actions to achieve this objective:

- i. Explore federal, state, and local funding opportunities to develop small scale renewable energy projects within our district.
- ii. Seek out opportunities to purchase green energy from utility companies.

XII. Environmentally Preferable Purchasing

Environmentally preferable purchasing (EPP), also called sustainable purchasing, seeks to reduce an organization's strain on the environment through the procurement of environmentally friendly and sustainable products. EPP can reduce costs by reducing waste and promoting efficiency.

Objective: To reduce [District Name]'s environmental impact and provide a healthier and safer educational environment.

[District Name] will implement the following strategies/actions to achieve this objective:

- i. Implement a district-wide EPP program that includes the following:
 - a. Paper products with X% post-consumer content
 - b. ENERGY STAR appliances
 - c. Cleaning products with the Green Seal or other reputable environmental accreditation

XIII. Other

Background

Objective:

XIV. Energy Management Projects and Actions

Appendix K

Appendix