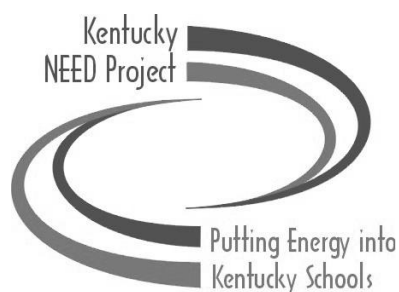


BLUEPRINT FOR SCHOOL ENERGY TEAMS

THIS GUIDE IS A TOOL FOR SCHOOLS SEEKING TO LOWER ENERGY CONSUMPTION THROUGH THE ADOPTION OF SCHOOL ENERGY POLICIES AND THE FORMATION OF A STUDENT ENERGY TEAM.



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ENERGY STAR® for K-12 School Districts

http://www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12

ABOUT THIS GUIDE

Energy costs are an increasing burden on school budgets. By implementing energy smart behaviors, districts can manage their energy consumption and redirect the savings to other needs. This guide, developed by the Kentucky NEED Project, provides a seven step approach aligned to the ENERGY STAR® Guidelines for Energy Management. It is written to help schools and/or districts develop and implement their own energy management plan.

In addition to this manual, Kentucky NEED, in partnership with KEEPS, Kentucky Green and Healthy Schools, Kentucky School Plant Management Association, and the Kentucky Department for Energy Development and Independence, offers resources to help schools achieve a complete and comprehensive energy management plan.

These organizations recommend a systems approach to energy management. A systems approach includes educating the building occupants and community members, helping them understand how their actions contribute to a successful school energy management program.

TEACHERS AND STUDENTS MAKE A DIFFERENCE

The choices we make about energy have both economic and environmental impacts. This guide is written for schools that want to address energy consumption in their buildings, utilizing teachers and students to design and deliver the energy management program.

REDUCING CONSUMPTION

It takes a great deal of energy to operate a school. Energy is typically the second largest item in a school's budget. A student energy team can help manage energy consumption by educating the school community about energy management and conservation. When energy use is reduced, additional energy costs can be avoided.

PROTECTING THE ENVIRONMENT

Saving energy also protects the environment. For every kilowatt of electricity saved, approximately 1.6 pounds of carbon dioxide is prevented from entering the atmosphere.

Addressing climate change is at the top of the nation's environmental priority list. Conserving energy is often overlooked but is one of the least expensive and swiftest solutions to this problem.

Whether students want to save energy, protect the environment or both—forming an energy team is an exciting and rewarding opportunity.

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STEPS FOR CREATING AN ENERGY MANAGEMENT PROGRAM

STEP ONE: MAKE A COMMITMENT AND ESTABLISH YOUR ENERGY TEAM

1. Institute an energy policy
2. Create your team
3. Educate your team

STEP TWO: ASSESS CURRENT STATUS AND PERFORMANCE

1. Establish benchmark/baseline
2. Conduct INITIAL building walk-through survey
3. Conduct *NEED School Energy Survey*
4. Conduct plug load study using *NEED Plug Load Guide*
5. Conduct Green and Healthy Schools energy inventory

STEP THREE: SET GOALS

1. Reduce energy consumption in the building
2. Educate the school community

STEP FOUR: CREATE AN ACTION PLAN

1. Present plan at faculty meeting
2. Host energy assembly for student body
3. Conduct activities that educate school community about energy conservation
4. Monitor school energy use regularly
5. Implement energy shut downs and setbacks during school breaks and vacations
6. Incorporate energy education in the classroom curriculum
7. Plan for awards

STEP FIVE: IMPLEMENT ACTION PLAN

1. Communicate plans to entire school
2. Raise awareness
3. Implement activities
4. Use positive reinforcement and incentives

STEP SIX: EVALUATE PROGRESS

1. Measure results
2. Review action plan

STEP SEVEN: RECOGNIZE ACHIEVEMENTS

1. Announce success of program to school and district
2. Announce success of program to community
3. Share your successes --apply for recognition awards

STEP ONE: MAKE A COMMITMENT AND ESTABLISH YOUR ENERGY TEAM

Saving energy in a school is an opportunity: an opportunity to reduce energy use, reduce a school's environmental impact and reduce energy costs. It takes a committed team to make a difference. Once a district or school makes the decision to reduce energy consumption, they can follow the outline in this guide to develop a plan that will accomplish these goals.

INSTITUTE AN ENERGY POLICY

A policy establishing an Energy Plan is the most effective way to establish an energy conservation program. It is a statement by the administration that energy conservation is a priority.

CREATE YOUR TEAM

Developing an energy team at your school is a coordinated effort. The team should include an administrator, a building support person (custodial/maintenance staff), and at least one teacher along with a team of students from multiple grade levels to ensure continuity of the program. The team members do not have to be energy experts; they just need to be willing participants. [Form 1a](#) provides a checklist for the year's activities.

1. Obtain administrative support

The administrator plays an important role by providing continuing support to the team. Having a school administration that believes energy conservation is important will give the energy team credibility and assist with buy-in from staff and students. Ask if your district has enrolled in the KEEPS program.

2. Recruit an energy team advisor

The majority of the energy program is student designed and implemented. However, an adult advisor is needed. The advisor's duties include monitoring the student meetings, maintaining supplies, and assisting in designing the monitoring schedule. The advisor will assist the student team as they develop awareness projects that will be used to educate the entire school population.

A stipend for the energy team advisor is recommended. The suggested amount is \$500 per semester. The advisor may be a teacher, an administrator or a building support person.

3. Engage building support staff

A successful energy program includes the school's building support staff as part of the energy team. The staff will guide and work with the students as they explore the energy use and features of the school building. The team advisor should alert the building support staff and ask them to recruit a representative to serve on the team.

4. Recruit students

The number of students selected for the energy team is at the team advisor's discretion. The students should be interested in energy and/or environmental issues. Most of the activities are student driven, so it is important to select reliable and trustworthy students. Students of all abilities should be considered.



Parental support is essential to the success of the energy team. They need to:

An application process may be used. Included with the application might be recommendations from teachers and a paragraph from the student stating why they would like to be a member of the energy team. A parent or guardian's signature confirming his/her support of the student's involvement on the energy team should also be part of the application. Sample energy team application and teacher recommendation forms are provided on [Forms 1b](#) and [1c](#).

- Encourage student attendance at all team meetings.
- Provide transportation as needed.

The team should decide when and how often to meet. Meeting a minimum of once a month is suggested. Many teams find that bi-monthly meetings work best. Sixty to ninety minutes is recommended for each meeting. It is also recommended that meeting attendance be recorded and active involvement rewarded ([Form 1d](#)).

5. Gather supplies

Recommended supplies for the team include a binder for energy team documents, the energy team checklist ([Form 1a](#)) and recording forms. Also include pens/pencils, a digital and/or disposable camera and energy management tools. It is suggested that these supplies be kept in a plastic bin that is easily accessible to team members.

6. Order materials

Grade-appropriate energy efficiency and conservation materials from The NEED Project may be downloaded at <http://www.need.org/curriculum.php>. Some recommended titles include:

NEED Infobooks (primary, elementary, intermediate and secondary)
Building Buddies (grades 2-3)
Monitoring and Mentoring (grades 4-6)
Saving Energy at Home and at School (grades 4-8)
Learning and Conserving (grades 7-12)
School Energy Survey (grades 7-12)

NEED's Energy Management tool kit may be purchased from The NEED Project.

EDUCATE YOUR TEAM

The first team meeting is an opportunity to build on the enthusiasm of the students who have been selected to be on the team. Discuss opportunities for the team to help reduce energy consumption and

teach the building occupants that each person can make a difference by making wise energy decisions. Devote some time to discussing plans for the year and what the team hopes to accomplish.

One of the first items of business for the team is to review what energy is and how electricity is generated. This will help them understand the science of energy and the benefits of energy efficiency and will also prepare them to more effectively communicate their message to the school and community.

NEED's Elementary, Intermediate and Secondary *Energy Infobooks* provide basic information on the sources of energy. Activities in the companion *Energy Infobook Activities* make the energy information fun to learn and easy for novice team leaders to deliver. *Infobooks* are online at <http://www.need.org/curriculum.php>.

SAMPLE ACTION PLAN TIME LINE

NOTE: This is a sample only. Your team should develop a calendar that supports their goals.

August – September

- Order or download NEED energy education materials
- Orientation meeting for teachers who will sponsor the student energy team
- Form student energy teams
- Training session for energy team members
- Study forms and sources of energy
- Establish baseline
- Conduct initial building walk-through
- Set goals and create an action plan

October

- Present program at faculty meeting
- Hold an energy assembly
- Begin regular school energy monitoring

November – March

- Design and conduct an energy education project
- NEED Building Energy Survey
- Complete Kentucky Green and Healthy Schools energy inventory
- Conduct plug load study
- Continue school energy patrols
- Assist in building shut-down for school breaks

April

- Evaluate progress
- Submit NEED Youth Awards Project (April 15 deadline)
- Submit report to school board and district administration

May

- Plan school-wide celebration
- Attend Kentucky NEED/Green and Healthy Schools awards luncheon
- Plan for next school year

June

- NEED Youth Awards Program for Energy Achievement in Washington DC

STEP TWO: ASSESS CURRENT STATUS AND PERFORMANCE

ESTABLISH BASELINE/BENCHMARK

The goal of the energy team is to reduce the school's energy consumption. In order to calculate the success of the team's efforts a pre and post assessment of the school's energy consumption is necessary, using [Forms 2a](#) and [2b](#).

An assessment of energy consumption before the energy management program begins is called a *baseline*. The on-going assessment of energy consumption is called a *benchmark*.

The energy baseline lays the groundwork for assessing the success of the energy program. At the conclusion of the first full year of the program, the school's consumption will again be calculated and compared to the baseline figures collected prior to the program's launch. This will establish the first annual benchmark.

To begin the assessment, the team should document the school's energy consumption for the previous school year (twelve months), using [Forms 2a](#) and [2b](#). This will begin a regular and ongoing practice of reviewing and monitoring utility data.

If your district has not tabulated the information, this should be one of the first tasks of the student team. They should request copies of the school utility bills for the previous twelve months.



Contact your school's utility provider to alert them to your plan and to find out what support and services they may be able to provide.

1. FORM 2A AND 2B BASELINE AND BENCHMARKING DATA

File the baseline data (consumption and cost) in the school energy team binder. Each consecutive year's data will be evaluated against the original baseline. This should be the first task the energy team completes each year.

2. ENERGY STAR® PORTFOLIO MANAGER (OPTIONAL)

Portfolio Manager is an interactive energy management tool that lets you compare the energy performance of your school to similar buildings nationwide. By inputting energy and building information, this tool provides a benchmark score on a scale of 1-100. Buildings with a score of 75 or over are eligible for the ENERGY STAR Label.

Form 2b contains the information required to complete the ENERGY STAR® Portfolio Manager <https://www.energystar.gov/istar/pmpam/>.

CONDUCT BUILDING SURVEY

In addition to tracking utilities, the energy-using behaviors of building occupants can also be assessed. This section describes four tools that monitor energy behaviors. The team will complete one or more of these assessments and use the results to establish goals. These assessments should be repeated periodically throughout the school year in order to document the impact of the program.

1. Building Walk-through Survey
2. NEED Building Survey
3. Plug Load Assessment
4. Green and Healthy Schools Energy Inventory



Remember to take pictures of all activities, including the walk-through audit. These may be used to document the team's activities for its NEED Youth Awards for Energy Achievement.

INITIAL BUILDING WALK-THROUGH SURVEY

The walk-through survey should take place after the energy team has established the school baseline. The walk-through survey should be completed early in the school year before anyone knows about the program. Students will tour the school recording their findings on the *INITIAL Building Walk-through Survey* [Form 2c](#). The teams will check rooms to see if lights and computers have been turned off when the room is unoccupied, if the windows and doors are closed, and if the heating, ventilation and air conditioning (HVAC) units are unobstructed.

This building survey will allow the team to observe the current energy practices in the school and create an energy practices baseline. They will use this data to build the awareness campaign and education program. This information will also be used along with monthly monitoring data to measure the success of the program.

NEED SCHOOL ENERGY SURVEY

To determine additional opportunities for energy savings, the students should conduct the *NEED School Energy Survey*. Students use assessment tools and observation skills to gather energy-related data in four areas: the building envelope, lighting, HVAC and electrical appliances. They also record examples of efficient use of energy and note opportunities for savings. This activity provides an opportunity for students to work with their building support staff.

To complete this survey, the energy team will need these assessment tools:

- Kill- A-Watt meter
- Digital light meter
- Hygrometer (relative humidity pen)
- Digital waterproof thermometer
- Flicker Checker

These tools are available in NEED's *Monitoring and Mentoring and Learning and Conserving* kits.

PLUG LOAD STUDY

It is estimated that up to 20 percent of the total electricity consumed by a school is from electrical devices or appliances that draw power through an electric outlet (also known as a plug load). Managing the use of such equipment can greatly reduce a school's electricity consumption.

An activity the student energy team may perform is a plug load study, using the *Plug-Load Worksheet, Form 2d*. This study will allow the team to assess how much energy electrical equipment uses and evaluate ways to use them more efficiently.

A more extensive assessment can be conducted using The NEED *Plug Load Guide* for intermediate and high school students. This activity teaches students how to determine the annual energy consumption and operating costs of machines and appliances found in the school building by using a Microsoft Excel spreadsheet. Using the spreadsheet, students will also be able to calculate the amount of carbon dioxide (CO₂) produced by the generation of electricity to power each appliance. In addition, the activity teaches the students about the electricity consumed even when certain appliances are turned off and how these "phantom loads" affect school energy bills and CO₂ emissions.

GREEN AND HEALTHY SCHOOLS ENERGY INVENTORY

The Kentucky Green and Healthy Schools Program, located on the web at www.greenschools.ky.gov, is a voluntary program consisting of nine inventories. The energy inventory, which parallels the NEED Energy Survey, requires students to answer 24 questions about the energy usage in their building and then design a school improvement plan. The information collected can be used to help the team develop the school energy management plan.



STEP THREE: SET GOALS

Now that the students have identified how much energy is consumed by the school and its occupants, they can set performance goals and record them on [Form 3a](#). Their goals will help drive energy management activities. Setting clear and measurable goals is critical for developing effective strategies. These goals should address both educating the building occupants and monitoring energy behaviors. The decision of how many goals to set is to be determined by the team. However, these core goals should be included:

- To reduce energy consumption in the school and maintain in subsequent years
- To establish energy education and awareness programs for the school community.

REDUCE ENERGY CONSUMPTION IN THE BUILDING

Reducing energy consumption in the school should be the primary goal of the team. According to the U.S. Department of Energy, schools can cut their energy consumption by 5% to 20% simply by efficient management and operation. The activities the team plans and facilitates in Step Four will help achieve this goal. The team may want to set as its goal the ENERGY STAR 10% Challenge, a national call-to-action to improve the efficiency of America's commercial (which includes schools) and industrial buildings by 10 percent or more. To register for the 10% Challenge go to http://www.energystar.gov/index.cfm?c=challenge.learn_challenge.

EDUCATE THE SCHOOL COMMUNITY

The ability of the team to reduce energy consumption at school depends on how well the team educates the school community about energy: how it is used at school and actions that will conserve energy. There are four groups within the school that will help make the program a success: teachers, students, building support staff and community members. Goals should address educating each sector about the actions they can take to reduce energy consumption.

A helpful guide for setting goals can be found in *Energy Projects and Activities Guide* online at www.need.org. Brainstorm ideas the team would like to accomplish. [Form 3a](#) (*Activity Planning and Reporting Form*) will be used throughout the year, first in goal setting, next in planning your activities and finally in documenting and evaluating your work at the end of the school year.



STEP FOUR:

CREATE AN ACTION PLAN

Once the team has set its goals, action plans should be developed to provide a roadmap for meeting these goals. Using **Form 3a** to write a detailed action plan ensures that the team projects and activities will be implemented in a systematic process. Each goal, such as reducing energy consumption at school and educating the school community, may have multiple action plans.

DEVELOPING AN ACTION PLAN

1. Spend time brainstorming activities that will achieve your goals.
2. Complete an action plan for each activity. List objectives and an estimate of the time, cost, materials and number of people it will take to accomplish the objectives (see [Appendix 4a](#) for a sample work plan).
3. Assign tasks.
4. Develop a master plan that includes all of the action plans. The master plan should include a calendar with a time line showing when each task should begin and end (see sample time line below).

ACTIVITIES TO PROMOTE AND FACILITATE THE PLAN

1. Present plan at faculty meeting

To ensure buy-in from the faculty, the energy team advisor should explain the energy conservation goals at a faculty meeting. It will help them understand the purpose and potential benefits of the energy team's mission.

2. Plan an energy assembly

The energy team needs to get buy-in from the students and all staff affected by the energy management plan. To do this, the team will need to communicate its goals and plans. An energy assembly is a dynamic way to accomplish this. As the team drafts the assembly agenda, consider including these key points:

- Introduce the team to the school
- Explain why energy conservation is so important
- Present the results of the team's building assessments (Step Two)
- Challenge everyone to help conserve energy

Suggestions for assembly activities:

- Start with an energy quiz; for sample questions see [Appendix 4b](#).

- Demonstrate how much electricity classroom machines use.
- Show how much the school spent on electricity last year.
- Show a graph that compares how much electricity the school used last year in comparison to the use in an average home.
- Show the school their carbon footprint (see *Additional Resources* on page 48 for information).
- Play NEED's *Energy Conservation and Efficiency Jeopardy* as a way to introduce the audience to energy efficient topics. Pre-select contestants (student council or faculty members) to be the participants.

3. Educate students, teachers and staff

There are many creative and diverse ways the team may educate students about how energy is consumed in their building and ways to practice energy efficiency. The education might include presentations to other classes or forming student energy partners where energy team members are assigned to work with students in other grade levels. For ideas on how the team might educate the school about energy conservation, see www.need.org/needpdf/ProjectActivities.pdf. Delegate tasks to the team members and document activities as you go along. Remember to design a way to evaluate whether the activity has been effective or not.

4. Monitor school energy use

One of the basic tasks of the student energy team is to regularly monitor the energy habits of the building occupants. The team will use *Building Monitoring Record*, [Form 4a](#), to complete this action. These forms are a vital part of the energy program. The team will use them to monitor progress in changing building occupant habits by comparing their records to the baseline data from the *Initial Building Walk-through Record*, [Form 2c](#). The action plan for monitoring contains several steps:

- **Design monitoring routes:** The team may want to use the school's fire exit plan.
- **Create monitoring schedules:** Schedule monitoring at times when classrooms are usually empty such as before and after school, during lunch and recess.
- **Monitoring identification:** In order to identify energy team members, it is recommended that the team be provided with identification, such as ID badges, vests or lab coats.
- **Communicate results:** The team should establish methods for rewarding good energy habits and encouraging those who still need to improve, e.g. handwritten notes, bulletin board or announcements (sample *Door Hanger Template* can be found on [Form 4b](#)).
- **Classroom participation:** Post the *Classroom Energy Checklist*, [Form 4c](#), as a reminder of positive energy conservation behaviors.

NOTE: These are general recommendations. Work with the maintenance staff to clarify the energy and safety policies of the school.

5. Implement a plan for energy shut downs and setbacks

Shutting down equipment that consumes energy when school is not in session will reap considerable energy savings. This action will require planning and partnership with the custodians and the administration. Include the following steps in this action plan:

- **Permission:** Gain approval from the principal, IT coordinator, district facilities director and the school maintenance staff for shut downs for school breaks.
- **Documentation:** Meet with your custodial staff to design your school Energy Shut Down Checklist. [Forms 4d, 4e, 4f and 4g](#) contain sample shut down checklists.
- **Notification:** Shut downs affect many departments, including food service, IT equipment, school office, classrooms and staff lounges. Include staff members in the development of this plan.
- **Delegation:** The team will act as assistants on this activity, proceeding under the direction of the building support staff.

6. Incorporate energy education in the classroom curriculum

Teachers may support the energy management program by incorporating energy into their existing curriculum. The team's energy advisor should present the energy management program at a faculty meeting early in the school year. At the meeting several points may be made:

- A new school energy team has been formed.
- Energy team members are available to make a presentation to their classes.
- Energy can be taught using an interdisciplinary approach. [Appendix 4c](#) lists some of the NEED energy curriculum available by subject area. The curriculum can be downloaded at <http://www.need.org>.
- The Kentucky NEED Project provides curriculum and professional development through training workshops for teachers. For information on how the school can be involved in one of these workshops contact the Kentucky NEED office at 859-578-0316 or email kreagor@need.org.

7. Plan for awards

There are two awards designed specifically to recognize student achievement in energy education. They are each student-driven and will require appointing one or two students to oversee the applications. Collecting data for these awards is highly encouraged; awards ceremonies in Frankfort provide a rewarding conclusion to the students' year of work.

- **NEED Youth Awards Program for Energy Achievement**

This program combines academic competition with recognition to acknowledge those who achieve excellence in energy education in their schools and communities. Students and teachers set goals and objectives, and keep a record of their activities. Students combine their materials into portfolios and submit them to their state coordinators no later than April 15. NEED's Projects and Activities Guide provides suggested activities, the application and reporting forms (www.need.org/needpdf/ProjectActivities.pdf).

The Kentucky NEED awards luncheon is held in May, recognizing all student energy teams who have submitted Youth Awards Projects. Energy teams are also eligible to attend the National Youth Awards Program held in Washington, D.C. in June.

- **The Kentucky Green and Healthy Schools** There are five award levels for schools participating the Kentucky Green and Healthy Schools Program. The awards, ranging from a certificate to a plaque, are based on how far a school has proceeded in the Green and Healthy Schools program. An Awards Ceremony for progress in the KGHS program is held every year in May. <http://www.greenschools.ky.gov/awardsprocess.htm>

In addition to these state awards, ENERGY STAR® provides a number of award opportunities.

- **ENERGY STAR® Leaders Award** Owning a building that achieves top energy performance is a sign of good management, but owning a portfolio of buildings that achieves continuous improvement in energy performance demonstrates superior management and environmental leadership. Those ENERGY STAR partners who demonstrate continuous improvement organization-wide, not just in individual buildings, qualify for recognition as ENERGY STAR Leaders. http://www.energystar.gov/index.cfm?c=leaders.bus_leaders
- **ENERGY STAR® Building Label.** To qualify for the ENERGY STAR label a school must score in the top 25 percent based on EPA's National Energy Performance Rating System. To determine the performance of a facility, EPA compares energy use among other similar types of schools on a scale of 1-100; buildings that achieve a score of 75 or higher may be eligible for the ENERGY STAR. To apply go to http://www.energystar.gov/index.cfm?c=business.bus_bldgs



STEP FIVE:

IMPLEMENT ACTION PLAN

Now that the team has set its goals and written action plans, it is time to implement the plan. Reaching the goals depends on the support of the entire school community and will require regular communication and monitoring.

COMMUNICATE PLANS TO ENTIRE SCHOOL

Review your planned activities. Do they reach the entire school community? Everyone is an energy consumer—including students, teachers, staff and those from the community who also use the building. The entire school needs to know what the program is and why it is important to participate. Remember, buildings don't use energy, people do.

RAISE AWARENESS

Awareness will build support for your energy management program. Do your activities raise awareness of the team goal to reduce energy consumption? You will find helpful ideas in [Appendix 5a](#) and additional support materials in the ENERGY STAR Challenge Toolkit on line at [www.energystar.gov/index.cfm?c=challenge.challenge_toolkit#spread_w
ord](http://www.energystar.gov/index.cfm?c=challenge.challenge_toolkit#spread_word).



Keep it fun! Try doing different things to keep interest in the program. Make announcements, such as “Are you energy efficient?” or “Energy tip of the day...!” Announce the results of your monitoring. Post the results on a bulletin board.

IMPLEMENT ACTIVITIES

Using the *Energy Team Checklist* ([Form 1a](#)), begin implementing the team's activities for the year. While not all activities may be completed in one year, there are several initiatives that should be done in the first year. This includes benchmarking the school's energy consumption using [Form 2c](#) and regular monitoring of the school's energy consumption using [Form 4a](#).

USE POSITIVE REINFORCEMENT AND INCENTIVES

Another implementation strategy to include is positive reinforcement. Do your activities motivate people to participate? Create ways to reward and recognize success when building occupants join in conserving energy. From announcements to post-it notes and other incentives, think of ways to give people a pat on the back.

STEP SIX: EVALUATE PROGRESS

Evaluation of the school's energy performance should be done by the student energy team at regular intervals with a culminating report at the end of the year. The team should provide brief monthly reports to the principal or school board. Evaluation results and information gathered during the year-end review may be used by next year's team to create new action plans, identify best practices and set new performance goals.

MEASURE RESULTS

In Step Two the team did a pre-assessment of the school's energy consumption. Toward the end of the school year, the student energy team will do a post-assessment (evaluation) to determine the success of the program.

The evaluation will be a comparison of data collected at the beginning of the year and the data collected during the year. Evaluation should include a tabulation of the following forms:

- *Building Monitoring Record*, [Form 4a](#),
- *Building Monitoring Record Summary*, [Form 6a](#)
- *Energy Team Activity Planning and Reporting form "evaluation,"* [Form 3a](#)
- *Baseline and Benchmarking Data*, [Form 2b](#)
- *Plug-load Worksheet*, [Form 2d](#)

In addition, teachers and staff may be surveyed for feedback on the program and offer recommendations for the following year.

REVIEW ACTION PLAN

The energy team will use its findings to:

- Prepare a summary report for the principal and school board
- Present the successes to the student body (be creative!)
- Identify best practices and make suggestions for next year's team



STEP SEVEN: RECOGNIZE ACHIEVEMENTS

Recognizing the accomplishments of the team and the school community is key to sustaining support and momentum for the energy management program. Recognition can also increase the participation of everyone involved.

Something as simple as a note of congratulations to a formal acknowledgment of efforts is a valuable tool to ensure continued participation in the program. Rewarding particular efforts sets the example for what constitutes success and helps motivate participants.

At the end of the school year, the team may consider a culminating celebration recognizing the efforts of the teachers, students, support staff and community members who have helped to make the program a success.

Good work also deserves to be acknowledged externally. Third party recognition can provide validation for the energy management program. Not only does it provide satisfaction to those involved in earning the recognition, but it can also enhance the program's public image and encourage others to take action, too. A solid reputation attracts sponsors and business partners and makes the community proud of the program.

Here are some opportunities for recognition the team and/or school may pursue:

ANNOUNCE SUCCESS OF PROGRAM TO SCHOOL AND ENTIRE DISTRICT

- Post achievements on the district's web site
- Recognize successes at an end of the year school board meeting
- Host an awards luncheon for the school energy team
- Conduct a school assembly
- Host an energy fair and feature table-top displays of the energy team projects

ANNOUNCE SUCCESS OF PROGRAM TO COMMUNITY

- Contact local utilities
- Produce a documentary for the local cable access channel, pod-casts, You-Tube and/or the district TV network
- Create a website
- Hold press conference

- Notify civic teams (Chamber of Commerce, Rotary, etc.)
- Send press releases announcing the success of the program to the following:
 - Local media—newspapers, radio and television stations
 - State Energy Office
 - Local EPA office
 - City Mayors
 - County Judge-Executives and Commissioners

[Appendix 7a](#) contains a sample news release.

SHARE YOUR SUCCESS—APPLY FOR RECOGNITION

There are many organizations that reward and/or recognize student achievements in the area of energy efficiency and conservation. A web search will provide links to these opportunities. Here are a few to consider. Note that the first award programs referenced below recognize students for their energy education initiatives with an award ceremony held in Frankfort in May of each year.

The NEED Project's Annual Youth Awards Program for Energy Achievement

www.need.org/youthawards.php

Kentucky Green and Healthy Schools

www.greenschools.ky.gov/

STLP™ (Student Technology Leadership Program)

www.education.ky.gov/KDE/Instructional+Resources/Technology/Student+Initiatives/STLP+Student+Technology+Leadership+Program/

School of the Future Design Competition

www.cefpi.org/i4a/pages/index.cfm?pageid=3550

ENERGY STAR Leader

www.energystar.gov/index.cfm?c=leaders.bus_leaders



FORM 1A

ENERGY TEAM CHECKLIST

	PEOPLE RESPONSIBLE	DATE COMPLETED
STEP ONE: MAKE A COMMITMENT AND ESTABLISH YOUR ENERGY TEAM		
1. Institute a district energy policy		
2. Create your team		
3. Obtain administrative support		
4. Recruit an energy team advisor		
5. Engage building support staff		
6. Recruit students (Form 1b, 1c)		
7. Set guidelines and schedule for team meetings (Form 2b). Form 2a .		
8. Gather supplies and order materials		
9. Educate team		
STEP TWO: ASSESS CURRENT STATUS AND PERFORMANCE		
1. Establish benchmark/baseline (Form 2c and 2d).		
2. Conduct INITIAL Building Walk-Through Survey (Form 2e).		
3. Conduct NEED <i>School Energy Survey</i> (Form 2a)		
4. Conduct NEED <i>Plug Load Study</i> (Form 2f)		
5. Conduct Green and Healthy Schools energy inventory		
STEP THREE: SET GOALS (Form 3a)		
1. Reduce energy consumption in school building		
2. Educate teachers, students and staff about energy conservation (Form 2a, Appendix 4c)		
STEP FOUR: CREATE AN ACTION PLAN		
1. Brainstorm activities		
2. Complete action plan for each activity (Form 3a, Appendix 4a)		
a. Present plan at faculty meeting		
b. Hold an energy assembly		
c. Design energy education activities(Form 2a, Appendix 4b and 4c)		
d. Monitor school energy use regularly (Form 4a, 4b, 4c)		
e. Implement energy shut-downs during school breaks (Forms 4d, 4e, 4f, 4g).		
f. Incorporate energy into classroom curriculum (Appendix 4c)		
g. Plan for awards		
STEP FIVE: IMPLEMENT ACTION PLANS		
1. Communicate plans to entire school		
2. Raise awareness (Appendix 5a)		
3. Implement activities		
4. Use positive reinforcement and incentives		
STEP SIX: EVALUATE PROGRESS		
1. Measure results: Tabulate <i>Building Monitoring Surveys</i> (Form 6a) and <i>Baseline and Benchmarking Data</i> (Form 2d).		
2. Review goals on Energy Team Activity Planning & Reporting (Form 3a).		
STEP SEVEN: RECOGNIZE ACHIEVEMENTS		
1. Announce success of program to school and entire district.		
2. Announce success of program to community news release to media (Appendix 7a).		
3. Apply for awards		

FORM 1B

Energy Team APPLICATION

Applications are due _____ **Return to room #** _____

School: _____

Student's Name: _____

Grade: _____ **Homeroom Teacher:** _____

Address: _____

Phone Number: _____

E-mail: _____

Being selected to be a member of the energy team is an honor and should be taken seriously. You will be expected to attend regular team meetings and to participate in activities planned by the energy team. Transportation to/from team meetings and activities will NOT be provided, unless otherwise noted. For this reason, you must make arrangements to be picked up after meetings and for team activities. You will need the signature of a parent or guardian stating that they support your participation on the energy team.

With this application, attach a ½ - 1 page statement, explaining WHY you would like to be a member of the energy team.

Recommendations from two teachers are required. Please use the form provided.

If selected to be a member of the team, I understand that I will be expected to attend all team meetings and activities.

(Student's Signature)

(Date)

As part of this program, video tapes, photographs, and web page photos are often produced by the energy team, school personnel, and outside media. By signing below I am giving permission to include my child's photo or class work in video tapes, photographs, newspaper articles and web pages. I also agree to provide transportation to/from meetings when necessary.

(Parent/Guardian's Signature)

(Date)

FORM 1C

Energy Team

TEACHER RECOMMENDATION

Please return this form along with your recommendation in a sealed envelope to

_____ by _____

School: _____

Student's Name: _____

Grade: _____ Homeroom Teacher: _____

Teacher Submitting Recommendation: _____

Teacher's Signature: _____

The above named student is applying to be a member of our school's energy team. Team members will be responsible for planning and facilitating an energy plan for our school. The team will meet on a monthly basis. Recommendations from two teachers are required. Based on your classroom experience with this student, please comment on the student's work ethic and leadership abilities.

Thank you!

Energy Team ATTENDANCE RECORD

School: _____ Year: _____

Team Members		August		September		October		November		December		January		February		March		April		May		June	
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							
13																							
14																							
15																							

SAMPLE

BASELINE AND BENCHMARKING DATA

School Name:

Energy Meter ID	Energy Type	Energy Unit	Start Date	End Date	Energy Consumption	Energy Cost (optional)
E223-455	Electricity	KWh	9/18/2002	10/16/02	17,520	
E223-455	Electricity	KWh	10/17/2002	11/15/02	13,200	
E223-455	Electricity	KWh	11/16/2002	12/14/02	13,440	
E223-455	Electricity	KWh	1/21/2003	02/18/03	15,600	
E223-455	Electricity	KWh	2/19/2003	03/19/03	16,560	
E223-455	Electricity	KWh	3/20/2003	04/17/03	15,120	
E223-455	Electricity	KWh	4/18/2003	05/19/03	15,120	
E223-455	Electricity	KWh	5/20/2003	06/18/03	15,120	
E223-455	Electricity	KWh	6/19/2003	07/18/03	15,120	
E223-455	Electricity	KWh	7/19/2003	08/18/03	15,120	
E223-455	Electricity	KWh	8/19/2003	09/17/03	15,120	
E223-455	Electricity	KWh	9/20/2003	10/17/03	15,120	
G239-4565	Natural Gas	ccf	9/18/2002	10/16/02	179	
G239-4565	Natural Gas	ccf	10/17/2002	11/15/02	1734	
G239-4565	Natural Gas	ccf	11/16/2002	12/14/02	2,520	
G239-4565	Natural Gas	ccf	1/21/2003	02/18/03	3,194	
G239-4565	Natural Gas	ccf	2/19/2003	03/19/03	4,408	
G239-4565	Natural Gas	ccf	3/20/2003	04/17/03	2,833	
G239-4565	Natural Gas	ccf	4/18/2003	05/19/03	331	
G239-4565	Natural Gas	ccf	5/20/2003	06/18/03	134	
G239-4565	Natural Gas	ccf	6/19/2003	07/18/03	54	
G239-4565	Natural Gas	ccf	7/19/2003	08/18/03	36	
G239-4565	Natural Gas	ccf	8/19/2003	09/17/03	48	
G239-4565	Natural Gas	ccf	9/20/2003	10/17/03	179	
Oil Delivery	Fuel Oil	gal	36861	36950	4000	

BASELINE AND BENCHMARKING DATA

School Name:

[illegible]

BUILDING MONITORING SURVEY

[illegible]

PLUG-LOAD WORKSHEET

Note: At least one classroom, one non-classroom and one office space should be inventoried to establish a baseline. To determine the total plug-load of the building, multiply your findings by the total number of rooms in each category.

¹ 1000 watts=1 kWh (kilowatt hour)

² **Average Electricity Cost per kWh = Q** Check with your local utility provider to determine your kWh rate. The national average is \$0.081 per kWh

³ **Average CO₂ emitted per kWh = 0.77 lbs**

[illegible]

FORM 3A

Energy Team

ACTIVITY PLANNING & REPORTING FORM

(One copy for each activity)

SCHOOL:

FORM _____ OF _____

GOAL # _____

ACTIVITY # _____

ENERGY CONTENT ACTIVITIES:

STUDENT LEADERSHIP:

RESOURCES:

EVALUATION:

FORM 4A INSTRUCTIONS

Building Monitoring Record INSTRUCTIONS

Start by getting the monitoring materials from the designated area. Using the *Building Monitoring Record, Form 6a*, the task is to document efficient energy behaviors as well as any wasted energy in the rooms assigned to the teams.

When the team enters a room, fill in the date and time at the top of the form. Then fill in the columns from left to right, beginning with the classroom number. Moving from column to column, use a check mark to record a positive energy behavior and an “X” to denote areas that need improvement.

For electrical appliances and equipment: if they are off, assign a check. If they are on and being used, you would also assign a check. If equipment/lights are on and the room is unoccupied, record this as an “X”.

If your school has heating, ventilation and cooling (HVAC) units inside the classroom, make certain they are clear from any obstruction. If there is an obstruction, such as books, boxes, anything sitting on or in front of the unit, place an “X” in the HVAC column of the form. If the units are unobstructed, place a check mark on the form.

Windows and doors should be closed at all times. Put a check if they are closed or an “X” if they are open.

After the form is completed, it is time to leave the room with either a “Congratulations” or “You’re getting there” message. If the room had mostly check marks then leave a “Congratulations” note. If the room had mostly “X’s” then leave a “You’re getting there” message (see **Appendix 3a** for ideas).

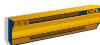
Thank you
for saving
energy!

Thank you
for saving
energy!

Congratulations!

The Energy Team stopped by. Here's what they found.

- ☐ Classroom lights turned off.
- ☐ Lights in closets turned off.
- ☐ Computer monitors turned off.
- ☐ Printers turned off.
- ☐ Ventilation units free of obstructions.
- ☐ Personal appliances turned off.
- ☐ Doors closed.
- ☐ Windows closed when heating or cooling is on.

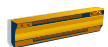


You are getting there...

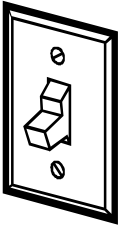
The Energy Team stopped by. Here's what they found.

YES NO

- ☐ ☐ Classroom lights off.
- ☐ ☐ Closet lights off.
- ☐ ☐ Computer monitors off.
- ☐ ☐ Printers off.
- ☐ ☐ Ventilation units free of obstructions
- ☐ ☐ Personal appliances off.
- ☐ ☐ Doors closed.
- ☐ ☐ Windows closed when heating or cooling is on.

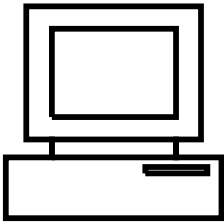


CLASSROOM ENERGY CHECKLIST



Lights out

- Before school
- After school
- Recess
- Lunch



Computer monitors & printers off

- When not in use



Personal appliances off

- When not in use



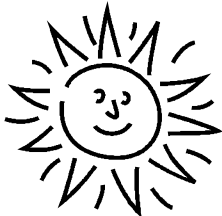
Doors closed

- During class
- When room is unoccupied



Windows closed

- When heat or cooling operating



Energy Smart Ideas

- **Lights off** when sun provides enough light
- **Blinds closed** to reduce heat from sun on warmer days
- **Blinds open** to admit heat from sun on cooler days
- **Vents unobstructed** so heating and cooling can freely enter
- **Room arranged** for best energy usage
- **Thermostat** should have no electronic equipment within five feet

School Energy Shut Down Checklist

LONG WEEKENDS

Person completing form:	School:	
Date:	Time:	
Status	Date completed	
Blinds Closed		
Office and classroom computer monitors, printers, scanners, DVDs, TV's, etc. SHUT DOWN (no green lights). Exception: This does not apply to LAN Servers and Cafeteria Computers.		
All interior lights TURNED OFF in unoccupied areas.		
All kitchen exhaust and ceiling fans TURNED OFF.		
All home economic appliances TURNED OFF except refrigerators.		
All exterior lights timed to turn off during daylight hours.		
Check and report any water fixtures that leak or run water constantly.		
<u>Notes/Observation:</u>		

Place completed form in your energy team notebook!

School Energy Shut Down Checklist

FALL/SPRING BREAK

Person completing form: Date:	School: Time:
Status	Date completed
All refrigerators (personal and shared) should be cleaned out, unplugged and door propped open. This includes Teacher Lounges. Exception: Food Service Refrigerators.	
Carefully verify the accuracy of the School and Community Use Schedule over the break. Some teams may not meet over the scheduled break. If there will be no actual activities over break, please notify Energy Management to schedule the building as "Unoccupied" during this time.	
All kitchen exhaust and ceiling fans TURNED OFF.	
Check thermostat set point. Minimum cooling level, 74 degrees. Maximum heating level, 68 degrees	
All interior lights TURNED OFF in unoccupied areas.	
Blinds Closed.	
Office and classroom computer monitors, printers, scanners, DVDs, TV's, etc. SHUT DOWN (no green lights). Exception: This does not apply to LAN Servers and Cafeteria Computers.	
Check and report any water fixtures that leak or run water constantly.	
All water fountains unplugged except one.	
All other unnecessary equipment TURNED OFF.	
All home economic appliances TURNED OFF including refrigerators (clean and empty before leaving to avoid safety/health hazard from possible spoiled food.)	
<u>Notes/Observations:</u>	

Place completed form in your energy team notebook!

School Energy Shut Down Checklist

WINTER BREAK

Person completing form:	School:	
Date:	Time:	
Status	Date completed	
All refrigerators (personal and shared) should be cleaned out, unplugged and doors propped open. This includes Teacher Lounges. Exception: Food Service Refrigerators.		
Carefully verify the accuracy of the School and Community Use Schedule over the break. Some teams may not meet over the scheduled break. If there will be no actual activities over break, please notify Energy Management to schedule the building as "Unoccupied" during this time.		
All kitchen exhaust and ceiling fans TURNED OFF.		
Check thermostat set point: Maximum heating level, 68 degrees		
All interior lights TURNED OFF in unoccupied areas.		
Blinds Closed.		
Office and classroom computer monitors, printers, scanners, DVDs, TV's, etc. SHUT DOWN (no green lights). Exception: This does not apply to LAN Servers and Cafeteria Computers.		
Check and report any water fixtures that leak or run water constantly.		
All water fountains unplugged except one		
All other unnecessary equipment TURNED OFF.		
All home economic appliances TURNED OFF including refrigerators (clean and empty before leaving to avoid safety/health hazard from possible spoiled food.)		
<u>Notes/Observations:</u>		

Place completed form in your energy team notebook!

School Energy Shut Down Checklist

SUMMER BREAK

Name of Checker:	School:	
Date:	Time:	
Status	Date completed	
All refrigerators (personal and shared) should be cleaned out, unplugged and door propped open. This includes Teacher Lounges. Exception: Food Service Refrigerators.		
Carefully verify the accuracy of the School and Community Use Schedule over the break. Some teams may not meet over the scheduled break. If there will be no actual activities over break, please notify Energy Management to schedule the building as "Unoccupied" during this time.		
All kitchen exhaust and ceiling fans TURNED OFF.		
Check thermostat set point: minimum cooling level, 74 degrees.		
All interior lights TURNED OFF in unoccupied areas.		
Blinds Closed.		
Office and classroom computer monitors, printers, scanners, DVDs, TV's, etc. SHUT DOWN (no green lights). Exception: This does not apply to LAN Servers and Cafeteria Computers.		
Check and report any water fixtures that leak or run water constantly.		
All water fountains unplugged except one.		
All other unnecessary equipment TURNED OFF.		
All home economic appliances TURNED OFF including refrigerators (clean and empty before leaving to avoid safety/health hazard from possible spoiled food.)		
Check (and reset) all time clocks for security and parking lot lighting.		
All animals and plants taken home/out of classroom including fish aquariums.		
<u>Notes/Observations:</u>		

Place completed form in your energy team notebook!

BUILDING MONITORING RECORD SUMMARY

Monthly totals	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		April		May	
Record Key	✓	x	✓	x	✓	x	✓	x	✓	x	✓	x	✓	x	✓	x	✓	x
Classroom																		
Before School =BS																		
Lunch/Recess =LR																		
After School =AS																		
Non-classroom																		
Before School =BS																		
Lunch/Recess=LR																		
After School =AS																		
Monthly totals																		

Record Key = ✓**x = on with no people****How to complete this form**

1. Gather all of your monthly Building Patrol Records.
2. Beginning with September, count how many total classrooms patrolled before school (BS) have a ✓. Write that number in the BS ✓ column for September. Count how many total classrooms patrolled before school (BS) have x. Enter that number in the BS x column for September.
3. Count how many total classrooms patrolled during Lunch or Recess (LR) have a ✓. Write that number in the LR ✓ column for September. Count how many total classrooms patrolled during Lunch or Recess (LR) has an x. Write that number in the LR x column for September.
4. Count how many classrooms patrolled after school (AS) have a ✓. Write that number in the AS ✓ column for September. Count how many total classrooms patrolled after school (AS) have an x. Write that number in the AS x column for September.
5. Now do the same for all the non-classrooms.
6. Repeat the steps 2 - 4 for each month.

SAMPLE WORK PLAN

GOAL

- To increase energy awareness in local elementary schools.

OBJECTIVES

- To provide fourth and fifth grade teachers with oneñweek energy units and materials.
- To conduct **Energy Carnivals** at the end of the energy units for fun and reinforcement.

WORKPLAN

Step One: Gain Necessary Permissions; Schedule Dates for Energy Units & Carnivals

- A. Get permission for the project from team sponsor, school principal, and teachers.
Time: 1 hour Deadline: October 1 Students Needed: 1
- B. Contact elementary school principals and teachers to gain their cooperation and set dates for programs. Visits to teachers to introduce energy unit agendas might be necessary.
Time: 20 hours Deadline: October 31 Students Needed: 5

Step Two: Develop and Deliver Energy Unit Guides & Materials

- A. Decide on activities for energy unit guides. Allot 45 minutes per day for five days. Begin with introductory activities and build on those. Make sure all energy sources are presented.
Time: 2 hours Deadline: October 7 Students Needed: All
- B. Prepare a detailed agenda for the energy unit to present to the teachers. Make copies for each teacher.
Time: 4 hours Deadline: October 14 Students Needed: 2
- C. Prepare a class set of materials for each teacher conducting the program. Mail with a cover letter offering assistance, if desired.
Time: 12 hours Deadline: November 1 Students Needed: 6
- D. Make follow-up calls to make sure teachers received materials, to answer any questions, and to confirm dates of programs.
Time: 2 hours Deadline: November 15 Students Needed: 2

Step Three: Fundraising

- A. Visit local businesses and organizations to solicit donations of money and merchandise for carnival prizes. Make sure to let them know that a list of sponsors will be included on the carnival fliers and posted at every carnival.
Time: 12 hours Deadline: January 1 Students Needed: 12
(Six teams of two)
- B. Write letters to local utilities and energy-related businesses explaining project and requesting donations for prizes. Make follow-up phone calls.
Time: 6 hours Deadline: December 1 Students Needed: 2
- C. Other fundraising projectsò raffles, car washes, bake sales, etc., as needed.

Step Four: Publicity

- A. Make fliers to promote each school carnival. Include sponsors' names. Send to schools to post and to local newspapers, TV and radio stations, the members of the Board of Education, and City Council.

Time: 6 hours

Deadline: January 1

Students Needed: 3

- B. Call newspapers and TV stations the day before each carnival to ask them to attend.

Time: 1 hour

Deadline: 1 day before

Students Needed: 1

Step Five: Prepare and Conduct Energy Carnivals

- A. Purchase supplies and construct two sets of carnival games. (Cost: \$20)

Time: 8 hours

Deadline: December 1

Students Needed: 4

- B. Make a master calendar of carnivals to be conducted and secure ten students for each carnival.

Time: 2 hours

Deadline: December 15

Students Needed: 1

- C. Purchase merchandise for prizes, if necessary. (Cost: \$50)

Time: 2 hours

Deadline: December 31

Students Needed: 1

- D. Conduct practice carnival sessions to familiarize everyone with roles.

Time: 2 hours

Deadline: December 31

Students Needed: 10 per carnival

- E. Confirm dates and times of carnivals with schools. Explain room set up for carnivals.

Time: 1 hour

Deadline: December 31

Students Needed: 1

- F. Arrange transportation for carnival Students.

Time: 2 hours

Deadline: 2 days before

Students Needed: 1

- G. Procure camera and purchase film for photographer. (Cost: \$10/carnival)

Time: 1 hour

Deadline: 2 days before

Students Needed: 1

- H. Meet to go over game plan.

Time: 1 hour

Deadline: 1 day before

Students Needed: All

- I. Conduct carnivalò have fun!!!

Time: 4 hours

Step Six: Evaluation and Follow-up

- A. Prepare and make copies of an evaluation form for participating teachers and students. (Cost: \$25)

Time: 4 hours

Deadline: December 31

Students Needed: 2

- B. Conduct a student evaluation meeting.

Time: 1 hour

Deadline: 1 week after

Students Needed: All

- C. Upload photos to computer and email copies to schools involved.

Time: 2 hours

Deadline: February 1

Students Needed: 1

- D. Summarize evaluation forms from teachers and students.

Time: 2 hours

Deadline: February 1

Students Needed: 2

- E. Conduct a project evaluation meeting.

Time: 2 hours

Deadline: March 1

Students Needed: All

- F. Prepare a project report using evaluation summaries and photos and submit to NEED.

Time: 4 hours

Deadline: April 15

Students Needed: 4

SAMPLE ENERGY QUIZ

1. What energy source is used to generate most of the electricity in the United States?
 - a. Coal
 - b. Uranium
 - c. Natural Gas
 - d. Hydropower
2. Which of the following uses the most energy in the average school?
 - a. Lighting rooms
 - b. Powering ventilation fans
 - c. Heating rooms
 - d. Cooling rooms
3. Scientists say the fastest and most cost-effective way to address our energy needs is to. . .
 - a. Develop all possible domestic sources of oil & gas
 - b. Build nuclear power plants
 - c. Develop more hydroelectric power plants
 - d. Promote more energy conservation
4. Leaving the lights on in an empty classroom for one hour wastes approximately how much electricity?
 - a. 100 watts
 - b. 500 watts
 - c. 1000 watts
 - d. 1500 watts
5. Global climate change focuses on an increase in which atmospheric gas?
 - a. Ozone
 - b. Sulfur dioxide
 - c. Carbon dioxide
 - d. Nitrous oxide
6. When an electrical device consumes energy in the "off" position this is called . . .
 - a. Phantom load
 - b. Standby power
 - c. Leaking electricity
 - d. All of the above
7. Recycling aluminum to make new aluminum cans uses what percent less energy than making new cans?
 - a. 25%
 - b. 55%
 - c. 75%
 - d. 95%
8. How is electric consumption measured?
 - a. Gallons
 - b. Pounds
 - c. Watts
 - d. Calories
9. What are the sources of greenhouse gases in the United States?
 - a. Combustion of petroleum
 - b. Combustion of coal
 - c. Combustion of natural gas
 - d. All of the above
10. What percent of lighting costs can be reduced by simply turning off lighting when rooms are vacant?
 - a. 1 - 5 %
 - b. 8 ñ 20%
 - c. 18-40%%
 - d. 30 ñ 50%

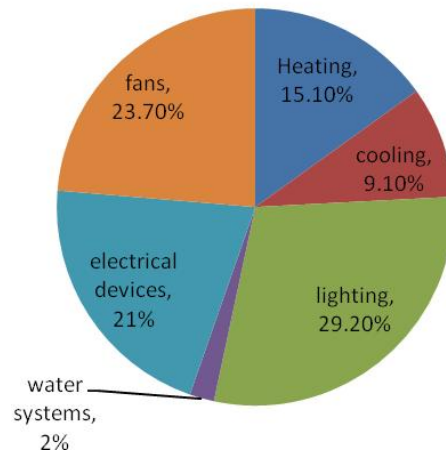
Correct answers: 1a, 2a, 3d, 4d, 5c, 6d, 7d, 8c, 9d, 10b

Support Documentation

1a 55% of electricity in the US is generated at coal-fired power-plants. 96% of Kentucky's electricity is generated at coal-fired power plants.

2a Lighting rooms (29.2%)
Powering ventilation fans (15.1)
Heating (15.1%)
Cooling rooms (9.1%)

Kentucky School Energy Consumption



3d The Tenth Annual National Report Card: Energy Knowledge, Attitudes, and Behavior, The National Environmental Education & Training Foundation ÇRoper ASW
<http://www.csu.edu/cerc/researchreports/documents/AmericansLowEnergyIQ2002.pdf>

4d Lights Out at Boone County Schools!

5c <http://www.eia.doe.gov/bookshelf/brochures/greenhouse/Chapter1.htm>

6c <http://standby.lbl.gov/> Energy Analysis Department, Lawrence Berkeley National Laboratory

7d Source: <http://www.eia.doe.gov/kids/energyfacts/saving/index.html>

8c 1000 watts = 1 kilowatt. Utility bills typically measure electricity in kilowatt hours (kWh).

9d all of the above'source
<http://www.eia.doe.gov/bookshelf/brochures/greenhouse/Chapter1.htm> Greenhouse Gases, Climate Change, and Energy brochure published by Energy Information Administration

10b http://www.achrnews.com/Articles/Web_Exclusive/BNP_GUID_9-5-2006_A_1000000000000090317 New York State Energy Research and Development Authority (NYSERDA)

Appendix 4c

NEED ENERGY CURRICULUM FOR TEACHERS

Content area (Correlations can be found at www.need.org)	NEED Curriculum (Descriptions can be found at www.need.org)
SOCIAL STUDIES	Energy on Public Lands Energy and Geography Energy Around the World Global Trading Game Mystery World Tour The Energy Debate Game
PRACTICAL LIVING	Energy Management Kits ▪ Building Buddies ▪ Monitoring and Mentoring ▪ Learning and Conserving
SCIENCE	ElectroWorks Energy Fair Energy Infobook Activities Energy Infobooks Energy Works H ₂ Educate Magnets Primary Science of Energy Science of Energy Solar Wind
MATH	Energy Math Challenge Energy Analysis
LANGUAGE ARTS	Energy Rock Performances Primary Stories and More Yesterday in Energy
ARTS	Energy on Stage Great Energy Rock Performances NEED Song Book
INTERDISCIPLINARY	Current Energy Affair Energy Carnival Energy Conservation Contract Energy Enigma Energy House Energy Source Expo Games and Icebreakers Great Energy Debate Game Mission Possible Museum of Solid Waste Talking Trash Today in Energy Trash Flipbook

Appendix 5A

AWARENESS IDEAS

Once teachers, students, and staff begin thinking about how they use energy, they will quickly see how easy it is to do a few simple things to save energy!

- Have students design posters about energy efficiency
- Post a graph of the school's energy usage and update monthly
- Have a door decorating contest with an energy efficiency theme
- Create reminder stickers for light switch plate covers that promote energy efficiency. Use an ordinary switch plate as a template.
- Have students write newsletter articles or design brochures about energy saving tips
- Create ribbons, certificates or buttons for recognition of excellence in energy saving practices
- Give energy-saving tips during morning or afternoon announcements
- Give presentations to the School Board and PTA
- Produce public service announcements for the local cable access channels
- Dedicate a bulletin board in a main area, highlighting program activities, progress, outstanding participants and important dates
- Challenge each class to use **Form 6e** to do a plug load study of their classroom. Have them compare the results of their classroom plug load to the baseline plug load study completed by the Energy Team.
- Host a "Green Energy Week."
- Send news releases about team activities to local papers, media outlets and school informational publications (**Appendix 7a** provides a sample news release).

Appendix 7A

SAMPLE NEWS RELEASE

STUDENTS LOWER SCHOOL ENERGY BILLS

FOR IMMEDIATE RELEASE: [Date]

CONTACT: [Name, Phone Number, E-mail Address]

School or District logo

[Organization] Launches School Energy Diet

Students commit to lowering energy consumption and saving district money

[City, State] ñ [Name of School or Energy Team] announced today [it is/they are] launching a campaign to reduce their school's energy consumption. The goal of the energy management is to reduce energy consumption at [name of school] in order to save money and protect the environment.

According to the Environmental Protection Agency, one kWh of electricity produces 1.5 lbs. of carbon dioxide. Energy experts also report that eight percent to twenty percent of lighting costs can be reduced by simply turning off lighting when rooms are vacant.

Facts such as these sent the students tracking down ways to reduce energy consumption in their school. "We have learned that there are simple ways for all of us to save energy," said student energy team member [first and last name]. "We decided to share this information with our classmates and see if our school could make a difference."

It has changed the attitude of the entire student body. Through energy assemblies, student monitoring, and partnering with the facilities team, energy at [school] is no longer wasted. [If you benchmarked, provide numbers of kWh you saved.]

"Every week we walk through the halls, monitoring energy usage," says [student leader's name]. "When we started, we found many empty classrooms with lights left on. But in just a few months, everyone has learned the importance of saving energy."

Sponsor teacher [first and last name] began the program by using energy curriculum provided by the non-profit organization The NEED Project to teach the students what energy is, where it comes from and how it is used in the school. "Energy is part of Kentucky's Core Content," said [last name of teacher]. "This project provided a perfect opportunity for us to combine science with real-life applications."

Turning out lights and shutting off computer monitors when not in use has become a way of life at [name of school], thanks to the school's student energy team. Not only are they lowering operating costs, they are also learning how to be wise energy users in the process.

###

GLOSSARY

Baseline: an initial set of data used for comparison.

Benchmark: a follow-up set of data from which measurements may be made, usually comparing them to the baseline data.

British Thermal Unit (Btu): the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit; equal to 252 calories. British thermal unit is abbreviated as Btu.

Carbon Footprint: the amount of carbon dioxide emissions produced by the energy consumed by an individual, organization or product.

Cost Avoidance: amount of money not spent because of advanced planning or preparation.

Emission: releases of gases into the atmosphere from some type of human activity (cooking, driving a car, etc). In the context of global climate change, they consist of greenhouse gases (e.g., the release of carbon dioxide during fuel combustion).

Energy Efficiency: refers to activities that are aimed at reducing the energy used by substituting technically more advanced equipment, typically without affecting the services provided.

Energy Information Administration (EIA): is a statistical agency of the U.S. Department of Energy that provides policy-neutral data, forecasts, and analyses to promote sound policy making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment.

ENERGY STAR® is a government-backed program helping businesses and individuals protect the environment through superior energy efficiency.

Environmental Protection Agency (EPA) is an independent federal agency established to coordinate programs aimed at reducing pollution and protecting the environment.

Greenhouse Gases: Gases that trap the heat of the sun in the Earth's atmosphere, producing the greenhouse effect. The two major greenhouse gases are water vapor and carbon dioxide. Lesser greenhouse gases include methane, ozone, chlorofluorocarbons, and nitrogen oxides.

HVAC: the abbreviation for heating, ventilating and air conditioning systems.

Kilowatt-hour (kWh): A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btu or 3.6 million joules.

Load: Any device that draws power from the electrical system and requires electricity to do work.

Phantom Load: The amount of electricity drawn from electrical appliances when they appear to be off, but are actually in stand-by mode (often signified by a small colored light). Usually, cords with small black boxes attached, such as a cell phone charger, continue to draw electricity, even when the phone is not connected to that cord.

Plug Load: The amount of electricity drawn from electric outlets by appliances and equipment.

ADDITIONAL RESOURCES

Alliance To Save Energy www.ase.org Promotes energy efficiency worldwide for economy, environment and security. Offers K-12 lesson plans, energy saving tips and a green schools program to assist districts in lowering energy consumption.

American Council for an Energy-Efficient Economy www.aceee.org/ A nonprofit organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection.

Calculating Your School's Carbon Footprint www.earthteam.net/GWCampaign/calculate.html The *SchoolNeutral* Carbon Calculator is a school-specific carbon calculator.

Earth 911 <http://earth911.com/> Enter your zip code and receive information on sites for recycling and product disposal resources; the site has information for over 100,000 programs and locations.

Energy Efficiency and Renewable Energy (an office of the U.S. Department of Energy) <http://www.eere.energy.gov/>

- **Energy Efficiency and Renewable Energy: Education** <http://www1.eere.energy.gov/education/> On this site you will find links to educational and training resources on energy, particularly energy efficiency and renewable energy.
- **Guide to Operating and Maintaining EnergySmart Schools** www1.eere.energy.gov/buildings/energysmartschools/o-and-m_guide.html A primary resource for implementing a district or school-wide operations and maintenance (O&M) program that focuses on energy efficiency. Accompanying the Guide are Action Plan Templates that provide a snapshot of customizable checklists used for planning and implementing energy-focused operations and maintenance
- **EnergySmart Schools** <http://www1.eere.energy.gov/buildings/energysmartschools/> This program is committed to building a nation of schools that are smart about every aspect of energy. It provides information in four areas of school facilities: planning, financing, design and build, and operation and maintenance.
- **Energy Savers** http://www.energysavers.gov/your_home/energy_audits/index.cfm/mytopic=11160 Guides the reader through a do-it-yourself home energy audit, provides a calculator to calculate your home energy costs, as well as links to government weatherization assistance and tax credits for energy efficiency.

Energy Hog <http://www.energyhog.org/> Students will love this site. It is an interactive video game full of sound effects, cartoon characters, and activities that teach about energy efficiency.

Energy Information Administration (an office of the U.S. Department of Energy) www.eia.doe.gov

- **Energy Explained:** www.eia.doe.gov/energyexplained clearly conveys the facts and latest data about energy. The site is full of graphs, data, and scientific information that can add depth to high school curricula in Science, Math, or Social Studies. The site explains where gasoline comes

from, what determines the price of electricity, how much renewable energy the United States uses, and hundreds of other energy topics.

- **EIA Kids Page** www.eia.doe.gov/kids/ contains energy facts, classroom activities as well as a more complete energy glossary.
- **Energy Education Resources: Kindergarten Through 12th Grade**
<http://www.eia.doe.gov/bookshelf/eeer/kiddietoc.html> a list of generally available free and low-cost energy-related educational materials.

Energy Star (a joint program of the U.S. Department of Energy and the U.S. Environmental Protection Agency) <http://www.energystar.gov/>.

- **Energy Star Home Energy Yardstick:**
http://www.energystar.gov/index.cfm?fuseaction=HOME_ENERGY_YARDSTICK.showGetStarted
Compare your household's energy use to others across the country and get recommendations for improvement.
- <http://www.energystar.gov/index.cfm?fuseaction=popuptool.atHome> interactive cartoon room that lets you point and click on items that save energy in each room of a house
- **Change the World, Start with Energy Star**
<http://www.energystar.gov/index.cfm?fuseaction=globalwarming.showPledgeHome> a national campaign encouraging all Americans to take small individual steps that make a big difference in the fight against global warming. Students and or schools may register to participate. The Energy Star web site will post the number of pledges you collect and calculate how many tons of greenhouse emissions you have avoided.
- **Energy Star for K-12 School Districts**
http://www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12 What school officials can do to lower energy consumption; what others are doing; how to earn recognition for your achievements and Energy Star qualified products.
- **Go Green Nights through PTO Today** http://www.ptotoday.com/sfn/SFN_gogreen_parent.php a free planning kit is provided to conduct this fun night. It is designed to show parents and kids how easy it is to help protect the environment by saving energy and living a greener lifestyle. Families will dive into a variety of fun activities that focus on the environment and energy efficiency.
- **ENERGY STAR Kids!** http://www.energystar.gov/index.cfm?c=kids.kids_index Contains fun facts, glossary, actions students can take to save energy and a parents and teacher area that contains lesson plans, games and activities.
- **ENERGY STAR LOW CARBON IT CAMPAIGN**
[HTTP://WWW.ENERGYSTAR.GOV/INDEX.CFM?C=POWER_MGT.PR_POWER_MGT_LOW_CARBON](http://WWW.ENERGYSTAR.GOV/INDEX.CFM?C=POWER_MGT.PR_POWER_MGT_LOW_CARBON) a nationwide effort to assist and recognize organizations for reducing the energy consumed by their computers and monitors. To join the Low Carbon IT Campaign, an organization pledges to activate power management features on monitors and computers to save energy and reduce its carbon footprint.

Find Your Efficiency Zone <http://homeenergysaver.lbl.gov> Based on the zip code entered, this web site will provide a comparison of the energy costs of an average home and an energy-efficient home in your area.

The Kentucky Department for Energy Development and Independence www.energy.ky.gov Visit this site to learn what energy efficiency initiatives are going on across the state of Kentucky. The Department's mission is to improve the quality and security of life for all Kentuckians by creating efficient, sustainable energy solutions and strategies; by protecting the environment; and by creating a base for strong economic growth.

KEEPS www.kppc.org/KEEPS The Kentucky Energy Efficiency Program for Schools offers a package of tools, training, coaching and expertise to assist participants in developing a systems approach to energy management. It provides resources specific to Kentucky schools to help analyze and understand their energy consumption, which includes everything from light usage and heating/air conditioning issues to natural gas usage and best environmental management practices.

The NEED Project www.need.org The NEED Project provides K-12 energy curriculum materials that are designed to be hands-on as well as science and energy management kits. An on-line pre and post assessment of Energy Knowledge is available as well as PDFs of the [Primary Poll](#), [Elementary Poll](#), [Intermediate Poll](#), and [Secondary Poll](#).

Standby Power Summary Table <http://www.standby.lbl.gov/> Information from the Lawrence Berkeley National Laboratory explaining Standby Power, including a chart showing minimum, average, and maximum standby power use of residential appliances.

BOARD ENERGY POLICY/RESOLUTION/MANDATE

I. PURPOSE

The [*name of district*] is responsible for the efficient use of its natural resources and shall provide leadership in developing a realistic energy ethic in the operation of its facilities to improve the learning and teaching environment and reduce energy consumption.

II. GENERAL STATEMENT OF POLICY

The success of this policy is the joint responsibility of the board members, administrators, teachers, students, and support personnel and is based on their cooperation. Everyone in the district is expected to contribute to energy efficiency and be an “energy saver” as well as an “energy consumer.”

The district shall provide information to the local media on the progress of the energy management program and its goals.

The school principal shall be accountable for energy efficiency efforts in their facility.

The superintendent is directed to develop the necessary administrative guidelines and plans to implement energy awareness and energy efficiency in the district.

SAMPLE DOCUMENT

ENERGY MANAGEMENT PLAN

PURPOSE

The purpose of this plan is to implement the [name of district] board energy policy to reduce energy consumption in the district's schools and to improve the learning and teaching environment for our students and teachers. Implementation of this plan will guide the district in achieving higher standards in energy and water use, environmental and economic performance.

GOALS

1. To reduce energy consumption in each school facility by at least (___) % at the end of [number of years—minimum of five recommended] and maintain the achieved level of consumption for five consecutive years. Baseline to be established at the beginning of ____ [date of year plan is implemented].
2. Establish an on-going energy awareness training program for all district employees.
3. Obtain and make available energy education materials for all teachers for incorporation into their subject matter.

OBJECTIVES TO ACHIEVE ENERGY REDUCTION

1. Achieve at least a (___)% reduction in energy consumption from the established baseline in at least (___)% of the schools by the end of ____ [date of year one]
2. Achieve at least a (___)% reduction in energy consumption from the established baseline in at least (___)% of the schools by the end of ____ [date of year two]
3. Achieve at least a (___)% reduction in energy consumption from the established baseline in at least (___)% of the schools by the end of ____ [date of year three]
4. Achieve at least a (___)% reduction in energy consumption from the established baseline in at least (___)% of the schools by the end of ____ [date of year four]
5. Achieve at least a (___)% reduction in energy consumption from the established baseline in at least (___)% of the schools by the end of ____ [date of year five]

OBJECTIVES TO ACHIEVE AN ENERGY AWARENESS TRAINING FOR PERSONNEL

1. Develop, implement and evaluate an energy awareness training program during baseline year.
2. Continue implementation each year.

OBJECTIVES TO ACHIEVE CLASSROOM ENERGY EDUCATION INTEGRATION

1. Identify and evaluate existing energy education materials.
2. Establish committee to review available energy education materials at all grade levels.
3. Devise a district-wide energy education plan and integrate with curriculum map.
4. Achieve 50% usage in classrooms by [year].

IMPLEMENTATION

1. Establish and fund an energy manager position.
2. Establish an Energy Management Team that includes representatives from all sectors of the school community.

3. Gather baseline-year energy utility data for all schools and enter into ENERGY STAR's Portfolio Manager: www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager.
4. Determine building occupancy profiles for each school.
5. Determine building and system characteristics for each school.
6. Conduct an energy audit in at least 10% of the buildings in baseline year; at least 50% by following year; at least 100% by third year.
7. Adopt a set of High Performance/Green Design guidelines for use in the design and construction of new and renovation of existing school facilities.

CHECKLISTS

1. Develop checklists for all sectors of the school community for use on daily energy conservation actions.
 - a. Classroom
 - b. Non-classroom spaces
2. Develop checklists for special circumstances to control energy usage
 - a. Holidays
 - b. Summer
 - c. Weather closings
 - d. Extracurricular activities

ENERGY AWARENESS TRAINING AND EDUCATION

1. Develop Energy Awareness training programs to support stated objectives
 - a. Administrators
 - b. Instructional
 - c. Support Personnel
 - d. Community
2. Obtain and survey existing energy education programs and select materials to achieve the stated objectives
 - a. NEED – National Energy Education Development Project
 - b. ASE – Alliance to Save Energy

ENERGY CONSERVATION MEASURES

As a result of energy audits and facility/systems inspections, develop an energy conservation measures project list in conjunction with the capital projects.

EVALUATION OF PLAN AND MEASUREMENT OF SUCCESS

Develop a rubric to provide annual evaluation of the overall program and to measure the success of the Energy Management Plan.

RECOGNITION

1. Develop a program for recognition of success in the program both internally and externally.
2. The community should be informed on a continual basis of the energy management program and what has been accomplished.

BLUEPRINT FOR STUDENT ENERGY TEAMS EVALUATION FORM

State: _____ Grade Level: _____ Number of Students: _____

- | | | |
|--|-----|----|
| 1. Did you conduct the entire activity? | Yes | No |
| 2. Were the instructions clear and easy to follow? | Yes | No |
| 3. Did the activity meet your academic objectives? | Yes | No |
| 4. Was the activity age appropriate? | Yes | No |
| 5. Were the allotted times sufficient to conduct the activity? | Yes | No |
| 6. Was the activity easy to use? | Yes | No |
| 7. Was the preparation required acceptable for the activity? | Yes | No |
| 8. Were the students interested and motivated? | Yes | No |
| 9. Was the energy knowledge content age appropriate? | Yes | No |
| 10. Would you use the activity again? | Yes | No |

How would you rate the activity overall (excellent, good, fair, poor)?

How would your students rate the activity overall (excellent, good, fair, poor)?

What would make the activity more useful to you?

Other comments:

Please fax or mail to:
NEED Project
PO Box 10101
Manassas, VA 20108
FAX: 1-800-847-1820