Assessment Guide - Energy Efficiency

*Now that you have completed **Step 1: Build a Green Team**, you are ready to proceed in your process of becoming a Washington Green School.*

Objective

Step 2: Assess. This Energy Efficiency Assessment Guide provides tips on how to complete the Energy Efficiency Assessment and some recommended resources. The goal of completing the Assessment is for your Green Team and other school members to get a good overview of what types of energy uses and fuels are being used by students and staff, and in school operations, and where there may be easy opportunities for conservation efforts. In addition, you'll learn how daily school operations and the choices of each individual can have on energy efficiency and conservation measures, and gain a better understanding of how and where energy originates and the financial costs associated with energy consumption.

Once your Assessment is complete, you will be able to use the answers and the information to identify a Lasting Change (for Step 3) that you can implement for an ongoing significant impact to improve energy efficiency and begin conservation measures at your school.

Things to Consider for a Successful Process

1. **Careful planning is the key to successfully completing the assessment.**

   First, meet with your Green Team and decide who will complete the Assessment:
   - The whole Green Team?
   - Or a combination of Green Team members, classrooms, staff or grade levels?

2. **Who do you need to call or meet to answer the Assessment Questions related to Energy Efficiency?**

   - Teachers who specialize in this topic
   - School district staff (Resource Conservation Manager)
   - Facilities staff
   - HVAC/ Building Engineer
   - Local utility
   - Purchasing Manager
   - Maintenance staff
   - School administrative staff

3. **How will you save the information you've collected for the future?**

   - To certify as a Washington Green School, you must enter 10 key findings from your Assessment in the Online Form for Step 2. You may want also want to save all the information you gathered on site at your school, so that other students who may repeat this Assessment in the future can learn from what you did, and can also compare results. This could show how the actions you completed helped improve energy efficiency. Find a central location that's easily accessible to store all your Assessment findings and other Washington Green Schools materials. Make sure to inform future key school staff and future Green Team members where to find it.
   - Remember, in order to certify, you must also scan (or take a picture of) your hand-written assessment findings, and upload them with your other Washington Green School records in your school account at www.wagreenschools.org.

Support Information for Assessment Questions

Assessment Question	Hint	Why It's Important	Related Action Items
General Information			
1. Does your school district have a Resource Conservation Manager?	Contact your district or facilities supervisor.	A Resource Conservation Manager (RCM) helps schools/districts increase their energy efficiency by improving operations and maintenance and instituting best practices for energy and other resource use in your school. If your school district has a Resource Conservation Manager (RCM) that person will probably be your best contact at the district level. The RCM is already tracking your energy bills and usage. To find out more about the Resource Conservation Managers in Washington visit: http://www.energy.wsu.edu/projects/rem/rcm.cfm.	• Contact your local utilities or agencies to schedule speakers on energy conservation or to order classroom resources related to energy conservation.
2. Contact your local utility/electricity provider to determine the primary sources of energy for your school.	Coordinate with school staff to determine what energy bills the school receives and from which utilities. Contact each of the utilities to find out fuel sources and fuel mix percentages. Enter information into the fuel fields provided for this question.	Different types of energy sources have varying levels of environmental impact. Awareness of the type of energy used by your school will aid in assessing your school's ecological or global footprint.	• Take a field trip to a local power plant and share information with whole school community.
General Building Information			
3. What type of energy is used to heat and/or cool your school buildings?	To obtain this information contact your school district building services director, RCM, or business manager, or ask your facility manager about the type of heating system that is in place, and what fuel type it uses.	Different types of energy sources have varying levels of environmental impact. Awareness of the type of energy used by your school will aid in assessing your schools ecological or global footprint.	• Learn about solar energy to heat water. Determine if solar-heated water would be appropriate at your school and present your findings and ideas to your administration or other appropriate audience.

Assessment Question	Hint	Why It's Important	Related Action Items
4. What facilities, other than the school building, use electricity on school grounds?	Ask your facilities manager or RCM.	Assess all contributing factors to energy use to establish the school's energy use baseline.	• Coordinate scheduling of after-school and weekend activities for efficient use of heating and lighting systems. Create a plan, highlight the benefits (environmentally and financially), and present your plan to the administration/district/school board, or other appropriate audience.
5. How much did your school (or district) pay for your school's energy last year? Include energy units and costs.	Contact your principal/ school administration or RCM. Teachers can include lessons on calculating or converting watt-hours, kilowatt hours, and energy cost of operation.	Assessing what the school has paid in energy costs will help establish a baseline for comparison in energy usage over time and will also help with translating energy savings to dollars saved.	• Begin tracking your school's energy use and associated costs. Students could use this data to create charts, graphs, give presentations to community members or other audiences, and display monthly usage results in a common area. Tracking your school's energy use could help measure the impact (and financial savings) of your newly adopted energy efficiency practices. • Benchmark your school's energy consumption. Benchmarking is a process where you calculate a building's energy use and compare it with other similar buildings in your area. Look at the detailed instructions in the action list to determine which data you will need to gather and track. • Connect with other schools and share information.
6. Contact your local utility/jurisdiction to find out what energy efficiency resources, programs and assistance are available to you.	There are special programs that can help with, and potentially pay for, upgrades and retrofits at your school		• Contact your local utilities or agencies to schedule speakers on energy conservation or to order classroom resources related to energy conservation.

Assessment Question	Hint	Why It's Important	Related Action Items
7. When was the primary school building built?	Contact your principal/ school administration to determine when the school was built.	Knowing what year the school was built can aid in determining building techniques and energy systems that were commonplace and available at the time.	
8. What changes have been made since the school was built and when?	Contact your principal/ school administration to determine when major renovations or system upgrades were made and identify what they were.	Knowing what changes have taken place in the history of the building can help determine opportunities for improvements. Also, knowing the age of a building connects the relationship of energy efficiency and building structure, technology and design, age of materials, or presence of insulation or sealants.	• Research what new equipment, retrofits and/or energy-efficient technology your school might need. Before recommending the purchase of new equipment, be sure to identify the criteria that decision makers need in order to invest in new equipment, such as payback period and legally mandated requirements. A good resource is the U.S. Department of Energy's Rebuild America Program, which offers technical resources to school districts.
9. Windows 10. Are windows left open when the heater or air conditioner is operating? 11. How often are blinds closed at night?	Complete the windows assessment table in the Assessment to answer this question. Contact your facilities/ cleaning/maintenance staff to determine how often blinds are closed at night, or complete an after- hours school windows "audit" with your Green Team and the facilities manager.	Knowing the different types of windows and insulation will help determine the energy efficiency of a building. Windows (like the exterior type of the building) can be graded on their R-value. R-value is the effectiveness of a building material to resist the flow of heat: the higher the R-value, the better the insulation capacity, which in turn affects the energy efficiency of a building. To learn more about windows and energy efficiency click on the Virginia Energy Savers Handbook http://www.mme.state.va.us/de/hbchap4.html. Open windows allow cooled or heated air to escape to the exterior. These heating or cooling losses can require HVAC systems to run more frequently and increase energy use. Closing blinds at night helps keep warm air in the building.	• Establish school-wide strategies to make sure windows, blinds, and curtains are closed and/or opened at appropriate times to reduce heating and/or cooling needs, i.e.

Assessment Question	Hint	Why It's Important	Related Action Items
12. Are exterior doors propped open during the day when the heater or air conditioner is operating?	Complete a "doors audit" with your Green Team and the facilities manager during the day when the heating or cooling system is running.	Open exterior doors allow cooled or heated air to escape from the building. These heating or cooling losses can require HVAC systems to run more frequently and increase energy use.	• Establish school-wide strategies to make sure doors to the outside of the building are not left open longer than necessary when heating and cooling. Classrooms should also keep windows and doors closed when heating and cooling.
13. Are the main doors left open for student arrival and departure in the morning and afternoon?			
14. Are any exterior doors missing weather stripping or seals?	Complete a "doors audit" with your Green Team: check for weather stripping and sealing around the doors by running your hands around a closed door to see if you can feel any air coming through. Look around the door frames for any obvious air gaps between the door and frame.	Weather stripping and seals are an integral part of the building envelope. Missing seals and weather stripping are places that can leak heated or cooled air. These heating or cooling losses can require HVAC systems to run more frequently and increase energy use.	
15. Does the building have insulation in the walls and ceiling?	Ask your facilities staff/ HVAC building engineer to determine insulation materials and levels.	Insulation in the walls and ceiling is an integral part of the building envelope. Adequate insulation aids in slowing down the conductive transfer rate from hot spaces to cool spaces. Dept of Energy has an insulation fact sheet: www.ornl.gov/sci/roofs+walls/insulation	
16. Are trees located closely around the building to provide shade during sunny days?		Trees located near the building may provide shade to the building and decrease solar heat gain by absorbing solar rays into the tree canopy. That in turn lessens the cooling need.	

Assessment Question	Hint	Why It's Important	Related Action Items
17. Are trees placed on the north and west sides of the school to provide a wind break?		Trees can provide a wind break for schools by deflecting incoming wind over or around the school.	
18. How old is your heating, ventilation and air conditioning (HVAC) equipment?	Contact your facilities manager/ HVAC building engineer to determine how old the HVAC equipment is, and what type it is.	HVAC systems are one of the main energy consumers in commercial buildings. A well-maintained HVAC system can lower utility costs, reduce replacement costs, and benefit the health of building occupants (occupants' health is covered in *Toxics Reduction and Indoor Air Quality*). Older HVAC equipment may not be as energy efficient as some newer models.	• Research equipment retrofits or energy-efficient technology your school may need and identify criteria that decision-makers may need to invest in equipment. • Establish a purchasing policy that specifies high-efficiency/air-cooled hot water heaters when replacement is needed.
19. What type of heating system do you have?			
20. What type of cooling system do you have?			
21. Does your school follow a schedule for servicing your HVAC equipment?	Contact your facilities manager/ HVAC building engineer to determine what the schedule is for servicing the school's HVAC equipment.	Regularly scheduled servicing and maintenance of HVAC equipment aids in continued optimum energy efficiency.	• Have appropriate school/district staff regularly check mechanical equipment and perform proper cleaning and preventative maintenance. Find out if this is already being done by interviewing appropriate staff or reviewing maintenance procedure guidelines, and depending on your findings, present information, recommendations and benefits to the appropriate audience and request that these options be adopted.
22. How often are furnace and ventilation filters cleaned or replaced?	Contact your facilities manager/ HVAC building engineer to determine what the schedule is for cleaning or replacing furnace and ventilation filters.	Cleaning or replacing furnace and ventilation filters improve indoor air quality and keep systems from having to exert more energy to push air through soiled filters. For increased energy efficiency and indoor air quality, ventilation filters should be replaced every 1-6 months.	

Assessment Question	Hint	Why It's Important	Related Action Items
Temperature			
23. Space around vents on walls or window sills is kept free of obstruction.	Complete the "Room Assessment Worksheet" to find the appropriate answer.	Energy efficiency is significantly impacted if items are blocking vents in classrooms or elsewhere in the school building. Make sure students and staff are educated about keeping these vents free from obstruction. This could be one duty of a classroom "energy patrol" or "energy monitor"	• Establish or improve school-wide strategies to make sure space around vents on walls and window sills is kept free of obstruction.
24. How is the temperature in your building controlled? 25. Who sets the thermostats?	Ask your facilities manager/ HVAC building engineer.	HVAC system controls can be located and operated in one place if the system is centrally located or have several individual controls if the system is a distributed system. Using standards for determining thermostat set points should aid in increasing efficient use of HVAC systems if the set points are based on seasonal changes as well as occupant use needs. A teacher has an added responsibility in energy conservation if he or she controls the classroom thermostat.	• Give a presentation to school district, school board, PTA, or other group, proposing a revised or new district policy or procedures that would address energy efficiency practices in all schools within the district. • Research what new equipment, retrofits and/or energy-efficient technology your school might need. Before recommending the purchase of new equipment, be sure to identify the criteria that decision makers need in order to invest in new equipment, such as payback period and legally mandated requirements. A good resource is the U.S. Department of Energy's Rebuild America Program, which offers technical resources to school districts.
26. Does your school use programmable thermostats?	Ask your facilities manager/ HVAC building engineer.	Programmable thermostats allow the HVAC system to run preprogrammed heating and cooling set points. Programs can be adjusted to reflect the time of day, seasonal changes, and changes in the types of activities occurring during occupancy. This maximizes the efficiency of the HVAC system. Programmable thermostats also eliminate daily decisions or actions for lowering temperatures at the end of each day.	

Assessment Question	Hint	Why It's Important	Related Action Items
27. Does your school or district have standards or guidelines for thermostat temperature settings?		Ideally, classroom thermostats should be set at 68 degrees during the heating season and at or above 75 degrees if an air conditioning system is operating. Schools may vary based on unique conditions. When school is not in operation, thermostats should be set to the lowest/highest temperature possible while still sufficiently heating/cooling the building.	
Lighting			
28. All lights are turned OFF when adequate sunlight is available, or when rooms are not in use.	Have students fill out the "Room Assessment Worksheet" to find out how much this is already happening in your school. Making sure lights are turned off when appropriate could be a job of a classroom "energy patrol" or "energy monitor".	Artificial lighting needs should be based on need for light and adjusted to supplement natural lighting, when available, rather than basing lighting use on occupancy. Schools can save a significant amount of energy (and money) by just making sure lights are turned off when adequate light is available from the sun, or when rooms are not being used. Turning off lights when they aren't needed should be one of the first activities schools choose when getting started with energy conservation. Reminder stickers on light switches can help students and staff to remember to turn them off.	• Establish or improve school-wide strategies for turning off all lights when adequate sunlight is available or when rooms are not in use.
29. Lighting controls	Complete the lighting controls table. Use Yes (Y) and No (N) to complete the chart.		
30. Are lights controlled by motion and/or photo sensors? What type and where are they located?	Complete the motion/ photo-sensor lighting controls table.	Some spaces do not require constant lighting and would benefit from motions/photo-sensors that automatically turn the light on/off when a space is occupied or empty. Is it possible to save energy and cut crime at the same time? According to a number of school districts, vandalism has been cut by simply turning off the lights at night time. Contrary to conventional law enforcement theory, which stresses well-lit areas, many districts had less vandalism once they instituted a dark campus policy to save energy dollars. This resulted in a reduction of vandalism costs as well. Do some research on the topic and see if this is an option for your school.	• Establish or improve school-wide strategies for turning off all outside lights during daylight hours. Consider turning them off at night after caretakers leave the school (dark campus w/motion sensor lights).

Assessment Question	Hint	Why It's Important	Related Action Items
31. Is natural lighting or skylighting (also known as daylighting) used as an alternative to artificial lighting?	Use the chart provided in the Assessment to fill in your findings for this questions. Visit the rooms listed in the chart and use Yes or No to complete the chart details for each room type.	Daylighting is free, so it can save a school a bundle of money. Studies also show that ample natural lighting improves student performance. Teachers and staff can take better advantage of daylighting by paying close attention to the scheduling of events: • Schedule events during daylight hours. • Match the appropriate room with available daylight for the meeting or event.	• Establish or improve school-wide strategies for turning off all lights when adequate sunlight is available or when rooms are not in use.
32. Does your school use vending misers or timers to control vending machine lighting and compressor use?	Contact your schools administration/ facilities manager to determine if the school uses vending misers or timers to control vending machine lighting and compressor use.	Using vending miser or timers to control vending machine lighting and compressor use allows the machines to go into a low power state and not run constantly when students/ staff are not present. Using a low power state decreases energy use.	• Establish policies that encourage energy efficiency regarding space heaters, coffee makers, microwaves, hot plates, personal refrigerators, and other energy using devices.
33. What type of lighting is used *outside* of the school?	Complete the outdoor lighting assessment table.	See above note on outdoor lighting and vandalism. Do some research on the topic and see if it is an option for your school to institute a "dark campus."	• Implement weekend and vacation shut-down procedures for heating/cooling and lights/equipment to maximize energy efficiency. Create a plan, and present the environmental and financial benefits to your administration/district/school board, or other appropriate audience.
34. What type of lighting is used *inside* of the school?	Complete the indoor lighting assessment table.	With many types of lighting available, matching the right kind of efficient lighting based on use and space requirements can aid in energy savings by ensuring that rooms are lit sufficiently for the task and nothing more.	• Establish or improve school-wide strategies for turning off all lights when adequate sunlight is available or when rooms are not in use. • Post conservation reminder stickers and posters around the school (turn off the lights, turn off this computer/monitor, thermostat settings, keep door closed, etc.)

Question	Hint	Why It's Important	Related Action Items
Appliances/Machines			
35. Are computer monitors turned OFF and computers put to SLEEP when not in use?	Complete the Room Assessment Worksheet and select the appropriate answer.	Turning off computer monitors and computer peripherals such as printers, scanners and other electronic equipment can save of energy (and money), and should be one of the first activities schools choose when getting started with energy conservation. Reminder stickers on monitors and other equipment can help students and staff to remember to turn off the equipment when not being used. Checking to make sure this type of electronic equipment is turned off can be a job of an "energy patrol" or "energy monitor".	• Establish or improve school-wide strategies to turn off (or put to sleep) all computer monitors, peripherals (printers, scanners, etc.) and other electronic equipment (copiers, typewriters, etc.) when not in use.
36. Are computer peripherals such as printers, scanners and other electronic equipment (copiers, typewriters, calculators, etc.) turned OFF when not in use?	Get this answer from the Room Assessment Worksheet.		
37. Which energy-using appliances does your school have?	Contact your schools administration/ facilities manager to determine what other appliances are in the school. Look for portable heaters, refrigerators, microwaves, coffee pots, etc. in common spaces as well as classrooms. Check to see if appliances/ machines are turned off each night.	Portable electric heaters, small refrigerators and other appliances use a large amount of electricity and their use should be minimized if not eliminated. Many districts with energy conservation policies have banned their use, and require special approval if they are to be used in special circumstances.	• Research potential energy and financial savings if portable electric heaters, small classroom refrigerators or other appliances not allowed. As part of your research, find if other schools, districts or agencies have banned their use as part of their energy conservation/efficiency policy. Present your findings and recommendation to appropriate audience.
38. Which of these appliances/machines are turned off every night?			
39. Are the coils on your school's refrigerators and coolers cleaned on a regular basis?	Ask your schools administration/ facilities manager.	Regularly scheduled cleaning, servicing, and maintenance of refrigerators and coolers aids in continued optimum energy efficiency. According to Energy Star, refrigerator coils should be cleaned twice a year.	• Have appropriate school/district staff regularly check mechanical equipment and perform proper cleaning and preventative maintenance. Find out if this is already being done, and depending on your findings, present information, recommendations and benefits to appropriate audience and request that these options be adopted.

Assessment Question	Hint	Why It's Important	Related Action Items
Curriculum and Community			
40. Does your school include energy usage and efficiency or renewable energy as part of the curriculum?	Ask your principal/ schools administration.	Including energy usage and efficiency or renewable energy as part of the curriculum will increase awareness of the actions students and staff can take to improve energy efficiency.	• Add renewable and non-renewable energy sources, global warming, ecological footprints, carbon footprints or energy efficiency themes into the curriculum for appropriate grades.
41. Have any of your school staff participated in any energy professional development programs or workshops within the past year?		School staff participation in energy professional development programs or workshops will help convey correct energy efficiency information to students.	• Include energy efficiency, global warming, ecological footprints, carbon footprints, or renewable or non-renewable energy themes in daily assignments or activities (reading assignments, current events, spelling lists, math problems, art projects, etc.)
42. How many power plants are in your County or region? • What type of power plants are they (i.e. hydro, wind, geothermal, coal, bio-energy)? • Which one provides energy for your school?	Contact your local utility/electricity provider for this information. Coordinate with a teacher or other school staff to schedule a tour of a power plant.	Increasing students' understanding of the source and impact of their school's power use can aid in conservation efforts.	• Take a field trip to a local power plant and share information with whole school community.
43. Has your school/class ever taken a tour of your local power plant?			
44. Are students and staff encouraged to use energy efficiently?	Interview staff and teachers to find out whether they have any rewards or use other methods to encourage energy efficient practices and behavior.	Encouraging energy efficiency and providing rewards may lead to greater adoption of energy efficiency practices by all members within your school community.	• Create a school wide recognition program for students who participate in energy efficiency activities inside or outside of the classroom and/or have students partner with community groups, non-profits, or businesses on conservation related projects.

Assessment Question	Hint	Why It's Important	Related Action Items
45. How many lunchtime vegetarian and meat entrée options are offered in your cafeteria in one week?	Do a lunch entrée count at least two days in one week to determine the vegetarian options available to students, and interview your school chef to find out how many dishes are made with fresh vs. processed food.	It takes more energy and water to grow/process meat than it does to grow vegetables. Fresh foods require less energy to produce and provide greater nutritional value (and processing can cause loss of vitamins).	• Do a promotional campaign to choose more vegetarian and fewer meat entrees in the cafeteria to save energy in the greater food system. • Do a research project on the amount of energy used in growing, processing, packaging and shipping food. Consider using a specific food item and tracking production, perhaps using data from two different methods of growing and preparing that food. Present as a poster project or presentation to your school community. You could do this as a class, with teams looking at different food items. Hang posters with your findings in the cafeteria. • Take a fieldtrip to a farm to learn about food production. Make a display or presentation in your cafeteria. • Organize a low carbon diet or local food day in your cafeteria to raise awareness of how food choices relate to energy use. Example: www.eatlowcarbon.org/# • Hold a community school event to watch and discuss a film about food. Contact the Washington Farm to Schools Program.
46. How many fresh foods and processed foods are offered at lunchtime in your cafeteria in one week?			
47. Has your school considered programs such as Watt-Watchers, energy teams, Cool Schools, etc?	Interview your administrative staff to determine whether they have researched and considered participation in these programs in the past, are currently participating, or are considering joining in the future.	Student involvement in efforts to conserve energy will aid in decreasing the amounts of energy used since students feel they have a stake in energy conservation efforts.	• Start a student "Watt-Watchers," "Conservation Patrol", "Classroom Energy Monitor" program, or rotate student responsibility to perform classroom and school walk-through to monitor energy efficiency (turn off lights, monitors, etc.).

Assessment Question	Hint	Why It's Important	Related Action Items
48. Has your school hosted energy fairs or supported classroom energy projects?	Ask your school administration.	Energy fairs or supported classroom energy projects can be a good way to engage students on the subject of energy conservation as well as encourage community involvement.	• Promote school-wide energy awareness through classroom activities, energy fairs, science displays, etc
49. Does your school emphasize conservation goals or programs on your website and/or other communication materials such as newsletters?	Review your school website and newsletters in detail and look for any statements made about resource conservation, school goals, and partnership organizations that your school has teamed with on certain environmental actions and initiatives. Interview admin staff to get additional information about what your school may be doing, or has done in the past.	Sharing the story about what you are doing is important for engaging the greater community. By sharing your progress and successes, you may inspire other to try the same.	• Design an advertising campaign including displays for the halls, commons, cafeteria or other space to educate students and staff about school energy conservation actions that they can take at school and at home • Include a "conservation minute" or "factoid" each day or week. Post this information, make it a trivia game, a morning announcement, staff meeting announcement, etc. • Promote school-wide energy awareness through classroom activities, energy fairs, science displays, etc.
50. Does your school have any renewable energy systems?	Contact your facilities manager/ HVAC building engineer to determine if the school has any renewable energy systems. Discuss active and passive solar, geothermal, and wind.	Renewable energy systems aid in reducing the schools demand on local utilities by generating energy yourself. This will also result in lower operational costs in the long run, as you can generate your own energy.	• Learn about solar energy to heat water. Determine if solar-heated water would be appropriate at your school and present your findings and ideas to your administration or other appropriate audience. • Include energy efficiency, global warming, ecological footprints, carbon footprints, or renewable or non-renewable energy themes in daily assignments or activities (reading assignments, current events, spelling lists, math problems, art projects, etc.) • Add renewable and non-renewable energy sources, global warming, ecological footprints, carbon footprints or energy efficiency themes into the curriculum for appropriate grades.