ENERGY AUDIT CHECKLIST

A school building or community center is more than just a set of rooms and offices; it is a living structure. Energy flows through the building just like any living thing. Buildings are an excellent resource for students to explore when learning about energy**.**

Establishing A Energy Baseline

Monitoring and reporting are critical components of a successful energy audit and energy action plan. A baseline must be established and should include:

1. Documentation of the utility bills that have been identified for future monitoring efforts, including the month, year, and utility – for the electric, natural gas, water, and any other energy related systems.
2. Identifying who will be responsible for comparing future utility bills to the baseline data, and what specific implementations/modifications will be monitored for their potential impacts on the baseline data
3. Establishing the frequency with which new data will be gathered and compared to the baseline (how often will you look for impacts?)
4. Determining who results will be shared with and why this is the target audience (the target audience should be in a position to make use of the results; and how the results will be shared (annual report? Online posting? etc.

Facility information

Contact Person:_____.
School address:_____.
Number of Buildings: _____.
Building name: _____.
Utility account number:_____.
Square footage of building:_____.
Construction date:_____.
Number of students: _____.
Number of staff: _____.
Operating hours during school year:_____.
Operating hours on weekends:_____.
Operating hours during summer: _____.
Type of heating fuel: _____.
Do you use any of the following: propane oil coal wood solar wind .

Building Envelope

What is the age of the roof:_____.
Is the roof in need of replacement?_____.
Do you plan to add insulation when the roof is replaced?_____.
Are there opportunities to reduce air leakage through weather stripping on doors and windows?_____.
Are there opportunities to repair cracks or add insulation to the building foundation?_____.
Are there opportunities to install insulation between conditioned and unconditioned spaces? _____.
Window type (tallied): Single-pane _____ Double-pane_____Cracked or broken_____.
Do you plan to replace any windows?_____.
Are there open doors around loading docks or other frequently accessed areas? _____.

Heating, Cooling, and Ventilation Systems

What is the type and age of heating system_____.
What is the type and age of boiler_____.
What is the boiler energy efficiency rating_____.
What is the type and age of furnace_____.
What is the furnace efficiency rating (AFUE rating)_____.
What is the type and age of hot water heater_____.

What is the water heater energy efficiency rating?_____.
What is the temperature of your hot water heater?_____.
What is you air conditioning system type and age?_____.
What is the air conditioning system efficiency rating (SEER rating)_____.
Are the filters replaced regularly?_____.
Are the HVAC systems maintained regularly?_____.
Has the duct system been tested for leakage?_____.
Is the duct system cleaned and maintained regularly?_____.
Are vents free from obstruction?_____.
Are there conditioned areas that are not used?_____.
Is there an opportunity for a programmable thermostat?_____.
Is the existing thermostat properly calibrated?_____.
Is the building properly ventilated? _____.

Motors and Equipment:-

- Is your equipment maintained so that it is operating at maximum efficiency?
- Is equipment load compatible with manufacturer specifications?
- Are machines shut down when not in use?
- Are fan belts at the proper tension and in good condition?

Computers, Electronic Equipment and Appliances

Are computers, copiers, electronic equipment, and other appliances turned off when not in use?_____.
Are energy efficient appliances and equipment used?_____.
Are the coils in the refrigeration units cleaned and maintained regularly?_____.
Are vending machines turned off when not in use?_____.

Lighting

- Lighting retrofits are one of the most cost-effective energy conservation measures available. Replacing inefficient lights and magnetic ballasts with efficient lights and electronic ballasts saves energy, provides a better quality of light, and the lighting system will last longer.

- The first step in a lighting retrofit is a lighting audit.

- To complete the independent lighting audit, you will first need a blueprint, map, or schematic of your school. This can be used to track the room names, number, and type of lights; number and type of occupancy sensors; type of lighting controls; and any relevant notes.

- If you are unsure of the wattage associated with a fixture, please consult your school maintenance director.

Answers to these questions should be found or asked for quick assessment of the status of energy efficiency

a) Lighting:-

- ♦ Is your facility using the most energy efficient lighting options (fluorescent mercury vapor, etc.)?
- ♦ Are there areas that have excessive or unneeded lighting?
- ♦ Are you making effective use of available lighting, such as natural sunlight?
- ♦ Have you installed lighting management equipment such as dimmers, timers and sensors?

Lighting Audit Checklist

Location (Room number/Type)	Quantity	Existing Fixture	Watts/Fixture	Hours/yr	Occupancy Sensors	

Energy Behavior (how humans are *using* the energy) and suggested areas for savings:-

- ♦ Are lights, fans and equipment (computer, printers, etc.) turned off when not in use?
- ♦ Are building temperatures set back when not in use?
- ♦ Are thermostats set to higher or Lower than necessary in summer and winter?
- ♦ After finding answers to the check list and identifying areas of improvement, following possibilities maybe explored as energy conservation measures.

Lighting-:

- ♦ Reduce Hours of Operation.
  - Occupancy Sensors, Photocells, Central Control.
- ♦ Reduce Capacity of Equipment.
  - Delamping, Reflectors.
- ♦ Reduce Load or Equipment Capacity. Requirements.
  - Day lighting.
- ♦ Reduce Energy Cost.
  - Base demand load reduction.
- ♦ Increase Efficiency

- T-12 to T-8
- Incandescent to Fluorescent
- Reflectors
- Dimmers

Building envelope:-

- ♦ Insulation
  - Insulation of roof & walls.

- ♦ Glass modifications-:
  - Use of permanent/movable shading on glass
  - Changing to low solar heat gain glass, insulating (low U-value) glass

- ♦ Reduce air Leakage-:
  - air lock entry
  - plugging all leakages

Heating-:

- ♦ Reduce Hours of Operation-:
  - Automated Controls.
- ♦ Reduce Capacity of Equipment-:
  - Size to meet actual load
- ♦ Reduce Load or Equipment Capacity-:

  Requirements
  - Insulation
  - Infiltration reduction
- ♦ Reduce Energy Cost-:
  - Fuel Switch
  - Rate Switch
  - Direct Purchase Gas
- ♦ Increase Efficiency-:
  - High Efficiency Boilers
  - High Efficiency Furnaces

Air Conditioning

- ♦ Reduce Hours of Operation-:
  - Automated Controls
  - Economizer

- ♦ Reduce Capacity of Equipment-:
  - Size to meet actual load
  - Chiller Loop

- ♦ Reduce Load or Equipment Capacity-:

  Requirements.
  - Insulation.
  - Infiltration reduction.

- ♦ Reduce Energy Cost-:
  - Rate Switch.
  - Thermal Storage.

- ♦ Increase Efficiency-:
  - High Efficiency Chillers.
  - Variable speed tower fans.
  - Geothermal Heat pumps.

Fans and Pumps-:

- ♦ Reduce Hours of Operation-:
  - Automated Controls.

- ♦ Reduce Capacity of Equipment-:
  - Size to meet actual load requirements.

- ♦ Reduce Load or Equipment Capacity-:
  Requirements.
  - Insulation.
  - Infiltration reduction.

- ♦ Reduce Energy Cost-:
  - Reduce base demand load through right sizing fans and pumps.

- ♦ Increase Efficiency-:
  - CAV to VAV conversion.
  - CP to VP conversion.