


EnergyRight® BUSINESS & INDUSTRY

School Uplift

Building Measures Checklist


School Name:		Date:	

Table of Contents & Navigation Links

1. Building Envelope

Any noticeable cracks in exterior doors? (weatherstripping) (can see daylight through)	◯ Yes	◯ No	Other
Any ceiling leaks? (wet spots cause greater energy transfer)	◯ Yes	◯ No	Other
Any insulation falling out anywhere or holes in exterior walls?	◯ Yes	◯ No	Other
Any Solar loading prevention? window film, blocking device (shade trees, window shades drawn, etc)	◯ Yes	◯ No	Other
Do teachers draw shades during appropriate times for East/South/West walls?	◯ Yes	◯ No	Other
Are any doors/windows left open often? (check for doorstops, more on the homemade side)	◯ Yes	◯ No	Other

Number of floors:

A) Implement Air-Sealing and Infiltration Reduction

Pre-Retrofit ACH (Typical is 0.6 // only above 1 if many intentional openings)	Building Height (ft)	Floor Area (ft^2)

B) Repair Ceiling/Roof

Existing Roof R-Value (Based on roof type)	Impacted Roof Area (ft^2)
- Select Roof Type -	

C) Use Window Treatments/Coverings

Impacted Area of Windows (ft^2)

Additional Notes

D) Air Sealing Calculator - Pre-Retrofit Condition

Building Component Category	Pre-Retrofit Condition	Quantity
Ceiling/ Ceiling Penetrations	- Choose Condition -	
Crawl Space	- Choose Condition -	
Door/ Door Framing	- Choose Condition -	

Additional Notes - Pre-Retrofit Condition

E) Air Sealing Calculator - Post-Retrofit Condition

Building Component Category	Post-Retrofit Condition	Quantity
Ceiling/ Ceiling Penetrations	- Choose Condition -	
Crawl Space	- Choose Condition -	
Door/ Door Framing	- Choose Condition -	

Additional Notes - Post-Retrofit Condition

1. Building Envelope (Cont.)

D) Air Sealing Calculator - Pre-Retrofit Condition

Building Component Category	Pre-Retrofit Condition	Quantity
Electrical Outlets	- Choose Condition -	
Exterior Walls	- Choose Condition -	
Fireplace	- Choose Condition -	
Floor Over Crawl Space	- Choose Condition -	
Joints	- Choose Condition -	
Penetrations	- Choose Condition -	
Vents	- Choose Condition -	
Window/ Window Framing	- Choose Condition -	

Additional Notes - Pre-Retrofit Condition

E) Air Sealing Calculator - Post-Retrofit Condition

Building Component Category	Post-Retrofit Condition	Quantity
Electrical Outlets	- Choose Condition -	
Exterior Walls	- Choose Condition -	
Fireplace	- Choose Condition -	
Floor Over Crawl Space	- Choose Condition -	
Joints	- Choose Condition -	
Penetrations	- Choose Condition -	
Vents	- Choose Condition -	
Window/ Window Framing	- Choose Condition -	

Additional Notes - Post-Retrofit Condition

2. HVAC Controls

Is all equipment included in control system? ◯ Yes ◯ No Other

If not, what areas are not included in control system?

Does the building have EMS overlay? ◯ Yes ◯ No Other

Does the school operate on a schedule? (even if just a thermostat?) ◯ Yes ◯ No Other

Are thermostats reset after power outages? (most reset to fail on 24/7) ◯ Yes ◯ No Other

Are holidays scheduled, or do they manually turn off for holidays? ◯ Schuduled ◯ Manual Other

Are any alarms outstanding? (still reading an error?) ◯ Yes ◯ No Other

2. HVAC Controls (Cont.)

Do they have demand control ventilation?	◯ Yes	◯ No	Other
Do they verify sensors are in normal levels/do they know what normal levels are? If erratic, better to turn off. 400-500 is OA, 600-800 is normal, 1200 is body odor smell or weird smells, >2000 is dangerous to humans	◯ Yes	◯ No	Other
Does School participate in a Demand Response program?	◯ Yes	◯ No	Other

A) Practice Proper Use of Thermostats, Thermostat Schedules, and Temperature Resets

Cooling Season Facility Temperature (°F)	Connected Cooling Capacity (Tons)	Heating Season Facility Temperature (°F)	Connected Heating Capacity (BTu/h)

Additional Notes	

B) Ensure Economizers are Functioning Properly

Unit(s)	Total Connected Cooling Capacity (Tons)	Economizer Functionality	Cooling Equipment Efficiency (SEER/IEER) - If not default
		- Select One -	
		- Select One -	
		- Select One -	

Additional Notes	

C) Adjust Equipment Temperature Set-Points of HVAC Systems

Total Connected Cooling Capacity (Tons)	Cooling Equipment Efficiency (SEER/IEER)	Cooling Equipment Efficiency (EER)	Chilled Water Temperature (°F)	Condenser Water Temperature (°F)

Total Connected Heating Capacity (BTu/h)	Heating Equipment Efficiency (%)	Stack Temperature (°F) Typically between 330F-500F (above 700F is considered too high) Higher stack temp = less efficient	Return Water Temperature (°F)

Additional Notes	

3. Fan & Pump Motors

Are the fans using synchronous belts or V-belts? Or are they direct mounted to the motors? ◯ V-Belts ◯ Synchronous Belts ◯ Directly Mounted Other:

Do the recirculation pumps run continuously, or are they also on the same control system? ◯ Run Continuously ◯ On Same Control System

Do you notice the pumps cycling? ◯ Yes ◯ No If yes, how often do they cycle?

Do you have any lead/lag strategy or staging? ◯ Lead/Lag ◯ Staging Other:

Do you currently have have a maintenance process or service contract for pumps? ◯ Yes ◯ No

A) Optimize Fan, Pump, and VFD Operations

Motor Application 1	Number of Motors	Motor Horsepower (hp per motor)	Control Type
- Select One -			- Select One -

Motor Efficiency (If not default)	Annual Operating Hours (If not default)	Part Load Ratio (If not default)

Motor Application 2	Number of Motors	Motor Horsepower (hp per motor)	Control Type
- Select One -			- Select One -

Motor Efficiency (If not default)	Annual Operating Hours (If not default)	Part Load Ratio (If not default)

Motor Application 3	Number of Motors	Motor Horsepower (hp per motor)	Control Type
- Select One -			- Select One -

Motor Efficiency (If not default)	Annual Operating Hours (If not default)	Part Load Ratio (If not default)

B) Replace V-Belt with Synchronous Belts

Location	Motor Application	Quantity	Motor Horsepower (hp per motor)	Drive Type
				- Select One -

Additional Notes

4. Ventilation

Are there obstacles blocking any return air vents? ◯ Yes ◯ No If so, where?

Is the exhaust fan tied directly to dishwasher unit? ◯ Yes ◯ No

Are filters clean? ◯ Yes ◯ No What is cleaning schedule? Any physical restrictions?

What is the condition of the inlets? How often are the coils cleaned?

Any IAC concerns?

Did you implement any measures as a result of COVID-19?

A) Close Outdoor Air Intake Dampers when Building is Unoccupied / Reduce Outdoor Air Rates

Space Type	Area of Affected Space (ft^2)	Reduce Outside Air Rates to Code
- Select Space Type -		◯ Yes ◯ No
- Select Space Type -		◯ Yes ◯ No
- Select Space Type -		◯ Yes ◯ No

Additional Notes

B) Program Exhaust Fans

Total Exhaust Fan Horsepower (hp)	Volume of Exhaust Air (CFM)	Control Type	Motor Efficiency (If not default)	Part Load Ratio (If not default)
		- Select One -		
		- Select One -		
		- Select One -		

Additional Notes

C) Clean and/or Replace Air Filters

Space Type	Number of Filters	Area of Affected Space (ft^2)	Control Type	Air Pressure Drop Classification	Motor Efficiency (If not default)	Part Load Ratio (If not default)
- Select Space Type -			- Select One -	- Select One -		
- Select Space Type -			- Select One -	- Select One -		
- Select Space Type -			- Select One -	- Select One -		

Additional Notes

4. Ventilation (Cont.)

D) Repair/Install Duct Insullation

Connected Cooling Capacity (Tons)	Connected Heating Capacity (Btu/h)	Duct Location	Approximate % Duct Leakage
		- Select One -	- Select One -

Additional Notes

E) Clean Air Inlets or Outlets

Space Type	Area of Affected Space (ft^2)	Control Type	Air Inlet/Outlet Pressure Drop Classification	Motor Efficiency (If not default)	Part Load Ratio (If not default)
- Select Space Type -		- Select One -	- Select One -		
- Select Space Type -		- Select One -	- Select One -		
- Select Space Type -		- Select One -	- Select One -		

Additional Notes

5. Hydronic Heating/Cooling

What are the temperature set points for water loops?

Any reasons for high/low settings?

Is there any scaling in cooling tower? ◯ Yes ◯ No

Are cooling towers equipped with Deduct meters? ◯ Yes ◯ No

Other

How is the water quality? ◯ Good ◯ Bad ◯ Dirty

Is there current treatment/service contract? ◯ Yes ◯ No

Does the equipment cycle? ◯ Yes ◯ No

How is capacity controlled? (VFD, etc.)

Do you have a lead/lag strategy or staging? ◯ Yes ◯ No

Are all pipes insulated? ◯ Yes ◯ No

What is the condition of the pipe insulation? ◯ Nonexistent ◯ Falling Apart ◯ Good Shape

5. Hydronic Heating/Cooling (Cont.)

Are there any puddles in the mechanical room? ◯ Yes ◯ No Notes:

Do they have a maintenance schedule/service contract? ◯ Yes ◯ No Are coils in good shape? ◯ Yes ◯ No

Are any coils hot/cold versus closed/on? If 90* out, the hot coil should be off and vice versa, Take Temp Gun

Additional Notes

A) Perform Boiler/Furnace Tune-Up

Total Connected Heating Capacity (BTu/h)	Affected Fuel Type	Heating Equipment Efficiency (%) If not default	Stack Temperature (Typically 330°F-500°F, >700°F is considered too high. Higher stack temp = less efficient)	Cycles Per Hour (default is dropping from 2 to 1 CPH)

Additional Notes

B) Install/Repair Heating Pipe Insulation

Affected Fuel Type	Heating Equipment Efficiency (%) If not default	Linear Feet of Affected Pipe	Pipe Fluid	Pipe Diameter (in.)	Pipe Material	Insulation Type	Insulation Thickness (in.)
			- Select One -		- Select One -	- Select One -	

Additional Notes

5. Hydronic Heating/Cooling (Cont.)

C) Perform Chiller Tune-Up

Chiller Type	Total Connected Cooling Capacity (Tons)	Equipment Efficiency (IPLV kW/Ton)	Equipment Efficiency (FL kW/Ton)	Equipment Efficiency (COP)	Chilled Water Temperature (°F)	Condenser Water Temperature (°F)
- Select One -						

Additional Notes

D) Install/Repair Cooling Pipe Insulation

Chiller Type	Equipment Efficiency (IPLV kW/Ton)	Equipment Efficiency (FL kW/Ton)	Equipment Efficiency (COP)	Annual Operating Hours	Linear Feet of Affected Pipe	Pipe Diameter (in.)	Insulation Type	Insulation Thickness (in.)
- Select One -							- Select One -	

Additional Notes

E) Clean and Maintain Cooling Towers

Chiller Type	Total Connected Cooling Capacity (Tons)	Equipment Efficiency (IPLV kW/Ton)	Equipment Efficiency (FL kW/Ton)	Equipment Efficiency (COP)	Chilled Water Temperature (°F)
- Select One -					

Additional Notes

F) Use Fans to Reduce Cooling Load

Affected Cooling Capacity (Tons)	Equipment Efficiency (SEER/IEER)	Fan Power (kW)	Additional Notes

6. Water Heating & Conservation

What are the temperature set points for domestic hot water?

Any reasons for high/low settings?

Do the faucets have aerators? ◯ Yes ◯ No

Are all pipes insulated? ◯ Yes ◯ No

Additional Notes

A) Reduce Domestic Hot Water Heater Temperature

Heater ID	Water Heater Setpoint Temperature (°F)	Area Served	Control Type	Affected Fuel Type	Summer Operation?
		- Select One -	- Select One -		- Select One -
		- Select One -	- Select One -		- Select One -

Additional Notes

B) DHW Tank Insulation

Locations	Existing Insulation?	Affected Fuel Type	Tank Volume (gal.)	Condition of Insulation	Summer Operation?
	◯ Yes ◯ No	◯ Electric ◯ Gas		◯ Poor ◯ Excellent	◯ Yes ◯ No
	◯ Yes ◯ No	◯ Electric ◯ Gas		◯ Poor ◯ Excellent	◯ Yes ◯ No

Additional Notes

C) Install Water-Saving Devices

Affected Fuel Type	Number of Faucets	Summer Operation?	Additional Notes
		- Select One -	
		- Select One -	

6. Water Heating & Conservation (Cont.)

D) Gallon Per Flush (GPF) of Urinals and Toilets

Note - toilet usages are in ASHRAE books for savings calculations

GPF of Urinals

Water Application	Gallon Per Flush (GPF)
Urinals	

Note: normal/wasteful GPF is 1.0, savings is 0.5/0.6

GPF of Toilets

Water Application	Gallon Per Flush (GPF)
Toilets	

Note: normal/wasteful is 1.6, savings is 1.1/1.0

Additional Notes

E) Install/Repair DHW Pipe Insulation

Location	Affected Fuel Type	Linear Feet of Affected Pipe	Pipe Diameter (in.)	Insulation Type	Insulation Thickness (in.)	Summer Operation?
	◯ Electric ◯ Gas			- Select One -	- Select One -	◯ Yes ◯ No
	◯ Electric ◯ Gas			- Select One -	- Select One -	◯ Yes ◯ No

Additional Notes

F) Install DHW Recirculation Controls

Location	Quantity	Horsepower	Motor Load Factor	Full Load Efficiency	Total Operating Hours

Additional Notes

7. Lighting

Exterior Lighting Type

Exterior Control Type

Interior Lighting Type (Based on ft²)

Interior Control Type

Does the after hours maintenance/cleaning staff leave full lights on, or by section/zone as they work? ◯ Full Lights ◯ By Zone

What about after hours practices and events? ◯ Full Lights ◯ By Zone

Are gym lights turned off during non-class time? ◯ Yes ◯ No

Are there any places that are underlit?

A) Replace Incandescent Lamps

# of Lamps	Total Lamp Wattage (W)	Control Type
		- Select One -

Additional Notes - Incandescent

B) Upgrade Existing Fluorescent Lighting to LED

Area of Expected Space(s) (ft²)	Lighting Power Density (LPD: W/ft²)	Control Type
		- Select One -

Additional Notes - LED

C) Ensure Interior/Exterior Lighting Controls are Operating Properly

Interior/ Exterior	Area of Affected Space(s) (ft²)	Lighting Power Density (LPD: W/ft²)	Control Type	% of Controls That Have Failed (%)	# of Failed Exterior Fixtures	Total Wattage of Failed Fixtures (W)
Exterior			- Select One -			
Exterior			- Select One -			

Additional Notes

D) Reduce/Control Decorative Lighting

# of Fixtures	Total Fixture Wattage (W)	Control Type
		- Select One -

Additional Notes

E) Turn Off Lights in Unoccupied Areas

Area of Affected Space(s) (ft²)	Predominant Lighting Technology	Lighting Power Density (LPD: W/ft²)	Control Type
	- Select One -		- Select One -

Additional Notes

8. Receptacles and Plug Loads

Are computers being turned off after class or after school hours? ◯ Yes ◯ No Can this be added to a control system? ◯ Yes ◯ No

Can they add surge protectors for easier manual turn off? ◯ Yes ◯ No Other

Do they have vend-misers? (occ sensors for vending machines) ◯ Yes ◯ No Other

Is personal equipment on surge protectors easily turned off? (heaters, coffee machines or warmers, TV's, etc.) ◯ Yes ◯ No

Are smart TV's scheduled off at night? ◯ Yes ◯ No Other

Are student laptop chargers "smart carts" or normal chargers? ◯ Smart Cart Chargers ◯ Normal Chargers

Can projectors be upgraded to smart TVs? ◯ Yes ◯ No

Additional Notes

A) Vending Machine Controls

# of Vending Machines	Connected Load per Unit (kW)	Summer Operation?	Additional Notes
		- Choose One -	
		- Choose One -	

B) Install Plug Load Controls (only consider if time allows)

Equipment Type	Quantity	ENERGY STAR® Rated?	Control Type	Space Type
- Choose Equipment Type -		- Choose One -	- Choose Control Type -	- Choose One -
- Choose Equipment Type -		- Choose One -	- Choose Control Type -	- Choose One -
- Choose Equipment Type -		- Choose One -	- Choose Control Type -	- Choose One -

Additional Notes

8. Receptacles and Plug Loads (Cont.)

D) Computer Management Software

Equipment Type	Quantity	ENERGY STAR® Rated?	Control Type	Space Type
Desktop Computer		- Choose One -	- Choose Control Type -	- Choose Space Type -
Laptop Computer		- Choose One -	- Choose Control Type -	- Choose Space Type -

Additional Notes

9. Refrigeration & Ice Machines

Are fridges full or sparse? (Can add thermal mass or consolidate)

Do walk-in coolers achieve temperature setpoints? ◯ Yes ◯ No

How are the seals along walk-in cooler doors?

Is there any ice forming in walk-in freezers ? ◯ Yes ◯ No

Are there shutdown procedures for refrigeration equipment during breaks?

Walk-in Cooler Temperature Setpoints:

Additional Notes

A) Turn Off Ice Makers During Extended Unoccupied Periods

# of Ice Makers	Ice Harvest Rate per Unit (lbs/day)	Additional Notes

10. Shutdown Procedure

A) Existing Shutdown Procedure:

B) Proposed Shutdown Procedure:

Summary of Proposed ECM's

C) School Need Index

Lighting	HVAC	Controls	Kitchen	Building Envelope	Custom/Other: _____
- Choose One -	- Choose One -	- Choose One -	- Choose One -	- Choose One -	- Choose One -

Score: 45 /18

(0) Excellent: No additional work required
(1) Good: Some replacement required in near future
(2) Subpar: Most equipment should be replaced soon
(3) Total Replace: All equipment needs attention

- Note the type of custom/other upgrade needed (if none exist, automatic score of 0 in that column)
  - Examples of custom: UVGI, DHW, water conservation, condenser water quality

School Need Index - Comments