

## Energy Efficiency Checklist for Municipal Buildings

This is an overview and checklist of simple measures for cities and towns to reduce energy use in schools and other buildings. These measures tend to be cost effective and require minimal analysis and planning, and many are eligible for Mass Save incentives.

Look up your local Mass Save representative at [ag.umass.edu/clean-energy/mass-save-contacts](http://ag.umass.edu/clean-energy/mass-save-contacts) and contact them to identify a contractor in your area who can help to review and implement these measures.

Advanced energy retrofits, including building envelope improvements, major HVAC system upgrades, and installation of clean heating and cooling technologies, should also be considered for more substantial energy savings.

**Building:** \_\_\_\_\_ **Date Completed:** \_\_\_\_\_

### Heating and Cooling

#### Evaluate and Adjust Schedules and Setpoints

Many programmable thermostats, energy management systems (EMS) or building management systems (BMS) are not properly programmed, which can reduce savings or even increase energy use. Controls need to be properly programmed and maintained in order to be effective.

Set temperatures to maintain comfort when the building is occupied, and set back heating or cooling (lower temperature in heating season, higher in cooling season) to avoid wasting energy when the building is not in use. In the winter, set back between 48-56°F to save energy while avoiding frozen pipes. In areas that tend to be especially cold, freezing can be avoided by applying thermostatically controlled electric heat tape to vulnerable pipes.

Set ventilation systems (exhaust fans, air supply fans and dampers) to operate only during occupied hours, or at least to operate at reduced speed when the building is not in use.

At least once a year, review the operating hours of buildings and adjust setpoints and schedules if needed.

#### Consider System Balancing or Retrocommissioning

Tuning the system can address comfort issues and ensure that equipment is operating efficiently.

#### Install Boiler Reset Controls

Boiler reset controllers automatically adjust boiler water temperature based on outdoor or return water temperature.

#### Install Efficient Fans and Pumps with Variable Speed Controls

Fans and pumps should use electronically commutated motors (ECMs) or high efficiency motors with variable frequency drives (VFDs) controlled based on differential pressure, return fluid temperature or occupancy.

#### Insulate Pipes

Insulate steam or hot water piping to reduce heat loss, especially in non-conditioned spaces.

#### Maintain Steam Traps

In steam systems, check steam traps annually and replace failed traps to avoid wasting steam.

#### Manage Use of Window Air Conditioners

Window air conditioners are often left running when the area is not occupied. Wasted energy can be reduced by using plug-in timers or smart plugs to schedule equipment operation and educating employees to turn equipment off when not needed. If buying new window units, look for efficient models that can be scheduled or centrally controlled.

### Domestic Hot Water

#### Install Efficient Circulating Pumps with Variable Speed Controls

Pumps should use ECMs or high efficiency motors with VFDs, and should only operate when the building is occupied.

### **Install Efficient Aerators on Bathroom Faucets**

Aerators rated at 1.0-1.5 gallons per minute provide sufficient flow while saving both water and energy.

### **Insulate Pipes**

Insulate hot water piping to reduce heat loss, especially in non-conditioned spaces.

### **Consider Replacing Low Use Water Heaters with On-Demand Heaters**

It may be cost effective to replace some water heaters with on-demand tankless heaters to eliminate standby losses.

## Food Service

### **Install Refrigeration Controllers**

Controllers can optimize operation of walk-in or reach-in coolers and freezers in several ways, described below. They can also provide remote access to monitor performance, send alerts when issues occur, allow a timed shutdown to safely turn the system off for stocking or maintenance work, and track operation over time.

- **Door heater control** – Operates anti-sweat door and frame heaters only when needed
- **Electronic defrost control** – Initiates defrost cycle only when needed
- **Evaporator fan control** – Adjusts operation of evaporator fans based on temperature

### **Upgrade Motors**

Motors in walk-in coolers and freezers should be upgraded to electronically commutated motors (ECMs).

### **Install Exhaust Hood Controllers**

Hood controllers adjust operation of exhaust fans as needed.

### **Upgrade Pre-Rinse Spray Valves**

Using more efficient pre-rinse spray valves to rinse dishes can save both water and energy.

### **Install Vending Machine Controllers**

These controllers, also known as vending misers, put machines into a low power mode when the surrounding area is not occupied, while maintaining necessary temperatures in refrigerated machines. On some newer vending machines, these controls are built in, so external controllers are not needed; check that the controls are active on these models.

## Lighting

### **Install LED Lighting**

Upgrade interior and exterior lighting to LED. Ensure that contractors remove existing fluorescent ballasts before installing new lighting because ballasts left connected will continue to use electricity unnecessarily.

### **Install Lighting Controls**

Occupancy sensors, daylight sensors, or timers can reduce energy waste by turning lights on and off as needed.

## Plug Loads

### **Use Advanced Power Strips or Smart Plugs**

These devices can eliminate standby power loads of electronic devices.

## Purchasing

### **Consider Energy Efficiency in All Purchasing Decisions**

When selecting new equipment, it is important to consider energy costs over its lifetime. High efficiency models are often available at little to no added cost, and sometimes energy savings can justify a higher purchase price. Contact your Mass Save representative to find out if incentives are available toward new equipment. Develop a policy requiring all municipal and school staff to consider efficiency in the purchasing process. Information about efficiency of many products – including appliances, commercial kitchen equipment, electronics, HVAC equipment, and office equipment – is available from the ENERGY STAR program at [energystar.gov/products](http://energystar.gov/products) and [energystar.gov/purchasing](http://energystar.gov/purchasing).