

## Statewide Best Practices Guidance Document – Energy Efficiency of Building Operations

### PURPOSE:

Identify resource conservation and associated cost saving measures in state agencies; establish guidelines to promote the practice of resource conservation for energy, water, recycling and waste prevention; implement efficient building operations to ensure state agencies contribute toward state government's goal of "net-zero" buildings and reduced greenhouse gas emissions.

(See "The New Hampshire Climate Action Plan,

[http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action\\_plan/nh\\_climate\\_action\\_plan.htm](http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/nh_climate_action_plan.htm))

For assistance with implementing these 'Best Practices,' please contact the State Energy Manager at 603-271-2698.

### APPLICABILITY:

State agencies that own, operate, or lease buildings as defined in this document.

### DEFINITIONS:

Agency: as defined in RSA 21-I:11, I. (b); any board, department, commission, hospital, sanitarium, home, library, school, college, prison or other institution conducted or operated by or for the state of New Hampshire

Ambient Lighting: overhead lighting in buildings, including work areas, hallways, bathrooms, break rooms, stairwells; does not include task lights in work stations

Communal Appliance: a Personal Appliance acquired by an employee or informal employee group for communal use in break rooms or similarly suitable locations. Examples include refrigerators, microwaves and coffee makers

Computer: central processing units (CPU) and monitors, laptops, notebooks and tablets that connect to the network or otherwise plug into a building's power grid. Other computer peripherals comprise "office equipment"

Energy Coordinator: person appointed by an agency director to facilitate and coordinate the resource conservation efforts within an agency

Extended Operations: exceptions to Normal Operations for HVAC and Normal Lighting Operations for lighting

Facility Manager: single point of contact for tenants in a state-owned building

HVAC: heating, ventilating and air conditioning

Normal Operations: Monday through Friday, 8 a.m. to 5 p.m. (specify per agency)

Normal Lighting Operations: Monday through Friday, 7 a.m. to 6 p.m. (specify per agency)

Personal Appliance: any privately-owned device that requires energy or produces heat, designed for residential use, brought into the workplace for an individual's use

Site Coordinator: person located at a branch or other agency location who works with the Energy Coordinator on resource conservation

State Energy Manager: DAS Administrator responsible for energy reporting, technical assistance on energy efficiency, energy contracts, and managing energy efficiency funding for state buildings

GUIDELINES:

## I. Building Operations

This section applies to agencies with control of all or a part of building operations. All other agencies please skip to page 4, section II.

Agencies may set building operations that exceed the minimum requirements of this document.

### **A. Energy Conservation**

#### 1. Heating and Cooling

- During Normal Operations, buildings should use a five-degree floating temperature set point (dead band): 70°F for the heating season and 75°F for the cooling season. Exceptions can be made for buildings with comfort or zoning issues, but it is the ultimate goal to correct these issues for maximum energy savings.
- If buildings are equipped with operable windows, they should be considered for occupant comfort before heating/air conditioning is utilized. Windows shall not be left open when heating or air conditioning is in use.
- Buildings remain closed on state holidays and weekends. Extended Operations require approval in advance by an agency administrator or Facility Manager.
- Delay the start time of HVAC systems as late as possible to achieve normal building temperature by 8 a.m. Use "optimum start" or other automatic programs. In periods of extreme weather, operate building systems at a minimal level during nights and weekends to maintain building temperatures.

#### 2. Lighting

- During Normal Operations, operate lighting systems with 30- to 35-foot candles for ambient light, and ensure 50-foot candles at desk surface with task lights.
- Reduce overhead lighting by using fluorescent lights or LED task lights.
- Turn off lights in unoccupied rooms at all times. Disable or remove lighting that is not necessary for normal business or safety.
- Replace incandescent light bulbs with compact fluorescent lights.
- Take advantage of natural lighting whenever possible.

- Turn off floor lighting after Normal Operations. If staff stays late or arrives early, use task lights rather than floor lights.
- Install motion detectors to control lighting in frequently unoccupied areas.
- Maintain security and safety lighting at the lowest acceptable levels.

### 3. Water Heaters

- Store hot water at a temperature of 120°F; use higher settings for cafeterias, laundries or bathing (recommendations of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, 12-2000, Section 4.1.6 Recommended Treatment.)
- Install timers on hot water tanks. Only circulate hot water during business hours.

### 4. Energy Reduction Requirements

- Buildings must strive to realize energy savings of at least 10 percent from comparable consumption levels in the year 2005. Office space will be compared on its energy use per square foot; other buildings will be evaluated on metrics specific to the building type. To meet the 10 percent target, the Facility Manager should consider the following:
  - Heat and cool only during Normal Operations; minimize energy consumption during off hours.
  - Actively manage window blinds throughout the day to retard heating and cooling loss. Close blinds at night to retard heat loss.
  - Close exterior, stairway and fire doors (except doors equipped with approved emergency-closure devices). Security doors must always remain closed.
  - In buildings where occupants control HVAC, identify one or more persons with the authority to control operable windows and HVAC settings.
  - For new construction or major renovations, buildings need to be controlled with either central control systems capable of 7 day programming or local thermostats with 7 day programming to provide night set backs and weekend un-occupied modes.
  - HVAC operators must maintain and operate the systems under his or her control in the most efficient manner possible while maintaining HVAC set points outlined in this document.
- Maximize incentives for energy-efficiency improvement projects including programs offered by local utilities

### 5. Energy Consumption Reporting

- Agencies shall review their monthly utility bills (electricity and heating fuel) and actively manage conservation. (See Senate Bill 73, 2010 Session <http://www.gencourt.state.nh.us/legislation/2010/SB0073.html>)
- Agencies shall report their monthly use quarterly to the State of NH Energy Information System located on Sunspot.

## **B. Water Conservation**

- Fully conform to local water system requests to conserve water.
- If responsible for irrigation of public grounds, consider installation of an automated irrigation system that tracks precipitation, or irrigate using a timer.
- If the local water/sewer service provider allows, install metering on irrigation and/or cooling tower water to reduce charges for sewer disposal of water.
- If a local water system declares a drought or other water emergency, local state facilities and leased sites should seek ways to model water conservation. If a state facility is a large user, contact the local water authority to plan for coordinated efforts that may exceed the minimum requested for conservation.
- Install water-saving bathroom and kitchen fixtures.
- Utilize landscaping methods that do not require irrigation.

## **C. Recycling and Waste Prevention**

### 1. Recycling by Individuals

- Develop and implement specific waste prevention and recycling plans and goals in each building.
- Establish procedures, mechanisms and collection systems within each building for the proper separation and disposal of recycled items.

### 2. Collection of Recycled Materials

- Statewide contracts exist for used oil, antifreeze, tires, electronic waste, mixed paper, cans, and bottles. For more information, please see Current State Contracts at: <http://admin.state.nh.us/purchasing/vendorresources.asp>

## **D. Custodial Operation**

### 1. Process

- When practical, perform custodial services during daylight hours. Where lighting systems allow, night crews should work in teams, and turn off lights as they vacate a space.

### 2. Products

- Custodial crews must use the most sustainable and environmentally preferred products possible. Ensure the products are third-party certified or purchased through statewide price agreements.

## **E. Landscape Operation**

### 1. Process

- Use the highest level of sustainable and “green” practices to minimize fertilizers, pesticides and water.

## 2. Products

- Use the most sustainable and environmentally preferred products possible. Whenever possible, use native plants and organic materials from local suppliers. Ensure the products are third-party certified or purchased through statewide contracts.

## 3. Equipment

- Use the most efficient power equipment. *Where possible*, phase out non-carburetor two-stroke engines and replace with more sustainable options by 2015. Use biodiesel or green electric power for mowers, tractors and transport vehicles.

## II. Employee Responsibilities

This section applies to all agencies.

### **A. Energy Conservation - Workstation Operation and Plug loads**

#### 1. Computers and Office Equipment

- Manage computers and office equipment in the most sustainable manner possible within the context of an agency's mission and resources.
- Manage the power environments in which computers operate through central, automated solutions that apply sleep or hibernation modes when a device remains idle. (Allow appropriate access for remote users and IT maintenance and support, such as fixes, patches and software rollouts.)
- Agencies should be implementing kW Countdown from the Commissioner level down. Settings are automatic through DoIT settings with Commissioner approval.
- In the absence of an effective central, automated solution for power management, ensure that all computer users turn off computers and all peripheral equipment after Normal Operations. An agency's chief information officer may approve the following exceptions in which an authorized user merely "logs off" his or her CPU (and turns off all peripheral equipment):
  - a. Remote access for an essential user
  - b. Mission-critical operations (full-time or seasonal)
  - c. Periodic instances of IT maintenance and support after Normal Operations
  - d. An approved exception according to the kW Countdown policy
- During Normal Operations, always turn off monitors when CPUs remain idle (a running screen saver uses energy; turning off a monitor conserves energy). Plug monitors into a power strip with other office equipment such as speakers and approved label printers (but probably not telephones); this enables single switch shutdown of office equipment after Normal Operations.
- Whenever possible, eliminate personal printers in favor of shared printers.

- Avoid printing non-critical documents. Try to make printing the exception, not the rule. Print multi-page documents in two-sided (duplex) mode, rather than one-sided mode.
- To save on energy and printing, send hyperlinks instead of document attachments, especially when sending e-mails to large distribution lists. For instructions, please contact your department's Information Technology representative.
- Develop a shared folder-file management strategy on the network for work units. This practice enables staff to view and share one set of documents electronically rather than maintaining multiple copies on the server.
- Avoid the operation of unnecessary energy-consuming devices within each workstation, such as personal cell phone chargers, speakers, label printers, electronic staplers, pencil sharpeners, etc.
- Limit the use of work critical devices and unplug them after use. Examples include camera chargers, adding machines, cell phone chargers for work phones, typewriters, etc.

## 2. Personal Appliances

- Do not use Personal Appliances in workstations or cubicles. Exception is made for personal desk fans of up to 15 watts. Administrators may approve requests for higher-watt desk fans (up to 60 watts).
- Examples of prohibited Personal Appliances (not an exhaustive list):

Candles, microwaves, coffee makers, refrigerators, coffee warmers, space heaters, crock-pots, toasters, fish tanks, warming plates, hotplates, water fountains, hotpots, electric pencil sharpeners

- All local and state fire and safety codes shall be followed.

## 3. Office Areas – General

- Turn off all office equipment when not in use.
- Buy the most energy efficient printer that meets the needs of the group. Typically a ratio of 5-12 employees per printer is sufficient.
- Shut down (using a power-off switch) copiers, printers, computer monitors, speakers and all other peripheral equipment after Normal Operations.
- Enable automatic "power down" or "energy saver" features on fax machines after Normal Operations.
- Turn on lights in work areas only when needed; turn off after Normal Operations. When employees work early or late, do not turn on or leave on any unnecessary lighting. Turn off task lights when leaving for long meetings and after Normal Operations.
- When ordering surge protectors, purchase surge protectors with occupancy sensors. These devices contain "sensored" outlets for monitors, task lights, computer peripherals, etc., and "non-sensored" outlets for computers and other sensitive equipment. Items plugged into sensed outlets

will turn off 15 minutes after the occupant leaves the space. Agencies may contact the State Energy Manager for information on energy efficient surge protectors.

#### 4. Break Rooms and Kitchenettes

- State agencies are encouraged to maintain designated break rooms for the benefit of all employees based upon the number of employees per floor and number of floors in a building. The Facility Manager and building tenants should agree on the location of break room(s), communal equipment capacity, plug loads, and custodial and safety issues.
- Kitchenettes and break rooms must not exceed agreed-upon equipment capacity or plug loads. Prior to purchasing or installing appliances for communal use, employee groups must contact their building's Facility Manager to discuss equipment or plug-load changes. Facility Managers will coordinate with Operations and Maintenance as needed.
- State agencies may request that their large appliances (refrigerators, air conditioners, space heaters, etc) be reviewed and approved by the State Energy Manager. Stickers will be provided for approved items and items to be replaced with Energy Star upon failure. If an item is reviewed and does not receive either of these ratings, it should not be allowed to operate in a state building.
- State agencies are encouraged to consult with the State Energy Manager before purchasing large appliances.
- Keep appliances in good condition, ensuring clean cooling coils or vents, ample air space and no combustible items stored above or around the appliance.
- Set the temperature set point for refrigerators at no less than 40°F.
- Remove or replace under-used or ill-maintained refrigerators.
- Use appliances in the manner and capacity designed by the manufacturer.
- Use only UL-approved appliances.
- Locate appliances in central break rooms or kitchenettes only, placing the equipment on laminated or metal counters.
- Plug appliances directly into wall outlets; do not use extension cords.
- Purchase only ENERGY STAR-rated appliances for communal use, i.e., refrigerators, dishwashers, water coolers.
- Do not use Communal Appliances in individual workstations.
- Designate Communal Appliances as "out of service" if a power emergency occurs or if DAS determines that a site has not achieved its energy-savings goals.
- Install commercial quality (grounded outlet) plug-in timers for communal water coolers and under-counter water heaters to ensure automatic shutdown after Normal Operations. Ensure the Facility Manager approves of the equipment and its installation process.

- Unplug unnecessary appliances after Normal Operations to eliminate phantom loads and fire hazards.
- Manage state-owned appliances for energy conservation.

## 5. Night Audits

To meet the Governor's goals for energy reduction in state buildings, night audits are encouraged to determine whether tenants follow the requirements of this document.

Components of a night audit (not an exhaustive list):

- Location of unauthorized space heaters and other unauthorized items, and whether the device is on or off
- Allowed items left on
- Copiers and office equipment
- Computers, monitors, and peripherals
- Task lights and other work station plug loads
- Break room appliances (includes appliances located in work stations not designated as break rooms)

A Facility Manager or members of a Green Team (where a team exists) are encouraged to perform night audits. Results of the audit should be shared with all building occupants with goals for improvement and methods that those improvements will be made.

For more information on Green Teams, contact the State Energy Manager.

## 6. Laboratories, Ski Areas, Wastewater Treatment Facilities, and Other Special Applications

Site managers must develop energy conservation plans and standards, suitable to their facility.

### **B. Water Conservation**

- Immediately report water leaks to a Facility Manager.
- Avoid excessive running water in restrooms or break rooms.

### **C. Recycling and Waste Prevention**

#### 1. Recycling

- Develop and implement specific plans and goals for waste prevention and recycling in each building.
- Establish procedures, mechanisms and collection systems within each building for the proper separation and disposal of recycled items.

## 2. Employee Training Program

- Make available a training program for employees that outlines an agency's expectations for waste prevention and recycling.
- Educate employees on proper separation and collection systems for recycled materials.
- Provide information on waste prevention and recycling in orientation for new employees.
- Provide employees with access to recyclable or reusable office- or work-materials.

### **D. Other Employee Behavior**

- Actively manage accessible window blinds to retard heating and cooling loss.

## III. Cafeteria and Vending Operation

This section applies to agencies and the contractors they oversee that operate cafeterias in state-owned or leased buildings. All other agencies please skip to the Procedures section below.

### **A. Times of Operation**

- Operate cafeterias only during the hours required to meet the needs of the building tenants, as determined by the Facility Manager, State Energy Manager, and the state agency managing the cafeteria operations.

### **B. Energy Conservation**

- Turn off all equipment, machines, exhaust fans, and lights when not in use.

### **C. Equipment**

- Monitor plug load capacity to ensure the space will accommodate the equipment.
- Do not add equipment not designed for the space.
- Prior to installing additional or replacement equipment, consult with The State Energy Manager, Operations and Maintenance, Facility Manager, and the state agency that oversees the cafeteria operations; submit documentation as requested prior to installing or reconfiguring equipment.

## PROCEDURES:

### I. State Energy Manager

A. Serve as statewide expert on resource conservation issues.

B. Assist Energy Coordinators, Site Coordinators and Facility Managers to develop resource conservation plans and standards.

C. Maintain state government's policies on resource conservation; obtain input from subject matter expert(s) and applicable stakeholders regarding conservation policies.

- D. Work collaboratively with staff and other agencies to resolve resource conservation issues.
- E. Educate coordinators on proper resource conservation.
- F. Compile, maintain and distribute reports on resource conservation to state agencies and the legislative branch.
- G. Monitor and record resource consumption and expenditures; report on energy use and costs as requested.
- H. Evaluate resource consumption against established baselines for agencies and statewide goals.
- I. Report the energy consumption data of the state to the Governor, legislature, and public.

## II. Energy Coordinator

- A. Assign at least one Site Coordinator in state-owned or leased facilities of 100 or more employees, to ensure employees practice conservation measures.
- B. Educate staff on appropriate techniques for energy conservation, water conservation, recycling and waste prevention in coordination with Site Coordinators and Facility Managers.
- C. Assemble and distribute information and resource plans to Site Coordinators.
- D. Coordinate with State Energy Manager.
- E. Evaluate resource consumption against established baselines for agencies and statewide goals.
- F. Report the energy consumption data of his or her agency to the State Energy Manager. Use database on a quarterly basis.

## III. State Agency that Oversees Cafeteria Operations

- A. Follow the requirements listed above.

## IV. Employee

- A. Comply with this document.

## V. Facility Manager

- A. Encourage and assist employees to conserve and prevent the waste of resources.
- B. Work collaboratively with Energy Coordinators, Site Coordinators and the State Energy Manager, where appropriate, to resolve issues with buildings, equipment or maintenance, including outdoor sprinkler systems.

## VI. State Agency that Oversees Food or Beverage Vending Machine Operations and Equipment

- A. Purchase and install the most energy efficient equipment available
- B. De-lamp vending machines or use LED lighting where possible.

C. To request vending machines for a building, a request for services should be entered at [www.nh.gov](http://www.nh.gov). The request should be forwarded to the Vending Stands program (Services for Blind & Visually Impaired) and Administrative Services for review. Additional equipment will not be placed in areas where it is determined that sufficient vending services already exist.

#### VII. Managers of Laboratories, Ski Areas, Wastewater Treatment Facilities, and Other Special Applications

A. Develop energy conservation plans and standards, suitable to their facilities.

#### VIII. Site Coordinator

A. Educate staff at a particular work site on proper resource conservation, waste prevention and recycling techniques.

B. Work collaboratively with Energy Coordinator to ensure that employees practice appropriate conservation measures to reach and maintain goals.