



ENERGY LEADERSHIP TRAINING

Energy Management Program
energy.okstate.edu

OVERVIEW

- ▶ Energy Leadership Award
- ▶ Energy Leadership Responsibilities
- ▶ HVAC at OSU
- ▶ Building envelope
- ▶ Windows/Blinds
- ▶ Dressing for comfort
- ▶ Impact of space heaters
- ▶ Comfort concerns and submitting work requests
- ▶ Scheduling events
- ▶ Ventilation Exemption Form (VEF)



Energy Leadership Award



Award Details

- ▶ Recognizes student groups and campus departments for being active partners in reducing the University's energy expenditures.
- ▶ Facilitates understanding of utilities on campus and the impact of individual behaviors on energy use.
- ▶ Reinforces the importance of good energy stewardship in reaching the University's mission of education, research and outreach.

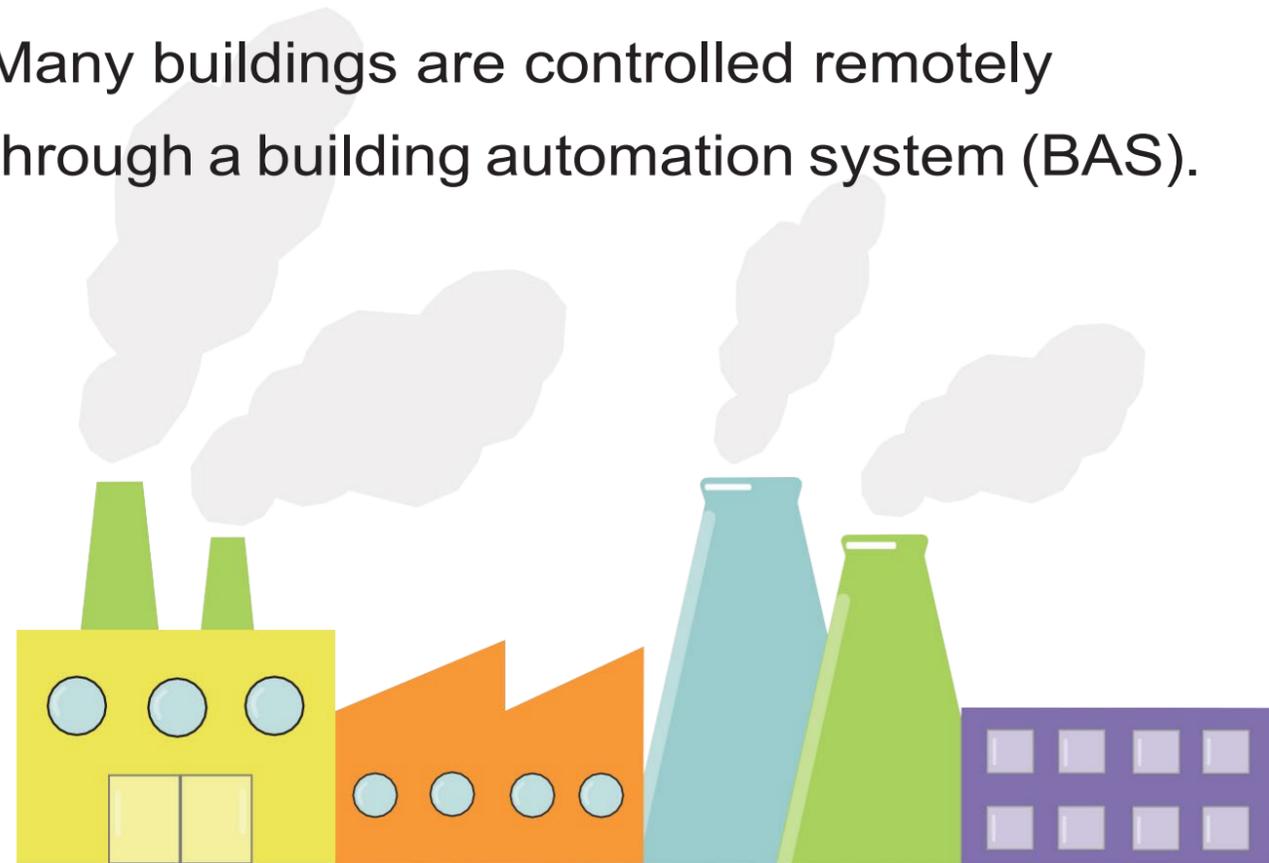


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- ▶ Faculty, staff and students are responsible for implementing the OSU Energy Guidelines during the time within their classrooms, offices, and housing.
 - ▶ Participants will gain a basic understanding of the following:
 - HVAC operations and scheduling
 - ▶ Building envelope
 - ▶ Plug load management
 - ▶ Impact of individual behaviors on energy consumption
 - ▶
 - ▶ Award recipients will participate in other educational opportunities through OSU Energy Management.

Heating Ventilation & Air-Conditioning (HVAC)

- ▶ Heating and cooling at OSU are provided through steam and chilled water in most buildings.
- ▶ Most buildings have more than one air-handling unit or air handler, which serve various areas called “zones” in the building.
- ▶ A zone is a space or group of spaces controlled by a single thermostat or sensor.
- ▶ Avoid blocking return air vents, as this restricts air flow.

- ▶ Placing heat-generating items or obstructing a thermostat or sensor can impact its ability to function properly, which can result in unfavorable temperatures for an entire zone.
- ▶ Many buildings are controlled remotely through a building automation system (BAS).



HVAC: Setpoints

- ▶ OSU Energy Guidelines suggest the following temperature setpoints:
 - ▶ Cooling Season (occupied):
74 - 78°F, 23 - 26°C
 - ▶ Cooling Season (minimally occupied):
85°F, 29°C
 - ▶ Heating Season (occupied):
68 - 72°F, 20 - 22°C
 - ▶ Heating Season (minimally occupied):
55°F, 13°C



HVAC

- ▶ OSU's HVAC includes large air handlers that use chilled water (CHW) and heating hot water (HHW) from steam, which are both produced at OSU's Central Plant.
- ▶ The CHW always provides 55°F - 60°F supply air, which may be tempered by the HHW from steam to balance the cooling.
- ▶ Air handlers have large fans that blow air across metal coils, heating and cooling, to condition the air.
- ▶ Unlike a home's HVAC system, where the fan may be turned on or off, the fans in OSU's buildings continue to run as long as an air handler is scheduled on.



HVAC

- ▶ Air from supply vents may vary in temperature depending on the equipment design.
- ▶ Most areas do not have an adjustable thermostat because many buildings are operated by a Building Automation System (BAS), a computer system that controls the temperatures and operation of HVAC equipment.
- ▶ **Understanding how HVAC works on campus is important because it is the greatest user of energy resources!**



Heat Gain & Loss

- ▶ Spaces continually gain heat from people, computers, appliances, and sunlight on exterior surfaces and windows.
- ▶ May result from conduction through walls, windows and ceilings.
- ▶ Infiltration - when warm outside air comes in or cool inside air leaks out. *(EX: An access door is left open and warm air enters the building while cool air escapes making it difficult to maintain indoor air temperatures.)*
- ▶ Radiation from the sun, either direct or indirect, through windows, glass doors, skylights, etc.
- ▶ Heat and moisture given off by people.
- ▶ Heat given off by computers or appliances.
- ▶ Heat loss usually occurs in winter when cold air is working to get into a building, and warm air is trying to leave a building.



Plug Load Management

- ▶ Plug load is the energy used by products that are powered by means of an ordinary AC plug.
- ▶ Departmental refrigerators, coffee makers, and microwaves are highly encouraged, but individual appliances waste a great amount of energy and money.
- ▶ Unplug any unnecessary devices, or plug them into a power strip so they can be turned off quickly and easily with one switch.
- ▶ Turn off any electrical devices that are not in use, such as computer, monitors, lamp, DVR, DVD player, gaming system, chargers, etc.
- ▶ Ensure that computers, monitors and printers are in power save modes so that they power down after a maximum of 15 minutes of non-use.



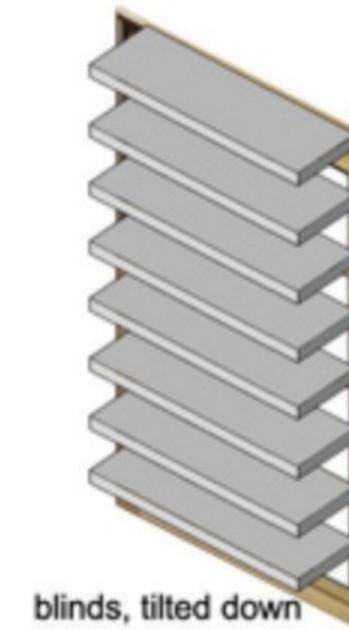
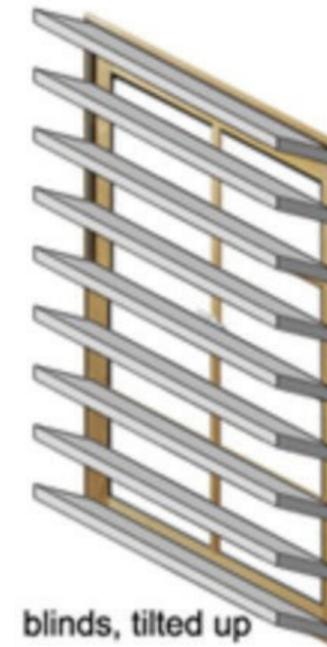
Building Envelope

- ▶ Building envelope refers to the physical barrier between the conditioned indoor and the unconditioned outdoor environment of a building. It plays an important role in determining the amount of energy necessary to maintain a comfortable indoor environment.
- ▶ Building envelope varies at OSU from the non-insulated native rock and wood of Old Central (1893), to the multi-story brick and insulated glass structure of the new business building (2016).
- ▶ Building envelope includes:
 - ▶ Structural frame
 - ▶ Moisture and air barrier
 - ▶ Insulation
 - ▶ Roof
 - ▶ Doors
 - ▶ Windows



Building Envelope: Windows

- ▶ Spaces continually experience heat gain from people, computers, appliances, and sunlight on exterior surfaces and windows.
- ▶ Keep windows closed and locked to maintain the indoor environment, which includes keeping humidity and allergens out.
- ▶ Close blinds and tilt them appropriately:
 - ▶ UP - Reduces heat gain by minimizing sunlight allowed into the space. (summer)
 - ▶ DOWN - Increases heat load by allowing sunlight in. (winter)



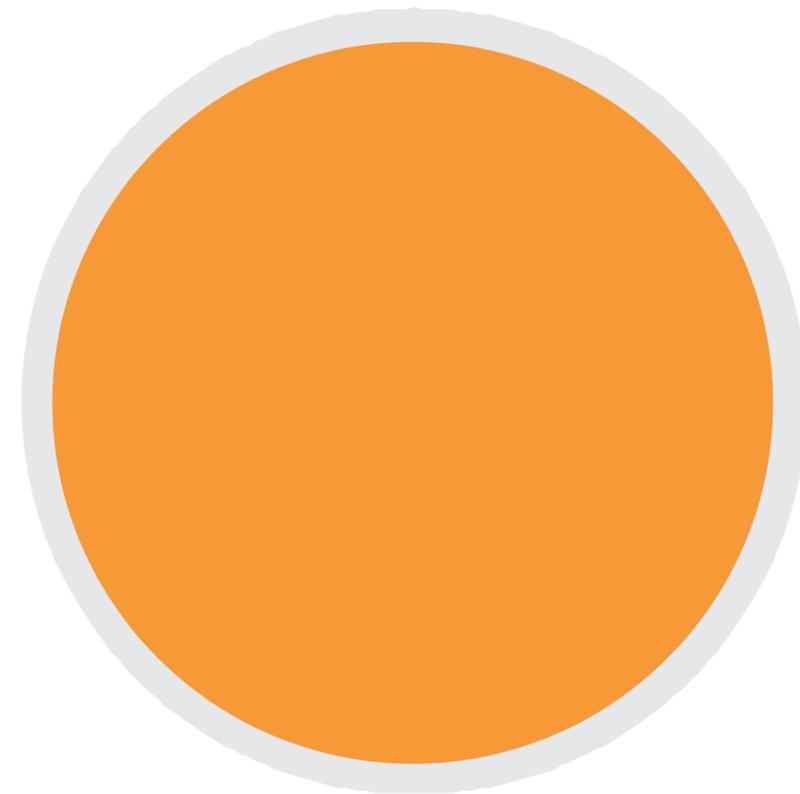
Dressing for Comfort

- ▶ “Shoulder season” refers to the time of year when there is large temperature variation from morning to afternoon. Spring and fall may have cold mornings and very warm afternoons.
- ▶ When temperatures vary throughout the day, layered clothing is a good idea. Being able to add or remove layers as needed allows flexibility to maintain one’s own comfort level.
- ▶ Clothing and footwear that are seasonally appropriate are encouraged. Sweaters, thicker socks, and slacks are great for winter. Summer brings lighter-weight shirts, short sleeves, and seasonal footwear.
- ▶ If the indoor temperature is often too cool for you, consider keeping a light sweater with you throughout the day.



Building Envelope: Doors

- ▶ Classroom doors should remain closed while HVAC is operating to keep conditioned spaces comfortable.
- ▶ Doors between conditioned space and non-conditioned space, such as a stairwell or hallway, should remain closed, if possible.
- ▶ Use the ADA Access button only when necessary. Doors stay open longer when using this option, allowing conditioned air to escape the building.
- ▶ Keeping doors closed as much as possible prevents outside humidity from infiltrating the building, ensuring better personal comfort.

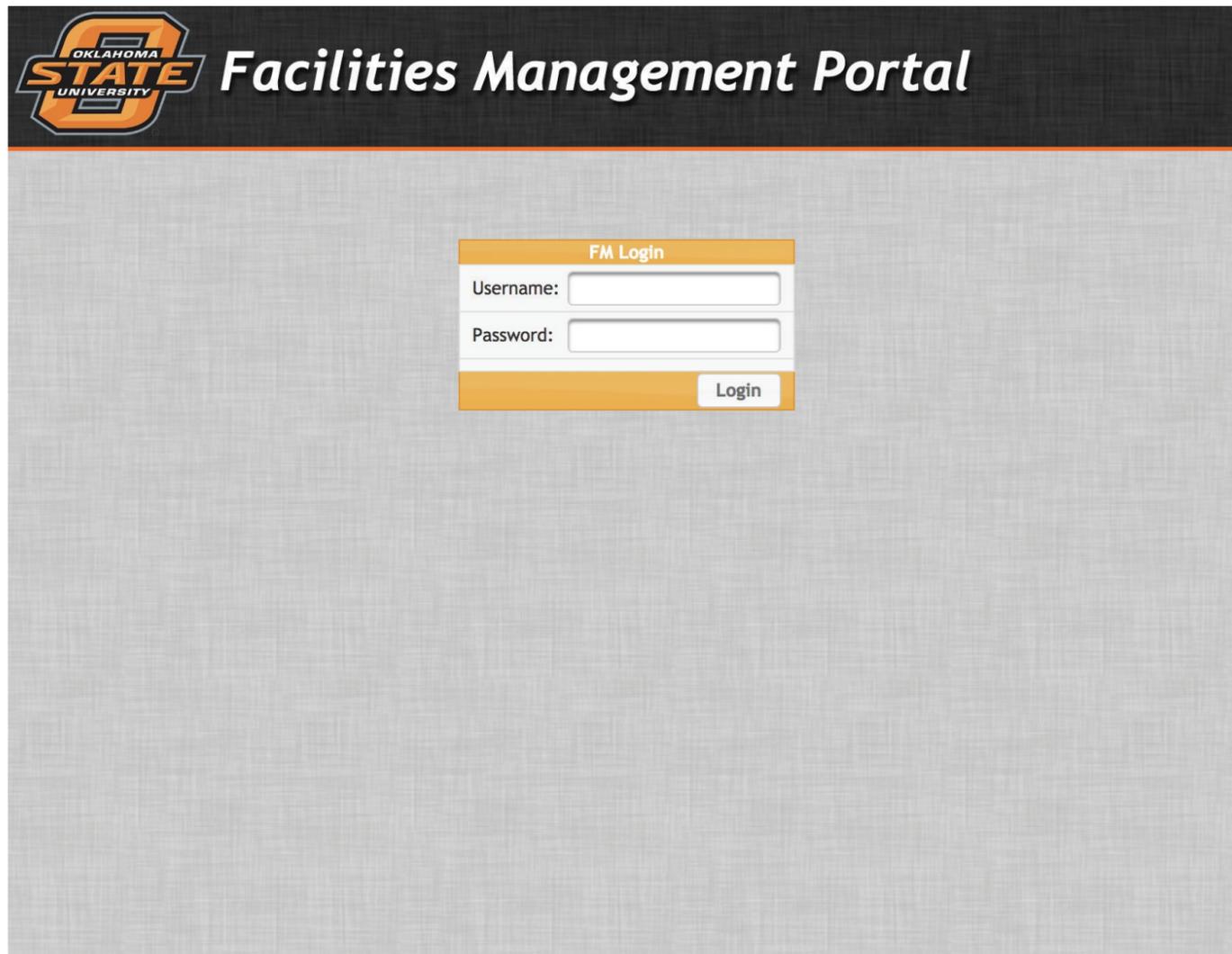


Impact of Space Heaters

- ▶ Space heaters are highly discouraged at OSU and are considered a fire hazard.
- ▶ If used in a space with a thermostat, a space heater can cause the HVAC system to operate based on false readings of the temperature in the area, thereby, making others uncomfortable.
- ▶ Rather than use a space heater, turn in a comfort complaint so that comfort issues may be addressed and corrected.



Comfort Concerns



The screenshot shows the login interface for the Facilities Management Portal. At the top left is the Oklahoma State University logo, followed by the text "Facilities Management Portal". Below this is a login form with the following fields and buttons:

FM Login	
Username:	<input type="text"/>
Password:	<input type="password"/>
<input type="button" value="Login"/>	

Comfort concerns may be turned in through the Facilities Management Customer Portal:

<https://workorder.okstate.edu/>

Ventilation Shutdown Exemption Request

- ▶ The Ventilation Shutdown Exemption Request is used to request additional HVAC run times outside the regularly scheduled hours in non-classroom spaces.
- ▶ The regular HVAC hours are dependent upon the working hours of 8:00 a.m - 5:00 p.m. and class schedules.
- ▶ The Ventilation Shutdown Exemption Request may be found under the OSU Employee Resources/Documents and Forms/Ventilation Shutdown Exemption Form (printable PDF) at energy.okstate.edu/forms



Room Scheduling Guide:

- ▶ Contact the Registrar's Office via email: GUrooms@okstate.edu, to schedule a room for an event or meeting.
- ▶ Allow two full business days of notice for room/HVAC scheduling.
- ▶ Scheduling a room for an event or meeting is important because...
 - ▶ The room you wish to use may not be available to you if not scheduled.
 - ▶ Energy managers need to know where and when to schedule HVAC.
 - ▶ Scheduling allows GCA (custodial staff) to know when and where to unlock doors or to clean.
- ▶ If a room is NOT scheduled, HVAC may not be available.



CONGRATULATIONS!

You have taken the first step toward earning the Energy Leadership Award for your organization.

<https://energy.okstate.edu/node/101>