An aerial photograph of a university campus, showing various buildings, courtyards, and green spaces. The image is overlaid with a semi-transparent green rectangular box containing the text. The text is in a bold, sans-serif font, with the words 'ENERGY', 'LEADERSHIP', and 'TRAINING' stacked vertically. The year '2016' is centered below the main title, flanked by horizontal lines.

ENERGY LEADERSHIP TRAINING

— 2016 —

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 Exception Form (VEF)

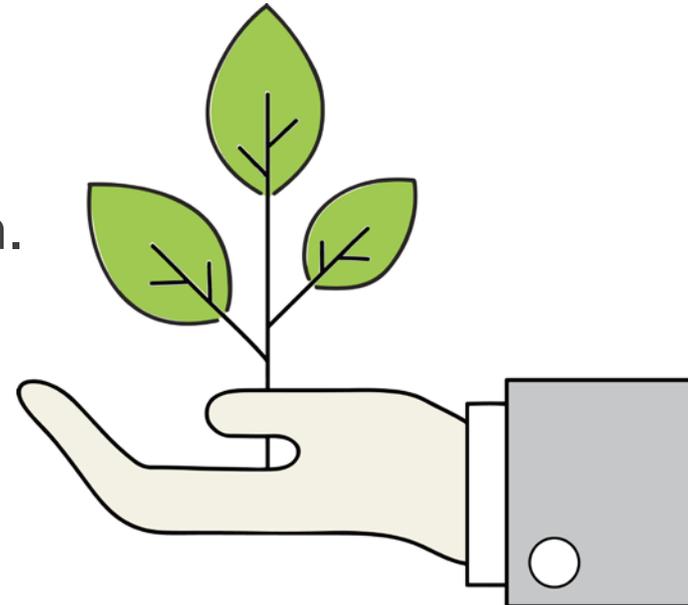


ENERGY LEADERSHIP AWARD



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.



ENERGY LEADERSHIP RESPONSIBILITIES

- ▶ 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, through this training, 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.

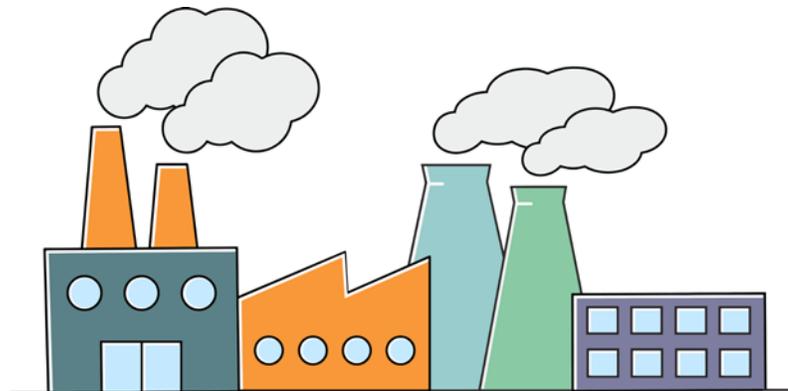


HEATING VENTILATION & AIR-CONDITIONING (HVAC)

- ▶ 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.
- ▶ 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

Minimally Occupied:

85°F, 29°C

Heating Season Occupied:

68 - 72°F, 20 - 22°C

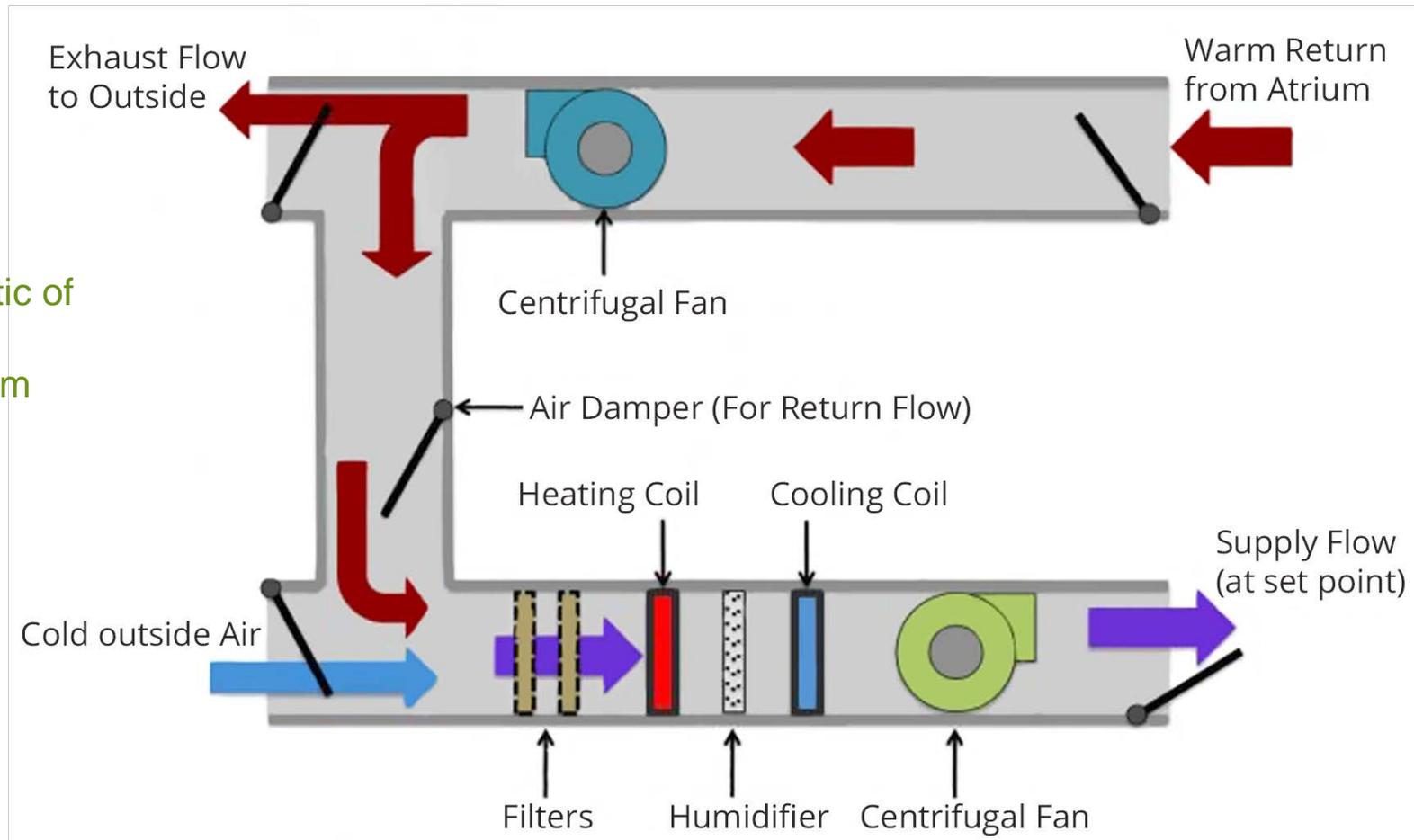
Minimally Occupied:

55°F, 13°C



HVAC

Figure: Schematic of Air-Handler with Recirculation from Atrium



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 MANAGMENT

- ▶ 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 are discouraged — they 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 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 & air barrier
 - ▶ Insulation
 - ▶ Roof
 - ▶ Doors
 - ▶ Windows



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.



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**)



Blinds with slats tilted up.



Blinds with slats tilted down.

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.



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



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

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

WORK REQUEST GUIDE:

ENTERING A TOO HOT/TOO COLD CONCERN

Facilities Management Customer Portal
Customer Lookup **Work Request** Logout

Customer Work Request

Please fill out the following form to submit a work request to the Facilities Management Work Control. For Emergencies, please call (405) 744-7154.

Contact Information	Location Information
Contact Name * JENNY GILLILLAND	Select Region * OSU-STILLWATER
Contact Phone 405-744-3945	Select Area * CENTRAL CAMPUS
Contact Email * jenny.gilliland@okstate.edu	Select Building * MORRILL
Select Division * AA - GENERAL UNIVERSITY	Select Floor * FIRST FLOOR
Select Department * D0518 - ENERGY MANAGEMEN	Select Room 101 CLASSROOM

Request Information	Request Description
Select Problem TOO HOT/COLD	Please provide a very detailed description of your request...
Desired Date yyyy-mm-dd	
Do you have alternate funding? No	
Alternate Funding <small>Select this option if you are requesting a billable service and it will be funded with a different account than Facilities Management has on file for your department.</small>	

Submit Request

Enter the following information using drop-down menus that include:

Contact Information:

Enter your name, phone and email.

Location Information:

Select Building

Select Floor

Select Room

Request Information:

TOO HOT/TOO COLD

Request Description:

Provide any detailed information that might assist technicians or energy managers with problem-solving in your area.

ROOM SCHEDULING GUIDE:

SCHEDULE A ROOM FOR AN EVENT/MEETING

- ▶ Contact the Registrar's Office via email: GUrooms@okstate.edu, to schedule a room for an event or meeting.
- ▶ Allow two (2) 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.



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 OSU Employee Resources/Documents and Forms/Ventilation Shutdown Exemption Form (printable pdf) at <http://energy.okstate.edu/forms>



CONGRATULATIONS!

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

Click on the link below to access the training quiz:

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

