



<b>UBC Facilities Energy &amp; Operations Policy</b>			
Prepared by: <i>Energy &amp; Water Services Building Operations Infrastructure Development</i>	Approved by: <i>John Metras AVP, Facilities</i>	Policy No: <i>I-B-53</i>	Issue Date: <i>February 2020</i>

**1. Intent**

Pursuant to the goals of both UBC and the VPFO Facilities Portfolio, the purpose of this policy is to provide guidance on operations and energy use in Core buildings at the University of British Columbia Point Grey campus.

Energy use in core buildings is largely driven by heating, ventilation, and air conditioning (HVAC) requirements with the purpose of providing comfortable spaces in which to teach, learn, and research, this policy is largely aimed at defining acceptable space temperatures. The guidance provided by this document aligns with the stated goals of the departments within the Facilities Portfolio, as well as with industry guidelines and best practices.

**2. UBC’s Commitment to Sustainability**

The University of British Columbia is committed to improving its performance in sustainability in all areas of operations. As the stewards of the lands and buildings on UBC campus, the Facilities Portfolio is responsible for upgrading, maintaining and operating the facilities in a manner that balances social, environmental, and economic impacts.

Staff, faculty, and students shall be required to comply with this Policy unless given express written permission from Facilities.

**3. Climate Action Goals**

UBC has an ambitious climate action plan targeting the following board-approved GHG emissions goals:

- 33% below 2007 levels by 2015;
- 67% below 2007 levels by 2020;
- 100% below 2007 levels by 2050.

In order to support the board-approved targets, UBC Energy and Water Services (EWS) has created the following internal energy management targets as part of its Strategic Energy Management Plan:

- Reduce electrical consumption by 4 GWh per year.
- Reduce natural gas consumption by 20,000 GJ per year.

These goals are designed to offset campus load growth through energy conservation.

#### 4. Related Policies

This policy has been developed in accordance with the following UBC policies:

- Policy SC1: - University Safety: UBC is committed to providing a safe, healthy, and secure environment in which to carry on the University's activities;
- Policy SC4 – Environmental Protection Policy: UBC is committed to protecting the natural environment, and to providing communication and education on environmental issues;
- Policy UP12 – Land Use Policy: UBC is committed to integrating sustainability into its operational and academic efforts.

#### 5. Facility Operation

##### 5.1. Heating, Cooling, and Ventilation

- 5.1.1. The departments in the UBC Facilities Portfolio will attempt to maintain indoor thermal conditions in the most sustainable way possible while enabling greatness in teaching, learning, and research.
- 5.1.2. Ventilation rates shall be maintained with the goal of maintaining indoor air CO<sub>2</sub> concentration at acceptable levels. Demand-control ventilation strategies will be implemented where possible.
- 5.1.3. UBC Learning Spaces Team defines normal operating hours for most classroom spaces. Outside of these times, building systems will be set to operate in an unoccupied nighttime setback mode with setpoints outside of the occupied ASHRAE 55 range and air systems turned off. Temporary variances may be organized through the building's Facilities Manager or Scheduling Services, Enrolment Services. Permanent variance from operating hours shall require approval by Learning Spaces Team and the Energy Policy Steering Committee.
- 5.1.4. UBC Facilities has defined an acceptable thermal comfort range in accordance with the ASHRAE 55 Standard:
  - Thermal comfort target range = 20 C to 27 C
  - Building heating system target temperature = 21 C
  - Building cooling system target temperature = 26 C (for spaces with mechanical cooling)
- 5.1.5. Fume hoods shall be closed by users when not in operation and user-enabled exhaust fans turned off.

## 5.2. Thermal Comfort for Changing Weather Conditions and Spaces with no Mechanical Cooling

While the University Facilities Team does their best to maintain temperatures within the range above, there will be times during the year where space temperatures fall outside of this thermal comfort target range. This can occur during abnormal weather events where outside air temperatures are abnormally hot or cold, or when weather is not atypical but has changed quickly over a short period of time. UBC's older buildings take more time to adjust to quickly varying conditions, especially during morning warm up after an overnight cold snap, or during a summer heat wave event.

During these times, the UBC facilities team will do it's best to maintain temperature as per the ASHRAE 55-2017 Adaptive Thermal Comfort Model. HVAC systems shall be operated with the goal of maintaining space temperatures within the 80% acceptability limit, as indicated by the light blue band in Figure 1. Note that in some of UBC's oldest buildings, it is possible that prolonged high outdoor air temperatures may render it impossible to achieve acceptable indoor thermal conditions.

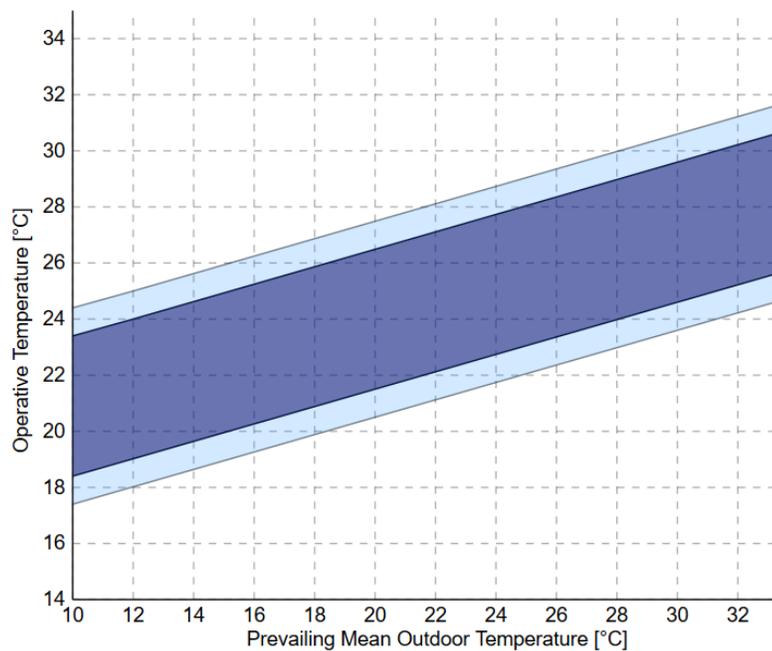


Figure 1: ASHRAE Adaptive Thermal Comfort Model. 80% acceptability within the light blue, 90% acceptability within the dark blue

## 5.3. Lighting

5.3.1. Acceptable lighting levels are based upon guidelines from the most recent edition of the Illuminating Engineering Society (IES) Handbook.

5.3.2. Building users are encouraged to switch off manual lighting when leaving a space unoccupied.

#### 5.4. Information Technology

5.4.1. Faculty and staff are encouraged to maximise opportunities for server virtualization, and colocation of virtual servers in the [UBC Data Centre](#) (UDC) located in the Pharmaceutical Sciences Building.

5.4.2. It is recommended that Faculty and staff adjust computer power settings to maximize electrical energy savings. The following settings are recommended:

- Monitor set to turn off after 5 minutes of inactivity;
- CPU to enter sleep mode after 15 minutes of inactivity;
- CPU to enter standby or hibernate mode after 30 minutes of inactivity.

#### 5.5. Once-Through Cooling Equipment

5.5.1. Installation and use of once-through domestic water cooling is not permitted.

#### 5.6. Plug-In Electronic Equipment

5.6.1. Portable heaters or A/C units shall not be used. If an occupant wishes to install a heater or portable A/C unit, they must first submit a hot/cold complaint to Building Operations. If the issue cannot be resolved, then a variance request must be submitted.

5.6.2. Computers and ancillary electronic equipment (i.e. printers, copiers) shall be turned off when not in use unless research requires continuous operation.

5.6.3. Refrigerators, microwaves, and coffee makers shall not be used in individual workspaces.

5.6.4. Laboratories shall follow energy conservation best practices and is recommended that lab users chill up their ULT. More information can be found at:

<http://greenlabs.sites.olt.ubc.ca/files/2016/05/Chill-Up-Info-Sheet.pdf>

<http://greenlabs.ubc.ca/get-involved-2/toolkits/energy-conservation-toolkit/>

5.6.5. All other unmentioned electronics shall be turned off when not in use.

5.6.6. Use of electrical devices causing the tripping of a circuit breaker will trigger review of acceptability of the device.

## 6. Implementation

The policy will be implemented for all Core buildings at UBC Point Grey campus. UBC Energy & Water Services and Building Operations will take the lead role in implementing the policy as it pertains to operation of heating, cooling, and ventilation systems. UBC Building Operations is responsible for enforcement of the policy through the Facilities Managers.

## 7. Variance Requests

Any variance from this policy requires submission of the variance request form as found in Appendix A of this policy document. Requests shall be sent to the building's Facilities Manager.

If the Facilities Manager deems the variance to be unnecessary, frivolous, or ineffective, they will provide a response to the requestor without forwarding the request to the Steering Committee.

A flow chart of the variance process is provided within Appendix B of this document.

## 8. Steering Committee

An Energy & Operations Policy Steering Committee consisting of delegates from each department within the VPFO Facilities portfolio shall be formed. The Steering Committee shall review new variance requests bi-monthly. A mailbox will be created for correspondence with the Steering Committee, and managed by the VPFO directory administrator.

## 9. Community Feedback

The UBC community is encouraged to submit its feedback on this policy. Please send any comments, questions, or concerns to the Energy Policy Steering Committee at [energy.committee.vpfo@ubc.ca](mailto:energy.committee.vpfo@ubc.ca).

## 10. References

### ASHRAE 55-2017: Thermal Environmental Conditions for Human Occupancy

This standard defines thermal comfort acceptability based on outdoor air temperatures, and various methods of determining whether a space should be considered "overheating".

[https://www.techstreet.com/ashrae/standards/ashrae-55-2017?gateway\\_code=ashrae&product\\_id=1994974](https://www.techstreet.com/ashrae/standards/ashrae-55-2017?gateway_code=ashrae&product_id=1994974)

### ASHRAE 62.1-2016: Ventilation for Acceptable Indoor Air Quality

This standard defines minimum acceptable ventilation rates to maintain indoor air quality which will not adversely affect human health.

[https://www.techstreet.com/ashrae/standards/ashrae-62-1-2016?product\\_id=1912838](https://www.techstreet.com/ashrae/standards/ashrae-62-1-2016?product_id=1912838)

### Berkeley College Thermal Comfort Tool

This tool was developed by Berkeley College for users to determine whether a space falls within the thermal acceptable range based on a wide variety of thermal comfort standards, including the ASHRAE-55 Adaptive Method on which this policy is based.

<http://comfort.cbe.berkeley.edu/>

### [CIBSE TM52: The Limits of Thermal Comfort: Avoiding Overheating in European Buildings](#)

Based in the UK, the Chartered Institution of Building Services Engineers provides an alternative standard for defining whether a building is overheating, which is in turn based on ASHRAE and European Union standards. This standard provides a useful definition of Running Mean Temperature, for use in adaptive comfort models.

<https://www.cibse.org/Knowledge/knowledge-items/detail?id=a0q200000817f5AAC>

### [UBC Building Operations: Hot/Cold Complaints](#)

UBC Building Operations provides here some basic information about the heating and cooling systems in UBC's buildings, as well as the procedure for submitting a service request.

<http://buildingoperations.ubc.ca/resources/building-administrators/hotcold/>

### [UBC Building Operations: Learn More About Your Building](#)

This link provides a convenient way for building occupants to find their Facilities Manager.

<http://www3.buildingoperations.ubc.ca/facility-manager-search/>

### [UBC Learning Spaces Team: Find a General Teaching Space](#)

UBC has provided a convenient tool to find the hours of many of UBC's spaces.

<https://learningspaces.ubc.ca/find-space>

### [UBC Technical Guidelines: Indoor Thermal Environment](#)

This guideline is meant to inform design of new buildings on UBC Vancouver campus.

[http://www.technicalguidelines.ubc.ca/Division\\_20/2019\\_Division\\_20\\_PDF/200030-2019\\_Indoor\\_Thermal\\_Environment.pdf](http://www.technicalguidelines.ubc.ca/Division_20/2019_Division_20_PDF/200030-2019_Indoor_Thermal_Environment.pdf)

## **Appendix A - Variance Request**

Prepared by: <i>Energy &amp; Water Services Building Operations Infrastructure Development</i>	Approved by: <i>John Metras AVP, Facilities</i>	Replaces: I-B-53 Appendix I	Issue Date: February 2020
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### **1. Variance Request Process**

All permanent Variance requests shall be submitted to the Facilities Manager responsible for the building in which the change is to take place. All requests should be submitted a minimum of two working weeks prior to the requested start date.

If the Facilities Manager deems the variance acceptable, they may provide a preliminary response to the requestor, and forward both the request and their response (if applicable) to the Energy & Operations Policy Steering Committee. The committee shall review the request and response, and either ratify the response and make the variance permanent, or overturn the decision. A written notice of the decision made by the Committee will be provided to the Facilities Manager.

The Facilities Manager may provide a preliminary response to the requestor. Any acceptance of the variance is non-binding, and may be overturned by the Steering Committee.

The Steering Committee will consider multiple criteria when reviewing a variance request, including (but not limited to) effects on energy consumption; impacts on building systems such as electrical or plumbing systems; whether any additional equipment can reasonably be maintained; and impacts on UBC's overall goals of operational excellence. After a request has been reviewed, a written response will be provided to the Facilities Manager.

### **2. Implementation**

One-off events will be implemented through a Service Request sent to the BMS Operations Centre. These events will be programmed as single occurrences.

For multiple or complex modifications to the time-of-day schedule, creation of new schedules, or variance from the Energy Policy, the BMS Office will implement the required changes.

Changes pertaining to physical infrastructure will result in a service request generated in Building Operations' service ticketing system. The service request number will be provided to the Facilities Manager to track the change and communicate progress to the original requestor.

## Variance Request Form

Please fill out as many fields as possible in the form below, and email to your facilities manager.

Request Date:

### *Requestor Contact Information:*

Name:

Phone:

Email:

Faculty/Department:

### *Variance Information:*

Building:

Room Number:

Number of Occupants:

Description of Project:

Description of why a variance is needed:

## Appendix B – Variance Request Process Flow Chart

Prepared by: <i>Energy &amp; Water Services                  Building Operations                  Infrastructure Development</i>	Approved by: <i>John Metras                  AVP, Facilities</i>	Replaces: I-B-53 Appendix I	Issue Date: 01 October 2019
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