a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Facilities Management
The University of British Columbia |
Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

UBC Okanagan Campus
Energy Team
Quarterly Report
April 2019 – June 2019

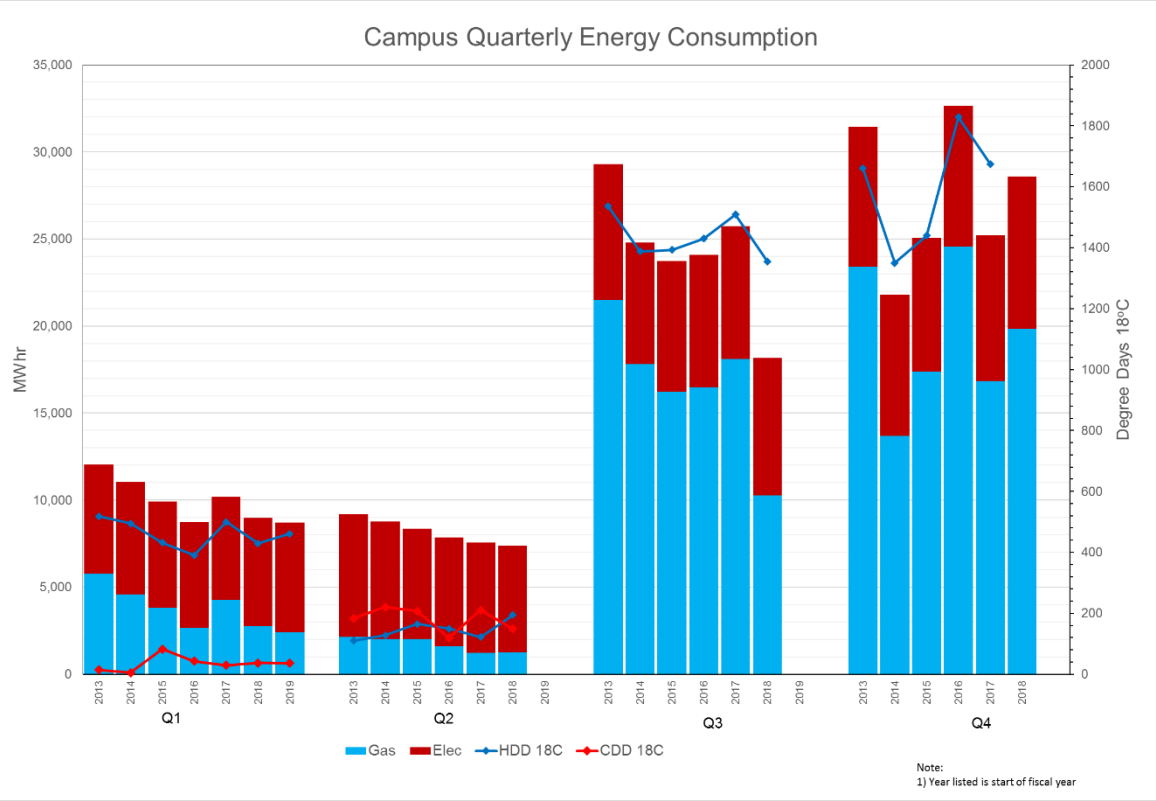
Report Date: 2019-09-09

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

1. Overview of the First Quarter of FY2019-2020

Campus natural gas consumption over the past quarter was 8660 GJ compared to 9970 GJ for Q1 last year, a 13% year over year reduction. In contrast to the reduction in natural gas usage, electricity usage on campus for Q1 was 6310 MWhr compared to 6200 MWhr in FY18-19, a 2% increase year over year.



Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

2. Policy Development

Appropriate policies and guidelines assist in meeting campus energy goals and as such are championed by the energy team. Significant developments in energy-related campus guidelines and policies that occurred in the past quarter are described below.

2.1. Campus District Energy Strategy

A Campus District Energy Strategy that is intended to guide how district energy systems on campus evolve to meet the requirements of an expanding campus is currently under development. The first phase of the strategy is expected to be completed in the fall of 2019.

2.2. Future Campus Construction

In order to ensure that future campus energy goals and targets are met, it is important that new buildings constructed on campus are designed and built to be consistent with the Whole Systems Infrastructure plan as well as other campus plans and goals. As such, the energy team has been involved in providing technical reviews and setting goals, targets and strategies as early as possible for future campus expansions. Ensuring timely development, review and acceptance of rigorous Owner's Project Requirements documents will be an important part of this work.

2.3. Technical Guidelines

Technical Guidelines are intended to provide minimum standards for campus projects. There are a large number of guidelines that cover both UBC as a whole and some that are specific to the Okanagan campus. The energy team is working to update several that are specific to energy performance and monitoring.

Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

3. Completed Projects

The following projects have been completed over the last quarter:

3.1. Library Data Center Heat Recovery

Data centers on campus produce a significant amount of heat year-round. In order to utilize this heat during cold weather, a hydronic connection has been made between the library data centre and the new adjacent Commons (TLC) building's central heating/cooling plant. With this connection, cooling for the data centre will be provided by the Commons' central plant with the heat being available for use in the Commons building. This system is expected to save 480 GJ of natural gas and 53 MWhr of electricity consumption annually.

3.2. Lighting Upgrades

Upgrades of existing campus lighting to LED lights is ongoing. Over the past quarter UBCO electricians have been replacing fluorescent tubes in the Fipke and ASc buildings as well as outdoor street lights with LED replacements.

4. Projects in Progress

The following are energy conservation projects that are currently in progress.

4.1. Groundwater Upgrade

The current geothermal groundwater injection system limits the quantity of groundwater that can be used for heating. In order to increase the capacity of the system, upgrades to the current infiltration basins are under consideration. A single recharge well is to be tested in the fall of 2019 to evaluate the amount of capacity increase that may be possible. If the results are deemed successful, more recharge wells will be considered for addition to the exisiting infiltration basin.

4.2. Science Ventilation Upgrade

Ongoing upgrades and optimization of ventilation systems within the Science building are expected to save $52,000 in energy costs per year (2,600 GJ of gas and 415,000 kWhr of electricity). The project has been approved for $25,815 in FortisBC electrical incentives and $55,681 in FortisBC gas incentives. Rebalancing of laboratory airflows has been completed as well as installation of variable-frequency drives on the building's main exhaust fan motors. Additionally, several laboratories have been connected to a system that monitors laboratory exhaust chemical content in order to allow for ventilation rate optimization and key fumehoods have been upgraded to variable air volume flow. With these changes in place, it is expected that one of the three main exhaust fans serving the building will no longer be required to operate continuously. Final commissioning of control systems that allow this fan to cycle off are now expected to be completed in the fall of 2019.

Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

5. New Construction Projects

The energy team is involved in the design and construction process for new construction on campus. The energy team's goal is to ensure that the design and construction of new buildings on campus are consistent with the campus Whole Systems Plan in terms of energy targets and sources. The energy team also co-ordinates the pursuit of energy efficiency incentives from FortisBC.

5.1. The Commons

The new Commons building (formerly referred to as the Teaching and Learning Centre) was opened in January 2019. Current estimates are that the Commons building will consume less than half the energy compared to a minimally code compliant reference building and over $115 000 of FortisBC energy efficiency incentives have been granted. Final commissioning of this building is still ongoing.

5.2. Nechako Residence Commons

The Nechako building is a new residence building with a large cafeteria and other campus amenities included. While the energy team has provided detailed feedback on the design of this building, as a residence building, decisions for this building are the responsibility of UBC Student Housing and Hospitality Services. Completion of this building is expected for summer 2021. FortisBC energy efficiency incentives of over $167 000 have been approved for this building

5.3. Skeena Residence

The Skeena Residence is a new residence building that is planned to be the first Passive House Certified building on campus. The energy team has provided detailed feedback on the design of this building. Completion of this building is expected for summer of 2020. FortisBC energy efficiency incentives of over $157 000 have been approved for this building

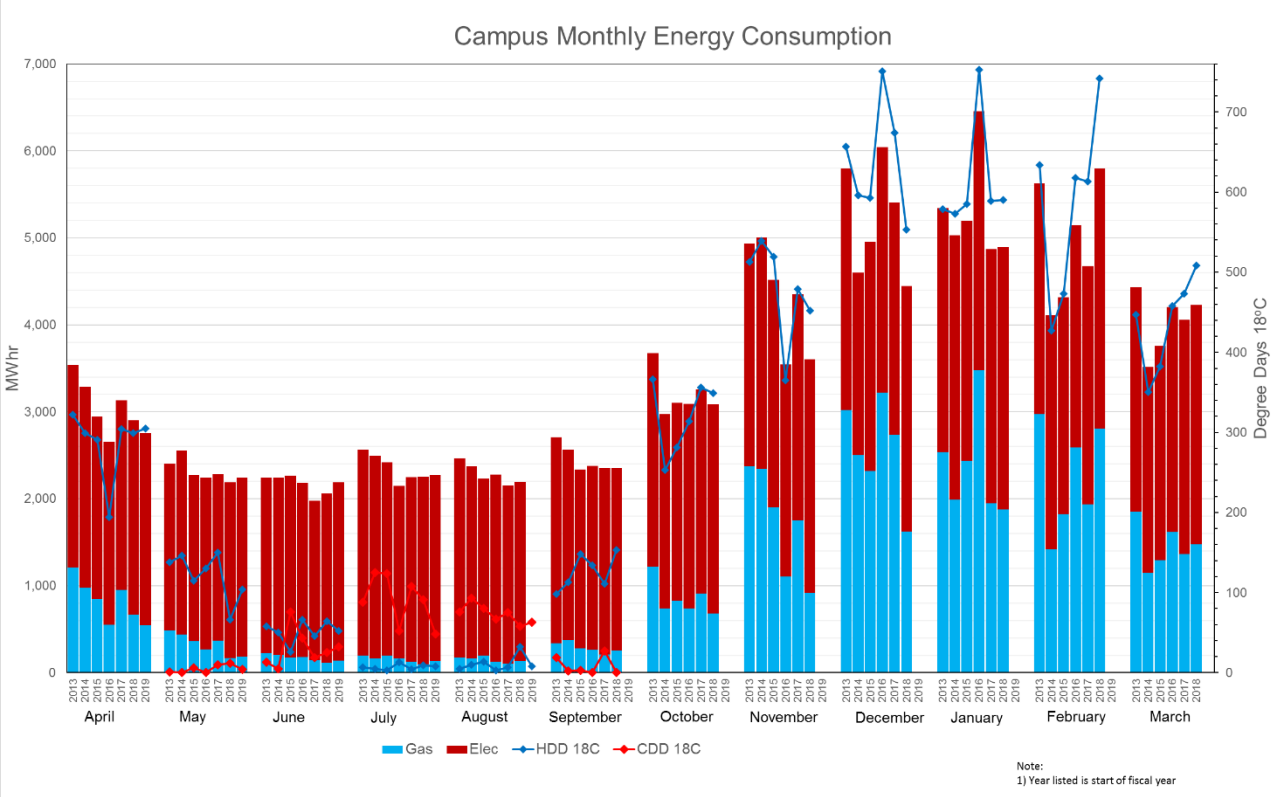
5.4. Greenhouse

A research greenhouse is planned for construction on campus. It is expected that due to cost constraints, this building will be built in phases with the final indoor growing area being 1000 m^2 total. The energy team has provided evaluations of energy conservation measures that may minimize the energy costs and greenhouse gas emissions of this facility.

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

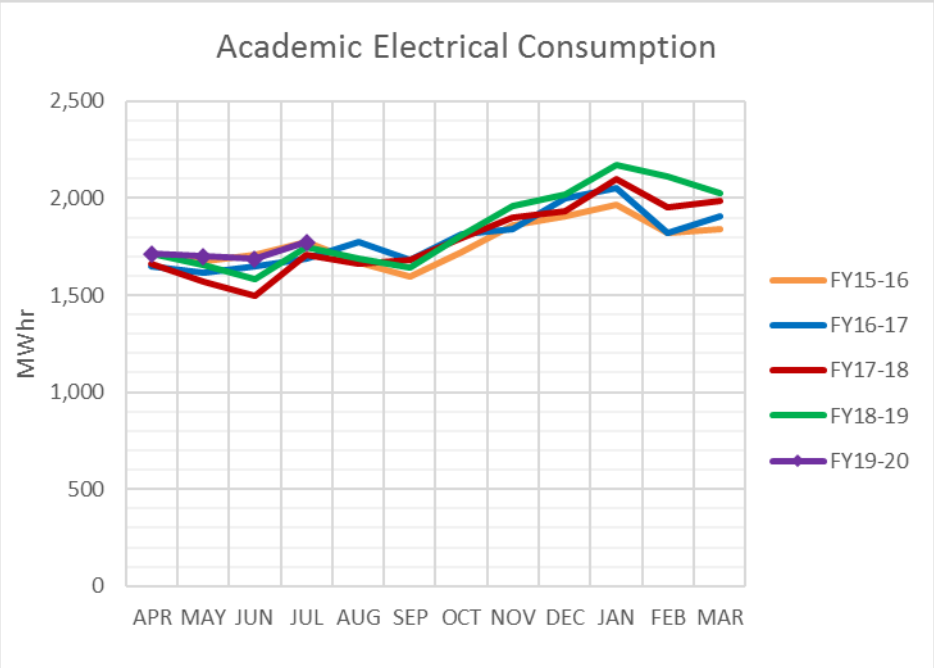
Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

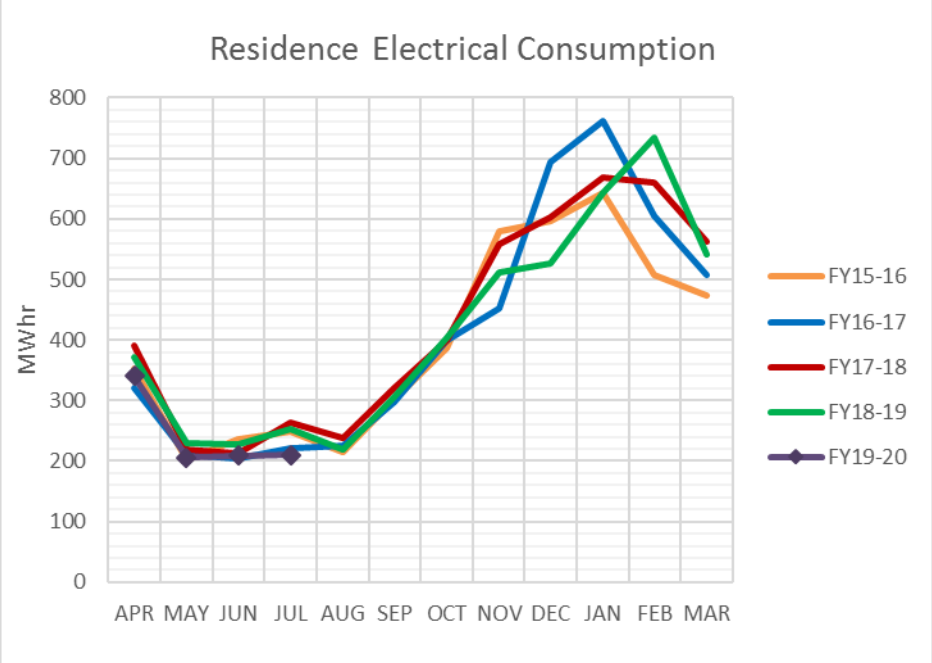
5.5. Energy Performance Graphs



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

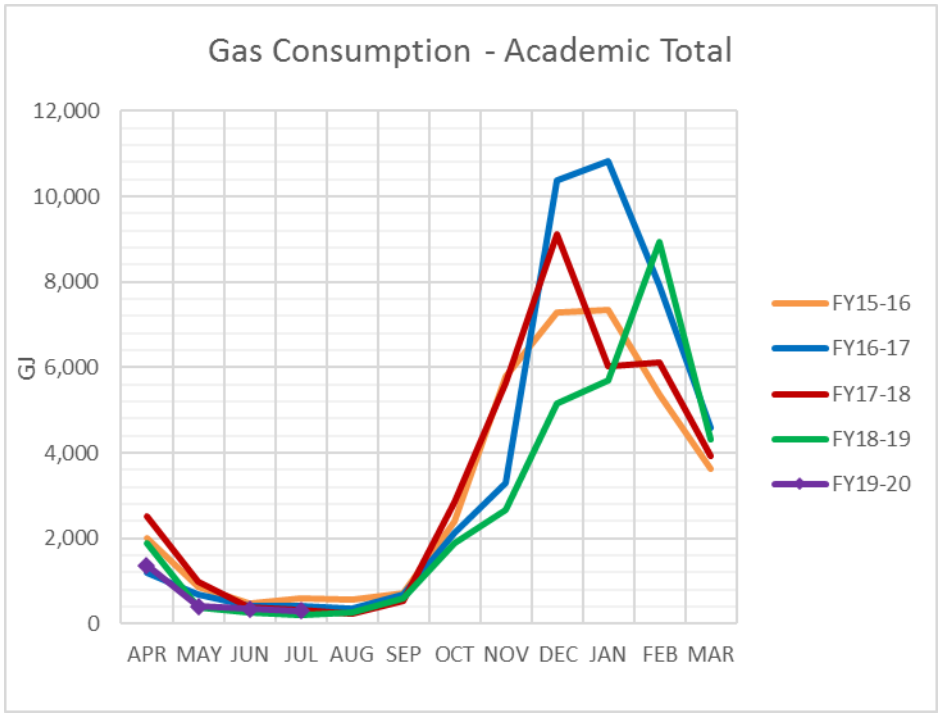
Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

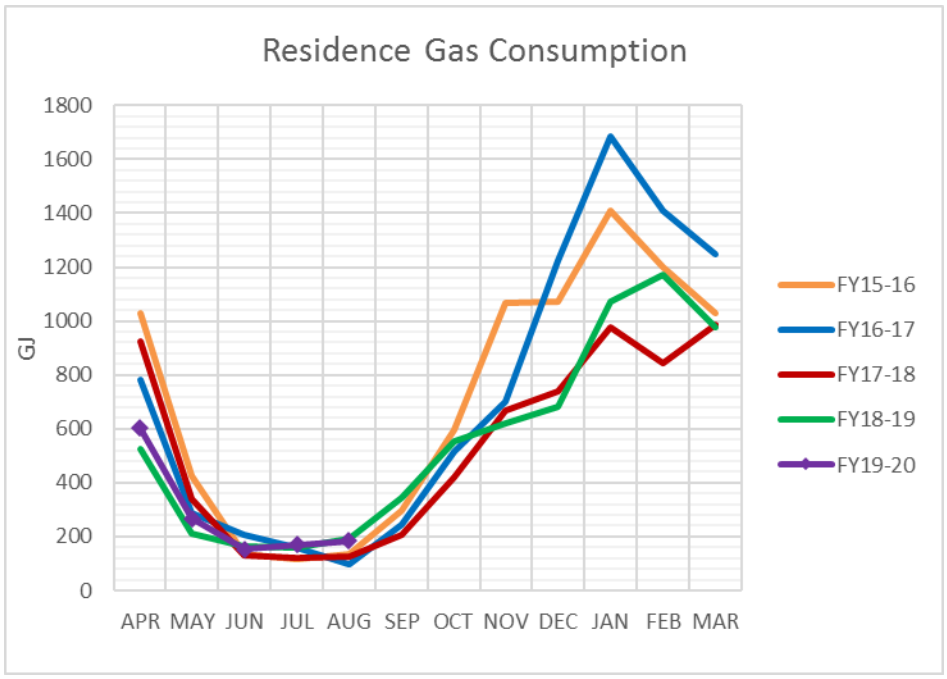




a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

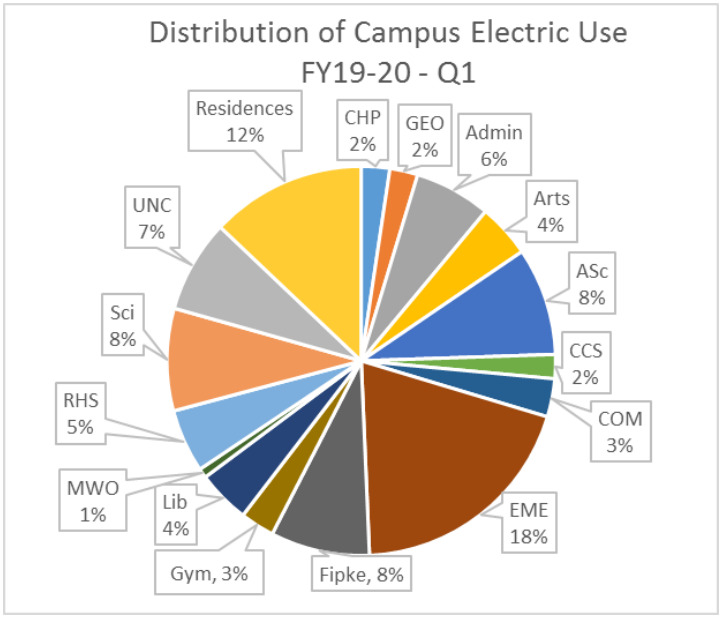
Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

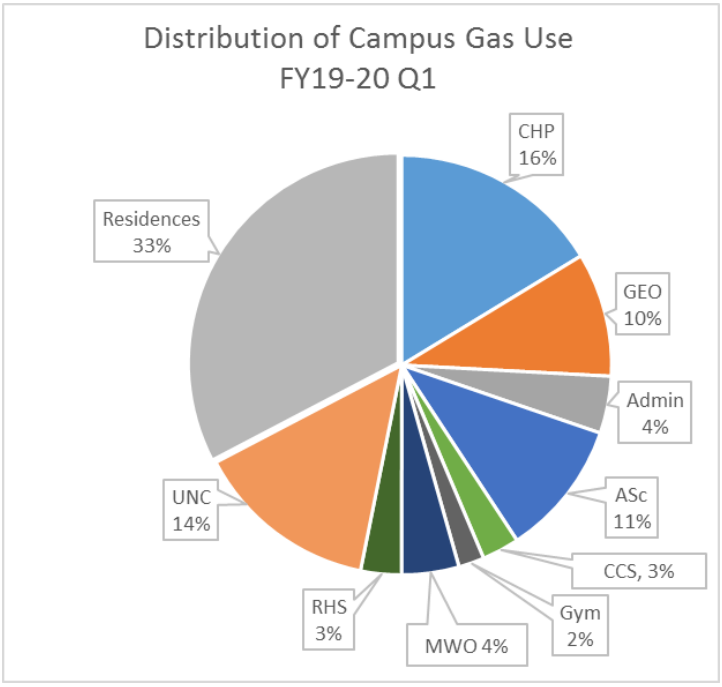




a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca

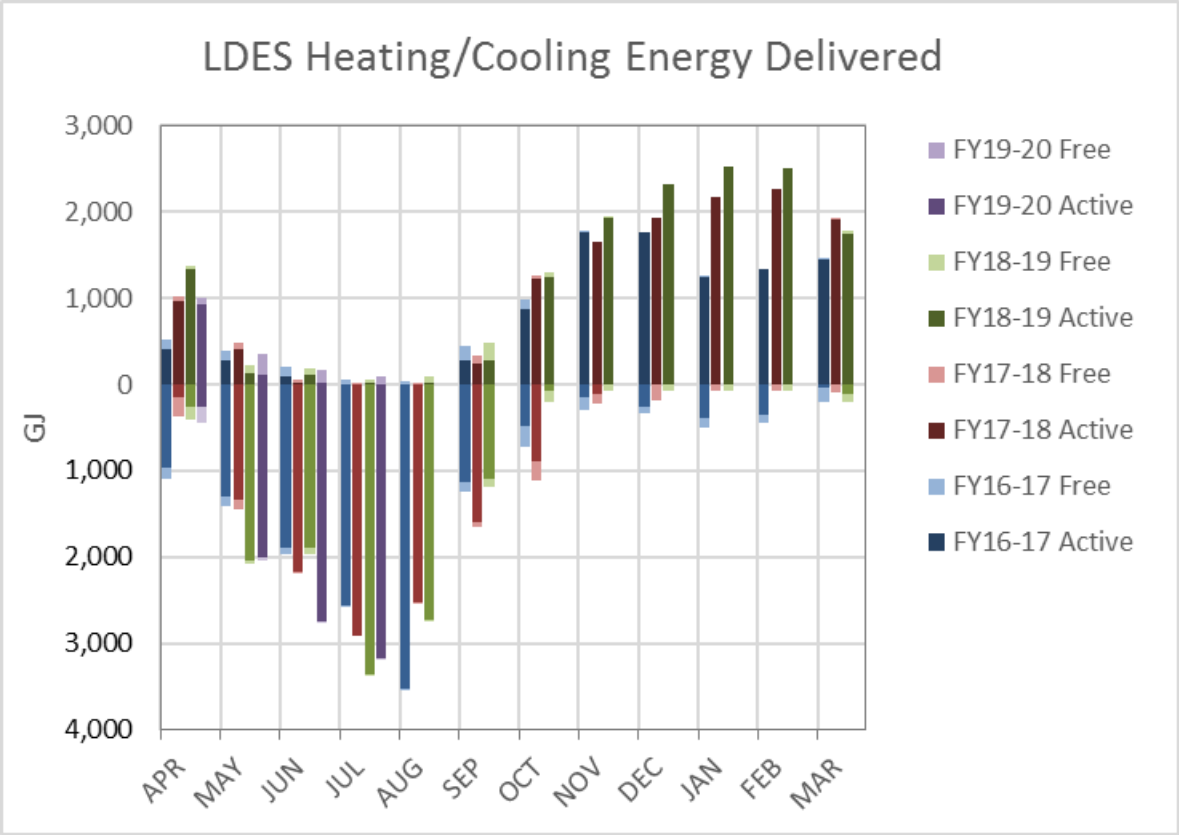




Note: Building electricity and gas consumption values shown are for consumption within the building. Indirect gas consumption via MDES & LDES is not included.

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Facilities Management
The University of British Columbia |
Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca



Note: MDES data not shown for Q1 due to minimal use during this season.

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Facilities Management
The University of British Columbia | Okanagan Campus
1138 Alumni Avenue | Kelowna BC | V1V 1V7 Canada
Phone 250.807.9272
facilities.ok@ubc.ca