

To: Dr. Erika Paterson, ENGL 301 professor

From: Ethan Fung, ENGL 301 student

Date: June 22, 2022

Subject: Proposal for the possibility of providing air conditioning to the UBC chemistry building

Audience

The intended audience for this formal report is Dr. Ken Macfarlane who is the director of finance and operations within the chemistry building.

Introduction

The UBC chemistry building stands as oldest building on the University of British Columbia (UBC) Vancouver campus. Built in 1925, the historical building has been featured in many popular movies such as The Flash and has become a UBC historical landmark. This has caused the institution to act defensively when suggestions about rebuilding the chemistry building arise, even though many signs of old age and design are becoming increasingly present to those working in the building. A common grievance shared among students, staff, and faculty of UBC chemistry is the lack of air conditioning and untrustworthy heating within the building. Recently global warming has created days that reach 32 °C in the summer, creating unbearable working conditions for chemists required to wear pants and thick lab coats.

Statement of the problem

Unruly temperatures create a problem not only from the perspective of worker comfortability but, it also affects the work being done in the labs possibly causing dangerous situations. For example, Dimethyl sulfoxide (DMSO) is a common solvent and has a freezing point of 19 °C. When the heating unit malfunctioned during the winter of 2021, many peers working with DMSO complained that their reaction literally froze on them. Oppositely another common solvent, dichloromethane has a boiling point of 39.6 °C. The compound is suspected to be carcinogenic and is known to be very flammable and volatile. Many labs within the chemistry building have multiple 4L jugs of this solvent and since the cabinets are made of wood, not providing air conditioning within the building on a very hot day could spell disaster. Outside of physical hazards, fluctuating temperature can affect the results of temperature sensitive reactions. With no way of maintaining a constant temperature some results become irreproducible, a cardinal sin in the scientific community.

Proposed solution

One possible solution to this problem is to install air condition units inside each of the wings in the chemistry building. This would allow for temperature control throughout the building avoiding the problems outlined in the previous section. There is also the possibility of installing air conditioning units only in the laboratories as students in classrooms are not required to cover up and can dress appropriately. This would cut on costs while also avoiding the problems mentioned above.

Scope

To determine the possibility of installing air conditioning in the UBC chemistry building I will ask the following questions:

1. How large is the chemistry building, how much would it cost to fund air conditioning for the whole building?
2. How large is each lab in the chemistry building, how much would it cost to fund air conditioning in each lab?
3. What other dangers does uncontrolled temperatures impose?
4. How many people are working with temperature sensitive reactions/experiments?
5. How many chemistry students feel uncomfortable about the possible increase in temperature due to climate change?
6. How will climate change in the future potentially affect the workspace safety of UBC chemistry?
7. What are some common chemicals that pose a threat under certain temperatures?

Methods

My primary sources will include online surveys as well as physical measurements of rooms to give a rough estimate of the volume of each lab/room. I also have UBC chemistry email wide access so I can contact anybody within the chemistry department for information.

Secondary sources will include floor plans of the UBC chemistry building as well as blueprints and documents concerning its dimensions. The cost of air conditioning will come from online research. Also, the websites of common chemical suppliers will be used to find the thermal properties of common chemicals.

My qualifications

I am currently an undergraduate chemistry student that has been working in the UBC chemistry building for over a year. I have access to many rooms and people in UBC chemistry. My association to UBC chemistry will allow me to gather information to proceed with this study.

Conclusion

With the rise of global warming the students, staff, and faculty of UBC chemistry are in danger if nothing is done to control temperature within the building. Furthermore, volatile, flammable solvents with low boiling points like DCM could set the whole building ablaze which would cost the department much more than a couple of air conditioners. If granted permission to proceed with the study, I will use the seven questions asked above to guide my research in determining the feasibility of providing the UBC chemistry building with air conditioning.