

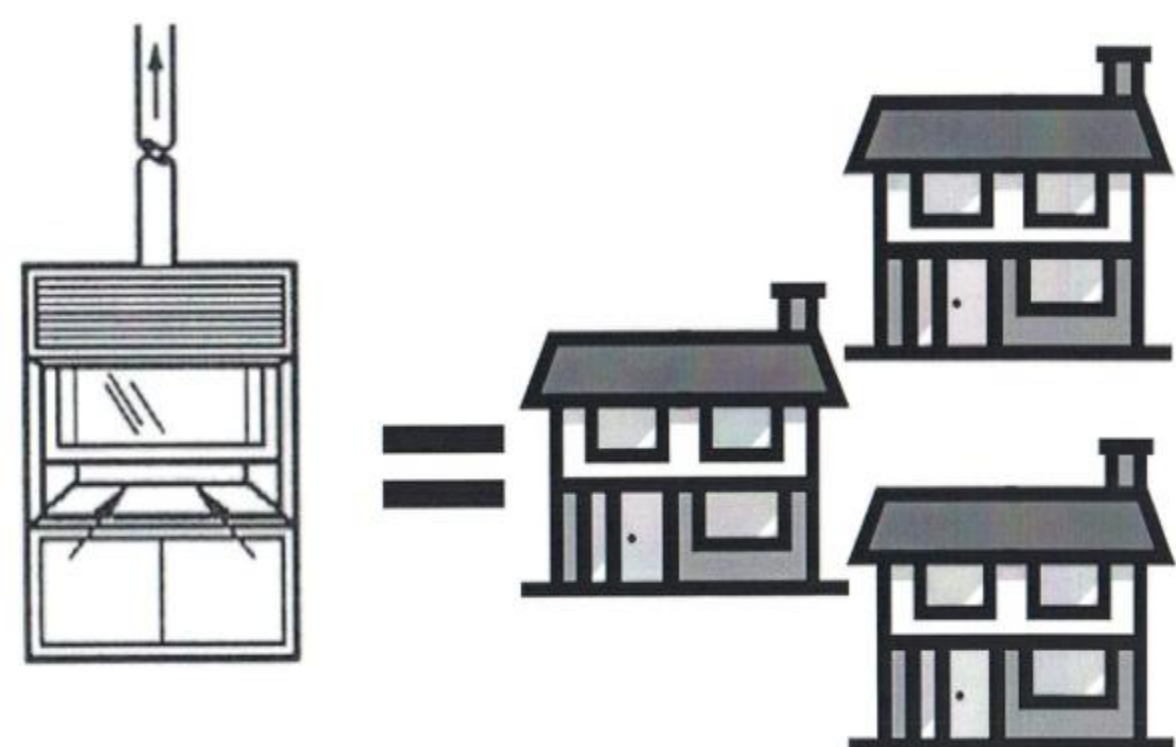
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Project Client

1. Problem

There are over 1100 fume hoods at the University of Toronto (U of T) St. George campus.

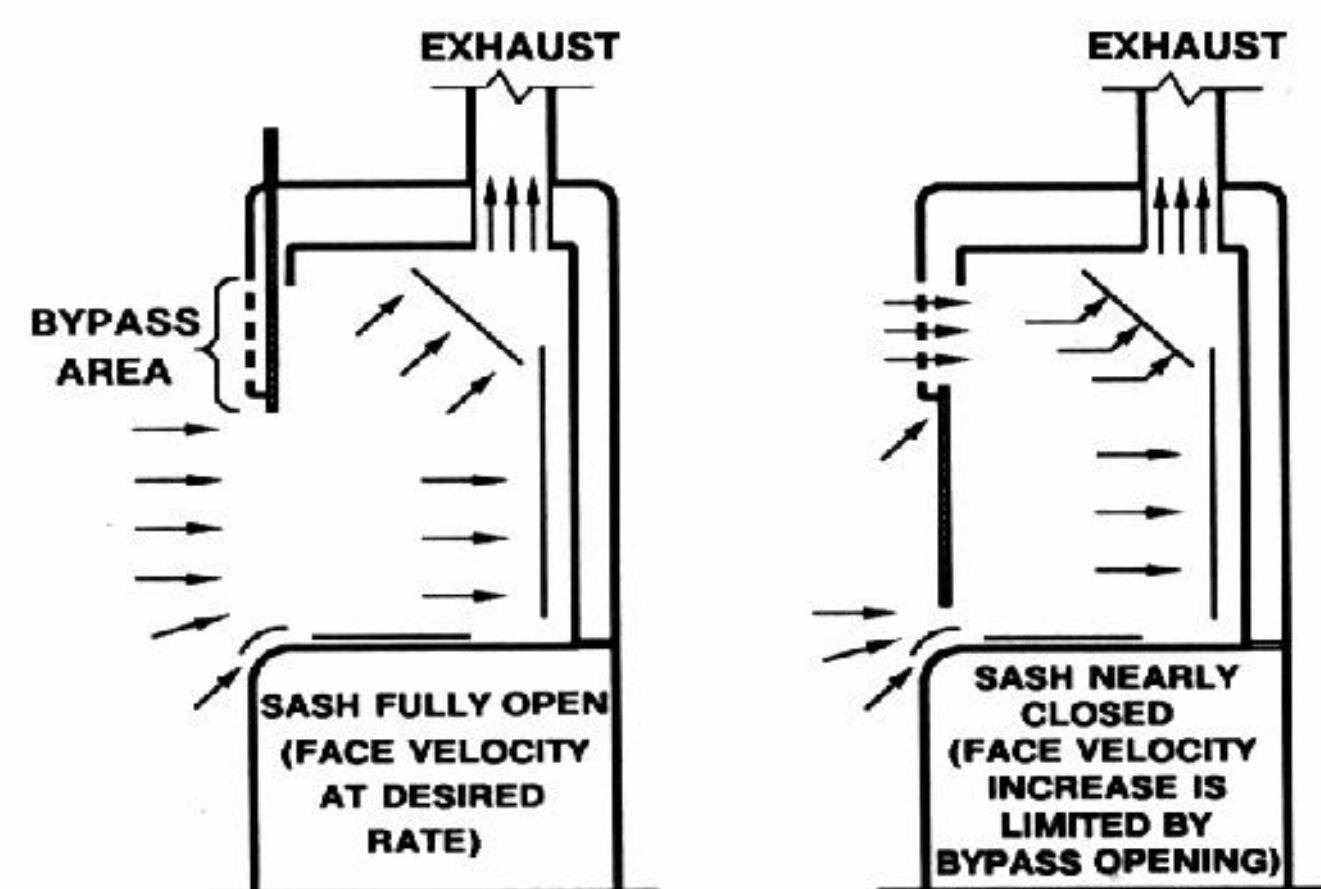


One fume hood consumes the equivalent energy of three houses

- A fume hood is a safety device that exhausts fumes at an average of 800 cubic feet of air per minute (CFM). They use a lot of energy!

2. The Opportunity

- The Sustainability Office used a pilot campaign called *Just Shut It!* to measure the potential energy savings of Variable Air Volume (VAV) fume hoods if students shut their sashes while not using them.
- Estimated potential annual energy savings of up to \$100 000 per year!

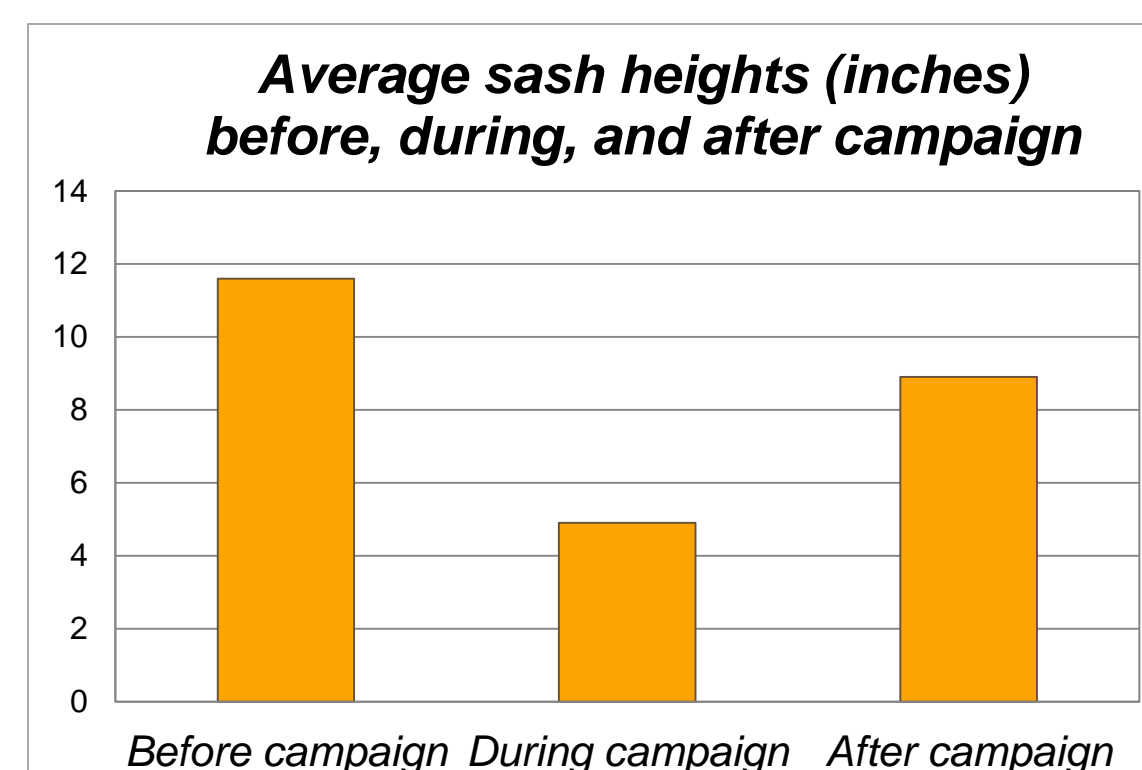


On the VAV fume hood, the exhaust rate is reduced when sash is lowered thus reducing the amount of energy consumed by the unit

- How can these energy savings be sustained?

3. Sustaining Behavioural Change

- Analyzed feasibility of recommendations from previous human factors research conducted on fume hood behaviours in undergraduate students
- Investigated results from the *Just Shut It!* campaign held in the U of T Department of Chemistry (see below)



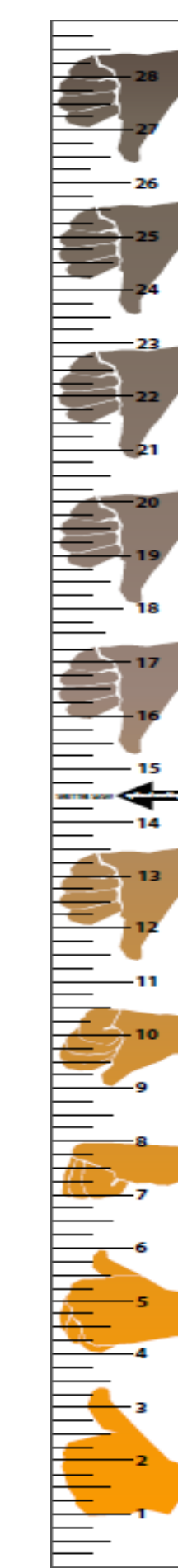
Incentive-based competition (prizes were awarded) using posters (right) and sash stickers achieved desired compliance rates during the campaign but the results were unsustainable afterward (left)

- Conducted literature review on adopting energy conscious behaviors
- Benchmarked activities of sustainability groups in other universities and efforts of environmental groups in labs across campus
- Concluded that the following factors inhibit users from adopting energy-efficient behaviors:
 - ✗ Forgetfulness
 - ✗ Intangible benefits
 - ✗ Misunderstanding
 - ✗ Unwillingness
 - ✗ Behaviour not praised
- Concluded that the following elements contribute to successful behavioural change:
 - ✓ Reminders
 - ✓ Voluntary stewardship
 - ✓ Awareness
 - ✓ Ownership
 - ✓ Peer pressure

4. Solution Package

Based on intrinsic and external motivators, team elected to develop **fume hood sustainability package** that promotes safety culture through education:

- Implement fume hood training module for all undergraduate and graduate students, which includes:
 - Training video
 - Training manual
- Install sash stickers on all VAV fume hoods: reminds students of appropriate sash height
- Develop sustainability pledge: encourages commitment
- Develop sustainability representative code of ethics



- The solution package was presented to client and stakeholders to much satisfaction.

5. Evaluation and Future Work

- Initial prototypes of training content and community based social marketing materials have been developed.
- Sash sticker (see left) used during the *Just Shut It!* campaign will be placed on all VAV fume hoods in Lash Miller labs.
- Preliminary evaluation of some of the training materials through usability testing will be carried out on representative student group within the next month.
- Based on feedback, a second iteration of the prototype will be developed and delivered by the end of the project term.