



Visual Analytics Use Case

Energy and Occupancy Dynamics at UBC

Context

Sensible Building Science is a University of British Columbia (UBC) based start-up in Vancouver, Canada, developing innovative technologies to integrate energy and occupancy dynamics for advanced building controls. They use visual analytics to help clients understand the key characteristics of building energy, and to show them where they can save on their utility costs and drive down their greenhouse gas emissions. <http://sensiblebuildingscience.com/>

As part of VIVA's Andrew Wade VA Program, researcher and data designer Lisa Shiozaki from UBC collaborated with Stefan Storey from Sensible Building Science to investigate energy and occupancy dynamics at UBC.

Problem

There is a discrepancy between the time a building's energy turns ON/OFF and the time the occupants are IN/OUT of a building.

- If a building turns ON when there are no occupants, energy is wasted when the building is empty.
- If a building turns OFF when there are many occupants, occupant discomfort occurs (e.g. the rooms are too cold in the winter, too hot in the summer).

When and where the discrepancies occur need to be determined so that more buildings are turned ON when there are many occupants and turn OFF when the occupants leave the building.

Solution

After organizing and cleaning 20 million rows of raw energy and occupancy data, Lisa created an interactive data narrative on Tableau, which allowed clients to see what buildings use what kind of energy at what time, and approximately how many occupants are in a building at a given time.



A screenshot of part of the Dashboard (actual Dashboard is interactive).

"[Lisa's] visualization has been shared with industrial partners, academics, and energy managers and has helped our clients to better understand the way that energy is being used in buildings, specifically by their occupants in terms of where and when they demand energy services."
– Stefan Storey, Sensible Building Science

Outcome

UBC can now use this interactive Dashboard in order to optimize energy use for heating, light and air conditioning to match the needs of occupancy, during the day and throughout the year, saving the University both energy and money.