

BUILDING USER AUDIT

CAPTURING ENERGY, BEHAVIOR, AND CULTURE



ABSTRACT

This project advances the practice of energy audits by developing and piloting a building use audit tool that observes and analyzes the effects of occupant behavior on building energy consumption.

Current Gap Existing energy audit protocols do not take into account the impacts of user-influenced energy use.

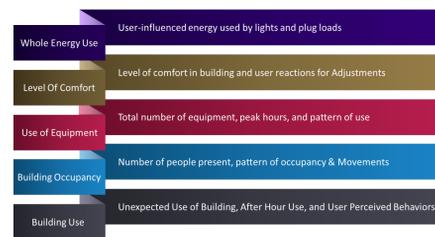
Audit Tool Components A baseline of the energy impacts characteristics of building users' behavior. A baseline of the cultural context of the building's users.

Main Deliverable Building User Audit Procedure (BUAP) guidelines that can be used to perform building user energy audits.

AUDIT PROCESS



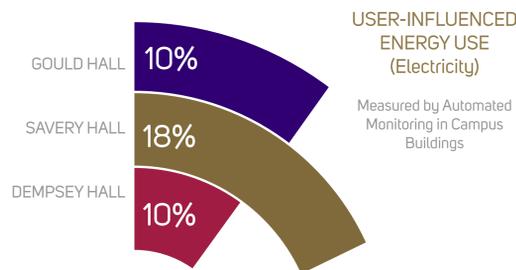
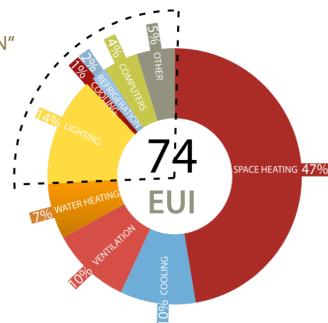
BUAP DATA CATEGORIES



TYPICAL "EDUCATION" BUILDING

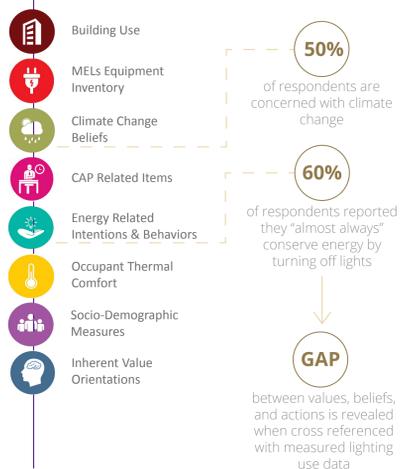
Source: CBECS 2003

Indicates User-Influenced Energy End Use

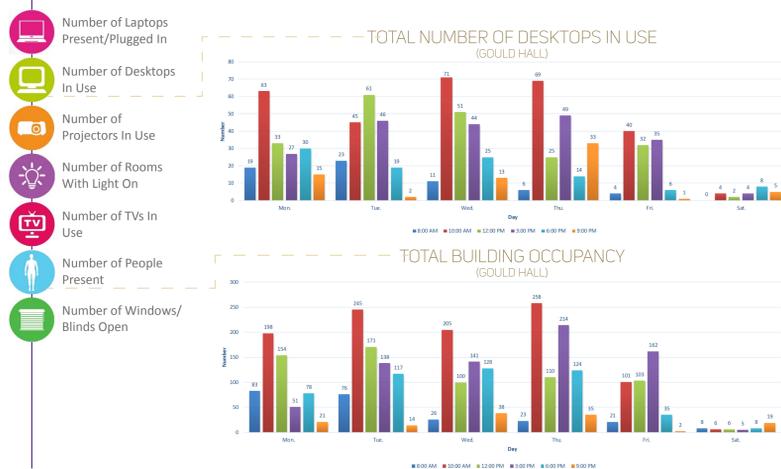


SAMPLE RESULTS

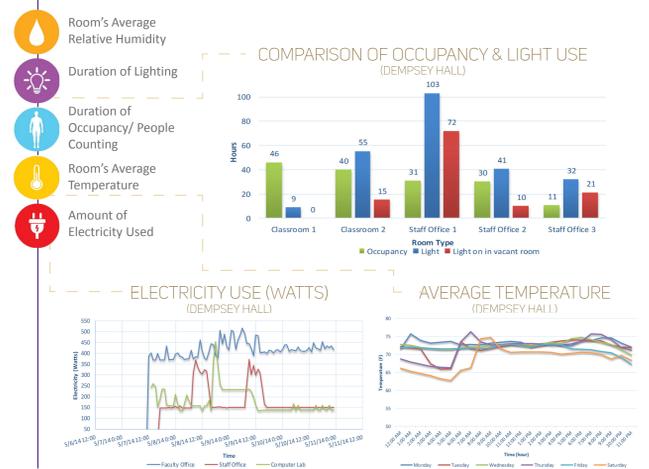
SURVEY



MANUAL OBSERVATION



AUTOMATED MONITORING



DESCRIPTION

The Building User Audit Procedure project team recognized that while UW has implemented several initiatives to raise awareness of energy use and reduce energy consumption on campus, the university needed a framework to accurately account for the effects of user-influenced energy uses in campus buildings in order for UW to meet its greenhouse gas reduction goals.

The BUAP, developed and tested through the UW's Green Seed Fund, reveals a considerable influence of building occupants on energy use as well as a significant gap between occupants' expected actions and their actual behaviors in terms of building and energy use. For instance, about 60% of survey respondents report that they turn off the lights when leaving their offices, while the building audits indicate that electric lights were left on between 40%-50% of the time in vacant offices.

This project introduces an effective, affordable method to estimate the amount and pattern of building occupancy by means of people counters and manual observations. This helps building managers to properly supply resources to the building users or create data-driven occupancy baselines for future building construction and renovation. Further, the BUAP provides a benchmark for creating a behavior-based energy efficiency campaign and improving facility operation and maintenance practices as the UW campus moves forward in reducing overall building energy consumption.

CREDITS

- Funded by** Green Seed Fund (2013-2014 academic year)
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