How Commissioning Fits Into Sustainable Design and Occupant Behavior

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California Commissioning Collaborative
Building Operators

• Insufficiently respected
• Risk-adverse
• Managing fires
• Limited access to utility bills
• Drivers: occupant complaints, work orders, and building walkthroughs
• Operate buildings conservatively (more energy use) to avoid complaints
• Responsible for many issues, energy efficiency is just one (if at all)
• Poor hand off from operator to another
What is a good occupant to building operators?

• “Treats building as if they pay the energy bill.”
• “Understand how systems work.”
• “Aware of the people around them and how their request effects neighbors.”
• “Well-mannered, respectful to janitors, don’t complain too much.”
• “Understands limitations and even comes up with new ideas.”
• “Doesn’t call all the time and appreciates what operator does.”
Building 74 Occupant Manual

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Introduction

The design of Building 74 is focused on creating a sustainable and energy-efficient work environment. This manual provides a quick start guide and instructions on how to use the EnergyShells, Zonies, and Work Request Center.

Quick Start

2. Log in to the EnergyShells portal and select Building 74 from the list.
3. Review your EnergyShells report and make any necessary adjustments.

Document Organization

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Target Audience

This manual is intended for all occupants of Building 74, including office workers, researchers, and visitors.

EnergyShells

EnergyShells is a web-based tool that allows occupants to view their energy usage and take steps to reduce their impact. To use EnergyShells, follow these steps:

2. Select Building 74 from the list.
3. View your energy usage report and take action to reduce your footprint.

Zonies

Zonies are energy-efficient zones that are designed to reduce energy consumption and improve comfort. To use Zonies:

2. Select Building 74 from the list.
3. Adjust your temperature settings to save energy.

Work Request Center

If you need to report a problem with the building, such as a broken window or a malfunctioning light, use the Work Request Center. To report a problem:

2. Select Building 74 from the list.
3. Fill out the form and submit your request.

Metering & Competitions

The building is equipped with metering equipment to track energy consumption. To participate in the energy metering competition, follow these steps:

2. Select Building 74 from the list.
3. Set your energy usage goals and monitor your progress.

Offices

The building has three air conditioners. Air conditioner #1 serves the north side of the building, air conditioner #2 serves the south side of the building, and air conditioner #3 serves the west side of the building.

Heating & Cooling

- Air conditioners are adjusted based on occupancy and weather conditions.
- In the summer, the building is cooled to a temperature of 74°F (23°C).
- In the winter, the building is heated to a temperature of 68°F (20°C).

Thermosets

Thermosets are used to regulate the temperature in the building. To use Thermosets:

2. Select Building 74 from the list.
3. Adjust the temperature settings as needed.

Energy Ambassadors

Each zone has an energy ambassador (EA). Here's a list of energy ambassadors by zone:

- Zone 1: Sue Smith (labs)
- Zone 2: Bob Jones (offices)
- Zone 3: Carol Nelson (labs)
- Zone 4: Joe Johnson (offices)
- Zone 5: Cathy Larson (labs)
- Zone 6: John Doe (offices)

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Another major responsibility of energy ambassadors is to make sure energy is not wasted in their zone and to work with their colleagues to save energy. This includes making sure all equipment and lighting is turned off at the end of the day and windows are closed.

In the labs, the energy ambassadors play a huge role in making sure sashes are closed at the end of the day.

If you're too cold, please inform your office manager or the building operator. If you're too hot, please inform your energy ambassador.

Why use space heaters? Space heaters are a temporary solution for spaces that are too cold, but use a lot of energy. Space heaters are also a safety hazard. Space heaters are not used in areas where there is a risk of fire, such as laboratories, cold rooms, or areas with high-voltage equipment.

No Sash

- If you're too cold, please inform your energy ambassador.
- If you're too hot, please inform your office manager.

Got an idea on how to save energy? Contact your energy ambassador or John Elliott at 510-694-5702.
NATURAL VENTILATION in Campbell Hall
Indoor Comfort Guide

What is natural ventilation?

Berkeley has a perfect climate for natural ventilation. Natural ventilation is an alternative to air-conditioning. Natural ventilation saves costs and uses less energy. It means opening windows, lowering shades to block the sun’s heat, and operating ceiling fans.

In the evenings when it cools down, open windows to cool the building. In the late mornings before it heats up outside, close windows to trap the cooler air inside.

The building design team estimates natural ventilation can reduce the cost of operating Campbell Hall by 30%.

Heating & cooling systems

Most of Campbell Hall, such as the partnership offices, is designed for natural ventilation. Some parts of the building, such as the interior core and some conference rooms and labs, are air conditioned.

COOLING

Heating

The building is heated by manually-controlled radiators in private offices and workstations on the building’s perimeter. Some parts of the building, such as the interior core and some conference rooms and labs, are heated centrally.

Thermal comfort checklist

ON MILD DAYS
- Turn radiators off before opening windows
- Open windows
- Lower window shades to cover windows
- Turn on ceiling fans for air circulation, as needed

ON HOT DAYS
- Use radiator to provide heat
- Close windows
- Raise window shades to allow sunlight into space
- Turn on ceiling fans for air circulation, as needed

HVAC system controls

THERMOSTATS are located in spaces with air conditioning. They automatically control these spaces in conjunction with natural ventilation. The preset temperature for summer is 75°F with ±2°F adjustment, and the preset temperature for winter is 65°F with ±2°F adjustment. The temperature can be adjusted ±2°F using the thermostats.

CEILING FANS play an important role in moving the air in different directions for summer and winter.

Individual fans in offices have 4 speeds. The fastest speed is 1 and slowest is 4. Multiple fans, located in common areas, are connected to one switch and have 3 speeds. The fastest speed is 1 and the slowest is 3.

RADIATORS in private offices and workstations in the building’s perimeter can be used to provide heat. Use the dials on each radiator to turn on and off.

BUILDING OPERATORS should change the direction of the ceiling fans in the summer and winter. In summer, toggle switches to the left, and in winter, toggle switches to the right.

The switches above the ceiling fans reverse the direction of the blades.

Energy efficiency tips

The UC Berkeley mypower program rewards departments for lowering their operating expenses by sharing 10% of the savings. Here’s how you can help your department:

- Designate someone to be responsible for windows, ceiling fans and radiators in conference rooms and other common areas.
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- Designate someone to be responsible for windows, ceiling fans and radiators in conference rooms and other common areas.
- On hot days, turn off radiators.
- On cold days, close windows.
- Turn off ceiling fans in unoccupied spaces at end of day.
- Janitorial Staff: Turn off ceiling fans at the end of each day.
Ways occupants Influence energy consumption

- Plug Loads
- Thermostats/Temperature
- Daylighting
- Stairs vs. elevators
- Buildings half-occupied
- Lighting
- Naturally-ventilated buildings
SWITCH
HOW TO CHANGE THINGS
WHEN CHANGE IS HARD

Nudge
Improving Decisions About
Health, Wealth, and Happiness

Fostering Sustainable Behavior
An Introduction to Community-Based Social Marketing
Change Through Process

- Systems Thinking
- Interactive
- Context Specific
Change Through Process

- Process-based behavior change programs cannot be done quickly or inexpensively.
- Understand people first in order to select the most relevant behaviors to focus on.
- Build on easy-wins and simple behavior changes over time.
- The goal is not static, it’s to continually prosper and thrive through process.
What might a process look like?

• Design and implement a behavior change process
• Create a green team
• Identify barriers and benefits
• Establish metrics and benchmarks
• Design and implement behavior change strategies
• Pilot strategies
• Evaluate and revise
Behavior Change Strategies

- Prompts
- Feedback/Dashboards
- Commitment/Pledge
- Tailored Messaging
- Face-to-Face
Questions Commissioning Agents could ask

• What role do you want your occupants and building operator to play in achieving energy efficiency?

• Are there departments that should be a part of the process that aren’t at the table?

• Who is ready for change or has already started?

• How will EMS be used to provide feedback to occupants on building’s energy performance?
What can Commissioning Agents do?

- Bridge design and occupants.
- Involve facilities, sustainability, and finance departments in Cx meetings.
- Review potential edits OPR to include: plug load management, etc.
- Facilitate robust dashboard/feedback systems.
- Inspire building operator(s).
- Collaborate with behavior change experts.
Case Studies

- University of California, Berkeley, myPower
- BCHydro, Workplace Conservation Awareness
- Pacific Gas & Electric, Step Up, Power Down
Lecturer David Presti studies human behavior and our habits.

Saving energy is a habit we can all adopt. Little things like switching off lights and power strips or dimming your computer monitor can make a big difference.

Make it a Habit to Save Energy.

myPower.berkeley.edu

myPower at BERKELEY
saving energy on campus
Engage building operators and engineers in accelerating whole building performance

Achieving measurable, lasting savings in high performance buildings requires more than just an equipment-based approach. Enhanced O&M training helps building operators and engineers see their building as a whole system. These trainings focus on field observations and new trends in energy management that help diagnose the underlying causes of building performance issues. Participants learn about no- and low-cost strategies and building system upgrades that save energy, money and improve overall building performance.

You can see substantial results!

This course is modeled on a highly successful O&M training program in which the average participating organization achieved:

- **Improved Strategic Building Operations**
  - 4.5% sustained energy savings

- Increased use of Rebates and Incentives
  - $34,500 projected cost savings

- Advanced Training for operators and engineers

You’ll learn to:

1. **Benchmark Operations**
   Brush up on measuring energy performance and data driven savings.

2. **Scope Buildings**
   See your building through “new eyes” and identify opportunities to save.

3. **Calculate Savings**
   Learn to estimate project savings and use data to build your business case.

4. **Share Results**
   Present results, issues and opportunities to staff and supervisors.

*One of the best practices we ever were part of was the training...it was a good process and great teachable moments for Engineers.*

—Chief Engineer
Real Estate Development and Property Management Co.

Get started!
stepupandpowerdown.com

Tag, You’re It!

Adopt a Light

IT’S UP TO YOU TO MAKE A DIFFERENCE
Conclusions

• Engage owners.

• Create effective bridges between design and occupants.

• Occupants are an opportunity to improve building performance. Identify and maximize these opportunities.

• Facilitate robust feedback systems.
Thanks and Questions.

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Do a Little, or Do It All

You choose the right level of participation for yourself and for your business. You bring the motivation, and we will help you:

**Make a Plan**
- Set your goals and choose the best tools to meet them
- Put together a team
- Understand how energy is currently being used
- Start using the online Energy Check software

**Participate in Training**
- Online or in-person orientation
- Learn to build a Sustainability Action Plan for your company
- Sharpen the energy saving skills of building operations staff

**Jumpstart Savings**
- Pick out simple actions everyone can do now, like powering down computers at night
- Watch as all of your efforts add up to big energy savings

**Save Big Together**
- Make it a group effort with creative energy-saving campaigns
- Take pride—you’re making your city a better place

**Strengthen Policies & Procedures**
- Build energy saving into everyday operations
- Set a clear schedule for maintenance and repairs to keep things saving energy and running smooth

**Upgrade Systems**
- Choose smarter technology that’s right for your business
- Learn about rebates that make upgrades budget-friendly