Engaging Students in Greening Cornell Labs

Ellen Sweet, MS, CCHO
Laboratory Ventilation Specialist
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Introduction

- What does Lab Sustainability mean and why it is important?
- How is Cornell addressing this?
- How are we engaging students?
Planet: Natural resource use and management

People: Quality of living and education, preservation of the community

Profit: Expense control, management of growth

Social- Environmental
Natural resources stewardship

Environmental- Economic
Energy efficiency, Incentives

Economic- Social
Business ethics

Sustainability
Cornell’s Path to Carbon Neutrality

Greenhouse Gas Reduction Trajectory

- ECI Phase 1 & 2
- Solar & CURBI
- Wind
- EGS Phase 1
- EGS Phase 2
- Offsets
  - Actual Campus Emissions (reported)
  - Projected Trajectory

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Climate Neutrality by 2035

- Broad vision for the campus.
- Green Office/Green Lab programs spear-headed by Energy Outreach Coordinator.
- Energy Management and campus support.
- Lab ventilation constitutes about 1% of the $60 million energy costs per year.
Climate Neutrality by 2035

- Cornell’s fume hood exhausts represent about 15% of Tompkins County’s carbon footprint.
- Ventilation is the largest user of energy in labs.
  - One fume hood = 3 households annual energy usage.
  - Lowering your fume hood sash is both safer and conserves energy.
- Cold storage of samples is the second largest use of energy.
What is a Green Lab?

• A Green Lab goes **beyond compliance** to include environment impacts as well as health and safety in its operational decisions.

• Acts as a community leader by sharing more sustainable practices with their peers.
How the Cornell Green Labs Program can help...

- Recognizing current Greening work going on in Cornell labs.
- Spreading the word about energy conservation and waste reduction opportunities in laboratories.
- Identifying laboratory greening opportunities from national peers (Harvard, Duke, etc...).

www.sustainablecampus.cornell.edu/initiatives/green-your-lab
The Program - Areas of Focus

• Chemical Management
• Green Chemistry
• Solid Waste Management
• Laboratory Energy Conservation
• Water & Steam
• Community Wellbeing
• Research
• Innovative Practices
The Program Goals

- Consider Green Chemistry Principles
  - Generate less hazardous waste
- Maintain Chemical Inventory
  - Minimize chemicals on-hand
  - Single purchaser of chemicals for group
  - Donate to the Surplus Chemicals Program
- Store and Use Chemicals Appropriately
  - Supports general ventilation rate reduction
- Reduce Plug Load
- Reduce Solid Waste
  - Double sided printing as default
  - Vendor buy-back or STACS or CATS
Engaging Graduate Students

- Graduate students can be leaders in educating others in their departments.

- Using our Resource Guides and other tools they are able to:
  - Identify greening opportunities in specific laboratories.
  - Prioritize the most important opportunities to take on first.
  - Implement innovative lab practices that can save money and carbon.
Risk Assessment Process

Step 1: Review chemistry for flammability, toxicity or odor concerns outside of local exhaust

Step 2: Consider ventilation effectiveness in the room

Step 3: Assess housekeeping practices

- Significant chemical sources outside local exhaust systems
  - Maintain normal operating rate of 8/4 ACH

- Development of "dead zones" likely
  - Maintain normal operating rate of 8/4 ACH

- Specific housekeeping issues found
  - Maintain normal operating rate of 8/4 ACH

- No concerns
  - Reduce operating ventilation rate to 6/3

8/4 ACH

6/3 ACH
Students Influencing Specific Activities

- Lower the sash- 50% of fume hoods are variable volume.
  - Lowering sash reduces ventilation by 75%.

- Maintain lab refrigerators and freezers- each minus 80 freezer uses roughly the same as an American home.

- Identify energy efficient new equipment.

- Engage peers.

- Explore the least impactful processes.
Questions