Greening Your MIT Lab

Minimizing Environmental Impacts in the Laboratory

1. **Recycling**
   - Maximize conventional recycling programs (paper, commingles, electronics, etc.)
   - Explore potential for lab-ware/supplies recycling: being sensitive to any health and safety concerns
   - Utilize chemical re-use/recycling
   - Utilize equipment re-use/recycling
   - Assign a recycling ambassador to champion efforts

2. **Energy Efficiency and Conservation**

A. Individual Actions:

- Turn lights off when not in use
- Enable computer power management software: sleep & hibernate
- Don't use screen savers
- Switch off all equipment when not needed (use power switch where possible)
- Purchase only energy efficient laboratory equipment when possible
  - Require only Energy Star rated equipment
- Turn down thermostat when heating (or up when cooling)
- Practice fume hood sash best use practices
  - Develop a workable fume hood sash management plan including:
    a) informational placards for hoods;
    b) awareness and use training. The sash management plan should be incorporated in the Chemical Hygiene Plan for the laboratory.
- Work with your EHS department to identify optimal ventilation requirements for your lab's needs.

B. Lab Design:

- Determine minimum ventilation requirements in laboratories based on user needs, health/safety protection and energy consumption; and set accordingly
- "Right-size" mechanical equipment by improving estimates of heat-gain from laboratory and process equipment
- Design labs for energy efficiency/environmental performance: low energy fume hoods, variable air volume, heat recovery systems
- Benchmark your energy use with other labs: http://www.dc.lbl.gov/Labs21/Labs21intro.php
- Use high performance low-flow fume hoods, when appropriate
- Use variable air volume fume hoods (combined with VAV supply and exhaust)
- Eliminate problematic simultaneous heating and cooling issues
- Use evaporative cooling when ambient conditions allow
- Deploy occupancy sensors for reducing lighting and ventilation needs
- Develop a lab energy conservation project applicable to larger campus implementation

3. **Pollution Prevention (P2):**
    - Substitute process inputs with less polluting alternatives
    - Modify processes to reduce pollution
    - Modernize processes
    - Improve operation and maintenance (O&M)
    - Recycle waste products
    - Maintain chemical inventories to reduce over purchasing
    - Conduct waste stream analyses
    - Identify P2 opportunities
    - Develop and implement P2 demonstration projects

4. **Water Conservation**
    - Use closed-loop cooling water for equipment cooling instead of open-loop/once through processes
    - Use non-potable water sources
    - Use vacuum pumps instead of aspirator fittings at cold-water faucets. One way to discourage this is to specify the use of non-threaded faucets, unless threaded faucets are required for other laboratory functions
    - Reduce process water use and process wastewater generation

5. **Environmentally Preferable Materials, Equipment and Supplies**
    - Purchase energy efficient equipment
    - Purchase recycled paper and office supplies
    - Purchase recycled or remanufactured toner cartridges, etc.
    - Purchase equipment with “take-back” programs

6. **Environmental Awareness and Education**
    - Develop lab education and awareness campaigns
    - Develop local lab facts and best management practices
    - Develop incentive and award programs to encourage best practices
    - Incorporate green practices into SOPs and Chemical Hygiene Plans

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