Green labs self-assessment tool: Collaboratively developed, comprehensive and uniform

Pros & Cons
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Learning Objectives

1. Essence of a good assessment
2. Compare live and online assessments
3. Introduction of UC Assessment Tool
What is a Green Lab?

A green lab has
1) engaged users,
2) management practices
3) equipment that conserve resources, improve performance, and increase quality of life
Assessment Goals

INTERNAL
• Teach
• Motivate
• Learn from Labs
  – present knowledge and action
  – gaps in service or products
• Complement, not drain, other Green Lab efforts

EXTERNAL
• Shows high value to researchers & public, vendors, granting agencies
• Sets a benchmark to compare
  (Scorekeeping is NOT a central goal)
Motivation Techniques

• Scorekeeping: Target for participants, competition, familiar
• Awareness—impacts, alternatives
• Outreach—newsletters, emails
• Naming participants and achievement
• Promotion of initiatives
Green Lab Assessment Types

In Person
• In-depth interviews & walkthrough (UCSB)

On-line:
• Survey (SurveyMonkey, Google Form)
• Spreadsheet (Googledoc, UC Davis)
• Interactive Form (Drupal, UW)
• Learning Management System (LMS)
“Perfect” Assessment

1. Easy to participate for client
2. Comprehensive analysis
3. Educational process: photos, links, and feedback
4. Revise a day, week or year later
5. For groups, shareable
7. Provides resources to client: equipment, service, information
8. Variable scoring for each action
9. Easy to Compile
Interviews: Pros & Cons

Pro’s:  
- Good first step for a campus
- Comprehensive & personal
- Reveals common campus gaps—spawns initiatives
- Customized Resources: service, product, information
- Essential student training

Con’s:  
- Best with FTE researcher
- Slow
- High-touch, staff time
- Link to site, forms?
### Interviews: Pros & Cons

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<th>Assessment</th>
<th>Easy for client</th>
<th>Comprehensive</th>
<th>Educational</th>
<th>Reviseable</th>
<th>Shareable</th>
<th>Final Report</th>
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Weak: -2, -1, 0, 1, 2, 3 (Strong)
On-line Surveys: Pros & Cons

Pro’s:
- Easy
- Fast
- Familiar
- Compiling results
- Can revisit and update with link

Con’s:
- No or little feedback to participant
- Boring: Few graphics or feedback
Surveys: Color Coded

Assessment
Pro's & Con's

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On-Line Spreadsheet: UCDavis

• Shared to Research “Group”
• 113 Best Practices
• 1 Green Champion/ “Group”
• 9 Module Leaders + PI
• Before and after column
  + Briefing, Walk-through
  + Kick-Off event, “Swag Bag”
  + Certificate

[Open Live version On line]
Read Only Version of 2014 Assessment Tool

Certified GOLD 2014
Spreadsheet: Pros & Cons

Pro’s: Comprehensive
Familiar
Sharable, comments in margin
Self-scored, “intuitive”
Expandable

Con’s: Needs some tending;
Editing & review (0’s vs. N/A)
Impersonal
No graphics
No interactive responses
Complex?
### Assessment: Pro's & Con's

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Interactive Form: Pros & Cons

**Pro’s:**
- Smooth appearance
- Scorekeeping
- Formatting and graphics
- Links
- Expandable

**Con’s:**
- Expensive to create ($5-10k)
- Expensive to maintain ($3-5k/year)

Example sites: WUI clinic financial stability
# Interactive Form: Color Coded

## Assessment

### Pro's & Con's

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### Expense

- $$$
- $  
- $$
- $$$$
Interactive Form for UC??

- Drupal common in higher ed
- Sharable across UC
- Combine features included in 2014 initiative
- Inexpensive across 10 campuses
Green Lab Assessment Tool:
Statewide Collaboration
Collaborators

Allen Doyle: UC Davis, Former Scientist, Sustainability Manager

Klara Olofsdotter Otis: UCLA, Scientist, Lab Manager

Allison Paradise: My Green Lab, Former Scientist

Amorette Getty, UCSB, Former Scientist, LabRATS co-chair

Mariana Fontes: UCLA, PhD Student

Shivan Bonanno: UCLA, PhD Student

Nurit Katz: UCLA, Chief Sustainability Officer

Matthew Williams: UCSC, Green Labs intern

Chrissy Thomure: UCSC, Climate Action Manager
Assessment Design

• 13 categories
• 130 questions
• branching

Creating Sustainable Labs

My Green Lab promotes safe, sustainable practices, procedures and equipment in research laboratories.

Learn More
Green Lab Assessment

Electricity

Laboratories consume nearly 5x more energy than a typical office space, and are often the largest consumers of energy on any given campus or at any given institution.

How efficiently is your lab running? Answer the questions below to find out.

1. Which of the following strategies for energy conservation do you use in your lab? (please check all that apply)
   - We have posted green lab procedures including stickers for fume hoods, turning off lights, etc. (checked)
   - We have labeled instruments with a start-up/shut-down procedure
   - We have checked for and are aware of energy saving modes on all pieces of equipment (checked)

2. We use and maintain outlet timers to avoid keeping equipment on all night.
   - Always
   - Frequently (checked)
   - Never
   - I don't know
   - N/A
Additional Information

We have posted green lab procedures including stickers for fume hoods, turning off lights, etc.

Posted green lab procedures make it clear to everyone how to follow best practices in the lab. For example, fume hood stickers serve as reminders to shut the sash when the fume hood is not in use. In the event of an explosion, a closed sash will prevent chemicals and other materials from entering into the lab. In addition, certain types of fume hoods, called variable air volume hoods, will consume less energy when the sash is closed.

Fume hoods are just one example of how posting green lab procedures can facilitate adherence to best practices.

For more information about how fume hood sash stickers can save energy, please click here.

For more information about how turning off the lights can save energy, please click here.
Fume Hood Sash Stickers Increases Laboratory Safety and Efficiency at Minimal Cost: Success at two University of California Campuses

Fume hoods represent the first line of worker safety measures in a research laboratory. Providing supply and exhaust air to fume hoods is highly energy intensive. A typical six-foot hood exhausting air at 100 linear feet per minute (LFM) and open 18 inches exhausts almost 1.5 million cubic feet of conditioned air every day. As opportunities for energy and resource conservation are found in laboratories, the clarion call of “shut the sash” goes forth, yet still many researchers don’t hear the call or forget the message. It is not unusual to find unattended hoods opened beyond 18 inches and remain that way for weeks.

Technical University in Copenhagen, where utility companies give rebates for its placement. Since 2009, the design has been shared with many campuses from Denmark to Singapore. As a public service, UC Davis prints and can provide this copyrighted sticker. From this case study, it appears the sticker promotes safe and efficient operation of fume hoods.

Implementation
In summer 2009, about 600 stickers were deployed in ten buildings at UC Davis and about 200 stickers in seven buildings at UC Santa Barbara. UC Davis hoods were chosen with safety and energy priorities. To improve safety awareness, two UC Davis chemistry buildings were recipients of the stickers even though they predominantly had constant air volume (CAV) fume hood systems and, thus, would see negligible energy reductions compared to a variable air volume (VAV) fume hood system. For safety and energy savings, all buildings with VAV systems were “stickered.” At UC Santa Barbara, only VAV lab buildings were stickered.

Survey efforts
At UC Davis, visual surveys of sash-position status were conducted: before sticker deployment; about 2 months after sticker
UCLA Pilot Study

10% response rate

74% learned something new

42% said it was too long
Meeting Assessment Goals

Teach: 74% learned something new

Motivate: requests for more information

Learn from Labs:

Complement Green Lab efforts: on-line, easy to reach researchers

Show High Value: has attention of vendors, office of President

Benchmark: single, uniform platform
Future Directions: Maximizing Impact

- breadth v depth
- identifying champions
- motivating internal lab changes
- motivating systematic changes
Thank you!

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