

The background of the slide features a light beige, textured paper-like surface. In the upper right, there is a faint, dark silhouette of a mountain range. On the right side, a dark, thin branch of a willow tree hangs down, adorned with numerous small, dark, round buds.

*A Systematic Approach to Managing
Construction and Demolition Waste
on a University Campus*

Michelle Smith Mullarkey

Ralph Stuart

The University of Vermont

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Building Sustainable Programs to support Sustainable Buildings

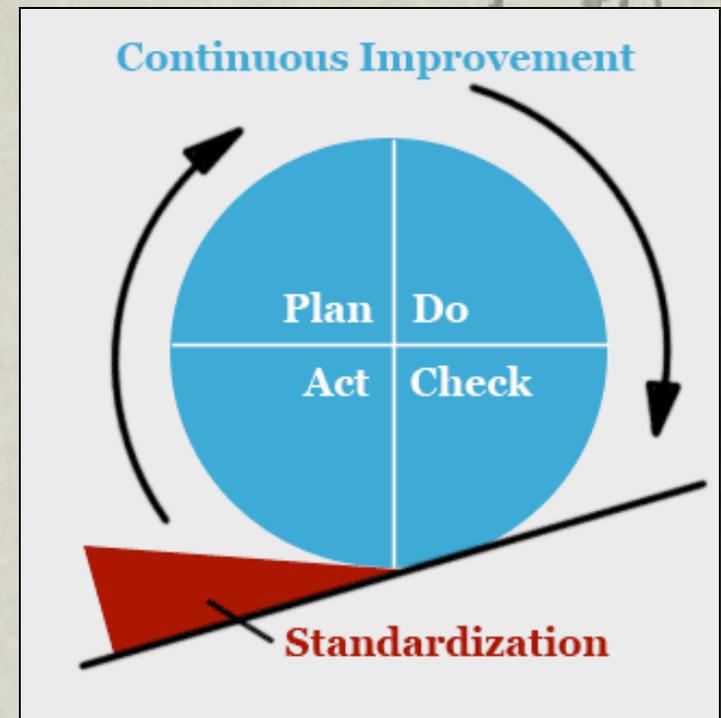
- ❖ The challenge for campus greening professionals is selecting a good idea (of many) and converting it into a ongoing program
- ❖ At UVM, we started early, so we've had experience with this challenge in:
 - Recycling (late 1980's)
 - Hazardous waste disposal (1993, with major program revisions in 2000)
 - Environmental Council (1995)
 - Green Buildings (2005)

Environmental Management Systems

- ❖ The Rio Conference in 1992 led to the establishment of the ISO Standard for EMS's for the corporate world
- ❖ In the late 1990's, the EPA began promoting the idea to higher education
- ❖ EMS's were incorporated into the Lab-XL regulation for laboratory chemical waste at UVM

The EMS Concept

- ❖ Focuses on continuous program improvement by organizing activities into four stages:
 - Plan
 - Do
 - Check
 - Act
- ❖ Program documentation is to maintain program improvements over time
- ❖ This approach is based on organizational quality improvement practices



“On the Ground” EMS experience

- ❖ At UVM, this approach has been successfully applied to chemical waste management with EPA oversight
- ❖ We also used the EMS as an academic tool to help a campus greening class evaluate UVM’s environmental operational footprint

The Role of Indicators

- ❖ The goal of the PDCA analysis is to identify key numerical indicators that can be used to set goals and track progress
- ❖ This work fits well into the “balanced scorecard” management approach

Establishing Goals and Measuring Progress

- ❖ The XL chicken and the egg:
 - Until you set goals, you don't know what data to collect
 - Until you have some data, you can't set goals.
 - The original XL had 9 indicators with a goal for each; currently we're managing four indicators, which is much more manageable and meaningful.

The EMS Opportunities

- ❖ Develops a common language among diverse stakeholders
- ❖ Improvement is explicitly built into program management
- ❖ Avoids the “Enron syndrome” of focusing on a single indicator as the measure of success

The Challenges

- ❖ An EMS requires an Management System, which is not common in higher education culture
- ❖ Defining the EMS: a ISO certifiable EMS requires a complete aspects and impacts analysis, including a definition of the “**boundaries**” and “**significance**” of environmental aspects
- ❖ Alternatively, the Eco Campus approach focuses on incremental improvement of the EMS over time, with recognition of various stages over time.

The C&D Challenge at UVM

- ❖ While UVM had committed to LEED certification of its new construction projects, it did not commit to attaining specific elements within the system.
- ❖ C&D Waste has been an ongoing challenge for the Solid Waste office because it is project based rather than program based.
- ❖ The Green Building Coordinator identified C&D waste management as a ripe piece of “low hanging fruit”.

The EPA Grant and Stakeholders

- ❖ EPA New England provides solid waste reduction grants, with a special interest in EMS development
- ❖ The Solid Waste Coordinator suggested the the Green Building program take on C&D Waste
- ❖ The Environmental Safety Manager provided EMS experience in developing the grant proposal.
- ❖ An architect was hired to develop program requirements and specifications
- ❖ A student from the EMS class took on the EMS program development as his senior environmental thesis

The C&D Tools

- ❖ Identification of Vendors
- ❖ Tracking System
- ❖ Signs
- ❖ Powerpoint Training File

Program Stakeholders

- ❖ Facilities Design and Construction Project Managers
- ❖ Physical Plant Project Managers
- ❖ General Contractors
- ❖ Capital Planning and Management

Expectations Relative to Project Size

- ❖ Major projects: new buildings, major renovations
- ❖ Minor projects: short term or partial building projects
- ❖ Ongoing renovations: physical plant routine maintenance and renovation

The C&D EMS

- ❖ **Plan:** vendor identification, development of job specifications
- ❖ **Do:** walkthrough checklist, collection of disposal tickets
- ❖ **Check:** entering of disposal data into the system, meeting of LEED goals
- ❖ **Act:** evaluation of program by project managers, analysis of financial impacts

Future C&D Indicators and Goals

- ❖ **Plan:** tri-annual review of vendor options and specifications
- ❖ **Do:** implement the project tracking system for all major projects and move the size of the projects covered smaller and smaller
- ❖ **Check:** assure C&D waste LEED points are achieved for every project (50% recycled for 1 point; 75% for 2 points) plus innovation point
- ❖ **Act:** financial break even compared to trashing the entire job

The Workshop

- ❖ Stakeholder analysis of your C&D situation
- ❖ Boundaries of the aspect of C&D waste
- ❖ Other potential indicators for the PDCA cycle

References

- ❖ The Eco Campus system
 - <http://www.ecocampus.co.uk/index.htm>
- ❖ Environmental Management Guide for Colleges and Universities
Madeline Snow, madeline_snow@uml.edu
Check out:
www.emswebware.com for on-line EMS documentation system from UMass Lowell
www.peercenter.net: Public Entity EMS Resource Cente