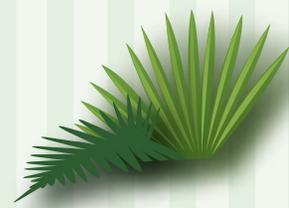


Creating a Green and Profitable Work Environment



An informative guide to "green" cleaning and maintenance practices which provide efficient, productive and healthy operation of commercial buildings in Florida.

2003



Creating a Green and Profitable Work Environment

This document was authored by the Florida Solar Energy Center, a research institute of the University of Central Florida, for the Pollution Prevention (P2) Program in the Florida Department of Environmental Protection. Funding for the guide was provided by a grant from the United States Environmental Protection Agency totaling \$25,000.

Prepared by:

Eric Martin, Research Engineer
Florida Solar Energy Center

Michael Ohlsen, Pollution Prevention Engineer
Mary Robbins, Environmental Specialist
Florida Department of Environmental Protection

Assisted by:

Stephen Ashkin, President
The Ashkin Group

The Florida Department of Environmental Protection and Florida Solar Energy Center would like to thank the following individuals and organizations that provided input to this document, and/or served as pilot facilities during the Summer of 2003.

Acknowledgements

Museum of Fine Arts
St. Petersburg, FL
Dr. John Schloder

Brevard County Schools
Viera, FL
Earl Lewallen

Ensco, Inc.
Melbourne, FL
Matt Capuano

Damion Maintenance Service
Melbourne, FL
Damion O'Neil

Sarasota County Government
Sarasota, FL
Jim McFadyen

Florida Department of Management Services
Ft. Myers, FL
Joel Russell

Florida Department of Environmental Protection
Ft. Myers, FL
Laura Comer

Green Seal
Washington, DC
Mark Petruzzi

The Center for a New American Dream
Takoma Park, MD
Scott Case

For More Information:

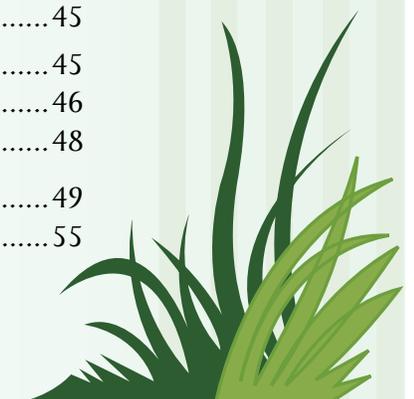
Florida Pollution Prevention (P2) Program
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 4570
Tallahassee, FL 32399-2400
www.dep.state.fl.us

Florida Solar Energy Center
University of Central Florida
1679 Clearlake Road
Cocoa, FL 32922-5703
www.fsec.ucf.edu

Table of Contents



1.0 Introduction to Guide	1
2.0 Set Facility Policy and Goals	4
2.1 Resources and References.....	5
3.0 Green and Profitable Work Environment Baseline Checklist	6
4.0 Identify Opportunities I – Cleaning and Maintenance and Indoor Air Quality	8
4.1 Products.....	9
4.1.1 Harmful product properties.....	9
4.1.2 Where to find information regarding product properties.....	10
4.1.3 Other product properties.....	12
4.2 Techniques and Equipment.....	13
4.2.1 Cleaning Product Portion Control Equipment.....	15
4.2.2 Soil Control.....	15
4.2.3 Soil Removal.....	17
4.2.3.1 Floors.....	17
4.2.3.2 Elevated Surfaces.....	18
4.2.4 Biological Control.....	18
4.2.4.1 Mold, mildew, and moisture control.....	18
4.2.4.2 Sanitization/Disinfection.....	21
4.2.5 Control of Gaseous Pollutants.....	21
4.3 Pest Control.....	22
4.4 Trash and Recycling.....	25
4.5 Resources and References.....	27
5.0 Identify Opportunities II – Cleaning and Maintenance and Building Energy Use	29
5.1 Lighting.....	29
5.1.1 Interior Lighting.....	30
5.1.2 Exterior Lighting.....	36
5.2 Building Policy and Supplemental Loads.....	37
5.3 Building Envelope.....	38
5.4 Building System Controls.....	39
5.5 Testing, Adjusting, and Balancing.....	40
5.6 Heating and Cooling System Maintenance.....	41
5.7 Resources and Assistance for Financing Energy Improvements.....	42
5.8 Resources and References.....	44
6.0 Identify Opportunities III – Cleaning and Maintenance and Building Water Use	45
6.1 Indoor Water Use.....	45
6.2 Outdoor Water Use.....	46
6.3 Resources and References.....	48
Appendix A – Opportunities to Consider When Undertaking a Renovation Project.....	49
Appendix B – Cleaning Product Considerations.....	55



2.0 Set Facility Policy and Goals

Chapter Highlights

- Develop an environmental performance strategy.
- Secure commitments at multiple levels.
- Set performance goals.
- Develop an action plan.
- Evaluate performance.
- Communicate successes.

The most effective way for a building or facility to achieve sustained environmental performance, and the benefits associated with that performance, is for facility and business managers to commit to an ongoing, integrated, and systematic approach to environmental management. This approach, as described by the US Environmental Protection Agency for energy management principles, can be extended to the principles of green cleaning and maintenance, and is outlined in Figure 1.

The approach begins with securing commitments from individuals involved; an activity required in order to ensure program success. Such commitments are required at multiple levels, for everyone in the building has a stake in the program, and therefore also has responsibilities to ensure a successful program. Building managers need to commit to the program, in order to put the wheels in motion through policy, purchasing authority, and changes in procedure. Janitorial and maintenance staff have an extremely important

role, for their support and performance is necessary for successful implementation of particular objectives and strategies. General occupants also have a certain responsibility; for they may be affected by policies aimed at minimizing a cleaning load, or conserving energy and water. They also play an important role in reporting various cleaning and maintenance issues, as well as acting as “first responders” to certain incidents. Outside contractors also have a responsibility, aimed at complementing, rather than counteracting the overall program. Lastly, product suppliers also have a responsibility; for they provide information regarding the hazards of certain products, and often provide training related to their proper use. Suppliers also need to offer products and equipment that meet the goals of the program.

Following securing commitment on multiple levels, performance goals should be set for the effort. Assessing current performance is an important aspect of this step, for most often goals are based on improvements over current practice. Goals can be comprehensive in nature, for those who desire to reap

full benefits of the green cleaning and maintenance principles, or goals may be specific and individual such as maintaining the health of employees or creating a new revenue stream through energy efficiency. The following section of this guide provides a simple checklist that assists with identifying areas in the realm of cleaning and maintenance

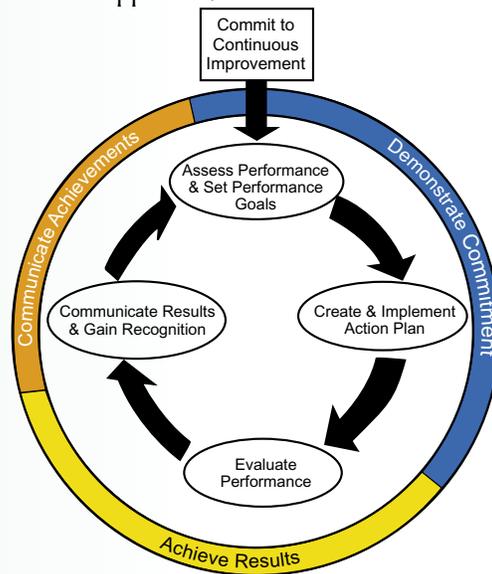
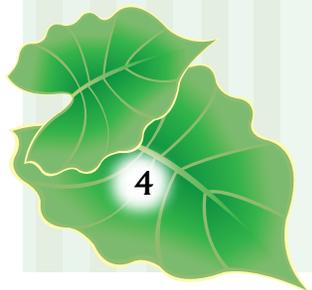


Figure 1. Environmental performance strategy. Source: US EPA



that have the potential to assist with the realization of stated goals.

Next, an action plan should be created and implemented aimed at achieving stated goals. The three Identify Opportunities sections of this guide provide specific recommendations that housekeeping and maintenance staff can implement towards that end, but again, activities in the action plan will target individuals at multiple levels. Management will play a crucial role through writing specifications for contracting with outside services, and the creation of various policies. Policies should be aimed at educating and empowering staff and general occupants to take an active role in the overall program. Occupants need to know what their role is when certain situations arise such as when to act, vs. when to report. Should an occupant adjust a thermostat when they feel uncomfortable, or should they report the problem? Should an occupant clean up a minor spill immediately, before it dries and becomes more difficult to remedy, or should they leave it until the cleaning staff stumbles upon it? Along with knowing when to act, occupants need to know how to act in order to fulfill their part in the program. Therefore, existence of and education on building policies such as those that may involve minimization of supplemental electrical loads through personal computer management need to be effectively communicated. In order to effectively carry out the action plan and monitor progress, individuals or groups should be designated to act as coordinators for the program(s). An overall coordinator should be appointed, or individuals may be appointed to coordinate individual tasks such as energy management, or pest control.

As plans are implemented, and goals are achieved, or not achieved, it is important to evaluate the program on a regular basis such that new goals can be created, or

procedures can be further modified in order to achieve existing goals. The process of evaluating performance will also assist with communication of successes to the occupants, as well as the general community. This will assist the staff responsible for the efforts with gaining well deserved recognition, and will also assist with communicating the overall benefits of the program in order to gain further support.

2.1 Resources and References

Environmentally Friendly Contract Specification and Purchasing Policy

Center for a New American Dream – www.newdream.org/procure/products/cleaners.html

Green Seal - www.greenseal.org

US Environmental Protection Agency Energy Star Program – www.energystar.gov

US Environmental Protection Agency IAQ Tools for Schools - www.epa.gov/iaq/schools/tools4s2.html

Green Building Management / Performance Strategies

US Environmental Protection Agency Energy Star Program – www.energystar.gov

US Green Building Council LEED™ for Existing Buildings Rating System
www.usgbc.org/LEED/existing/leed_existing.asp

