

Green Cleaning for Green Buildings

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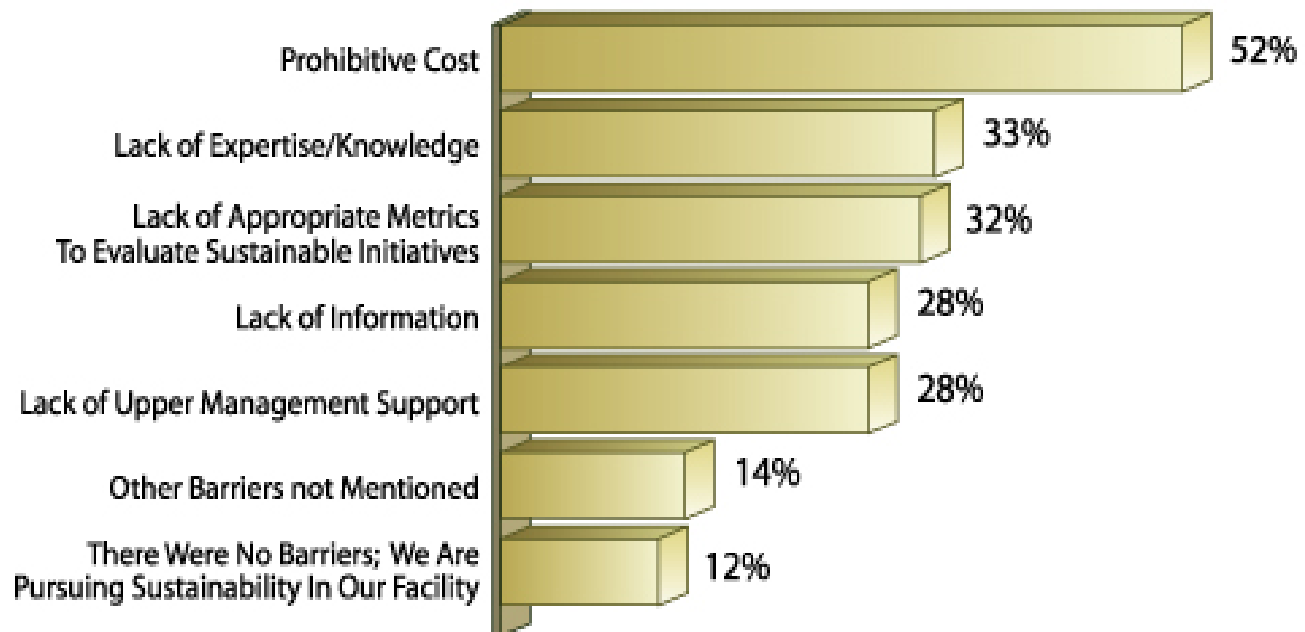
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The Barriers of Adopting Sustainable Concepts

Chart 3. Barriers Preventing Sustainable Concepts Adoption
The largest barrier is the cost of adopting sustainable concepts.



Greening Your Building Toward The Bottom Line

Examples of Actual Savings

Cal/EPA Sacramento 2005Downtown EER

Waste Removal	\$0.00	\$0.06
Cleaning Supplies	\$0.05	\$0.14
Electricity	\$0.99	\$2.05
Misc. Jan/Eng/Admin	\$0.10	\$0.31
Water	\$0.02	\$0.06
Landscape	<u>\$0.05</u>	<u>\$0.09</u>
Partial Total	\$1.21	\$2.71

Difference \$1.50 p.s.f. annually

Annual Savings \$1,425,000

7% Cap Rate = \$2,035,142 of additional value

Some Adopters of Green Cleaning Reporting \$\$ Savings

ATHENS, GA — As the University of Georgia converts to green cleaning, its physical plant department reports that green cleaning saves about 20 percent compared to conventional cleaning, according to [The Red & Black](#), the university's student newspaper.

Kim Thomas, assistant director of the service department at Physical Plant, said that with green cleaning, only three cleaning products are needed, while conventional cleaning requires more than 300 different cleaning agents, the story stated.

Boston Public Schools

*Improved children's and janitors health –
Reduced Asthma*

•**Focused on cleaning chemicals**

- Mass. has highest asthma rate in U.S.
- Cleaning products the 2nd leading cause for occupational asthma
- Asthma is leading cause of school absences
- Better cleaners readily available

Goals & outcomes

- Improved health and environment & reduced use of less toxic chemicals
- Established green purchasing criteria
- Identified/converted all depts. using cleaners
- Established annual training program

Lockport (Illinois) Township High School

Achieved Improved student attendance with Greener cleaning

Conversion

- Green Seal Certified Cleaners
- Disinfectant wipes
- HEPA vacuum filters
- MERV Filters Upgrade
- IAQ: Monitor CO2 in all classrooms

Outcome

- Improved attendance
 - Avg attendance '97-'04 @ 92.2%
 - Avg attendance '04-'05 @ 95%
 - 108 more kids in school per day
 - **Equal to \$80,000 / Yr**

According to Greenguard...

Some of the

Facts About IAQ

- Air pollutants 2-5 (sometimes 1,000) times higher than found outside.
- Illness & lost productivity costs estimated over \$120 billion annually.
- Health symptoms experienced by 20% - 30% of US office workers.
- Over 50% of all schools have IAQ concerns.

Environmental impact study

Air Pollutant Category	% Change	Most Probable Contributor
Airborne Dust	-52%	Efficient vac's/bags, matting, damp dust cloths, frequent vacuuming, dusting, deep-cleaning of bldg
Total VOC	-49%	Cleaning Chemicals, balanced ventilation, carpet extraction
Total Bacteria	-40%	Disinfectants, control of food and perishables, new extraction equipment, moisture control, good matting
Days absent from school	-46%	School buses were cleaned

Environmental Impact Study, Dr. Michael Berry, Frank Porter Graham Development Center

National Research Council says “Good IAQ” and “Cleanliness” in the Top Five Attributes of Green Schools

Five attributes of a green school

In “Green Schools: Attributes for Health and Learning,” the National Research Council described a number of attributes of a green school that support student and teacher health, learning, and productivity.

- 1 **Dryness:** Excessive moisture, which has been associated with adverse health effects, particularly asthma and respiratory diseases, is not present.
- 2 **Good IAQ and thermal comfort:** Ventilation rates, air pollutants, humidity levels, and temperature ranges, which have been linked to human health, learning, and productivity, are effectively controlled.
- 3 **Quietness:** Acoustical quality, which has been shown to affect student learning and the development of language skills, meets ANSI standard 12.60, “Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools.”
- 4 **Well-maintained systems:** Building systems are commissioned to ensure that they perform as intended, and their performance is monitored over time. Routine preventive maintenance is implemented throughout the school’s service life.
- 5 **Cleanliness:** Surfaces are disinfected to interrupt the transmission of infectious diseases; measures are implemented to help control indoor pollutants that have been associated with asthma and other respiratory diseases.

Green Cleaning in Health Care Facilities

A presentation by:

Lynne Schulster, PhD, M(ASCP)

Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

CDC Study: Health Impact to Janitorial Staff

- Irritant and allergic contact dermatitis on hands and forearms
- Occupational asthma on the increase
- 20% of injuries are eye and skin burns (chemical exposures)
- Muscular/skeletal injuries (ergonomics)
- Annually **\$75 million** are spent for medical expenses and lost time wages due to these cleaning product chemical injuries.

Definitions: Green Cleaning and Green Cleaning Products

- Green Products: Products that reduce impacts on health and the environment when compared to similar products used for the same purpose. (E.O. 13101)
- Green Cleaning: Cleaning to protect health (patients/occupants, staff, administrators, and visitors) without harming the environment.

Green Cleaning Products

- Chemicals:
 - Cleaners: Green Seal GS-37
 - Others: Low VOC
 - Concentrates with dilution controls
 - Floor Finish: Sustainable
 - Hand Soaps: Non-antimicrobial (except where required)
- Paper & Liners:
 - Comprehensive Procurement Guidelines
 - Green Seal
 - Chlorine-Free Paper Association
- Equipment
 - Vacuums: CRI Green Label Program
 - Floor Machines: Vacuum attachments
 - Microfiber cloths, mops
 - High-efficiency carpet extractors
 - Water-conserving equipment
 - Vapor machines
 - Entry mats

Cleaning and Janitorial Maintenance Products

- Use Green Seal or EcoLogo Certified products
 - www.greenseal.org
- Use low VOC products for other categories
- MSDS – full disclosure
- Use concentrates with dispensing equipment
- Increase the “life” of finishes
- Maintain a log of all cleaning activities
- Train cleaning personnel re: chemical storage, dispensing, use
- Provide adequate janitorial space and utilities for proper mixing and preparation of

Going Green: A Four Step Roadmap

1. Products
2. Process
3. Certifications
4. Communications



Green Seal GS-37 / 40 Criteria

• **Product Performance**

- Human Toxicity
- Carcinogens & Reproductive Toxins
- Skin & Eye Irritation
- Skin Sensitization
- Combustibility
- Smog Production/IAQ (VOCs)
- Aquatic toxicity
- Aquatic biodegradability
- Eutrophication
- Packaging
- Concentrates (1:8 min)
- Fragrances
- Prohibited ingredients
- Training
- Animal Testing

Increasing Your Efficiency: Microfiber and Dilution Control

Some considerations in LEED EB Rating System:

- “Where appropriate, use active micro-fiber technology to reduce cleaning chemical consumption and prolong life of disposable scrubbing pads.”
- “Use Closed loop chemical dispensing systems that minimize chemical waste and to maximize user safety.”

Microfiber mops have less environmental impact

L-E-S-S

- Less water used (up to 90 percent reduction)
- Less chemical used
- Less laundry
- Less waste down the drain
- Less safety issues

Microfiber Mopping: Cost Comparison

Johnson PACE Micro Fiber Mop	Conventional Loop Mop	PACE Micro Fiber Mop
Mop Costs		
Mop Cost Per Use	\$0.19	\$0.02
Processing Cost Per Mop	\$0.32	\$0.04
Number of Mops used per Day	20	60
Number of Mops used per Month	600	1800
Monthly Cost	\$308.25	\$104.88
Water Use		
Total Gallons used per day	60	3
Price per gallon for water and sewer	\$0.03	\$0.03
Water Cost per day	\$1.80	\$0.09
Monthly Cost	\$54.00	\$2.70
Chemical Costs		
Chemical Costs per Gallon	\$0.06	\$0.06
Gallons of Water used per day	60	3
Chemical Costs per day	\$3.82	\$0.19
Monthly Cost	\$115	\$6
Labor Costs		
Total Daily Labor Cost	\$240.00	\$240.00
Number of Daily Buckets and Mop Changes Daily	20	0
Total Daily Minutes saved by eliminating Mop and Bucket Changes	0	140
Daily labor cost saving by eliminating mop and bucket change	\$0	\$23.33
Monthly labor cost saving by eliminating mop and bucket change	\$0.00	\$700.00
Total Monthly Labor cost	\$7,200.00	\$6,500.00

Monthly Savings in Mops	\$203.37
Monthly Savings in Water	\$51.30
Monthly Savings in Chemicals	\$108.95
Monthly Savings in Labor	\$700.00

Microfiber Pilot Test Results Swedish Hospital – Seattle Washington

- ◆ Water/chemical usage before microfiber: 36 gallons per day and 18 oz. of cleaning chemical
- ◆ Water/chemical usage post microfiber: 9 gallons per day and 4.5 oz. cleaning chemical
- ◆ Staff satisfaction: cleaner floors, no mop wringers, reduction of shoulder and arm strain injuries

Source: Mike Smith, Swedish Hospital, Seattle Washington

Concentrated, Multi-Purpose Products Can Lower Costs

	<u>Concentrated</u>	<u>Ready-to-Use</u>
• Glass Cleaner	\$.12 / qt	\$1.26 / qt
• Carpet Prespray	\$.12	
• Light Soils Spray/Wipe	\$.12	
• Stainless Steel	\$.20	\$6.12
• Grout	\$.20	
• Med. Soils Spray/Wipe	\$.20	
• Bowls / Urinals	\$.20	\$1.13
• Carpet Spotter	\$.20	\$3.52
• Carpet Extraction	\$.09	
• Floor Cleaner	\$.09	

Go Green by Keeping it Simple: One Product with Multiple DILUTION USES



Dilution: 1 to 64
Medium to Heavy Soils
Grout Cleaning
Stainless Steel
Ceramic Tile
Spray & Wipe
Disinfecting
Bowls & Urinals
Carpet Spotting

1 to 128
Light Soils
Spray & Wipe
Mirrors & Glass,
Ceramic Tile
Carpet Prespray



1 to 128
Light Soils
Hard Surfaces
Floors
Pace Unit
Mop & Bucket

1 to 256
Light Soils
Auto-scrubber
Pace Unit
Daily cleaning
Carpet Extraction



Environmental impact of Packaging: Bag-in-Box Floor Finish Packaging vs Pails

Plastic Savings	137,271 lbs
Energy Savings (Reduced Plastic Production)	5,000,000 MegaJoules (38,000 gallons of gasoline or 460,000 lbs of coal)
Storage Space Savings (Reduced Warehouse Needs)	27,554 ft³
Landfill Space Savings	40,580 ft³
Greenhouse Gas Emissions (Reduced Plastic Production and Transportation)	234,000 lbs CO₂ (88 Acres of pine forest storing carbon for 1 year)

Take A Holistic Program Approach: Healthy, High Performance Green Cleani

- Combine *products* with **process** improvement
- Establish guidelines, training and support beyond chemicals
- Adopt best practices to optimize environment, health & safety

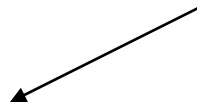
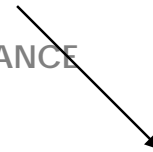
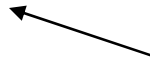
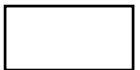
Operational Tools and Training to Support Implementation

Green Procedure Guide

Training Posters

HEALTHY HIGH PERFORMANCE
CLEANING

OJT Training Tools



Promote your program with employees
and building occupants

Conduct Audits and Drive Continuous Improvement

Regulatory Compliance			
Requirements	Pass/Fail	Inspector	Date
Annual Environmental Regulation Records			
Environmental Compliance Plan			
Annual Training Requirements for Employees			
Standard Operating Procedures			
Requirements	Pass/Fail	Inspector	Date
Standardized Cleaning Procedures			
Chemical Handling Procedures			
Chemical Tracking Procedures			
Equipment Care & Maintenance Operations			
Documented Periodic Inspection Program			
Reporting/Record Keeping Procedures			
Building Specific Procedures			
Requirements	Pass/Fail	Inspector	Date
Comprehensive Customer Communications Plan			
12-20 Feet of Walk-Off Matting at Entryways			
Floor Maintenance Plan			
Accurate & Up-To-Date Job Routes			
High Traffic Cleaning Procedures			
Dining & Food Preparation Area Cleaning Plan			
Proper Storage & Use of Chemicals			
Vulnerable Populations Identified			
Identify Temporary/Permanent Indoor Pollutants			
Seasonal or Periodic Conditions or Periods			
Copy of Integrated Pest Management Program			
Identify Any Negative Impacts on Human Health			
Identify Hazardous Materials (Asbestos)			
OSHA Compliant Bloodborne Pathogen Standard			

LEED®

Leadership in Energy and Environmental Design

LEED Certification is Growing

newsbriefs

LEED Certification A Goal For More Than 250 Ohio Schools

The U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Schools Rating System was adopted in September by the Ohio School Facilities Commission (OSFC) as part of its school design standard.

Hundreds of new and renovated Ohio schools are set to meet higher energy efficiency and environmental standards under the "Green Schools" initiative. There are four progressive levels to LEED certification: certified, silver, gold and platinum; under the initiative, all future OSFC-funded buildings will be encouraged to meet LEED for Schools-Gold certification.

To qualify for LEED for Schools designation, buildings must meet specifications for land use, water and energy efficiency, construction materials and indoor air quality. More than \$4 billion is targeted for school facilities under the state's Tobacco Securitization plan, meaning more than 250 buildings will register for silver certification in the next two years.

"The LEED criteria have been shown to have a positive effect on student health, attendance and performance. While the state is sharing in the cost of the upfront construction, the benefits — including energy savings — accrue directly to the school districts participating in our programs," said OSFC Executive Director Michael C. Shoemaker in a news release.

LEED for Schools is a new design and construction certification for K-12 public schools. Building service contractors can help school buildings earn points toward LEED certification with green cleaning programs. Points in Innovation in Upgrades, Operations and Maintenance and Low Environmental Impact can make a big difference for facilities looking to be certified. ■



www.cleanlink.com/calendar

CALENDAR

Greenbuild
Nov. 7-9, 2007
Chicago

The Greenbuild International Conference & Expo offers educational programming, workshops and exhibition floor. Cleaning contractors can learn about updates to the LEED Green Building Rating System and network with building owners and facility managers. For more information, visit www.greenbuildexpo.org.

Carpet-Cleaning Training
Nov. 12-14, 2007

Burton, Wis.
Racke Industries Inc. offers the 2007 School, a three-day training course in professional carpet cleaning. For more information, visit www.horstcarpetcleaning.com.

CEO Seminar
Jan. 23-Feb. 2, 2008
St. Maarten

Building Service Contractors Association International's CEO seminar addresses motivational subjects of interest to CEO and top management, including leadership, strategic planning and sales. For information, visit www.bscai.org.

NADCA
March 7-10, 2008
San Diego

The National Air Duct Cleaners Association presents its 2008 annual meeting and exposition. For more information, visit www.nadca.com.

BSCAI 2008
April 25-28, 2008

Tampa, Fla.
Building Service Contractors Association International's annual convention and trade show will feature speakers, seminars and exhibits. For information, visit www.bscai.org.

LEED-EB for Operations & Maintenance

Certification Requirements:

Certified 34 – 42 points

Silver 43 – 50 points

Gold 51 – 67 points

Platinum 68 – 92 points

- **Sustainable Site** **Max. 12 points**
- **Water Efficiency** **Max. 10 points**
- **Innovation in Operations** **Max. 7 points**
- **Materials & Resources** **Max. 14 points**
- **Energy & Atmosphere** **Max. 30 points**
- **Indoor Environmental Quality** **Max. 19 points**

Potential LEED EB Green Cleaning Points

PREREQUISITE: “Implement a green-cleaning policy that addresses standard operating procedures (SOPs), sustainable products and equipment, chemical handling and storage, and staff training.”

- High Performance Cleaning Program 1 point
- Custodial Effectiveness Assessment 2 points
- Sustainable Cleaning Products & Materials 3 points
- Sustainable Cleaning Equipment 1 point
- Entryway Systems 1 point

Total = 8 points

Materials & Resources		
Credit 6	Solid Waste Mgmt: Waste Stream Audit	1
Indoor <u>Envir.</u> Quality		
Prerequisite	Green Cleaning Policy	Required
Credit 2.1	Occupant Comfort- Occupant Survey	1
Credit 3.1	Green Cleaning- High Performance Cleaning Program	1
Credit 3.2	Green Cleaning- Custodial Effectiveness Assessment, <3	1
Credit 3.3	Green Cleaning- Custodial Effectiveness Assessment, <2	1
Credit 3.4	Green Cleaning: Sustainable Cleaning Products & Materials, 30%	1
Credit 3.5	Green Cleaning- Sustainable Cleaning Products & Materials, 60%	1
Credit 3.6	Green Cleaning- Sustainable Cleaning Products & Materials, 90%	1
Credit 3.7	Green Cleaning- Sustainable Cleaning Equipment	1
Credit 3.8	Green Cleaning- Entryway Systems	1
Credit 3.9	Green Cleaning- Indoor Integrated Pest Management	1

**Uses
APPA
Standard**

Going Green: A Four Step Roadmap



Green Cleaning Info Sources

- www.usgbc.org (green buildings & LEED)
- www.GreenSeal.org (chemical certification)
- www.carpet-rug.com (certified vacuums)
- www.scorecard.org/chemical-profiles/index.tcl (to learn about chemicals)
- www.NewDream.org (green purchasing)
- www.h2e-online.org (health care)
- www.chps.net (schools)
- www.HealthySchoolsCampaign.org (schools)