THE CENTER FOR GREEN SCHOOLS · USGBC · **How to Green Existing Schools Training Companion Guide**

BEFORE you watch the web training, answer the following questions:

1. What do you think are the components of a comprehensive school sustainability plan?

2. What do you currently have in place in your school or district?

AFTER you watch the web training, answer the following questions:

1. What additional aspects of sustainable schools planning did you learn during the training?

2. What will you do to begin improving sustainability at your school or district?

3. What further information do you need to get started and where can you find it?

Green Schools: A green school creates a healthy environment that is conducive to learning while saving energy, resources and money.

Green Schools Plan: A comprehensive green schools plan will focus on ensuring that individual schools are energy efficient, which may require upgrading building systems, such as HVAC and lighting, and implementing sustainable operations and maintenance practices, including green cleaning policies, water management plans, and recycling programs.

The process to develop a comprehensive green schools plan includes the following steps:

- Identify and invite stakeholders to participate on the project team
- Host a kick-off meeting
- Educate team members
- Develop a comprehensive communications strategy
- Conduct assessments and audits to benchmark existing conditions and policies
- Research financing options
- Identify facilities that need energy-efficient upgrades and the O&M practices that need improvement
- Select pilot school(s)
- Create a comprehensive plan-of-action with timelines to implement upgrades and adopt the new sustainable O&M policies and practices
- Measure and verify the plan's effectiveness and seek ways to continuously improve it
- Integrate the new green features into curriculum
- Celebrate success

Stakeholders

- Community Members
- Custodial Staff
- Dining Services
- Facilities Engineers
- Faculty
- Finance
- Operations and Maintenance Personnel
- Parents
- Principals
- Procurement Staff
- School Board Members
- Students
- Superintendent

Recommended Assessments

Energy Management

Energy management is a critical component of a comprehensive green schools plan and will require conducting both preliminary assessments and more comprehensive audits.

Preliminary Assessments

Gathering the answers to these preliminary assessment questions can help you determine how far along your school or district is in implementing an energy management plan.

- Does the school have an energy management plan?
- Does the school get a separate energy bill or is it tracked at the district level?
- Are buildings metered? Sub-metered?
- What is the number and size of windows in the facility?
- Are windows single pane? Double? Triple?
- What kind of light bulbs are in the facility? What is the re-lamping policy?
- Are there any lighting controls other than room-by-room switching?
- Is there a preventive maintenance plan for building equipment?

Audits

ASHRAE is the American Society for Heating, Refrigeration and Air Conditioning Engineers. They have a series of audits referred to as ASHRAE level one, level two, and level three. A level one audit includes a preliminary energy-use analysis and involves looking at the facility's historical energy use, benchmarking the building, and performing a utility rate analysis to identify any cost-saving opportunities. The benchmarking can be completed using EPA's ENERGY STAR Portfolio Manager.

The level two audit includes more detailed energy calculations and financial analysis of the proposed energy saving measures suggested by the level one audit. This financial analysis most often includes Life Cycle Analysis (LCA), which allows the facility owner to understand the true costs and financial benefits of implementing upgrades or improvements because it analyzes the total cost of owning equipment, including maintenance, energy use, and equipment lifetime. A level three analysis builds upon level one and two audits and is based on the school's selection of specific measures to examine further. This may include refinement of an energy model, more extensive data collection, or more intensive study of potential equipment replacement.

For more information on these assessments and audits, view the Center for Green Schools' web training modules on Energy Management and Tools for Green Schools.

Other Preliminary Assessments for Developing a Comprehensive Green Schools Plan
Conducting the preliminary assessments outlined below can help you evaluate your current green school practices. These are not exhaustive lists, but they provide a good starting point. Best practices and follow-up information can be found in the following Center for Green Schools' web training modules:

- Green Cleaning
- Groundskeeping
- Indoor Environmental Quality
- Materials and Sustainable Purchasing
- Recycling and Waste Management
- Transportation
- Water Management

Green Cleaning
- How clean is the school? Is dust visible?
- What is the green cleaning policy?
- Can you smell the cleaning products long after cleaning is complete?
- Are green cleaning techniques employed?
- Is there an entryway system pollutant capture system, such as walk-off mats, grates, grills? Is it cleaned regularly?

Groundskeeping
- What kind of exterior pest management practices are used?
- Are parents, faculty or staff notified if pesticides or fertilizers will be used?
- What kind of lawn-care services are used? Is the equipment gasoline, battery or electric powered?
- How is landscape waste disposed?
- Are buses or parents' cars allowed to idle?
- Is stormwater managed onsite or does it go into a municipal sewer?
- What kind of snow-removal practices are employed? Chemical?
- What kinds of paints are used on the building exterior?

Indoor Environmental Quality and Occupant Comfort
- Is there adequate fresh air in classrooms?
- Is there a HVAC maintenance plan?
- Is there an Indoor Air Quality (IAQ) Management Plan?
- What is the frequency of filter changes?
- Does the IAQ Management Plan have a section on facility alterations and additions?
- Is smoking allowed anywhere at your school?
- Are there odors that indicate moisture (mold or mildew) or other problems?
- Do students have access to daylight and views in indoor spaces?
- Are there lighting controls in each classroom?
- Are the acoustics in classrooms acceptable?
- Are there echoes or dead zones?
- Is there conflicting noise?
- Conduct an Occupant Comfort Survey. Collect responses from school staff on topics such as thermal comfort, acoustics, indoor air quality, lighting levels, and building cleanliness. Make sure to document the results.

Materials and Sustainable Purchasing
- Is there a green purchasing policy?
- Are products specified at the school or district level?
- Are recycled-content products specified? Paper? Plastic garbage bags?
- Are locally made products purchased?
- Is the food organic, local, and/or rainforest certified?
- What kind of light bulbs are being ordered?
- Are cleaning products low-emitting?
- Are equipment and appliances specified to be ENERGY STAR rated?
- Do students eat with disposable dishes and flatware? What is it made out of?

Recycling and Waste Management
- How much waste is generated by your school every week? Count the bins or bags.
- Does the school pay for waste pick-up?
- What percentage of waste is recycled?
- What percentage of waste is composted?
- Is there a waste avoidance policy or program at your school?
- Are there hand dryers or paper towels in restrooms?
- Is there a double-sided printing or no print policy?
- Are recycling bins located around the school?
- Are assignments given electronically?

Transportation
- Develop and administer a commuter survey.
- How do faculty and staff get to work?
- Is there a carpool program for faculty, staff or parents to sign up with?
- Is there reserved parking for carpool, fuel efficient or alternative fuel vehicles?
- Do students ride public or private buses to school?
- Is there adequate bicycle parking for students, faculty, and staff?
- Is there a walk-to-school program?
- Are there showers and changing facilities for faculty and staff, as well as students?

Water Management
- Conduct a fixture audit, including determining how many fixtures are in the school, when they were they installed, and the flush and flow rates.
- Do faucets shut off automatically?
- Is water metered for the building?
- Is there an irrigation system? Is it separately metered?
- Does the school have a full service or heat-and-serve cafeteria?
- Does the cafeteria have a garbage disposal?
- Does the school have a swimming pool? Chlorine or salt?
- Is there currently a water management policy?
- How are leaking fixtures reported?

Financing Options

Equipment Finance Agreements (EFA)
An equipment finance agreement, also known as a conditional sales agreement, is an agreement for the purchase of an asset in which the borrower is treated as the owner of the asset for federal income tax purposes, thereby entitled to the tax benefits of ownership, such as depreciation, but does not become the legal owner of the asset until the terms and conditions of the agreement have been satisfied.

Equipment Leases
Under an equipment lease, the lender owns the equipment and leases it to the organization for a defined period of time for a set cost. At the end of the lease term, the organization may purchase the equipment at its fair market value or for a predetermined price. It can also continue the lease, lease new equipment, or return the equipment.

Power Purchase Agreements (PPA)
A power purchase agreement is a contract between an electricity generator and a building owner to provide electricity at guaranteed rates. This is used for renewable energy projects like solar and wind. The electricity generator is usually a utility company and is referred to as the PPA provider.

The owner purchases energy from the PPA provider for a guaranteed rate. The PPA provider in turn secures funding for the renewable energy project, maintains and monitors the energy production, and sells the electricity to the owner at a contracted price for the term of the contract. The term usually runs ten to 25 years. In some contracts, the owner has the option to gain ownership of the generating equipment from the PPA provider at the end of the term. Other options may include renewing the contract with different terms or having the equipment removed. Insurance on the system may be provided by the PPA provider.

A PPA allows the building owner to utilize renewable energy without making a large up-front capital expenditure. The owner is able to lock-in an energy rate over the term of the contract, resulting in significant cost savings. In addition, a PPA gives a tax-exempt entity, such as a school, non-profit, or government agency, the opportunity to take advantage of federal tax incentives for renewable energy. By assigning system ownership as well as all rebates and tax credits to the PPA provider, the owner is able to reduce the system's installation costs significantly, resulting in a lower rate for the owner.

Property Assessed Clean Energy (PACE) Bonds
A PACE bond is a municipal bond where the proceeds are lent to commercial or residential property owners to finance energy efficiency measures and small renewable energy systems. The owners then repay their loans over a 20-year term via an annual assessment on their property tax bill.

Tax-Exempt Lease-Purchase Agreements
A tax-exempt lease-purchase agreement is an effective alternative to traditional debt financing because it allows organizations to pay for energy-saving upgrades by using money set aside in the annual utility budget. When properly structured, tax-exempt lease purchase agreements make it possible for public sector or qualifying organizations to draw on the anticipated savings from future utility bills to pay for new, energy-efficient equipment and related services up front.

In most states, a tax-exempt lease-purchase agreement does not constitute a long-term "debt" obligation because of non-appropriation and/or abatement language written into the agreement, which may mean that public approval is not required. Non-appropriation language effectively limits the payment obligation to the organization's current operating budget period, typically 12 months. The organization will, however, have to assure lenders that the energy-efficiency upgrades being financed are considered of *essential use,* which minimizes the non-appropriation risk to the lender. If, for some reason, future funds are not appropriated, the equipment is returned to the lender, and the repayment obligation is terminated at the end of the current operating period without placing any obligation on future budgets. Abatement language limits the payment obligation to the ability to use the equipment and may be required in some states.

Qualifying organizations should consider using a tax-exempt lease-purchase agreement to pay for energy-efficiency equipment and related services when the projected energy savings will be greater than the cost of the equipment (financing costs included). While the financing terms for tax-exempt lease-purchase agreements may extend as long as 20 to 25 years, they are usually less than 15 years and are limited to the useful life of the equipment.

Supplemental Funding

Supplemental funding is a category of financing that does not incur a formal recurring obligation or debt repayment. Examples are utility rebates, renewable energy grants, and revolving funds.

Utility Rebates and Renewable Energy Grants
Utility rebates or renewable energy grants are used to reduce capital costs, which in turn reduce the amount of financing needed, making the project more attractive to lenders.

Revolving Funds
Many institutions, including state governments and universities, have established revolving funds to finance building improvements that generate utility cost savings. The savings, in turn, are used to replenish the fund.

LEED Certification: A Way to Define Green for New and Existing Schools

In 2000, the U.S. Green Building Council (USGBC) established the LEED® rating system as a way to define and measure "green buildings." In school terms, LEED is like a report card for buildings, demonstrating to the community that a facility is built and/or operated in a way that supports the health and well-being of occupants and saves energy, resources and money. LEED is an internationally recognized certification system that measures how well a building performs using several metrics:

- sustainable land use
- energy savings
- water efficiency
- CO_2 emissions reduction
- improved indoor environmental quality
- stewardship of resources

LEED provides a concise framework for identifying and implementing practical and measurable green building solutions. Based on established sustainable building practices and emerging concepts, the LEED rating systems are performance-based and comprehensive in scope. Points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts. Different levels of certification are granted based on the total number of earned points. The four progressive levels of certification are: Certified, Silver, Gold and Platinum.

Once the credits are implemented and the energy-efficiency and performance requirements met, the final step for certification is submitting the project certification documentation using the Web-based LEED Online system. The Green Building Certification Institute (GBCI) reviews the application and provides feedback. If all requirements are met, GBCI awards LEED certification to the building.

LEED Rating Systems:

LEED® for New Construction & Major Renovations™
LEED® for Existing Buildings: Operations & Maintenance™
LEED® for Commercial Interiors™
LEED® for Core & Shell™
LEED® for Schools™
LEED® for Neighborhood Development™
LEED® for Homes™
LEED® for Retail™
LEED® for Healthcare™

Green Building Certification Institute (GBCI)

Established in 2008, GBCI is the institution that grants both project certification and professional credentials that recognize excellence in green building performance and practice. GBCI administers project certification for commercial and institutional buildings and tenant spaces under USGBC's LEED rating systems. GBCI also manages the professional credentialing programs based upon the LEED rating systems, including the LEED Green Associate and LEED AP credentials.

How Much Does LEED Cost?

The cost to certify a school facility is based on the project's square footage. The process provides a comprehensive third-party review of the energy and environmental performance of the school and ensures that the stated goals of the project are met.

The cost to register and certify at 100,000-square-foot school for USGBC members is less than $4,000 using LEED for Existing Buildings: Operations & Maintenance, and less than $5,500 using LEED for Schools.

Prices are determined by GBCI and are subject to change. For complete pricing information, visit www.gbci.org.

Glossary

Alternative Fuel Vehicles (AFVs): Vehicles whose main fuel source is not petroleum based. For example: compressed air, natural gas, or electric vehicles.

Biodegradable Product: Biodegradable cleaning products use organic material such as plant and animal matter and other substances originating from living organisms. These products break down through natural processes.

Commissioning: Commissioning is a quality-assurance process for achieving, verifying, and documenting that a facility's systems perform as designed. Commissioning accomplishes higher energy efficiency, environmental health, and occupant safety and improves indoor air quality by ensuring the building components are working correctly and that the owner's goals are met throughout design and construction.

ENERGY STAR: ENERGY STAR is the Environmental Protection Agency's (EPA) symbol for energy efficiency. The label was established to make it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.

Environmentally Preferable Product: Environmentally preferable products are certified by a third-party environmental label, such as Green Seal or EcoLogo. The label indicates that the product and its packaging were developed based on a consideration of human health and safety, ecological toxicity, environmental impacts, and resource conservation.

Fuel-efficient Vehicles (FEVs): Vehicles with high miles per gallon (MPG) ratings and/or use fuel in more efficient ways than tradition vehicles.

Indoor Air Quality Building Education and Assessment Model (I-BEAM): Released in 2002, I-BEAM is a guidance tool designed for use by building professionals and others interested in indoor air quality in commercial buildings. I-BEAM updates and expands EPA's Building Air Quality guidance and was designed to be a comprehensive state-of-the-art guidance for managing IAQ in commercial buildings. I-BEAM contains text, animation/visual, and interactive/calculation components that can be used to perform a number of diverse tasks.

I-BEAM consists of many individual modules which explain different aspects of IAQ including how to manage, operate, and maintain your building for IAQ, and how to insure that your energy efficiency projects are compatible with IAQ. I-BEAM creates a way for you to learn how to manage for indoor air quality as an integral part of your daily building management activities. You can use I-BEAM to train management and building personnel on IAQ issues and tasks. You can use I-BEAM as a reference tool for specific issues. You can use I-BEAM to assist in solving problems and responding to complaints. You can use I-BEAM to set up an IAQ management program including maintenance, housekeeping, and renovation, and energy efficiency functions to protect IAQ.

Low-emitting Materials: Low-emitting materials are products that do not release significant pollutants into the indoor environment. These products contain zero- and low-volatile organic compounds (VOCs).

Low-emitting Vehicles (LEVs): Vehicles that have low CO_2 emissions.

Volatile Organic Compounds (VOCs): VOCs are carbon-based chemicals that easily evaporate at room temperature. Breathing low levels of VOCs for long periods of time may increase some people's risk of health problems. Common symptoms of exposure to VOCs include eye, nose and throat irritation; headaches; nausea; dizziness; and worsening of asthma symptoms.

U.S. Green Building Council
Publications and Resources

Green Existing Schools Implementation Workbook (PDF)
The *Green Existing Schools Implementation Workbook* includes sample policies, programs, and plans; data collection forms and tables; and sample surveys.

Green Existing Schools Project Management Guide (PDF)
The *Green Existing Schools Project Management Guide* includes general guidance on navigating the LEED for Existing Buildings: O&M certification process, including how to conduct personnel and organizational assessments, educate and train staff, initiate the certification process, and manage a school or district-wide sustainability program.

LEED 2009 for Existing Buildings: Operations & Maintenance Project Checklist (XLS)
The LEED Project Checklist is a scorecard to track the credits being pursuing toward certification.

LEED 2009 for Existing Buildings: Operations & Maintenance Rating System (PDF)
The LEED 2009 for Existing Buildings: Operations & Maintenance rating system summarizes the intent, requirements, and technologies/strategies for each credit.

Sustainable Purchasing Tracker – Materials and Resources
Sustainable Purchasing Tracker – Indoor Environmental Quality
Solid Waste Management Tracker
Occupant Commuting Survey - Summary Table

The publications and resources can be found at the Centers for Green School's Green Existing Schools Toolkit at http://www.centerforgreenschools.org/k12toolkit.

Questions?
The Center for Green Schools at USGBC has assembled a panel of experts, facilities staff, and school district sustainability officers, to answer your questions. Please email schools@usgbc.org with the subject line "Green Existing Schools," and we will promptly connect you with a peer who can help you find the answers.

Green Schools Planning
References and Resources

100 Ways to Conserve Water
http://www.wateruseitwisely.com/100-waysto-conserve/index.php

2006 International Plumbing Code
http://www.iccsafe.org

Advanced Buildings Technologies and Practices
http://www.advancedbuildings.org

American Council for an Energy Efficient Economy (ACEEE)
http://www.aceee.org

American Public Transportation Association (APTA)
http://www.apta.com/

Association of Commuter Transportation (ACT)
http://www.actweb.org

Association of Physical Plant Administrators (APPA): Leadership in Educational Facilities
http://www.appa.org

Building Commissioning Association
http://www.bcxa.org

Build It Green
http://www.builditgreen.org/

Building Green
http://www.buildinggreen.com/

Business and Institutional Furniture Manufacturer's Association (BIFMA) Level
http://levelcertified.org/

The Carbon Footprint of Water
http://www.rivernetwork.org/resource-library/carbon-footprint-water

Carpet & Rug Institute
http://www.carpet-rug.org/

Carpet & Rug Institute Green Label Plus
http://www.carpet-rug.com

Healthy Schools Campaign
www.healthyschoolscampaign.org

Healthy Schools Campaign (HSC) advocates for policies and practices that allow all students, teachers and staff to learn and work in a healthy school environment.

HSC accomplishes its work by addressing issues of environmental health and wellness in schools. HSC prepares school stakeholders — students, parents, teachers, school nurses, administrators, community members and others — to become leaders in efforts to create change at the school, district, state and national levels.

Center for New American Dream (CNAD)
http://www,newdream.org/cleanschools/safelist.php

Cleaning for Healthy Schools Toolkit
http://www.cleaningforhealthyschools.org/

Composting for Kids
http://www.benefits-of-recycling.com/typesofcomposting.html
http://meetthegreens.pbskids.org/episode4/kitchen-composting.html

Electronics Recycling Programs
http://www.earth911.com/
http://www.mygreenelectronics.org
http://www.eiae.org
http://www.lamprecycle.org

Energy Policy Act of 1992
http://www1.eere.energy.gov/femp/regulations/epact1992.html

Energy Smart Schools
http://www1.eere.energy.gov/buildings/energysmartschools

Environmental Choice
http://www.environmentalchoice.org

Environmental Choice Certified Products (Ecologo)
http://www.ecologo.org/en/index.asp

Erosion Control Technology Council
www.ectc.org

FSC Certified Wood
http://www.fscus.org

Fundraising
http://www.empties4cash.com
http://recycleforschools.com

Green Building Certification Institute (GBCI)
http://www.gbci.org

Green Cleaning Resources at the Worldwide Clean Industries
http://www.issa.com

Green Cleaning in Schools
http://www.edfacilities.org/rl/green_cleaning.cfm

Green Existing Schools Toolkit
http://www.centerforgreenschools.org/k12toolkit

GREENGUARD
http://www.greenguard.org

Green Seal
http://www.greenseal.org/

Green Shield Certified
http://www.greenshieldcertified.org

Healthy Schools Network Guide to Green Cleaning
http://www.healthyschools.org/documents/green_cleaning_guide.pdf

Municipal Solid Waste in the US: 2009 Facts and Figures
http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009rpt.pdf

NSF-140
http://www.nsf.org/business/newsroom/pdf/Sustainability2.pdf

NSF International
www.nsf.org

Plant Native
www.plantnative.org

The Quick and Easy Guide to Green Cleaning in Schools
http://www.healthyschoolscampaign.org/programs/gcs/

Recycling Activities for Kids
http://www.populationeducation.org/docs/ppp/garbage.pdf

Resilient Floor Covering Institute
http://www.rfci.com/int_FloorScore.htm

Scientific Certification Systems (SCS) Certified Products
http://www.scscertified.com

South Coast Air Quality Management District
www.aqmd.gov

State Energy Program and Energy Efficiency Conservation Block Grant Technical Assistance
http://www1.eere.energy.gov/wip/assistance.html

Stormwater Manager's Resource Center
www.stormwatercenter.net

Sustainability Education Clearinghouse
www.greeneducationfoundation.org

Sustainable Purchasing Tracker – Indoor Environmental Quality
http://www.usgbc.org/ShowFile.aspx?DocumentID=6416

U.S. Department of Energy, Energy Efficiency and Renewable Energy
http://www.eere.energy.gov

U.S. EPA Clean School Bus
http://www.epa.gov/cleanschoolbus/antiidling.htm

U.S. EPA Comprehensive Procurement Guidelines
http://www.epa.gov/cpg

U.S. EPA ENERGY STAR
http://www.energystar.gov

U.S. EPA ENERGY STAR for Buildings
http://www.energystar.gov/buildings

U.S. EPA ENERGY STAR Energy Star for K12 School Districts
http://www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12

U.S. EPA ENERGY STAR Portfolio Manager
http://www.energy.gov/benchmark

U.S. EPA ENERGY STAR Target Finder
http://www.energy.gov/targetfinder

U.S. EPA Environmentally Preferable Purchasing (EPP) Landscaping
http://www.epa.gov/epp/pubs/products/landscaping.htm

U.S. EPA Green Vehicle Guide
http://www.epa.gov/greenvehicles/Index.do

U.S. EPA HealthySEAT
http://www.epa.gov/schools

U.S. EPA I-BEAM
http://www.epa.gov/iaq/largebldgs/ibeam/index.html

U.S. EPA Indoor Air Quality Tools for Schools (IAQ TfS)
http://www.epa.gov/iaq/schools/tfs/coord_section_1.html

U.S. EPA Integrated Pest Management in Schools
http://www.epa.gov/pesticides/ipm/index.htm

U.S. EPA Low-Impact Development
http://www.epa.gov/owow/nps/lid

U.S. EPA, Mercury
http://www.epa.gov/mercury

U.S. EPA, Pesticides
http://www.epa.gov/pesticides

U.S. EPA SmartWay
http://www.epa.gov/smartway/

U.S. EPA Stormwater Technology Fact Sheet
http://www.epa.gov/owm/mtb/sandfltr.pdf

U.S.EPA Waste Wise Program
http://www.epa.gov/wastewise/about/index.htm
http://www.epa.gov/osw/education/pdfs/toolkit/tools.pdf

U.S. EPA Wastes, Composting
www.epa.gov/wastes/conserve/rrr/composting

U.S. EPA WaterSense
http://www.epa.gov/WaterSense

U.S. Green Building Council (USGBC)
http://www.usgbc.org

Walking School Bus.ORG
http://www.walkingschoolbus.org

Waste Free Lunches
http://www.wastefreelunches.org/

Water Education for Kids
http://www.epa.gov/ogwdw/kids/flash/flash_watercycle.html

Water Science for Schools
http://ga.water.usgs.gov/edu/