Online Training Tool for EnergySmart Schools Operations & Maintenance
Today’s Speakers

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Thank You to Our Sponsors

- CEFPI’s goal: to build healthy, high performing, sustainable learning environments that enhance student and teacher performance and support culture and community vitality

- Offers online management tools for utility tracking/analysis, facility maintenance and facility scheduling
EnergySmart Schools

Agenda

• Introduction
  – EnergySmart Schools program
  – Guide to Operating & Maintaining (O&M) EnergySmart Schools

• Online Training Tool for EnergySmart Schools O&M

• O&M Best Practices Panel Discussion

• Questions & Answers
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• Questions & Answers
Energy Realities
• Rising costs
• $13B annually¹
• Growing demand
• Carbon emissions
• Energy security

K–12 Realities
• Rising fuel costs
• Aging facilities
• Higher operating costs
• High construction costs
• Centers of community

EnergySmart Schools
Resources, tools, and strategies

Goal: Promote 30% improved efficiency in existing buildings and 50% in new construction and major renovations over current standards

Window of Opportunity

- About $50 billion will be spent over the next three years to build or renovate schools\(^2\)
  - Average school: 42 years old, outdated facilities
  - Around 1,000 schools are built annually

**Enormous opportunity to build sustainable, EnergySmart schools!**

- Reduced energy and water use
- Lower operating costs
- Reduced absenteeism
- Better staff retention
- Improved community shelter capability
- Healthier learning environments
- Reduced carbon dioxide emissions

EnergySmart Schools Program Focus

New Construction and Major Renovations
• Target Audience: Primarily suburban districts and states with growing populations
• Opportunity: Design in sustainability and high performance from the outset
• Goal: At least 50% energy savings over ASHRAE standards

Existing Buildings/Retrofits
• Target Audience: Primarily urban and rural districts, some driven by consolidations or need to upgrade aging infrastructures
• Opportunity: No-cost or low-cost solutions
• Goal: At least 30% energy savings
EnergySmart Schools Solutions

EnergySmart Schools provides tools and resources for school:

• Planning
• Financing
• Designing & Building
• Operating & Maintaining
• Energy Education

www.energysmartschools.gov
Guide to Operating and Maintaining EnergySmart Schools

• The Guide’s purpose is:
  – to improve O&M in schools nationwide and to disseminate best practices
  – to reduce energy use in existing school buildings

• Targeted toward all audiences and experience levels
  – Information is presented in a structure that can be referred to according to specific needs

• EnergySmart Schools O&M Action Plans
  – A key take-away for facilities managers
  – Customizable checklists

Co-sponsored by CEFPI
O&M Challenges

- School facilities are aging with the average age of schools greater than 40 years old.

- The level of resources and experience that schools can devote to energy and O&M varies.

- The country’s least efficient schools use four times the energy per square foot than the most efficient schools.

Poorly maintained facilities can affect student and teacher performance, health, and morale.

The National Center for Education Statistics reports that the cumulative value of deferred maintenance nationwide for all K-12 public schools is several hundred billion dollars.

O&M Solutions

• Energy is a controllable cost
• With cuts in new construction projects, a school district’s focus on existing buildings is critical
• O&M reduces energy bills so schools can redirect money towards their primary mission: education

High-Performance Schools are school facilities that improve the student learning environment and achieve the maximum level of energy performance possible – saving energy, resources and money.

Operations and Maintenance are activities related to all scheduled and unscheduled actions for preventing equipment failure or decline, with the goal of increasing efficiency, reliability and safety.
Energy Cost Cutting Strategies in K-12 Operations and Maintenance Webinar

• To learn more about the Guide watch the webinar sponsored by SchoolDude, hosted by Roger Young and featured speakers:
  – Margo Appel, U.S. Department of Energy
  – Doug Heurich, Northbrook School District 27 (IL)
  – Joe Piantedosi, Town of Andover (MA)

• The webinar focused on the following energy efficient O&M strategies:
  – Control energy costs by identifying and implementing O&M repairs and retrofits
  – Prioritize O&M actions by estimating life-cycle costs and benefits
  – Make the business case for a sustained high-performance O&M plan
  – Integrate high-performance O&M into school energy policy

Archived at: www.schooldude.com/energy
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Overview of the Online Training Tool

- Online training resource for school district decision-makers & facilities management (90 minutes)
- “Live” version of the O&M Guide
- Qualifies for 1.5 HSW CEU credits upon successful completion
- Co-sponsored by CEFPI

Available at: www.energysmartschools.gov/training.html
Objectives

• After completing the training, users will be able to:
  – describe various energy savings activities
  – identify and describe the five steps for developing and implementing an energy management plan
  – identify and describe low-/no-cost energy management O&M strategies for each of the major building systems
ENERGY SMART SCHOOLS

Operating and Maintaining

Introduction
This module describes the organization of the training and introduces basic concepts. It is recommended that you start here.

Develop & Implement a Plan
This module has six lessons that describe how to develop an energy management plan.

Technical Considerations
This module has five lessons that describe energy saving strategies.

Evaluation & Certification
This module contains a test to evaluate your mastery of the content and provides an opportunity for certification.

Lower Operating Costs, Healthier Learning Environments ... And a Brighter Energy Future
Main Menu ...

... How to Use This Training

How to Use This Training

Click the elements in the screen image on the right to learn about each element.

Click MENU to return to the Main Menu
Main Menu ...
... Introduction

About This Training

Read the course objectives.

Modules:
- Introduction
- Develop and Implement a Plan
- Technical Considerations
- Evaluations and Certifications

This training will assist you in planning, operating, and maintaining energy-efficient, high performance schools.

RESOURCE: Download Application
Operating and Maintaining EnergySmart Schools

Top 10 Strategies

1. Install programmable thermostats
2. Perform energy surveys and audits
3. Keep doors and windows closed
4. Review cleaning and maintenance activities
5. Provide training for key staff
6. Conduct a plug load survey and develop a plan
7. Control exhaust fans
8. Inspect outside air systems
9. Install outdoor lighting controls
10. Replace exit sign lights with LEDs

Resource: USGBC Webinar Series

Lower Operating Costs, Healthier Learning Environments … And a Brighter Energy Future
Factors of success

- Ensure goals are attainable
- Provide resources for implementation
- Review critical factors (which are described on the next page)

A typical "critical path" for the first year of advanced program development is detailed in the O&M Guide, Appendices G and H.

Read how the Alder Creek Middle School in Truckee, CA, improved energy performance.

Judy Hoskens, president of the Council of Educational Facility Planners International, discusses the benefits of developing an O&M program.
Operating and Maintaining
Energy Smart Schools

Main Menu...Develop and Implement a Plan...
...Maintain Buy-in

Knowledge Check - Maintain Buy In

Which is not a benefit of having an energy policy?

a. To compete with other schools for rewards
b. It helps the administration stay abreast of the situation
c. The policy helps gain initial buy-in from decision-makers
d. To keep the decision makers involved

Selected Answer: ?

Select the correct response and click submit. When correct, click Menu to continue.
Kitchen Considerations

In this lesson, you’ll learn about low-cost or no-cost energy management operation and maintenance strategies for technical considerations in the kitchen, specifically for kitchen equipment and lighting.

Note that lighting strategies covered in this lesson may be implemented in other locations in your school.

Click each highlighted item.
In this lesson, you’ll learn about low-cost or no-cost energy management O&M strategies for technical considerations in the computer classroom. This lesson has one topic:

- Plugs Loads
Main Menu ...
... Evaluation & Certification

Knowledge Check - Exam

Data gathering and analysis is the last step to set the benchmark and the foundation for building a business case.

Selected Answer: ?

Select the correct response and click SUBMIT

Lower Operating Costs, Healthier Learning Environments ... And a Brighter Energy Future
Certificate of Completion

This Certifies that:

Kristyn Ivey

Has completed the Department of Energy
EnergySmart Schools Web-Based training

May 25, 2010

Date
Submitting for CEUs

The accrediting authority for this training is the American Institute of Architects (AIA); however, CEFPI is a educational provider and can process the CEUs for its members.

If you are a member of CEFPI, please visit the CEFPI Web site for instructions on submitting your certificate and obtaining your CEUs.

If you are a member of AIA only, please visit the AIA Web site for instructions.

NOTE: If you are not a member of CEFPI/AIA, you will not be able to receive CEU credit.

For more information, contact Margo Appel at DOE.

For more information on the CEU credit process, please contact Barbara Worth at CEFPI.

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Panel Facilitator

Roger Young
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Principal
Roger Young & Associates
Truths ...

• Scarce resources
  – Financial
  – Energy

• All school districts can further reduce energy consumption
  – Manage behavior
  – Preventative maintenance
  – Metrics, benchmarking, and bill assessment
  – No value added for more energy consumed than necessary

• Energy costs impact teaching and learning
• Build upon the shoulders of others
• Resources are available
Energy Management

- Energy Data Management
- Energy Supply Management
- Integration into the Organization
- Efficiency of Systems and Equipment
- Energy Use in Facilities
Panel Introduction

Jason Turner
Energy Coordinator
Onsite Energy Services

Sue Pierce
Director of Facility Planning and Energy
Washington Elementary School District in Arizona
Developing an Energy Management Program

• Getting Started
  – Commit to having an Energy Manager
  – Gather utility bills: Electric, Gas, and Water for at least 12 months to establish a baseline
  – Find current operating procedures
  – Learn what systems are in your buildings
Establish an energy policy and energy conservation plan district-wide and campus specific:
- Gain commitment from the top
- Establish realistic goals
- Policy applicable to all
- Designate an Energy Manager
- Make plan visible, relevant, and responsive
- Link plan to budget
Bullet Points in Your Policy

- Acknowledge rising utility costs and need for energy cost controls
- Achievable goals and timelines
- Apply to entire district’s staff and students
- Designated Energy Manager answers directly to superintendent and board
- Requires EMP with board approval to be visible, relevant, and responsive
- Energy management budget allotment
Energy Conservation

• Behavioral Energy Auditing
  – No Cost
  – Education
  – Vigilance

• Energy Efficient Equipment Upgrades
  – Link budget and plan
Behavioral Auditing

- Turn it off/down when not in use
  - Lighting accounts for 20%-30% of energy budget
  - Use natural lighting when possible
  - Computer Power Management
    - EZ Wizard or EZ GPO available through ENERGY STAR
  - Daytime: Heating 68° Cooling 78°
  - Peak Demand- stage large equipment start times
  - Custodial cleaning policies
Electricity Peak Demand

• Staging
  – Athletics
  – Custodial
  – Maintenance
  – Administration
  – Teachers
Low Hanging Fruit

• Lighting retrofits
  – T-12 to T-8
    • 25% plus savings
    • Magnetic to Electronic ballasts
    • One ballast to four lamps
      – Some lamps on 2 bulbs
  – Gym lighting
    • Metal Halide and Sodium to high bays
    • Better light output
Facility Planning

- Unused Meters
- 75% of Building cost comes after construction
- Working with Engineers and Architects
- CHPS*
- ASHRAE*
  - New standards

*Collaborative for High Performance Schools
*American Society of Heating Refrigeration and Air-conditioning Engineers
### Websites

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Reducing Energy Consumption

Achieving Success

Sue Pierce
Washington Elementary School District
Glendale, AZ
About Washington

- North central Phoenix and east Glendale, Arizona
- Diverse population
- 24 Title I schools
- 51 different languages
- Largest elementary school district in Arizona
- Approximately 24,000 students in grades K-8
- 32 school campuses
- 3 administrative/service campuses
- 3,000,000 square feet of building under roof
Goals

5 Year Strategic Goal – Reduce Electric Energy Usage 40%

1st Year Goal – Behavioral Change (FY 2008-2009):
- Reduce electric usage 10%
- Reduce natural gas usage 10%
- Reduce water usage 10%
- Reduce solid waste 10%

2nd Year Goal – Behavioral Change + Low Cost Improvements (FY 2009-2010):
- Reduce electric usage an additional 10%
Use of the O&M Web Tool

Module 2: Develop & Implement a Plan
Module 2: Develop & Implement a Plan

Making the Business Case – Energy Benchmarking

Baseline Rating (1-100)
Module 2: Develop & Implement a Plan

Making the Business Case – Benefits

- Save $
- Educate Students, Staff, the Community
- Improve the Environment
- Make $
Module 2: Develop & Implement a Plan

Making the Business Case – The Plan

- Energy Policy
- Energy Standards
- Energy Teams
Module 2: Develop & Implement a Plan

Maintain Buy-In – Critical Factors

- Monthly Data Collection
- Progress Reporting & Program Visibility
- Continuous Education & Training
- Celebrating Success
Module 2: Develop & Implement a Plan

Getting O&M Staff On-Board

- The challenge: how to train several hundred O&M staff working different hours/shifts at multiple locations
- Use of the web tool at O&M staff meetings – group training
- Use of the web tool independently – one on one training
- Testing module
- Continual improvement – on-going training
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• An archive of this Webcast will be made available at:
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  • www.k12masters.com/webcasts
  • www.schooldude.com/energy

Please visit the websites above for additional resources and information!