



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

Avoiding the Friday 4pm Maintenance Call

Northern New England
Facility Masters Conference
February 25 and 26, 2015

Carolyn Sarno Goldthwaite

NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

“Accelerating Energy Efficiency”

MISSION

Accelerate the efficient use of energy in the Northeast and Mid-Atlantic Regions

APPROACH

Overcome barriers to efficiency through
Collaboration, Education & Advocacy

VISION

Transform the way we think about
and use energy in the world around us.



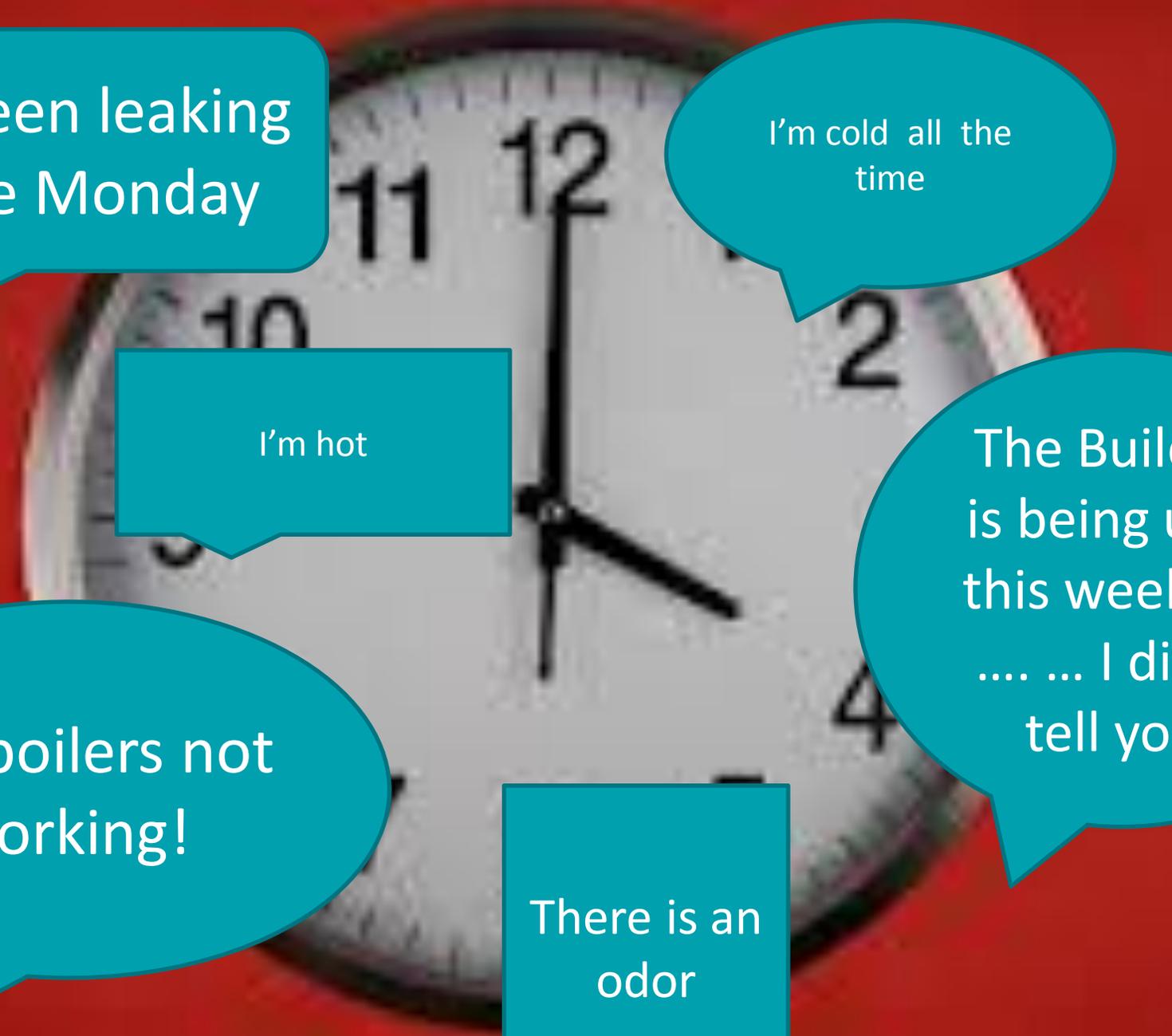
One of six Regional Energy Efficiency Organizations (REEOs) designated by U.S. Dept. of Energy to work collaboratively with them in linking regions to DOE guidance, products

TODAYS TOPICS



- Maintenance Management Plans
 - O&M Energy Efficiency Measures
 - Stakeholder Engagement
- Resources





It's been leaking
since Monday

I'm cold all the
time

I'm hot

The boilers not
working!

The Building
is being used
this weekend
.... I didn't
tell you?

There is an
odor

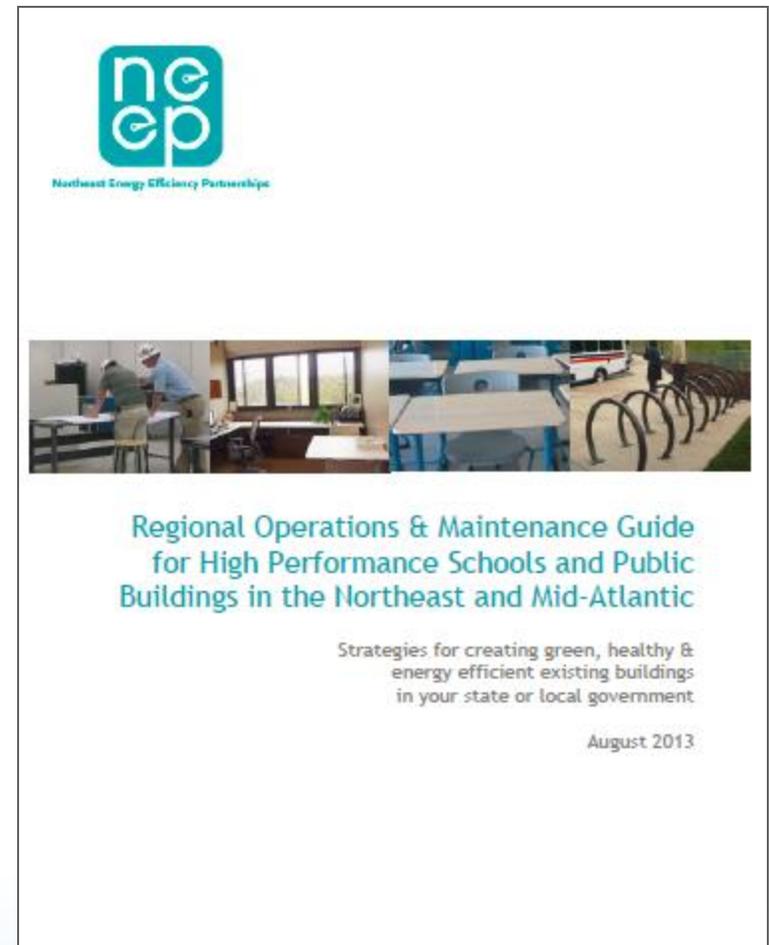
REGIONAL OPERATIONS & MAINTENANCE GUIDE

Strategies for creating green, healthy & energy efficient existing buildings in your state or local government



WHAT IS IT?

- A pathway for existing Public Building to adopt high performance strategies
- Many low cost ideas
- Regionally developed
- Available online as a free resource



COVERING

- **Establishing Operations and Maintenance Policies**
- **Indoor Environmental Quality**
- Integrated Pest Management
- **Energy Efficiency**
- Alternative and Renewable Energy Systems
- Commissioning and Retro-Commissioning
- Water Efficiency
- **Materials Selection and Specification**
- Recycling
- Landscaping to Reduce "Heat Island Effect"
- Transportation
- Innovative Financing Options
- Cafeteria Practices
- Zero Net Energy Buildings
- Specialized Building Types

Existing buildings don't come with instructions.....



THE CHALLENGE - Energy



- 42
- Not designed to meet demands of today's
- 70% of school energy use
- Per pupil energy expenditure have risen 19% while inflation was only 4%

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THE CHALLENGE -IEQ



- 1 in 10 asthma
- Poor IAQ can verbal, motor and behavioral disabilities.
- Cause hearing impairments, irritability and developmental delays

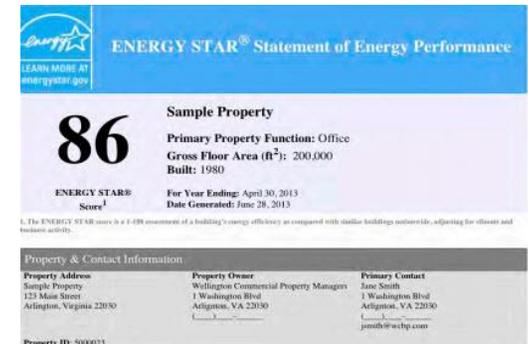


Source: NE Lung Assoc. & American Journal of Respiratory and Critical Care Medicine

ENERGY EFFICIENCY ISSUES COVERED:

Operate with minimal energy usage while providing superior performance

- Benchmarking
- Energy Management Systems
- Boilers
 - Checklist
- Building Envelope Improvements
- Renewables



ENERGY STAR[®] Statement of Energy Performance

86 ENERGY STAR[®] Score¹

Sample Property
 Primary Property Function: Office
 Gross Floor Area (ft²): 200,000
 Built: 1980
 For Year Ending: April 30, 2013
 Date Generated: June 28, 2013

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and building activity.

Property & Contact Information		
Property Address Sample Property 123 Main Street Arlington, Virginia 22200	Property Owner Wellington Commercial Property Managers 1 Washington Blvd Arlington, VA 22200	Primary Contact Jane Smith 1 Washington Blvd Arlington, VA 22200 jsmith@wcp.com
Property ID: 5000023		



Manual boiler tube cleaning at Calais Elementary School, Calais, Vermont (from the Biomass Energy Resource Center's Wood Chip Heating Systems)

EUI	
National Median Comparison	
National Median Site EUI (kBtu/ft ²)	122
National Median Source EUI (kBtu/ft ²)	352
% Diff from National Median Source EUI	-58%
Annual Emissions	
Greenhouse Gas Emissions (MTCO ₂ e/year)	1,927

I is true and correct to the best of my knowledge.

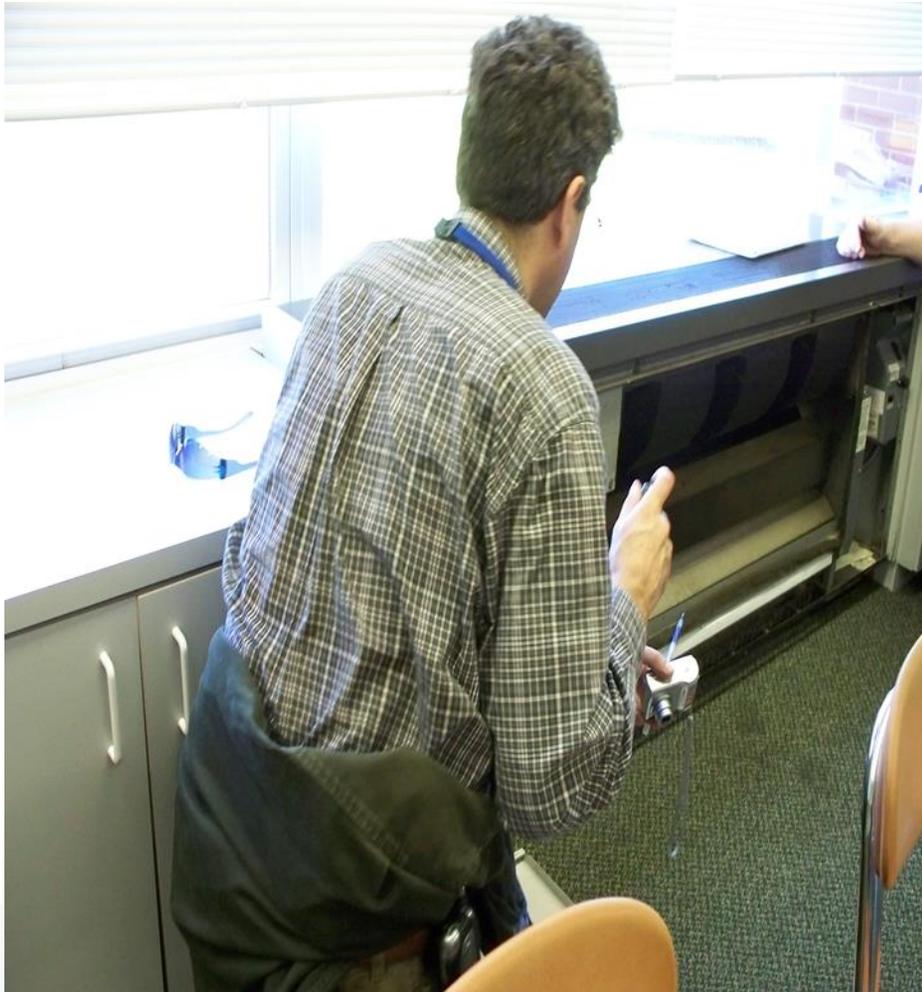


Professional Engineer Stamp (if applicable)

Strategies to achieve 20% baseline reduction goals!

BEST PRACTICE:

Benchmarking and Energy Audits



BEST PRACTICE: EQUIPMENT SCHEDULING



- Conduct an occupant survey regarding times of use
- Take a nighttime field trip through your facilities

BEST PRACTICES: ENERGY EFFICIENCY

LOW HANGING FRUIT



What's been done?

Steps for Energy Conservation & Efficiency

There are many opportunities for energy conservation and efficiency in our schools and public buildings. You might be wondering where to start. Although it can be overwhelming to determine your starting point, the first step is always to build a relationship with your **custodial** and facilities staff to find out what has already been done and what activities you can work together on moving forward.

"Low Hanging Fruit" Measures

Lighting

- Turn off lights when not in use and utilize daylight
- Post turn-off reminder sign near light switches
- Replace all incandescent bulbs with high efficiency CFL or LED lights

HVAC

- Keep large items away from air vent to avoid the obstruction of heat or AC flow into rooms
- Let your facility staff know if a room is uncomfortably hot or cold. Avoid opening of windows when the heat is on to minimize energy loss or plugging in space heater when it is cold.
- If possible, reduce the demand for heating or air conditioning in unoccupied areas in the building through shades and thermostat setting.

Electronics and Appliances (Plug Load)

- Turn off computers, printers, and other electronics when not in use.
- Use power strips to shut off multiple appliances and electronics at the end of the day
- Post signs about vampire or phantom loads to educate occupants about the amount of energy consumed when electronic devices are off or in standby mode

Occupant Behaviors and Education

- Hold public or intra-organizational training to educate staff and occupants on building energy/ resource uses and conservation tips. Publicize energy costs and savings.

Further Conservation & Efficiency Measures

Weatherization

- Utilize weather-stripping and caulk to seal leaks and drafts near windows, doors, and any other area where outside air may infiltrate the building

Lighting

- Install occupancy sensors

HVAC

- Keep regular maintenance of air filter in the ventilation systems and replace them based on manufacturer's recommendation.
- Identify ducts and pipes that are lacking insulation.

Appliances

- Decommission refrigerators for the summer in unoccupied buildings
- Set a policy that requires that all new appliances or electronics be ENERGY STAR rated or very energy efficient.
- Specify in procurement documents that an energy-consuming devices will be selected based upon the lowest lifecycle-cost, not the lowest first-cost

Water

- Install low-flow showerheads and sink aerators and worn washers to reduce water use
- Identify and repair leaky faucets

BEST PRACTICE: WORK ORDERS CITY OF NEWTON MA



Then: 13 years ago (No CMMS)

- Paper work orders;
- Lack of tracking
- Paper billing long lag time
- O&M budget chronically in the red!

Now (With CMMS)

- Faster repairs
- Accountability at all levels
- Forecast spending and stay with budget
- Monthly reports to School Committee
- Justify need for increased budget
- Expands base of support and stakeholder



BEST PRACTICE

MATERIAL SPECIFICATIONS AND GREEN CLEANING



- Environmentally Preferable Purchasing (EPP)
- Assessing the Needs of the Facilities
- “Green” Cleaners
- Custodial best practices
- Establishing A Donation Policy
- Recycling

See it in Action:
Vermont Legislation for
Green Cleaning in Schools

In 2012, Vermont passed [Senate Bill 92](#), titled [An Act Relating to the Protection of Students' Health by Requiring the Use of Safe Cleaning Products in Schools](#). The Act requires manufacturers and distributors of cleaning supplies to only sell green cleaning products to schools. Vermont schools may only use environmentally preferable cleaning products certified by an independent third party, or those used by the department of buildings and general services under state contracts. For more information, see Vermont's [Green Cleaning Products Law Summary](#) and the [Department of Health's Basics of Green Cleaning Guide](#).

GREEN CLEANING BENEFITS



65% Asthma cases could be prevented



Lebanon Middle School , NH

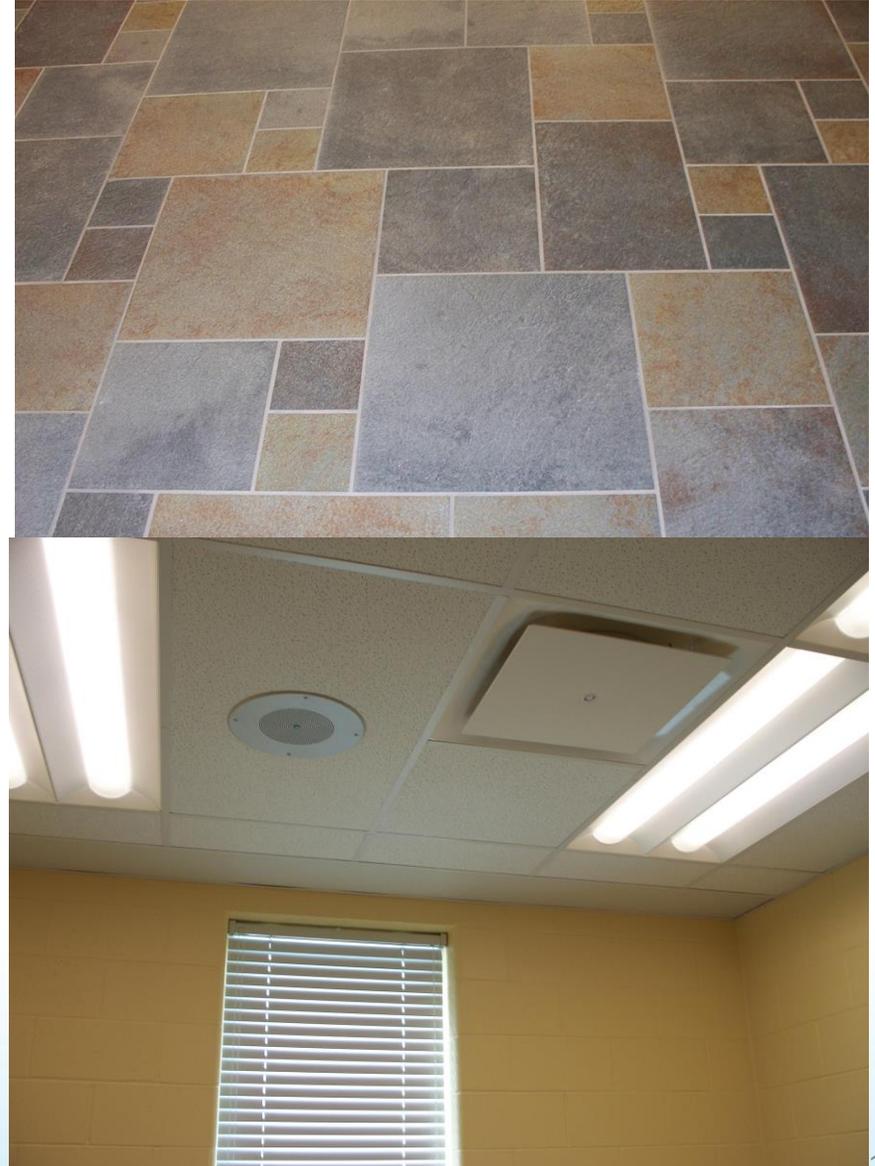
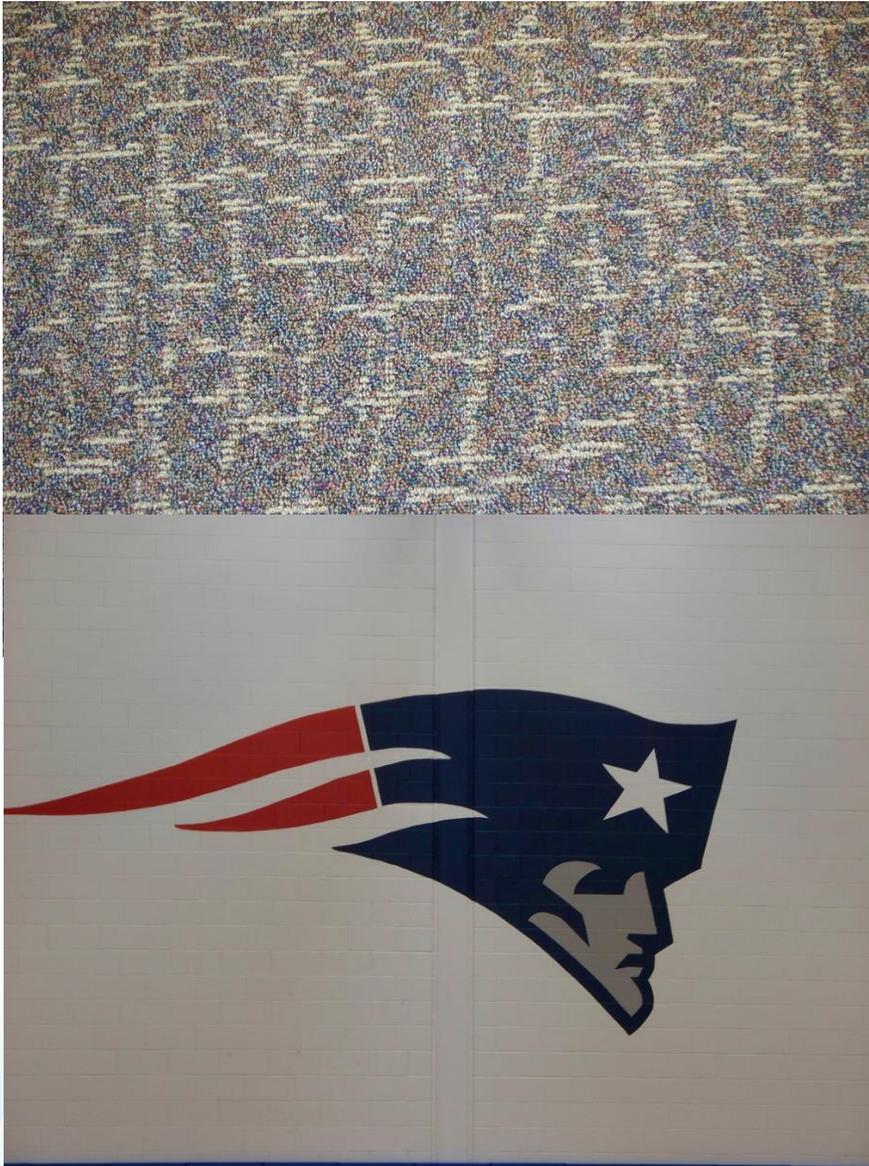


HOW MUCH DOES A POUND OF DIRT COST?



GREEN CLEANING

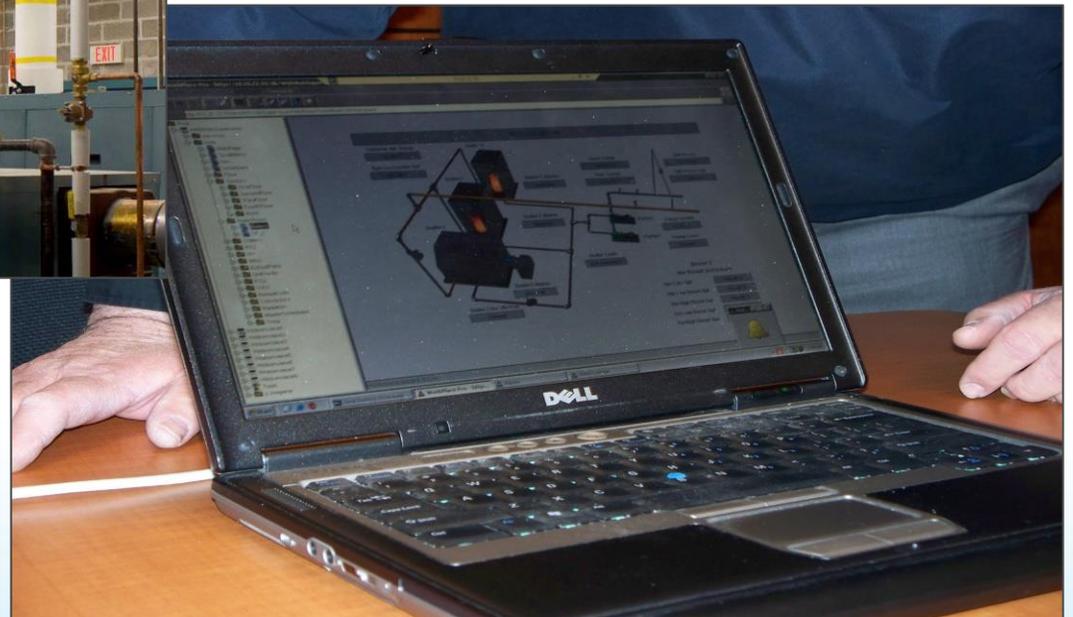
MAINTAINING INTERIOR SURFACES



BEST PRACTICE: TRAINING



Do you have the skills you need?



BEST PRACTICE OCCUPANT ENGAGEMENT SIGNAGE



Eco

**Please, turn off the
lights**

www.neep.org



**Please, switch
me off**

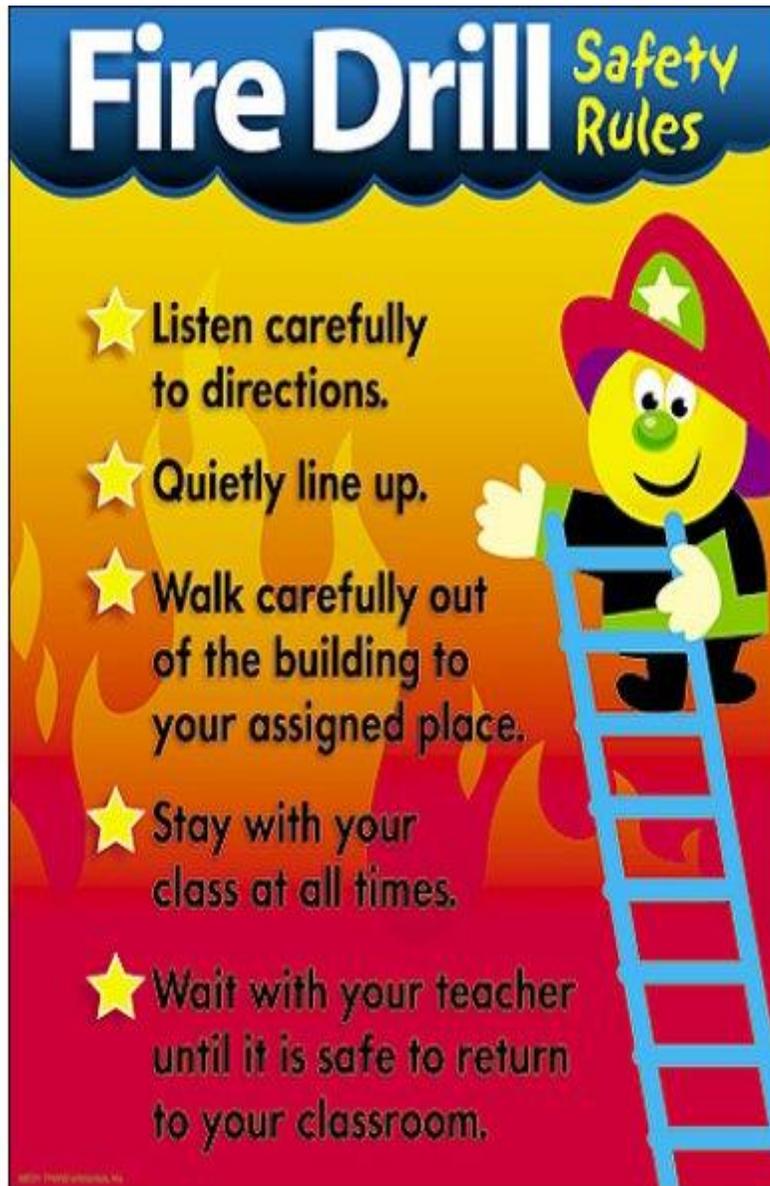
www.neep.org



Reminders



BEST PRACTICE: ENERGY DRILL



Energy Drill

- Benchmark your buildings
- Post information
- Mock billing for departments

BEHAVIOR MODIFICATION



ANACOSTIA HIGH SCHOOL

Green Team



- Energy audit walkthrough
- Carbon footprint assessment
- Poster campaign
- Energy Patrol
- “Random Acts of Greenness Day”

11% energy savings!

RESOURCES AVAILABLE AT WWW.NEEP.ORG



dunsky energy CONSULTING

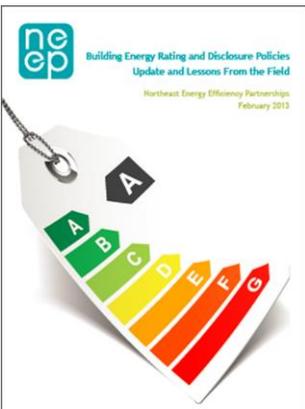
**VALUING BUILDING ENERGY EFFICIENCY THROUGH DISCLOSURE AND UPGRADE POLICIES
A ROADMAP FOR THE NORTHEAST U.S.**

A DUNSKY ENERGY CONSULTING REPORT
A COLLABORATION WITH ZERO-CARBON INVESTMENT CONSULTANTS

Whitney Dunsky, President, DEC
Jeff Labadie, Sr. Analyst, DEC
Elena Poyarkov, Senior Analyst, DEC
Richard Reed, Senior Product Manager, DEC

FOR NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS
with participation of Bill Schmidt, Director of Regional Initiatives

NOVEMBER 2008



NEEP

Roadmap to Zero Net Energy Public Buildings
Recommended Steps for the Northeast & Mid-Atlantic

Presented by the Northeast Energy Efficiency Partnerships

neep
Northeast Energy Efficiency Partnerships

Regional Operations & Maintenance Guide for High Performance Schools and Public Buildings in the Northeast and Mid-Atlantic

Strategies for creating green, healthy & energy efficient existing buildings in your state or local government

August 2013

neep

GREENING THE PUBLIC SECTOR, MAXIMIZING ENERGY EFFICIENCY

Regional Policies Mandating High Performance State-Funded Public Buildings and How to Maximize Their Energy Efficiency

Northeast Energy Efficiency Partnerships
October 2012

FINAL REPORT

Attributing Building Energy Code Savings to Energy Efficiency Programs

February 2013

neep

Model Progressive Building Energy Codes Policy 2012 Update

Northeast Energy Efficiency Partnerships
November 2012

Increasing Energy Efficiency in Small Multifamily Properties in the Northeast: Recommendations for Policy Action

Northeast Energy Efficiency Partnerships
April 2014

AN OPPORTUNITY

MAINTENANCE PLANNING - SAVES MONEY, IMPROVES HEALTH OF OCCUPANTS



WHY MAINTENANCE PLANNING?

BENEFITS

- Contribute to schools' **instructional effectiveness** and **financial well-being**
- Improve **cleanliness, orderliness, and safety** of school facilities
- Reduce the **operational costs** and **life-cycle cost** of buildings
- Help staff **identify facilities priorities proactively** rather than reactively
- **Extend the life** of buildings
- **Increase energy efficiency** and thereby help the environment

Source: NCEP Planning Guide

NE CHPS 3.0



Updates include:

- Improved Acoustics Requirements
- Electric Vehicles
- zEPI Energy Scale
- Benchmarking Emphasis
- Greater Occupant Engagement Focus
- Enhanced Commissioning of Building Systems
- District Level Commitment to Sustainability
- Crime Prevention through Environmental Design



US DOE RESOURCES

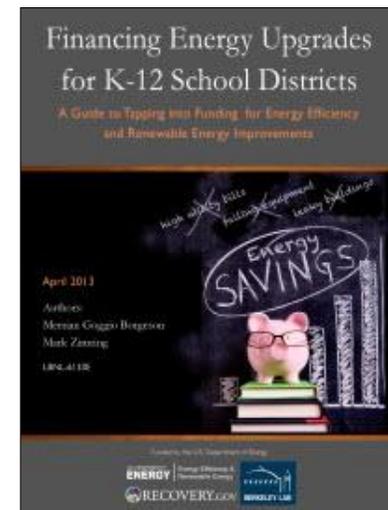


Recent Energy-Focused [TedEd](#)

- Joshua Sneideman’s “A Guide to the Energy of the Earth”

[Guide to financing Energy Upgrades for K-12 School Districts](#)

- Tax Exempt Lease Purchasing
- Energy Performance Contracting
- On-Bill Financing
- Power Purchase Agreements
- Grants/Internal Cash
- Bonding

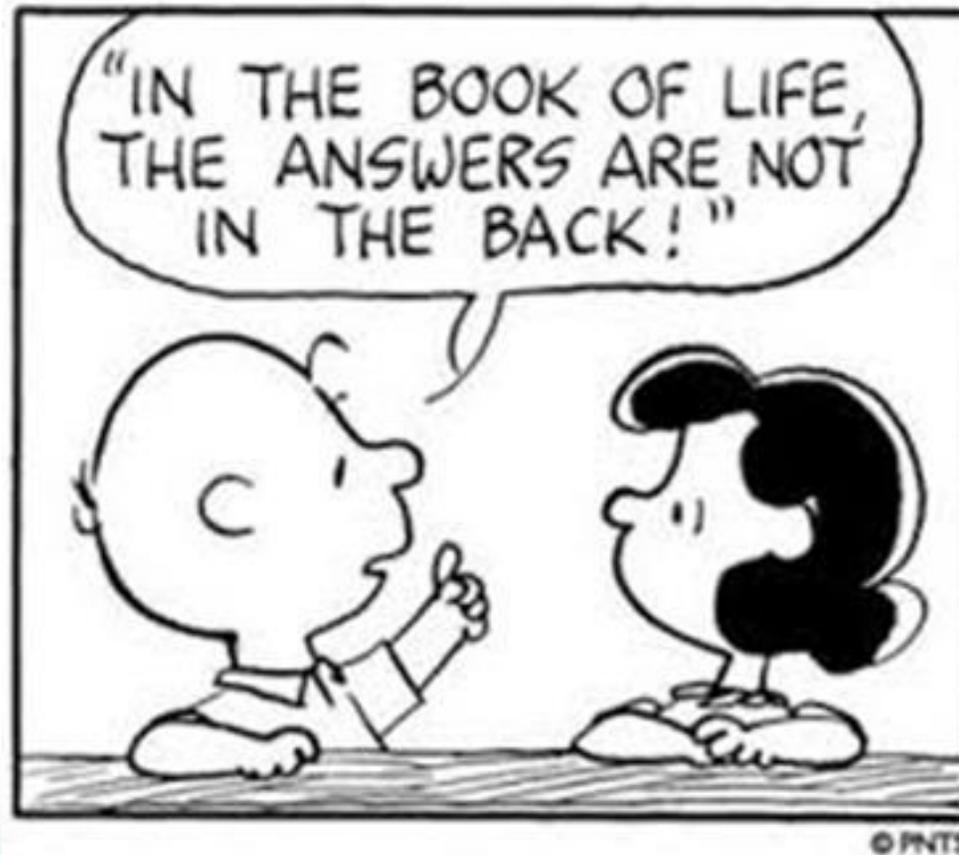


Better Buildings Challenge

- Education [Partners](#)
 - Ex. NY’s Indian River Central School District
- Summit May 27-29, 2015
 - K-12 Track



QUESTIONS / DISCUSSION





THANK YOU!

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