



The Parker Ranch installation in Hawaii

Low to no cost strategies for Public Buildings

Carolyn Sarno, Senior Program Manager
High Performance Buildings
Ed Londergan, ORNL TAN Coordinator
Northeast Energy Efficiency
Partnerships (NEEP)

- Introduction to TAP and NEEP
- Low to no cost strategies
- Success stories
- Resources
- Upcoming webinars

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.



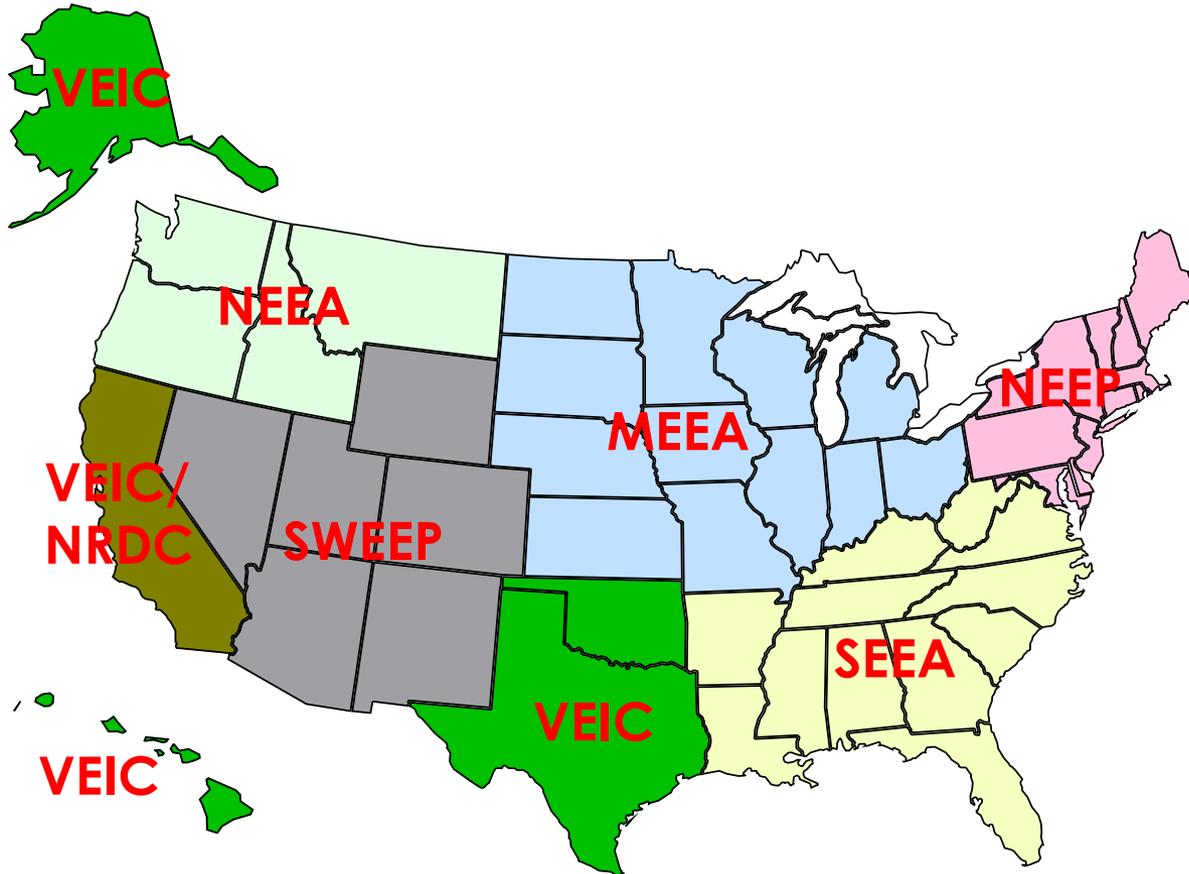
TAP offers:

- One-on-one assistance
- Extensive online resource library, including:
 - Webinars
 - Events calendar
 - TAP Blog
 - Best practices and project resources
- Facilitation of peer exchange

On topics including:

- State and local capacity building
- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting

Who We Are: Team 4

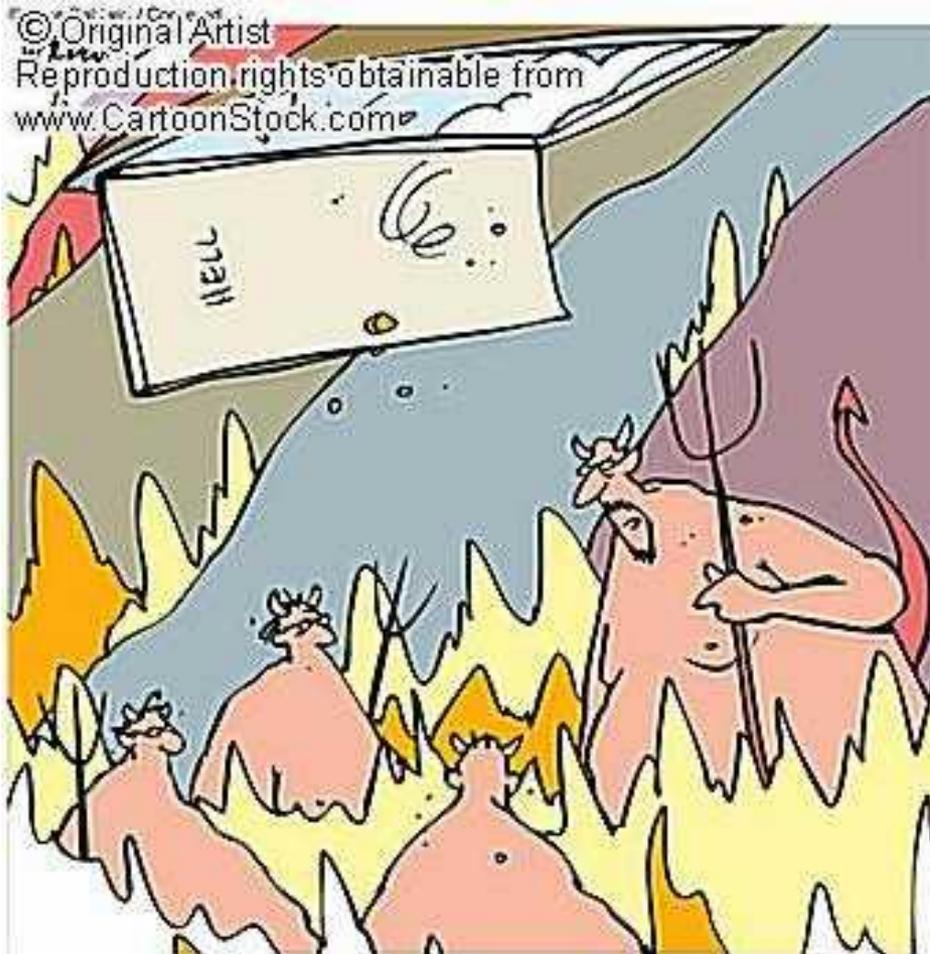


ACEEE, NRDC: National Support



**NORTHWEST
ENERGY
EFFICIENCY
ALLIANCE**





“Keep that dang door shut. I’m not paying to heat the whole neighborhood.”

- Conservation turns off the light bulb;
- Efficiency uses a better bulb.

“Energy Efficiency”

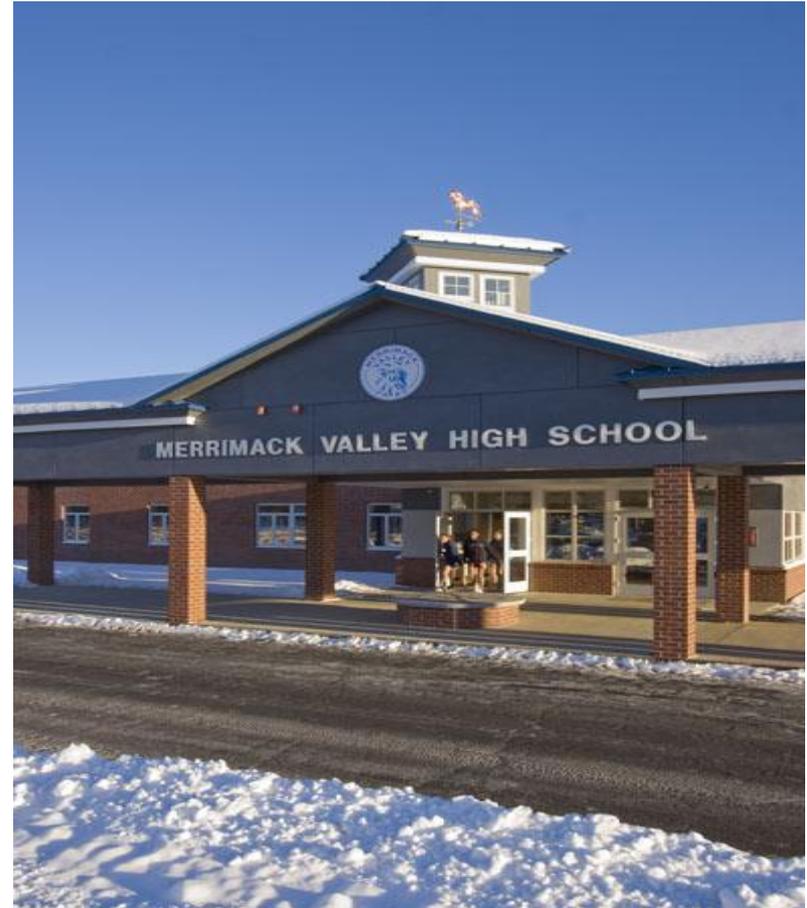
“Green”

“High Performance”



Characteristics

- Superior Indoor Environmental Quality (IEQ)
- Energy Efficient
- Reduce impact on the environment



Buildings Should Be

- Low cost
- Cheap
- Easy to maintain
- Comfortable
- Energy efficient
- Reduce its impact on the environment
- Healthy
- Great place to work
- Low operating cost



Economic Implications



- Do it
- Defer it
- Don't do it



Life Cycle Cost (LCC) Cost to own!



An Opportunity







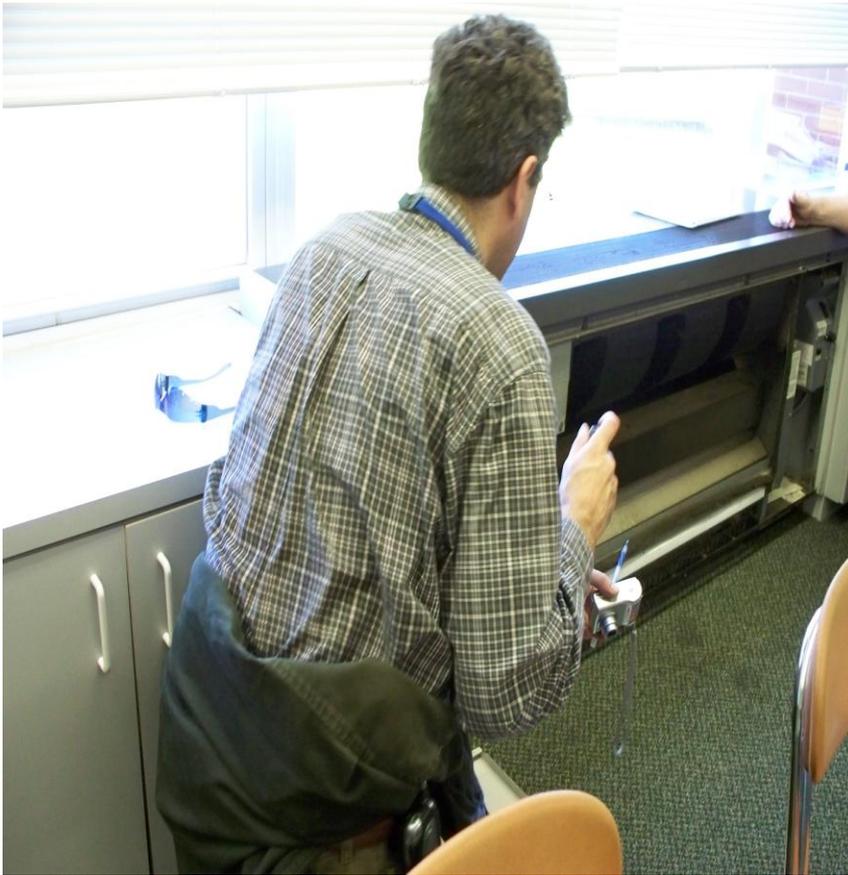
MACGYVER

All he needed was a ball-point pen and a paper clip.

Step 1: Track Utility Bills

- Can't manage what you haven't measured
- Understand how to read the bill
- Use for utility procurement and budget forecasting
- Typically yields a **10% utility savings**

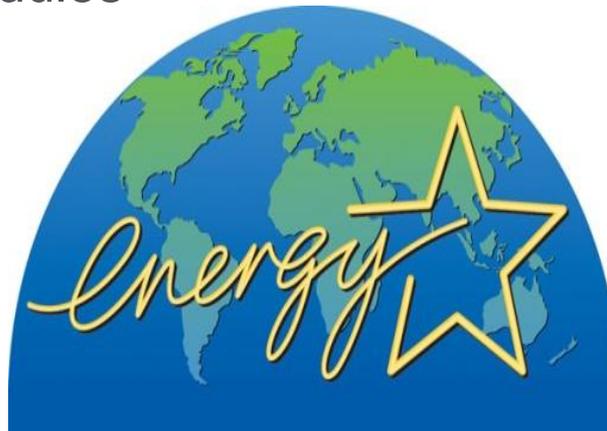
Step 2: Energy Audit



Step 3: EMP Basis for O & M plan

Should include:

- Seasonal temperature settings for HVAC
- Boiler operating temperatures
- Lighting levels
- Maintenance schedules



Existing buildings don't come with instructions

Name of School

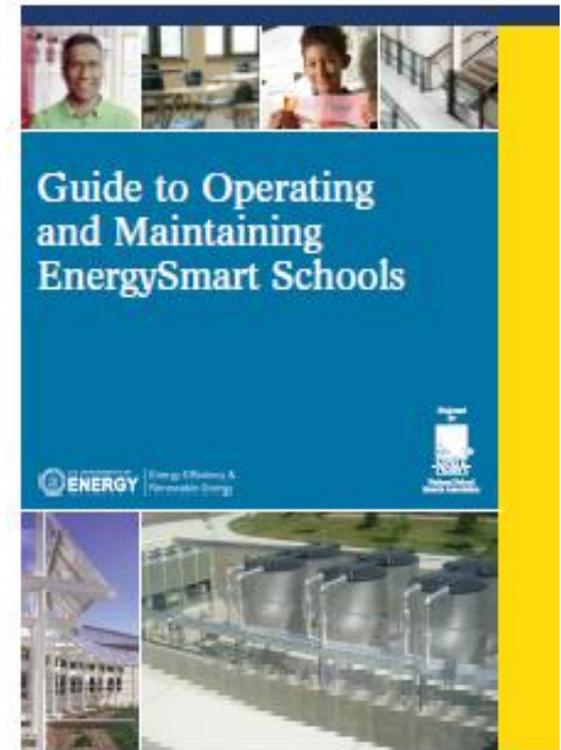
Facility Operating Plan
Version 1.0

By: _____ **-Facility Manager**

Date: _____

Phone Number: _____ **Email Address:** _____

Norm Eshand, CEM, BEP, CSDP, CBCP Program Director 2 Prospect Street, Montpelier, VT 05602
E-mail: SEMP@vtvsa.org Fax: (802) 229-4739



Action Plan Template • BUILDING ENVELOPE—Page 1

Action	Roles & Responsibilities	Implementation Dates			
Monthly		Fill in implementation Date			
Ensure all doors and windows are closed when the air-conditioning or heating system is operating					
Ensure all freight or overhead doors are closed when they are not in use					
Maintain notes on service records and electricity consumption. Prepare the notes when the information is fresh					
Compare building envelope energy consumption with similar school buildings seasonally, normalized for heating degree days					
Quarterly		Fill in implementation Date			
Check for and repair building leaks in the following areas: - Doors (caulking and weather-stripping) - Windows (caulking and weather-stripping) - Foundation (caulking and weather-stripping) - Walls (caulking and weather-stripping) - Roofs (caulking, weather-stripping, clean roof drain screens)					
Bi-Annually		Fill in implementation Date			
Annually		Fill in implementation Date			
Inspect all attic spaces to monitor and maintain proper attic space ventilation (unless the space was specifically designed as non-vented space). Note, exhaust system should not exhaust into the attic space, especially if it contains moisture. Exhaust diminishes insulation effectiveness					
Training		Fill in implementation Date			
Train facilities staff to conduct building envelope energy consumption comparisons with similar school buildings and season-to-season comparison, normalized for heating degree days					
Train facilities staff to maintain detailed notes on the equipment service records and energy use (electricity consumption). Prepare the notes when the information is fresh					
Train facilities staff, teachers, students, and staff not to open doors and windows when the air-conditioning or					

Step 4: Train Building Staff



Step 5: Teamwork

- Energy Champion
- Energy Team
 - Every consumer is expected to be a saver
 - Involve everyone



Phantom Loads

- Copier left on all day and night costs more than **\$150/year**
- A leaking faucet – 20 drips per minute **\$3.15/year**
- Cost to run a vending machine up to **\$300/year**



Based on standard U.S. Government tests

ENERGYGUIDE

Clothes Washer
Capacity: Standard

Model(s) MAYTAG
MAH5500B

Compare the Energy Use of this Clothes Washer with Others Before You Buy.

This Model Uses 302 kWh/year

ENERGY STAR
A symbol of energy efficiency

Energy use (kWh/year) range of all similar models

Uses Least Energy	Uses Most Energy
177	1298

kwh/year (kilowatt-hours per year) is a measure of energy (electricity). Your utility company uses it to compute your bill. Only standard size clothes are used in this scale.

Clothes washers using more energy cost more to operate. This model's estimated yearly operating cost is:

\$24	\$11
When used with an electric water heater	When used with a natural gas water heater

Based on eight loads of clothes a week and a 2000 U.S. Government national average of \$0.0803 per kWh for electricity and \$0.688 per therm for natural gas. Your cost will vary depending on your local utility rates and your use of the product.

Important: Removal of this label before consumer purchase violates the Federal Trade Commission's Appliance Labeling Rule.



kWh Meters



Smart Strip





Energy Drill

- Benchmark your buildings
- Post information



Please, turn off the lights



Please, shut down the computer



Please, shut down the computer



Please, don't leave the faucet running



Please, don't leave the faucet running



Please, turn off the copier at the end of the day



Please, turn off the copier at the end of the day



Please, switch me off



WHAT CAN I DO?

TAKE A PLEDGE

Use it less
Turn it off!
Turn it down
Compact Florescent light bulbs
Programmable thermostats
Water saving shower heads
Window Treatments
Weather stripping
Clean air filters
Insulation

<http://cpsed.net/news/energy/energy.pdf>



Efficiency First



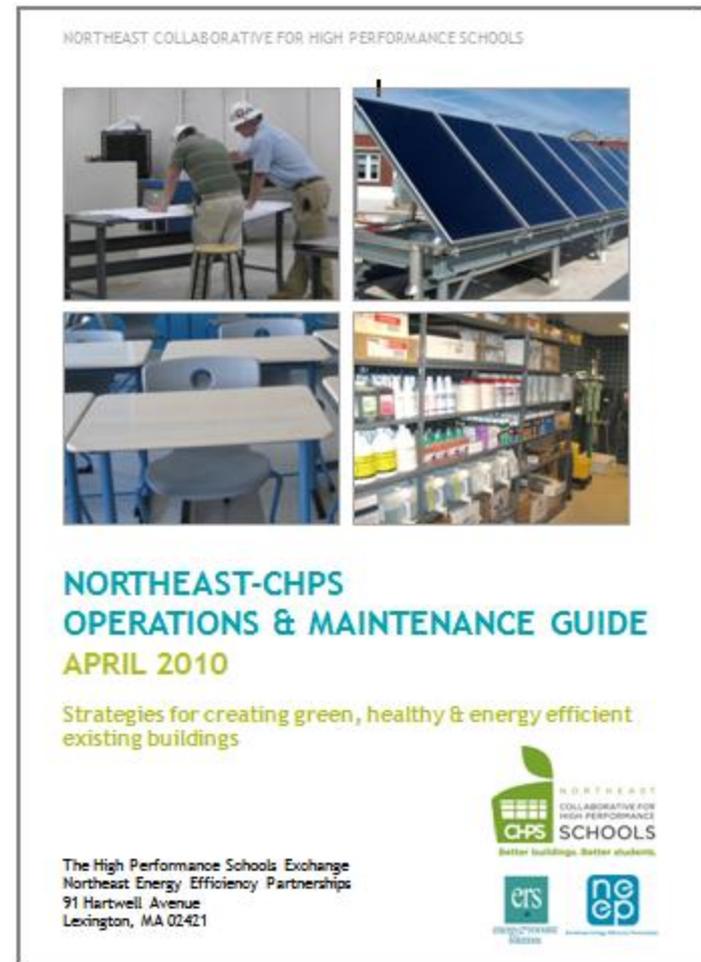
Brattleboro Vermont

- “High performance people”
- Fuel savings 23%
- Electrical improvements in lighting (3 year payback), 17% savings
- Staff education - switching lights off nearer to windows
- BOC (Building Operator Certification)
- Buy-in from management is critical to successful operations and maintenance

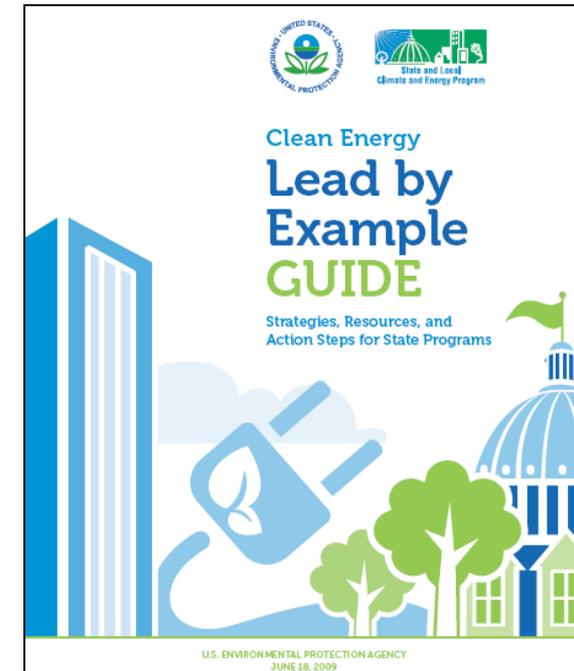


NE-CHPS O&M Guide: What is it?

- A pathway for existing schools to become high performance
- Many low cost ideas
- Regionally developed
- Eleven sections, from Policies to Materials
- Available online as a free resource at www.neep.org



- Assists states in the development of comprehensive LBE programs
 - Key resource for states just getting started
 - Can be used “piecemeal” by states with existing programs
 - Addresses buildings, facilities, and operations (not fleets)
- Contents:
 - Activities and measures
 - Establishing a framework
 - Implementing the program
 - Tracking, evaluating, and reporting on progress
- Includes supporting appendices and 100’s of state examples
- Documents key strategies and resources

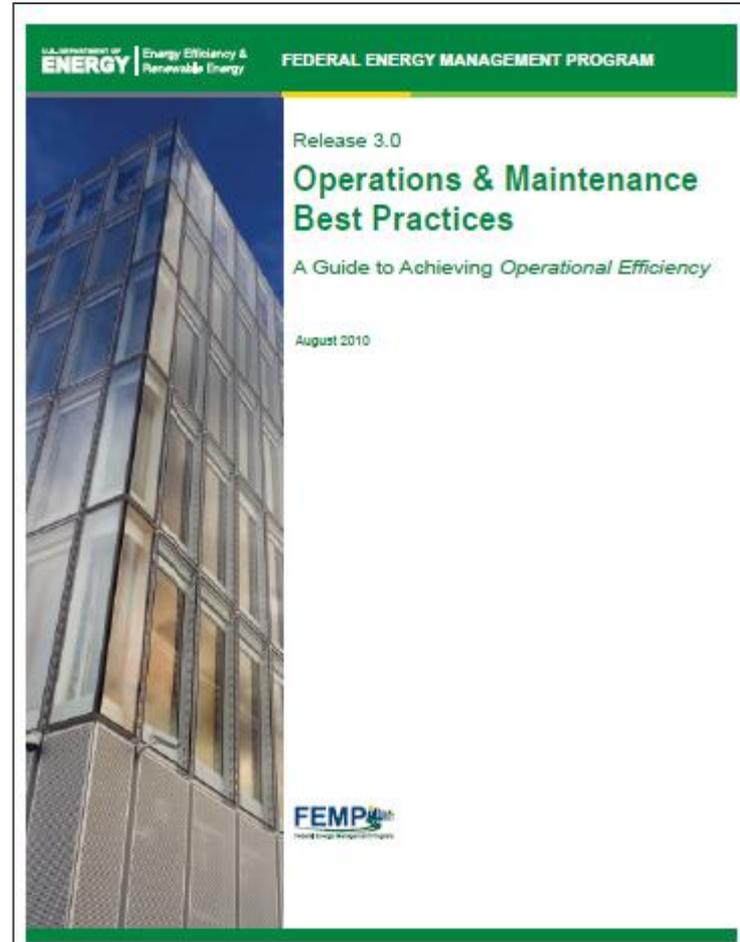


On the Web:

http://www.epa.gov/cleanenergy/documents/epa_lbe.pdf

Federal O&M Best Practices

- “...follow a mantra of **O&M First.**”
- Sections include:
 - building commissioning process and how it contributes to effective O&M
 - promising O&M technologies and tools on the horizon



Better Public Investment \$100,000



We all want this.....and not this!

- Maximize energy efficiency
 - Involve your energy efficiency programs and local utilities from the start
 - State your case remember cost to own / cost to buy
 - Energy efficiency first then renewable technology
 - Create policies that set clear and attainable goals for energy reduction AND behavior change
 - Remember the mantra “O&M First”
 - Be the champion and build your team

Questions, contact csarno@neep.org

Additional Resources

- Department of Energy O & M Best Practices
http://www1.eere.energy.gov/femp/program/operations_maintenance.html
- DSIRE – Database of State Incentives: <http://www.dsireusa.org/>
- Energy Star: <http://www.energystar.gov/>
- Energy Smart Schools Guide to O & M
http://www1.eere.energy.gov/buildings/energysmartschools/o-and-m_guide.html
- EPA LBE Guide http://www.epa.gov/cleanenergy/documents/epa_lbe.pdf
- Facilities Operating Plan
<http://www.vtvs.org/files/Facility%20Operating%20Plan%20Template%20Version%201.0.doc>
Solutions Center
- <http://www1.eere.energy.gov/wip/solutioncenter/default.html>
- Northeast Energy Efficiency Partnerships: www.neep.org
- Your local utility & energy efficiency program providers

We encourage you to:

1) Explore our online resources via the [Solution Center](#)

2) Submit a request via the [Technical Assistance Center](#)

The screenshot shows the 'Solution Center' page for the U.S. Department of Energy. The header includes the DOE logo and 'Energy Efficiency & Renewable Energy'. Below the header, there are navigation tabs for 'Webcasts', 'Project Map', and 'Request Technical Assistance'. The main content area is divided into several sections: 'Buildings' with a description of the Solution Center's purpose; 'Energy Education' with a link to 'Upcoming Webcast' for 'Getting to Net Zero Today' on March 18, 2010; 'Industry' with a 'Need Help?' section and a 'Click Here to Request Technical Assistance' button; and 'Activities' with a description and a diagram showing various energy efficiency and conservation strategies like 'Material Conservation Programs', 'Reduction and Capture of Methane and Greenhouse Gases', and 'Energy Efficient Networks, Energy Distribution, and Emerging Energy Technologies'.

The screenshot shows the 'Technical Assistance Center' page in a Windows Internet Explorer browser. The header features the DOE logo and 'Energy Efficiency & Renewable Energy'. The main content area includes a 'Log In' section with 'Username' and 'Password' input fields, and 'Log In' and 'Reset' buttons. Below the login section, there are links for 'EECRG Home', 'SEP Home', 'EERE Home', and 'U.S. Department of Energy', along with 'Web Site Policies | Security & Privacy | USA.gov'. The footer indicates 'Content Last Updated: 02/19/2010' and 'Version: 1.0.7'.

3) Ask questions via our call center at 1-877-337-3827 or email us at solutioncenter@ee.doe.gov

Please join us again:

Title: **Stretch/Reach Codes**

Host: Isaac Elnecave, Midwest Energy Efficiency Alliance

Date: September 15, 2010

Time: 2:00 – 3:00 EDT

Title: **Loan Loss Reserves: Lessons from the Field**

Host: Merrian Fuller, Lawrence Berkley National Laboratory

Date: September 20, 2010

Time: 2:00 – 3:15 EDT

Title: **Taking Advantage of Qualified Energy Conservation Bonds (QECBs)**

Host: Mark Zimring, Lawrence Berkley National Laboratory

Date: September 22, 2010

Time: 3:00 – 4:30 EDT

Title: **Energy Saving Performance Contracting (ESPC) Basics**

Host: Meg Giuliano, ICF International

Date: September 23, 2010

Time: 1:30 – 2:30 EDT

Title: **“Green” Codes and Programs**

Host: J.C. Martel, Southwest Energy Efficiency Alliance

Date: September 24, 2010

Time: 2:00 – 3:00 EDT

Title: **Designing Effective Renewables Programs**

Host: Cheryl Jenkins, Vermont Energy Investment Corporation

Date: September 28, 2010

Time: 2:00 – 3:00 EDT

Title: **Driving Demand for Home Energy Improvements: Lessons from the Field**

Host: Sarah Busche, National Renewable Energy Laboratory

Date: September 29, 2010

Time: 3:00 – 4:15 EDT

For the most up-to-date information and registration links, please visit the Solution Center webcast page at www.wip.energy.gov/solutioncenter/webcasts

CONTACTS

VEIC: Dan Quinlan, dquinlan@veic.org, 802-488-7677 (**Team 4 Lead**)

MEEA: Wendy Jaehn, wjaehn@mwalliance.org, 312-784-7272

NEEP: Ed Londergan, elondergan@neep.org, 781-860-9177

NEEA: Dave Kresta, dkresta@nwalliance.org, 503-827-8416

SWEEP: Curtis Framel, cframel@swenergy.org, 303-447-0078

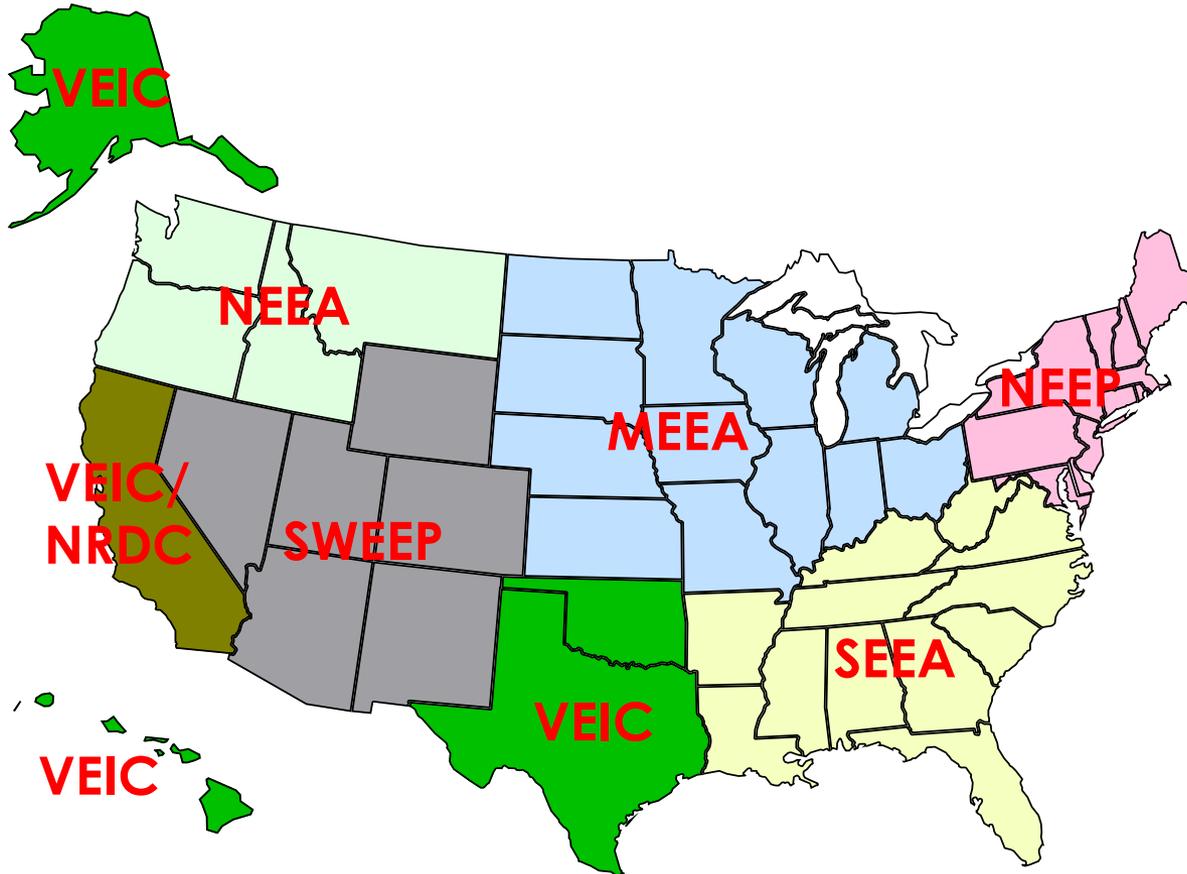
SEEA: Ben Taube, ben@seealliance.org, 404-931-1518

ACEEE: Eric Mackres, emackres@aceee.org, 202-507-4038

NRDC: Lara Ettenson, lettenson@nrdc.org, 415-875-6100

EFG: Richard Faesy, rfaesy@energyfuturesgroup.com, 802-482-5001

Who We Are: Team 4



ACEEE, NRDC: National Support



**NORTHWEST
ENERGY
EFFICIENCY
ALLIANCE**

