Northeast Energy Efficiency Partnerships

LOCAL ENERGY SOLUTIONS CONFERENCE

The Certified Building Operator Experience: Saving Energy Through Lessons Learned

Northeast Energy Efficiency Partnerships (NEEP)

Saturday, March 21, 2015

NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

"Accelerating Energy Efficiency"

MISSION

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

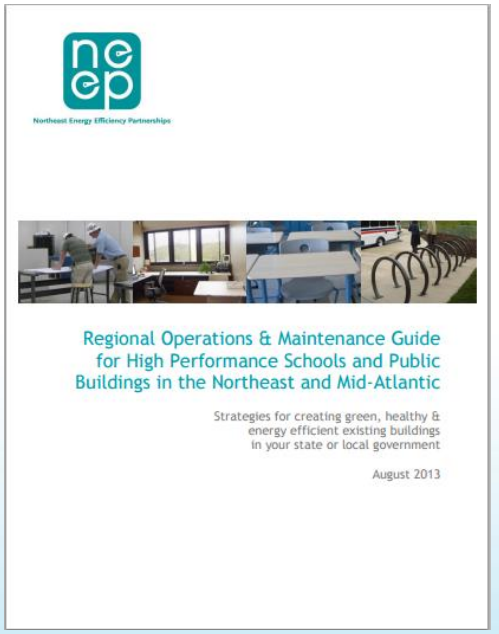
APPROACH

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



BUILDING OPERATOR CERTIFICATION

Building Operator Certification Value:

- Course **costs ~$1,500**
- **Costs only $740** if C&I customer of PSNH, Unitil, Liberty Utilities, or New Hampshire Electric Cooperative
- Covers HVAC, Benchmarking, Lighting, Indoor Environmental Quality, Low cost operational improvements, etc.

Benefits:

- Company realizes **$12,000 annual energy savings** per participant on average
- 50% of participants report **increased salary**/responsibility

Time Commitment

- **Eight classes** (74 hours)
- **Two days a month**, for four months

Upcoming Courses:

- **Worcester, MA**: August 11- Nov 18, 2015
- Finger Lakes Community College: TBA

BUILDING OPERATOR CERTIFICATION

TODAY'S PANEL

Richard G. Fortier Sr.,
Facilities Director, Rollinsford Grade School,
Rollinsford, NH

Russell Weeks,
Maintenance Crew Chief, Meredith Parks and Recreation
Meredith, NH

Scott Lindquist,
Supervisor Energy/HVAC Services, University of New Hampshire
Durham, NH

MEREDITH COMMUNITY CENTER ENERGY CONSERVATION PLAN

Russell Weeks,
Maintenance Crew Chief,
Meredith Parks and Recreation

Meredith Community Center

- Constructed in 2006
- 18,000 sq. ft.
- Forced hot water closed loop glycol heating system
- Automated climate and lighting controls

In House Renovations

Repairs

- Remove trim and seal windows
- Install gap covers on exterior doors
- Caulk gap above air units

2 Year Energy Plan

- Perform all in house renovations ASAP
- Program building controls to maximum efficiency
- Perform lighting audit
- Perform insulation audit
- Analyze building for solar

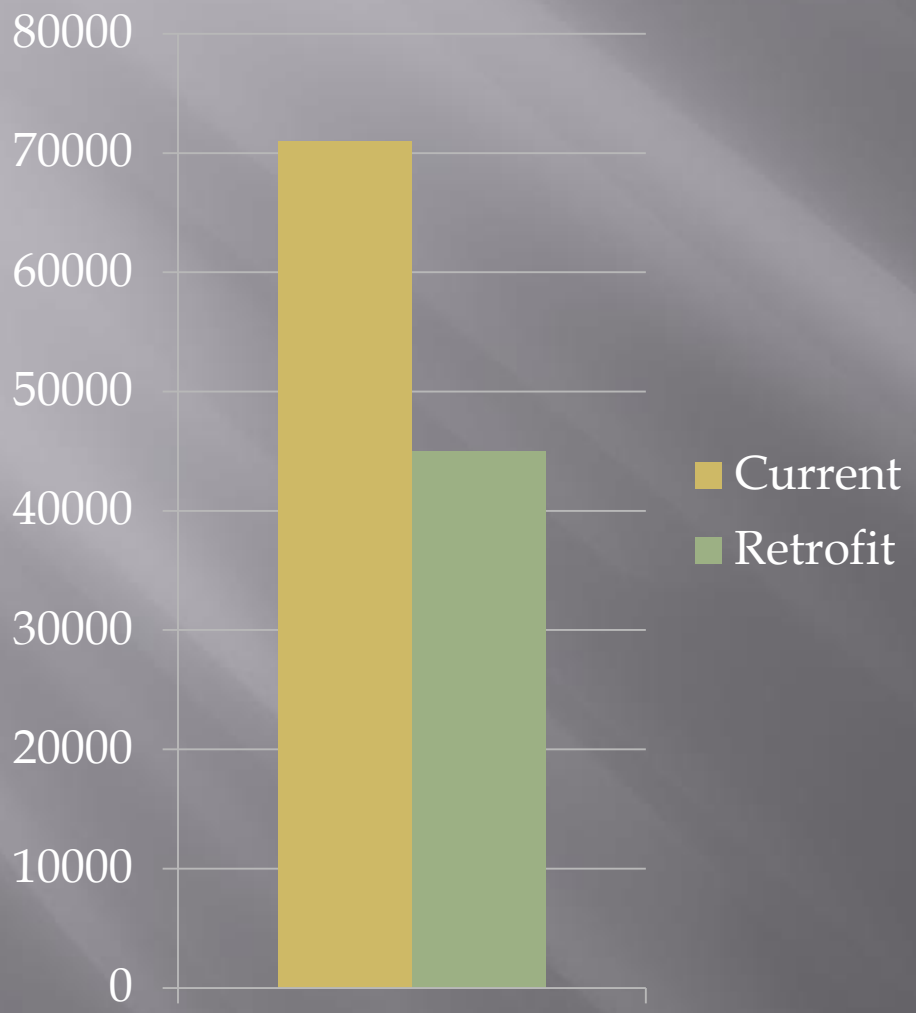
Control Renovation

- Install Economizer on Activity Center intake
  - Closes outside air dampers in all units
  - Prevents high humidity level in the building
- Repair VFD's on Circulator Pumps
- Program unused rooms to unoccupied

Lighting Renovation

- Replace light bulbs throughout center with LED replacements
- Couple motion sensors into security lighting to keep the building dark unless needed at night

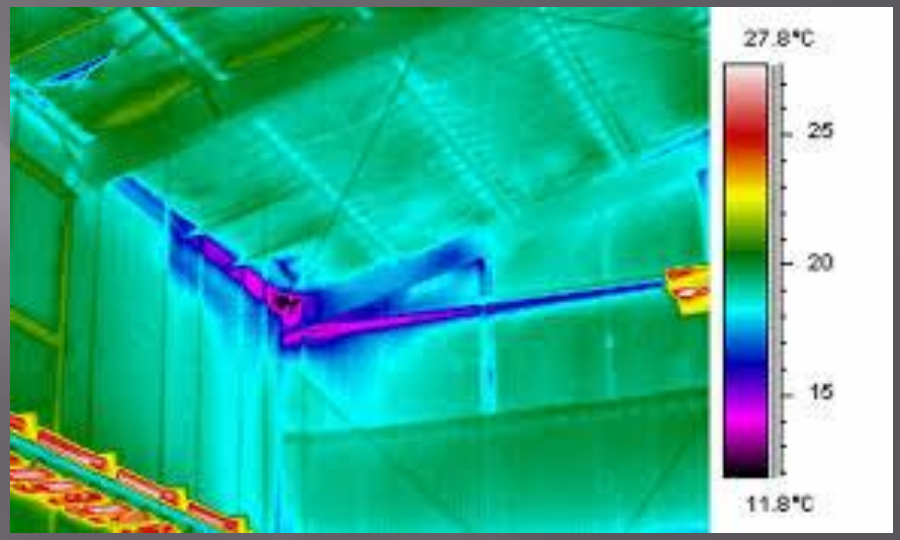
LED Renovation



- Cut current wattage use by more than 30%
- $15,000 rebate
- $54,000 in savings over 15 year bulb life
- 7 year buyback
- Feasible when coupled with smart start financing
- Awaiting Selectmen approval

Insulation Audit

- Uninsulated areas between hallways and attics
- Many rips in air barrier
- $20,000 repair will save over $350,000 over life of building
- Approved for next years budget



Solar Panel Study

- 7000 sq. ft. of the building faces south with little obstruction
- Contact contractors for consulting or form committee to explore
- Potential for 280 kwh a day

Building Operator Certification

- Most of the items discussed were a direct result of BOC training
- Changes the approach from building repair to building investment
- Helps in the selling of projects

Rollinsford Grade School

Richard G. Fortier Sr.,
Facilities Director, Rollinsford Grade School,
Rollinsford, NH

Section Highlights

- Importance of the Five Senses
- Seeing ,hearing ,smelling ,feeling and tasting
- Setting benchmarks as management tool
- LED Lighting advantages
- Real and Apparent Power
- Indoor Air Quality

Lighting Improvements

- 12 classrooms
- 14 fixtures /room
- 2 lamps /fixture
- Changed ballast state price $13.00
- rebate from PSNH $10.00
- Total ballast cost $3.00

Lighting Improvements

- 32 watt lamps
- 4 lamps/fixture 128 watts
- 14 fixtures /room 1792 watts=1.792 kw/hr
- 10 hour school day =17.92 kw/day
- 12 rooms=215.04 kw/day
- 1,075.2 kw/week
- 4,300.8 kw/month

Lighting Improvements

- 2 – 25 watt lamps/fixture 50 watts
- 14 fixture/room 700 watt=.7 kw
- 10 hour school day 7 kw/room
- 12 rooms 84 kw/day
- 420 kw/week
- 1680 kw/month

Lighting Improvements

- 4-lamps 32 watt 4ft changed to 2-25 watt
- Savings /fixture 78 watts
- savings /room 1,092 watts= 1.092 kwhr
- 12 rooms = 13.104 kw/hr
- Daily operation 10 hours =131.04 khw /day
- 655.2 khw/week
- 2620.8 khw/month saved

Payback

Savings

- 2620.8 khw X .20/khw =$524.16/month
- Ballast $3.00X14/rm=$42
- Lamps $4.80X28/rm=$134.40
- Total cost/rm $176.40X12rooms=$2116.80
- Payback 4.03 months

- pole lights in classrooms
- 60 - 60 watt light bulbs 3600watt/hr= 3.6kw
- 10 hour school day 36 kw/day
- 180 kw/week
- 720 kw/month

From New Hampshire Saves

- change to LED
- 60 lights 9.5watts= 570 kw = 0.57 kw/hr
- 10 hr school day= 5.7 kw/day
- 28.5 kw/week
- 114 kw/month

Payback

- Difference
- 720kw
- -114kw
- 606 kw saved /month
- cost $3.00/each $178.00 2015 price $5.95
- payback at rate of .20/kwh 1.5 months

Total Savings

Room Project 2620.8 kw
Pole lights 606 kw
Total 3226.8 kwh per month
dollars saved at .20/kwh $645.36/m

Parking Lot Lighting

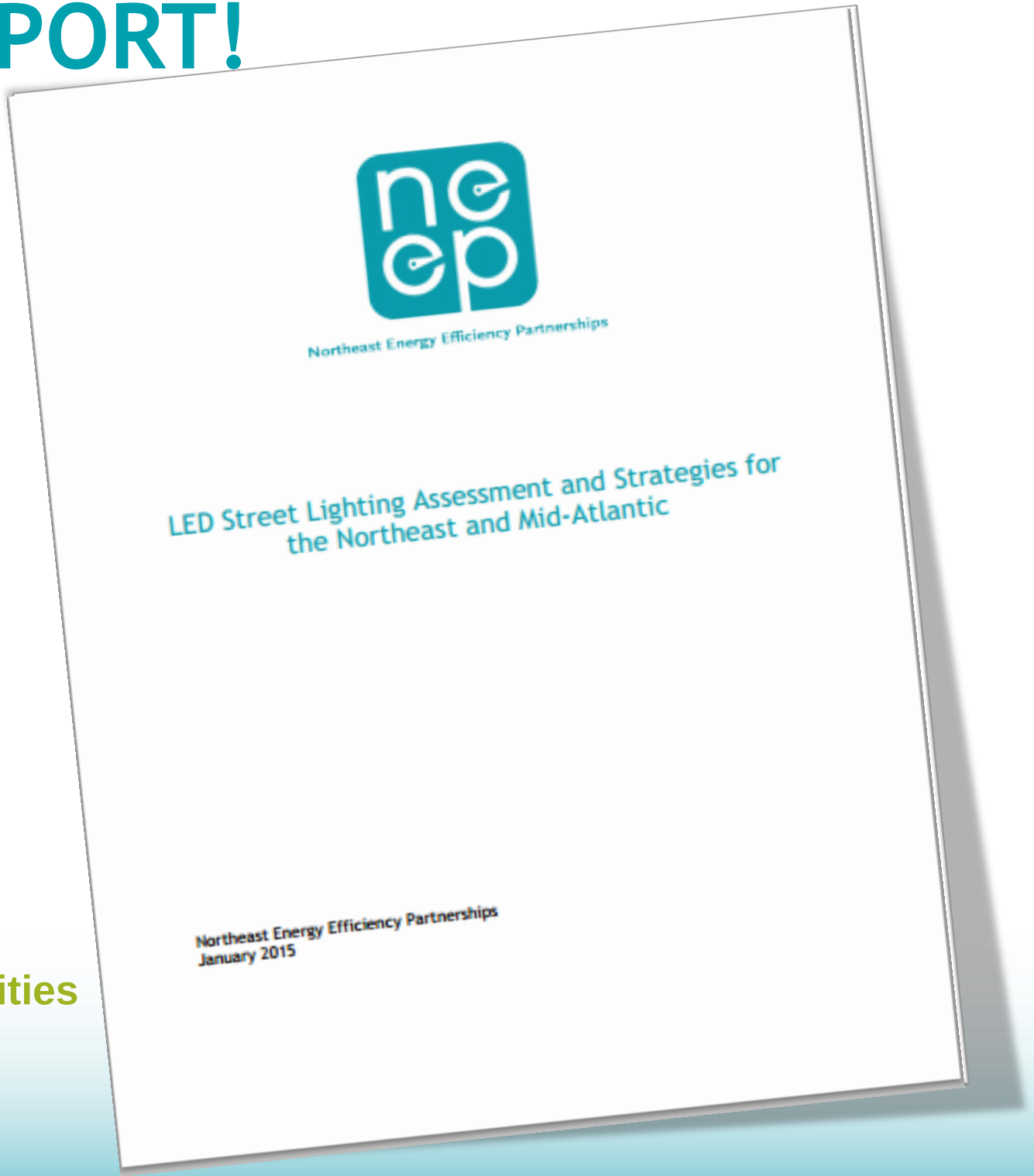
250 watt metal halide/lamp = .25 kwh
2.5 kw 10hr/day
12.5 kwh/week
50 kwh/month
45 watt LED = .045 kwh
.45 kw 10h/day
2.25 kwh/week
9 kwh/month

Savings

50 kwh/month Metal Halide
9 kwh/month LED
41 kwh/month saved $8.20 saved at .20
$80 to replace lamp and ballast
$160 cost LED
$80 difference
Payback 9.75 months/fixture

DISCUSSION

NEW REPORT!



Available at:
NEEP.org/Communities

Cost savings

- Street Lighting accounts for 20-40% of a municipality's electric utility costs
- Energy Cost-Savings (reduces consumption by 50%+)
- Maintenance Cost-Savings (~$50/lamp/year)

Table 4: SCL Example of LED Street Light Cost Reduction over 4-Year Period[24]

LED Street Light Cost Reductions over 4-Year Period					
	2009	2010	2011	2012	2013
Seattle (Purchases of 2,000+ Units)	$369	$288	$239	$204	$179
Los Angeles	$432	$298	$285	$245	$141

additional benefits

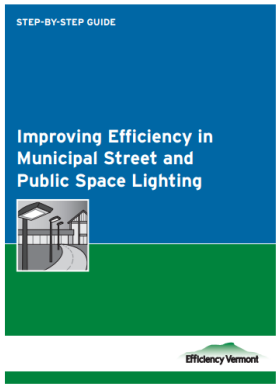
- Reduced Light Pollution at Night
- Lighting Quality
- Great Perceived Security

- Extended Lifecycle
- Reduced Carbon Emissions
- Can Incorporate Advanced Controls

RESOURCES

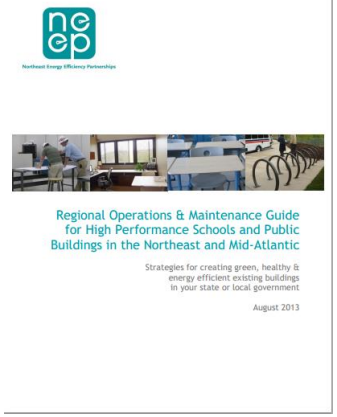
Better Buildings Challenge- Outdoor Lighting Accelerator

The US Department of Energy's Outdoor Lighting Accelerator program provides municipalities with the tools and guidance necessary to complete a goal of replacing all lights system-wide within two years. Summit May 27-29, 2105



Efficiency Vermont Street Lighting Conversion Guide

Step by step Guide for improving Efficiency in Municipal Street and Public Space Lighting.



NEEP Public Building Operation and Maintenance Guide

Guidance for facilities and DPW personnel for maintaining energy efficient, healthy, productive facilities.

Municipal Solid State Street Lighting Consortium (MSSSLC)

Shares technical information and experiences related to LED street and area lighting demonstrations, standing as an objective resource for evaluating new products on the market intended for those applications.

MODEL TOOLS AND SPECIFICATIONS

- Streetlight retrofit financial analysis tool to help municipalities determine cost-savings of a potential conversion
- Model Specification for LED Roadway Luminaires, V2.0
- Model Specification for Networked Outdoor Lighting Control Systems V2.0