Optimal ENERGY Integrated Energy Resources

Utility-Owned LED Street Lighting

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On Behalf of the Illinois Attorney General's Office

Illinois Stakeholder Advisory Group
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Agenda

- Intro to Ownership and Street Lighting Rates
- What is the opportunity and why should we pursue it?
- Case Study: Vermont Municipal Street Lighting Initiative

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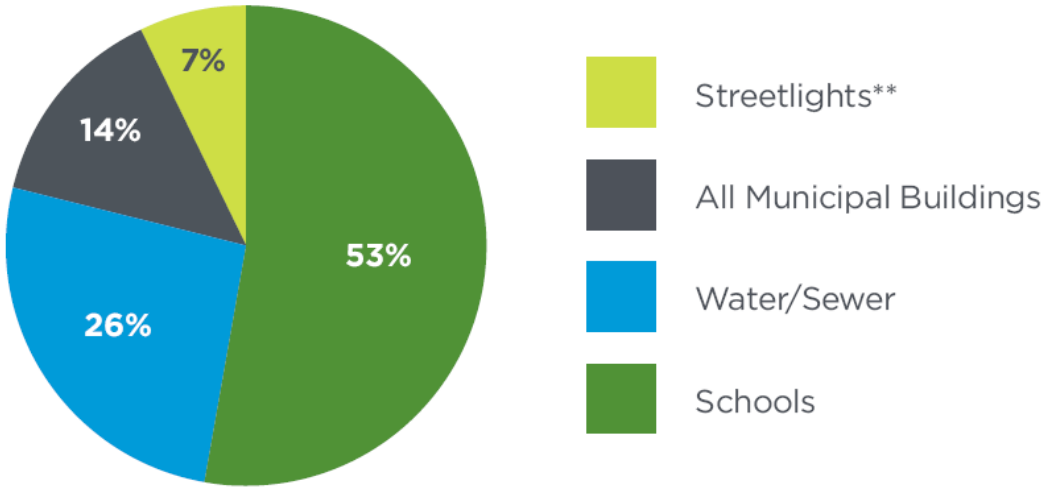
Street Lighting is a Significant Cost for Municipalities

- Up to 40% of Municipal Electricity Bill
- Up to 30% of Municipal Electricity Consumption

Massachusetts Municipal Electricity Use by Sector, FY2011



Source: Massachusetts Department of Energy Resources

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Street Light Ownership

Municipal Owned Street Lights

- Usually metered by the utility
- Municipality pays for electricity (aside from possible franchise agreement issues)
- Municipality is responsible for all maintenance and repairs
- Municipality is free to install LED or any other technology
  - But, barriers such as first cost often prevent energy efficient adoption

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Street Light Ownership

Utility Owned Street Lights

- Unmetered
- Governed by special utility street lighting rate tariffs
- Similar to renting or leasing from municipality perspective
- Municipality pays flat monthly fee to utility that includes all costs associated with installing, operating, and maintaining street lights
- Utility is responsible for all maintenance and repairs
- Municipalities are only offered the technologies listed in the rate tariff
- Current rate tariffs typically do not include LED, and often include large numbers of outdated mercury vapor lamps
- Utilities typically have penalties for early retirement of street lights to recoup un-depreciated costs.

Focus of this talk: Utility-Owned Street Lights

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The Win – Win – Win Scenario

Municipalities

- Financially Attractive to pursue conversion
- Bill/Rate Savings
- Little or No Capital
- Pays for itself
- Positive PR
- Visible community benefits
- Better lighting, dark-sky compliant

EE Programs

- Claim savings for conversions
- Cost-effective role in conversions
- Provides incentives
- Positive PR

Utilities

- New rates for LEDs
- Financially Attractive to support conversions
- Recovers all costs
- Maintains or increases profit
- Positive PR

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Rates

The 3 Components of Utility-Owned Street Lighting Rates

- Energy – 20%
- Capital Recovery – 60%
- Maintenance – 20%

Example Bundled Rate

	LED		
20 LED	2530 Lumens	37 System Watts	$10.07
20 LED	3162 Lumens	50 System Watts	$10.36
40 LED	5050 Lumens	67 System Watts	$12.57
40 LED	6312 Lumens	92 System Watts	$13.14

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Make-up of a Utility-Owned Street Light Tariff

~20%

- Generation Charge (Energy)
  - Highest at Peak, Lowest at Off-Peak
- Transmission and Distribution Charge (T&D)
  - Operating, maintaining, depreciation of infrastructure

LED ↓

~60%

- Lighting Asset Base Charge
  - Poles, wires
  - Fixtures (20 yr life)
  - Photocells, lamps, brackets, etc
  - Labor

LED ↑

~20%

- Operation and Maintenance of Lighting System Charge
  - Lamps, photocells, brackets, refractors, etc
  - Painting, covers
  - Fuses

LED ↓

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Make-up of a Utility-Owned Street Light Tariff

In Utility-Owned Rate Design – the increased LED fixture cost *may* wash out the energy and maintenance savings, resulting in little or no bill savings vs. older technology

2 options to address this…

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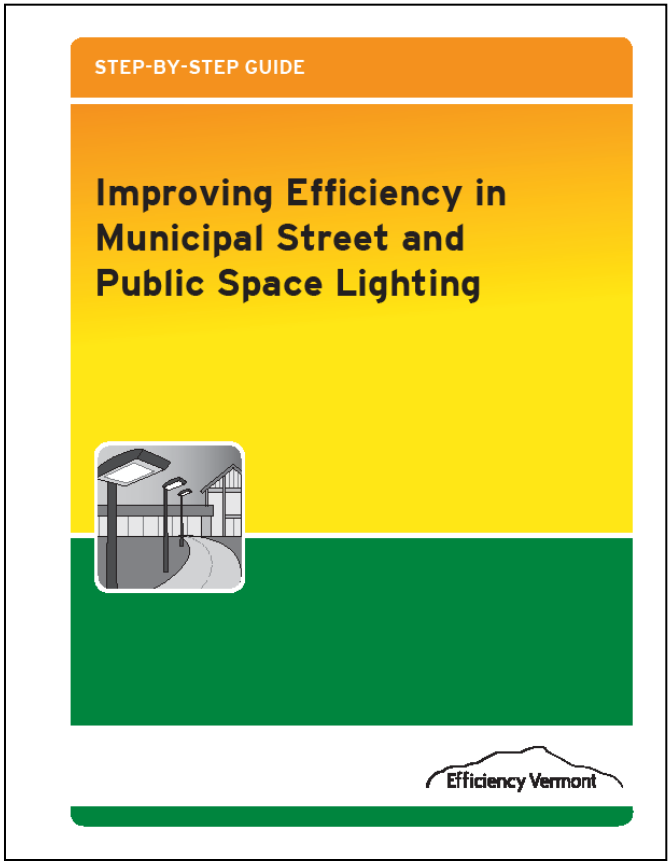
EE Incentive Can be Applied to Reduce Rate or to Reduce/Eliminate Un-depreciated Costs?

- Customers typically must payback utility un-depreciated costs if it chooses to remove or replace streetlights
- Utilities have asset value on books, and face stranded costs if remove or replace streetlights
- This creates barrier:
  - Customer incurs high capital cost to take advantage of more efficient LEDs and lower future tariffs on their own
  - Utility faces shareholder loss on un-depreciated asset, and therefore can't provide favorable customer tariff
- Solution is to apply EE incentive to one or both of these problems:
  - Directly buydown utility stranded costs, then set rates at true cost of LED technology (the VT model)
  - Pay a direct rebate to customer to cover capital expenditure, with limited tariff decrease (less desirable because customers have to drive each decision and don't see immediate bill savings)

Vermont Municipal Street Lighting Initiative

- Partnership among Utilities, EE Programs, and Municipalities
- 2/3 of Vermont's Municipal Street Lights Converted to LED by 2015



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Results and Pipeline

Fixtures upgraded to LED, 2012:	1,805
Savings, 2012:	1,021,000 kWh
$ Paid to cover non-depreciated cost:	$230,492
Average undepreciated cost:	$128 per unit
$/kWh:	$0.23
Savings pipeline, 2013-4:	4,000,000 kWh
Estimated total savings potential:	8,000,000 kWh

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Utility Roles and Responsibilities

- Develop new LED rate(s)
- Provide Existing Street Light Inventory to Municipalities
- Provide and Install new LED Street Lights

GREEN MOUNTAIN POWER
Generating Possibilities

Central Vermont Public Service

VERMONT ELECTRIC CO OP INC

* Green Mountain Power has since purchased Central Vermont Public Service

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GMP LED Rates

- GMP successfully developed rates that were lower than rates for other technologies

High Pressure Sodium			**LED**			
Size	System Watts	Price/Month	Size	System Watts	Price/Month	% Savings
70	90	$13.70	20 LED LDC	37	$10.07	26%
100	130	$15.12	20 LED NDC	50	$10.36	31%
150	190	$17.34	40 LED LDC	67	$12.57	28%
200	240	$20.09	40 LED NDC	92	$13.14	35%

- Most Recent Approved Rate Tariff can be found at: http://www.greenmountainpower.com/upload/photos/308Rate_18_Outdoor_Lighting_new.pdf

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Efficiency Vermont Roles and Responsibilities

- Provide limited technical support to municipalities pursuing conversion (savings calculator, basic tech support)
- Sign MOU with Municipality
- Encourages Municipality to Assess, then Convert
- Provides up to $100 per fixture incentive to offset or eliminate non-depreciated asset costs

Why Assess, Then Convert?

- Many street lights installed decades ago, no longer serving intended purpose
- Some areas are overlit, some are underlit
- Discrepancies between utility info and what is actually installed
- Most cost-effective and greatest savings: eliminating street lights

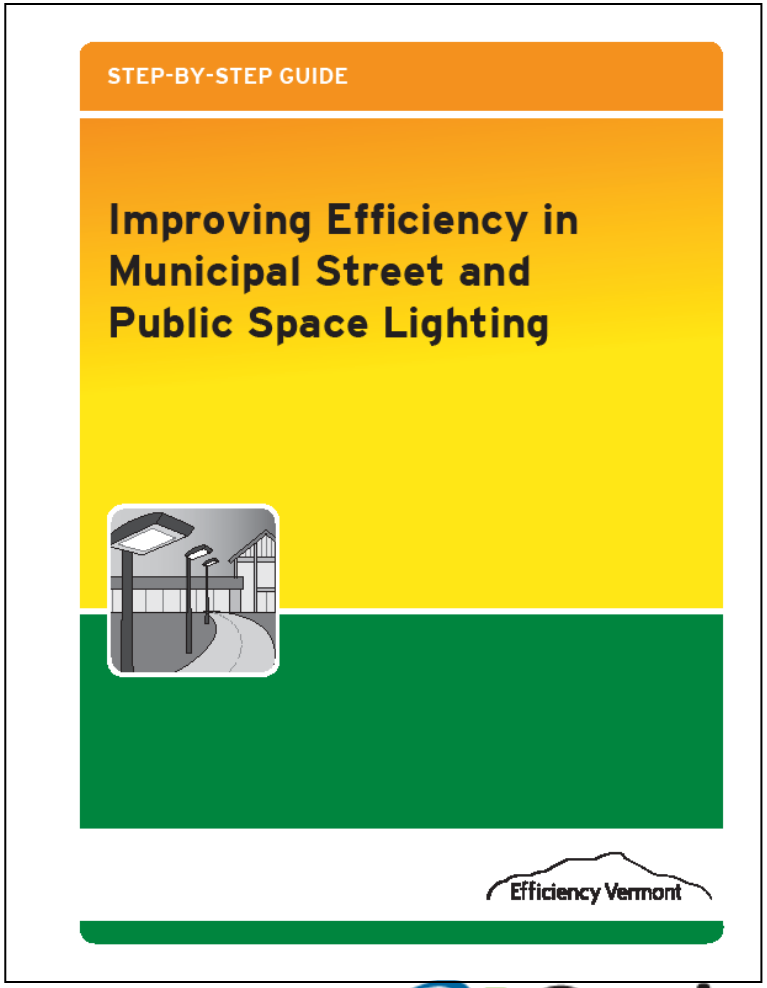
Town	Initial # of fixtures	Total # of fixtures removed	% of fixtures removed
Hartford	521	175	33%
Rockingham	461	123	27%
Shelburne	233	124	47%
Williston	160	53	33%

Efficiency Vermont Guide

- Step 1: Obtain Inventory and Map
- Step 2: Form a Team
- Step 3: Build Support
- Step 4: Identify Criteria for Lighting Needs
- Step 5: Perform Assessment

Etc……

Guide can be found at www.efficiencyvermont.com/streetlighting



Municipality Roles and Responsibilities

- Fully Develop Project Scope
- Engage Community (recommended)
- Identify opportunities for eliminating unnecessary lighting, if willing
- Provide info to Utility and Efficiency Vermont
- Provide capital, if not fully covered by Efficiency Vermont
- Enjoy new LED Lighting and Cost Savings

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Thank you

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ENLARGE IMAGE

Green Mountain Power lineman Josh Brown installs a new 30-watt LED fixture recently. The benefits of the new LED fixture go beyond the reduced energy usage and light quality. The old light was a semi cut-off, meaning light escaped above the fixture. The new LED light is dark sky-compliant; all light is directed to the ground and none escapes above the fixture.
Photo: Fran Racicot photo