



Google Earth Visualization
LED Plan

Installation Phase

Begins July '13 and finishes July '14

1. Fix all 'out' lights - work order backlog
 2. Primary arterials
 3. Secondary arterials
 4. Residential streets
- City Issues / Con Ed issues flagged
 - Enter new LEDs into billing database

Lease Phase

- No payment until installation is complete
- City crews perform maintenance using parts supplied by vendor
- 10 annual payments of \$870,000
- Annual Reconciliation
- At end of lease, ownership goes to City for \$1

Performance Security

- Installation performance bond
- Energy savings guarantee
 - \$1.834 million in energy savings in each year
 - Right of offset
- Replacement parts guarantee / inventory
 - 50 replacement cobraheads in quantities proportional to those in the field
- 12 year LED Lamp and Photocell warranty

Results

- Financial Benefits
 - \$8.5 million project costs
 - \$18.5 million in guaranteed energy savings
 - \$10 million NET over 10 years
- Environmental Benefits
 - 65% reduction in energy use
 - 8.4 million kWh annual savings
 - 3,400 tons of CO2 equivalent

LED Street Light Project Toolkit

One Page Project Brief:

<https://www.hightail.com/download/UIRSd0VGaTErV3l4djhUQw>

12 Page Case Study - Climate Smart Communities Anchor Project 2014

<https://www.hightail.com/download/ZUczV0p4ZEtTRTRQWWNUQw>

“Electric Light is Now Cheaper” Presentation:

<https://www.hightail.com/download/OGhmTmZUQ0NrYUExZXNUQw>

Request for Proposals in PDF:

<https://www.hightail.com/download/OGhmTmZaTIFOMURMbjhUQw>

Request for Proposals in Word:

<https://www.hightail.com/download/OGhmTmZaTIF6RThQWWNUQw>

Executed Contract:

<https://www.hightail.com/download/OGhmTmZaTIFsamQ3czlVag>







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Dobbs Ferry Streetlights: *The Road to Energy Efficiency*



NINA ORVILLE
CHAIR, DOBBS FERRY ENERGY TASK FORCE
PRINCIPAL, ABUNDANT EFFICIENCY



DECEMBER 10 , 2014

The Opportunity



Streetlights may represent biggest, easiest energy efficiency win (for local governments that own their own lights).

Installed wattage (as shown in streetlight inventory)
X estimated hours X energy cost
= Energy cost for streetlights

Background



Addressed Streetlight Opportunities in Various Capacities:

- Chair, **Dobbs Ferry Energy Task Force**. Mayor-appointed local committee.
- Founding Executive Director, **Southern Westchester Energy Action Consortium** (now merged with NWEAC to form Sustainable Westchester)
- Principal, **Abundant Efficiency** (Sustainability Consultancy)

Dobbs Ferry



Dobbs Ferry's Sustainability Commitment – 2009



DOBBS FERRY CLIMATE SMART COMMUNITY RESOLUTION

The following is a synopsis of a Resolution adopted by the Dobbs Ferry Village Board 7/14/2009.

1. Pledge to Combat Climate Change by Becoming a Climate Smart Community

Set goals to reduce green house gas (GHG) emissions and adapt to predicted climatic changes.

- Continue Task Force to review issues & propose actions
- Designate point person to oversee initiatives.
- Maintain membership in ICLEI Local Governments for Sustainability - Climate Protection Campaign.

Adopted Climate Smart Community Pledge

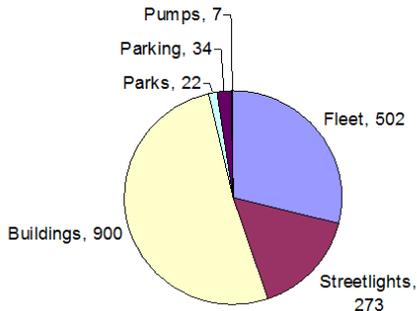
3. Decrease Energy Demand for Local Government Operations

Adopt goal of reducing electricity use and GHG by 20% from projected levels by 2015.

- Include new and existing public facilities, community infrastructure, vehicle fleet and community.

Set 20% municipal GHG reduction target (focus on savings this can represent)

Government Sector CO₂e Emissions



Completed municipal GHG Inventory. Streetlights = 16% GHG emissions (and almost \$100K)

Streetlight Project - Background



- Streetlight inventory of 700 lights included mix of HPS and incandescent
 - Superintendent of Public Works decided to leapfrog from incandescent to LED.
- 2009 – 2010 Tested LEDs for performance and ease of installation and maintenance.
 - Meetings with vendors
 - Staff of neighboring municipalities invited.
- Issued RFP in early 2011.
 - 300 + for Dobbs Ferry but contract for 1,000 to allow for purchases by other municipalities.

Streetlight Project



- Included in long-term capital budget plan (\$100K+)
 - Self-funded by Village
- Payback calculated at 3 years
- Installed by village electrician
- In addition to installing lights:
 - Electrician worked to correct and then update the streetlight inventory
 - Only realize ongoing savings if inventory reflects energy efficient lights
 - Correcting the inventory is somewhat time-intensive.

Maintenance and Performance



- **Replacing / repairing streetlights is labor and equipment-intensive**
 - Requires electrician and bucket truck (in Dobbs with single electrician covering all other duties – 18 months).
- **All LED lights installed have functioned properly since installation.**
 - Longer life span (2 – 3 X) results in fewer outage complaints and less maintenance/replacement expense.
 - Guaranteed for 5 years (didn't purchase additional 5 year warranty - judged not necessary/cost effective).



Promoting Best Practices

SWEAC Sustainability Forum January 2012.

SWEAC Sustainability Forum featured Dobbs Ferry's installation of LED streetlights.



Dobbs Ferry's experience helped Yonkers officials to prioritize replacing all city streetlights. Replaced over 11,000, reducing municipal GHG emissions almost 10% and saving almost \$1 million / year with no capital outlay.



Promoting Best Practices

Event hosted by Pace Land Use Law Center 11/7/13.

29 municipalities registered.

Case studies:

- Eastchester
- Dobbs Ferry
- Yonkers

Yonkers RFP and final contract shared on SWEAC website.

Something **brilliant**

will save your municipality money.

> Learn strategies for implementing LED street lights from your neighbors who are already doing it.

Find out more and register at:

streetlights.eventbrite.com

Dobbs Ferry's Strategy



- Energy Projects = Investment Opportunities
- Think in terms of *Payback* not *Outlay*
- Availability of \$ grants shortens payback (but not essential if economics are attractive)
- Shorter Payback Period  Bigger Investment  Greater Savings for Taxpayer
- Energy efficiency projects can also solve operational and maintenance problems

Dobbs Ferry Energy Projects

UtilityTrac Plus
Powered By FACILITY DUDE

THE VILLAGE OF Dobbs Ferry New York

Johnson Controls

Home Support Preferences Admin About

Search for Acct, Bldg, Meter by code or name

Buildings & Meters Actual Data Calendarized Data Normalized Data Organization Properties

Properties | Projects

Energy Projects

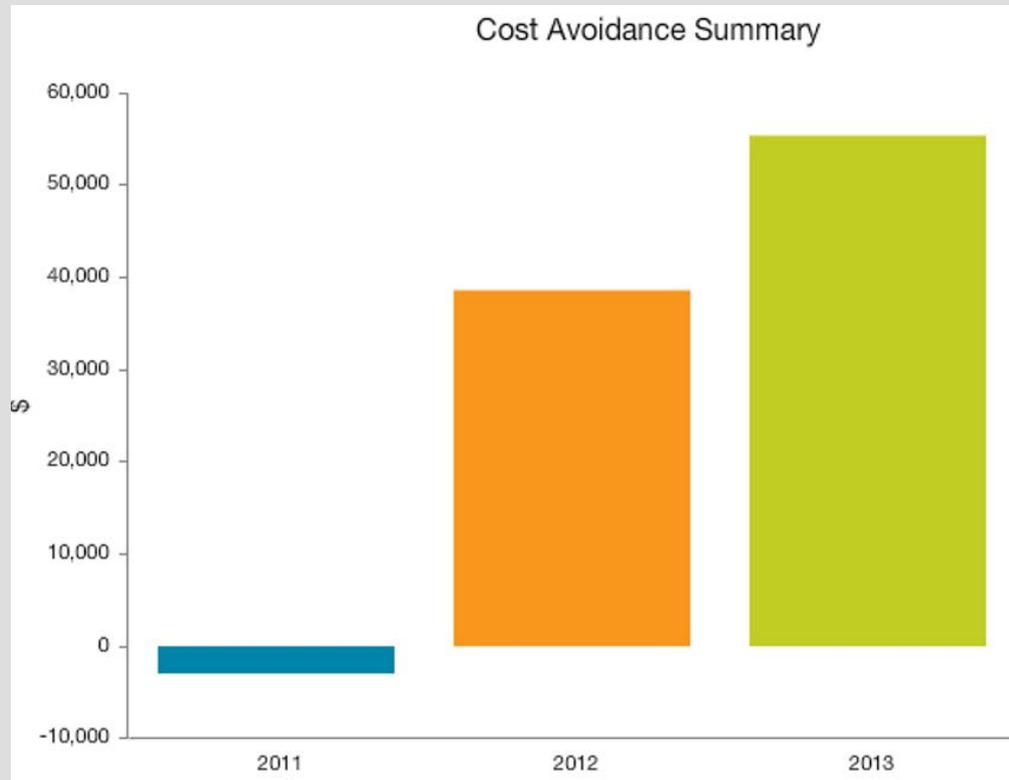
+ Add Project

Copy Data

Building	Project Name	Cost	Compl Date ▲	Cost Savi...	Energy Savi...	Energy...	Start Date	Project Type	Funding So...	Project Ma...	Rebat...
Community Ce...	LED Lighting	\$11,626	02/28/2012	\$2,622	18,730	kWh	02/01/2012	LED Lighting	Village of Dobb...	Jim Dunn	\$0
Library [LIBRA...	Solar PV - Library	\$86,839	02/29/2012	\$2,850	20,336	kWh	10/01/2011	Solar PV	NYSERDA, with...	Nina Orville	\$74,682
Library [LIBRA...	HVAC Controls	\$82,500	02/29/2012	\$10,000	0	kWh	04/01/2011	Controls, HVAC	Village of DF	Jim Dunn / OLA	\$0
Dpw Garage [D...	Solar PV - DPW	\$186,783	02/29/2012	\$7,702	55,015	kWh	10/01/2011	Solar PV	NYSERDA and ...	Jim Dunn / OLA	\$160,633
Ogden Firehou...	Boiler Replacement	\$12,400	04/30/2012				04/01/2012	Boiler Repla	Village of Dobb...	Jim Dunn	\$0
Library [LIBRA...	Lighting Controls	\$28,349	08/17/2012	\$2,567	19,161	kWh	08/01/2012	Controls - Light	NYSERDA (reb...	Jim Dunn / OLA	\$18,426
Street Lights [S...	LED Street Lights - Pha...	\$52,200	09/14/2012	\$16,911	93,951	kWh	12/01/2011	LED Lighting	Village of Dobb...	Jim Dunn	\$0
Dpw Garage [D...	LEDs - Garage Shop	\$3,012	10/31/2012	\$230	1,206	kWh	10/01/2012	LED Lighting	Village of Dobb...	Jim Dunn	\$0
Village Hall [VIL...	LEDs - Police Dept.							LED Lighting	Village of Dobb...	Jim Dunn	\$0
Street Lights [S...	LED Street Lights - Pha...	\$52,200		\$16,911	93,951	kWh	09/17/2012	LED Lighting	Village of Dobb...	Jim Dunn	\$0

Using financial criteria for energy projects, many projects completed – some primarily grant funded (e.g. 2 PV systems) and some fully funded by the Village (e.g. retro-commissioning of library HVAC, LED streetlights).

Dobbs Ferry Energy Projects



Annual energy savings over \$55,000 – those savings will continue to accrue (and increase with energy costs).

Dobbs Ferry is a Certified Climate Smart Community





New York State Climate Smart Communities
Taking Local Action to Combat Climate Change

The Village of
Dobbs Ferry
is a
Certified
Bronze
Climate Smart
Community



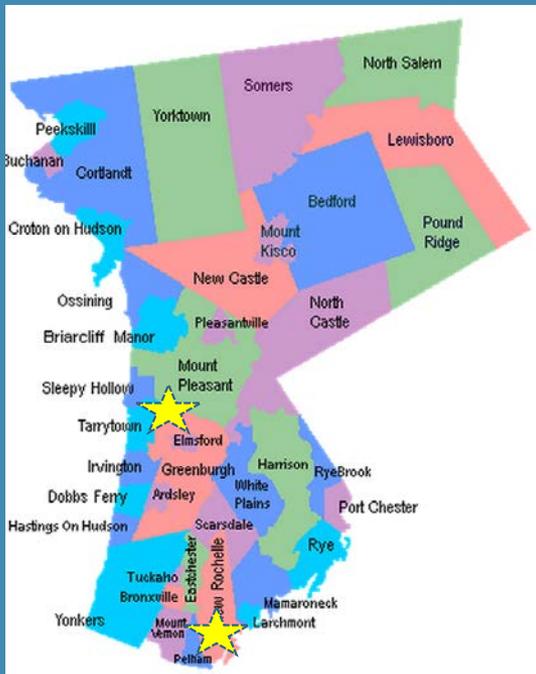
New York State
Governor Andrew M. Cuomo



10 Steps to becoming a Climate Smart Community:

1. **Pledge** to Become a Climate Smart Community (2009)
2. Set **Goals, Inventory Emissions**, Move to **Action**
3. **Decrease Energy Demand** for Government Operations
4. **Encourage Renewable Energy** for Government Operations
5. Realize **Recycling** & Other Climate-Smart Waste Benefits
6. **Promote Climate Protection** Through Community Land Use Tools
7. **Plan for Adaptation** to Unavoidable Climate Change
8. Support a **Green Innovation Economy**
9. **Inform** and **Inspire** the Public
10. Commit to an **Evolving Process**

Streetlight Replacement Completion



- New opportunity to easily complete streetlight replacement.
- **City of New Rochelle** and **Village of Elmsford** issued RFP for LED streetlights providing opportunity for others to purchase off their contract.
- Cost of lights has continued to fall. Approximately same price *including* installation.
- Options for either direct purchase or Energy Performance Contract.

Virtuous circle of intermunicipal collaboration and financial/environmental benefit ...



Lessons Learned / Final Thoughts



- Consider energy projects like any other investment (but with added environmental benefits).
- Choose projects that provide significant and verifiable benefits to increase municipal appetite for more.
- Projects economics and technology changes... sometimes faster than we think.
- Collaboration between municipalities can reduce the burden on each municipality (LED streetlight project required significant investment of time) as well as drive down costs.

Thank You!



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Street Lighting in New York Opportunities and Challenges

Climate Smart Communities Webinar

12/10/2014

Peter Savio

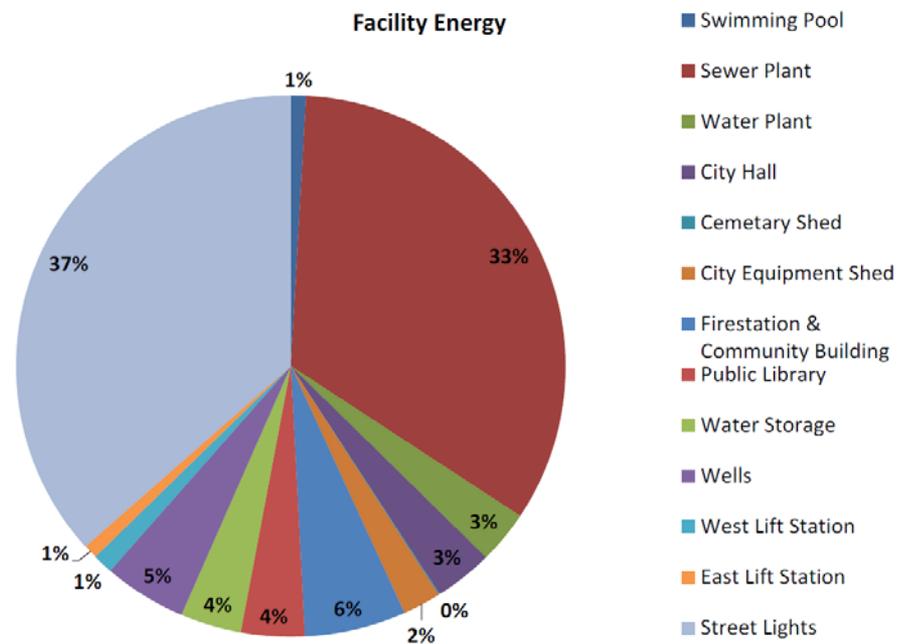
NYSERDA

Overview

- Street Lighting Overview
- New York Street Lighting Inventory
- What is the Opportunity?
- Challenges: Ownership and Tariffs

Street Lights are a Significant Cost

- Up to 60% of Municipal Electric Bill
- Up to 40% of Municipal Electric Use



Street Lighting Technologies

	Mercury Vapor	Metal-Halide	High Pressure Sodium	Induction	LED
Delivery Efficacy (Lumens per Watt)	Low	Medium-High	High	Medium	High-Very High
Lifetime	High	Low-Medium	High	Very High	Very High
Color Rendition	Low	Medium	Very Low	High	High
Initial Cost	N/A	Low	Low	Medium-High	Medium-Very High

Long lifetime, Good Color, High Efficiency,
Becoming less expensive

3 Ways LEDs Save Energy

- Higher Lumens per Watt
 - More Lumens per Watt = Fewer Watts Needed
- Inherent Directionality
 - LEDs reduce or eliminate losses from reflectors
- Better Optical Control of Light
 - Less “Hotspots” → Less over-lighting
 - More Uniform → Better visibility, less light needed

Approximate Energy Savings

Decorative



Post-top
acorn

25-50%+



Decorative
Street Light

Cobrahead/Shoebox



Cobrahead



Full cutoff
cobrahead

40-75%+



Shoebox

New York Street Lighting Inventory

Methodology:

- Street light inventory – 12 NY cities and towns; 453,000+ municipal street lights
- Extrapolate to statewide total
- Estimate statewide lamp type and size; data from five cities data

New York Street Lighting Inventory

Findings:

- Approximately 1,386,000 municipal street lights statewide
- Current total energy consumption of 990 GWh annually ($\approx 0.7\%$ of total NYS electric consumption)
- Vast majority of existing equipment is High Pressure Sodium

How Much Can Be Saved?

Assuming a full statewide conversion...

Measure	Ann. Energy Savings (GWh)	Ann. Energy Cost Savings (\$ Million)	Ann. Maintenance Savings (\$ Million)	Total Ann. Cost Savings (\$ Million)	Total Installed Cost (\$ Million)	Simple Payback (Years)
LED Retrofit	524.0	\$ 27.9	\$ 67.0	\$ 95.0	\$ 435.9	4.6
Advanced Controls	42.0	\$ 2.2	\$ -	\$ 2.2	\$ 41.4	18.5
TOTAL	566.0	\$ 30.2	\$ 67.0	\$ 97.2	\$ 477.3	4.9

Ownership and Tariffs

Customer-Owned

Municipalities may have broad options for implementing LED street light upgrades

- Rate tariffs – electricity cost
- Municipality/jurisdiction responsible for maintenance
- Municipality/jurisdiction may install LEDs and receive the benefits of reduced energy and maintenance costs

Utility Owned Street Lights

Utility-Owned

- Municipalities currently lack clear avenues to implement LED street lighting
 - Municipality pays flat monthly fee that includes equipment, installation, electricity, and maintenance
 - Utility responsible for all maintenance
 - Utility selects technologies offered
 - *Most IOU rate tariffs do not currently offer LED option*

Status of NY LED Rate Tariffs

Utility	Offers an LED Rate for Utility-Owned Street Lights?	Notes
Central Hudson	No	
ConEd	N/A	ConEd customers own their own street lights
National Grid	No	
NYSEG	No	
O&R	Yes	The LED rate offered by Orange and Rockland is approximately 30% higher than other technologies offered by O&R.
RGE	No	
NYPA	N/A	NYPA does not provide street lighting service
LIPA	No	

Challenges to Developing LED Tariff

Utility Concerns:

- Capital cost of widespread conversion
- Potential lost revenue
- Complex rate design challenged by LED technology
- LED performance and cost still evolving

Seattle streetlight experience (for purchases of 2,000+ units)

Fall 2009	Spring 2010	Fall 2011	Winter 2012	Spring 2013
\$369	\$288	\$239	\$204	\$179

Example: O&R's LED Rate

LED Equivalent to 70W HPS

O&R Assumptions (2011)

- LED Fixture Cost: \$531
- LED Fixture Watts: 74

Research from Recent Case Studies

- LED Fixture Cost: \$113-350
- LED Fixture Watts: 32-54

Potential LED Rate – Updated Inputs

Lower LED rates are possible:

	Current O&R Rate 70W HPS	Current O&R Rate 70W LED	ERS/Optimal Estimate
Street Light Cost	\$71	\$531	\$150
Watts Used (with ballast/driver)	108	74	43
Monthly Rate	\$14.56	\$19.39	\$12.39 ^b
Estimated monthly charge ^a	\$691.89	\$631.34	\$403.42 ^b

^aEquals $[(\text{Total wattage}/1000) \times 440 \text{ monthly burn hours} \times \text{Monthly Rate}]$.

^bA rough estimate only - specific analysis applying O&R's rate methodology would be required to determine the actual rate.

Assumes updated cost assumptions; lower wattage fixtures where appropriate

Activities in Other States

Massachusetts

- Legislation passed that required utilities to allow street light purchase

Vermont

- Threat of large-scale street light purchase combined with Legislation

North Carolina

- Regulatory intervention

Current Options for NY Municipalities

1. Review/assess current street light bills, street light inventory (e.g. #, light source, wattage, location/spacing characteristics), street light options
2. Work with IOU to seek high efficiency street light options, including new LED rates
3. Explore Street Light Purchase from Utilities
4. Secure technical support as needed/appropriate

Win-Win-Win Scenario

Municipalities

- Financially Attractive to pursue conversion
- Bill/Rate Savings
- Little or No Capital
- Positive ROI and taxpayer savings
- CO2e reductions

EE Programs

- Technical and financial support to Municipalities to support conversions
- Cost-effective role in conversions
- Positive PR
- CO2e reductions

Utilities

- New rates for LEDs
- Financially attractive to support conversions
- Recovers all costs
- Positive PR

Thank You!

See: <http://www.nyserda.ny.gov/Cleantech-and-Innovation/EA-Reports-and-Studies/Energy-Efficiency-Services-Reports>

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