



Partner Meeting: Outdoor Lighting Accelerator

Better Buildings Summit

Monday, May 9th

MAY 2016 BETTER BUILDINGS SUMMIT

CITY OF HUNTINGTON BEACH –
SCE STREETLIGHT ACQUISITION
AND RETROFIT





Streetlight Overview

Energy Expenditures and SCE Rate Overview

Cost Analysis

Cash Flow & Financing

Acquisition

Revenue Opportunities

Conclusion and Q&A

STREETLIGHT OVERVIEW

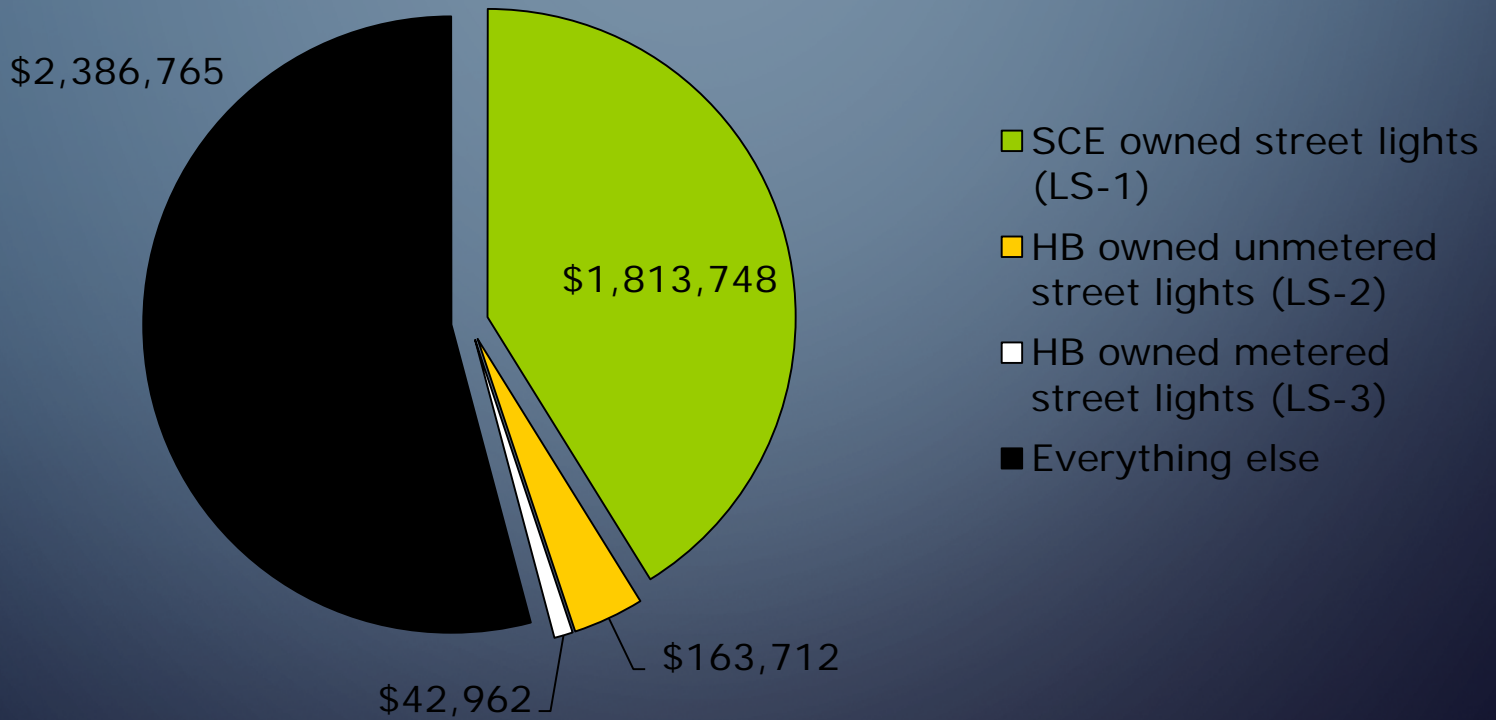
- Streetlights are a significant cost to the City - \$1.8 million per year and rising (proposed 3% rate increase annually)
- Street lighting is the most visible of all energy costs to residents and businesses

STREETLIGHT OVERVIEW – TYPES OF STREETLIGHTS

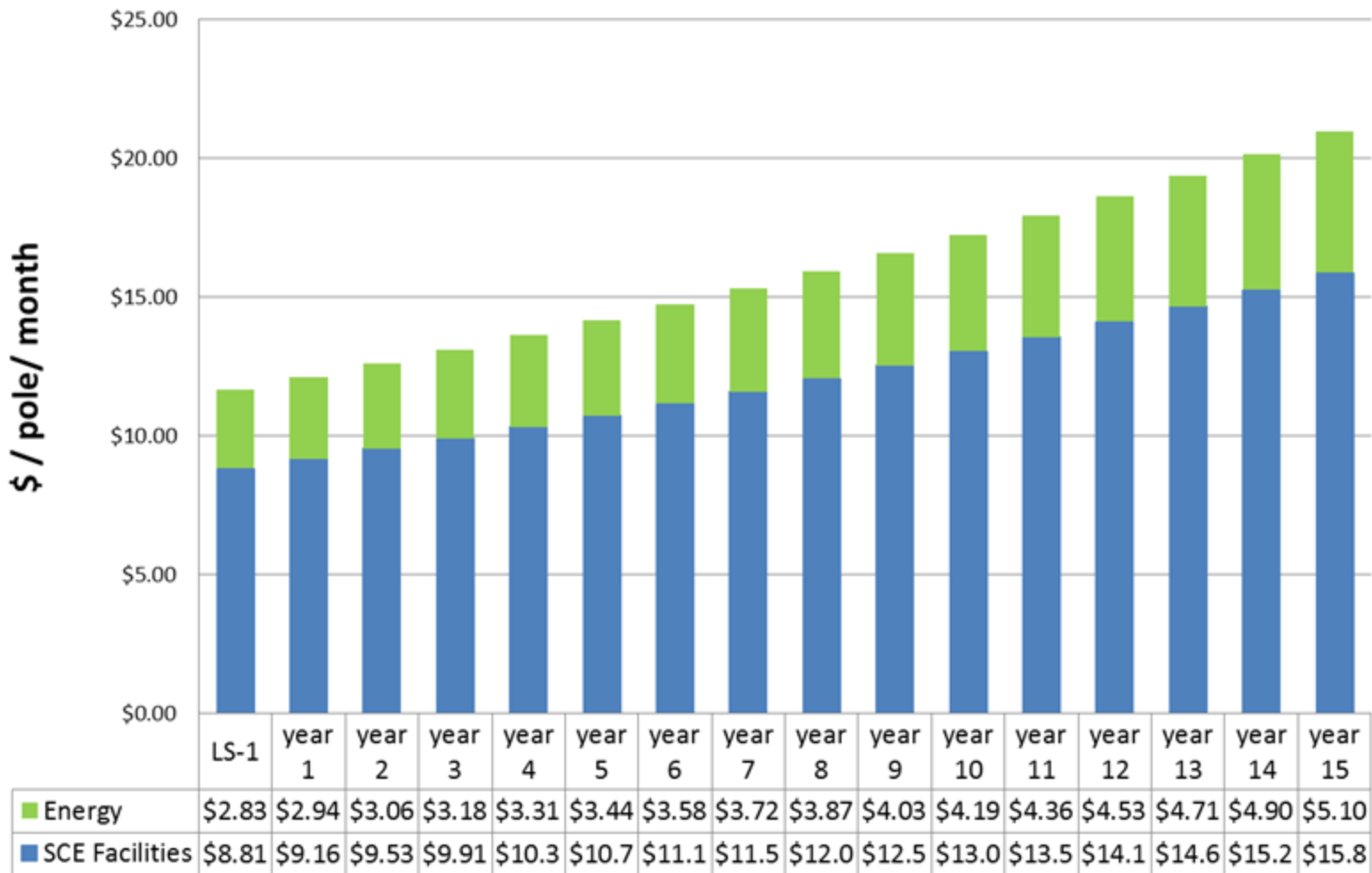
- LS-1 – SCE owned and operated (unmetered) – 13,000
 - Advantages – SCE provides maintenance and service
 - Disadvantages – High rates, annual rate increases, and no local control over upgrades or service issues
- LS-2 – City owned and operated (unmetered) – 2,000
 - Advantages – Lower unmetered rate, local control on upgrades and maintenance
 - Disadvantages – Maintenance of poles falls upon the City

ENERGY EXPENDITURES

FY 14/15 Energy Expenditures



SCE RATE PROJECTIONS



CPUC Rate Projections – information from WRCOG

COST ANALYSIS: COALITION FOR AFFORDABLE STREETLIGHTS (CASL)

- HB joined CASL in 2011
- Coalition of cities – Moreno Valley, Rancho Cucamonga, Murrieta, and Torrance
- CASL and SCE reached a settlement agreement in 2012
- Over \$440,000 in avoided costs from rate increases through our CASL partnership
- SCE changed its policy to **amicably** sell utility owned street lights – This has now changed.

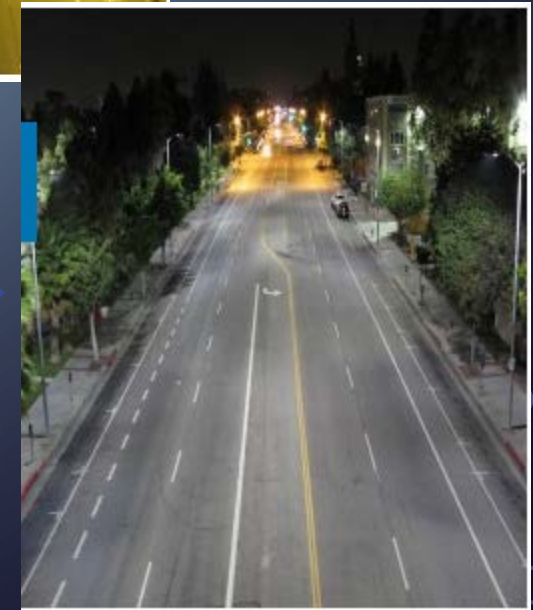
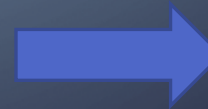
BENEFITS OF LED STREETLIGHTS

- Increased visibility
- Better color rendition
- Less maintenance – 80% reduction in fixture maintenance costs



High Pressure Sodium

LED

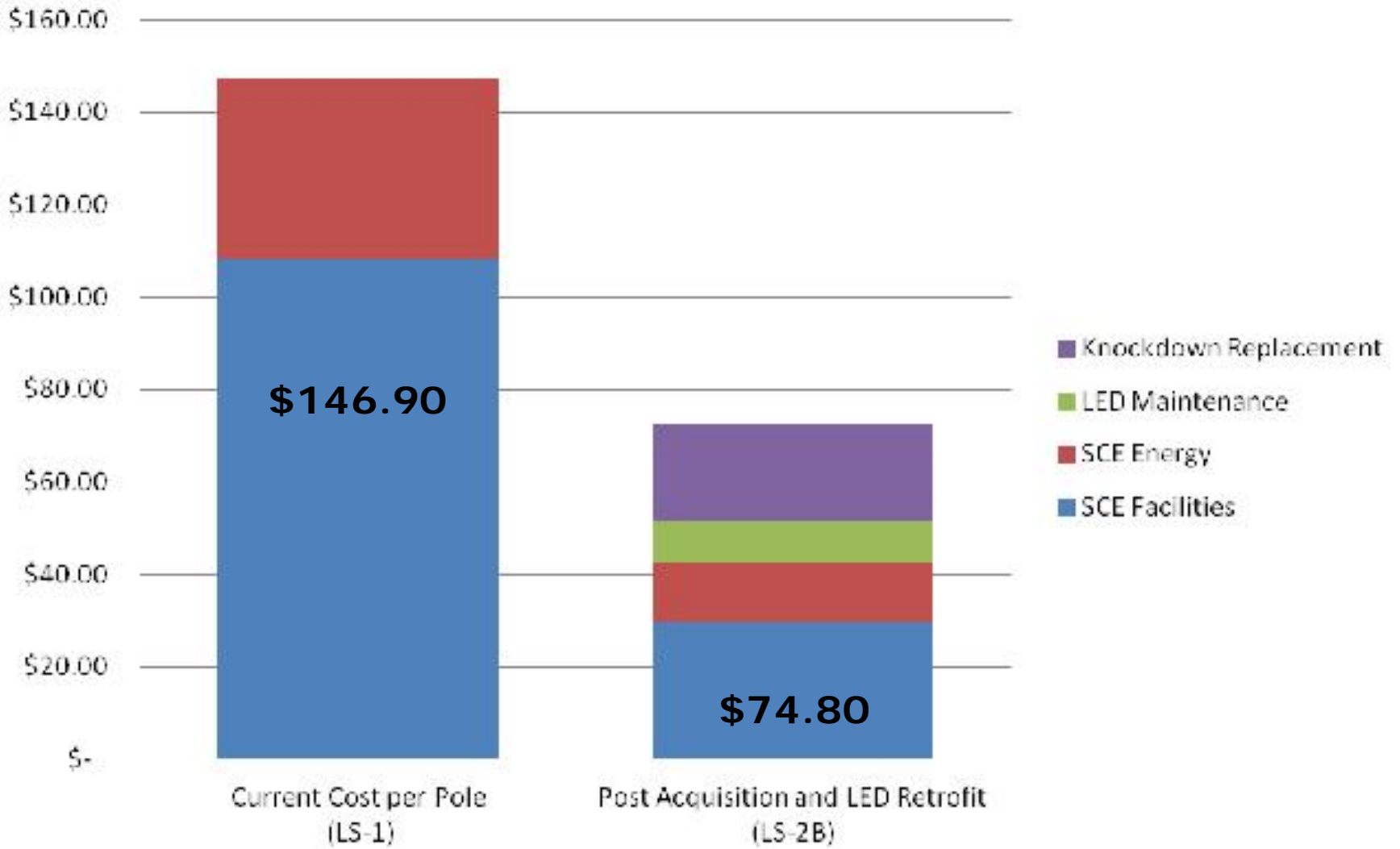


- **More than 50%**

STREETLIGHT COMPARISON

	High Pressure Sodium (HPS)	Light Emitting Diode (LED)
Color	Orange	White
Life Expectancy	24,000 hours (~6 years)	100,000 hours (~20 years)
Energy Use	39 kWh/fixture/month	50-75% less than HPS
LED Retrofit Payback	-	4-12 Years
SCE Accepts	YES	YES

Annual Streetlight Cost Comparison



STREETLIGHT ACQUISITION

Acquisition and LED Retrofit Budgetary Estimates (10 Year Program)

SCE Acquisition of Assets (11,181 street lights)	\$4,358,350
Transfer of Ownership (ID Tagging and Database)	\$420,105
LED Streetlight Retrofit	\$3,695,338
SCE Energy Rebates	(\$702,907)
10 Year Finance Costs	\$911,026
Acquisition and Retrofit Subtotal	\$8,681,912

Streetlight Maintenance Estimates (10 Year)

Maintenance Total (Approximate Estimate)	\$3,000,000
Acquisition, LED Retrofit and Maintenance Total	\$11,681,912

CASH FLOW PROJECTION

Street Light Acquisition and Retrofit Project Cashflow

City of Huntington Beach
Loan Program of 10 Years

Year	1	2	3	4	5	6	7	8	9	10	11	12-20*	Totals
Pre-Acquisition SCE Cost	\$ 1,642,470	\$ 1,687,417	\$ 1,733,626	\$ 1,781,133	\$ 1,829,975	\$ 1,880,190	\$ 1,931,818	\$ 1,984,899	\$ 2,039,476	\$ 2,095,590	\$ 2,153,286	\$ 22,260,512	\$ 43,020,391
Pre-Acquisition Total Annual Cost	\$ 1,642,470	\$ 1,687,417	\$ 1,733,626	\$ 1,781,133	\$ 1,829,975	\$ 1,880,190	\$ 1,931,818	\$ 1,984,899	\$ 2,039,476	\$ 2,095,590	\$ 2,153,286	\$ 22,260,512	\$ 43,020,391
Post-Acquisition SCE Cost	\$ 475,165	\$ 487,982	\$ 501,156	\$ 514,695	\$ 528,610	\$ 542,912	\$ 557,612	\$ 572,721	\$ 588,252	\$ 604,215	\$ 620,623	\$ 6,404,025	\$ 12,397,968
Street Light Maintenance Cost (LED)	\$ 104,268	\$ 152,347	\$ 155,394	\$ 158,502	\$ 161,672	\$ 164,906	\$ 168,204	\$ 171,568	\$ 174,999	\$ 178,499	\$ 268,218	\$ 2,668,690	\$ 4,527,267
Knockdown Maintenance Cost (55 poles/year)	\$ 360,838	\$ 368,055	\$ 375,416	\$ 382,924	\$ 390,583	\$ 398,335	\$ 406,362	\$ 414,490	\$ 422,780	\$ 431,235	\$ 439,860	\$ 4,376,482	\$ 8,767,420
Knockdown Insurance Recovery (36 poles/year)	\$ (236,185)	\$ (240,909)	\$ (245,727)	\$ (250,641)	\$ (255,654)	\$ (260,767)	\$ (265,983)	\$ (271,302)	\$ (276,728)	\$ (282,263)	\$ (287,908)	\$ (2,864,607)	\$ (5,738,675)
Project Lease Payment (Private Loan @ 3%)	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ 552,816	\$ -	\$ 5,528,163
Project Lease Payment (CEC Loan @ 1%)	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ 315,375	\$ -	\$ 3,153,748
Post Acquisition Total Annual Cost	\$ 1,572,278	\$ 1,635,667	\$ 1,654,430	\$ 1,673,671	\$ 1,693,402	\$ 1,713,636	\$ 1,734,387	\$ 1,755,668	\$ 1,777,493	\$ 1,799,677	\$ 1,040,792	\$ 10,584,591	\$ 25,482,144
Total Cash Flow (Pre-Acquisition less Post-Acquisition)	\$ 70,193	\$ 51,750	\$ 79,196	\$ 107,462	\$ 136,573	\$ 166,554	\$ 197,431	\$ 229,231	\$ 261,982	\$ 295,712	\$ 1,112,494	\$ 11,675,921	\$ 14,384,498
Cumulative Cash Flow	\$ 70,193	\$ 121,943	\$ 201,138	\$ 308,600	\$ 445,173	\$ 611,727	\$ 809,158	\$ 1,038,389	\$ 1,300,371	\$ 1,596,084	\$ 2,708,577	\$ 14,384,498	\$ 14,384,498

* Maintenance cost projections in years 11-20 include fixture costs, as material warranty concludes in year 10.

Street Light Acquisition & Fixture Replacement Loan Detail		
Total Loan Amount	\$	8,473,793
SCE Rebate	\$	(702,907)
Capital Contribution	\$	-
Net Loan Amount	\$	7,770,886
	Private Loan	CEC Loan
Loan Amount	\$ 4,770,886	\$ 3,000,000
Interest Rate (assumed)	3.00%	1.00%
Loan Term (years)	10.0	10.0
Payments per year	12.0	12.0
Annual Loan Payment	\$ 552,816	\$ 315,375
Finance Cost	\$ 5,528,163	\$ 3,153,748
Total Finance Cost	\$	8,681,912
Savings Detail and Assumptions		
Total Program Savings	\$	14,384,498
20 Year NPV (5% Discount Rate)	\$	7,137,160
Energy Charge Cost Escalation		2%
Distribution Charge Cost Escalation		3%

Possible SCE Rebate	
Annual Energy Savings (kwh)	3,514,534
Rebate Rate per kwh	\$ 0.20
Total Rebate*	\$ 702,907

*SCE Rebates are not factored in to cash flow

Project Costs	
ECM-2 LED Street Light Retrofit	\$ 3,695,338
FIM 1a- SCE L5-1 Buy Back	\$ 4,358,350
FIM 1b- City Cut-Over	\$ 420,105
Total Financed Cost	\$ 8,473,793

ACQUISITION & RETROFIT

- Advantages

- Reduced street light costs (energy and reduced rate)
- Improved system maintenance and reliability
- Maintenance cost savings (LED fixtures last 15+ years)
- Management control over expenditures
- Improved customer service

- Disadvantages

- Acquisition cost of streetlights from SCE
- City would assume on-going maintenance/customer service
- LED upfront cost of retrofit

ACQUISITION: SCE VALUATION

- Guaranteed max. price \$450/pole
 - ~11,045 poles eligible for sale
- ~\$4.3 million purchase price
- Requires PUC approval (3 month process)
- SCE is halting acquisition program, thus the purchase process must be completed by August 31, 2016

REVENUE GENERATING OPPORTUNITIES

- Wireless/Broadband Capabilities



STREET LIGHTING BECOMES DIGITAL REAL ESTATE



Rendering of a “smart pole”

CONCLUSION

- City's energy program has been successful in focusing on City buildings and City owned streetlights. **The City has been a leader.**

- Cut **5,000,000 kWh** of waste from buildings through re-commissioning and cool roof projects
- Phase I Streetlight Retrofit - annual savings **\$140,296** and saves **1.5 m kWh**
- Achieved platinum partner status with SCE

- **Streetlight acquisition**

- Small initial annual savings (\$70,000-120,000)
- Significant annual savings after pay-off (11th year - \$1 million and 20 years \$12 million)
- Improved customer service and management control
- **80+ cities in the queue to purchase their lights**

NEXT STEPS

CPUC Filing 3-6 months
(Advice Letter) - August
31, 2016 Deadline



Take Over Lights
(one year process)

QUESTIONS





LED street lights conversion in Rhode Island

George Sfinarolakis

May 9, 2016

***“Leading Rhode Island to a secure,
cost-effective, and sustainable energy future.”***

LED street lights

- As of August 1, 2014, Rhode Island municipalities are able to purchase and maintain their own street lights pursuant to the [**Municipal Streetlight Investment Act**](#) .

LED street lights programs

Municipal

- 39 Municipalities – 99,700 fixtures
- Enhanced incentives are being offered in addition to any applicable National Grid-administered incentives and represent a unique project cost savings opportunity

State - Roadway

- DOT 7,500 fixtures
- OER provides technical assistance and financial incentives - 35% of the total cost (RGGI)

LED street lights programs

Municipal

- \$0.40 per watt reduced per LED fixture
- \$20.00 for each remotely-programmable dimming control installed

State - Roadway

- DOT 7,500 fixtures
- OER provides technical assistance and financial incentives - 35% of the total cost (RGGI)

Municipal program

- A qualified municipality can receive a total award of up to \$300,000.00 in addition to any available National Grid-administered incentives.
- This funding is being made available thanks to the State's participation in the Regional Greenhouse Gas Initiative (RGGI).
- Application and information www.energy.ri.gov

State LED Program - Objective

- **Replace all highway (7,500) – DOT owned – HPS fixtures to LED**
- **Install control system**

The OER is the lead state agency on energy policy and programs.

The partnership

- Rhode Island Office of Energy Resources
- Rhode Island Department of Transportation
- National Grid

Benefits of the LED Lighting Retrofit Project

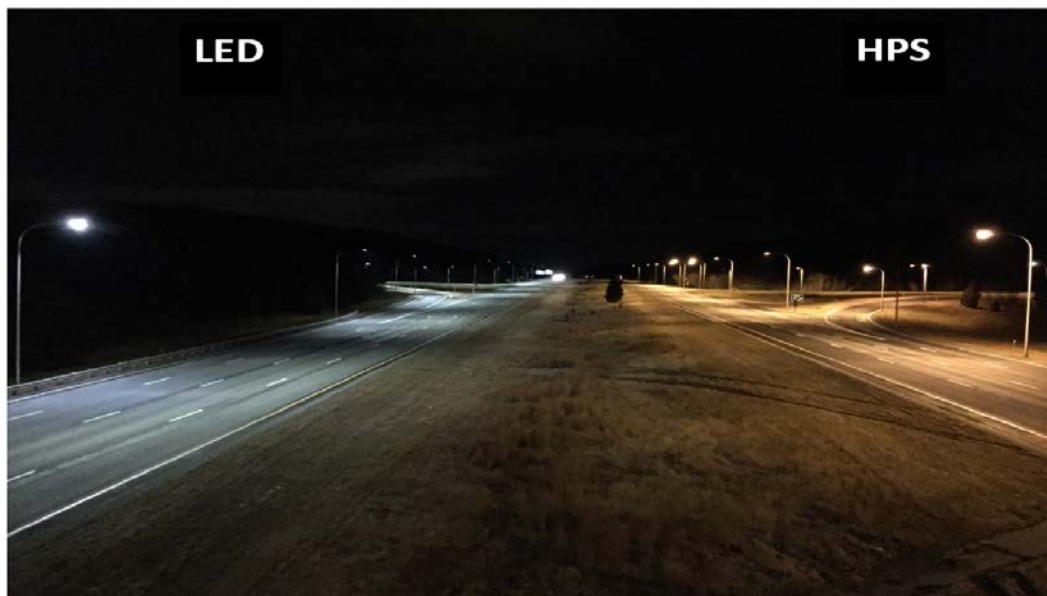
- 47% reductions in electric costs
- Great Maintenance costs savings
- Reliable roadway lighting (expected 20 to 25yrs from LED fixtures, vs. 3-4 years from HPS)
- Remote control of each individual light
- Instant notification of knockdowns, lights out, day-burners
- Reduction of light pollution
- Mash Network set up able to provide real time traffic signal data, vehicle counting data, etc.
- Ability to tie in many ITS devices and other IP based devices to the system
- Asset inventory and management

Challenges

- **Identifying Equivalent LED fixture replacement**
 - Lighting quality study needed
- **Existing poles: distance between existing poles bigger than optimal**
- **Proprietary operation system for light controls**
- **DOT maintenance requested only 2-3 models to cover all replacements**
 - (for inventory maintenance purpose)
- **Location and count data not always accurate**
 - (Relied on inventory done by the GIS section through aerial images)
- **Difficulty to match number of poles-fixtures with existing utility power meters**
 - (multiple meters per interchange)
- **Lead time for the production and delivery of fixtures and controls**
 - Greater than initially anticipated (4 to 13 weeks)
- **Procurement**

Pilot – Jan 2015

- Identify specs for replacing 250w and 400w HPS (meet RP-8 standards)
- Test the functionality of the light control system



Pilot – Jan 2015

Pilot project

- Tested LED fixtures from 5 major manufacturers
- Tested one wireless controller system
- Developed specifications for LED lighting (RP8 guidelines)
- Adopted a wireless controller system for statewide deployment



Innovation

- **Light controls in all fixtures**
 - Outdoor wireless control systems enable lights to “talk” with a server to provide operational improvements and energy savings with utility-grade metering, asset management, remote dimming control per fixture and more.
- **Light controls with tilting sensor**
 - To detect vehicle collisions with light poles
 - To track hit and run drivers through the Traffic Management Center
 - To identify bent poles



Implementation Plan

- **Replace 15% of the total number of fixtures using DOT employees**
- **Replace the remaining 85% through a competitive process - RFP**
 - Completed Projects to date
Installed fixtures = 1,250 fixtures
 - Ongoing Projects
 - Completed by September 16, 2016 = 6,200 fixtures

Project in Numbers

- **Total cost: \$5.5 million**
- **Average cost – LED and controller - \$743 per fixture**
- **Total Energy savings 47%**
- **Annual Total Savings per fixture \$144**
 - (incl. maintenance)
- **Payback period 5.1 years**

Questions

George Sfinarolakis
Chief of Program Development



Southeast Michigan Regional Energy Office

Michigan Street Lighting Coalition



Rick Bunch, Executive Director
Southeast Michigan Regional Energy Office

SOUTHEAST MICHIGAN



REGIONAL ENERGY OFFICE



SE Michigan Regional Energy Office

- Founded in 2007
- SEMREO was the first of its kind in the country—an opportunity for cities to share resources and expertise to help each other save energy.
- SEMREO has grown from five founding cities to 26 participating communities with a total population of over 1.8 million.





Michigan Street Lighting Coalition

- Founded in 2015 to intervene in MPSC case U-17767 brought by DTE
- Goal: fair tariffs that reward energy efficiency investments
- 23 municipalities plus support from Michigan Municipal League and Michigan Townships Association
- Managed by SEMREO; expert witness and rate case attorney; financial and clean energy consultants





Key Michigan Street Lighting Issues

- Tariffs
- Recovery of conversion costs
- Pace of conversions
- Ownership





MPSC U-17767 Outcome

- Rejected DTE's E1 tariff proposal, citing MSLC findings
 - Proposed rates not cost-based
 - CIAC contributions not credited in monthly rates
 - LED maintenance efficiencies not recognized
- Commission mandated "Collaborative" between DTE and municipalities, convened and supported by MPSC staff, to develop better proposal.
- Collaborative started March 2016.
- DTE filed rate case U-18014 on February 1.





MPSC U-18014

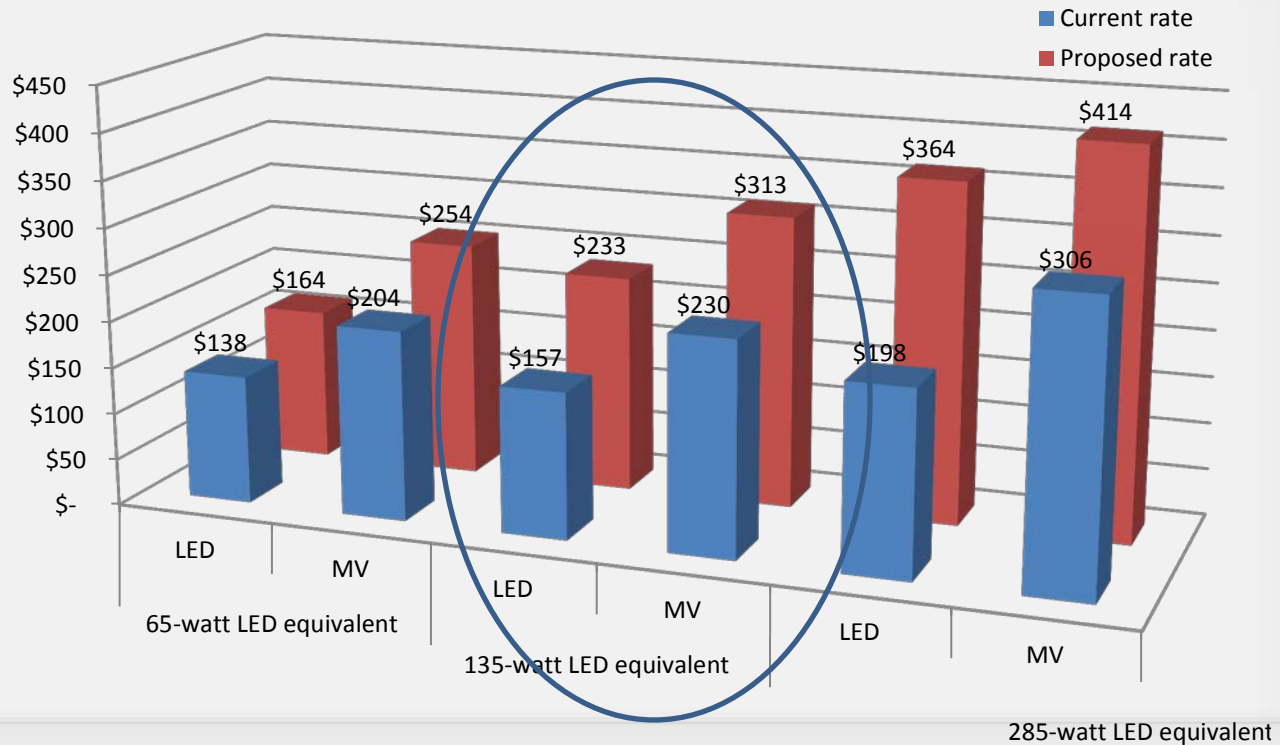
- Previews DTE's negotiating positions for Collaborative
- Formally proposes equal, across-the-board increase to street lighting tariffs
- Previews “cost-based” realignment of street lighting tariffs
 - General rate increase driven by higher rate of return – affects all rate classes
 - Reduce 2:1 ratio of rates for street lights with underground vs. overhead wiring





MPSC U-18014

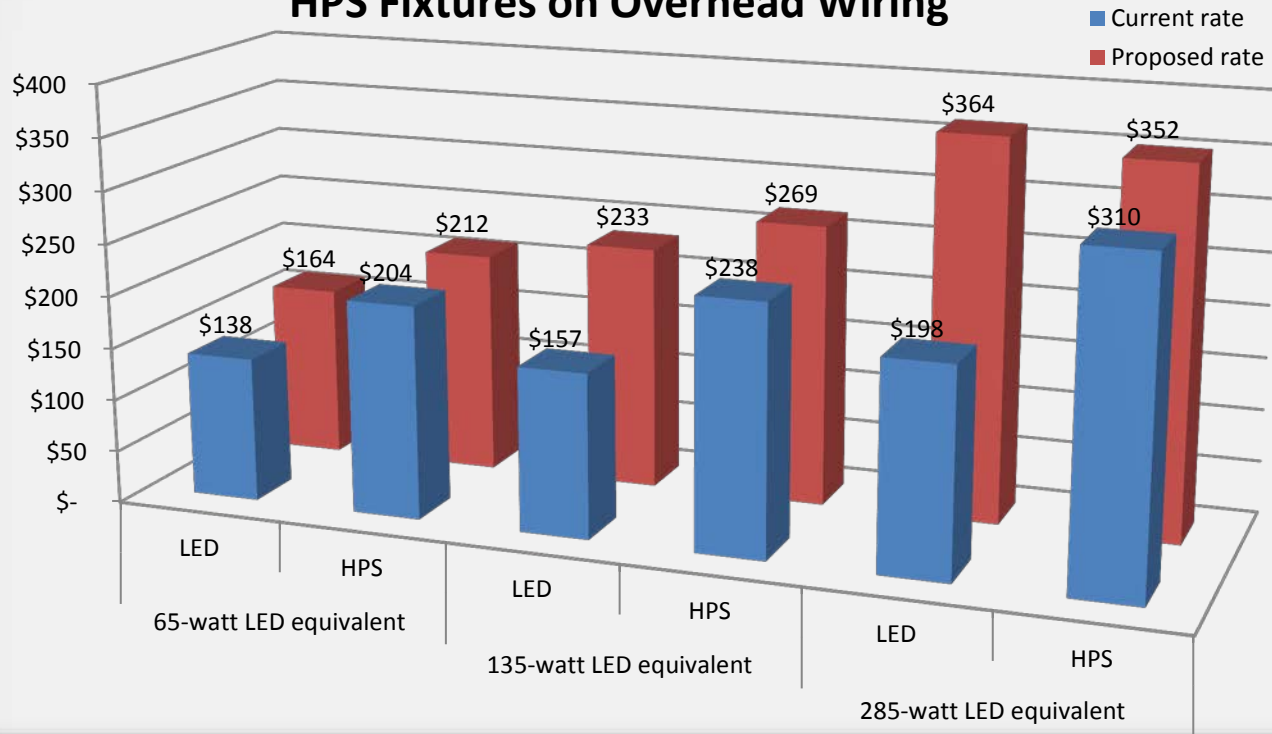
Current and proposed rates for equivalent LED and MV fixtures on overhead wiring





MPSC U-18014

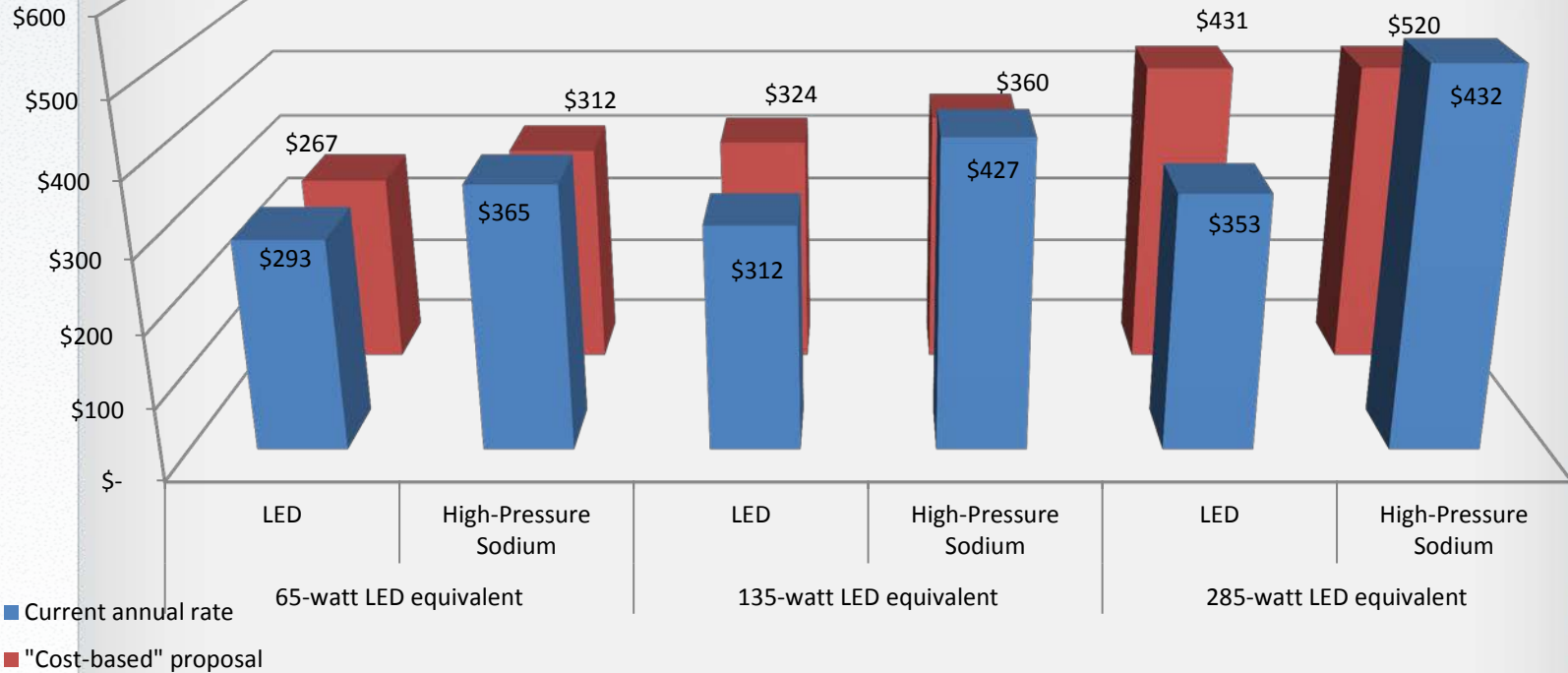
Current and Proposed Rates for Equivalent LED and HPS Fixtures on Overhead Wiring





MPSC U-18014

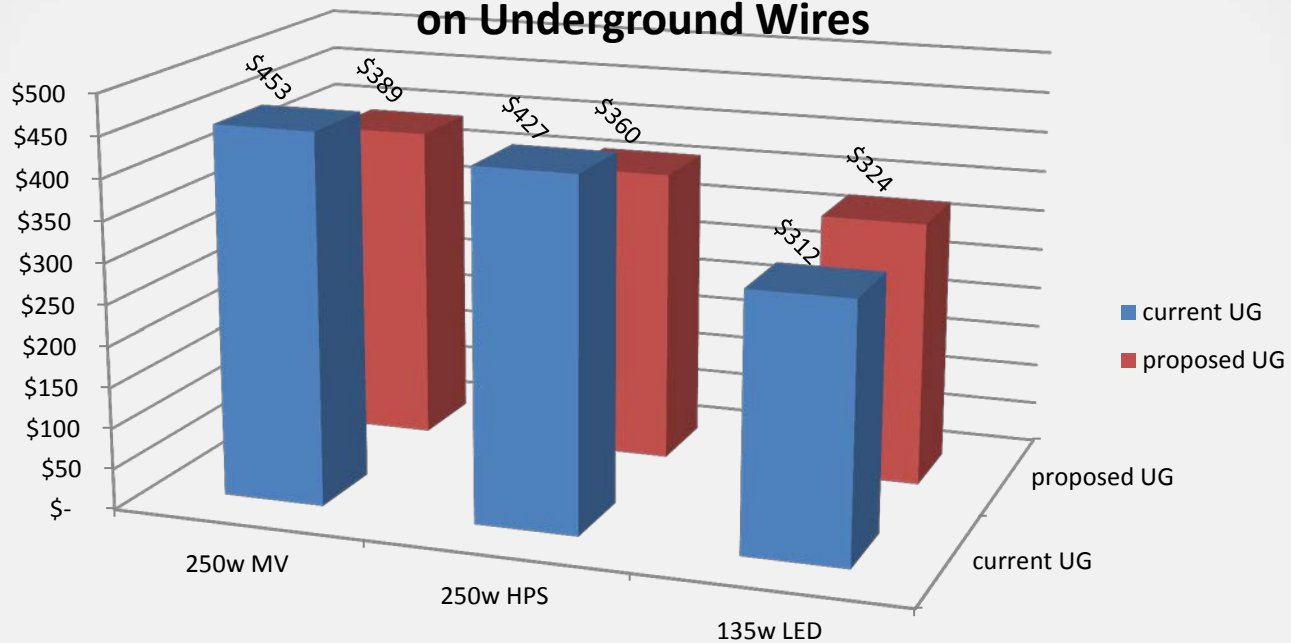
Tariffs for Comparable HPS and LED Fixtures on Underground Wiring: Current and Proposed "Cost-Based" Rates





MPSC U-18014

Current and Proposed Tariffs for Equivalent Fixtures on Underground Wires





Key Learnings

- Cost and price (tariff) aren't related)
- Large information, resource and incentive asymmetries put municipalities at disadvantage BUT munis have political/PR leverage
- Control of street lighting assets is critical
- rick@regionalenergyoffice.org

