

CenterPoint Energy Street Light Luminaire Replacement

LED Street Light Conversion Program

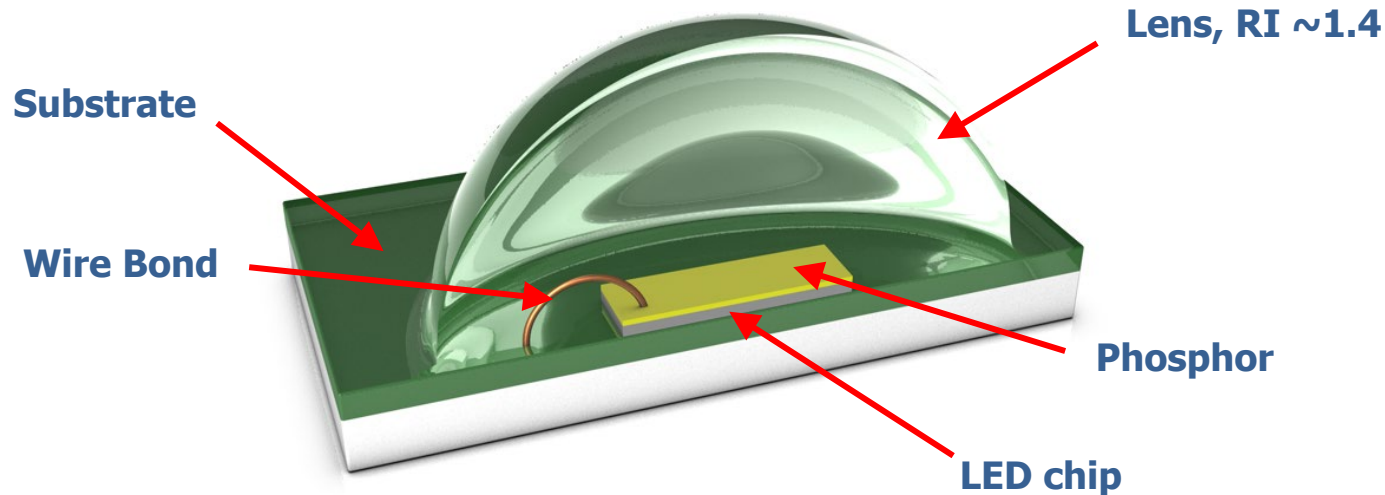
July 11th, 2022

The purpose of this presentation is to provide a brief description of CenterPoint Energy's LED Street Light Conversion Program

- Introduce LED street lighting technology
- Provide information on the conversion project

What is LED?

Light-Emitting Diode: a semiconductor device that emits visible light when an electric current passes through it



The LED Package provides:

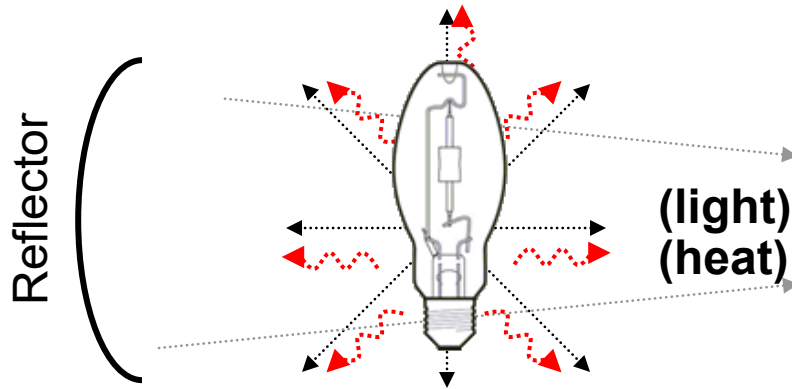
- Protection for the LED chip from the outside environment
- Conductive path to carry generated heat away from the LED chip

Reliability

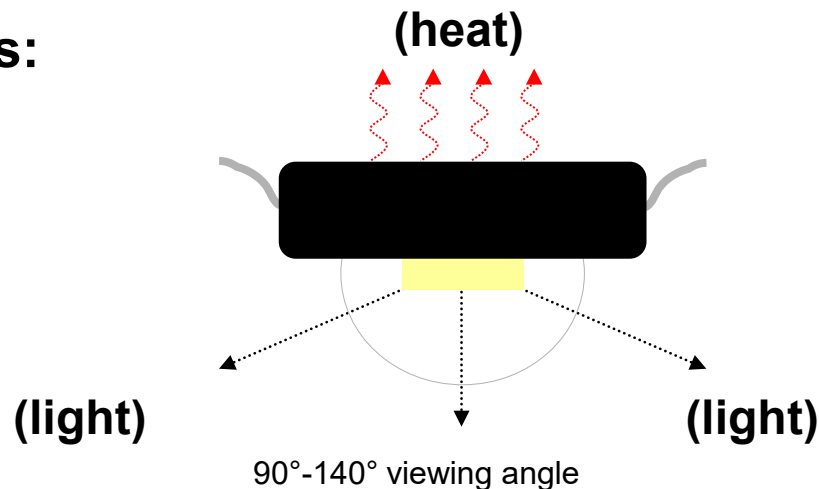
- Lens & encapsulant systems should not discolor under UV and exposure to high amounts of luminous flux

HID Lamp vs. LED Technology

HID lamps:



LEDs:



Technological Differences:

- Directionality of generated light
 - Omni-directional (HID)
 - Directional (LED)
- Means of evacuating generated heat
 - Convection (HID)
 - Conduction (LED)
- Light Source
 - Single (HID)
 - Multiple (LED)

- **High Pressure Sodium**
 - Amber/Orange in Color
 - Standard Installation
 - Economical – 8 year life

- **Metal Halide**
 - White/Blue in Color
 - Not Economical – 2-3 year life
 - More Expensive

- **Mercury Vapor**
 - White/Blue in Color
 - Restricted Availability
 - 1,000 left in system

- **LED – Light Emitting Diode**
 - White/Blue in Color
 - Highly Efficient – 8-10 Years

Traditional Street Lights vs. LED Luminaires

Operate – A Culture of Safety – High Quality White Light

HPS VS LED



Traditional Street Lights vs. LED Luminaires

HPS VS LED



Traditional Street Lights vs. LED Luminaires

HPS VS LED



LED: Advantages and Disadvantages

ADVANTAGES

- **Energy efficient:** 80% of the electricity used by an LED is converted to light, compared to just 10% for incandescent bulbs.
- **Long and predictable life:** LEDs last up to 100,000 hours or more; substantially longer than High Pressure Sodium and Metal Halide lamps
- **Excellent CRI (color rendering index):** LEDs can produce a high quality of white light that allows the eye to detect colors more effectively.
- **Environmentally friendly:** LEDs emit very little infrared radiation and contain no mercury.
- **Directional lighting:** LEDs focus light in a particular direction, making them useful for spotlight and other applications.
- **Quick turn on and off:** LEDs come on with full brightness instantly. Unlike mercury vapor, metal halide and sodium vapor lamps (commonly used in street lighting), LEDs do not have a problem restarting immediately (hot ignition) following a brief power failure or inadvertent turn off.

LED luminaires may provide up to approximately 60% kWh energy savings for the end-use customer

DISADVANTAGES

- **Cost:** LEDs are currently more expensive than other conventional HID sources.
- **Heat:** LEDs are very heat sensitive. Correct dissipation of heat is necessary to light output and lifespan of the fixture.

Equivalent LED Luminaires

LED Luminaire	Percent of CNP Lamps	Alternative For
45 Watt	~75%	<ul style="list-style-type: none">• 100W MV*• 100W HPS*• 70W HPS• 100W MH*
95 Watt	~10%	<ul style="list-style-type: none">• 175W MV• 150W HPS• 175W MH
115 Watt	~14%	<ul style="list-style-type: none">• 250W HPS• 250W MH
180 Watt	~< 1%	<ul style="list-style-type: none">• 400W MV• 400W MH

* MV = Mercury Vapor, HPS = High Pressure Sodium, MH = Metal Halide

- The LED conversion program includes
 - Removal of existing HID luminaire and Photoelectric Relay (PER)
 - Installation of equivalent LED luminaire
 - Installation of “hardened” Photoelectric Relay (PER)

Notes:

- LED luminaire costs have decreased significantly over time and are expected to continue to decline
- Increased life of the LED luminaire, coupled with the “hardened” PER is expected to reduce street light outages

Municipalities will be required to enter into an installation agreement. Some of the terms & conditions included are:

- **Deployment Schedule**

The deployment schedule will be based on the number of lights and current workload

- All new street light installations, including the 6% allotment, will be LED technology
- Agreement to the recently accepted LED tariff rates, and the potential of increased LED tariff rates in the future

100 WATT – MERCURY VAPOR

Inventory:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
1	41	41	492

45 WATT - LED

Total Number of Lights if Converted:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
1	17	17	204

ANNUAL TOTAL KWH SAVINGS

Unconverted KWHs	Converted KWHs	You Save
492	204	288

100 WATT - HIGH PRESSURE SODIUM

Inventory:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
86	38	3,268	39,216

45 WATT - LED

Total Number of Lights if Converted:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
86	17	1,462	17,544

ANNUAL TOTAL KWH SAVINGS

Unconverted KWHs	Converted KWHs	You Save
39,216	17,544	21,672

150 WATT- HIGH PRESSURE SODIUM

Inventory:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
16	58	928	11,136

95 WATT - LED

Total Number of Lights if Converted:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
16	32	512	6,144

ANNUAL TOTAL KWH SAVINGS

Unconverted KWHs	Converted KWHs	You Save
11,136	6,144	4,992

250 WATT - HIGH PRESSURE SODIUM

Inventory:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
18	106	1,908	22,896

115 WATT - LED

Total Number of Lights if Converted:	KWH Hours:	Total KWHs Per Month:	Total KWHs Per Year:
18	38	684	8,208

ANNUAL TOTAL KWH SAVINGS

Unconverted KWHs	Converted KWHs	You Save
22,896	8,208	14,688

TOTAL KWH HOURS SAVED ANNUALLY:

41,640

Questions?