

**Energy Efficiency  
for  
Small Business Owners and  
Property Managers**



**PSEG**

# Goals for Today

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Learn more about how PSE&G can help customers save energy and money and about other resources that are available from the State of New Jersey

Gain a better understanding of the basics of energy efficiency and how they can help you save money

# Resources

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Both the State of New Jersey and PSE&G have resources available to help small businesses become more energy efficient.

## PSE&G

- Direct Install Program
- Business Solutions Center

## NJBPU Clean Energy Program

- Commercial, Industrial and Residential Programs

# Resources

## PSE&G Direct Install Program

The PSE&G Direct Install Program provides affordable energy efficiency solutions to help small businesses (UEZ), government agencies and non-profits save energy and lower costs.

\$15 million program

PSE&G provides a FREE energy audit

PSE&G pays for 100% of the cost of the energy efficiency upgrades recommended in the audit

Participants repay 30% of the cost, interest free, on their PSE&G bill over a period of 36 months (or in one lump sum)

# Resources

## PSE&G Direct Install Program – Basic Eligibility

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Small businesses in the 25 Urban Enterprise Zones (UEZs) in PSE&G service territory

Government and non-profit 501(c)3, 501(c)19 facilities in PSE&G service territory

Peak electric use  $\leq$  200 kilowatt

# Resources

## PSE&G Direct Install Program – UEZ Municipalities

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Bayonne

Camden

Carteret

East Orange

Elizabeth

Gloucester

City

Guttenberg

Hillside

Irvington

Jersey City

Kearny

Mount Holly

New

Brunswick

Newark

North Bergen

Orange

Passaic

Paterson

Pemberton

Perth Amboy

Plainfield

Roselle

Trenton

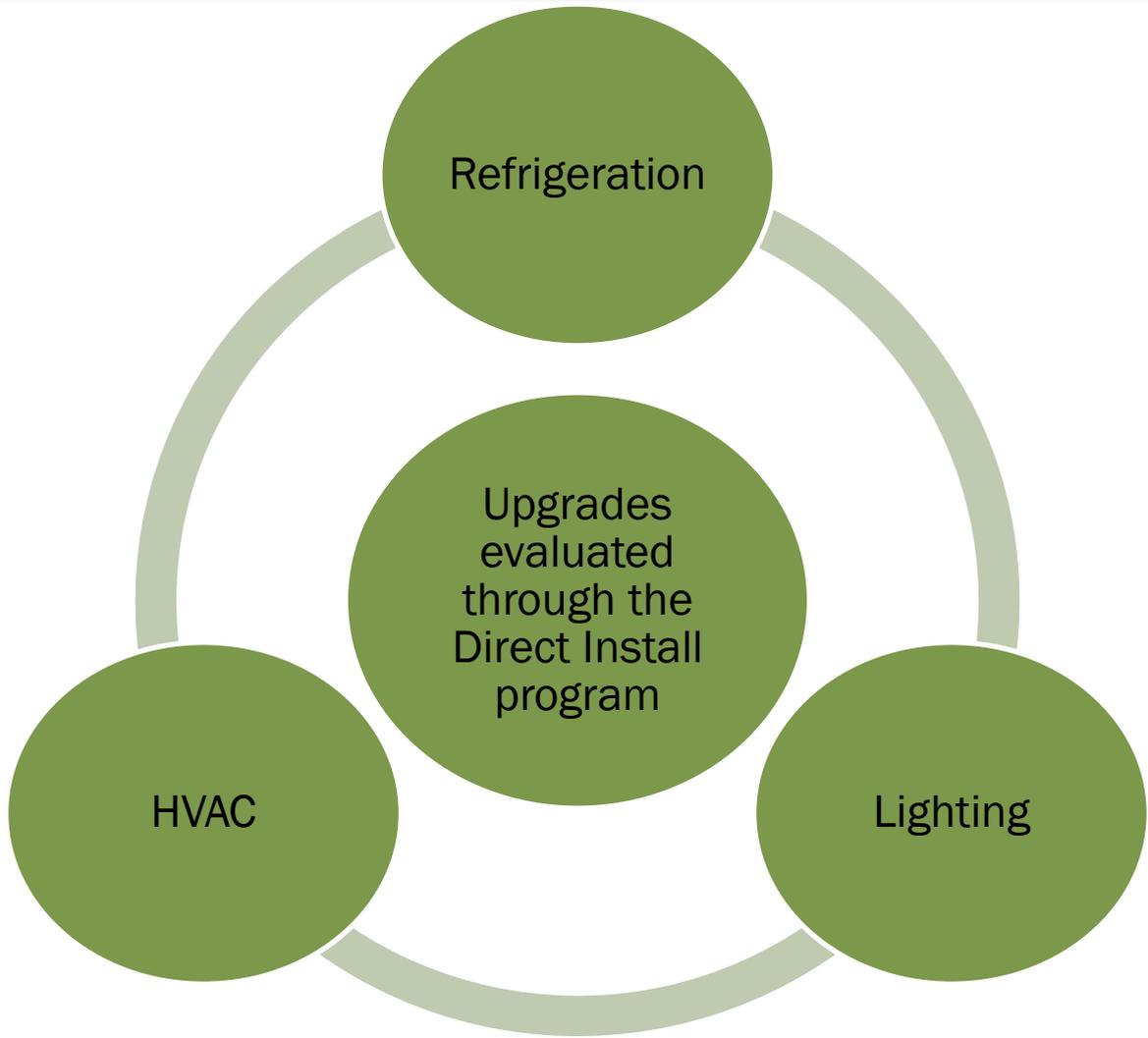
Union City

West New York

# Resources

## PSE&G Direct Install Program

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# Example Project: Typical Direct Install Small Business Customer

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## Audit Findings/Site Conditions:

- Aging equipment
- End of life & early upgrade scenarios
- Hours of operation

## Energy Conservation Measures:

- Lighting Upgrades
- Replacement of aging rooftop HVAC units
- First generation lighting to low wattage- high efficient lamp and ballast technology- improve light output for fewer watts
- Sensors where applicable
- Old Exit signs to be replaced with LED Exit signs

# Example Project: Direct Install Small Business Customer

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Total Material Cost	\$143,526.64
Total Labor Cost	<u>\$138,239.10</u>
Total Project Cost	<u>\$281,765.74</u>

## Annual Savings

• Electric	\$30,879.44
• Gas	\$ 2,121.00
• Maintenance (3-yrs)	\$ 2,457.77
• HVAC Maintenance	\$ 5,000.00
• HVAC From Lighting	<u>\$ 525.00</u>
• Total Annual Savings	<u>\$40,983.20</u>

# Example Project: Direct Install Small Business Customer

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<b>PSE&amp;G Payment (70%)</b>	<b>\$197,236.01</b>
<b>Customer Payment (30% )</b>	<b><u>\$ 84,529.73</u></b>
<b>Total</b>	<b><u>\$281,765.74</u></b>

<b>Monthly Reduction on Utility Bill</b>	<b>\$ 3,415.27</b>
<b>Monthly Customer Payment</b>	<b><u>\$ (2,348.05)</u></b>
<b>Monthly Positive Cash Flow</b>	<b>\$ 1,067.22</b>

# Example Project: Direct Install Small Business Customer

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- Energy Savings: 260,012 kWh and 2,600 therms annually
- Enough electricity to power about **40 average size homes** annually and supply the **natural gas for two average size homes for a year**
- 30 acres of trees planted
- 15 cars removed from our roads
- 9,550 gallons of gasoline saved

# Resources

## PSE&G Direct Install Program

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For more information or to apply to the Direct Install program visit:

[www.pseg.com/directinstall](http://www.pseg.com/directinstall)

Direct Install Team Contact :

directinstall@pseg.com

Direct Install phone: (888) 541-3595

# Resources

## NJBPU Clean Energy Program

### New Jersey State Incentives

### NJBPU Clean Energy Program

[www.njcleanenergy.com](http://www.njcleanenergy.com)

- Commercial
- Industrial
- Residential

The screenshot shows the website for the New Jersey State Incentives NJBPU Clean Energy Program. At the top, there is a search bar and a navigation menu with categories: HOME, RESIDENTIAL, COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT, and RENEWABLE ENERGY. The main content area is titled 'Commercial Industrial and Local Government Programs' and features a photo of a diverse group of professionals in hard hats reviewing documents. Below the photo are two prominent blue buttons: 'Find Your Industry' and 'Programs Available'. The page also includes a sidebar with 'Program Updates', 'Program Literature', 'Success Stories', 'Local Govt and Schools', 'Business Energy Advisor', and 'Subscribe to eNewsletter'. The footer contains the NJBPU logo and the PSEG logo.

# Resources

## PSE&G Business Solutions Center



PSE&G has created a dedicated website and toll-free phone number to address business customers' energy questions and concerns.

[www.pseg.com/businessresources](http://www.pseg.com/businessresources)

1-855-249-7734 (1-855-BIZ-PSEG)

# The Basics: How Energy is Measured

## Power versus Energy

- Kilowatt (kW) is a measure of power/demand



- Kilowatt-hour (kWh) is a measure of energy/load consumption. It is the amount of power used over time...



Energy Cost = Energy Consumption in kWh x Cost of kWh

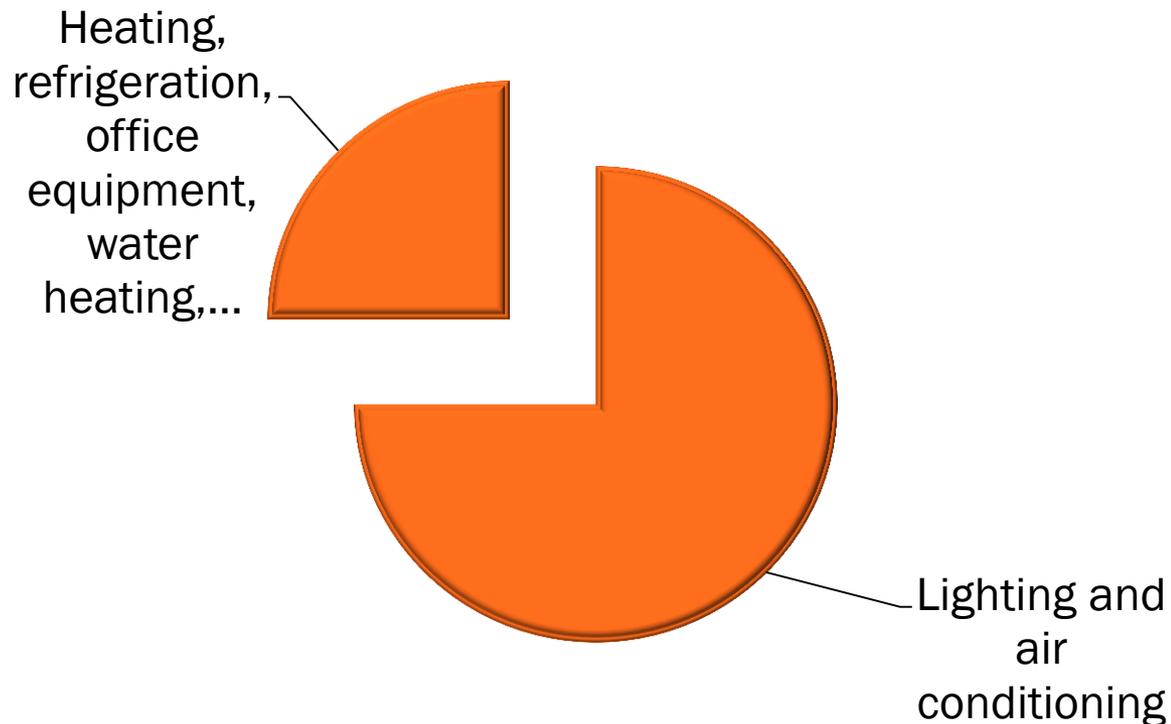
A 100 watt light bulb operated 16 hours a day costs about \$58 a year (.100 kW x 5,840 hr x \$0.10/kWh = \$58.40)

# The Basics

## Typical Energy Use

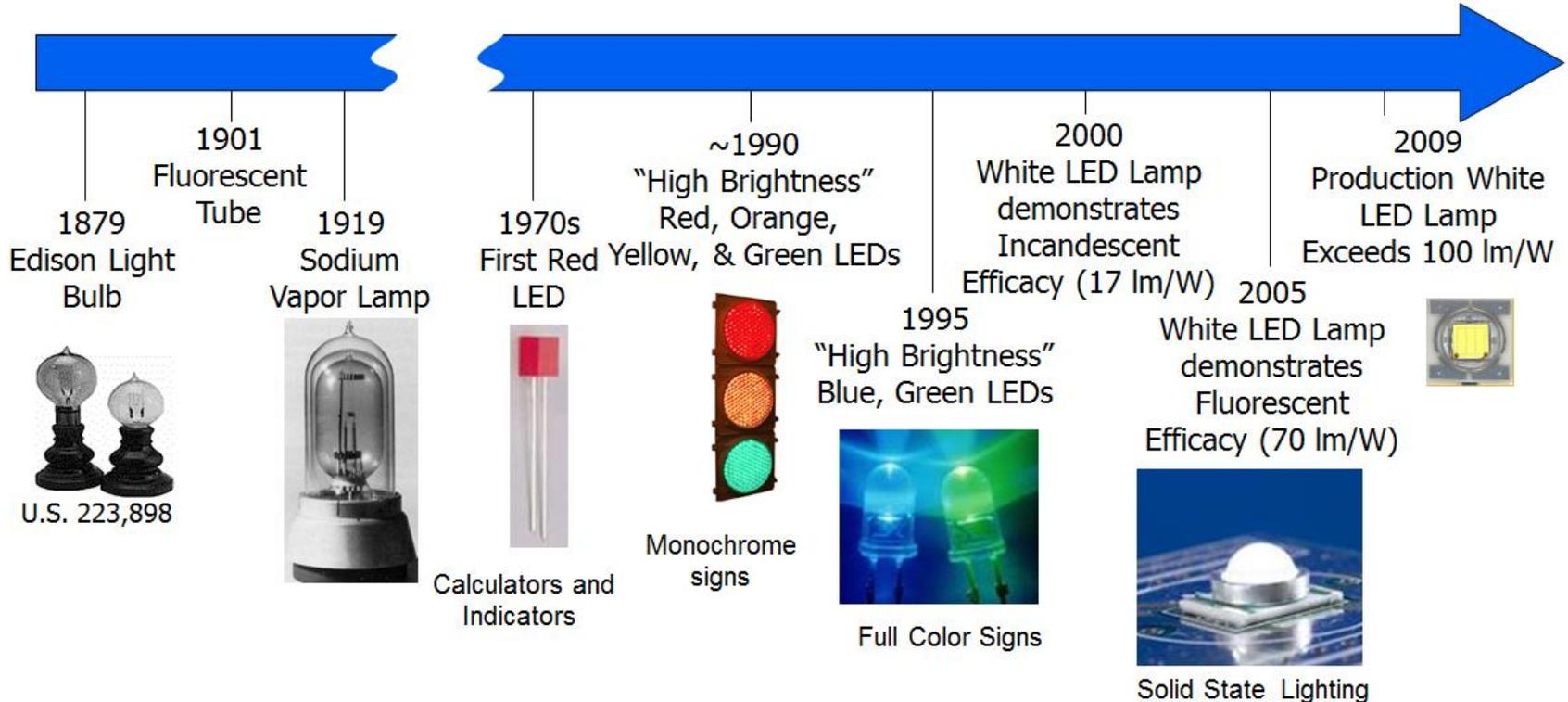
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- Lighting and air conditioning account for 75% of electric use at a typical small business
- These two items offer the greatest opportunity for energy and dollar savings



# The Basics Lighting

- Lighting technology is 120+ years old
- LEDs are poised to become the most efficient light source ever created



# The Basics

## CFL and LED Lighting



### LED

- 60 to 100 lumens per watt
- Shock/vibration resistant
- No life impact from frequent on/off
- Great in cold temperatures
- Daylight and occupancy
- More than five years “always on” life
- 90% less energy use compared to incandescent



### Compact Fluorescent Lamps

- The replacement for the incandescent lamp
- Available in a wide range of wattages and shapes
- Relatively Low Cost
- Up to one year “always on” life
- 75% less energy use compared to incandescent

# The Basics

## Benefits of LED Lighting

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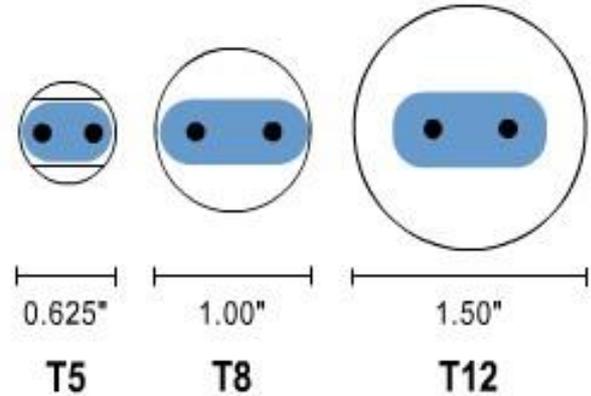
- Instant-on at full brightness and directional - no wasted light
- Long life - Last up to five times longer than CFLs
- More versatile and durable
- Fully Dimmable- additional energy savings
- No sensitivity to cold temperatures
- Available in soft, warm, and bright hues
- LEDs are safer for the environment - no mercury

# The Basics

## Fluorescent Lighting

### Replace Existing T12 Fixtures

- T8 fluorescent lamps or LEDs
- Up to 30% savings!



Four-lamp T12 versus T8 Fixtures			
Lamp Type	Fixture Watts	Fixture Lumens	LPW
F40T12	190	10,800	57
F34T12	144	10,600	74
F32T8/LED	113	10,600	94



# The Basics Fluorescent Lighting

## Increasing Fixture Efficiency

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- Many lighting retrofits re-used 30 year old fluorescent fixtures that are inefficient
- Lenses may be discolored or damaged
- May still be a very cost effective energy efficiency upgrade

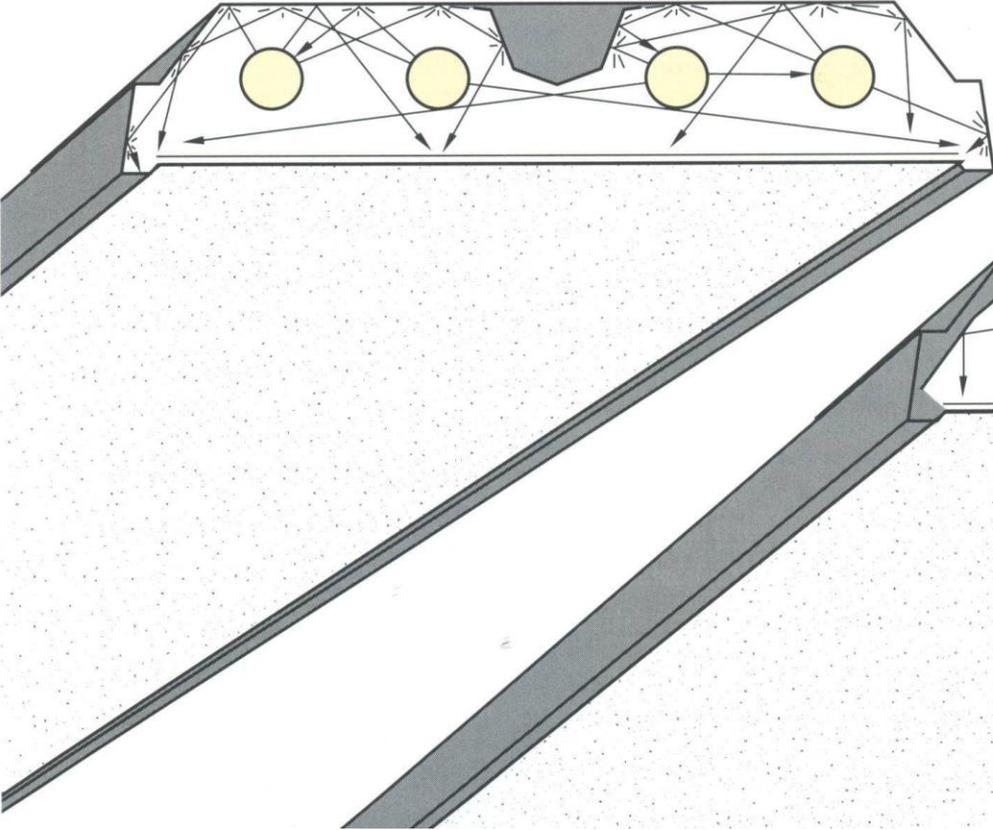


# The Basics

## Reflectors - Fixture and Lamp Efficiencies

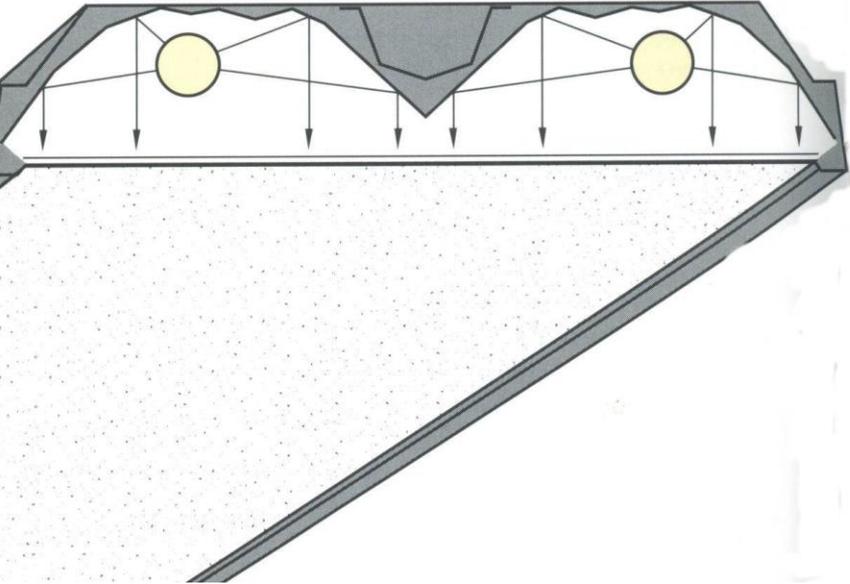
### *Without reflector*

Light undergoes multiple diffuse reflections and loses intensity before leaving the fixture.



### *With reflector*

Light reflections are minimized by the specular reflective surface, reducing light loss within the fixture. The downward concentration of light reduces uniformity of illumination, but can also reduce glare. With 50% delamping, average light levels can be reduced by 25-40%.



# The Basics

## Fluorescent Fixtures for High Ceiling Applications - Examples

Before



After



# The Basics

## Fluorescent Fixtures for High Ceiling Applications

- T5 Fluorescent fixtures
- 42 fc under fixtures
- 36 fc between fixtures



# The Basics

## Outdoor and Area Lighting

### Outdoor and Area Lighting

- Lumen maintenance higher for LEDs versus HID lighting
- Color rendering and uniformity for LEDs are better than HPS
  - Minimum illuminance levels equal to HPS (perceived as better)
- Simple payback of 3 to 10 years minimum
  - Capital cost of \$850 for LED versus \$250 for HPS or CMH cobra head
  - Energy savings of 30% to 50%



LED (left) vs. HPS (right)

# The Basics

## Exit Signs

Annual cost of ownership for LED exit signs is much less than for fluorescent exit signs

	Wattage	Rated Life, (yrs)	Initial Cost	Annual Energy Cost	Annual Maintenance Cost	Total Annual Ownership Costs
Incandescent	40	0.5	\$6	\$25	\$10	\$47
Fluorescent	11	1-1.5	\$22	\$7	\$5	\$30
LED	5	6-10	\$22	\$3	0	\$6

Incandescent



Fluorescent



LED



# The Basics

## Occupancy Sensors

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- ▶ Can deliver 30% or more savings, especially for low use areas
- ▶ PIR – Passive Infrared Technology
  - Senses occupancy by detecting the movement of heat emitted from the human body against the background space.
- ▶ Ultrasonic –
  - Senses occupancy by bouncing sound waves off of objects and detecting a frequency shift between the emitted and reflected sound waves
- ▶ Dual Technology
  - Combination of PIR and US technology
- ▶ Common Wall sensor PIR
  - Good Common wall sensor for most
  - Applications, good for small office.
- ▶ Fixture Mounted or ceiling Mounted

# The Basics

## HVAC Equipment

- ▶ HVAC = Heating, Ventilation and Air Conditioning
- ▶ Roof Top Units
- ▶ Split Systems
  - Heat and Cool
- ▶ Boilers
  
- ▶ Rule of thumb, consider replacement or upgrade if equipment is more than 20 years old



# The Basics

## Thermostat Setback

Save 1.5% per °F per 12 hrs.

- ▶ Lowering thermostat by four degrees for 12 hrs. saves 6%



Upgrade older HVAC (10 to 15 years)

- ▶ Rooftop HVAC: 1.5 kW/ton → 1.2 kW/ton (20% less!)



# Wrap Up

## Simple Things You Can Do Right Now

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Replace high use lamps/fixtures with LEDs

Turn off appliances at night or when not in use.

Lower thermostat settings at times when business is closed

Battery chargers continually draw power when plugged in

- Unplug when batteries are fully charged or not in use.

Change (or clean if reusable) HVAC filters every month during peak cooling or heating seasons.

- New filters usually only cost a few dollars.
- Dirty filters cost more to use, overwork the equipment and lower indoor air quality.

# PSE&G Contact

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Direct Install Team Contact :

[directinstall@pseg.com](mailto:directinstall@pseg.com)

Direct Install phone: (888) 541-3595