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LIGHTING = CASH + CODE

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BENEFITS
OF
LED Technology

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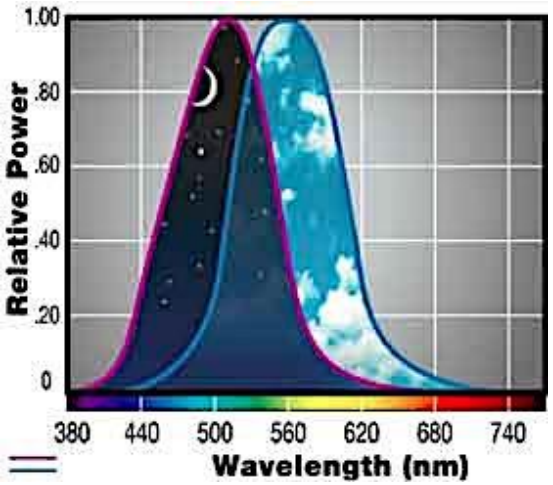
Advantages & Benefits

- Significantly lower wattages
- Longer Life of Lamp/Maintenance Savings
- Superior Light Output
- Safer Material
- HVAC Savings

Advantages & Benefits

SUPERIOR LIGHTING

- Light quality
  - High Color Rendering Index
- Wide range of Kelvin temperatures (2700K – 6500K)
- Higher Efficiency/Higher Lumen to Watt Ratio
- Instant on/off with no degradation of lamp life
- No UV light generated



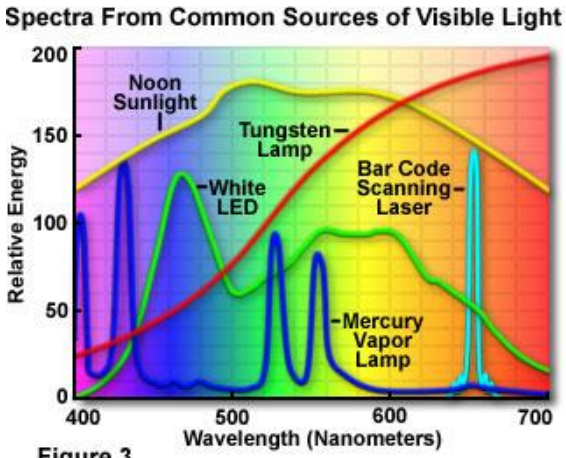


Figure 3

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Longer Life of Lamps

Traditional Lighting

- 60W Incandescent
  - Avg Life 5,000hrs

- 13W CFL E27
  - Avg Life 8,000hrs

- 4’ 32W Linear Fluorescent
  - Avg Life 10,000hrs

- 250W Metal Halide
  - Avg Life 10,000hrs

LED Replacements

- 9W A19 LED Bulb
  - Avg Life 40,000hrs

- 7W A19 LED Bulb
  - Avg Life 40,000hrs

- 15W 4ft Linear LED Tube
  - Avg Life 50,000hrs

- 60W LED Metal Halide Wallpack
  - Avg Life 50,000hrs

Significant Wattage Reduction

Traditional Lighting

- 60W Incandescent

- 13W CFL E27

- 4’ 32W Linear Fluorescent

- 250W Metal Halide

LED Replacements

- 9W A19 LED Bulb
  - 85% Reduction

- 7W A19 LED Bulb
  - 46% Reduction

- 15W 4ft Linear LED Tube
  - 53% Reduction

- 60W LED Metal Halide Wallpack
  - 76% Reduction

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Examples of LED Technology

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LED Tubes

- Direct Replacement of Linear Fluorescent
- Internal vs External Drivers
  - Internal Drivers – NO BALLASTS
  - External Drivers – WORK WITH FLUORESCENT BALLASTS
- Options
  - Various K temperatures
  - Clear and milky lenses
  - 2-8 foot versions
  - Multivoltage
- Applications
  - Stairwells
  - Maintenance Areas
  - Office Spaces

Retrofit LED Lamps

- Screw-in lamps for all applications
  - PARs & Spotlights
  - Household & High Power
  - Decorative
- Many options
  - K temperatures
  - Beams angles
  - Wattages
  - Voltages and base types

LED Interior Fixtures

- Sconces
- Ceiling lights
- Lay-in troffers
- Energy Star/UL Listings
- Typically comes with a 5 year warranty
- Provides solutions for a number of applications:
  - PL-based CFL fixtures
  - Customer w/ UL requirements
  - New construction projects

LED **Exterior Fixtures**

- Building Mounted Fixtures
- Cobraheads
- Wall Washers
- 5 - 7 year warranty
- New exterior fixtures, rather than retrofits, often provide highest value for customers

Third Parties and Standards

Underwriter's Laboratories (UL)
Relevant Parties and Standards

- Independent product safety certification from Underwriters Laboratories
- Tests the following :
    - Product
    - Materials
    - Components
    - Assemblies
    - Tools
    - Equipment
- Considered the leader in product safety and certification in the world

DesignLights Consortium (DLC)
Relevant Parties and Standards

- Collaboration of utilities & efficiency organizations committed to raising awareness of benefits of efficient lighting for commercial consumers
- Qualified Products List
  - Rebate eligibility through high-quality, high-performance, tested & verified LED products
- DLC listing is REQUIRED for all utility rebates

DESIGNLIGHTS CONSORTIUM

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Other Standards
Relevant Parties and Standards

- **ETL:** Proof of Product Compliance from Intertek's *Edison Testing Labs*
- **CE**: Mandatory mark for products placed on the market in the European Economic Area
- **Energy Star**: International standard for energy efficient consumer product originated in the U.S.
  - 6,000 hr. evaluation period

NYC LED Lighting Rebate programs

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NYC LED Lighting Rebate Programs

- In NYC, there are two separate rebate programs available to commercial/industrial customers
  - *NYSERDA*
  - *Local Utility (CON ED)*
- These programs provide REBATES for LED Lighting. These rebates cover:
    - Materials
    - Installation
    - Disposal
- These LED rebates are given both **prescriptively & on a custom basis**.

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conEdison
GREEN TEAM

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NYSERDA

- Rebates are available to owners through the “Existing Facilities Program” under the Lighting Retrofit category
- What kind of LED upgrades qualify for rebates?
  - Fixture Replacements
  - Screw-ins
  - Downlights
- All products must be new as well as Energy Star or DLC Approved

Con ED Lighting Rebate Programs

- Con Ed offers three different rebate incentive programs

1. Commercial Industrial Program
2. Multi-Family Program
3. Demand Management Program

Con Ed Commercial Industrial

- This program is offered to commercial buildings or multi-family buildings with over 75 units.
- Most interior and exterior lights and fixture replacements qualify for rebates.
- All products must be either Energy Star or DLC approved in order to qualify for rebates

Con Ed Multi-Family

- This program is offered to multi-family buildings with 5-75 units.
- The rebates only apply to lighting upgrades in common areas.
- Eligible lights include tube lights, screw-ins, new interior fixture replacements, exterior fixture replacements and garage fixture replacements
- Added incentives are offered for lighting controls for these buildings as well.

Con Ed Demand Management

- This program is based on the reduction in energy consumption that will be achieved by converting existing lighting to more efficient LED's.
- Incentives are given in the form of a fixed amount for every kWh reduction your building will consume by converting to LED's
- Bonus incentives are offered for projects with a drop in usage that exceeds 500 kWh.
- Incentives Capped at 50% of the total project

Case Studies

Case Study #1 – Small Apt Building

	Current Lighting	*LED Conversion*	*Savings by Year*	*Percent Reduction*
Electric Used for LIGHTING this year	10,072 kwh	4,713 kwh	5,358 kwh	**53%**
Electric Cost for LIGHTING this year	$1,732.00	$810.00	$922.00	**53%**
Maintenance (bulb and ballast replacement & MAN HOURS)	$233.00	$111.00	$122.00	**52%**
Yearly Electric & Maintenance Cost per year for LIGHTING	$1,966.00	$922.00	$1,044.00	**53%**

Total Cost: $2,302.00
Con Ed Rebate: $1,450.00
Net Cost of Project: $870.00
Return on Investment: 10 months

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Case Study #2 – Large Apt Building

	Current Lighting	*LED Conversion*	*Savings by Year*	*Percent Reduction*
Electric Used for LIGHTING this year	293,106 kwh	135,917 kwh	157,189 kwh	**54%**
Electric Cost for LIGHTING this year	$47,041.00	$21,813.00	$25,228.00	**54%**
Maintenance (bulb and ballast replacement & MAN HOURS)	$7,704.00	$3,705.00	$3,999.00	**52%**
Yearly Electric & Maintenance Cost per year for LIGHTING	$54,746.00	$25,519.00	$29,227.00	**53%**

Total Cost: $87,577.00
Con Ed Rebate (C&I): $13,211.00
Net Cost of Project: $74,366.00
Return on Investment: 2.5 years

Case Study #3 – Office Building

	Current Lighting	*LED Conversion*	*Savings by Year*	*Percent Reduction*
Electric Used for LIGHTING this year	299,396 kwh	68,593 kwh	230,802 kwh	**77%**
Electric Cost for LIGHTING this year	$65,867.00	$15,090.00	$50,777.00	**77%**
Maintenance (bulb and ballast replacement & MAN HOURS)	$3,105.00	$463.00	$2,642.00	**85%**
Yearly Electric & Maintenance Cost per year for LIGHTING	$68,972.00	$15,553.00	$53,419.00	**77%**

Total Cost: $98,744.00
Con Ed Rebate (C&I): $28,870.00
Net Cost of Project: $69,875.00
Return on Investment: 1.3 years

Case Study #4 – Nursing Home

	Current Lighting	LED Conversion	Savings by Year	Percent Reduction
Electric Used for LIGHTING this year	1,139,365 kwh	417,005 kwh	722,360 kwh	**63%**
Electric Cost for LIGHTING this year	$172,044.00	$62,967.00	$109,076.00	**63%**
Maintenance (bulb and ballast replacement ONLY; NO LABOR INCLUDED)	$49,480.00	$1,887.00	$47,593.00	**96%**
Yearly Electric & Maintenance Cost per year for LIGHTING	$221,525.00	$64,855.00	$156,669.00	**70%**

Total Cost: $386,261.00
Con Ed Rebate (DM): $142,541.00
Net Cost of Project: $243,720.00
Return on Investment: 1.6 years