



## Universal ROI Calculator

### An Estimating Tool to Compare Payback of LED Lighting

[Click for Wide Screen Version](#)

#### Please read:

Light levels are NOT calculated or suggested.  
This calculator gives payback time, and both the annual and life-time savings figures for energy, maintenance, and CO<sub>2</sub> production. It calculates Lighting Power Density from area of at least 50 square feet per fixture, and provides the maximum fixtures allowed from a target LPD. It's not exclusive to LED, can compare any lighting.

Simple ROI is calculated on product lifetime with the industry standard  $[(\text{Payback} - \text{Investment}) \div \text{Investment} \times 100]$  formula. Cost may be full direct if retrofit, or may be difference (Original - New) if complete new installation. Include ALL COSTS and verify calculations before implementing a solution. Check with your electric utility provider for rate structures related to Lighting Power Density (LPD/UPD). Site owner not responsible for errors, misapplications or oversights.

Start with the **Tab** key, or select an entry with mouse.  
Step forward with **Tab**; fill in shaded **??** cells as required.  
Step back with **Shift Tab**.

#### Set up basic parameters for energy statistics:

**Hour-Day-Week Notes:**  
• For Occ. sensors or dimming, use average hours  
• For photocell use nighttime hours  
• Use decimal weeks if holidays affect lighting (1 day = 0.14 wk)

Original (HID) Fixture Wattage + Ballast	125	Watts
- LED Wattage	25	Watts
= Saved per Fixture	100	Watts
× Fixture Quantity	1000	
= Power Saved	100000 W = 100 kW	
× Daily use	12	Hours
× Weekly use	7	Days
× Yearly use	52	Weeks
= Annual Energy Savings	436800.00	kWhr
× Power Cost	\$ 0.05	per kWhr
= Annual Energy Cost Savings	\$21840.00	

#### ANSI/ASHRAE/IESNA Standard 90.1-2007 Lighting Power Density Section

LPD = Total Watts ÷ Total Square Feet  
1000 Sq-Ft per Fixture = 1000000 Total  
Enter Target LED LPD 0.10  
This LPD combo allows 4000 LED fixtures.

LPD Statistics	W/Ft <sup>2</sup>
Original LPD	0.125
- LED LPD	0.025
= Saved	0.100

**LPD Notes:**  
• Target LPD uses LED Watts and Quantity, and affects only the count below it.  
• HID LPD = LED projection when = Watts.

#### Investment:

Cost for 1 LED Fixture Fully Installed = \$ 7.63 May be direct cost if retrofit, or difference between LED and the fixture it substitutes if a new installation. Include all costs & labor.  
\$7.63 × 1000 fixtures = \$7630.00 + FIXED JOB COSTS \$ 00 = \$7630 Investment  
Subtract a rebate from JOB COSTS, or, enter negative (-)JOB COSTS if rebate only.

#### Energy cost savings and reduced CO<sub>2</sub> production during LED lifetime:

LED Life	45000	Hours
÷ Hours of use per year	4368.00	Hrs/Year
= LED Operational Lifetime	10.30	Years
× Annual Savings	\$21840.00	
= Lifetime Energy Cost Savings	\$225000.00	

CO <sub>2</sub> reductions *
371.28 Tons Less per year
3824.18 Tons Less per lifetime

#### Maintenance savings during LED lifetime:

LED Life	45000	Hours
÷ Original fixture life	35000	Hours
× Number of fixtures	1000	
× Fully burdened repair cost of original fixture.	\$ 58.5	
= Lifetime Maintenance Savings	\$75214.29	

Group relamping, ballasts and photocells. Include labor, fuel, travel, equipment, inventory, etc.

#### Payback time and ROI based on amortized changeout cost savings per year:

Lifetime Maintenance Savings	\$75214.29	
÷ LED Lifetime	10.30	Years
= Amortized Maintenance Savings	\$7302.36	Per Year
Investment ÷ Energy Savings	\$7630 ÷ \$21840.00	= 0.35 Years on energy alone
Investment ÷ (Energy + Maint. Savings)	\$7630 ÷ \$29142.36	= 0.26 Years on energy & maint.
Simple ROI	(Payback - Investment) ÷ Investment	= 3834.66 % ROI

[RESTORE DEFAULT VALUES](#)

\*US national average CO<sub>2</sub> emissions caused by various power generation capabilities, value provided by the US EPA.