



Universal ROI Calculator

An Estimating Tool to Compare Payback of LED Lighting

Please read:

This program requires Javascript on your computer. This calculator gives payback time, the annual and life-time power, CO₂ AND maintenance savings when you upgrade your lighting to LEDs. Enter the wattage and life for both the old and new fixture and the billing rate per kilowatt-hour. Be sure to include all costs, i.e. labor, parts, inventory, fuel, equipment, etc.

Start with the **Tab** key, fill in shaded cells and/or step forward with **Tab**; step backward with **Shift Tab**.

1. Compute kilowatts (kW) saved by upgrading to LED technology.

Original Fixture Wattage + Ballast	-	LED Wattage	=	Watts Saved per Fixture	×	# of Fixtures to Replace	=	Watts Saved
106 Watts	-	36 Watts	=	70 Watts	×	1	=	70 W 0.07 kW

2. Compute kilowatt hours (kWh) saved and tons of CO₂ production saved annually.

Kilowatts Saved	×	Hours of Use per Day	×	Days of Use per Week	×	Weeks of Use per Year	=	Annual savings:
0.07 kW	×	12	×	7	×	52	=	305.76 kWh 0.26 Tons of CO ₂ production *

3. Compute power cost savings per year.

kWh Saved per Year	×	Cost Per kWh (typically \$0.10)	=	Annual Savings
305.76	×	\$.07	=	\$21.40

4. Compute power cost savings and saved CO₂ production over life of the LEDs.

Replacement LED Life (hours)	÷	Hours per Year Usage	=	LED Est. Life	×	Annual Power Cost Savings	=	Lifetime Power Cost Savings
50000 Hr	÷	4368.00 hr/yr	=	11.45 Years	×	\$21.40	=	\$244.96
							LED lifetime CO ₂ savings *	= 2.98 Tons

5. Compute payback from power cost savings.

NOTE: LED Cost is the amount used to calculate payback. It may be the direct cost if retrofit, or may be the cost difference between the LED and the fixture it substitutes if a new installation. This entry should include all installation costs.

(Enter LED Cost)

Payback From Power Savings	=	LED Cost, or Diff. between LED & Original	=	\$ 140 × 1 Lights	=	6.54 Years
		Power Cost Savings per Year		\$21.40		

Return on Investment (ROI) from power savings	100% is based on full repayment in first year	=	100	=	100	=	15.29 %
			Simple Payback		6.54		

6. Compute maintenance savings during life of the LEDs. Include labor, equipment, fuel, parts, inventory, etc.

LED Life (hours)	÷	Original Fixture Life (hours)	×	# of Fixtures	×	Maint Labor Original Fixture	+	Maint. Parts Original Fixture	=	Lifetime Savings
50000	÷	15000	×	1	×	(\$ 100	+	\$ 38)	=	\$460.00

7. Compute the amortized changeout cost savings per year.

Total Lifetime Replacement Cost Savings	÷	Lifetime of Replacement Fixture	=	Total Amortized Savings per Year
\$460.00	÷	11.45 Years	=	\$40.17

Simple Payback on Power Consumption And Maintenance Costs	=	Initial Cost of Upgrade	=	\$ 140 × 1	=	2.27 Years
		Power + Maintenance Cost Savings		\$ 61.57		

ROI	=	100	=	100	=	43.98 %
		Simple Payback		2.2738		

*US national average CO₂ emissions caused by various power generation capabilities, value provided by the US EPA.

Savings by replacing a 4' T5 Freezer Fixture with a 4' LED Fixture

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Start with the *Tab* key, fill in shaded cells and/or step forward with *Tab*; step backward with *Shift Tab*.

1. Compute kilowatts (kW) saved by upgrading to LED technology.

Original Fixture Wattage + Ballast		LED Wattage		Watts Saved per Fixture		# of Fixtures to Replace		Watts Saved
60 Watts	-	36 Watts	=	24 Watts	x	1	=	24 W 0.024 kW

2. Compute kilowatt hours (kWh) saved and tons of CO₂ production saved annually.

Kilowatts Saved		Hours of Use per Day		Days of Use per Week		Weeks of Use per Year		Annual savings:
0.024 kW	x	12	x	7	x	52	=	104.83 kWh 0.09 Tons of CO ₂ production *

3. Compute power cost savings per year.

kWh Saved per Year		Cost Per kWh (typically \$0.10)		Annual Savings
104.83	x	\$.07	=	\$7.34

4. Compute power cost savings and saved CO₂ production over life of the LEDs.

Replacement LED Life (hours)		Hours per Year Usage		LED Est. Life		Annual Power Cost Savings		Lifetime Power Cost Savings
50000 Hr	÷	4368.00 hr/yr	=	11.45 Years	x	\$7.34	=	\$84.02
LED lifetime CO ₂ savings *							=	1.03 Tons

5. Compute payback from power cost savings.

NOTE: LED Cost is the amount used to calculate payback. It may be the direct cost if retrofit, or may be the cost difference between the LED and the fixture it substitutes if a new installation. This entry should include all installation costs.

(Enter LED Cost)

$$\text{Payback From Power Savings} = \frac{\text{LED Cost, or Diff. between LED \& Original}}{\text{Power Cost Savings per Year}} = \frac{\$150 \times 1 \text{ Lights}}{\$7.34} = 20.44 \text{ Years}$$

$$\text{Return on Investment (ROI) from power savings} = \frac{100}{\text{Simple Payback}} = \frac{100}{20.44} = 4.89 \%$$

6. Compute maintenance savings during life of the LEDs. Include labor, equipment, fuel, parts, inventory, etc.

LED Life (hours)		Original Fixture Life (hours)		# of Fixtures		Maint Labor Original Fixture		Maint. Parts Original Fixture		Lifetime Savings
50000	÷	15000	x	1	x	(\$100	+	\$25)	=	\$416.67

7. Compute the amortized changeout cost savings per year.

Total Lifetime Replacement Cost Savings		Lifetime of Replacement Fixture		Total Amortized Savings per Year
\$416.67	÷	11.45 Years	=	\$36.39

$$\text{Simple Payback on Power Consumption And Maintenance Costs} = \frac{\text{Initial Cost of Upgrade}}{\text{Power + Maintenance Cost Savings}} = \frac{\$150 \times 1}{\$43.730000000000004} = 3.43 \text{ Years}$$

$$\text{ROI} = \frac{100}{\text{Simple Payback}} = \frac{100}{3.4301} = 29.15 \%$$

*US national average CO₂ emissions caused by various power generation capabilities, value provided by the US EPA.

Savings by replacing a 4' T8 Cooler Fixture with a 4' LED Fixture

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