

Lighting the Way

A Business Case for LED Lightbulbs

By Chris Seepe

Whether lighting a single family home or the common areas of an investment property, the difference in electricity costs between LED, fluorescent and incandescent light bulbs is astounding.

According to a recent analysis undertaken at my own rental property, I discovered it costs potentially six times as much to operate an incandescent bulb as it does the equivalent illumination (lumens) of an LED bulb. (In my geographic area, a 60W incandescent lamp costs 15 cents to operate 24 hours while the equivalent LED bulb costs 2.5 cents.)

Below is a detailed analysis of 30 lights left on 24 hours per day for 20 years. While that is likely not a scenario that would exist in a home, the cost ratio between the two lighting technologies should remain similar.

Conclusions

Based on average lifespans, an incandescent bulb is replaced 29 times for every one LED bulb. Many municipalities, for example, have been replacing traffic signal lamps with LEDs.

Incandescent bulbs convert a lot of their electrical energy to heat whereas LEDs produce very little heat. LEDs are also much more environmentally-friendly, containing no mercury and usually no lead.

LED bulbs cost arguably three-to-six times more than incandescent bulbs, but this acquisition cost is insignificant compared to their lower energy consumption, maintenance costs and other factors. With electricity prices forecasted to rise significantly every year regardless of where you live, the business case for LED light bulbs just keeps glowing brighter.

For your own analysis, a downloadable spreadsheet can be found at: <http://www.aztechrealty.com/leds.xlsx>. Just plug in your own numbers to determine your results.

	LED	FLOURESCENT	INCANDESCENT
PURCHASE COST			
Lifespan (hours)	35,000	8,000	1,200
Number of hours in a year	8,766	8,766	8,766
No. bulbs/year to light one area	0.3	1.1	7.3
No. bulbs needed over 20 yrs	5.0	21.9	146.1
No bulbs needed vs LED	1.00	4.38	29.17
Cost/bulb	\$6	\$2	\$1
Purchase cost/bulb for 20 yrs	\$30	\$44	\$146
Bulbs (lit areas)/building	30	30	30
Purchase cost/building for 20 yrs	\$901.65	\$1,314.90	\$4,383.00
ELECTRICITY COST			
Watts/bulb	10	14	60
kWh per bulb	0.010	0.014	0.060
kWh per bulb/24-hr day	0.240	0.336	1.440
Peak Cost/kWh	\$0.16	\$0.16	\$0.16
% Peak hours	20%	20%	20%
Peak kWh/day	0.048	0.067	0.288
	\$0.008	\$0.011	\$0.046
Mid-peak Cost/kWh	\$0.12	\$0.12	\$0.12
% Mid-peak hours	20%	20%	20%
Mid-peak kWh/day	0.048	0.067	0.288
	\$0.006	\$0.008	\$0.035
Off-peak Cost/kWh	\$0.08	\$0.08	\$0.08
% Off-peak hours	60%	60%	60%
Off-peak kWh/day	0.144	0.202	0.864
	\$0.012	\$0.016	\$0.069
Cost to operate 1 bulb/24-hr day	\$0.025	\$0.035	\$0.150
	1.00	1.40	6.00
Operating cost/bulb/year	\$9.12	\$12.76	\$54.70
Cost to operate 1 bulb for 20 years	\$182.33	\$255.27	\$1,094.00
Bulbs (lit areas)/building	30	30	30
Cost to operate above bulbs for 20 years at 24/7/365	\$5,469.98	\$7,657.98	\$32,819.90
Purchase cost/building for 20 yrs	\$901.65	\$1,314.90	\$4,383.00
TOTAL COST	\$6,371.63	\$8,972.88	\$37,202.90
	1.00	1.41	5.84

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