



Why LED? Why Now?

Bottom Line: Savings.

Sure, LED lighting saves energy, is good for the environment, requires less maintenance, and provides bright, long lasting, uniform light. But, ultimately, these advantages all add up to savings. And with the giant leaps in efficiency and lowered price points that have happened in the last year, in collaboration with available utility rebates, those savings are even greater. It's win-win.

Just ask our customers. We are seeing annual returns on investment (ROI) of 20-70% regularly on our retrofit LED lighting projects. The best returns are typically seen for outdoor lighting that burns all night, any indoor space where lights are on more than one work shift, and any area that the existing fixtures are starting to need maintenance such as replacement of lamps or ballasts.

Want to know more? Consider the following:

LED: A Brief History

LEDs (or Light Emitting Diodes) use semiconductors to transform electricity into light. The technology has been around for more than 50 years. It was part of the solid state transistor revolution which gave us walk around AM radios in the 1960s and it was instrumental in putting man on the moon. Yet, the viability of LEDs as a practical light source for replacing traditional lighting has only been a recent innovation. In their early development, LEDs could only produce light at a low level and were widely used in digital displays. As time progressed, LEDs evolved to produce higher levels of light, but at significant costs. Then, in the 1990s, LED technology became economically viable for niche commercial uses, such as traffic signals. In the last two years, substantial breakthroughs in technology and cost reduction have made LED technology an extremely attractive replacement for traditional lighting.

What's New?

Brighter – A significant increase in the lumens (light intensity) per watt that LEDs can deliver means LEDs can replace almost any traditional lighting we use today.

Longer Lasting - The useable life expectancies of LEDs are now 10+ years, which greatly exceeds those of traditional light sources.

Less Expensive - Costs have come down significantly due to the adoption of technology and scale production.

What Makes LED Better Than Other Sources, Including Fluorescent?

In addition to being energy efficient, long lasting, environmentally friendly, and requiring less maintenance, LED offers unique advantages over traditional lighting sources. These include directional illumination, lighting uniformity, maintained light output, and higher efficiency. All of these benefits are achieved while saving 50% to 80% of energy costs.

Directional Illumination - One of the largest advantages is the directional component of LED lighting. Traditional light sources, such as incandescent, fluorescent, and HID lighting, use round lamps which project light at 360°. This usually means more than half the light emitted from the lamp is being directed somewhere other than where the light is needed. Many fixtures attempt to reflect that light back to where it is useful, but this results in energy loss as even the most efficient reflective surface absorbs light. LEDs, however, are directional. By simply projecting light only where it is needed, LED takes less lumens (light intensity) to light an area. In many instances, it takes half the lumens to provide the equivalent amount of light. This is the primary driver in energy savings.

Light Uniformity - Light uniformity is the ability to project light evenly over a large area. A perfect example is parking lot lighting. Historically, parking lots have been illuminated with metal halide (MH) or high pressure sodium (HPS) shoe box fixtures (known as HID lighting). The results are bright spots under the fixture and relative darkness between fixtures. In between fixtures, the luminance can drop to as much as one tenth of the light directly under the fixture. This contrast of high vs. low light is hard on the human pupil. LEDs are directive and non-reflective. That means light is spread evenly, eliminating bright and dark spots and dramatically improving visual acuity. When parking lot lights are replaced with LEDs, the human eye is able to easily adjust and see more clearly.

Improved Safety and Security -LED lighting not only makes an area feel brighter and more secure, it works in synergy with your HD camera system to dramatically improve recorded images. The surveillance cameras are able to register the direct, uniform light of LEDs as if it is daylight, instead of having to compensate for the over/under lit areas (hot spots) prevalent in HID lighting. The whiter light of LEDs also makes it easier to correctly identify details such as vehicle or clothing colors and facial features.

Maintained Light Output - Another LED advantage is negligible light depreciation. Over the life of each traditional HID bulb (3 years), lamps will diminish in brightness, often dropping to as low as 50% brightness until the lamp burns out. LED fixtures will last 100,000+ hours (10+ years) with little diminishing light quality. This results in a dramatic reduction of ongoing maintenance costs.

Cost Effective Dimming - It can be very expensive to dim HID and fluorescent lights. LEDs, on the other hand, can easily be dimmed automatically, at any part of the day, by a timer, further reducing energy usage and increasing savings.

Cooled Space Advantages - Consider this: Energy efficient LED lighting not only radiates less heat but it operates better in extreme temperatures. This makes it ideal for cooled spaces, such as freezer cases and cooled warehouses. For every watt saved, you are saving 3.4 BTUs. For example, if you replace a 459 watt metal halide high bay with a 169 watt LED, you are saving 986 BTUs. That adds up to considerable cooling system savings in addition to the energy saved in your lighting system and the maintenance costs. Plus, LEDs maintain, or even increase, their light output in extreme cold, whereas fluorescent lighting diminishes significantly.

Environmentally Friendly – In addition to saving energy, LED technology reduces the number of lamps disposed of in landfills and does not contain harmful mercury like fluorescent. A 2012 Department of Energy report found LEDs had significantly less of an impact from raw materials and manufacturing than incandescent and compact fluorescent lighting. Further, the DOE estimates that switching to LED lighting over the next two decades could save the country \$250 billion in energy costs over that period, reduce the electricity consumption for lighting by nearly one half, and avoid 1,800 million metric tons of carbon emission.

Is LED Right For Me?

Savings are greatest for the following situations:

- 24/7 operations like a convenience store, retirement home, or three shift manufacturing
- Anyone operating exterior lighting from dusk to dawn
- Anyone using 1000 watt HID exterior lighting, even if not operating dusk to dawn
- Retail currently using metal halide lighting or certain types of fluorescent lighting that operate 4,500 hours or more
- Anyone using 400 watt HID lighting inside
- Anyone using incandescent or quartz lighting

How Much Will I Save?

Here again are the major factors that drive savings:

- **Hours of operation.** The more hours you operate, the more energy you will save.
- **Wattage of your current light source.** The higher the wattage, more energy you will save.
- **Cost of the retrofit and the amount of labor involved to retrofit.**
- **The cost you are paying for energy currently.**
- **The maintenance cost of replacing lamps and ballasts is significantly reduced.**
- **Available rebates and incentives from your utility company.**

So Why Not?

So why would anyone not immediately upgrade their existing lighting to LED? Well, there is a cost benefit analysis specific to each customer. How much will you spend to upgrade, and what is the return on investment or payback? In many applications, we are seeing the costs of an upgrade to LED recovered in anywhere from 1-7 years; in some cases, return on investment exceeds 100% annually. ROI depends on the particular lights required, but significant reduction in energy usage and eliminating maintenance costs for 10 years play a huge part in short payback periods. In many of these cases, the cost of waiting is considerable, especially in the low interest rate environment of our current economy.

Overcoming Objections

OBJECTION #1 *We don't have the money to pay for it right now.*

For anyone with good credit, there are numerous sources in our industry for a lighting upgrade capital lease. With LED savings, it is possible to create a lease with payments that are less than money being saved by the lighting upgrade itself. This way, money can be saved from day one. The industry recognizes the benefits of LED lighting and is readily willing to finance profitable projects.

OBJECTION #2 *Our requirement for a lighting retrofit is a two year payback.*

In effect, you are asking for a 50% return on invested capital in order to upgrade fixtures. However, as stated above, loans for the lighting upgrade with payments less than savings allow positive cash flow from day one. So if it's more money in the firm's pocket today, why does it matter if the payback is four or five years?

OBJECTION #3 *It's not in our capital expenditure budget this year, or I don't want to put debt on the balance sheet.*

For this objection, MVE Group is offering what we call an "ESPA". This stands for "energy saving purchase agreement". In short, it is a rental agreement where MVE Group retains ownership of the new LED lighting and rents it to you, allowing you to recognize the benefits and savings without any upfront cost and nothing showing in the CAP-EX budget or balance sheet. A typical ESPA is for a ten year term.

A typical scenario may look like this: You have twenty 400 watt metal halide parking lot lights operating dusk to dawn. Your current electric expense to operate these fixtures is \$3,160 per year, and your maintenance expense to change lamps and replace any burned out ballast is \$1,000 per year. Your total expense to your P&L for these fixtures is \$4,160 per year. You choose to enter in an "ESPA" with MVE Group and we rent you LED fixtures. Our annual rental fees are \$2,100 and your electric expenses drop to \$900. Your new annual expenses are \$3,000 - a savings of \$1,160 or 27%. You are saving 27% every year without spending any money, incurring any debt, or spending any CAP-EX money.

OBJECTION #4 *Shouldn't we wait? Isn't technology still improving and won't costs continue to come down?*

Technology is always improving and costs are always coming down, but the leap made in LED technology

in recent years is a game changer that will not be repeated. Consider the cost of waiting. Right now, there is the ability to save 80% on energy, in some cases with zero maintenance costs for 10 years. Replacement lights are also fairly inexpensive. You could wait 10 years and possibly obtain 90% saving for less money, but tens of thousands will be lost while waiting -- when a current LED system could have paid for itself twice. A typical 75 watt incandescent bulb can be replaced with a 9.5 watt LED bulb, and a typical 150 watt wall pack can be replaced with a 26 watt LED wall pack. There just isn't that much more room for improvement or much more savings that can be achieved from this point.

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More importantly, how much is it costing you to wait? LED upgrades can start saving you money **right now**. Plus, rebates available today may not be available in the future. Waiting to replace inefficient lighting is simply costing you money and time.

LEDs just make sense - financially, economically, and environmentally. Save maintenance costs, save time and save headaches. There is no reason to wait.

Still looking for the bottom line? Let us work up a custom cost benefit analysis just for you. Contact KWReduction, a division of MVE Group, at 717-738-2451 and ask for sales, or email me directly at tim@mvegroup.com (Be sure to check out several of our latest LED retrofit projects online at www.mvegroup.com.)

Join the growing list of satisfied KWReduction clients and upgrade to LED lighting. Start saving money, energy, and time!

Happy savings,

Tim Bollinger
CEO

