Renewable Concepts & Design

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Energy Efficient Lighting

Inside:

Why LED?

- **Energy Savings:** LEDs will consume up to 95% less energy than traditional lighting.
- **Longer Life:** LEDs last from 50,000 to 100,000 hours—five to 50 times longer than incandescent or fluorescent lighting.
- **Low Maintenance:** No ballasts mean savings on cost, parts and labor.
- **No Hazardous Materials:** LEDs use solid state technology and do not require any mercury, gases or lead.

LED Lighting - the new standard

"LED is only the third revolution in illumination technology since the dawn of fire."
- Forbes

Most of us are aware of the savings that fluorescent lighting can realize over traditional incandescent lighting. The curly compact fluorescent lightbulbs (CFLs) have almost completely replaced traditional incandescent bulbs on the shelves of our hardware stores and markets. Indeed, incandescent bulbs will no longer even be made after 2012.

LED lighting is built of solid-state semi-conductors and is a more dependable quality of lighting than fluorescent. And it does not require mercury, argon or carbon gases.

The new LED technology can replace incandescent, halogen, track and fluorescent lamps in task lighting, ambient lighting and accent lighting. It is excellent for commercial use, especially in buildings that operate long hours: hotels, hospitals, restaurants, supermarkets, distribution facilities and etc.

Light quality, also an issue with fluorescent lighting, can be finely tuned to the client's needs. Color temperature is vital in achieving the look you want for your space. Color temperature is measured in Kelvin degrees (K), and is commonly referred to as varying degrees of "warm" or "cool" light *(see chart on page 2)*. LEDs can be made with anywhere from 2,700 K (equivalent to incandescent lighting) to 6,500 K which mimics daylight. Tube covers can be clear or frosted for added light control. For direct lighting, LEDs can provide flood or spot lighting with degree spans of 25^{o} to 120^{o}.

Due to the solid state materials there is no radio or magnetic frequency interference generated from LED lighting. Also, there are no harmful UV effects. No buzzing, flickering, or strobe effects are experienced, either. LED lights are an "instant on" and will not require a warming up period before they are at full brightness.

Of course the savings in energy use is the principal reason to retrofit your facility with LED lighting. When you replace your traditional lighting with LED lighting, you will realize an savings of 45-95%.

dayLEIT - an Ohio company

dayLEIT is a company that is owned by Master Electrician Perry Leitner of Cincinnati, Ohio. Leitner Electric, has over 30 years experience in the industry and their experience extends to solar and wind energy installations through Blue Chip Wind and Solar.

The engineer, Perry's son Evan, says, "We didn't invent LED or plasma-induction lighting; we just make it better and make it *work*."

dayLEIT products are designed to retrofit existing fixtures, rather than requiring entire new fixtures. Thus, component and installation costs are significantly reduced.

Renewable Concepts & Design is proud to be one of their first Manufacturer Representatives in the United States. We are based in Central Ohio.

Energy Savings

The Energy Information Administration of the United States has detailed energy consumption data based on type of building, end use, size of building, geographic region, and other parameters. The electricity use in the average commercial building is divided into several categories: 43% Lighting; 19% Heating, venting and air conditioning (HVAC);3% Office Equipment; 6% Computers; 13% Refrigeration and 16% Other.

Lighting draws the greatest percentage of a commercial building's electrical use. As discussed on the first page of this publication, LED lighting can reduce that by 45-95%, depending on what is currently deployed.

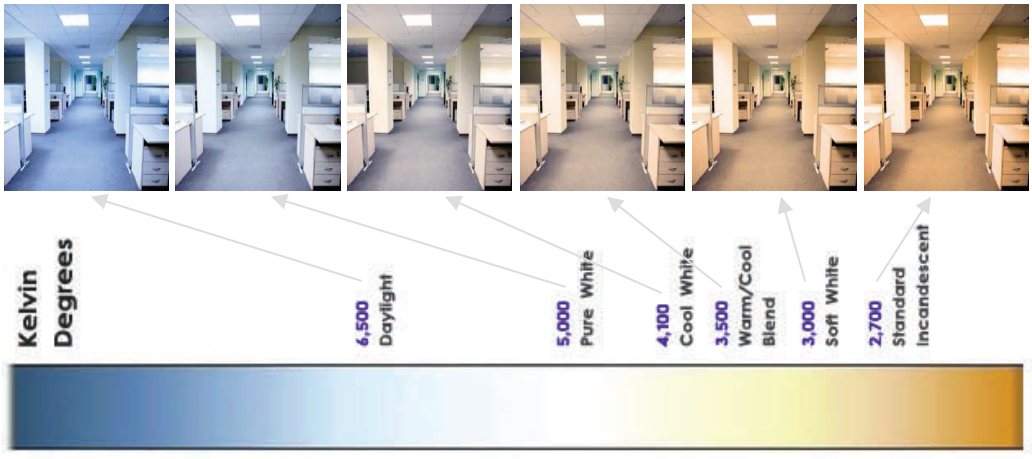
LED lighting further impacts air conditioning and refrigeration because LEDs generate less heat than incandescent or fluorescent lights. The exact impact is difficult to calculate, however it could impact HVAC and Refrigeration costs by as much as 30%. Immediate savings can be realized when installing LED lighting.

Financial incentives offered by federal, state and utilities can combine to generate even greater savings. Rebates, tax incentives, depreciation, and grants combined with the **SmartLease** program may mean no out of pocket expense in addition to monthly savings on your energy costs.

We can perform a lighting audit that will give you an estimate of how much you can save each month by upgrading your facility to LED and plasma-induction lighting. Please contact Russ to set up an appointment.

The best watt

is the one
you don't use.



Fluorescent Replacements

Fluorescent tube lighting has gone through several generations. There is already a fluorescent replacement light for the older T-12 tube. The T-8 tubes are smaller and more efficient and less prone to ballast issues.

The next step is the LED replacement technology. Energy savings are only a part of why this is a better option. As mentioned earlier, there are no mercury or harmful gases used in these lights. When we do replace your current fluorescent lighting, we provide hazardous waste disposal.

This LED lighting is also OSHA approved because the casing is a polycarbonate that will not shatter like the thin glass fluorescent tubing currently in place.

These lights are vibration and shock resistant, generate no UV radiation, have unlimited on/off cycles and can operate in temperatures from -40° F to 122° F.

Color preferences can be customized for all LED lighting, as shown above. Desks and task areas may require Daylight, whereas reception areas may benefit from a warmer tone.

Plasma-Induction Lighting

In the 1890s, Nicola Tesla invented a lamp without electrodes or filaments. Tesla would later predict that Edison's incandescent technology would be replaced by Telsa's invention -- "a lamp much more economical and yielding a light of indescribable beauty and softness."

The lamp works on fundamental principles of gas discharge and electromagnetic induction to produce light. As a result, each lamp offers an unmatched lifespan and efficiency. They can last longer than 100 incandescent bulbs, 5 HID, or 5 typical fluorescent lamp changes. Induction lamps have a long life span due to the lack of internal electrodes and very high energy efficiency due to high frequency electronic ballasts which are 98% efficient.

Plasma-Induction lighting is an optimal solution to Metal Halide, High Pressure Sodium, T8 and T5 Fluorescents. Applications include Hi-Bay, Low-Bay, Street and Parking Lights, Outdoor Security Lights and other uses. They are extremely cost effective in hard to reach applications where the cost of maintenance and repair are high such as bridges, tunnels, airports and stadiums.

These lamps are also energy efficient. For instance a Plasma-Induction lamp that replaces a 400 w Metal Halide lamp requires only 250 w for the same light output. This is an energy savings of ~ 40%.

- Reduces energy consumption and cost by 40 to 70%
- Dramatically reduces maintenance costs due to average lamp life of 100,000 hours
- Eliminates hazardous mercury being added to landfills
- Positively impacts HVAC systems' performance due to heat reduction
- Performs in temperatures from -5^0 F to 115^0 F.
- Optional color temperatures (2720K—6500K) suitable for different needs.
- Allows for positive and more healthy work environment (no hum, buzz, or flicker)

Efficient lighting increases productivity

Multiple Efficiencies

The Plasma-Induction lighting is efficient in more ways than just reduction of energy use.

When planning for the inclusion of Plasma-Induction (or LED) lighting, because the energy draw per each fixture is considerably less—fewer electrical lines need to be laid to carry the load.

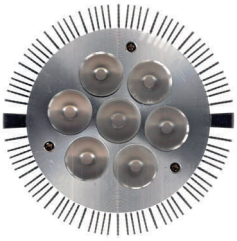
The instant on feature means that there is no need to turn on the lights in advance so they will be at full brightness when they are needed.

The heat output of these units is far less than traditional HID lamps, therefore the need for air conditioning is reduced.

The lamps can last five times longer than Metal Halide or High Pressure Sodium lamps. This means that the maintenance costs for changing the bulbs can be reduced by 75% or more.

The Hi-Bay lamps weigh no more than 20 pounds. So, whereas you may have had two or more maintenance workers installing or changing the fixtures, a single person can lift and install them herself. With less heat output, changing the bulbs or maintaining the fixtures becomes less hazardous, as well.

LED Lighting Products

 50,000 hr Candleabra 3w	 50,000 hr Accent 3w	 50,000 hr Snowball 5w
 Par 20	 MR16	 Par 30 Diecast
 Par38 Diecast	 Par 38 Milled	 Par 38 Flood 12w

Can Energy Efficient Lighting Work for You?

Along with other pictures throughout this document, the above photos represent just some of the many types of LED lamps available.

The base can be made to fit standard Edison fixtures, candelabra fixtures, halogen, fluorescent fixtures, or any other lamp base. The lighting pattern can be direct or diffused, with angles from 25^0 to 120^0. Color can also be controlled by ordering within the 2720—6500 Kelvin range.

If you are interested in an assessment of how this new technology can save you energy and money, please contact us at the address to the left to set an appointment.

Using our SmartLease program can save you from day one. Simply put, the reduction in your energy costs through decreased wattage can be greater than your lease payment. This could give you a n immediate positive cash flow .

In addition, depreciation, deduction of lease payments, federal energy efficiency incentives and utility rebates may mean that your return on investment can be reached within the first year.

Using the SmartLease program also helps you in projecting your energy costs. With a level monthly payment, you are assured that this part of your energy budget will not be affected by increased electricity costs.

RENEWABLE CONCEPTS & DESIGN

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