

FROM PRODUCTIVITY TO POSITIVITY

The Hidden Power of Better
Industrial Lighting



CONTENTS

I Intro	3
II Run Efficient	
Intro	4
Energy Efficiency	5
Reduced Waste	5
Productivity	6
III Save Money	
Intro	7
Cost-Saving Incentives	8
Free up Reinvestment	8
Reduced Maintenance & Downtime	9
IV Work Happy	
Intro	10
Mood & Morale	11
Safety	12
V Protect the Planet	
Intro	13
Reduced CO2	14
Simplify Disposal Issues	14
VI Take the Step	15
VII Sources	16

You turn on the lights at the beginning of your workday; you turn them off when you leave. For years, that's the extent of the consideration many businesses gave to workplace lighting. Today, that mindset is shifting. Although lighting once seemed like a trivial aspect of the work environment, new research shows it plays a sizable role in business and employee performance.

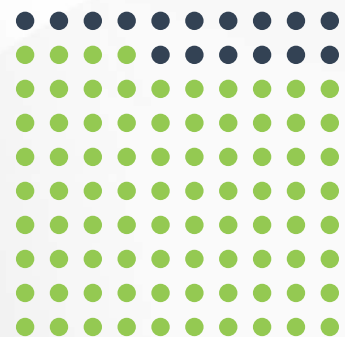
Driving this transformation is the exponential growth of LED lighting, which gives all businesses the ability to make rapid improvements — both for workers and for their bottom lines.

In particular, companies with massive Industrial workspaces, which have traditionally been costly and difficult to light, stand to achieve the most significant performance improvements.

By 2035, LED lighting is expected to comprise

84%

Of all lighting installations¹



From warehouses and factories to refineries and shipyards, LEDs are capable of changing how industrial environments look, feel and perform.

In this e-book, we'll highlight research that illustrates how LED lighting — When custom designed and targeted to suit the specifications and needs of the work space — has been proven to help businesses and their employees run efficient, save money, work happy and protect the planet

1



RUN EFFICIENT

2



SAVE MONEY

3



WORK HAPPY

4



PROTECT THE PLANET

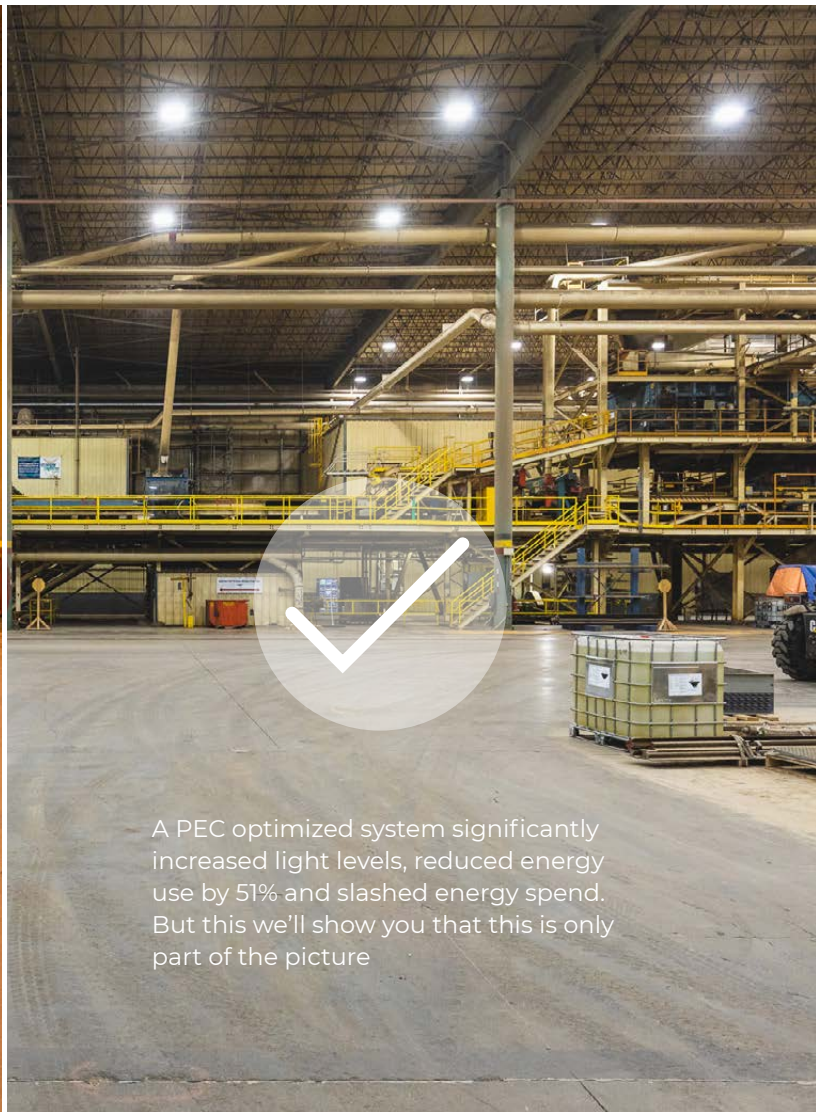
I | RUN EFFICIENT

These days everyone is being asked to do more with less, which requires us to become more efficient. Leveraging technological advancements in LED lighting has been shown to create meaningful improvements in operations, including energy efficiency, productivity, merchandising, and production while decreasing errors, waste, and even maintenance and downtime.



 **Norboard:** Grande Prairie, Alberta, Canada

Outdated lighting systems in this facility created poor light levels, high energy use and expensive energy bills. Lower light levels also impact productivity which further impacts performance.



A PEC optimized system significantly increased light levels, reduced energy use by 51% and slashed energy spend. But this we'll show you that this is only part of the picture

Energy Efficiency

Outdated lighting systems in warehouses, factories, retail spaces and other commercial buildings can account for as much as a third of total energy consumption. By modernizing their lighting fixtures with high-efficiency industrial LED lighting, these facilities can massively reduce their lighting energy consumption compared to electricity-hogging systems like high-pressure sodium (HPS) and other high-intensity diode (HID) sources.

LED Energy Reductions by as Much as

80-90%

Reduced Waste

LED installations can be designed to direct light precisely where people need it — on the workspace and other critical areas. This results in clearer workspaces, more task focus and less product waste. By delivering the right light for the environment, and often with fewer fixtures, you get a higher return on your energy bill.

20%

Improvement

Reported in industrial manufacturers defect rate after implementing LED lighting strategies²

Productivity

Many businesses continue to use fluorescent lighting fixtures, which they installed long ago. However, this lighting is hard and can be dim. These factors can cause eye strain, headaches, fatigue and a lack of focus — all of which are destructive to the concentration and productivity of employees. LED lighting provides a more consistent, softer-quality light, with significantly more control for brightness, tone and color.

LED light fixtures paired with dimming and advanced controls can lead to...



8.34%

Improvement in work performance³

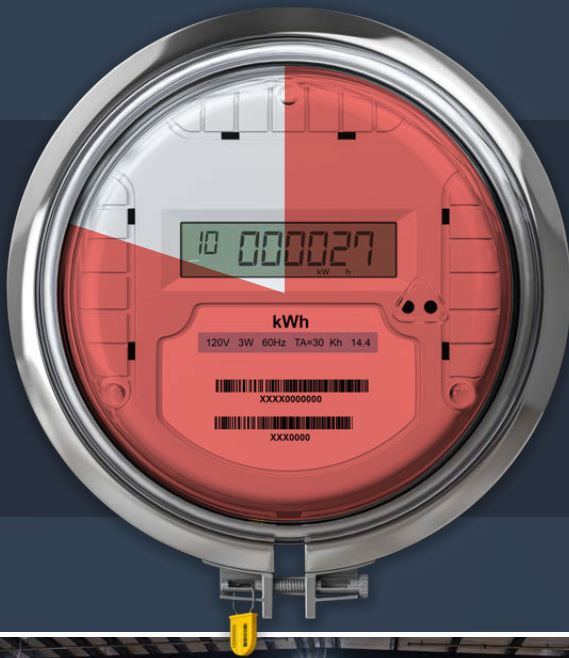


5.76%

Increase in work efficiency³

|| SAVE MONEY

Given the size of their facilities and buildings, it's not surprising that some commercial and industrial facilities can spend as much 40-80% of their energy bill on lighting. Poor quality lighting is to blame for much of those wasted dollars. Innovative LED retrofit upgrades with the right specification, design, and implementation can make facility improvements that actually give funds back to your bottom-line providing your business a competitive edge.



Some facilities can spend up to
40-80%
Of their energy bill on lighting

Following an LED lighting project that featured unique fixtures and controls to fit each facility's environmental requirements, Weyerhaeuser has slashed its energy costs.

[View Project](#)

\$432,067 | Annual Energy Savings

\$655,686 | Expense Covered by Incentives

2.43 years | Rate of Return on Investment

Cost-Saving Incentives

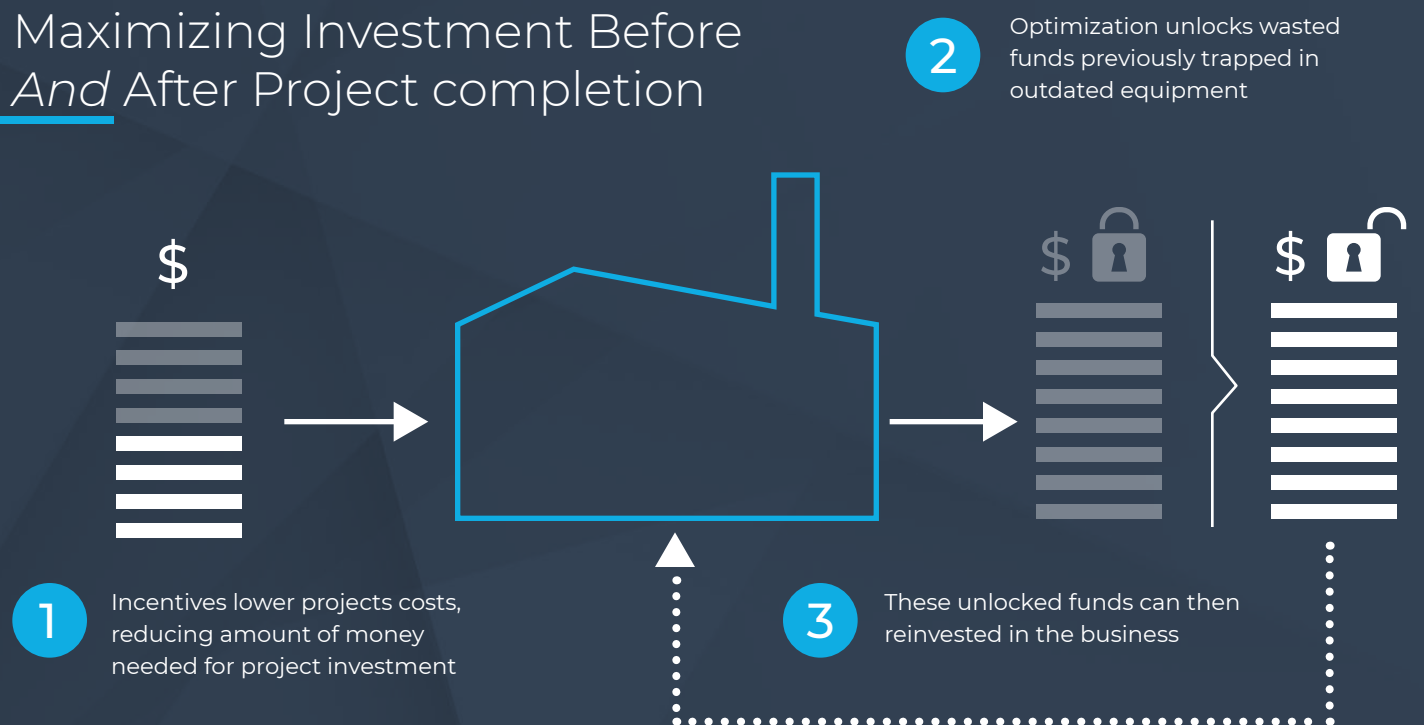
There is increasing regulation around energy use and in most states there are a multitude of incentives and rebates offered to commercial & industrial energy consumers. These incentives are designed to encourage large consumers to reduce their energy demand thereby helping utilities manage their energy supply.

Incentive programs are a terrific way to offset costs of lighting implementations and retrofits. However, navigating the complexity and plethora of available incentives can be a project in itself. An experienced lighting design partner will have relationships with electric utilities across the country and be able to maximize energy efficiency incentives for their customers.

Free-up Operational funds

By spending money on poor quality and unoptimized lighting, companies lose funds that could be reinvested into growing their business. These inefficient systems and technology are wasting valuable operational dollars, slowing down technological advancement, and hindering your competitiveness. Innovative LED upgrades mean that, with the right specification, design, and implementation you can make facility improvements that actually free up funds for reinvestment, providing your business a competitive edge.

Maximizing Investment Before And After Project completion



Reduced Maintenance & Downtime

Conventional bulbs fail far more frequently than LEDs, especially in high-vibration environments, cold-storage facilities and other harsh industrial spaces. This results in frequent maintenance and replacement. In large, for production-intensive facilities, this routine maintenance often requires mechanical lifts and production shutdowns, which can mean costly downtime.

The average lifespan of a quality LED fixture is 100,000+ hours, which translates into 11 years of 24-hour operation. This means companies can avoid having to waste downtime, money, and resources to replace lamps and bulbs.



LED

Up to

11 Years
Of 24-hour operation

Lighting Type	Hours of Life
LED Fixture	100,000+
High-Pressure Sodium	24,000
Compact Fluorescent Lights	8,000
Incandescent	1,200

III | WORK HAPPY

Along with other environmental factors like the temperature, quality of air and noise level, workplace lighting has a significant impact on worker comfort and productivity.



1/3

Of workers specify that access to comfortable light (intensity & color) is important for their daily health.⁴

Mood & Morale

Regardless of the type of work your employees engage in, happiness is a powerful motivator. According to the California Lighting Technology Center, which researches the link between light and health, light plays a major role in mood and energy levels⁵. When people are exposed to a sufficient amount of light, they are more likely to be positive and productive, while poor lighting contributes to depression and other health deficiencies.

Upgrading a facility's lighting is also an important tool for improving employee engagement. One recent study revealed that a modern workplace with the right amount of light can reduce worker absences by **15-25%**⁶. Given that unscheduled absenteeism costs companies an estimated **\$3,600** annually for hourly workers and **\$2,650** each year for salaried employees, the business case for quality lighting is clear⁷.

15-25%

Recorded reduction
in worker absences



Safety

Workplace safety is one of the biggest concerns for any business. Nearly **3 million American workers are hurt on the job each year**. The most common workplace accidents include trips, falls and contact with objects and equipment. Unsurprisingly, poor lighting is often to blame for these types of incidents. If an employee cannot clearly see a hazard, they are more likely to misjudge an object's position, shape and speed. That's when accidents happen.

Beyond light quality, lighting such as high-intensity discharge (HID) and fluorescent are a danger in themselves. Hot running temperatures in demanding environments can lead to fires, and industrial vibration can cause them to fall from the ceiling. Furthermore high pressure sodium lights can pose a UV radiation hazard if cracked and fluorescent lights contain toxic mercury.

Despite the risks associated with improper lighting, the majority of industrial facilities continue to rely on conventional lighting fixtures. These antiquated fixtures are notorious for unnatural color, short lifespan, humming and flickering.

Research has shown that improving workplace lighting can reduce accidents. One CDC study even found that LED lighting helped workers **detect trip hazards 94% faster**⁸.


LED Fixtures




High Pressure Sodium



Incandescent



Compact Fluorescent Lights




Fire Hazard



Chemical Hazard




Radiation Hazard




94%
Faster
Hazard Detection


Some of the most common lighting-related accidents occur due to:




Insufficient light on the task




Lighting that distracts




Strong shadows cast by structures and objects



Uneven lighting



Reduced contrast between an object and its background



Glare on surfaces

IV | PROTECT THE PLANET

Businesses are increasingly recognizing the importance of operating more sustainably. In fact, 86% of companies see reducing their environmental impact as crucial to staying financially competitive⁹. LED lighting provides a simple path to demonstrating your company's green values.



See reducing their environmental impact as crucial to staying financially competitive.

LED lighting provides a simple path to demonstrating your company's green values.

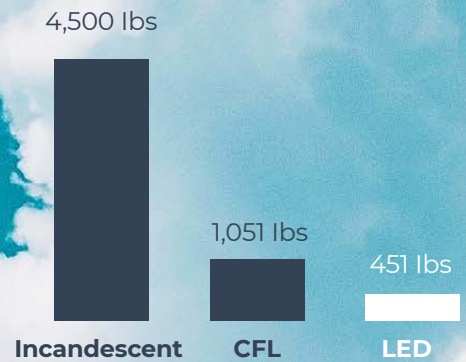


Reduce CO2 Emissions

While much of the conversation about sustainability has focused on solar and wind energy, small improvements in lighting can make a massive difference in the world's energy consumption. Lighting accounts for nearly **5%** of global CO2 emissions¹⁰ and can utilize up to **40-80%** of an individual facility's energy use.

One advantage of LEDs is that they emit the least amount of CO2. Incandescent bulbs create 4,500 lbs. of CO2 per year. CFLs create slightly less at 1,051 lbs. of emissions per year. LED bulbs create the least at only 451 lbs. per year¹¹.

LED emits almost 10x less CO2 than incandescent



Simplify Disposal Issues

Another environmental concern with old lighting solutions is how businesses dispose of burnt-out bulbs.

All commonly available fluorescent tubes and high-intensity discharge (HID) lamps contain mercury. The most common HID lamps are mercury vapor, metal halide, and high-pressure sodium lamps. Fluorescent lamps manufactured before 1994 may contain nearly 50 milligrams of mercury per 4-foot-long fluores-

cent lamp. Although the amount of mercury in newer bulbs is less, they require additional handling and recycling measures.

With their long life and lack of toxic mercury, LEDs are your best bet for reducing your energy bill and protecting the planet.



Take the first step toward better, brighter industrial lighting.

When you consider the productivity, safety, cost and employee experience benefits, switching to more efficient LED lighting is a no-brainer. So why do millions of outdated lamps still burn in the nation's factories, warehouses and retail spaces, delivering suboptimal workspace illumination? Sometimes, it's just a matter of finding the right lighting partner.

As one of the nation's leading LED lighting design and implementation specialists PEC has the experience, talent and technology required to light even the most massive, complex and industrial environments.

**Others change light bulbs.
We transform businesses.**

Traditional lighting companies will try to sell you on their lighting fixtures, regardless of what you're looking to achieve. That's not us. We are a vendor-agnostic, independent lighting design company that develops and implements the right lighting strategy for you and your employees.

Contact us today for a free energy and lighting evaluation and learn how we can help your business improve the health, safety and happiness of your workers.



Follow the link below to continue the journey

pecnw.com



Follow the links below to find out more about...

Run Efficient

Save Money

Work Happy

Protect the Planet

Sources

¹ Energy.gov forecast report, 2020

² Green Building and the Bottom - U.S. DEPARTMENT OF ENERGY - RMI Institute

³ Building Investment Decision Support for Six Energy Efficient Lighting Retrofits- Recommendations for 'Triple Bottom Line Savings'

⁴ Future Workplace LLC, Wellness Research Study, 2019

⁵ ArchDaily.com, What is Healthy Lighting?

⁶ Green Building and the Bottom - U.S. DEPARTMENT OF ENERGY - RMI Institute

⁷ DailyPay, How Much are Absent Employees Affecting Your Bottom Line,

⁸ www.cdc.gov/niosh/nioshtic-2/20042615.html

⁹ www.forbes.com/sites/jamesellsmoor/2019/08/04/us-businesses-are-benefiting-from-ambitious-environmental-goals/?sh=5be654ea4e33

¹⁰ www.seniorled.com/led-vs-incandescent-vs-cfl

¹¹ exclusive.multibriefs.com/content/the-environmental-benefits-of-led-lighting/facilities-grounds