



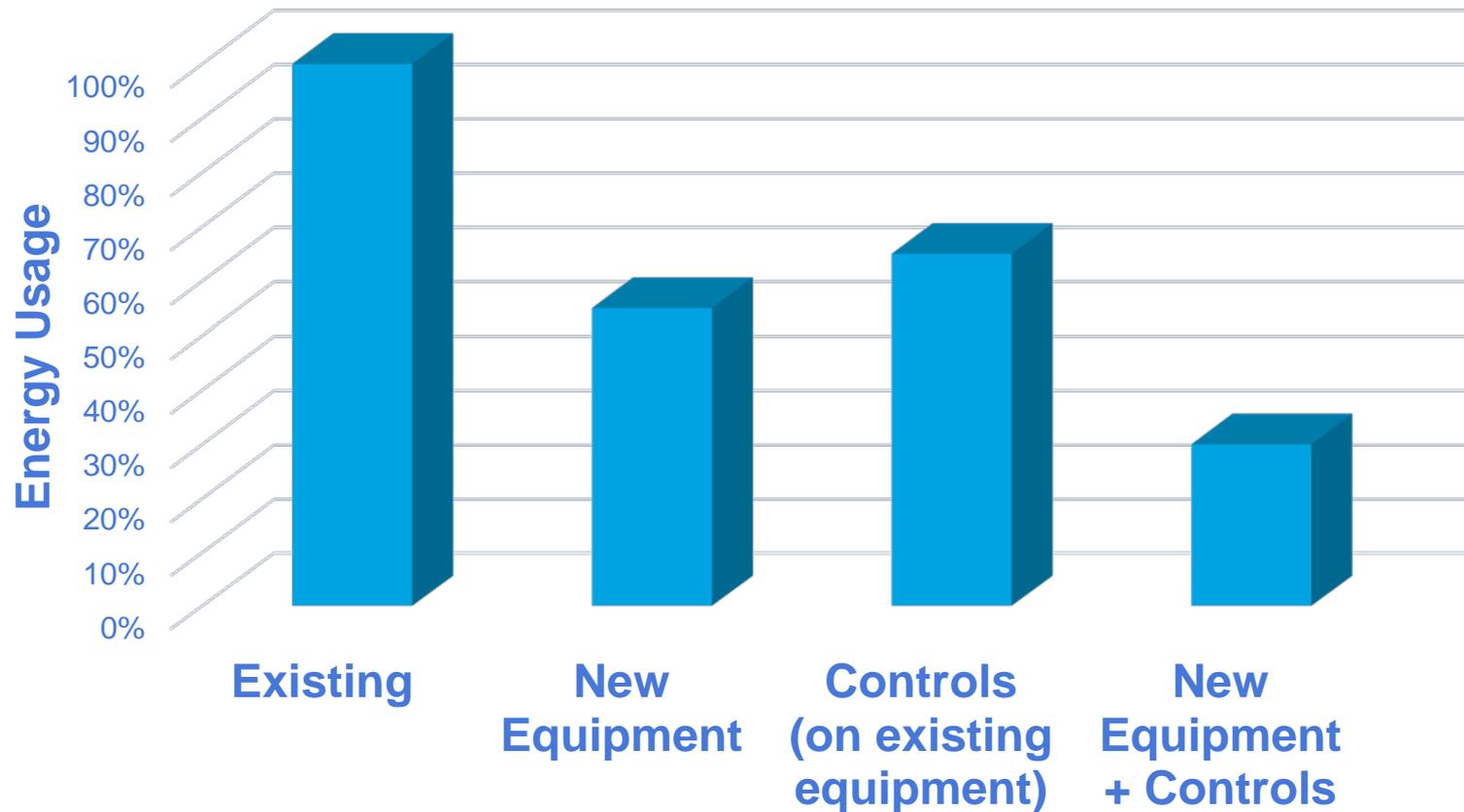
**Better
Buildings®**
U.S. DEPARTMENT OF ENERGY

Interior Lighting Campaign

Michael Myer

Achieving Lighting Energy Savings

Lighting represents 20% to 30% building energy use



DOE-Supported Lighting Efforts

ORGANIZERS:



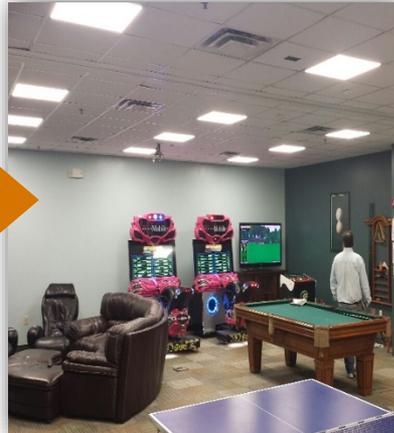
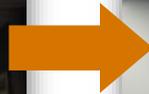
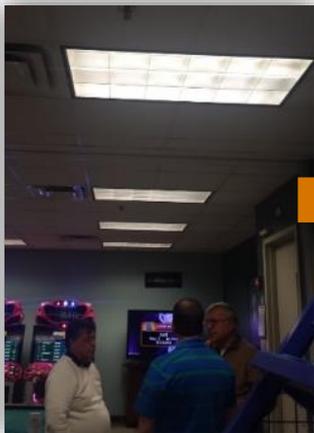
- Interior Lighting Campaign
 - Technical assistance
 - Guidance and recognition campaign
 - Recognition for excellent performance

Interior Lighting Campaign

Recognition and guidance program supporting efficient interior lighting solutions

Before

After



2016 ILC Recognition Example:

T-Mobile Call Center, Oakland, ME

Highest Absolute Annual Savings for Troffer

Lighting Retrofits - Medium Project

65,000 kWh annually (56%)

► Achievements

- > 1.1 million high efficiency troffer lighting systems documented
- 59 Participants (site owners)
 - 13 recognized for exemplary performance
 - Recognized sites saved 40% - 80%
- 154 Supporters

► What's new?

- Case studies of exemplary sites
- New fixture categories
- Supporter Recognition

Resources

New Certificate Series

Advanced Lighting Systems

Complete the Series: Earn 0.6 CEUs
Learn to deliver exactly the right illumination levels at the right time for comfortable, productive, and safe environments.

The new FEMP Certificate Series – Advanced Lighting Systems provides comprehensive instruction on the most current interior and exterior lighting system applications, including lighting sources, technologies, controls, and emerging trends, as well as federal procurement guidance, requirements, and resources.

[REGISTER FOR THE SERIES](#)

FEMP 50

Advanced Lighting Systems: An Overview

0.2 CEUs

Provides a summary of current lighting sources and applications, with a concentration on light-emitting diode (LED) technologies, as well as controls, retrofits, and how to identify the most cost-effective installation options. This course also details federal guidance, requirements, and procurement resources.

[Register Now](#)

FEMP 51

Advanced Interior Lighting Systems

0.2 CEUs

Covers interior applications, including fluorescents, compact fluorescent lamps (CFLs), induction, metal halide, and LEDs, as well as controls, savings opportunities, emerging technologies, and future trends.

[Register Now](#)

FEMP 52

Advanced Exterior Lighting Systems

0.2 CEUs

Covers exterior applications, including high intensity discharge sources, induction lighting, and LEDs, as well as exterior fixtures, controls, example projects, emerging technologies, and future trends.

[Register Now](#)



Instructor:
Mike Myer
 Lighting Engineer

Pacific Northwest
 National Laboratory



FEMP eTraining is designed for Federal energy and facility managers, but is open to all individuals. For more information and to register, [CLICK HERE](#).

LED Retrofit Kits, TLEDS, and Lighting Controls: An Application Guide

Lighting use constitutes about 20% of the total source electricity consumption in commercial buildings. The vast majority of lighting in U.S. commercial buildings is provided by fluorescent troffer ceiling fixtures. There are currently over 350 million installed troffers using more than 65 million kWh (the annual energy usage of 6 million U.S. homes).

Retrofitting these fluorescent troffers to light-emitting diode (LED) sources offers the potential for enormous energy savings. As of 2015, only 5% of the troffers in use had LED light sources. At a project level, retrofitting or replacing fluorescent troffers with LEDs can result in energy savings of 20% to 60% and help agencies meet energy-efficiency goals.



In a lighting upgrade of the New Carrollton Federal Building in Lanham, Maryland, the General Services Administration cut energy use by 82% and trimmed an annual lighting bill from \$291,000 to \$53,500 by replacing 11,800 fluorescent troffers with LED fixtures and controls. Photo source: GSA.

Troffer Lighting at a Glance

The term "troffer" is a combination of two different architectural elements: a "trough" and a "coffer." A troffer is a rectangular light fixture designed to fit into a modular dropped ceiling grid. Fluorescent tubes were introduced to the market in 1938, and ceiling troffer fixtures were soon designed to accommodate standard linear fluorescent lamp sizes (T12s, T8s, and T5s). Troffers are typically available in standard sizes of 1x4-ft, 2x4-ft, and 2x2-ft. There are hundreds of millions of fluorescent-based troffers in use in the United States; nearly every commercial building has them. Around 2010, LEDs began to gain popularity for interior lighting, and lighting manufacturers began designing troffer models with integral LED sources. Most LED troffer luminaires sold today are still designed in the traditional

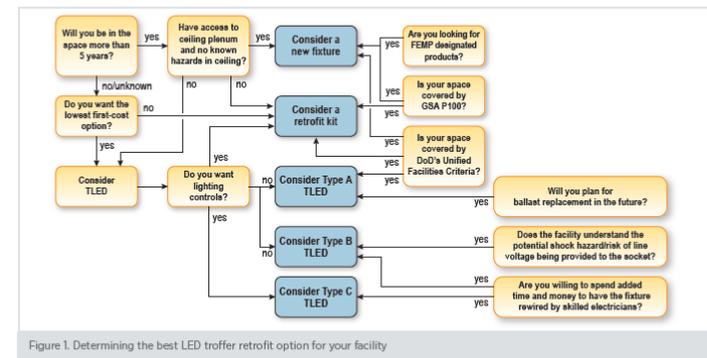


Figure 1. Determining the best LED troffer retrofit option for your facility

Retrofit Kits

- Working with commercial entities on advanced retrofit kits
- Draft specification
- High efficiency requirements
- Examining how to implement / install kits



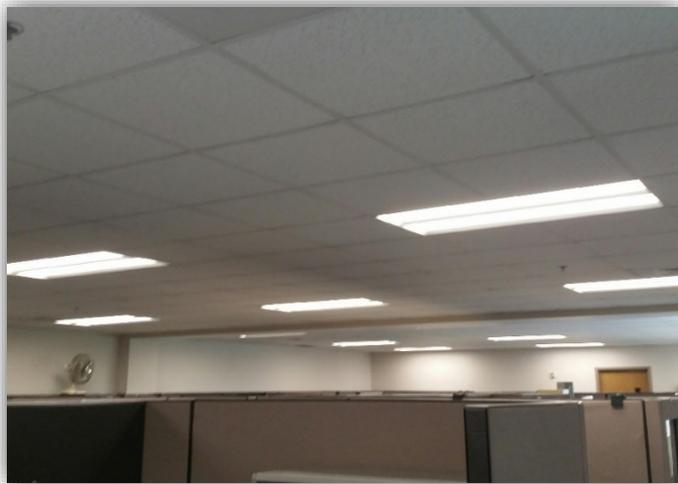
Forrestal Relighting TLEDs

- FEMP ENABLE ESPC
- 2.3 million kWh saved across the building
- 47% energy savings
- Completed in less than 1 year
- Utilizes UL Type A TLEDs
 - Operate off existing fluorescent ballasts
 - Needed an MOU with GSA
 - DoD's UFC addressed UL Type A



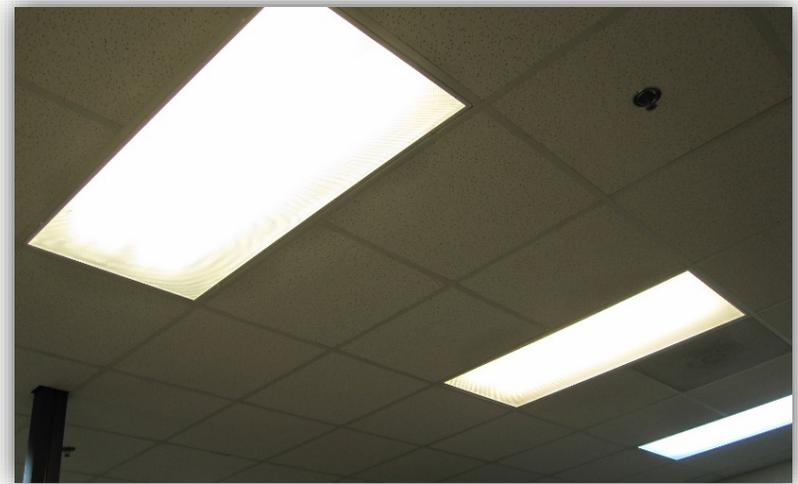
2016 ILC Recognition: Army Reserve – 99th RSC & 9th MSC

Exemplary Federal Government Sector Site



- 184,000 kWh saved annually
- 51% energy reduction compared to existing usage

Exemplary Federal Government Sector Site



- 125,000 kWh saved annually
- 62% energy reduction compared to existing usage

2016 ILC Recognition: GSA New Carrollton Federal Building



Highest Absolute Annual Savings for Troffer Lighting Retrofits - Large Project
Highest Percentage of Annual Savings for Troffer Lighting Retrofits - Large Project

- 2,100,000 kWh saved annually
 - 2,000,000 kWh from new equipment
 - 100,000 kWh from controls
- 78% energy reduction compared to existing usage
 - 73% from new equipment
 - 5% from the use of controls
- Energy usage of 200 homes

2016 Recognition: GSA Byron Rodgers Federal Building & U.S. Courthouse



Best Use of Lighting Controls in a Single Building

- 477,000 kWh saved annually
 - 358,000 kWh from new equipment
 - 119,000 kWh from controls
- 59% energy reduction compared to existing usage
 - 44% from new equipment
 - 15% from the use of controls
 - Modeled, not measured
- Dual technology occupancy sensors per luminaire
- Closed loop daylighting harvesting control for 15' perimeter zone
- 8 daylight harvesting zones per floor
- Daylight dimming to 0%

Contact Information & Questions

- Contact Information:

- www.interiorlightingcampaign.org
- Michael Myer
- Michael.myer@pnnl.gov
- 509-375-7292

- Questions:

- Any interest in follow-up calls?
- Any agency communication channels that can promote ILC?