

Cleveland Clinic Offers Healthy Savings with LED Retrofit

Cleveland Clinic was recently recognized for excellence and leadership in interior lighting by the Interior Lighting Campaign for savings achieved from a major lighting upgrade conducted at its Lerner Research Center in Cleveland, Ohio.

- **Highest Absolute Annual Savings for Troffer Lighting Retrofits – Large Project:** The Clinic replaced fluorescent lamps with LEDs in 10,500 ceiling troffers at the six-building research complex to achieve savings of nearly 2.6 million kWh. Cleveland Clinic replaced old 31-W and 59-W fluorescent lamps and ballasts with direct-wired 13-W and 26-W LED lamps to cut annual energy use from 4.7 M to 2.1 M kWh. The energy reduction translated into an annual cost savings for this project of \$179,900, and a quick payback.

Cleveland Clinic upgraded 14 buildings in addition to the Lerner Research Center. For their overall lighting project, Cleveland Clinic calculated a 4-year payback based on energy savings only, and a 2.3-year payback when maintenance savings were included. The return on investment was 23 percent on energy only and 41 percent with maintenance savings. Savings calculations are based on a 10-year product life (the lamps had a 10-year warranty), an electricity rate of \$0.07/kWh, and a combined material (tube/ballast) and labor cost of \$7.85/fixture per year for the fluorescent system. Materials and labor costs were validated by reviewing actual tube and ballast invoices, and estimating the labor necessary to install the materials. Utility incentives are not included as none were available at the time of the project.

Keys to Success

Cleveland Clinic's commitment to affordable care and its external partnerships with ENERGY STAR® and the Better Buildings Challenge were both drivers for the project. The Better Buildings Challenge includes a commitment for companies to become 20 percent more energy efficient within 10 years.

The Lerner complex retrofit was part of a larger \$12 million effort to cut energy use across all of Cleveland Clinic's properties. Their portfolio includes more than 32 million square feet of office, research and health care space, including its 165-acre main campus, with 42 buildings, nine regional hospitals and 18 health centers in Ohio, Florida, Nevada, Toronto and Abu Dhabi. By 2021 Cleveland Clinic expects to be 100 percent LED. By that time, all 200,000



Cleveland Clinic retrofitted 10,500 troffers with LEDs at its Lerner Research Center in Cleveland for an energy savings of 2.6 M kWh per year. Photo courtesy of Cleveland Clinic.

Interior Lighting Overall Results

Energy Savings	10.3 million kWh annually, a savings of 55%
Troffers Upgraded	49,900
Total Area of Project	32 million square feet
Annual Energy Cost Savings	\$717,800
Payback	4 yr energy only (2.3 years with maintenance savings)

“By scaling up, we were able to manage the project and achieve savings on parts and installation. By retrofitting the fixtures [rather than replacing them], the project made economic sense without incentives, even with a low electricity rate (\$0.07).”

— Jon Utech, Senior Director of the Office for a Healthy Environment of the Cleveland Clinic

fixtures will have been retrofitted with upwards of 500,000 LED tubes, saving more than 40 M kWh.

Project Methodology

These lighting retrofits are expected to cut electric consumption by 28.6 M kWh each year for a total annual savings of over \$2 million. This will reduce its carbon footprint by nearly 19,400 tons of CO₂ annually – equivalent to taking 3,600 cars off the road.

Cleveland Clinic purchased the lights for this project from a local manufacturer, Energy Focus, Inc., of Solon, Ohio. Energy Focus, Inc. supplied the installers and worked with Cleveland Clinic to provide the optimal LED lighting solutions. As part of this process, 20 different products were reviewed and eight were tested in mock ups of different sizes to come to a final lighting system choice.

The LED Lighting Project created 10 new manufacturing jobs in addition to 10 new installation jobs. Cleveland Clinic contracted with Evergreen Energy Solutions, LSI, Lake Erie Electric, and URG for installation.

Creating a total project plan helped to keep the overall retrofit project on schedule. Patients and caregivers have commented positively on the improved light quality.



When you have over 100,000 fixtures to retrofit, installation rate is a factor. Trained crews were able to retrofit 5 to 6 fixtures per hour. Photo courtesy of Cleveland Clinic.

2016 ILC Recognition for Highest Absolute Annual Savings for Troffer Lighting Retrofits (Large Project)

Location	Cleveland, OH
Troffers Upgraded	10,500
Energy Savings	2.6 million kWh annually

Tips and Best Practices

- ▶ Lighting quality is especially important in healthcare settings, where factors such as spectrum, brightness and flicker can impact patient outcome, staff productivity and the overall health of the indoor environment.
- ▶ Creating a total project plan will help keep large projects on schedule, but factor in time for testing, obtaining funding and getting contracts in place.
- ▶ When selecting a supplier, factors to consider include warranty, volume discounts and ability to deliver as needed rather than all at once when storage space is limited.
- ▶ Installation rate is a factor in large retrofit projects. Experienced crews can retrofit a troffer in as little as 10 minutes per fixture.

Learn More

Through the [Better Buildings Alliance](#), members across different market sectors work with the U.S. Department of Energy's (DOE) exceptional network of research and technical experts to develop and deploy innovative, cost-effective, energy-saving solutions that lead to better technologies, more profitable businesses and better buildings in which we work, shop, eat, stay and learn.

Learn more about how to join the Better Buildings Alliance's Interior Lighting Campaign (ILC) at <https://interiorlightingcampaign.org/>. The ILC is a recognition and guidance program designed to help facility owners and managers take advantage of savings opportunities from high-efficiency interior lighting solutions. As of January 2017, ILC participants are collectively saving close to \$13 million annually across approximately 95 million square feet by upgrading to high-efficiency interior lighting solutions.

Find more resources and guidance on lighting in the [Better Buildings Solution Center](#).