

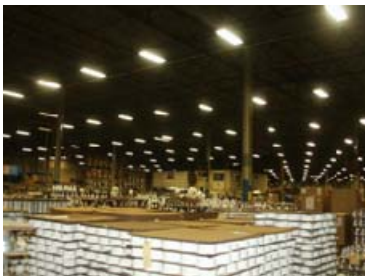
Philips Lightolier

Energy Conservation Case Study

Summary

Philips Lightolier has adopted several energy efficiency measures that have saved the company close to one million dollars annually. The facility, which manufactures lighting systems, reduced energy consumption for its own lighting needs and enhanced the efficiency of its air compression system by monitoring compressed air movement and upgrading factory lighting. Improving the compressed air system reduced electricity use by 531,951 kWh and saved approximately \$66,000 in annual energy costs. In addition, Philips Lightolier replaced all of its lighting and fixtures with more energy efficient models. This project reduced electricity use by 570,000 kWh and saved close to \$71,000 per year. In total, these energy efficiency measures have saved the company 1,101,951 kWh and \$137,000 annually. Thanks to an incentive program through National Grid, Philips Lightolier reduced its out-of-pocket costs by nearly 70 percent for these energy efficiency projects from \$237,921 to \$76,511. Both of these projects had payback periods of less than nine months. Since OTA last worked with Philips Lightolier, the company implemented new projects to reduce natural gas and electricity use, including phasing out rooftop heaters and using heat generated from the new powder coating line for 50 percent of the factory's comfort heat. This has reduced natural gas consumption by 42 percent and has saved \$345,000 from 2007-2011. Additionally, Philips Lightolier has recently completed the installation of a 2.0 MW wind turbine. The turbine is expected to save the company \$480,000 in annual energy costs.

Philips Lightolier previously eliminated the use of approximately 1.25 million pounds of trichloroethylene in their Fall River, MA plant by adopting less toxic alternatives and modifying the production process. Additionally, the Fall River location has reduced its annual water consumption by 70 percent. This amounted to \$242,000 in savings annually.



T5 High Bays

Background

Philips Lightolier is a vertically integrated reflector factory headquartered in Fall River, MA. The Fall River plant is about 310,000 square feet on a 31 acre property, and enjoys annual sales of approximately \$155 million. This plant employs approximately 425 individuals and has implemented toxics use reduction methods since the late 1980s. More recently, Philips Lightolier has enacted specific measures to improve energy efficiency and conserve water throughout its facilities.

Energy Conservation

Philips Lightolier has developed several new methods of reducing energy consumption in the Fall River plant. Some of the new strategies implemented include revamping its compressed air system and replacing factory lights with more energy efficient lighting. The company reduced natural gas consumption by 42 percent and saved \$345,000 from 2007-2011, primarily by phasing out its rooftop heaters and implementing low temperature cleaners on its three cleaning lines. The company was able to eliminate these heaters by using the process heat generated by its new powder coating line to



Powder Coated Reflectors

provide comfort heat for half the facility. Additionally, Philips Lightolier reduced electricity use by 40 percent via the lighting upgrades, compressor improvements, and the installation of variable frequency drives (VFDs).

“Implementing toxics use reduction and resource conservation has helped us to provide Green Products from Green Processes. We’ve made a lot of friends over the years at OTA and TURI and look forward to our continued relationship with them and many more successful projects in the coming years.” - Ron Westgate - Plant Engineer, Philips Lightolier

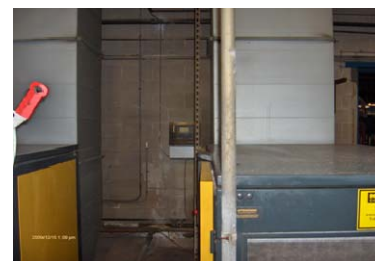
Compressed Air Improvement

Philips Lightolier installed several new measures to ensure that its compressed air system was operating as efficiently as possible. Before beginning the leak repairs at the facility, the company conducted pre-metering and leak surveys to establish baseline reports. Following the leak repair and baseline report, the company installed a permanent air management system that also came with a vertical receiver and dryer, to monitor any potential leaks. These projects cost a total of \$14,200, and were entirely covered by National Grid rebates. The following table lists each project, the total cost and subsequent National Grid rebate, and reduced electricity use (in kWh) per year.

Project	Project Cost	National Grid Rebate	Reduced kWh/Year	Annual Cost Savings
Leak repairs	\$7,500*	\$3,300	381,951	\$47,389
3,000 gallon vertical receiver, 520 cfm cycling dryer (including shipping)	\$36,300*	\$16,543	100,000	\$12,407
Post-installation monitoring, distribution improvements	\$5,000	\$2,250	50,000	\$6,204
Total	\$63,000	\$36,293	531,951	\$66,000

* Estimate

These improvements have reduced the company’s energy use by 531,951 kWh annually, which translates to \$66,000 per year in financial savings. Most notably, the company has reduced its electricity use by nearly 400,000 kWh annually from repairing air leaks, saving approximately \$47,000 in electricity use each year. Through incentives from National Grid, the company was able to minimize costs related to these energy efficiency projects. In total, the company paid \$26,707 – a payback period of only 20 weeks.



Compressed Air System



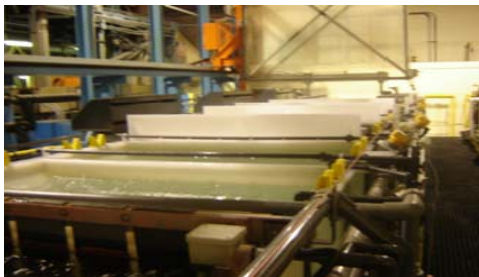
3,000 gallon vertical receiver

Philips Lightolier has continued its toxic use reduction efforts with its phosphoric acid co-product mechanisms. The facility intentionally manufactures approximately 30 percent phosphoric acid. While marketing this acid has led to a small revenue increase, the majority of the company’s current \$228,000 annual savings is due to cost avoidance. This project has allowed Philips Lightolier to reduce its purchase of sodium hydroxide. The original cost of this project was \$28,000 for the phosphoric acid collection tanks. This effort has been in place since the mid 1980s.

Factory Relighting

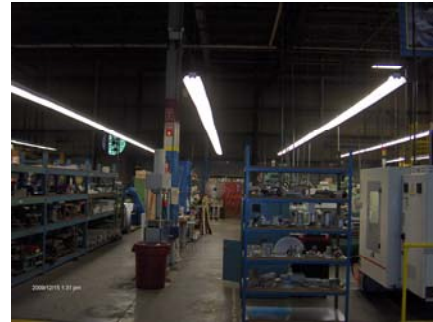
As part of the factory relighting project, Philips Lightolier replaced 100w metal halide (MH) and T12s with high bay T5s and T8 task lights. The project took two phases to complete. The first phase included assembly and shipping of 242 T5 high bays, 16 T8 emergency fixtures, and 77 T8 task lights.

Project	Project Cost	National Grid Rebate	Reduced kWh/year	Annual Cost Savings
Phase 1: Assembly and shipping of 242 T5 high bays, 16 T8 emergency fixtures, and 77 T8 task lights	\$83,000	\$43,000	323,000	\$40,233
Phase 2: Fabrication, buffing, anodizing, and purchase of 291 T5 high bays, 17 T8 emergency fixtures, 83 T8 task lights	\$95,772	\$85,968	247,000	\$30,767
Total	\$178,772	\$128,968	570,000	\$71,000



Typical process tanks in one of Philips Lightolier's state of the art automated anodizing lines

Philips Lightolier reduced energy use by 570,000 kWh, and saved \$71,000, annually from this project. Through incentives from National Grid, the company was able to minimize its costs to \$49,804 – a payback period of 36 weeks.



T8 Lights

Results

The compressed air and relighting projects reduced electricity use by 1,101,951 kWh, and saved the company \$137,000 per year. In addition, Philips Lightolier recently installed a 2.0 MW wind turbine. The company plans to sell million kWh back to the grid, which will offset two-thirds of the company's annual 6 million kWh usage. This is estimated to save Philips Lightolier \$480,000 annually. Philips Lightolier has recently consolidated operations to maximize key competencies. During this time, the Fall River facility has maintained its profitability, largely due to the cost savings achieved through toxics use reduction and resource conservation efforts.



Wind Turbine Generator

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