

## Lighting Retrofit and a Solar Roof

When the Fortin family pursued energy savings at their **Fortin Ironworks in Columbus, Ohio**, they decided to invest in a new white roof, a rooftop solar array, and a lighting upgrade in the production facility and Showroom as well. The lighting upgrades were expected to save enough energy to pay back the cost of the lighting work as well as noticeably shorten the overall project payback, and create instant cash flow. Watt Works Inc. was called in to sort out the confusing array of lighting technologies, produce reliable savings projections, and navigate rebates from AEPOhio GridSMART to provide the best payback possible. In addition, a State of Ohio Energy Plan Grant was awarded for the combined lighting and solar project.

Watt Works first step was to meet with President Dan Fortin and determine his goals for the lighting portion of the project. A previous lighting report had projected great savings but also raised concerns with inaccurate fixture counts, a complex retrofit installation that had to address existing below-code work, and overlooked savings and rebate opportunities. Watt Works updated the lighting survey and addressed the additional issues with the chosen electrical installer, which improved the net savings and utility incentive potential.

The warehouse and production areas incorporated TechBrite 4 ft. T8 high-bay fluorescent fixtures to replace existing 8 ft. T-12 and Metal Halide high-bay fixtures. TechBrite fixtures are manufactured in Ohio and were shipped as kits that minimize packaging waste and allow the chosen electrical contractor a natural progression of work each day. Under the lighting renovation, the licensed electrical contractor cleaned up the existing electrical deficiencies as he worked through the fixtures and circuits, and the resulting project passed the electrical inspection and resulted in a safer facility.

Watt Works provided the detailed energy savings and lighting calculations required:

- ▶ to select the proper retrofit products,
- ▶ to verify the payback to make the business decision for the lighting project,
- ▶ to satisfy the State of Ohio grant documentation requirements, and
- ▶ to successfully apply for AEPOhio gridSMART rebates.

The project only took 8 weeks from survey to completion including deliveries, inspections and utility acceptance, and the utility rebates and lower electric bills have already started showing up on the Fortin Ironworks bottom line.

Watt Works has unmatched experience with and access to the newest and best energy saving technologies. From T5/T8 Fluorescent and LED lighting to web-enabled HVAC systems, from radiant heat panels to variable speed drives, from solar collectors to water conservation, Watt Works can help you take advantage of the best, most efficient, and best-performing technologies for your situation to get you the results you need, whether you own a building or lease a space for your business.

*Call Watt Works today to start saving money!*

**Fortin Ironworks - Columbus, Ohio****Lighting Retrofit Details - December 2011**

## 1. Annual Facility Power Usage

- a. May 2010 through April 2011 total consumption was 225,520 kWh at a cost of \$29,071.
- b. Calculated average cost of power was \$0.1289/kWh.
- c. Monthly demand varied from 100 to 131 kWd, averaging 112 kWd.

## 2. Lighting Upgrade - Savings Projections

- a. Total upgrade involved 294 fixtures and reduced the lighting load by over 25 kW, reducing monthly demands by over 22% and annual consumption by 77,205 kWh/yr which is a **34.3% savings** over 2011 consumption.
- b. The cost savings is anticipated to be \$6,800 per year and the savings will increase with rising electricity rates.
- c. Lighting retrofit project total installed cost, with material and labor, was \$38,000 .
- d. AEPOhio gridSMART applied-for **rebate was \$8,827** (based on \$0.35/Watt reduction) .
- e. Lighting Retrofit alone **pays back in 4.3 years** after rebate. (This payback considers the State of Ohio ARRA grant as if it applied to roof replacement and solar only).

## 3. Fixture Retrofit Details - Original and Upgrades

- a. 235 ea. **8 ft. T12 Fluorescent** white reflector fixtures with two 96" tubes and magnetic ballast, at 210 Watts/fixture were converted to four 48" T-8 tubes and electronic ballast at 144 Watts/fixture, operating 3200 hrs/year.  
Total connected load reduction was 15,510 Watts, reducing consumption by 49,632 kWh/yr.
- b. 25 ea. **400 Watt Metal Halide high-bay** fixtures with magnetic ballasts at 455 Watts/fixture were converted to fluorescent fixtures housing six 48" T-8 tubes and electronic ballast at 222 Watts/fixture, operating 2600 hrs/year.  
Total connected load reduction was 5,825 Watts, reducing consumption by 15,145 kWh/yr.
- c. 18 ea. **250 Watt Metal Halide high-bay** fixtures with magnetic ballasts at 295 Watts/fixture were converted to fluorescent fixtures depending upon light level needed: 18 ea. used four 48" T-8 tubes and electronic ballast at 144 Watts/fixture, and 16 ea. used six 48" T-8 tubes and electronic ballast at 144 Watts/fixture. All are operating 3200 hrs/year.  
Total connected load reduction was 3,884 Watts, reducing consumption by 12,428 kWh/yr.

The new white roof and roof-mounted solar power array are partially enabled by a grant from the State of Ohio under the ARRA-SEN program. The lighting retrofit is a coordinated part of the overall energy project, and its impact shortened the payback period and created utility savings immediately.

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