

## BACKGROUND

Founded in 1977 and located in Ontario, NY, HARBEC, Inc. is a custom injection molding company. HARBEC's 50,000 square foot manufacturing facility operates three shifts, six days a week. HARBEC's manufacturing capabilities include a diverse set of specialized equipment, including injection molding machines, CNC machining centers, CNC lathes, EDM machines, 3D printers, one metal molding machine, and a range of other specialized machines.

As a manufacturing company HARBEC use resources including energy, water, materials, and fuels. HARBEC's 150 employees operate state-of-the-art equipment to produce custom injection molded parts, CNC machined components, 3D printed and additive manufactured precision parts and prototypes, and other finished manufactured parts and assemblies.

HARBEC, Inc. is seriously committed to sustainable manufacturing. HARBEC takes an "inside the gate" approach to sustainability, proactively choosing to be accountable to the resources they use, the products they produce, and their impact on our community. By focusing on an "inside the gate" approach to sustainable manufacturing, HARBEC has greater control on its impact on human health and the environment while simultaneously creating sustainable value for their customers and community. In 2014 HARBEC was awarded the Environmental Excellence Award by the New York State Department of Environmental Conservation (NYSDEC) for their innovation in achieving carbon neutrality.



250kW and 850 kW Wind Turbines at HARBEC, Inc.'s Manufacturing Facility in Ontario, NY

## THE PROJECT

In 2014 HARBEC reevaluated the lighting efficiency of its 50,000 sq. ft. facility. A diversity of new LED lighting products have been launched in the past two years which can provide better light quality, lower energy use, and a total reduction in lighting costs compared with other lighting products. To discover if a facility-wide lighting retrofit would make Eco-Economic sense, Rochester Gas and Electric (RGE) provided the opportunity for HARBEC to work with Lockheed Martin's Energy Efficiency Services group on a lighting assessment. In addition, HARBEC also worked with Rochester, NY based Lumentek Global, an LED lighting design, distribution, and manufacturing company.

## THE TEAM

			
<p><b>HARBEC, Inc.'s 50,000 sq. ft. facility was the lighting assessment and upgrade site.</b></p>	<p><b>RGE, HARBEC's local electric utility provided financial incentives for lighting efficiency.</b></p>	<p><b>Lockheed Martin's Energy Efficiency Services Group provided technical support, lighting assessment, and post-installation verification of product install and savings.</b></p>	<p><b>Lumentek Global provided high-quality lighting consultation and LED products to achieve HARBEC's LED lighting retrofit goals.</b></p>

## ECO-ECONOMIC OPPORTUNITY AT HARBEC

HARBEC has developed an internal [Eco-Economic](#) model for evaluating the costs and benefits of all technologies, equipment, and projects that relate to business objectives of pursuing sustainable manufacturing and achieving its goals of carbon and water neutrality. HARBEC's Eco-Economic model is also a deliberate tool that ensures the business always achieves financial value from its investments, so that goals for environmental, energy, social, and sustainable impact do not interfere with the ability of the business to achieve desired financial performance.

By incorporating Eco-Economic decision criteria into its purchase of energy efficiency measures including lighting, HARBEC has been able to use “energy dollars” or those dollars which would have been spent on electricity (kWh) and gas (therms) with the utility toward high-value energy efficiency improvements. The result of this unique approach has been significant. HARBEC has been able to save hundreds of thousands of dollars in energy costs by offsetting what they would have paid for energy if they had not made Eco-Economic analytical choices on energy improvements.

## PROCESS

With the assistance of HARBEC, Lockheed Martin conducted a facility-wide audit of HARBEC's existing high-bay and overhead lights. The process yielded an inventory of how many and what types of lighting fixtures and bulbs were in use. In addition, HARBEC and Lumentek Global also spent time talking with employees about their lighting needs and existing satisfaction with lighting quality throughout the facility.

## FINDINGS

In total, Lockheed Martin's lighting assessment identified more than 520 fixtures and tallied 1,280 lamps, representing 32 watt fluorescent lamps that could be replaced with more energy efficient 18 watt LEDs at HARBEC. Lockheed Martin's assessment also determined that HARBEC was eligible for a Rochester Gas and Electric (RGE) lighting efficiency incentive. In dialog with HARBEC employees, HARBEC and Lumentek determined that the lighting quality in certain and critical areas of the facility was sufficient, but could be improved to support better color rendering, and improve the productivity of machine operators, part inspectors, and secondary operations employees.

## ECO-ECONOMIC SOLUTION

HARBEC chose to implement Lumentek Global's LED T8 Replacement, a DLC certified product. Lumentek's T8 replacement works with a ballast (Ballast Friendly) or without a ballast (Direct Wire). The advanced circuitry allows the LED tube to operate on most Instant Start, Rapid Start, and Program Rapid Start electronic and Magnetic ballasts. In the event that the LED tube does not work with a ballast or if the ballast should ever fail or begin to hum in the future, it can then be wired direct to line voltage bypassing the ballast. Lumentek's “Ballast Friendly”™ LED product is a true “Universal” replacement tube that's as easy to

Features of Lumentek's “Universal” LED Replacement tube for T8 & T12 fluorescent lamps:

- High Lumens Per Watt – Up to 118 lumens per watt.
- High Color Rendering – 81 CRI.
- Plug and Play operation.
- **Long Life** 50,000 hours operation.
- Available in 18 watt or 21 watt versions.
- Cooler operation extends existing ballast life.
- Universal 120-277 Volt Direct Wire operation.
- Operates LED and Fluorescents on the same ballast.
- **No rewiring of fixtures** - Ballast Friendly operation does not disturb the fixture's existing wiring; and no fixture replacement cost.

install as a light bulb without the concern for future ballast replacements.

## RESULTS

<b>Total Project Costs</b>	\$32,000 total cost for 1,280 new LED bulbs
<b>Electric Utility Incentive</b>	\$16,000 (50% RGE Energy Reduction Grant)
<b>HARBEC Share (\$)</b>	\$16,000
<b>Energy Savings from LED Retrofit Project (kWh's)</b>	45% Lighting energy reduction (from 32w to 18w)
<b>Economic Savings from Energy</b>	\$22,000 in annual savings in lighting energy cost
<b>Return on Investment</b>	1-Year Payback with RGE/Utility Grant 2-Year Payback with no Grant



## SUMMARY

In working together, HARBEC, Lockheed Martin, RGE, and Lumentek Global demonstrated that there are pragmatic solutions for regional sustainable economic growth. This project enabled HARBEC, Inc., and employer of more than 160 high-value manufacturing jobs to further reduce its energy use, save money, and achieve an eco-economic outcome and very favorable return-on-investment.

As an economic incentive partner, RGE supported HARBEC's LED upgrade by providing a simple-to-use lighting retrofit application.

Lumentek Global benefited as a high quality supplier of innovative LED products to HARBEC. By earning the trust of HARBEC, Lumentek was able to deliver their LED solutions to another satisfied local customer, another step in their business growth.

Finally, Lockheed Martin demonstrated the power of having the right technical supporter for energy efficiency upgrade projects. Not only did Lockheed support HARBEC in the lighting assessment, they provided HARBEC with the tools to develop an application for the RGE energy incentive. Further, as Lockheed conducted their post-installation verification, they pointed out additional lighting opportunities which HARBEC could pursue to achieve even more Eco-Economic potential.