



Project: AEP-Ohio gridSMARTOhio – Energy Efficiency Program
Location: 2751 Tuller Parkway
Dublin, Ohio

Lighting Upgrade – Corporate Office Building

Scope of Work:

Through the marketing efforts of KEMA, a leading authority in energy consulting, and Lighting Unlimited, a local fixture vendor, Varo Engineers (Varo) became aware of the gridSMART energy efficiency program sponsored by AEP-Ohio. The focus of the program is to provide incentives to non-residential customers of AEP-Ohio for implementing qualified energy efficiency projects. The incentives pay for new equipment to reduce energy consumption and installation by a contractor.

Varo submitted a Prescriptive Program Project application for a lighting upgrade at its' corporate office building. Upon approval of the application, Varo commenced with engineering, procurement and installation of the project. When the project was completed, Varo submitted the final application from which AEP-Ohio verified the incentives and released the funds, in check form, to Varo.

Process:

Varo selected its' corporate office building for several reasons: 1.) "The low hanging fruit" option – a lighting retrofit is an obvious Energy Conservation Opportunity and a relatively straightforward project to implement; 2.) The payback and ongoing savings was significant; and 3.) The project exemplifies Varo's commitment to and leadership of energy conservation and sustainability initiatives.

To complete the application, a walk down was completed and data collection was conducted. The quantity, type and technical specifications were collected for all existing fixtures, lamps and ballasts. VISUAL, a software product by Acuity Brands Lighting, Inc. was utilized to calculate the output performance of the new lighting equipment. Calculations are based on procedures established by the Illuminating Engineering Society of North America, or standard industry practice.

Three styles of fixtures were identified for the retrofit, for a total of 199 fixtures, and 4 exit signs. To simplify the installation and reduce impact on the operations of the office, a retrofit kit was used to upgrade the existing fixtures versus complete fixture replacement. Existing T12 fluorescent lamps were replaced with Reduced Wattage T8 lamps, Standard T8 lamps were replaced with Reduced Wattage T8 lamps, and magnetic ballasts were replaced with electronic ballasts. In addition, all incandescent exit signs were replaced or retrofitted with LED lamps. Finally, Lighting Occupancy Sensors were installed in multiple zones, and as a result of replacing three and four-bulb fixtures with two-bulb fixtures, 322 other lamps were removed without replacement (de-lamping). All materials removed/replaced were recycled, following Varo's corporate policies on sustainability and recycling.

Anticipated savings were determined by calculating the total watts for an existing unit (3 or 4 lamps x 40W x n^*) and subtracting the total watts for a new unit (2 lamps x 30W x n). This difference is divided by 1,000 to determine a kw value. Usage time is calculated (hours each day x 5 days/week x 52 weeks) and that sum is multiplied by the kw value and the current billing rate, found on the most recent utility bill. This sum is the savings for one unit for one year.

These calculations were done for each fixture type, with each type showing a different payback, from one year to three years.

Summary:

The entire project, from walk down, pre-application, application process and approval, engineering, procurement, installation and final application submittal was approximately six months. AEP-Ohio's verification and approval process was straight forward and the incentives were paid out within 30 days of the approval date.

The equipment cost to complete the project was \$16,987.00 and the incentive paid by AEP-Ohio was \$4,648.00. Considering the monthly savings from this initiative, the result of this effort will be a net payback by August, 2013 and a continued saving of more than 30% per annum on the lighting portion of the electric bill.

As for the utility and working benefits of a new lighting system, the illumination distribution and positive effect in the work spaces is outstanding. The retrofit packages and distribution selected have an improved min/max ratio and have reduced the glare in the workspace, leading to more uniformity in coverage and less eye strain and eye fatigue. The performance of the occupancy sensors reinforces the idea: "turn the lights off if no one is there" and also shows that all the lights don't need to be on to provide a comfortable work area.

* n equals a ballast factor, which is a percentage factor for energy loss.