UNITED ENERGY ASSOCIATES, INC.

A Lighting Conversion Case Study

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COCHRAN SPARKLE MARKET
Youngstown, Ohio

"It is not often that one gets an opportunity to make a dramatic change in their store's appearance and then have it pay for itself in less than a year."

Description:

The Cochran Sparkle Market has been in business at the same location in Youngstown, Ohio for over thirty years. The owners, Art and Jerry Cohen, have worked hard to develop Sparkle's reputation for fresh merchandise and friendly service. The store occupies approximately 35,000 square feet of space and uses its lights an average of about 149 hours per week. Lighting is supplied, in large part, by (120) 2x4 lay-in fixtures and (210) 8' strip fixtures. The 2x4's are standard 4 lamp, 2 ballast fixtures with watt draws of 192 Watts (four 40W lamps plus two 16W ballasts). The 8' strip fixtures each burned two (2) 75W lamps and one (1) standard 24W ballast, for a total input draw of 174 watts.

Retrofit Goals:

The primary goal of the conversion was to improve the appearance of the grocery by making it brighter and more cheerful. The owners, Art and Jerry Cohen, felt that their first objective as retailers was to improve the environment within the store. They particularly wanted the conversion to produce a positive response from their clientele. The secondary goal was to save as much energy as possible, producing an investment payback, if possible, in less than two years.

Constraints:

The goal of increasing light quality represents a constraint on maximizing watt reduction as did the owner's insistence that measurable light levels be maintained or increased, but not lowered. Other constraints were basically budgetary as the owner had a financial ceiling on the project.

Solutions:

The conversion of the 2x4 fixtures consisted of removing the old lamps, ballasts, ballast cover, light sockets and end brackets and replacing with all new components. An electronic 2-lamp ballast was used with (2) high CRI 841 T-8 lamps. New lamp sockets were inserted into the new end brackets and a one piece, full-coverage aluminum reflector (which acts as a new UL approved ballast cover) was snapped into each fixture to complete the installation.

The conversion of the 8' strip fixtures entailed removing the lamps, ballast and ballast cover and replacing those components with the same electronic ballast and lamps used in the 2x4 conversions. A new reflectorized ballast cover was added before the two 4' lamps were installed in tandem. While this conversion requires considerable skill on the part of the installation technicians, because it entails a total redesign of the fixture system, the performance results are outstanding.

Results:

Watt requirements within the 2x4 fixtures were reduced from 192 watts per fixture to 59 (a 72% reduction). In the 8' strip fixtures, watt levels were reduced from 174 to 59 (a 66% reduction). Light levels were uniformly maintained throughout the store and because of the high color rendition of the new T-8, 841 lamps, visual acuity was dramatically improved. In addition, the store has reduced its maintenance costs by 50% and now has the advantage of using the same standardized lamps and ballast in both types of the store's fixtures.

Explanation:

The T-8 lamps (80 CRI) chosen for this project produce a much better quality of light than standard fluorescent T-12 lamps (60 CRI). In addition, the reflector system installed in this conversion greatly increased both types of fixture's efficiency (i.e., the ability to get the light out of the fixture and down to the work space). This combination of these factors explains the increased visual acuity.

Financial Facts:

The projected energy savings for this lighting retrofit is over **$30,000 per year**, or about *.88 cents per square foot of floor space* . The return on investment is over 105% per year, which produces a very impressive capital recovery period of less than one year.

Environmental:

This project reduced the need to generate 504 KWD of electricity per year; eliminating the burning of 75 tons of coal and thereby avoiding the emission of 700,000 pounds of carbon dioxide into the atmosphere.

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