

# A Lighting Conversion Case Study

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## THE FEDERAL BUILDING Orlando, Florida

*"We sought compliance with the President's mandated reduction of energy consumption by absolutely minimizing the watt draw of our lighting systems, but we also wanted to establish optimal illumination and completely eliminate medium term maintenance requirements."*

### DESCRIPTION:

The Orlando Federal Building is a six story structure built in 1976 and located in the center of downtown Orlando, Florida. It is operated and maintained by the General Services Administration (GSA), the house-keeping arm of the Federal Government. Although the building has several different types of light fixtures, United Energy Associates was scheduled to retrofit (525) 2x4 lay-in fixtures. (400) of these fixtures had been de-lamped from (4) 40W lamps to (2) 34W lamps as part of an earlier energy-efficiency project and the remaining

fixtures were still equipped with (4) 40W lamps. Although the majority of fixtures had been de-lamped, the corresponding ballasts had not been disconnected and, thus energized, continued to waste wattage. Replacing (4) 40W lamps with (2) 34W lamps had also, in most cases, produced unacceptable light levels.

### GOALS:

The GSA's stated goals were three fold. The first goal was to absolutely maximize KWD reduction. The second goal was to provide an increase in the quality and quantity of overall illumination, thus improving employee comfort and performance. The third goal was to completely eliminate medium term fixture maintenance and component replacement.

### PROCEDURES:

Remove old lamps, ballasts and socket brackets. Clean lens and housing, install new socket brackets and electronic ballasts, mount reflectors and new lamps. Each 2x4 fixture now contains (1) electronic ballast, (2)

T-8 lamps and is optically reflectorized.

### COMPONENTS:

Philips GL 70 T-8, 32W lamps with CRI of 79, initial lumens of 2850 and rated at 20,000 hours.

Osram Quicktronic electronic ballast, which exceeds all government standards for thermal protection, sound rating, harmonic distortion, crest factor, power factor and ballast efficacy and specifically constructed to operate T-8 lamps for optimal performance.

Reflect-a-Light, Inc. custom-fabricated the reflectors from Alcoa's EverBrite lighting sheet. They exhibit 86% reflectivity, increase fixture efficiency by 30% and carry a 25 year warranty.

### CONSTRAINTS:

The only constraint on this project was the scheduled completion date. An industry-wide supply shortage of electronic ballasts backed up the start date and compressed the time for completion. Coupled with access and security arrangements common to all Federal facilities, the finish date be-

came a critical factor. Despite these obstacles, this conversion project was completely implemented before the scheduled completion date.

### RESULTS:

FIXTURE NO.	DRAW BEFORE / AFTER	REDUCED KWD
400	100 / 62	20.4
125	192 / 62	21.6
TOTAL:		42

It is interesting to note that a 40% reduction in energy usage was still available to fixtures containing (2) 34W lamps and standard ballasting.

### ENVIRONMENTAL

This project eliminates the burning of 135,000 pounds of coal or 262 barrels of oil, thereby avoiding the emission of 25,286 pound of carbon dioxide (CO<sub>2</sub>), 1,801 pounds of sulphur dioxide (SO<sub>2</sub>) and 668 pounds of Nitrous Oxide (N<sub>2</sub>O).

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