LED Parking Garage Lighting Installations Accelerate With EPAct Tax Savings

By Charles Goulding, Taylor Goulding, and Raymond Kumar

Charles Goulding, Taylor Goulding and Raymond Kumar explain the tax benefits of installing light emitting diodes (LED) into mainstream building categories, specifically examining the LED benefits to parking garage lighting installations.

The much anticipated introduction of energy efficient LED (light emitting diode) lighting into mainstream building categories is escalating with parking garages. LED lighting uses semiconductors called diodes to provide a lower energy consumption powerful light source. Informed commercial building owners and designers of government-owned garages are using the Energy Policy Act 60-cent-per-square-foot EPAct lighting tax incentive to further accelerate this market change.[1]

Although it was predicted that LEDs would eventually mainstream into core building lighting, the speed of introduction of LEDs for parking garages has caught even leading lighting experts, including lighting designers, architects and engineers by surprise. The economic downturn has caused LED lighting manufacturers to accelerate product development cycles and bring LED parking garage lighting to markets much earlier than anticipated.

Before these recent developments, many garages were converting from metal halide lighting to fluorescent lighting. The metal halide to fluorescent changeover is still a very good investment that typically has an economic payback of less than two years, and often less than one year.[2] However, now some metal halide garages are leapfrogging directly to LEDs, and many fluorescent lit garages are upgrading to LEDs as well.

The Importance of Parking Garage Lighting Retrofits

Parking garages are one of the most important building categories for introducing new lighting products because lighting is the biggest energy user in parking garages and garage lighting is generally low ceiling height lighting that is clearly visible to the public. We sometimes forget the sheer number of parking garage applications. Major parking garage facilities include:

1. City and town: government and private general parking garages
2. Airports: government and private parking
3. Universities: often large state universities
4. Malls and shopping centers
5. Office buildings: government and private
6. Sports stadiums: government and private
7. Hotels
8. Convention Centers

The LED Product Solution

Parking garages present challenging lighting environments related to high energy costs, exhaust emissions, vehicle vibration and high maintenance costs. This is an excellent opportunity for LEDs which provide tremendous energy cost savings, re-

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sistance to environmental impacts and have very long product life.

Understanding LED Economic Payback Analysis

Like any new technology, LEDs are quite expensive as compared to current lighting technologies. However, it is crucial to evaluate and compare LED payback after considering energy cost savings, utility rebates and product life. One of the first LED parking garage projects took place in February 2007 for the convention center in Raleigh, North Carolina. Because of the prominence and local support for Cree Inc., the leading LED subcomponent supplier, Raleigh has been an earlier adopter of the LED City initiative. LED City, a combined government and industry organization, advocates energy efficiency, environmental awareness and lighting quality for safety by encouraging the accelerated adoption of LED lighting for cities and municipalities.[3] The actual LED lighting fixture manufacturer for the product used in the Raleigh convention center is the Wisconsin-based Beta LED. Beta LED has provided a detailed presentation of the economics of this project on its web site as follows:

Economic Analysis

To evaluate the economic impacts of the LED lighting alternative, the city constructed a 15-year life cycle analysis that contained the following elements for each alternative.

- capital costs
- energy costs
- maintenance costs
- replacement costs

We will examine each component as well as the overall analysis.

Capital Costs

As this was a new construction project, the LED lighting costs were compared to the costs of purchasing the 175-watt metal halide fixtures. The LED light fixtures were more expensive than the traditional fixtures, and the additional first cost for the 544 LED light fixture was $262,000.

Energy Costs

The metal halide fixtures consumed significantly more energy than the LED fixtures. Each metal halide fixture consumes 218W-175W for the lamp plus 43W for the ballast. The LED fixtures each consume 110W (74W for the LEDs and 36W for the power supply). This yields a savings of 108W per fixture. For the 544 fixtures, the total savings is 58,752W. Since the lighting operates 24 hours-a-day, seven days-a-week, the yearly savings are 514,668 kWh.

The City of Raleigh pays a blended rate of approximately $.06/kWh for their electricity. Therefore, the yearly energy savings are $30,880. To account for the expected increases in energy costs, the analysis assumed a three-year increase in electricity costs. This assumption appears to be extremely conservative given the local utility has filed for a 16-percent increase already this year.

Using these factors, the 15-year energy savings total $574,335.

Maintenance Costs

The metal halide lamps in the traditional HID fixtures require replacement each 15 months due to the continuous use and the vibrations from the vehicular traffic in the parking deck. The lamps are typically replaced upon failure and the yearly replacement cost is estimated at $76 for each fixture including $60 for labor and equipment and $16 for the materials. The labor and equipment number is a fully loaded cost including depreciation on equipment and tools, salary, benefits and vehicle fuel. For 544 fixtures the yearly maintenance cost is therefore $33,075. As with the energy costs, the maintenance costs are assumed to increase an average of three-percent per year over the study period.

The 15-year maintenance cost for the metal halide fixtures is therefore $615,163. The LED fixtures are anticipated to require no regular maintenance over the study period.

Replacement Costs

The LED fixtures offer extremely long lamp life—50,000 hours of use before considering replacement. A lifetime of 50,000 hours represents 5.7 years assuming continuous 24-hour-a-day operation. After 50,000 hours, the lights are not out. Instead, they simply have reduced light output—70 percent of the original output. This is an important consideration for a public space, as the city will not have regular outages creating potential safety hazards.

After 50,000 hours, or 5.7 years, the LED modules in the fixtures can be replaced. Given the rapid increases in LED performance and the expected cost reductions of LED lighting solutions, the replacement costs in year 6 and year 12 are estimated at $160,200 and $131,750 respectively, including labor.

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corporation; and (2) as a result of the first condition, the foreign corporation is treated as a surrogate foreign corporation.

Modification to the Internal Restructuring Exception

An exception from the applicability of Code Sec. 7874 applies to internal group restructurings of a domestic corporation in which the common parent of the EAG directly or indirectly owned stock representing at least 80 percent (by vote and value) of the corporation both before and after the restructuring. If the exception applies, stock held by an EAG member in the reorganized corporation is excluded from the numerator of the ownership fraction in testing whether Code Sec. 7874 applies to the restructuring, but included in the denominator of the ownership fraction. The exception also applies for restructurings of domestic partnerships. The ownership thresholds, however, refer to profits and capital interests in the domestic partnership. The new temporary regulations will not apply the exception when, pursuant to the same plan (or a series of related transactions), all or part of the stock of the foreign corporation is transferred outside the EAG that includes the foreign corporation after the acquisition.

The Take Away

The temporary regulations provide some needed clarification that allows taxpayers to determine whether certain transactions will trigger the inversion rules. At the same time, however, the regulations aim to prevent taxpayers from structuring transactions to avoid triggering the inversion rules by expanding the range of transactions that will result in inversion treatment. For example, in at least one instance, the regulations seem to strip taxpayers of objective measures needed to apply the complex inversion rules by doing away with the objective and clear safe harbor tests and related examples, making it difficult for taxpayers to contend that the EAG has a meaningful and bona fide business presence in the relevant foreign country.

LED Lighting/EPAct

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Total Life-Cycle Cost Assessment

Using the results outlined above, the total 15-year life-cycle cost analysis shows

Figure 1.

Capital Cost Differential	$(262,000)
Energy Savings	$574,335
Maintenance Savings	$615,163
Replacement Costs	$(291,950)
Total Savings	$635,548

The payback comes in just over three years.

It should be noted that LED building lighting is an emerging new technology and, as with any new technology introduction, there will be product issues that need to be resolved.[4]

The Tax Benefits

Both commercial owners of parking garages and designers may be eligible for substantial tax savings related to LED garage projects.

Commercial Owners

Commercial owners, particularly those replacing fluorescent lighting (or occasionally for a recent metal halide installation) in a garage previously subject to a cost segregation study will be potentially eligible for multiple tax benefits including Code Sec. 179D deductions. The cost segregation opportunity arises because the remaining basis of the lighting being replaced can also be written off for tax purposes.

Designers on Government Garages

Designers of government garage LED projects may be eligible for substantial tax benefits if they follow the EPAct tax requirements which generally require a parking garage project to meet ten EPAct procedural requirements.

Conclusion

Parking garage LED lighting is effectively a market changing disruptive technology. The quick widespread introduction of LEDs into this market will serve as precursor to other building categories, particularly as LED lighting price points begin to fall. EPAct tax savings will accelerate this market conversion, which is exactly what the EPAct tax law was intended to do.

Endnotes

1. Code Sec. 179D.
2. Charles Goulding, Peter Kelly and Taylor Goulding, *EPAct Tax Deductions for Parking Garage Lighting Projects Gain Wider Use*, The Parking Professional, Sept. 2008.
3. *About the LED City Program*. LED City (*http://ledcity.org*).
4. Charles Goulding, Jacob Goldman and Taylor Goulding, *The Economic, Business and Tax Aspects of Light Emitting Diode Interior Building Lighting*, Corp. Bus. Tax'n Monthly, Jan. 2009, at 29.