

### Overview

The second largest gaming company in the world by revenue, MGM Resorts International (MGM) has recently installed energy efficient parking area lighting and controls at 65% of its U.S. facilities. With 20 U.S. facilities in NV, MI, and MS, MGM lighting projects have covered more than 8 million square feet of parking area. By replacing more than 4,400 existing metal halide and high-pressure sodium light fixtures in the parking facilities with a mixture of LED and induction fixtures, MGM saved 4.5 million kWh per year across their portfolio.

Most impressively, at the MGM Grand Detroit Casino—a 401-room hotel and gaming facility—the company achieved 4 million kWh of annual energy savings by replacing medium-wattage metal halide fixtures in a 2.6 million square foot parking structure with high efficiency, low-wattage LED fixtures.

### Keys to Success

**“The drive to reduce energy use is in our DNA.”**

*Chris Magee, Executive Director of Sustainable Facilities, MGM Resorts International*

Starting in the 1990s with focused commitment on energy efficiency, MGM grew a corporate sustainability division that scans for and compiles best practices—currently 1,000 and growing—and generates facility-wide efficiency projects.

Energy cost savings and the focus on increased sustainability topped the list of drivers for the parking area projects. With its track record of past successes with efficiency projects, making the business case was not an issue for the sustainability team. Even without incentives, the projects had less than a two-year payback.

**“There’s a level of trust. We speak CFO language. We show folks why—with energy and maintenance savings—our projects have the potential to compete on an ROI basis with our slot machines!”**

*Chris Magee, Executive Director of Sustainable Facilities, MGM Resorts International*



*Excalibur parking lot, Las Vegas NV. Photo courtesy MGM*

Results	
<b>Energy Savings</b>	4.5 million kWh, a savings of 60-70% across multiple facilities
<b>Lighting Power Density (W/sq. ft.)</b>	0.05 (Detroit), a reduction of 80%
<b>Simple Payback</b>	Average of 1.7 years.
<b>Installation and Maintenance</b>	Energy reductions were achieved by addressing control of the lighting systems. Most sites were upgraded to a custom web-based lighting control system, along with a custom web-based dashboard and iPad application to easily control and monitor the system remotely.
<b>Overall Performance</b>	In addition to reducing wattage by 60-70% in most cases, in 90% of the areas the lighting quality was also improved. With the avoided lamp changes, MGM is able to redirect facilities teams to preventative maintenance tasks elsewhere.

MGM took advantage of NV Energy's Sure Bet program and Detroit's DTE Energy incentives. In Detroit, additional incentives were made available to MGM for using Relume, a local, Michigan-based LED equipment manufacturer.

The team added a measurement and verification (M&V) component to the project, which included post-M&V requirements. Field measurements came first, with lighting measurements in each parking lot to evaluate illumination levels and see what would work best.

The parking area lighting project results were even better than what the team had hoped for. The average simple payback period for all the upgraded properties is 1.7 years. In addition to reducing wattage by 60-70% in most cases, in 90% of the areas the lighting quality was also improved.

**"The high-pressure sodium lighting gave a yellowish hue. The feedback we got was that people felt the light was grainy. Afterwards, it was 'Wow! You've changed the whole look of this space.'"**

*Chris Magee, Executive Director of Sustainable Facilities, MGM Resorts International*

## Lessons Learned

- ▶ In Nevada, existing fixtures had their own failure issues, as they began to degrade in the extreme heat. Distorted or oxidized lenses compromise fixture optical efficiency, so the possibility of a retrofit of those fixtures was taken off the table.
- ▶ In Detroit, 20 different products and then generations of those products were tested over a three-year period. The products either did not produce enough light at the outset, flickered or lost light output due to extreme temperature swings, or failed outright. In the end, Relume came up with an LED luminaire that delivered what the property was looking for. Local contractor Motor City Electric managed the installation.
- ▶ In Detroit MGM converted to all LEDs on low parking garage ceilings, while in Las Vegas, with its less frigid winters, MGM was able to use NEPTUN induction fixtures for outdoor parking areas. YESCO managed the induction lighting installation.
- ▶ An ancillary benefit of the induction lighting is the uniform lighting appearance MGM can achieve across its contiguous Las Vegas properties, from Mandalay Bay to Bellagio along the strip.

## 2014 LEEP Awards

<b>Location:</b>	Various sites in MI, NV, MS
<b>Parking Area:</b>	8 million sq. ft. (21,000 spaces and 4,492 fixtures) (portfolio) 2.6 million sq. ft. (5,233 spaces and 3,117 fixtures) (Detroit)
<b>Solution:</b>	Installed induction (most of portfolio) Replaced medium-wattage metal halide with LED (Detroit, MI)
<b>LEEP Awards</b>	Highest Absolute Annual Energy Savings in a Retrofit at a Single Parking Structure (portfolio) Largest Percentage of Facilities Upgraded (MGM Detroit Grand, MI)

## Next Steps

Currently the sustainability team is upgrading wall-mounted fixtures at all properties in southern Nevada, including in the stairwells of parking garages. With induction lighting for the wall packs, they expect to reduce the original wattage by 70%, and take it down an additional 50% with bi-level dimming in some areas.

And beyond that, a plan for upgrading lighting in interior garage spaces is on the horizon. With 14,900 linear fluorescent fixtures, the team thinks it's time to consider a second phase of high performance upgrades, possibly to LED pendant or surface mounts with controls.

MGM will continue to lean on industry partners for information on new lighting technologies and practices for future projects and they hope this project can help others in the same regard.

## Learn More

Learn more about how to join the [Better Building Alliance's](http://www.betterbuildingalliance.org) Lighting Energy Efficiency in Parking Campaign, at [www.leepcampaign.org/](http://www.leepcampaign.org/).