



CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

CityCenter MGM Resorts, Las Vegas, NV

8.2-MW CHP System



ARIA Resort & Casino

Quick Facts

LOCATION: CityCenter MGM Resorts Las Vegas, NV

MARKET SECTOR: Hotel/Casino/Mixed Use

FACILITY SIZE: 18 million sq. ft.

EQUIPMENT: Two Turbines (Mercury 50)

FUEL: Natural Gas

USE OF THERMAL ENERGY: Water heating

CHP TOTAL EFFICIENCY: 73%

ENVIRONMENTAL BENEFITS: Reduction in carbon emissions.

TOTAL PROJECT COST: \$12.6M

ANNUAL ENERGY SAVINGS: \$1.8M per year

PAYBACK: 7yrs

CHP IN OPERATION SINCE: 2009

Site Description

MGM Resorts International (MGM) is a global entertainment company headquartered in the middle of the Mojave Desert, Las Vegas, Nevada. CityCenter is an 18-million-square-foot mixed-use resort on the Las Vegas Strip. Its centerpiece is the ARIA Resort & Casino. MGM is recognized in Las Vegas for offering best-in-class hotels and casinos, state-of-the-art meetings and conference spaces, nightlife and retail offerings. MGM Resorts developed the CityCenter project with an eye on sustainability and functional design. Sustainability and earth-friendly design were at the heart of every step in the development of CityCenter. Overall energy efficiency is a key component of its performance today.

Reasons for CHP

The Aria Resort operations require consistent and reliable access to electricity and hot water for guest services and hotel security functions so CHP was an integral component to the campus' development.

The installed CHP plant provides more than 25 percent of the annual electricity used at the CityCenter campus and gives the Aria Resort & Casino a measure of resiliency from the local electricity grid not available at other resorts.

This CHP project and other MGM properties would go a long way toward meeting the company's published goal of reducing its carbon intensity by 50% by 2030.

– Henry Shields, Executive Director of finance and analysis; Corporate Sustainability, MGM Resorts International

In the event of a grid failure, CityCenter has the ability to maintain operations of critical functions. It has this alternate resource that lessens the demand for more conventional, diesel fuel-powered standby generators.

CHP Equipment and Configuration

At the core of CityCenter is a state-of-the-art, 8.2-megawatt combined heat and power system. The system utilizes clean natural gas to generate electricity through two turbines as well as capture process waste heat to warm domestic water for hotel use.

The energy performance of this combined system contributes to CityCenter's high overall energy efficiency when compared to other resorts. Further, the operation of this CHP system lessens the overall demand on the local electricity grid, which is congested and vulnerable to interruptions, providing benefits to all system ratepayers.



**CityCenter MGM 8.2 MW
Two Turbine System**

System Operation

The first on-site energy generation on The Strip, CityCenter's natural gas-powered 8.2 MW CHP system provides efficient electricity for the resort while reducing emissions and using "waste heat" to provide domestic hot water. In addition, the hot water loop system was tied into adjacent properties, providing the Monte Carlo, New York New York Casino and the T-Mobile Arena with hot water.

The Mercury 50 Turbine has the highest electrical efficiency for a gas turbine in its size range and an ultra-low emissions profile. Some of the benefits of this system are excellent thermal efficiency, unique power-to-heat ratio, and best in class emissions at 5 ppm NOx on natural gas.

Lessons to Share

The following are the highlights of the results of the MGM installing a CHP system at CityCenter:

- CityCenter was awarded six distinct Gold LEED certifications from the U.S. Green Building Council in part due to its superior energy performance
- Air emissions reduced due to avoiding much of the boiler heating required by other developments
- CHP contributes to CityCenter's increased energy efficiency.
- CHP plant provides more than 25% of the annual electricity used on the CityCenter campus

For More Information

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More CHP project profiles:
www.westernCHPTAP.org
Date produced: June 2019