



Westin Jersey City Newport

300-kW CHP System



Project Overview

The Westin Jersey City Newport is a 23 floor hotel in Jersey City, New Jersey. It has 410 rooms, 19 suites, and over 20,000 square feet of meeting space.

Starwood Hotels & Resorts Worldwide, Inc. is one of the world's leading hotel and leisure companies with brands including Westin®, Le Méridien® and Sheraton®. In 2009, Starwood launched an environmental sustainability program that pledged to reduce energy consumption by 30% and water consumption by 20% per built hotel room by 2020 — referred to as 30/20 by 20 — across all 1,200 of its owned, managed and franchise hotels. In 2013, the company added a complementary goal to reduce greenhouse gas emissions by 30% within the same timeframe.

In 2015, The Westin Jersey City Newport took steps to meet this standard by installing a CHP system from Tecogen, Inc. that provides heating, cooling, and power. By installing absorption chillers as part of the CHP system, the Westin Jersey City Newport is able to use the thermal output of their CHP system for both cooling in the summer and heating in the winter. This greatly increases the capacity factor at which the system is operated throughout the year, providing greater efficiency and energy savings.

Quick Facts

LOCATION: Jersey City, New Jersey

MARKET SECTOR: Hotel

FACILITY SIZE: 23 floors with 429 rooms and 20,227 sq. ft. of meeting space.

EQUIPMENT: 3 x 100kW Tecogen Microturbines

FUEL: Natural gas

USE OF THERMAL ENERGY: Space heating and cooling

CHP TOTAL EFFICIENCY: 83% HHV

ENVIRONMENTAL BENEFITS: 3.58 million pounds of annual GHG reduction, equivalent to taking 343 cars off the road or planting 42,000 trees

YEARLY ENERGY SAVINGS: \$123,000-\$212,000

CHP IN OPERATION SINCE: 2015

CHP Equipment & Configuration

The Westin Jersey City Newport utilizes three 100kW Tecogen InVerde CHP units. They are highly efficient, with 28.7% electric efficiency and 83.4% overall efficiency, both high heating value. They achieve this partly by recovering heat from both the engine jacket and exhaust, and the generator and power electronics. It also has high part-load efficiency, with turndown to 10% load.



Three Tecogen InVerde 100kW CHP modules installed on the roof of the Westin Jersey City Newport

COURTESY OF Tecogen, Inc.

In the winter, thermal output from the CHP engines is transferred to hot water boilers, reducing the energy needed for generating space heating and hot water in the building. In the summer, two absorption-chiller units use the thermal output from the CHP system, transforming the Westin project into a tri-generation system. The absorption chillers powered by the CHP system provide close to half of the hotel's cooling needs.

In addition to their efficiency and environmental benefits, the InVerde modules have rapid black-start to serve as emergency power sources. While the Westin has not lost utility power since the CHP installation in 2015, it has been designed to provide hotel guests with power, heating and/or cooling during any potential grid outages.

CHP Operation

The Tecogen CHP units supply energy to the facility throughout the year at a much higher efficiency than the utility, lowering the building's carbon footprint. The CHP units will save the hotel, on average, 367,209 kWh of electricity per year, resulting in annual savings of \$123,000—\$212,000. This cuts the Westin's energy-related carbon footprint by 3.58 million pounds of carbon dioxide annually, almost half of its prior carbon footprint. That is equivalent to eliminating the annual carbon emissions produced by 343 passenger vehicles or planting over 42,000 trees.

To operate the CHP system, The Westin entered a long-term service agreement with Tecogen. Through proprietary software, powered by GE Equipment Insight, Tecogen's experienced maintenance and service personnel monitor the equipment and provide proactive maintenance, ensuring the longevity of the CHP units, optimal equipment performance, and maximum efficiency.

"It's through partnerships and programs like New Jersey's energy-efficiency incentives that The Westin Jersey City Newport is better able to reduce its environmental impact, while saving money and supporting Starwood's environmental goals,"
- Andrea Pinabell, Vice President of Starwood Hotels & Resorts

For More Information

**U.S. DOE NEW YORK-NEW JERSEY
CHP TECHNICAL ASSISTANCE
PARTNERSHIP (CHP TAP)**
Thomas Bourgeois, Director
(914) 422-4031
tbourgeois@law.pace.edu

TECOGEN
Benjamin Locke
Director & Chief Executive Officer
(781) 466-6400

products@tecogen.com
www.tecogen.com

More CHP Project Profiles:
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