MID-ATLANTIC CHP TECHNICAL ASSISTANCE PARTNERSHIPS

PROJECT PROFILE

Montgomery County Public Safety Headquarters

865 kW CHP and 2 MW PV Microgrid

Quick Facts

LOCATION: Gaithersburg, Maryland

MARKET SECTOR: Public Safety - Critical Infrastructure

FACILITY SIZE: 865 kW CHP & 2 MW_{dc} Solar

FACILITY PEAK LOAD: 1.9 megawatts (MW)

EQUIPMENT: Reciprocating Engine, Absorption Chiller, Solar

FUEL: Natural Gas

USE OF THERMAL ENERGY: Heating, Domestic Hot Water and Reheat

CHP TOTAL AVAILABILITY: 90%

ENVIRONMENTAL BENEFITS: reduced net carbon emissions by 5,900 metric/year

PROJECT STRUCTURE: Public-Private-Partnership using Energy-as-a-Service

TERM: 25 Years

CHP IN OPERATION SINCE: 2018

Site Description

The Montgomery County Public Safety Headquarters (PSHQ) is the County's primary administrative facility for a range of crucial public services. PSHQ houses many of the County's transportation management resources, components of the County's Office of Emergency Management and Homeland Security, Fire and Rescue Service headquarters and a police station serving much of the central part of the county. This 400,000 ft^2 facility, the county's largest with the surrounding campus, is viewed as a long-term investment for the County.

Reasons for CHP

Two pivotal events led county leaders to pursue microgrids. The first occurred in 2012 when a devastating storm, known as a derecho, launched a surprise assault on the Mid-Atlantic. Originating in the Midwest, the fast-moving, complex line of tornadoes, lightning, wind, and rain proved to be one of the most devastating storms in U.S. history, leaving 22 people dead and millions without power. Over 250,000 Montgomery County residents and 71 County facilities were without power for multiple days. There was another pressing need that framed the County's interest in microgrids. The electrical infrastructure within county buildings, low- and medium-voltage gear, needed urgent replacement. The buildings are between 30 and 50 years old on average. The County needed to find a novel way to pay for expensive upgrades while improving facility capability.

CHP Equipment, Configuration and Operation

865 kW Packaged CHP System
PHOTO COURTESY OF MONTGOMERY COUNTY

The PSHQ microgrid incorporates nearly 2 MW_{dc} of canopy-mounted solar energy capacity, providing shade to cars while powering the facility. The facility benefits from Maryland's aggregate net energy metering policy, which allows government organizations to credit excess generation to other facilities and receive a retail credit for each kilowatt-hour generated. A new 865 kW CHP system replaced two existing standby generators providing baseload energy supply to the facility.

Collectively, the PSHQ microgrid system can generate 9.6 million kWh annually, providing an estimated 90 percent of the facility's annual electricity consumption and nearly infinite backup capacity with minor adjustments to operations. Should the grid go down, the system can sustain itself in island mode. It will reduce County greenhouse gas emissions by over 5,900 metric tons annually, equivalent to taking 1,200 cars off the road. The PSHQ project is also one of the first of its kind and the first project in Maryland certified under the Green Business Certification lnc's (GBCI) Performance Excellence in Energy Renewal (PEER) rating system - the resilient infrastructure equivalent to the U.S Green Building Council's Leadership in Energy and Environmental Design (LEED) green building rating system.

Creative Energy -as-a-Service PPA

From the beginning, the County required potential vendors to provide an energy on a "service" arrangement whereby the County paid for the benefits of the project - signaling its intent to enter into a public-private partnership (P3), as opposed to a more traditional capital investment. The County ultimately awarded the project by expanding the power purchase agreement (PPA) model into an "energy -as-a- service" contract that it developed to support earlier solar projects. This 25-year energy-as-a-service PPA allowed the County to pay for the project by purchasing the availability of equipment and the energy generated, rather than buying the microgrid system outright - leveraging the utility operating budget to support the project costs without competing with other County needs. Montgomery County vetted, with the assistance of the Mid-Atlantic CHP TAP, over a dozen proposals as part of its competitive "down-select'' process. The County ultimately selected Schneider Electric as the energy performance contractor that would construct and maintain the microgrid project and Duke Energy Renewables as the owner and operator of the microgrid components sited within and around the facility. The support of the Maryland Energy Administration and the Potomac Electric Power Company (Pepco) was critical in helping support the project. Incentives from Pepco, provided by the EmPOWER Maryland Program, and grants from MEA helped close the investment gap and enable additional equipment such as an electric vehicle DC fast charger. Pepco also provided assistance during project implementation.

> ***"On a typical operating day at the PSHQ advanced microgrid, the Combined Heat and Power system can provide up to 70% of the site's energy from CHP with the remainder from on-site solar with very little utility power."***
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> ***Eric Coffman***
> ***Chief - Office of Energy and Sustainability***
> ***Montgomery County***

For More Information

U.S. DOE MIDATLANTIC CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)
Dr. James Freihaut, Director
814-863-0083
jdf11@psu.edu

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MONTGOMERY COUNTY
Dgs.green@montgomerycountymd.gov
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