



Montgomery County Correctional Facility

220 kW CHP and 2.8 MW PV Microgrid



The Montgomery County Correctional Facility
PHOTO COURTESY OF MONTGOMERY COUNTY

Quick Facts

LOCATION: Boyds, Maryland
MARKET SECTOR: Correctional Facility
FACILITY SIZE: 220 kW CHP & 2.8-megawatt (MW)_{dc} Solar
FACILITY PEAK LOAD: 1,000 kilowatts (kW)
EQUIPMENT: Reciprocating Engine
FUEL: Natural Gas
USE OF THERMAL ENERGY: Heating, Domestic Hot Water and Reheat
CHP TOTAL AVAILABILITY: 90%
ENVIRONMENTAL BENEFITS: reduced net carbon emissions by 950 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 Correctional Facility in Boyds, MD is the site of the County's second microgrid project. This facility is responsible for the custody and care of approximately 1,000 inmates

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



220 kW Packaged CHP System

PHOTO COURTESY OF MONTGOMERY COUNTY

The Montgomery County Correctional Facility microgrid project expands the facility's power generation capabilities by adding a 220 kW CHP system to its existing generators. The system can produce hot water used on-site for space heating and potable water heating. The CHP system combined with 2.8 MW_{dc} of on-site solar energy capacity installed under another initiative enables the correctional facility to generate almost 100% of the facility's electricity consumption.

During an emergency, it benefits from advanced controls that enable it to separate from the utility grid and take advantage of the CHP and existing generators to operate in island mode.

Creative Energy-as-a-Service PPA

From the beginning, the County required potential vendors to provide a fully functional microgrid on a "service" arrangement whereby the County paid for the benefits of the project - signaling its intent to enter into a public-private partnership, as opposed to a more traditional capital investment. The County ultimately awarded the project by expanding a power purchase agreement (PPA) template 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 Combined Heat and Power system at the Correctional Facility provides power and heat for the facility while bolstering resilience and reducing the environmental impact of the facility."

*Eric Coffman
Chief - Office of Energy and Sustainability
Montgomery County*

The support of the Maryland Energy Administration and the electric utility Potomac Edison was critical to the project. In particular, MEA provided grants that reduced the costs of operating the facility and Potomac Edison provided incentives from the EmPOWER Maryland Program. Potomac Edison also helped facilitate interconnection and commissioning of the system to ensure compatibility with the grid.

For More Information

U.S. DOE MIDATLANTIC CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)

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More CHP Project Profiles:

www.machptap.org

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MONTGOMERY COUNTY

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