



Aberdeen Proving Ground

7.9-MW CHP System

Quick Facts

LOCATION: Edgewood, MD
MARKET SECTOR: Government (Military)
FACILITY SIZE: 7.9 MW
EQUIPMENT: Combustion Turbine
FUEL: Natural Gas
USE OF THERMAL ENERGY: Process and Heating Steam Loop
CHP TOTAL EFFICIENCY: 74.5%
ENVIRONMENTAL BENEFITS: Annual energy savings ~ 297 MMBtu, emissions reduction of ~22,571 tons of CO₂.
PROJECT: Energy Service Performance Contract - Performance Period of 22.7 years
TOTAL PROJECT COST: \$36.6 million
ENERGY SAVINGS: Guaranteed savings of \$4.486 million per year
CHP IN OPERATION SINCE: 2018
BGE CHP INCENTIVE REBATE: \$2.5 million



Site Description

Aberdeen Proving Ground (APG) is a \$1 billion U.S. Army research and development facility – and a key player in the nation’s homeland defense and international counterterrorism efforts. The site has more than 2,000 buildings and is one of the largest employers in the state, with more than 21,000 civilian, military and contractor employees. The Edgewood area of the installation supports crucial Army research, development, testing and evaluation facilities that directly support the warfighter and national security missions.

Reasons for CHP

In 2012, a local utility announced the decommissioning of an energy plant that had generated a major portion of the site’s steam requirements. This project represented a critical thermal energy solution to Edgewood’s steam requirements by replacing the capabilities of the local steam plant, which generated 70% of the thermal requirements. The utility steam plant was decommissioned in 2016, making the successful implementation of this project vital to support critical mission requirements of the Edgewood facility.



7.9 MW Combustion Turbine Generator package with Heat Recovery Steam Generator (HRSG); Fuel Gas Compressor, and Selective Catalytic Reduction (SCR) Emission Control (photo courtesy of Aberdeen Proving Grounds)

CHP Equipment & Operation

The major CHP equipment/systems included the following: natural gas fuel/#2 fuel oil nominal 7.9 MW combustion turbine generator package (Solar Turbines Taurus 70); Heat Recovery Steam Generator (HRSG) with a natural gas duct burner for supplemental firing; natural gas compressor assembly; and selective catalytic reduction (SCR) emission control system. The CHP plant generates 13.8 kV electrical supply and is connected to the existing 33 kV substation through a 13.8 to 33 kV step-up transformer and 38 kV switchgear. The HRSG produces 34,600 lbs/hr of 350 psig steam unfired and 93,900 lbs/hr with natural gas duct burner supplemental firing.

The CHP plant supplies 91,600 lbs/hr of 325 psig steam to the existing high-pressure steam header in the Edgewood steam plant. Greenhouse gases and other pollutants are reduced because the CHP consumes less fuel than separate electric and steam plants while producing the same amount of energy. The CHP provides approximately 86% of the steam supply and offsets approximately 50% of the current electricity use. The overall annual energy savings is estimated at 297,469 MBtu, and the emissions reduction is estimated at 22,571 tons of CO₂.

Project Financing

The \$36.6 million project was financed through guaranteed energy savings using an Energy Savings Performance Contract (ESPC) between the U.S. Army Corps of Engineers and Johnson Controls. The customer also is directly benefited with \$2.5 million in incentives from BGE Smart Energy Savers Program. (<https://bgsmartenergy.com/business/chp>)

Highlights to Share

The site produced a how to design and build a CHP plant "Lessons Learned" document for other military installations supported by a \$677,800 DOE Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) grant.

"The real innovation is the long-term and enduring capabilities. I'm excited about the savings and the energy efficiency, but I'm more excited about the opportunities that now exist."

Maj. Gen. Bruce Crawford, Commander, Army Communications - Electronics Command

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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