

Energy Efficiency for the DIA

Efficiency measures to cut energy costs and save agency \$900,000 annually



Challenge

The Defense Intelligence Agency (DIA), part of the Department of Defense, is located on Joint Base Anacostia-Bolling in Washington, D.C. Its large 26 acre campus consists of 8 connected towers of almost 1 million square feet of usable office space—built at various times within the last 25 years.

Recent laws and executive orders have required federal agencies to improve energy efficiency at their facilities by reducing energy and water consumption, cutting greenhouse emissions, and increasing use of onsite renewable energy. Because of these mandates, the DIA was under a deadline to improve its energy efficiency at the Joint Base Anacostia-Bolling campus. But with governmental budgetary constraints, the DIA and many other federal agencies found it increasingly difficult to obtain the substantial upfront capital necessary for infrastructure upgrades.

Solution

The DIA contracted Constellation to make energy efficiency upgrades through an Energy Savings Performance Contract (ESPC). The upgrades required no upfront capital from the DIA and will be funded through the savings. Total capital investment was approximately \$12.3 million, and annual guaranteed savings will be \$900,000 over 20 years. Energy Conservation Measures (ECMs) included lighting upgrades, new high-efficiency boilers, new air compressors, water conservation measures, demand response,

cooling system upgrades, control strategies, and solar photovoltaic (PV) panels.

Heating and cooling system upgrades will reduce both electric and natural gas consumption. New high-efficiency, rapid-start steam boilers replaced old, inefficient steam boilers and eliminated the need for an “always-on” back-up boiler. Water-side and air-side economizers will reduce the need to run energy-intensive compressors for cooling. And, to increase the capacity of their water-side economizers, the plate and frame heat-exchanger was replaced with a larger unit. Air-side economizers were re-enabled to bring in cold outside air to cool interior spaces when the outdoor temperature is low enough.

To aid in water conservation, Constellation installed a water treatment and filtration system to allow the use of well water in the cooling towers, reducing the use of municipal water by nearly 17 million gallons per year.

Innovative control strategies will provide additional cost savings. Occupancy and CO₂ sensors send real-time input to the Building Automation System (BAS). This allows for not only the typical control of lighting in private offices, but also the Variable Air Volume (VAV) boxes. The sensor data also helps shorten override runtimes of lighting and air-conditioning in open spaces based on occupancy, time of day, space usage and other adjustable criteria.



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Highlights

Project

- 20-year contract term
- No upfront capital from the DIA
- Contracted through a competitive process under DOE Energy Savings Performance Contract (ESPC)
- Capital investment: \$12.3MM
- Annual guaranteed savings: \$900K

Technical

- Demand Response: Constellation enabled the customer to participate in PJM's Economic Program and later expand into their Synchronous Reserve Program
- Savings are guaranteed for 20 years and verified through Measurement & Verification (M&V) protocol
- 568 kW PV solar array

To meet renewable energy requirements and take advantage of Washington, D.C.'s renewable energy credits, a PV Solar Array over 500 kW in size was installed on the roof of the main building. An innovative ownership structure of the array allows the Renewable Energy Credits to offset project costs.

Constellation's dynamic energy management capabilities helped the DIA increase revenue from its Demand Response (DR)—a program to reduce its electricity consumption at strategic times. The DIA had been proactive about managing its demand for utility savings, and had been enrolled in a DR program. Constellation enabled the DIA to increase its revenues by implementing more aggressive reduction strategies and switching from PJM's Emergency Capacity Program to the Synchronous Reserve and Economic Programs.

With this project complete, the DIA anticipates meeting the mandate requirements by improving efficiency, reducing water consumption, decreasing its greenhouse gas emissions, and increasing its use of renewable energy—all without an upfront capital expenditure.

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