Project Profile: Coast Guard Yard ESPC Modification

Verus Resource Management, Inc. (Verus) serves as program management consultant in support of the United States Coast Guard Office of Energy Management, COMDT (CG-46). Verus provides on-going comprehensive services that include project facilitation, performance reporting, strategic planning, outreach, and policy development.

Verus Resource Management Services

- Project facilitation
- Financial analysis
- Resiliency Planning
- Project Management
- Technical Review

Project Background

In 2007, the Coast Guard awarded an Energy Savings Performance Contract (ESPC) to build and install a Renewable Energy Center (REC), located on the Coast Guard Yard campus. A partnership between the Coast Guard, the City of Baltimore, and a private contractor, the REC was designed to provide a significant portion of electricity to the Yard from landfill gas (LFG) combustion provided by the City of Baltimore's Quarantine Road Landfill.

Once REC operations started, the LFG supply failed to satisfy the quantity and quality that original models required. As a result, the REC failed to provide the needed electricity, forcing the Coast Guard to convert one of the four engines to burn city-supplied natural gas. That left the Coast Guard with increased, supplemental natural gas payments, as well as unrealized electricity production. The shortfall required additional electricity purchases of $700k annually in utility costs. Optimal LFG output continued to elude original project objectives.

Novel Approach

In partnership with the Coast Guard, Verus explored a novel approach that would remedy original project gaps. Verus proposed a new strategy that called for a modification to the existing contract that would include a wide-reaching

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portfolio of Energy Conservations Measures (ECM). The modification would eclipse the original project's capital improvements, enhance worker capabilities and industrial environments, and yield additional cost and energy savings to ensure a net positive cash flow.

After exploring cogeneration optimization, the Coast Guard/Verus team proposed all REC engines run from natural gas or a fuel mix; and consider a fuel blending station, fuel filters, and necessary controls. The team also sought a capability of restarting each of the four, one megawatt (MW) generators at the REC in the absence of regional utility power. This capability substantively increased the energy resilience across the entire Yard campus, ensuring a catastrophic or unplanned regional power outage does not degrade operational tenants or endanger shipyard workers.

The Coast Guard/Verus team investigated additional areas for energy conservation throughout the campus that could be corrected with an ESPC modification. Leaks in the north end of the Coast Guard Yard's steam loop were causing high-energy losses; the existing Compressed Air Systems (CAS) were insufficient for industrial operations; the Yard housed a considerable amount of inefficient T-12 and high-bay lighting; pumps and fans did not use variable frequency drives, and numerous older buildings on campus housed poor HVAC systems.

Unprecedented Financial Strategy

While the modification expanded efficiency opportunities, Verus helped the Coast Guard quantify and fulfill an innovative financial strategy.

As custodian for providing the LFG as part of the legacy contract, the Coast Guard was obligated to fund the ESPC as well as the electricity deficits. The team developed a task order modification that shifted risks back to the contractor and reconciled perceived savings, real costs, and energy shortfalls.

The new contract modified the REC to include natural gas on all engines, allowing each to run at full capacity. The REC retrofit is anticipated to increase LFG use and mitigate previously flared LFG due to start-up issues. While additional natural gas engines also require increased natural gas purchases, the decreased electricity use will offset the new purchases.

As a Department of Energy (DOE)-approved project facilitator, Verus helped the Coast Guard leverage the modification to refinance the original contract. The original project was previously financed at 6.2%. Now, the modification and the original contract are financed at 3.43%, saving an additional $1M over the life of the contract. The refinance is a first for the Coast Guard.

Overall, the modification rectified savings shortfalls (at least $700k in savings per year), extended the life of the REC, shifted the electricity production burden back onto the contractor, and `balanced the budget' by reconciling actual savings with actual ESPC payments. By doing so, the Coast Guard will pay less than the annual cost savings they are receiving.

Project Outcomes

On September 18, 2016, the Coast Guard awarded a task order modification to the existing ESPC at the Coast Guard Yard. The contract, valued at $7M, is estimated to avoid more than $700k in annual energy expenditures at the Yard through a combination of aforementioned ECMs and modifications to the on-site REC. The contract term will complete in February 2025.

The modification installed the new ECMs that are anticipated to reduce Coast Guard energy consumption by approximately $500k annually, beyond the original contract. ECMs include lighting improvements, motor improvements, building re-commissioning, and HVAC upgrades, and will also provide an extension of equipment life and better working conditions. These projects have a simple payback of nearly eight years.

Moreover, new ECMs penetrate industrial operations on campus and have improved worker conditions dramatically and energy burdens associated with labor rates will decrease. Due to the accounting structure at the Coast Guard Yard, utility costs are included as a portion of reimbursable labor rates for ship-related maintenance and repairs. Since this project both eliminated supplemental energy costs and reduced the total amount of energy costs it will have a long-term effect of reducing the overall costs for work performed at the Coast Guard Yard for both Coast Guard ships and other entities that have work performed by Coast Guard Yard personnel.

The Coast Guard Yard serves as a multi-agency regional response hub for contingent requirements. The REC restarting capability will enhance uninterrupted response during regional power outages and has the potential to become one of the first Department of Homeland Security (DHS) sites to export excess power back to the utility grid.

The Coast Guard Yard ESPC modification is the first Department of Energy (DOE) ESPC to be refinanced successfully.

Lessons Learned

- Managing ESPCs throughout their entire life cycle can be challenging for any project and can be made more difficult when there are changes post-construction to site conditions, on-going operations, or changes in the assumption of available fuels.
- Having the ability to identify not only the impacts of changes, but to look for innovative approaches to resolve them and expand the benefits to the site are critical to the success of a project.
- Engaging additional stakeholders to understand the current and future state of the project can bring a more comprehensive and long lasting impact to the project and overall region.

For More Information

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