



Energy Savings Performance Contract Information

Project Overview

A Combined Heat & Power Plant (CHP) is being constructed at the Norfolk Naval Shipyard (NNSY) in Portsmouth, VA. A two-story, 30,000 square foot building will be constructed to house the CHP which will be located adjacent to the Gosport Ring-Tie Electrical Substation near Elm Avenue.

The project will consist of a Combined Heat & Power Plant providing on-site electric and steam generation, a Microgrid Control System (MCS) and a Battery Energy Storage System which will provide the installation with its own source of steam and electricity and the ability to operate independent of the electrical grid in the event of an extended grid outage.

The CHP plant is one component of a larger Energy Conservation Project at NNSY and will provide energy cost savings that will help to pay for a new Industrial Wastewater Treatment Plant (IWTP) at NNSY. The new IWTP will replace the existing 40+year-old plant, which is well beyond useful life, and not functioning at full capacity. Along with the new IWTP, additional improvements will be made to the Shipyard's energy infrastructure by improving the steam system with new piping, traps, and insulation as well as replacing over 280 electrical transformers with high efficiency ones. All the infrastructure improvements are scheduled to be completed by the end of 2022.

The primary purpose of the CHP project is to support the Department of the Navy's Three Pillars of Energy Security: Reliability, Resiliency and Efficiency.

- Reliability: Dual fuel equipment. New backup electrical feeder. 15 days of on-site backup fuel supply.
- Resiliency: Uninterrupted service to select critical substations and the ability to "island" the shipyard during extended utility outages
- Efficiency: Lower energy costs and lower emissions

Environmentalists have been involved throughout project development. A requirement of the National Environmental Policy Act (NEPA) is that an Environmental Assessment (EA) be prepared for any major improvements that would involve new construction and/or potential environmental effects on various resource areas. In 2017 NNSY began an Environmental Assessment (EA) for the implementation of the Energy Conservation Measures (ECMs). In this assessment, NNSY addressed air quality, water resources, cultural, visual and biological resources, infrastructure, hazardous material & wastes, and environment justice. The EA determined that there are no significant short-term, long-term, direct or indirect impacts to water resources, cultural, visual or biological resources during Combined Heat and Power (CHP) Plant construction or operational activities.

This project is being executed with no additional taxpayer expense and is self-funding, meaning annual operating savings relative to existing budgets are used to fund the project.



Benefits

NNSY mission:

- Maintain Shipyard Mission and avoid potential ship repair delays
- Eliminate potential off-site waste disposal & cost
- Faster implementation versus appropriated funding
- Reduced Operation and Maintenance costs
- Guaranteed CHP plant performance over 22-year contract term

Economic and workforce:

- NNSY will save an estimated \$13.7 million annually which includes approximately \$11.8 million in savings from the CHP, \$1.3 million from the IWTP, \$467,000 from steam system upgrades, and \$100,000 from the replacement of electric transformer across the shipyard
- A majority of the project's construction vehicles will utilize the Jordan Bridge, generating an additional \$45,000 in bridge toll revenue
- The project will utilize local businesses within 1/4 mile of the plant, including ready-mix concrete and concrete piles, minimizing truck traffic
- \$37.4 million total economic impact, which includes \$29.7 million in local subcontracting and \$7.7 million in food, lodging, and other ancillary revenues
- An estimated 210 local construction tradesmen will be employed by contractors and subcontractors during construction
- The plant will hire 17 full-time employees for the operations team

Environmental:

- There are no significant short-term, long-term, direct or indirect impacts to water, cultural, visual or biological resources during construction or operation
- The CHP plant will incorporate Best Available Control Technologies (BACT), per the Virginia DEQ. These controls, which include a combination of clean fuels, good combustion practices and other technologies, will minimize the effects of any additional emissions.
- When accounting for the elimination of emissions from the remote power plants that are currently providing electricity to NNSY, there will be a net decrease in Greenhouse Gas emissions, because CHP is more efficient than separate procurement of electricity and steam.
- Less fuel is burned to produce each unit of energy output, and transmission and distribution losses are avoided
- CHP is promoted by the Environmental Protection Agency (EPA), whose CHP Partnership seeks to reduce air pollution and water usage associated with electric power generation (<https://www.epa.gov/chp>)

Efficiency:

- CHP requires less fuel to produce a given energy output and avoids transmission and distribution losses that occur when electricity travels over power lines



Conservation measures:

- CHP Plant implementation would allow NNSY to be self-reliant for electricity and steam in the event of power grid failure. It will benefit NNSY by providing critical energy and infrastructure upgrades, improved energy efficiency and saving the Navy an estimated \$11.8 million a year.
- The IWTP would increase wastewater treatment capacity and will save an estimated \$1.3 million a year in avoided repair, replacement, and operations and maintenance and reduce consumption of approximately 300,000 gallons of municipal water per year.
- Implementation of Energy Conservation Measures of the CHP and IWTP would be anticipated to have long-term positive impacts on NNSY infrastructure with these energy efficient upgrades. Additionally, these upgrades would avoid shutdowns, delays in maintaining and repairing ship and in the long-term save money on excess repair costs and maintenance.

Construction:

- There will be minimal construction traffic added to the area with an anticipated addition of an average of 80 vehicles per day traveling to and from NNSY for the duration of the project
- So as not to impact roadways, major truck deliveries will be staged and offloaded in the CHP laydown/former Enlisted Parking area
- Sourcing materials like ready-mix concrete and concrete piles from local vendors will eliminate an estimated 900 deliveries from impacting traffic outside the immediate vicinity of the project.
- All construction waste will be disposed of or recycled in a manner consistent with NNSY sustainable practices and procedures
- Additional noise pollution is not expected, as the project is within an existing industrial area; noise exposure off the CHP property will not exceed any of the current noise levels which have been observed in the industrial area.
- Virginia DEQ guidelines will be followed to eliminate any construction debris in public streets or sidewalks, including establishing construction entrances that will clean vehicle tires as they leave the jobsite; project dust will be minimal as the current paved facilities around the plant site will be left in place to the extent possible
- DEQ requirements related to stormwater management will be stringently followed during construction. Silt discharge will be minimized off-site as the existing site is paved and will remain paved in areas that do not require excavation or asphalt removal; areas which are not paved will have silt fence and inlet filter devices installed per DEQ requirements; silt run off to the Elizabeth River will be prevented during construction; and removal of excess soils from the project as they accumulate.