



Norfolk Naval Shipyard

Combined Heat and Power Plant and
Energy Conservation Measures Briefing

Agenda

- Introduction
- Executive Summary and Project Purpose
- Project Overview and Community Benefits
- Q&A

Executive Summary

- A Combined Heat and Power Plant (or CHP) will be constructed at the Norfolk Naval Shipyard (NNSY) in Portsmouth, Virginia
- Once built, it will significantly improve the shipyard's energy security and efficiency by conserving energy and reducing emissions
- Energy cost savings from the CHP Plant will even help to pay for a new Industrial Wastewater Treatment Plant (IWTP) to replace the existing 40+-year-old facility that is well beyond its useful life
- While the coming changes for the shipyard are important, there will also continue to be significant positive impacts on the local economy and workforce

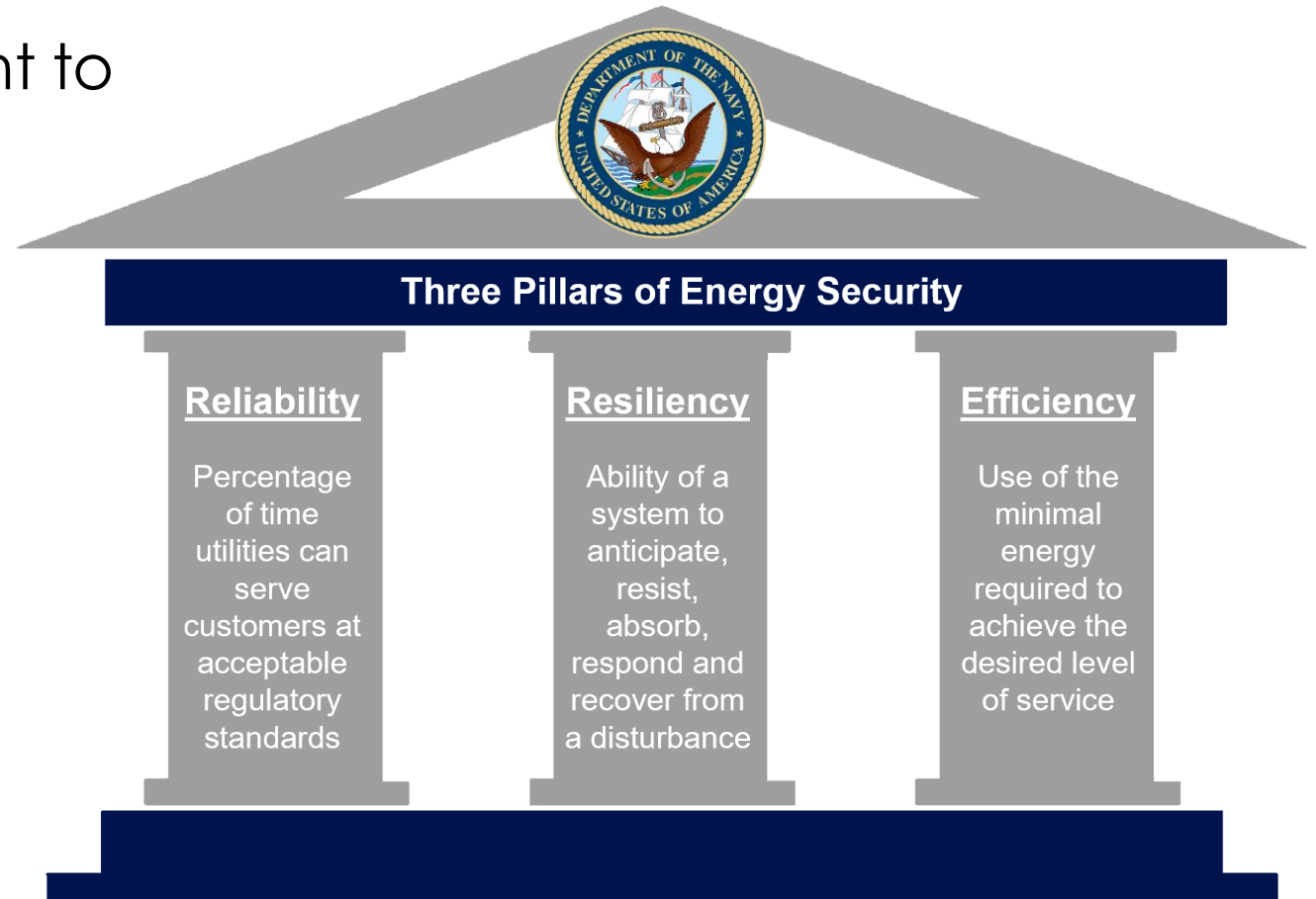
Background Information

- An Energy Savings Performance Contract (ESPC) was awarded for four energy conservation measures (ECM) at Norfolk Naval Shipyard
- The largest ECM is the Combined Heat and Power Plant (CHP) being constructed at the NNSY
- The CHP plant will provide NNSY 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

Purpose of the ESPC

Provide significant improvement to the Department of the Navy's Three Pillars of Energy Security

- Reliability
- Resiliency
- Efficiency



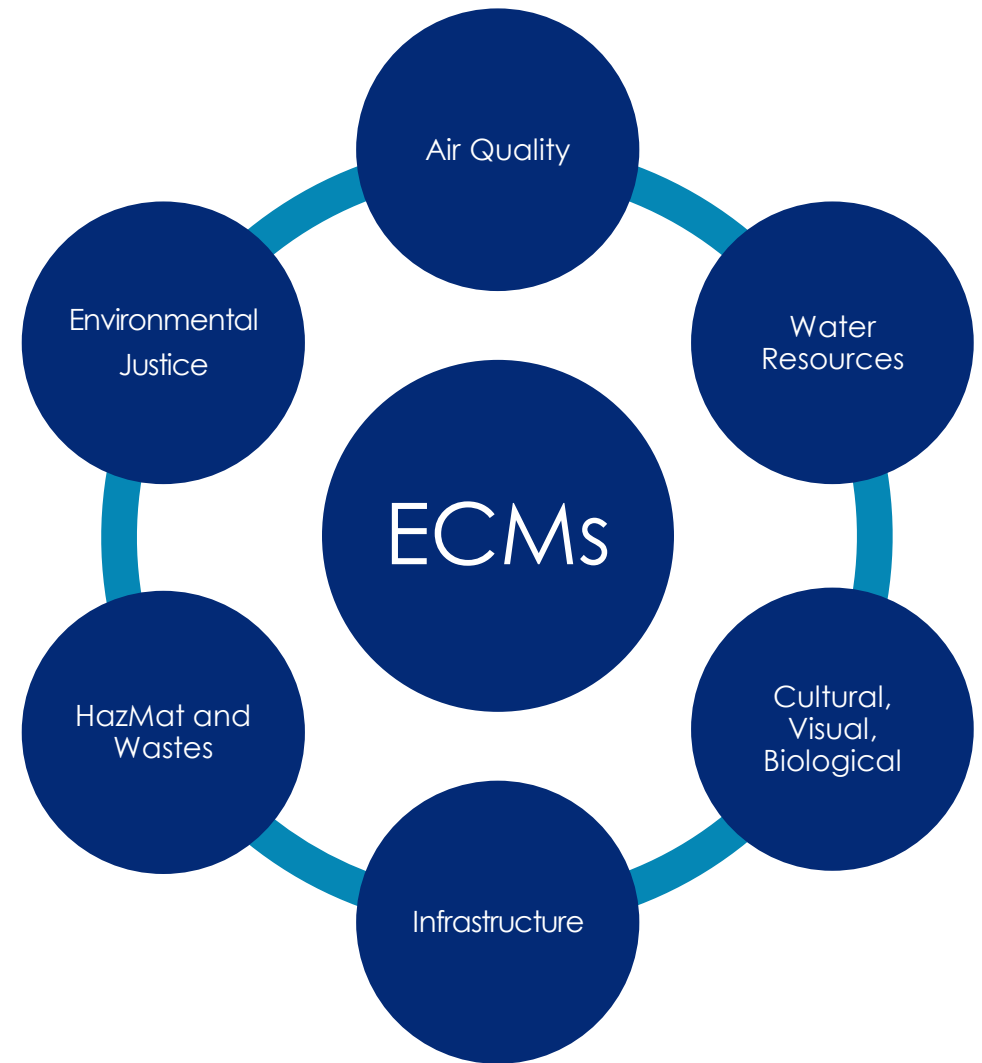
ESPC Background

- CHP is one of four planned Energy Conservations Measures (ECMs) at NNSY
 1. CHP Plant
 2. New Industrial Wastewater Treatment Plant
 3. Steam System Improvement
 4. Electric Transformer Replacement
- All four ECM construction scopes are scheduled to be completed by the end of 2022



Environmental Assessment

- NNSY's September 2019 Environmental Assessment for the implementation of the ECMs addresses numerous factors
- There are no significant short-term, long-term, direct or indirect impacts to water resources, cultural, visual or biological resources during CHP Plant construction or operational activities
- Public Involvement
 - Notice of Preparation: May 26, 2019
 - Fact Sheet posted on NNSY Website
 - Solicitation of public comments: May 26 – June 07, 2019





Project Overview

CHP Project Background

- A two-story, 30,000 square foot building will be constructed to house the CHP
- Location: South end of NNSY in existing parking lot
- Project components:
 - CHP Plant providing on-site electric and steam generation
 - Microgrid Control System
 - Battery Energy Storage System



Location



Project Benefits – Navy

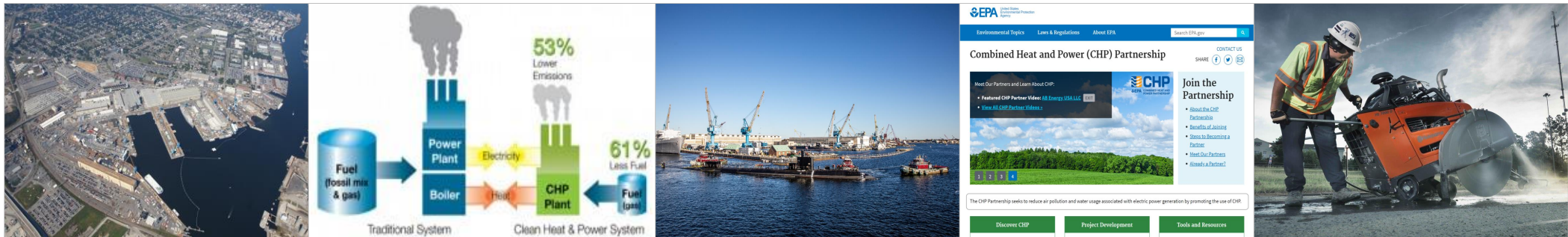
- Maintains Shipyard Mission and avoids potential ship repair delays
- Eliminates potential off-site waste disposal & cost
- Faster implementation versus appropriated funding
- Reduced operation and maintenance costs
- Operate independently of the community's electrical grid in the event of a blackout
- Guaranteed CHP plant performance over 22-year contract term



Community Considerations

Community Considerations

- Economic Impact
- Workforce
- Environmental
- Air Quality



Economic Impact

- **Total Local Economic Impact: \$37.38 million** (including \$29.7 million in local subcontracting and \$7.7 million in food, lodging, and other ancillary revenues)
- Local businesses within 1/4 mile of the plant will be utilized, including ready-mix concrete and concrete piles

Component	Local Subcontracting	Prime Contractor Ancillary Food/Lodging/Other
CHP Plant	\$ 18,200,000	\$ 4,800,000
IWTP	\$ 9,555,000	\$ 2,000,000
Other Subcontracting	\$ 1,979,000	\$ 844,000
Totals	\$ 29,734,000	\$ 7,644,000
Total Local Economic Benefit	\$ 37,378,000	

Figures provided by Ameresco, ESPC contractor

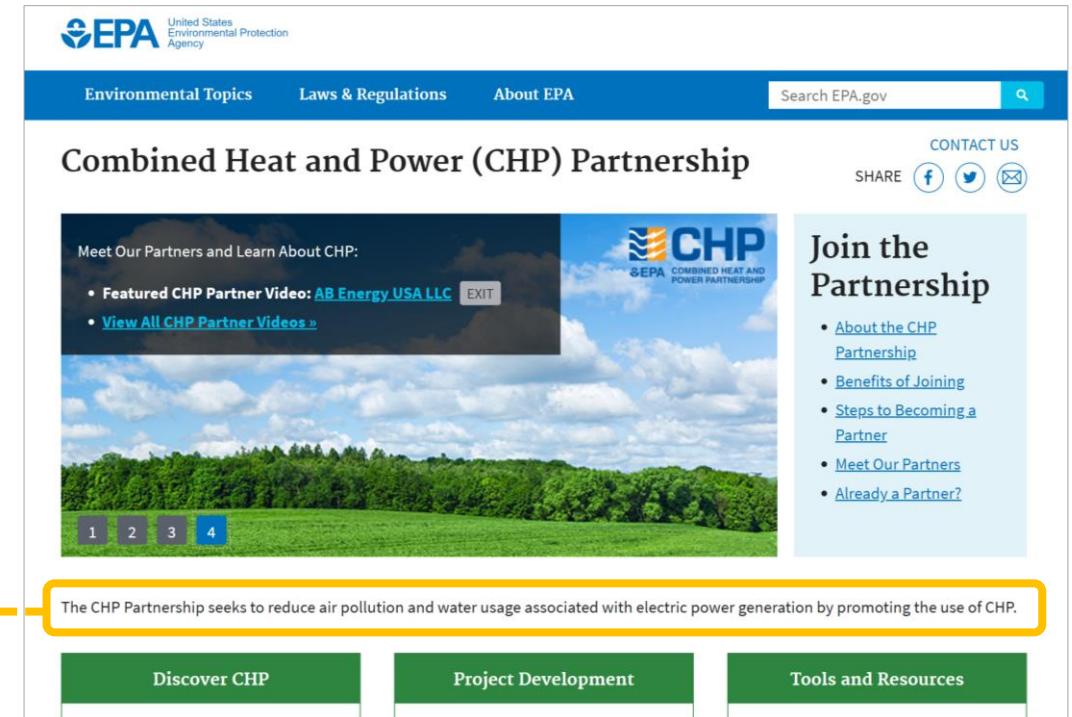
Workforce Opportunities

- 210+ local construction tradesmen will be employed by contractors and subcontractors during construction
- 17 full time employees will be hired for the operations of the plant
- 15 employees from the home office of the project's contractor will be paid per diem to establish a temporary residence in the local area, making a direct economic impact of \$4.8 million



Environmental Impact

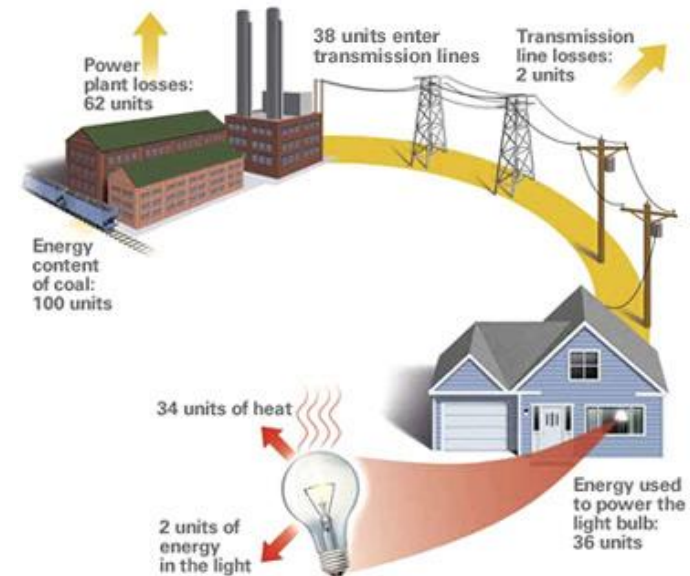
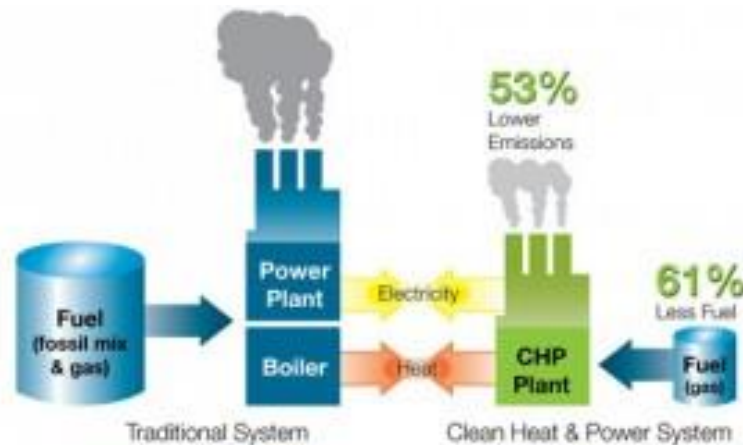
- There are no significant short-term, long-term, direct or indirect impacts to water, cultural, visual or biological resources during construction or operation
- CHP is promoted by the Environmental Protection Agency (EPA)
 - Their CHP Partnership seeks to reduce air pollution and water usage associated with electric power generation
<https://www.epa.gov/chp>
- CHP reduces emissions of greenhouse gasses and other pollutants



Environmental Impact (cont'd)

The CHP plant will reduce the Navy's energy consumption which results in reduced emissions and reduced demand

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



Air Quality

- The CHP plant will incorporate Best Available Control Technologies (BACT), per the VDEQ
- BACT controls include a combination of clean fuels, good combustion practices and other technologies
- The air quality impacts are all in accordance with NAAQS
- This project will not cause a disproportionately high and adverse impact on any resident of the local community or any resident of Virginia.*

* VADEQ Engineering Analysis # 60326



Emissions Discussion

- Project includes emission controls to greatly reduce NO_x, CO and VOC emissions
- There are multiple Federal regulations that require the plant to minimize HAP emissions
 - For example, the Turbine MACT specifically targets formaldehyde emissions
- Except during extreme circumstances (natural disaster, other natural gas shortage), the plant will operate on natural gas
 - Emission factors from EPA and the State show no heavy metal emissions from natural gas combustion.
 - When forced to burn fuel oil, the facility will fire only ultra-low sulfur diesel in order to further minimize emissions

Pollutant	Emissions (tons per year)
CO	35.2
NO _x	29.4
PM	21.5
PM ₁₀	21.5
PM _{2.5}	21.5
SO ₂	6.0
VOC	12.4
CO _{2e}	262,458
Total HAPs	2.1
Highest Individual HAP (Hexane)	1.7



Neighborhood Considerations

Neighborhood & Construction

- Construction noise exposure off the CHP property will not exceed any of the current noise levels
- Project dust will be minimal and silt discharge to the Elizabeth River will be prevented during construction
- Major truck deliveries will be staged and offloaded in the CHP laydown area
- All construction waste will be disposed of or recycled in a manner consistent with NNSY sustainable practices and procedures



Community Outreach and Engagement Summary

- We directly engaged over 100 external stakeholders through baseline fact-finding conversations, one-on-one briefings, virtual community information sessions and distribution of project information
- Engaged stakeholders included leaders of communities, civic and community organizations, economic development agencies, public education, businesses and houses of faith
- We held two virtual public information sessions in May and August focused on explaining the project details and available SWaM opportunities respectively
- During the DEQ public comment period, we have continued outreach and engagement with a focus on local and concerned stakeholders



Thank You!