

CUMBERLAND COUNTY JAIL CO-GEN PROJECT



Bruce Tarbox, Director

Cumberland County Facilities

Maine
Cumberland **County**



CUMBERLAND COUNTY GOVERNMENT

■ We are a government agency involved in various areas:

- Law Enforcement
- 911 Dispatch
- Emergency Management
- Assessing
- Probate Court
- Violence Intervention
- Community Development



CUMBERLAND COUNTY CAMPUSES

- Jail, Law Enforcement, Pre-Release, and Fleet - 50 County Way, Portland
- Courthouse and Garage – 142 federal St. & 192 Newbury St., Portland
- Regional Communications Center & Emergency Management Agency – 22 high street, Windham



CHP UNITS SERVE THE JAIL COMPLEX

- The building is 145,000 Sq. Ft.
- Consist of multiple Pods with the capacity of housing up to 642 inmates
- Yearly average is 450 inmates per day
- In addition to the Pods the facility consists of:
 - Kitchen
 - Medical area
 - Gym
 - Administrative area
- 24 hour operation



ENERGY PROFILE – CURRENT YEAR

- Electric 460V – 3 Phase – 2000 AMP Service Entrance grid supplied
- kW per year – Current use 1,542,800 kWh Building load not supplied by CHP Units - from the grid
- Natural Gas – Current use
 - 4,693 DTH Building load
 - 12,600 DTH CHP load
- Metered - Both



PRE-IMPLEMENTATION

- The previous configuration consisted of 2 Cleaver Brooks low pressure boilers that supplied the building loop and two domestic PUI storage heaters (1,500 gals) – Electrical was grid supplied with generator backup
- Electrical was 2,593,600 kWh for year 2011
- Natural gas was (15,493.8 DTH)
- Added CHP units based upon estimate to save the County \$11,511 per year and offset up to 632 tons of CO₂ per year

POST-IMPLEMENTATION

- Contacted by an energy service company (ESCO), American DG Energy, to co-author application
- Savings guarantee
- Risk aversion
- Review of outcome
- Future systems

EFFICIENCY MAINE

- American DG Energy (ESCO) evaluated data and utility history – Based upon this information the County was a good candidate
- American DG Energy (ESCO) and the County both applied for the grant
- It was estimated to save the County \$11,511 per year and offset up to 632 tons of CO₂ per year including 96,000 Therms of heat and hot water
- Per contract American DG Energy designed, furnished, installed, and are maintaining the units installed in 2012
- The County realizes a discount of 10% on the electrical energy used for the term of the contract (15-year term)

THE PROJECT

- In 2012 the County installed 150 kW system using two 75 kW Tecogen CM-75 CHP units
- The two Tecogen CHP units are located in the Mechanical Room of the Jail



THE PROJECT

- The 180° water produced is supplied to a building loop and two domestic hot water 1,500 gal storage tanks
- The Tecogen units have reduced our electrical grid energy by 35% (960,000 kWh) The Jail still requires +/- 1,400,000 KWh to be provided each year by grid

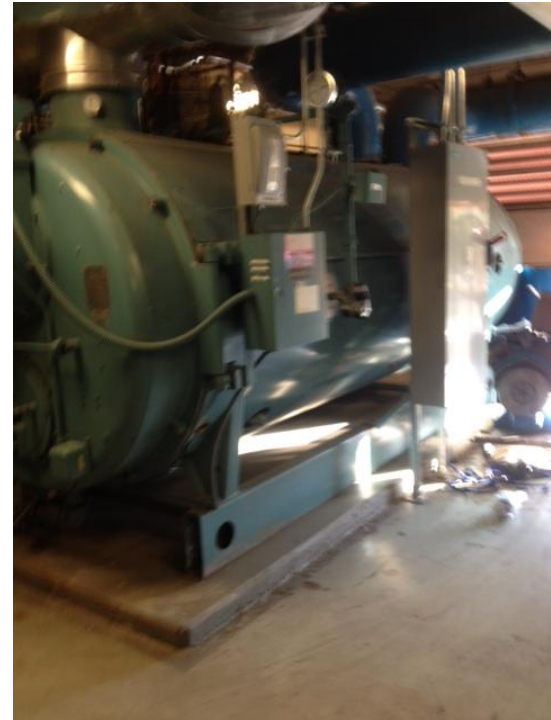


THE PROJECT

- The Tecogen units offset approximately 95,000 therms per year (100% necessary for summer months and approximately 40% winter months)
- Annual savings realized since 2012 are over \$11,500 based on contract with American DG Energy (ESCO)
- Over \$199,000 to be realized at the end of the 15-year term agreement

SAVINGS COMPONENTS

- A reduced boiler maintenance cost and extended lifespan due to significantly reduced run hours including non-use of boilers during summer months
- Reduction of stand-by lost/run time on boilers



THANK YOU