



State Correctional Institution (SCI) - Dallas, Luzerne County Pennsylvania Department of Corrections

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Project @ a GLANCE

Type:
Guaranteed Energy Savings Project

Size & Scope:
Installation of new gas fired boilers, LED lighting, water controls, sewage treatment plant upgrades

Consultant/Prime Contractor:
ESG (Energy Systems Group)

Project Cost:
\$20 M

Energy Savings:
\$2 M Annually
(1,926,707 kWh + 54,174 MMBtu of fuel)

Water Savings:
\$437 K Annually
(170,321 mGal)

Sludge Savings:
\$197 K Annually
(723,600 mGal)

Carbon Reduction:
1,843 MMTCO₂e per year

■ ABOUT

SCI Dallas (located in Northeast PA) was constructed in 1959 for the purpose of detaining troubled youth. The current day facility now houses about 2100 adult residents and is comprised of 26 acres of grounds with a building total of 674,771 gross square feet. Department of Corrections (DOC) began investigating this facility in 2013 for operational cost reduction opportunities. The facility originally burned coal for heating and hot water, see Photo 1 for view of the abandoned coal boiler. In fiscal year 2014-2015, the facility temporarily switched to heating oil, and during the winter months would regularly receive and consume 1 heating oil delivery per day. This became logistically difficult and created additional managed risk. During this time, an excessive amount of water was consumed due to minimal controls on flush toilets and water valves throughout the facility. Onsite well water withdrawals frequently reached maximum daily allowances under permit and forced additional water purchases from the utility. The excess water use in combination with older wastewater treatment processes also resulted in high treatment costs and increased maintenance for the facility. The DOC staff recognized there were significant opportunities to save on operational costs and the associated reduction of staff time allocated to maintaining the antiquated equipment.

■ SOLUTION

In 2013, DOC engaged with the Department of General Services on a Guaranteed Energy Savings Act (GESA) project. GESA projects provide state agencies with a budget-neutral

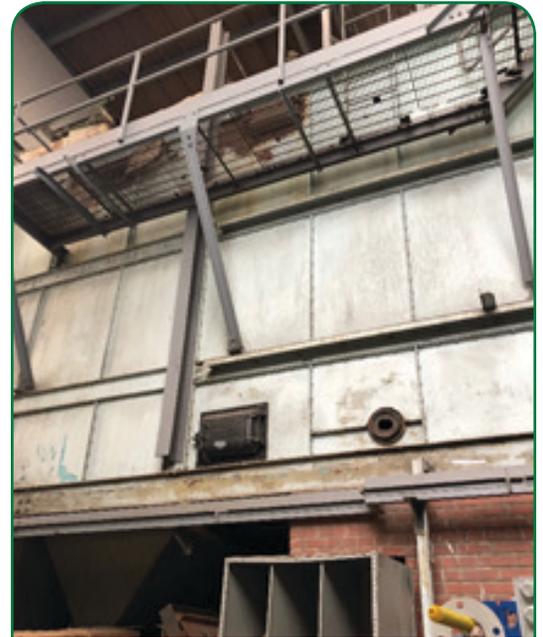


Photo 1: View of historic and abandoned coal boiler

project delivery tool enabling investments in their facilities. Projects are funded with future utility savings, and therefore all equipment upgrades installed during the GESA must demonstrate verifiable utility savings in order to be a part of the project. An Investment Grade Audit (IGA) was performed in 2014 year and identified several facility utility reduction opportunities. The DOC analyzed the opportunities and decided to pursue the following primary upgrades: (1) replace the existing coal boilers with new high-efficiency natural gas boilers; (2) switch out existing aging lighting with new LED lights; (3) install electronically controlled flush toilets and valves which can be controlled remotely to reduce water demand and resulting treatment needs; and (4) upgrade the waste water treatment plant to reduce the maintenance, handling and disposal of sludge. These selected measures were projected to cost \$20 million and yield a \$2.2 million per year operational cost savings.

PRIMARY EQUIPMENT INSTALLATION

BRAND & TYPE	QUANTITY	ADDITIONAL EQUIPMENT SPECIFICATIONS
Multiple brand LED light bulbs	8,395	Varied wattage, CRI = from 2700 - 5000 degrees Kelvin
ICON electric flush toilets	2,100	Flush rates of 0.5 to 1.0 gallons per flush, ICON intelligent control system
Cleaver Brooks type NB boilers	2	800 HP each with economizers, 80% + efficient, blowdown recovery, burner management, and SCADA system

■ RESULTS

The GESA program requires Measurement and Verification (M&V) of actual utility bills compared against the projected savings from the IGA. As of post construction measurements in 2019 (year 2 of M&V), actual utility costs savings exceeded expectations with \$2.7 million savings per year (~\$500,000 additional savings). DOC is also seeing significant reductions and efficiency improvements in past high-maintenance areas such as light bulb change-outs and sewage treatment plant operations. Maintenance staff is now able to focus their attention on additional projects and maintenance needs which were previously deferred due to the extra time commitment that aging equipment and processes necessitated.

■ BEST PRACTICES

The DOC views that this highly successful project is a result of the GESA process that directly engages staff who manage and operate the facility ensuring correct measures are selected. Also, critically important is the selection of measures from the IGA which have lucrative payback, utilize proven technologies and focus on energy conservation. For project-selected system components that require regular replacement from normal wear cycles, DOC recommends taking a close look at replacement costs and product availability as some components may be proprietary to a single manufacturer. Investment strategies should not only be evaluated on the savings achieved, but also on the anticipated availability of materials five or ten years after the project is complete.

■ NEXT STEPS

DOC is looking at additional GESA projects at its state correctional facilities. DOC believes there are many more opportunities to be evaluated.



Photo 2: View of natural gas boilers installed through GESA program



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