PaCT Partnership for Cleaner Textile | AN INNOVATION OF IFC International Finance Corporation WORLD BANK GROUP

Cleaner Production Case Study:
Energy Recovery
Square Fashions Ltd.

This series showcases success stories of PaCT (Partnership for Cleaner Textile) partner factories in the Bangladeshi textile sector that have implemented cleaner production projects.

A washing, dyeing, and finishing (WDF) factory can recover exhaust heat from gas engines by utilizing the energy to generate steam for process heating. Readymade garment (RMG) factories, where there is little or no demand for steam, can use the exhaust heat for chilling. Installing a waste heat recovery boiler (WHRB) at the outlet of a gas engine can recover heat from the flue gas exiting at about 550°C. The Exhaust Gas Boiler (EGB) usually brings down the temperature to about 220°C. At the outlet of WHRB, an economizer can be installed to further utilize the heat by lowering the final exiting temperature of flue gas between 120°C and 130°C.

Factory status

Square Fashion Limited (SFL) is a vertically integrated factory involved in spinning, knitting, dyeing, and finishing. The unit has fiber, yarn, knit, mercerized fabric (a finishing treatment), and sewing thread dyeing facilities with modern technology and machineries, especially in its wet processing sections. SFL's installed capacity, considering an average of three batches a day, is about 42 ton per day (TPD). In 2017, it recorded an average daily production of 28 TPD.

While the primary source of energy at SFL is natural gas, its secondary source is electricity purchased from the grid. SFL uses about 51 percent of the natural gas for heating applications. The remaining 49 percent generates electricity. The factory uses six gas generators to meet its total power needs.

Waste heat recovery at SFL

SFL operates seven gas-fired generators for power generation. They have already installed 2246 kg/hr rated WHRB by using the three gas generators (two generators are situated in garments unit (GU) part and one generator is situated at the fabric unit (FU) part of SFL). However, during the follow-up PaCT visits, experts suggested that SFL install another WHRB for the other four gas-fired generators (at FU part of SFL). The gas engine's flue gas temperature was 550°C. The assessment team recommended reducing it up to 220°C by installing WHRB. The team also suggested installing an economizer at the outlet of WHRB. This could help reduce the final flue gas temperature between 120° and 130°C. SFL was consuming 13-16 ton per hour (TPH) of steam generated by natural gas-fired boilers. By installing the WHRB with a capacity of 5.7 TPH, the factory now saves natural gas consumption by about 340 m3/hr. The initial investment to procure the WHRB was $115,000, with an annual savings of approximately $162,976.

Environmental Benefits

2,021,505 Nm3/year
Natural Gas Saving

6,480 Ton/year
Steam Saving

4,354 tCO2e/year
GHG Avoided

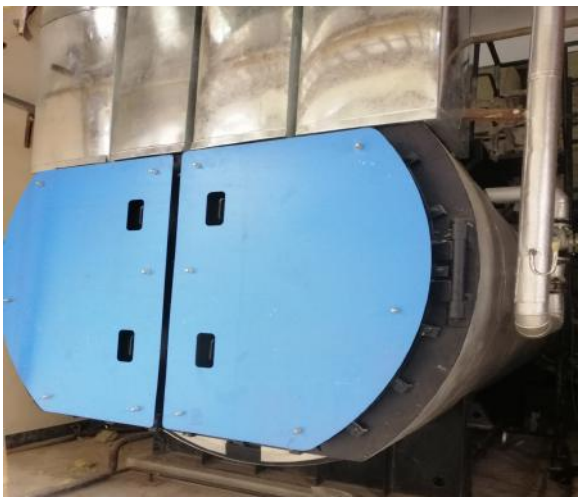


Image of a boiler

"The PaCT II team recommended installing a waste heat recovery boiler to utilize the exhaust flue gas heat from five gas generators. Installing the WHRB was a huge step for us. This allowed us to use the exhaust flue gas energy, saving natural gas consumption. We appreciate PaCT II team's efforts to save energy and prevent environmental pollution." – SFL Factory Management.

Investment	Annual Savings	Payback Period
USD 115,000	USD 162,976	8.5 months

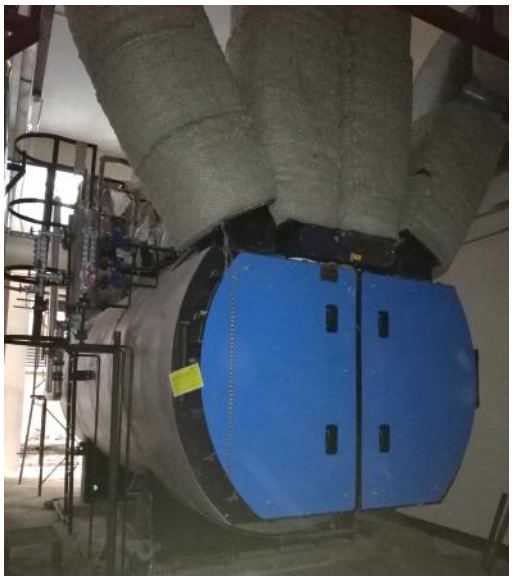
Annual Savings:

Natural Gas Consumption (Nm3)

Before WHRB Saving	14,109,588
After WHRB Saving	12,088,083

Natural Gas Consumption (m3/kg)

Before KPI	1.13
Aft er KPI	0.97



IFC-led Advisory Partnership for Cleaner Textile (PaCT) *is a holistic program that supports the entire textile value chain – spinning, weaving, wet processing and garment factories – in adopting cleaner production (CP) practices. PaCT engages with brands, technology suppliers, industrial associations, financial institutions, and the government to bring about systemic and positive environmental changes to the Bangladesh textile sector and contribute to its long-term competitiveness and environmental sustainability.*

WHAT PaCT DOES:

- *Chemical Management Assessments*
- *Basic Cleaner Production Assessment*
- *In-Depth Cleaner Production Assessment*
- *Water & Energy Management*
- *Rooftop Solar PV Pre-feasibility Study*
- *Rooftop Solar Calculation*
- *Online Resource Monitoring*

DEVELOPMENT PARTNERS

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BRAND PARTNERS

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