

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

If water in a boiler contains high concentrations of dissolved solids, it carries over through the steam produced, which can lead to foaming. This leads to a phenomenon called water hammer, which damages piping, steam traps and process equipment. Levels of suspended and total dissolved solids in a boiler can be reduced by blowing down or periodical discharging. Surface blowdown can remove dissolved solids which accumulate on the boiler liquid surface and is a continuous process. Suspended and dissolved solids can also form sludge. Sludge in boilers reduce their heat transfer capabilities, resulting in poor fuel-to-steam efficiency and quite possibly, pressure vessel damage.

### **Manual Blowdown and its downsides**

The surface blowdown process discharges a controlled amount of boiler water containing high concentrations of dissolved solids to the sewer. Most operators do not know when to blowdown the boiler and for how long. Blowdown heat recovery systems exist but are not always efficient. This results in lost water, chemicals and heat energy (the blowdown liquid is the same temperature as the steam produced, approximately 185°C for 8 bar-gauge [bar(g)] saturated steam). Most factories drain this resource manually without checking the amount of Total Dissolved Solids (TDS), rapidly decreasing the boiler's efficiency.

### **Automatic Blowdown**

Steam is widely used as an energy carrier in textile processes such as dyeing, washing, and finishing. Blowdown is one of the primary reasons for energy loss at the places where steam is generated and this energy waste needs to be reduced. An automatic blowdown control system optimizes blowdown rates by regulating the volume of water discharged from the boiler in relation to the concentration of dissolved solids present, overcoming all the challenges of manual blowdown.

### **Factory Status**

XYZ factory has two natural gas (NG)-fired boilers with a capacity of 5 tons per hour

(TPH) and 3TPH. Actual steam production based on historical data is 3-4 TPH at a pressure of 8.0 bar. It was observed that XYZ conducts manual blowdown at a rate of about 10 to 12 blowdowns/day for about 30 seconds.

ABC factory has three NG-fired boilers — two with a capacity of 6 TPH each and the other with a capacity of 10 TPH. Average steam production in this factory is 13-16 TPH at a pressure of 8.0-8.5 bar. It was observed that ABC conducts manual blowdowns at the rate of about 10 to 12 blowdowns/day for about 20 seconds.



**Installed automatic blowdown control system at XYZ**

\*This case study represents cases from two random factories that implemented automatic blowdown control systems

## Savings with Total Dissolved Solids (TDS) sensors

XYZ and ABC installed TDS sensors to check TDS levels of boiler water. Once the TDS level reached the limit set by the factory, the blowdown valve automatically opened and reduced the TDS level in boiler. The valve closed once the TDS level was acceptable. This auto blowdown system is expected to reduce energy losses, saving fuel and water by 3 to 5 percent.

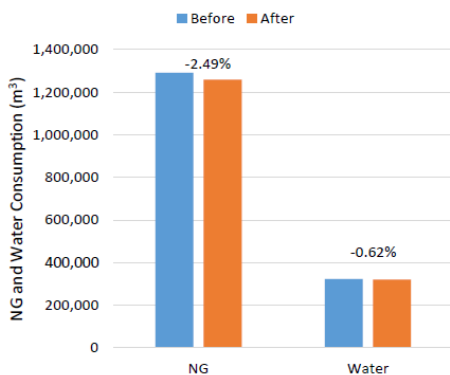


Figure: Natural gas and water savings for XYZ

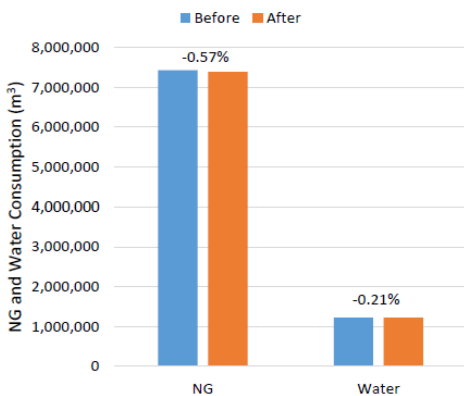


Figure: Natural gas and water savings for ABC

## Environmental Benefits

XYZ	ABC
<b>1,988 m<sup>3</sup>/year Water Saving</b>	<b>2,609 m<sup>3</sup>/year Water Saving</b>
<b>32,170 m<sup>3</sup>/year Natural Gas Saving</b>	<b>42,163 m<sup>3</sup>/year Natural Gas Saving</b>
<b>69 tCO<sub>2</sub>e/year GHG Avoided</b>	<b>91 tCO<sub>2</sub>e/year GHG Avoided</b>

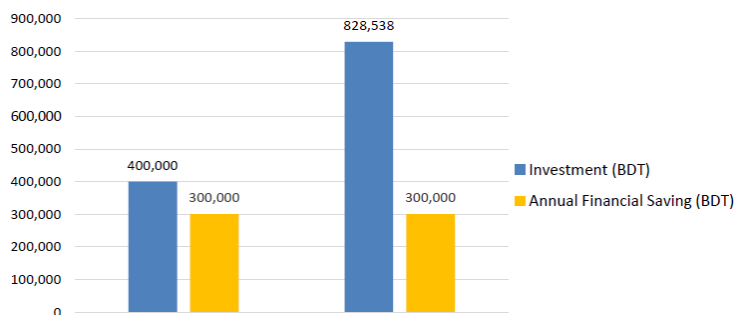


Figure: Investment and savings for XYZ (left) and ABC (right)

## IFC led Advisory Partnership for Cleaner Textile (PaCT)

is a holistic program that support the entire textile value chain – spinning, weaving, wet processing and garment factories in adopting Cleaner Production (CP) practices and engages with brands, technology suppliers, industrial associations, financial institutions, government to bring about systemic and positive environmental change for the Bangladesh textile sector and contribute to the sector's 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



### IMPLEMENTING PARTNER



### CONTACT:

Nishat S. Chowdhury, Program Manager;  
[nchowdhury2@ifc.org](mailto:nchowdhury2@ifc.org)

### BRAND PARTNERS



### IMPLEMENTER



Creating Markets, Creating Opportunities