

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 condensate recovery system (CRS) can either be vented-into-atmosphere or it can be pressurized. If the condensate is recovered in an open-to-atmosphere tank it is vented, otherwise it goes to a pressurized vessel or directly to a boiler.

In a vented CRS, a steam trap or a condensate pump is used to return condensate to an open-to-atmosphere collection tank for later use as boiler make-up water, pre-heat or other hot water applications. Pressurized condensate usually comes from boiler make-up water. In a pressurized CRS, the recovered condensate should be above atmospheric pressure throughout the recovery process. Apart from the pressure, one of the major differences between these two systems (vented and pressurized) is the temperature at which the condensate can be recovered.

In a vented system, since the condensate is vented to atmospheric pressure, the maximum recovery temperature of condensate is approximately less than 100°C [212°F]. Temperature loss is caused by flashing and from travelling through return piping and equipment. However, for a pressurized system, condensate recovery can be achieved at much higher temperatures. For example, the condensate recovery can be done in a closed system with steam at 10 barg [145 psig] pressure, condensate recovery can achieve 184°C [363°F] if the receiving system captures the heat of the higher temperature liquid.

### **Factory Status**

Viyellatex Ltd. (VTL) is a factory in Bangladesh that works with knit washing, dyeing and finishing, and garment washing. VTL had no CRS to return condensate from any section of their processes and the total condensate produced from dyeing and washing section was being drained without reuse.

### **Condensate recovery and its benefits**

As condensate water contains 20 percent steam energy, it should be returned or recovered as soon as it is formed. However, if the condensate is held in collection tanks, its temperature reduces via radiation losses. Quickly returning condensate to the feed water tank can increase the temperature of the feed water. This improves the boiler's efficiency — for every 6°C rise in boiler feed water temperature, boiler efficiency increases by 1 percent and fuel consumption reduces by 1 percent. Returning condensate also lowers consumption of make-up water.

### **Condensate Recovery system at VTL**

PaCT recommended that VTL install a CRS to recover at least 50 percent of condensate by collecting it from all the areas in the process where it is produced. The CRS comprises steam traps, a condensate transfer pump, and condensate piping to the boiler

feed water tank. The condensate piping is insulated to minimize the heat loss.

VTL installed the condensate recovery system in their factory to recover almost all the total condensate it produces. The recovered condensate is used as make-up water and to increase the temperature of the boiler feed water. The initial investment for the vessel, pumps, piping, and insulation was \$49,814 (BDT 4,284,038). So far, it has generated annual savings of approximately \$39,000 (BDT 3,354,772).

## Environmental Benefits



**49,536 m3/year**  
**water saving**



**447,064 m3/year**  
**natural gas saving**



**963 tCO2e/year**  
**GHG avoided**

## Economic Benefits



**\$49,814**  
**Investment**



**\$39,000**  
**Annual Savings**



**15.3 months**  
**Payback Period**

### 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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