

# Cleaner Production Case Study

## On the Pathway to Sustainability Tarasima Apparels Ltd.

This series showcases success stories of PaCT partner factories in the Bangladesh textile sector, which have implemented Cleaner production projects.

### PROJECT OVERVIEW

Tarasima Apparels Ltd. (TAL) is a **100%** woven factory that specializes in trousers, manufacturing 55,000 pieces per day. Established in 2007, TAL is a leading supplier to global brands including VF Asia, H&M, Decathlon, and Benetton.

With the vision to achieve sustainability and reach global standards, TAL set out to implement several innovative and sustainable technologies, which resulted in significant resource and cost savings, and an enhanced image of the company.

Steam is a major utility in the textile factories, accounting for approximately **50-60%** of the total utility cost. TAL depended heavily on steam for washing, drying, and ironing purposes. In order to reduce this dependence, the company replaced their steam dryers with more efficient, and easy-to-maintain thermal oil heaters. The smart switch has markedly cut down TAL's consumption of resources, realizing annual cost savings of **US\$ 575,000**.

Given the rise in fuel price and the spiralling energy demand, the company leaned towards investments in sustainable and resource efficient 'green lighting options' - installation of skylights. Investing in skylights offered TAL a number of key benefits: reduced energy consumption, substantial cost savings within a short payback period (4.2 years), and greater resource efficiency.

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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.

TAL consumes around **1.6** million liters of water per day, which results in the generation of large quantities of wastewater. TAL installed an Electro Cascade Reactor at its on-site Effluent Treatment Plant (ETP) that runs at a capacity of **70m<sup>3</sup>/hr**. The reactor synthesizes nanocatalysts that continuously enter the wastewater and accelerate treatment processes.

### KEY IMPLEMENTATIONS

- Installation of thermal oil heaters to cut down steam consumption
- Installation of a 2 tonne incineration boiler, resulting in savings in natural gas consumption
- Using skylights in the cutting, washing, and finishing units
- Installation of Electro Cascade Reactor at the on-site Effluent Treatment Plant (ETP)
- Establishment of a biogas plant, producing 56 m<sup>3</sup>/day biogas from food waste

Environmental Benefit		Financial Benefit	
Water Savings	40,560,000 l/year	Total Investment	US\$ 1,398,520
Electricity Savings	105,000 kWh/year	Cost Savings	US\$ 655,800 /year
Natural Gas Savings	1,073,280 m <sup>3</sup> /year	Payback Period	0.67-15 years
Steam Savings	21,840,000 kg/year		

Other benefits: Chemical conservation, improved wastewater quality, improved waste management, reduced GHG emissions

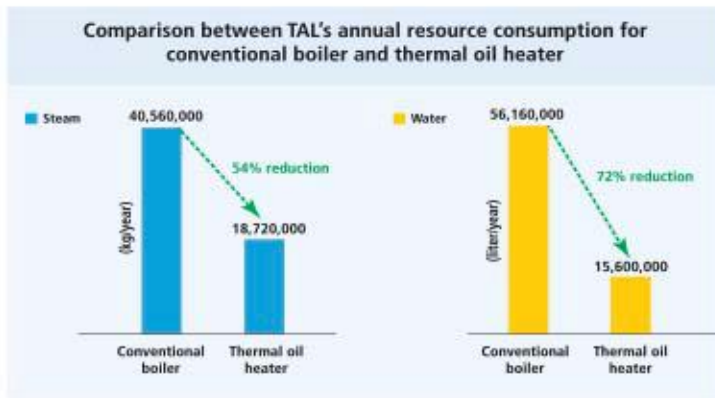




## PROJECT DRIVERS

### Oil is *better* than steam

Unlike conventional boilers, thermal oil heaters can operate at atmospheric pressure and reach temperatures up to 300°C. As a result operating costs are comparatively cheaper. TAL replaced 20 steam dryers in the wet processing section with 12 thermal oil heaters. This has led to **72%** (40,560,000 l/year) savings in water, **54%** (21,840,000 kg/year) savings in steam, and **52%** savings in TAL's total natural gas consumption per year. In addition, batch times were reduced, while batch cycles and quality improved.



### Best from waste

To minimize the volume and disposal cost of waste generated at the different units, TAL installed a 2 tonne incineration boiler that uses factory waste - fabric waste, thread cones, and cartons as combustion fuel. The heat generated is used to produce steam, which in turn is supplied to the washing and finishing units. TAL's smart utilization of fabric waste saves the factory **450,000 m<sup>3</sup>** of natural gas, and realizes cost savings of **US\$ 68,000** per year.

### Staying close to nature

TAL replaced the 400 W electric bulbs in their cutting, washing, and finishing units with skylights. A simple yet efficient change, this green lighting option has significantly reduced TAL's annual energy consumption by 105,000 kWh, realizing **21%** savings in total lighting energy consumption.



Skylights replace light bulbs in TAL's warehouse.

### Nanocatalysts make a *big* difference

For wastewater treatment, TAL applies Electro-catalytic Oxidation technology, which uses the nanocatalysts synthesized in the Electro Cascade Reactor. Electro-catalytic Oxidation process effectively treats almost all organic pollutants and removes color, minimizes sludge generation, and reduces chemical consumption in subsequent units. TAL's overall wastewater quality improved, with reduction in COD and TDS by **82%** and **7%**, respectively. In total TAL invested **US\$ 743,400** in establishing the ETP; unit cost of wastewater treatment amounts to **US\$ 0.3045/m<sup>3</sup>**.

### Food waste is *fuel* for cooking, gardening

Biogas serves as an excellent alternative fuel for cooking and heat/energy generation. The process of biogas production at TAL starts at the cafeteria that caters to 6,200 factory workers.

Instead of disposing of the 200 kg food waste that is generated every day, TAL uses it as feedstock for its biogas plant. The food waste to biogas transformation leads to a daily production of **56 m<sup>3</sup>** of biogas, which is piped to the factory kitchen burners. The remaining slurry is used as fertilizer for the factory gardens.



Food waste from cafeteria used as feed for biogas plant



Biogas produced is piped to kitchen burners

## CHALLENGES AND FUTURE PLANS

Adoption of the mind-set to implement new concepts was one of the biggest challenges for TAL. In the future, the company aspires to further utilize biogas to operate a 30 kW gas generator, reduce steam consumption in the processes, and work towards becoming a zero waste discharge factory.

Executive Director  
Bitopi Group

*"Manufacturing garments, while respecting environment is our mission. TAL started its journey to become energy efficient by joining hands with the Cleaner Production program in 2011. Adding to that interest, we also joined Bangladesh PaCT program with the same enthusiasm and since then, this journey has never slowed down. Thanks to IFC for such an initiative, which encourages us towards continuous improvement."*

## REFERENCES

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