ENERGY EFFICIENCY PROJECT DEVELOPMENT
VAS/DEPP3 Programme

REPLACING BIOMASS-FIRED THERMAL OIL HEATER TO IMPROVE ENERGY EFFICIENCY IN TEXTILE MANUFACTURING

Sector: Textile
Energy focus: Thermal oil heating system

At this textile manufacturing facility, the dyeing workshop's stenter machines relied on a 2,000,000 kcal/h biomass-fired thermal oil heater (TOH) that was suffering from severe inefficiencies. Operating at an efficiency of just 69.4%, the aging fixed-grate system experienced massive flue gas and surface heat losses. Consequently, it consumed over 3.27 million kg of biomass annually.

Through the feasibility study, the enterprise identified a strategic solution to replace the outdated equipment with **a new, high-efficiency biomass-fired TOH utilizing advanced reciprocating grate technology**.

Once implemented, the proposed solution will:

- Increase the thermal oil heater's average efficiency **from 69.4% to approximately 82%;**
- Save over **501.6 tons of biomass fuel annually;**
- Reduce non-biogenic greenhouse gas emissions by approximately **17.3 tons per year;**
- Provide **stable, automated temperature control** to improve the reliability of the fabric setting process.

FINANCIAL PERFORMANCE SUMMARY

NET PRESENT VALUE (NPV)*
~2.02
BILLION VND

SIMPLE PAYBACK PERIOD
~4.3
YEARS

INTERNAL RATE OF RETURN (IRR)*
22.7%

(*) = baseline scenario

ENERGY BENEFITS

ANNUAL ENERGY REDUCTION
~8,954
GJ/YEAR

ESTIMATED BIOMASS FUEL SAVINGS
~501.6
TON/YEAR

TOTAL CO_2 REDUCTIONS
~912.7
tCO_2e/YEAR

NON-ENERGY BENEFITS

- **Maximized Product Quality:** Provides stable, automated temperature control for precise fabric setting.
- **Slashed Operating Costs:** Replaces a manually-fed system with an automated grate, reducing labor and maintenance.
- **Enhanced Reliability & Safety:** Eliminates unplanned shutdowns and hazardous surface heat leaks from aging equipment.
- **Protected Profit Margins:** Cuts overall fuel dependency and allows for flexible, cost-effective biomass sourcing.

WHY THIS CASE MATTERS?

The Vietnamese textile industry faces intense pressure to improve production efficiency and meet the strict sustainability and decarbonization mandates of global fashion brands and export markets. While many factories have transitioned to renewable biomass fuels to reduce their carbon footprint, the equipment burning that fuel is often outdated and highly inefficient.

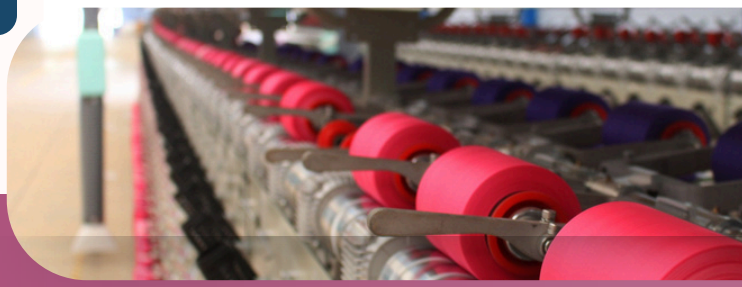
This feasibility study proves that simply utilizing biomass is not enough to optimize production costs. By upgrading from basic fixed-grate furnaces to modern, automated reciprocating grate technologies, textile manufacturers can drastically cut their fuel consumption.

EXPLORE SIMILAR OPPORTUNITIES

For more information and additional case studies, please visit:

Vietnam – Denmark Energy Partnership Programme 2020-2025

Energy Efficiency Center of Excellence



This case was developed under the Voluntary Agreement Scheme (VAS) for the Vietnamese Industrial Sector, part of the DEPP3 Programme (Vietnam – Denmark Energy Partnership Programme Phase III).

VAS supports industrial enterprises in identifying, preparing, and implementing bankable energy efficiency investments through structured audit, pre-feasibility and feasibility assessment processes.