ENERGY AND CLIMATE
PANORAMA

ASSESSMENT OF **BIOMASS-BASED BOILER** OPERATION FEASIBILITY IN TEXTILE INDUSTRY

About Us

Who we are

We are a dedicated team of researchers and experts who recognize the urgent need for action in addressing climate resilience and energy transition in Pakistan. Our mission is to develop and implement effective policies for cleaner, renewable energy sources like solar and wind, aligning with Pakistan's 2030 goal of 30% renewable energy in its electricity mix. As a multidisciplinary team, we leverage expertise in three key disciplines of study—Energy Systems Engineering, Thermal Energy Engineering, and Electrical Power Engineering—to drive our mission forward. We are united by a shared vision of creating a sustainable and resilient future for Pakistan, where cleaner energy sources play a pivotal role in reducing the nation's vulnerability to climate-related challenges.

What we do

We conduct in-depth, evidence-based research to analyze and improve energy policies in Pakistan. Our focus is on advancing renewable energy solutions and engaging stakeholders to ensure effective policy implementation. Our methodology involves a critical examination of current energy policies to pinpoint areas of improvement and formulate strategies for the widespread adoption of renewable energy sources across various levels.

In line with our commitment to fostering sustainable practices, we have established a fellowship program as part of our broader initiatives that aims to facilitate evidence-based research for promoting energy transition in Pakistan. Through research studies, surveys, and forecasting, we plan to assess various aspects of energy transition, including the adoption of renewable energy technologies and their impact on climate change. Our approach involves active engagement with stakeholders to address their concerns and facilitate the effective implementation of policies, fostering the growth of renewable energy manufacturing and marketing facilities.

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Executive Summary

Industrial production remains dependent upon fossil fuels, which is the main source of greenhouse gas (GHG) emissions worldwide. Over the past two decades, fossil fuels have largely failed to resolve the persistent energy crisis in developing countries like Pakistan. Therefore, the commercialization of renewable energy sources for industrial applications is required to mitigate the adverse impacts of climate change and ensure the affordable and clean energy supply (SDG 07, 13).

The textile sector, a large contributor to world energy consumption, is facing the challenge of lowering its carbon footprint while retaining operational effectiveness in an era characterized by environmental awareness and the pursuit of sustainable industrial practices. The project, titled "Assessment of Biomass-Based Boilers Feasibility in the Textile Industry," launches a thorough investigation into the viability and possible advantages of biomass-based boiler technology within the framework of Pakistani textile production. For this purpose, three textile facilities: KOHINOOR Textile (Pvt) Ltd. Islamabad, Master Textile (Pvt) Ltd. Lahore and Packages Industries (Pvt) Ltd. Lahore are studied from the perspective of biomass utilization in boilers to cater the process heat demand.

A comprehensive techno-economic feasibility assessment is carried out using the energy management tool RETScreen®, that how well the biomass boilers may be adapted to different textile industries' thermal load considering the capital expenditure, operating expenses, and prospective financial incentives. Feasibility of different biomass fuels such as rice husk, wheat, wood chips, corncob, bagasse, etc. in target industries, is analyzed in terms of economic indices such as fuel saving, Benefit-Cost ratio (BCR), payback period and Net present value (NPV). Furthermore, environmental impact of biomass-based boilers is analyzed in terms of GHG emission reduction emphasizing the advantages of sustainability and the reduction of carbon emissions.

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