



# BIOREFINERY INDUSTRY DEVELOPMENT FACILITY

## WORK WITH US:

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# BIOREFINERY INDUSTRY DEVELOPMENT FACILITY

The Department of Science and Innovation (DSI)-Council for Scientific and Industrial Research (CSIR) Biorefinery Industry Development Facility (BIDF), which is based in Durban, works with forestry, agro-processing and other biomass industries to improve manufacturing technologies and to develop and implement biorefinery technologies to create additional high-value products from their waste.

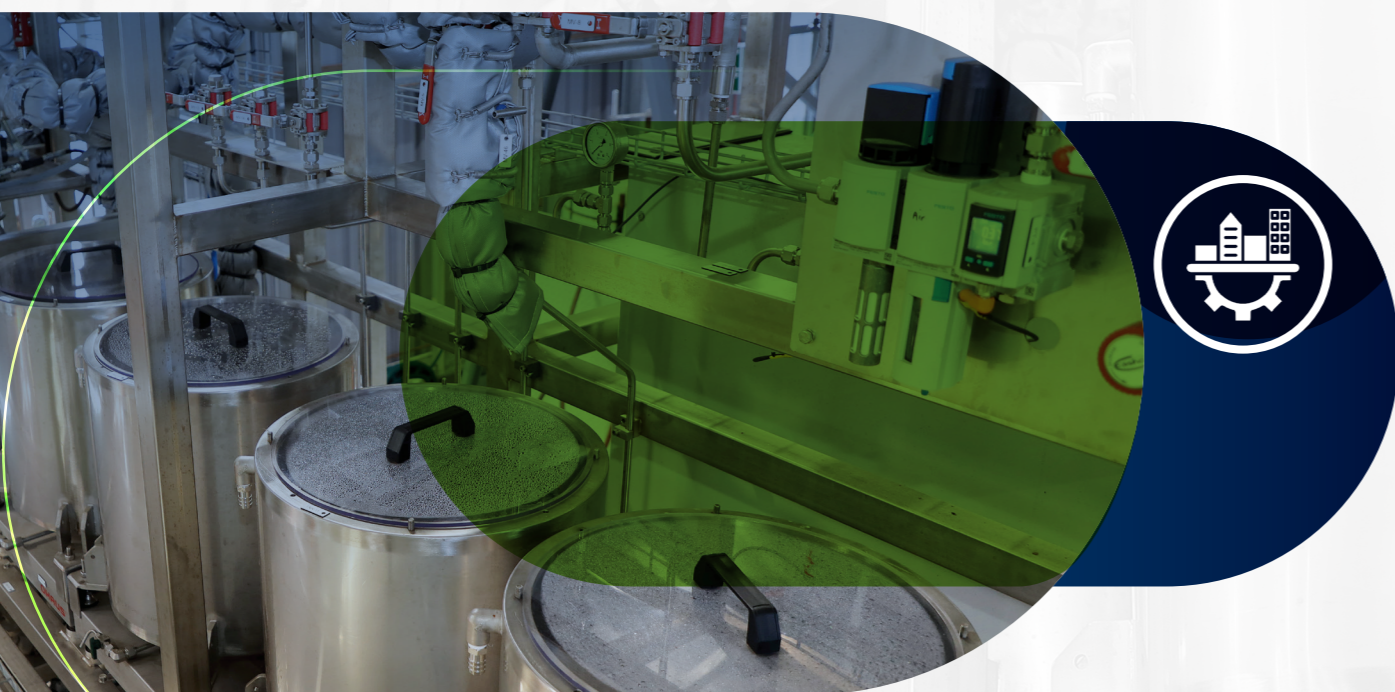
A team comprising chemists and engineers involved in technology development makes up the staff complement. The facility offers specialised chemical fractionation equipment, advanced analytical facilities and pilot facilities for upscale demonstrations of new and existing technologies and products applicable to South African biomass sources.

## BIDF INFRASTRUCTURE AND CAPABILITIES

The BIDF infrastructure comprises of a fibre recovery pilot plant for paper-based waste streams. The facility assists industry from the laboratory scale to the industrial scale with an aim to revive ailing manufacturers, create new industry value chains and lead to new jobs through improved competitiveness.

## POTATO BAG PULPING

The BIDF developed a technology to recover fibres from used potato bags to manufacture paper-based packaging materials such as fluting, which is a corrugated medium used in paper packaging materials.



## OFFERING TO INDUSTRY

The DSI-CSIR BIDF has been established to help local industry improve its competitiveness by providing access to specialised analytical and pilot-scale facilities, as well as skills that enable the more efficient use of our biomass resources, overcome significant organic waste challenges and develop new products for markets.



The use of wastepaper offers economic and environmental benefits and is a cornerstone for a circular economy. Fibres procured from wastepaper are less expensive compared to virgin fibres, and the use of waste fibres downsizes the requirements of the upstream processes in the pulp production process value chain, resulting in significant reduction in chemicals, energy and water usage.



The Paper Manufacturers Association of South Africa (PAMSA) and the DSI co-funded this project, aiming to generate reliable research and design data to assist PAMSA in designing and implementing a series of commercial-scale plants in South Africa, with a potential benefit for small, medium and micro enterprises (SMMEs).

## EXTRACTION OF HIGH-VALUE PRODUCT FROM SAWDUST BIOMASS

The BIDF developed a protocol for the optimal extraction of the high-value product xylitol from xylose, a sugar isolated from wood or sawdust biomass. The protocol contains in-depth processes on how to evaluate and process parameters for converting xylose into an important platform for sustainable bioproducts for the xylitol market. Xylitol is widely used as a food and beverage sweetener and its market is expanding.



Recent research and development include the study of the effect of the process parameters on yield, as well as determining the optimum process conditions that will serve as the baseline for subsequent studies. The technology will be licensed to SMMEs that are interested in manufacturing xylitol locally. The product will serve as a direct import replacement to xylitol, which is currently being sold in South Africa.