

## CIRCULAR ECONOMY BUSINESS CASE STUDIES IN SOUTHEAST ASIA

Naturaall Glass  
Solutions

- Klang, Malaysia
- Waste management
- naturaall.com.my
- Analysis period: 2021-2024

## Repurposing Glass Waste

## Business Spotlight

Naturaall Glass Solutions Sdn Bhd ('Naturaall') was established in 2017 in the waste management sector to commercialise responsible glass recycling. The main innovation involves a patented mobile glass crusher suitable for small-scale community-level recycling, enabling even the smallest communities to contribute to the circular economy for glass. This initiative engages local communities in recycling efforts, focusing on education and training for schools and rehabilitation centres. The crushed glass waste is transformed into high-value products like abrasive blasting media, corporate gifts, and hybrid glass composites for the building and furniture industries.

This initiative significantly improves natural resource use by increasing glass waste recovery and recycling, promoting materials efficiency, and minimising waste generation. This approach not only conserves materials but also creates economic opportunities, resulting in increased sales and profits for Naturaall while improving livelihoods within the community. Naturaall aims to scale operations by establishing a central glass recycling hub and expanding grassroots collection efforts in collaboration with community leaders, further enhancing the company's social and environmental impacts.

## Keywords

Community recycling, Glass recycling

## Innovation

End-of-life management, Resource circularity



# Analysis of Naturaall Glass Solutions

## Context and baseline

Malaysia generates an estimated 39,000 metric tonnes of municipal solid waste daily, of which approximately 2.7% is glass waste, equating to 385,000 metric tonnes of glass waste annually.<sup>1</sup> Currently, only households in the Federal Territories of Kuala Lumpur and Putrajaya, Pahang, Johor, Melaka, Negri Sembilan, Perlis, and Kedah are required to separate their waste into recyclables and non-recyclables. As a result, most glass waste is mixed with municipal solid waste and ends up in landfills across the country, where it remains inert and does not degrade. Even when households and businesses voluntarily segregate glass waste, it is often rejected because it has no commercial recycling value.

Naturaall addresses the significant issue of glass waste in Malaysia by commodifying glass waste and thereby simplifying the reverse logistics and recycling processes. Inspired by over 10 years of experience in the recycling sector in New Zealand and Malaysia, the company's founder has developed a small-scale mobile glass crusher designed for use in small communities. This compact and mobile recycling solution allows for on-site glass crushing, reducing transportation costs and increasing efficiency. Naturaall collaborates with non-governmental organisations (NGOs), schools, communities, and industrial waste recycling companies to ensure the effective collection, crushing, and transformation of glass waste into high-value products, thereby promoting circularity and benefiting the environment, society, and the economy.

## Innovation

Naturaall's proprietary circular technology, a patented mobile glass crusher with an industrial design, revolutionises small-scale community recycling. This innovation addresses the neglected issue of glass waste management by providing a low-cost, small-scale and easy to operate glass crusher, particularly well-suited for communities where glass recycling is often overlooked due to its low value. The company transforms glass waste into high-value products, thereby addressing the end-of-life management stage of the glass products and diverting glass waste from landfills. While the concept of glass recycling is well-established globally, Naturaall's approach and implementation are pioneering within the specific Malaysian non-urbanised context. Naturaall offers end-to-end services for the safe collection – at community level – and onward transportation and repurposing of glass waste.

Naturaall promotes GOCRETE, its own recycled glass composite, in innovative ways, including public art installations, furniture, table tops and fashionable interior accessories. This innovation has a profound effect on the value chain by fostering collaboration with partners in various pilot projects, and by ensuring the efficient collection, crushing, and transformation of glass waste. It generates new revenue streams and job opportunities in participating communities while promoting sustainability.



GOCRETE™



MOBILE CRUSHERS

## Circular Economy impact

Naturaall contributes to the circular economy through the recovery, recycling, and repurposing of glass waste, exemplifying resource circularity. Over the past three years, the company has collected and recycled approximately 40 metric tonnes of glass waste. Of this, 14 metric tonnes have been supplied to glass bottle manufacturers for the production of new bottles, while the remaining 26 metric tonnes have been used to create composite products, such as flooring, shelving, and tabletops for construction projects. In all, Naturaall has produced approximately RM 80,000 valuable composite products, primarily for the construction sector. Additionally, by using recycled glass as a raw material for composite products, Naturaall reduces the need to mine raw materials, helping to conserve natural habitats and ecosystems that might otherwise be disrupted by resource extraction activities, avoiding adverse impacts on land use and nature.

## Business and market impact

Naturaall has set up a mobile glass crusher in a recycling plaza and local schools in Petaling Jaya as part of a social initiative led by the non-governmental organisation (NGO) Generasi Peduli Sampah. The company also provides training in pottery and handicrafts. In addition, Naturaall collects the waste glass and transforms it into valuable products, such

<sup>1</sup> <https://www.thestar.com.my/news/nation/2024/01/02/39000-tonnes-of-solid-waste-daily>

as composite materials mixed with cement that are as strong and durable as quartz.

The company's mobile glass crusher has reduced operational costs by minimising transportation expenses through crushing at source. Naturaall directly supplies building materials to interior designers and architects, using innovative technology to create products from recycled glass. As the company markets its composite materials and finalises its patent, it expects increased sales, which will attract more clients and drive revenue growth.

The company plans to scale up its operations by establishing a central glass recycling hub with waste management partners to process various types of glass other than bottles. Naturaall anticipates finalising its patents for GOCRETE, which will further facilitate commercialisation at scale. Additionally, the firm aims to expand community projects, engaging schools and places of worship to enhance community involvement and economic opportunities. Naturaall will transition from manual production to machine-based processes to enhance glass recycling efficiency. The company plans to market its products, secure funding for machinery for production of composite slabs, and attract investors for a full-scale plant while maintaining social impact initiatives for effective grass-roots collection of glass waste.

## Stakeholders

The company has been collaborating with their partners from the NGO Generasi Peduli Sampah. Together, they have implemented this project in schools, recycling centres, and even a rehabilitation centre. The company has trained school children and individuals to separate, collect, and crush glass waste, turning it into souvenirs and other craft items.

Altogether, around 50 individuals are involved. The company is working with a waste collection company to implement glass recycling in a central hub, serving as a pilot plant for research and development of new technologies and new applications for the recycled glass composite materials.

## Implementation

The company follows a 3-pronged approach: to commodify glass waste, to simplify and decentralise collection and crushing, and finally to convert the crushed glass waste into high-value products. The problem with glass waste in Malaysia is that glass has not previously been widely accepted for recycling, and thus the market value remained low. By commodifying glass – offering an acceptable market value – the company aims to boost the collection of glass waste, allowing communities to earn supplementary income from glass waste. One of the Naturaall's focus areas as it moves forward in 2025 will be to implement more on-the-ground, grassroots-style collection of glass waste, involving communities in the outskirts of Klang Valley and Malaysia. To do this, the company is targeting collaborations with community leaders to offer workshops and awareness programmes to the communities.

## Takeaways

Naturaall demonstrates that innovative solutions can foster community engagement and enhance economic opportunities. Collaboration with local stakeholders, including NGOs and community leaders, is crucial for driving awareness and participation. The company also shows how to find value and an opportunity for glass waste, turning it from low-value material into something more valuable.

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