

GLASS WASTE

CREATED BY



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BRIEF & SOLUTIONS
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Overview

The transition from plastic to glass is the first association when it comes to sustainable zero-waste operations. Glass is made from raw materials found in nature, such as sand, soda ash, and limestone. Although glass is considered a great alternative to other materials, it requires more fossil fuels to produce and ship. Since we do not want to add up to the issue of waste mismanagement, glass should be recycled.

The average daily quantity of glass waste disposed of at landfills in Hong Kong was 183 tonnes in 2020. Due to the low residual commercial value and high collection and logistics costs of glass recycling, the majority of the glass waste in Hong Kong does not reach recycling facilities. The quantity of waste glass (mainly glass containers) recovered for local recycling dropped by about 34% compared to 2019, which is likely to be attributed to the crisis in the F&B industry due to the COVID-19 pandemic. Only 14,700 tonnes of glass waste were recycled in 2020, which represents 1% of total glass waste.

In Hong Kong, there is still room for improvement in its glass recycling systems. Taking into account the incredibly long lifecycle of glass, its landfill disposal is a waste of resources. Since glass does not decompose naturally, it harms the environment. With glass being relatively easier to reuse and remanufacture, recycling it should be more prevalent than now. The Hong Kong government addresses this issue by implementing the following measures.

- **Waste Glass Bottle Recycling Plant**

At the plant, glass bottles collected from the community go through the processes of sorting, non-glass material removal, crushing, and grinding. The resultant glass granules are conveyed for further recycling treatments, for example, as the raw material for eco-paver and land reclamation applications.

- **Producer Responsibility Scheme on Glass Beverage Containers (expected)**

The government has already appointed glass management contractors (GMCs) to provide regional waste glass container collection and treatment services. The GMCs are required to set up a network of collection points, within their catchment regions, for providing free collection services on waste glass containers at commercial and industrial establishments such as pubs, food premises, shopping malls, industrial buildings, as well as residential buildings, and housing estates.

Currently, Baguio serves as a qualified glass management contractor to undertake waste glass container collection and treatment services in Hong Kong Island and the New Territories. At the same time, Baguio will invest resources in public education to promote “proper and clean recycling of glass bottles”.

- **Charging Scheme for Glass Beverage Containers (expected in Q2 of 2023)**

The charging scheme, expected to be fully implemented on 1 May 2023, is aimed at encouraging bottle suppliers to do more to recycle their containers. Under the arrangement, glass beverage bottle importers and suppliers are required to pay a HK\$0.98 levy for every one-litre bottle they distribute in the city.

While a lot is being done, the Hong Kong government needs to continue improving the infrastructure in order to reach its goal of zero-waste to landfill by 2035.

INSIGHTS FROM OUR TRIAL

Glass was the biggest waste category for the 20 restaurants that participated in our trial that took place between June and November 2022 in the SoHo Central district of Hong Kong. In total, we diverted 10,347kg of glass from the landfill. To better imagine the scale, on average, each F&B generated 5.5kg of glass waste per day, which equals 11 bottles. During the trial period, we set up glass collection for multiple outlets that did not segregate glass until that moment. Although many of the restaurants used to segregate glass, the collection was interrupted by the social unrest in 2019, which led to the removal of glass collection bins from the streets. Glass was the biggest category of waste also due to the fact that glass weighs more than most of the other sources of waste when taking into account its volume. The challenge with the reduction of glass waste is the unavailability of closed-loop recycling system, and options for restaurants to replace glass containers for products they buy with alternatives or reverse logistics.

GOOD PRACTICES & INNOVATIVE SOLUTIONS

Recycling Glass With Other Byproducts

- In Næstved, Denmark, glass waste is recycled at the Glass Cluster, which not only produces new glass but also creates insulation from byproduct glass and supplies a local city with 50% of its heating from surplus heat. The Næstved municipality has taken the circular economy to heart, so the city holds the name of "Resource City".

Municipal Deposit Return Scheme

- When German shoppers buy their drinks, they pay a deposit on top of the cost of the beverage itself — the so-called Pfand. When they return their bottles and cans to the store, they get their money back. One of two types of bottles in Germany's Pfand system has producer-set deposit prices ranging from EUR0.08 to EUR0.25 (HK\$0.66 - HK\$2.07), can be reused multiple times, and can be made from glass or PET plastic. The second type is destroyed and recycled. A drinks wholesaler transports bottles to a sorting facility with a truckload of empties, where it is put with other bottles of the same shape before being taken to a producer that uses that particular type of bottle. There, it is cleaned, refilled, and delivered back to a shop shelf for repurchase.

Extended Producer Responsibility (EPR) Scheme

- Spain has seen rapid growth in recycling from just 36.3% in 2002 to 70.4% in 2015. Following the Spanish EPR scheme, packaging companies finance the scheme based on the weight of the material they place on the market. The national EPR administrator for glass, Ecovidrio, especially focuses on the hotels, restaurants, and catering (HORECA) sector as they are large generators of one-way glass containers. For HORECA, Ecovidrio introduced self-loading containers, provision of resources, informative visits, and training.

Internal Deposit System for Reusable Glass Bottles

- Ancolie, a café from New York, only serves food in reusable glass jars. Their goal is to offer a sustainable alternative to the typical to-go restaurants. Although Ancolie encourages patrons to keep the jars for reuse at home, there are also incentives to bring them back for a US\$2 credit (HK\$15.58), and returning 10 jars results in a free meal.
- When the Tin Tin bar opened in Stuttgart, its owners with sustainability in mind ordered a full pallet of glass bottles to bottle their drinks. At that time, the bottles were not returning to the bar for reuse, as customers preferred to repurpose them for other liquids at home. During the COVID-19 lockdown, the owners of the Tin Tin bar came up with the idea of cocktails-to-take-home to maintain their business activity. They set up a deposit system and bought a dishwashing machine that washed 16 bottles at 67 °C in just two minutes. It was the launch of a functioning circular system at the bar. Now, cocktail lovers can return their empty bottles and they will receive a small refund of EURO.50 (HK\$4.14) when they pick up their next order.

Industry-owned Deposit Return Schemes

- Germany-based soft beverage producer Fritz-kola has never sold a drink in a plastic bottle since they see circularity and sustainability as the core values of their business. In 2020, they moved even further and introduced a glass reuse system. Their beverage products are sold at a price inclusive of deposit, after disposal every beverage producer can sell, collect, and refill these bottles. They work with local partners to ensure a minimum CO2 footprint from transportation. Also, they sell beverages in 0.2-, 0.33-, and 0.5-liter portion bottles only to avoid wastage.
- In Companhia Muller de Bebidas in Brazil, 65% of their product portfolio is sold in returnable packaging. Their reuse system is organised around 1,100 distributors and 20 brokers (bottlers). Companhia Muller dispatches bottles to regional distributors with their own point of sales network. The beverage company owns the bottles, so they only charge the liquid to the distributor. Distributors will sell products through their network, pick up empty bottles from bars and restaurants, and bring them back to the company for washing and refilling.
- By the end of 2022, Coca-Cola in France became the first supplier of non-alcoholic beverages to distribute 100% of its beverages to hotels, restaurants, and cafés using a deposit system. Once emptied, the bottles are stored in their own crates and collected for return to the factory to be cleaned and refilled. The bottles can be refilled up to 25 times, saving energy and raw materials.

Sustainable Procurement and Distribution of Beverages

- EcoSPIRITS is an innovative closed-loop distribution system that nearly eliminates packaging waste in the premium spirits supply chain. It operates in many countries and cities including Hong Kong. The closed-loop distribution system uses ecoTOTES – a fully-reusable, refillable, tamper-proof, and shock-proof 4.5L glass vessel to replace the standard six-bottle case of spirits. That means less glass and cardboard in local landfills.

RECOMMENDATIONS

Restaurants

Due to glass' high energy-consuming process and its low recycling rates, it may be better to use recyclable plastic containers rather than single-use glass containers when serving beverages. Glass' CO2 footprint decreases with a certain number of cycles of use, so single-use glass is nowhere near as good as a reusable plastic container.

If not reused as a beverage container again, a clean glass container can be repurposed to store other items: from coffee to paper clips, from screws to pens, or be a flowerpot. Finally, we recommend F&B companies to always recycle waste glass. Follow tips on how to sort and prepare glass and promote this initiative among employees.

In Hong Kong, businesses can request the placement of glass collection containers near their premises. For example, [Baguio Glass Bottle Recycling Services](#) and [Hong Kong Glass Reborn Limited](#), EPD Glass Management Contractors, especially target bars, restaurants, and hotels in their services.

Customers

If it is possible to avoid single-use glass containers, avoid it, as the production of glass requires a lot of energy and sand, which is by now a scarce resource. What you can do instead is drink tap water, draught beer, sparkling water from a soda maker, homemade juice, or whatever you can pour into a glass or jug. A preferable to-go option is a refillable glass bottle or plastic bottle or carton package, provided you are able to recycle these containers and your location has a reliable recycling system.

Glass jars, bottles, and other types of glass containers can all be reused or repurposed in a variety of ways. For example, you can reuse glass containers for crafts, storage, or DIY projects or as a vase, drinking glass, or flowerpot.

If you cannot find another use for your glass, then you should always recycle it. Make sure there are no foreign objects in the glass waste when you deposit it in the recycling bins. Foreign objects can cause contamination or complications during the melting and fusing of glass at high temperatures.

Some glass waste, however, can be difficult to recycle and should not be put in the recycling bins designed for bottles and jars. Some of the items that cannot be recycled are shattered drinking glass, glass dishes, heat-resistant glass, window glass, windshields, lightbulbs, eyeglasses, and more. Check the recycling bin instructions about what glass items can be deposited and your local recycling system to make sure your glass waste gets recycled.

Government

The biggest caveat of glass waste management in Hong Kong is the lack of a recycling facility that aims to close the loop of glass production.

To improve glass waste collection rates (and eventually recycling rates), the government should provide convenient collecting services such as door-to-door, curbside collection, drop-off recycling sites (bottle banks), or container deposit systems. The biggest losses of glass material occur at the collection stage, therefore a well-designed municipal collection programme could bring significant improvements to the waste management system.

Glass waste sorting is a subsequent issue the Hong Kong government should deal with. The whole chain relies heavily on the quality of the collected material: the more glass is separately collected and colour-sorted, the fewer contaminants and non-targeted infusible elements are to be removed as well as the fewer losses during the manufacturing process. Taking into account the lack of space in Hong Kong, the responsibility of coloured glass separation should fall upon a sorting facility equipped with technologies capable of identifying different types of waste.

In implementing a Charging Scheme for Glass Beverage Containers, there should be an incentive to encourage consumers to bring their bottles back. The government should use the funds acquired from the glass recycling fees to reinforce the infrastructure and implementation of environmental policies, like putting into practice a scheme whereby shoppers pay a deposit on top of the cost of a beverage and get it back only when they return the bottles. The promotion of incentives such as sorting obligations and Pay-As-You-Throw schemes has to be extended. These instruments are extremely important in order to reach collection performances of over 90%.

The Hong Kong government should also draw attention to the most efficient solution to the glass waste issue, which is reusable glass bottles. It has been demonstrated that if reused once, rather than being recycled, the environmental impact of a glass bottle drops by 40%. Reusable glass bottles have lower emissions than single-use bottles made of glass, polyethylene terephthalate (PET), or aluminum when they are reused for a certain number of cycles. With respect to that, reuse targets for the beverage sector should be a priority in packaging legislation in order to effectively close the loop of these materials.

The lack of economic and legal incentives to support reusable systems is one of the biggest challenges for this model. It is important that policies are in place to support this transition – for instance, by putting in place regulatory measures (e.g., reuse targets, packaging format harmonisation, economic incentives) and instruments to facilitate and optimise the transition towards reuse; but also through investments in reverse logistics infrastructure.

We support the implementation of a Deposit Return Scheme in Hong Kong for both single-use and reusable beverage packaging since the collection infrastructure can be easily integrated and used for both as it is done in Germany and the Scandinavian countries. The authorities should consider categorising bottles as single-use and multiple-use containers in order to process them further and send them to recycling or reusing facilities, which will be extremely effective in terms of resource usage.

We highlight the need to focus on the glass collection from HORECA, for which high quality seems more challenging to reach. It is vital to improving reverse logistics for recycling in the hospitality sector because this business is an important market for glass-packed products. Reverse logistics need to be improved in order to ensure the return of empty containers, for a refill or for recycling.

Transportation to the recycling facilities should be done as locally as possible due to the greater carbon emissions from transporting heavy glass waste. The government should facilitate the establishment of local recycling facilities in close proximity to the city.

Education takes a central part in a policy related to glass waste because there is a need in a behavioural change to make it work smoothly. The government needs to develop clear guidelines to improve local performance. Inform residents what kind of glass can and cannot be recycled, provide instructions for glass recycling preparation, and engage with residents about glass recycling at events. Additionally, residents need to be incentivised to recycle in larger volumes. This could be achieved partially through Municipal Waste Charging as glass is bulky and heavy and thus will increase the costs of landfilling if not recycled. However, reverse systems with monetary benefits should be implemented in parallel as they would incentivise a larger population to participate in glass recycling.

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