

# FOOD WASTE

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CREATED BY



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BRIEF & SOLUTIONS  
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## Overview

Food waste is the most important type of waste. It may seem that it is less harmful to the environment because it is biodegradable but, in fact, being disposed of at the landfills and incinerated, it produces greenhouse gas emissions which contribute to global warming significantly.

Wasted food is still food, and its wastage results in a great economic loss due to resource mismanagement. Asian countries are among the leaders in food waste production - Asia is responsible for over 50% of global food waste, and China, Japan, and South Korea combined generate over a quarter of the world's wasted food. As these statistics illustrate, food waste is specifically present in high-income countries including Hong Kong, where food waste accounts for 30% of the Municipal Solid Waste (MSW) landfilled (3,255 tonnes per day).

Nevertheless, the authorities in Hong Kong are aware of this ever-growing issue so they introduced a range of campaigns and are implementing infrastructural changes. Reducing the quantity of food waste is critical to Hong Kong's achievement of the overall waste reduction target of 40% by 2022. Food waste segregation and disposal are at the core of any successful municipal waste management system.

The biggest achievement of recent environmental policy is launching the first Organic Resources Recovery Centre, O·PARKI, which converts food waste into biogas for electricity generation and uses its residues for composting purposes. O·PARKI is capable of handling 200 tonnes of food waste per day. Hong Kong has other facilities aimed at food waste recycling and composting - Baguio and Green Environmental Kitchen Residue Recycle. The plants offer pickup services and cradle-to-grave food waste management programmes.

Besides, the Environmental Protection Department (EPD) leads the Food Wise Hong Kong Campaign, which encourages a "waste less" culture through various schemes and activities, e.g., Food Wise Charter, Food Wise Eateries Scheme, publicity of the Big Waster, etc. Related to food eatery outlets in the hotel and food & beverage (F&B) sectors, Food Wise Eatery Scheme motivates participating restaurants to adopt food waste reduction measures. The Campaign also promotes food donations from those commercial establishments with surplus food to charitable organisations. Hong Kong residents may donate their surplus food to NGOs that run food recovery projects, for example, Food Angel, Feeding Hong Kong, Foodlink, St. James Settlement People's Food Bank, and others.

In 2021, the EPD launched a larger scale Pilot Scheme on Food Waste Collection, focusing on food waste generated from private (commercial and industrial sector) and public premises. Source-separated food waste collected under the Pilot Scheme will be transformed into energy, and compost as a by-product at O·PARKI.

In addition, the EPD and Drainage Services Department (DSD) are working on the first trial scheme on the food waste/sewage sludge anaerobic co-digestion, which was launched in 2019 at the Tai Po Sewage Treatment Works. The scheme is expected to expand its operations to cover commercial and industrial establishments in other areas at a later stage.

Currently under construction and scheduled to commence operation by 2023, is another facility - O-PARK2 - at Sha Ling in North District, which will be able to treat 300 tonnes of food waste daily and produce biogas for the generation of electricity. The residue from the process will be converted into fertiliser as a by-product for landscaping and agricultural application.

As a regional and international hub, Hong Kong positions itself as Asia's gourmet capital, attracting residents and visitors with its broad range of eateries. That is why the F&B industry should take an active interest in food waste management transformation.

## **INSIGHTS FROM OUR TRIAL**

During our trial with 20 F&Bs in the SoHo/Central district of Hong Kong that took place in June-November 2022, we diverted over 10,427kg of food waste from landfills. Food waste constituted 32.3% of total waste reported (food waste + recycling + landfill waste) and was repurposed during the trial while each participating restaurant measured its waste for three consecutive months. The vast majority of outlets did not segregate food waste prior to the trial mainly due to the unavailability of affordable collection services and a lack of knowledge regarding the impact of food waste. Space for the placement of collection bins and hygiene and smell concerns of residents when collection bins are placed on the street level remain to be the major challenges with food waste reduction and segregation. Sharing bins and collection fees with neighboring restaurants and bars could be a solution to making the service affordable and more widely practiced as seen during the trial.

## **GOOD PRACTICES & INNOVATIVE SOLUTIONS**

### **Sustainable Food Production Planning**

- McDonald's in Sweden has advanced production planning tools forecasting the demand for different food and beverages based on historical data, the weather, and other key parameters hour by hour.
- At the IBM canteen in Finland, Fazer Food Services has developed a system for menu planning based on daily feedback from the guests: "What do you want for lunch tomorrow?" Fazer Food Services do not prepare 100% of the food in advance. Instead, the canteens base their operation on batch production. In addition, sauces and some other ingredients are added just at the last minute to minimise avoidable food waste.

## Food Waste Trackers

- In Singapore, a team of alumni from the University of Singapore launched a start-up called Lumitics, dedicated to reducing food waste in the hospitality industry specifically. Their device, called “Insight”, is an AI-powered food waste tracker directly installed on existing bins. It records what and how much is wasted, in order to improve purchasing habits, menu designs, and production. According to Lumitics, early tests have demonstrated that within the first four to five months of using the sensor, cafés and restaurants reduced food waste by almost one-third.

## Using Food Waste as a Resource

- Hong Kong-based social enterprise Dyelicious is taking action to tackle the city’s food waste problem by turning it into colourful dyes. Dyelicious holds workshops to teach people how to style clothes, scarves, hats, and bags with dyes made from leftover foods such as coffee, red cabbage, sweet potato, and ginger, which would have ended up in Hong Kong’s landfills.
- At Haven’s Kitchen in New York City, the team led the initiative to use leftover trimmings such as lemon peels for cocktails. This change enhanced the beverage menu and initiated conversations amongst diners about food waste reduction. For the company, whole-product utilisation served as a creative and cost-effective method of reducing food waste and a valuable addition to the dining experience.
- The chefs at 21 Greenpoint in New York City offer their seven-course Sunday Night meals for US\$21 (HK\$163.62) per person, made up entirely of leftover foods from dishes cooked earlier in the week (and edible food scraps), courses are served family-style. The delicious and creative dinners impress the guests and leave the refrigerator and trash cans emptier at the end of the week.
- Sage Restaurant Concepts in Portland, the US, reduces food waste by using beef trimmings to make candles, using up vegetables that might otherwise go to waste, raising tilapia in the restaurant’s basement, and harvesting honey from bees housed on the roof.

## Sorting and Composting Food Waste On-site

- Hotel Continental and Hotel Rica Park Holmenkollen in Oslo have installed equipment for the local treatment of their kitchen waste. The machines are used for the grinding, heating, and degradation of food waste. The volume of the food waste is reduced by 10:1. This is mainly because much of the water in the food waste is removed by drying in the composting process. The hotels thus save costs both related to the collection and the gate fee at the incineration plant. As the hotel managers noted, such equipment had a low pay-back period, mostly due to the compaction of the food waste treated on site. In addition, the investment is regarded as a hygienic solution, and both practical and pedagogic approaches show immediate results after just 48 hours.

## Excess Food Distribution Services

- Hong Kong's web app [Breadline](#) helps to fight food waste in the city. By offering open-source information on food production, distribution, consumption, and waste disposal in the city, Breadline connects bakeries to volunteers who can collect leftover bread and help redistribute them to charities and the people in need.
- [CHOMP](#) is a Hong Kong-based app that is saving food one bite at a time. It is designed to change the way people feel about food consumption and encourage sustainable living in Hong Kong by connecting F&B businesses (restaurants, cafes, bakeries, and others) to customers who can purchase a "Mystery Box" of unsold food items.
- [Phenix on The List](#) is another app in Hong Kong that helps distribute unsold food at restaurants and other F&B outlets to customers towards the end of the day.
- [Last Minute Sotto Casa LMSC](#), a project based in Italy, utilises "live-proximity marketing" that allows stores with food in excess and/or expiring items to inform thousands of people through a mailing list or through the app. LMSC rewards anti-waste shopkeepers by helping them transform the losses generated by unsold food into new revenues previously unthinkable. About 700 shops take part in the network of LMSC and the app currently has 50,000 app. The project embodies the following idea: if the retailer could alert people of the availability of excess produce sold at a discounted price, it could be a win-win solution.

## Banning Food Waste in Landfills

- In 2005, the South Korean government banned food waste from being discarded into landfills and waterways. As a result, landfilling of food waste has been reduced to 3-5 %, household waste decreased by 30%, and restaurant food waste was reduced by 40 %. A few years later, in 2013, the government introduced compulsory food waste recycling through a special charging scheme: South Koreans deposit their food waste using garbage bins with a Radio Frequency Identification (RFID) system that recognises barcodes unique to each household. Residents pay a monthly collection fee based on the amount of food waste they discard.
- On January 1st, 2021, [New York's Food Donation and Food Scraps Recycling Law](#) officially went into effect, requiring businesses and institutions that generate an annual average of two tonnes of wasted food per week or more to donate excess edible food; and recycle all remaining food scraps if they are within 25 miles of an organics recycler (composting facility, anaerobic digester, etc.).
- In Canada, Nova Scotia residents have been diverting food and garden waste from landfills since a [ban was introduced in 1998](#). Residential, commercial, and industrial composting programmes collect over 100,000 tonnes of organic waste a year. Over 90% of households have access to council green bins for organics and the remainder compost in their own backyards. Businesses in Nova Scotia are also required to divert organic waste by offering customers and staff comprehensive sorting programmes. Composting centres were set up to process food and organic waste, including meat, fish, bones, dairy products, coffee grounds, fruit and vegetable scraps, dinner packaging, and soiled and non-recyclable paper products.

# RECOMMENDATIONS

## Restaurants

The supply chain for food waste should include three stages - prevention, recovery, and recycling. Initially, in procurement, restaurants can make efforts to prevent food waste in the future by opting for smaller case or pack sizes, look into pre-prepped items to minimise the amount of trim waste, buy imperfect produce, and buy frozen when appropriate as it has a longer shelf life.

Meanwhile, restaurants should establish reduction targets and a baseline by conducting a food waste audit. Strong data makes the case for investing in food waste prevention efforts and wins buy-in from the executive team and restaurant staff. Consider utilising waste tracking systems that capture the weight, type, and source of food waste, and use this information to improve kitchen operations (e.g., reduce prep trim and overproduction). Some waste tracking systems will convert the data into the cost (money lost) based on the amount and type of food waste. Track both pre- and post-consumer food waste and use that data to adjust operating procedures, update training materials, and make menu changes. Tracking food waste can help to adjust food production levels based on what is leftover at the end of the day.

Through operations with food waste reduction in mind - reducing the number of ingredients and repurposing food prep trim and overproduction - restaurants can not only help the environment but also increase their profits. Eateries can minimise the range of ingredients used across dishes to maximise opportunities for cross-utilisation. Similarly, seek out opportunities to repurpose food prep trim and overproduction in other dishes and optimise food preparation through batch cooking, specific portion sizes, cross-utilisation, and providing refilling options. Guests receive exactly what they want while restaurants prevent surplus waste.

Collaboration with a food donation organisation will help restaurants recover food that could be lost. It is important to choose services that connect to a local food bank or soup kitchen, provide transportation and offer flexible pickup times, do not have minimum donation requirements, categorise value by food type and track donated food, as well as provide documentation required to maximise tax deductions where applicable. Food can be donated for animal consumption or for the production of animal feed too.

To allow better recycling, arrange food waste sorting conveniently. For example, place small clear containers at each food station rather than in one location to encourage employees to put food trimmings or leftovers in recycling rather than trash bins. Food waste can be used for industrial purposes or composting later. Composting food scraps can be done on-site, or a restaurant can deliver them to a composting facility through a local hauler for pickup services.

Finally, to avoid landfilling food waste including cooking oil, it is better to send it for anaerobic digestion for biodiesel production - a renewable, biodegradable fuel.

## **Customers**

Citizens can take action within their daily lives and communities to reduce food waste in the home, when shopping, at work, and in restaurants, cafes, and hotels. They can also influence the actions of the sector through their consumption habits. When dining in restaurants, guests can make sure to finish their meals or take home leftovers to prevent food waste. Ordering only the amount we can eat is another strategy to prevent food from being wasted, especially when ordering sharing plates.

At home, citizens should pay attention to date labels on food. A Use By Date indicates when a product may no longer be safe to eat. However, a Best Before Date is an indication of quality, not safety. The colour or texture of the food may be far from perfect but they are not rotten, so could be safely consumed after the date has passed. Also, proper food storage is vital to keep food fresh longer.

Creativity in cooking helps to reduce food waste, so use up all the ingredients, freeze the unused parts, and keep leftovers for another day. With many donation services available and organisations existing, it is always a workable solution for a surplus food problem such as close-to-expiry canned foods and others that could be used in a soup kitchen and help the needy.

## **Government**

Government financial support as well as the need for broader availability of technological innovations are critical in running food waste campaigns effectively. Technological innovations to be explored, piloted, and eventually implemented are smart bins that directly weigh and identify the type of food waste discarded using artificial intelligence. For commercial purposes, more efficient composters or digesters are also needed to tackle the food waste problem in high-density cities.

In order to scale up food waste donation, it is crucial to develop a convenient infrastructure for food banks, so the F&B outlets do not have to struggle with storage, transportation, and handling food waste. It is also important to have legislation in place that safeguards F&Bs in the process of food donation to incentivise participation.

The best option to keep unavoidable food waste out of landfill is diverting it to an alternative waste management solution. This may include food scrapping for animal feed, composting and anaerobic digestion. The government needs to expand these practices to provide a solution for the whole city.

Another way to stimulate avoidable food waste prevention stems from imposing landfill and incineration taxes. Taxes on waste treatment make it more expensive to waste food. The Hong Kong SAR Government may take inspiration regarding effective food waste taxes and bans on landfilling food from Canada, South Korea, and France.



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