SUSTAINABILITY PLAYBOOK FOR FOOD & BEVERAGE COMPANIES

EMBARKING ON YOUR SUSTAINABILITY JOURNEY

Developed by

Enterprise Singapore

Supported by

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RESTAURANT ASSOCIATION OF SINGAPORE

sniba singapore nightlife business association

CONTENTS

FOREWORD

Singapore's Food and Beverage (F&B) industry is deeply woven into the fabric of our nation's identity. With food being a staple in everyone's lives, F&B companies are in a good position to influence consumer behaviour and drive positive environmental change.

The F&B industry can play a key role in the country's green efforts - the industry generated an estimated 354,000[1] tonnes of food waste in 2023, which accounted for almost half of Singapore's total food waste. This underscores the need for the industry to optimise its use of resources to reduce waste, which can help lower operational costs while contributing to Singapore's overall sustainability goals.

We recognise that the path to a sustainable F&B industry is not without challenges. With rising costs of raw materials and energy, as well as increasing environmental regulations and shifting consumer expectations, the industry is under growing pressure to constantly adapt and innovate.

This playbook will provide a guide for Singapore's F&B industry to kickstart its sustainability efforts, offering practical solutions to optimise resource use and foster innovation.

I encourage you to build your sustainability capabilities and embed them in your business models. By implementing these best practices, you can strengthen your business while supporting Singapore's environmental goals. Together, we can ensure the F&B industry continues to thrive and contribute to a sustainable future.

JEANNIE LIM, ASSISTANT MANAGING DIRECTOR, SERVICES AND GROWTH ENTERPRISES, ENTERPRISE SINGAPORE

[1] The 2023 baseline estimate was calculated from over 500 data points provided by commercial building owners/operators, F&B companies and waste collectors. Food waste from residential takeaway orders, hawker centres, hotel operations and upstream food manufacturing facilities was excluded.

ABOUT THIS PLAYBOOK

The playbook provides practical action and guidance to help F&B companies implement sustainable practices. Developed in consultation with F&B companies, associations and solution providers, it aims to help companies navigate real-world challenges and leverage sustainability opportunities and solutions[2].

YOU CAN FIND:

- Information on Singapore's current F&B sustainability landscape, focus areas and relevant policies
- Practical action and guidance to navigate sustainability challenges and leverage opportunities
- Resources to support the sustainability journey such as programmes, tools and frameworks

It will focus on three priority areas:

1. FOOD WASTE

2. PACKAGING WASTE

3. GREENHOUSE GAS (GHG) EMISSIONS

[2] This playbook focuses on operational activities within F&B companies (hawkers and supermarkets are not included) and excludes upstream activities, such as sourcing from sustainable sources.

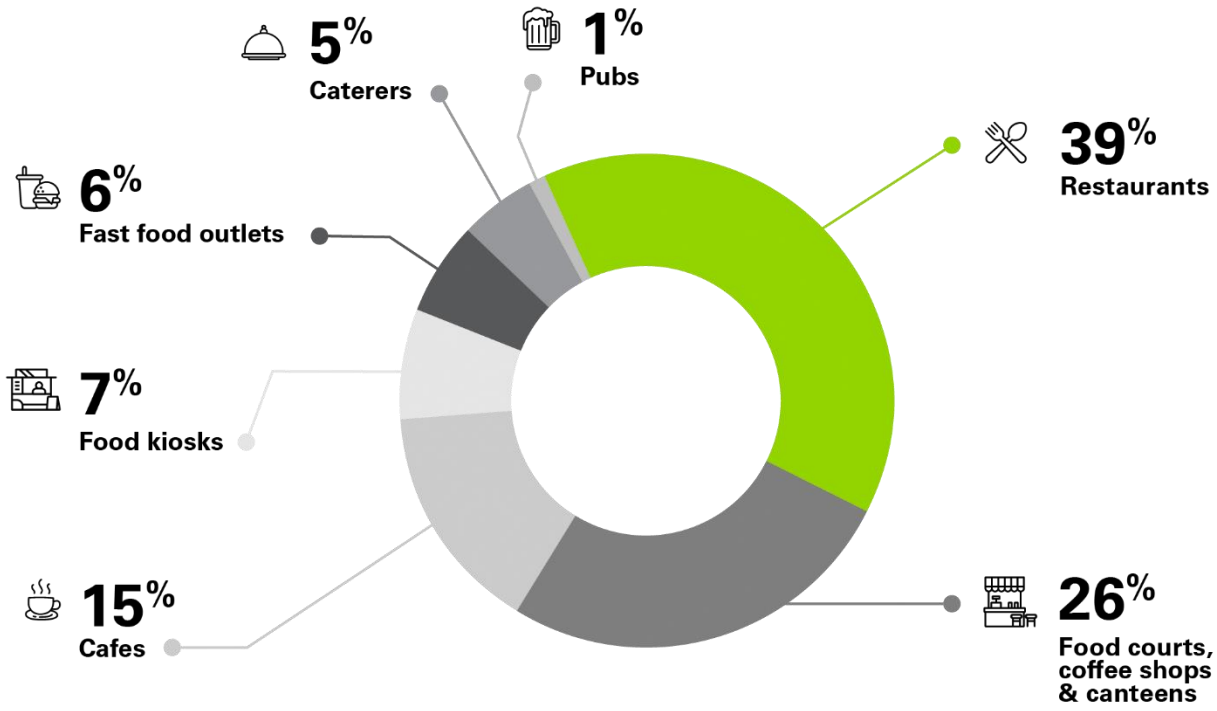
INTRODUCTION

Singapore's F&B landscape

Singapore's F&B industry comprises over 14,000 establishments[3], ranging from restaurants to food courts, cafes and others.

Over the last few years, many F&B companies have started embracing new trends, such as increasing delivery and takeaway options, placing a stronger focus on health and wellness, and adopting innovative technologies in their operations. However, to sustain growth, the industry will need to continue to adapt to changes – and this includes addressing sustainability impacts and risks.

Proportion of F&B establishments in Singapore by segment[4]



[3] Department of Statistics (DOS), 2022.
[4] DOS, 2022.

This playbook focuses primarily on solutions for F&B companies' operations, targeting downstream activities within their control, such as reducing kitchen waste and improving waste management or recovery.

UPSTREAM

POST HARVEST ----> HANDLING ----> PRODUCTION

MIDSTREAM

STORAGE ----> PROCESSING ----> PACKAGING ----> DISTRIBUTION

DOWNSTREAM

Major focus of the playbook

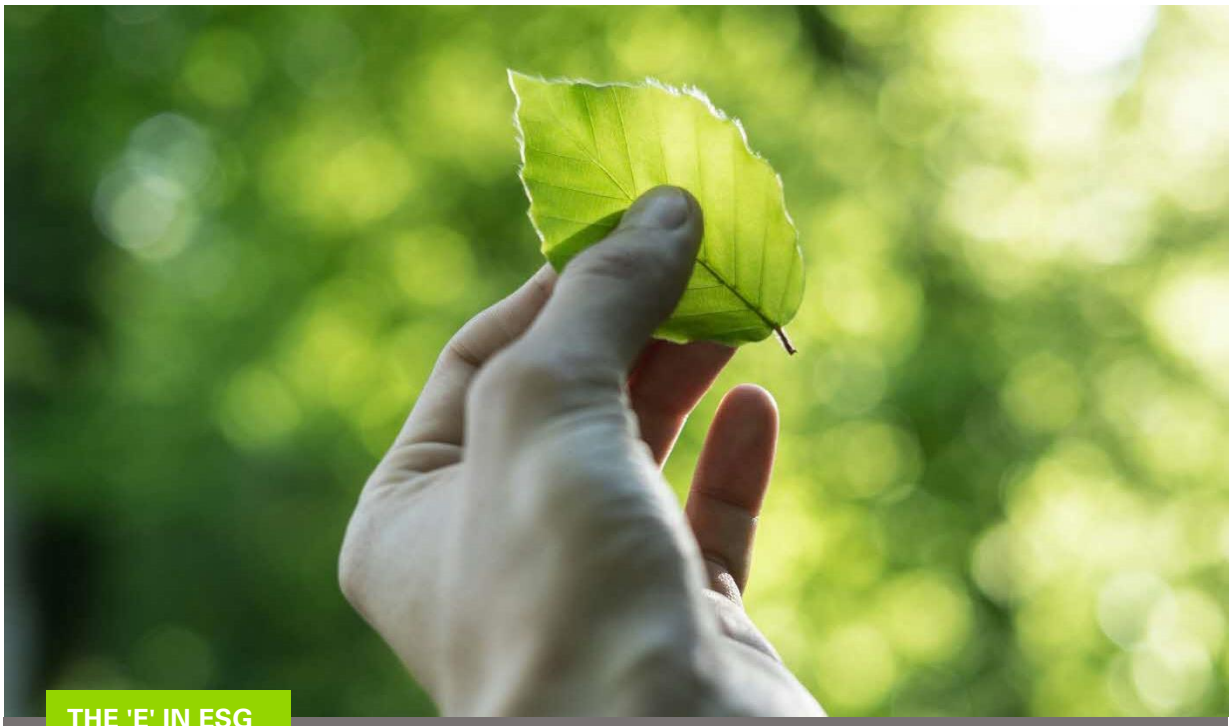
F&B COMPANIES -------> PREPARATION ---> CONSUMPTION ---> WASTE MANAGEMENT

Downstream activities F&B companies can influence

What is sustainability?

Sustainability is about operating in a way that does not harm the environment or society. Investors increasingly consider a company's Environmental, Social and Governance (ESG) performance in making investment decisions, in addition to traditional metrics, such as financial performance.

For companies, sustainability presents opportunities to optimise resource use and develop a more competitive value proposition. Embracing sustainable practices can lead to cost savings and improved efficiency, and ensure companies are better positioned to deal with future external challenges.



THE 'E' IN ESG

ESG metrics look at a company's non-financial performance, including its impact on climate change, pollution, and health and safety.

The 'E' encompasses environmental factors, with climate change being a top priority due to its immediate threat on the livability of our planet. This playbook focuses on the 'E' in ESG for the F&B industry, highlighting the following key areas:

WASTE MANAGEMENT

GHG EMISSIONS

ENERGY MANAGEMENT

PRIORITY AREAS

Food waste, packaging waste and GHG emissions have emerged as the three key material areas in the F&B industry due to their considerable environmental and commercial impact. These material areas were determined through extensive reference to both local and international standards, including the Singapore Standards (SS), Sustainability Accounting Standards Board (SASB) Restaurant Standard, Global Reporting Initiative (GRI), United Nations Environment Programme (UNEP) and the World Resources Institute's Food Loss & Waste (WRI FLW) Protocol.

The relevance of these focus areas is underscored by global best practices, where other countries such as the United Kingdom, South Korea and France have prioritised similar areas. Engagements with local F&B companies have also validated and refined this prioritisation.

Among the three areas, food waste stands out as the most pressing issue in the industry. It is not only the largest source of waste, but also aligns closely with global sustainability efforts, presenting significant commercial opportunities. This is reinforced by stakeholder feedback indicating that food waste is a critical concern and the most accessible for F&B companies to address.

WHY SUSTAINABILITY MATTERS

Globally, governments and companies are responding to the urgency of climate change and waste reduction. Singapore is no exception. Singapore has set targets to reduce waste to landfill[5] per capita by 30% by 2030 and is committed to achieve net-zero emissions by 2050, under the Zero Waste Master Plan and Singapore Green Plan 2030. With F&B companies generating about 47%[6] of the city-state's food waste, addressing this is a key opportunity for the industry to improve long-term business resilience, reduce costs, and lower environmental impact.

For the F&B industry, sustainable practices are becoming increasingly critical to manage risks, stay competitive and meet the growing demand for responsible consumption.

Some companies are already taking the lead to introduce sustainable practices. For instance, some drink stalls have adopted a default straw-free policy and found minimal customer resistance, demonstrating that small changes can be embraced when they align with consumer values. Similarly, other businesses are building sustainability into their operations, such as investing in energy-efficient appliances to manage the environmental impact and cut down on operational costs.

[5] Waste to landfill in the context of Singapore means diverting waste from Singapore's incineration facilities and the resulting landfill of ash from this process. This means emphasising waste reduction, recycling and reuse to minimise the volume of waste incinerated and the resulting ash sent to landfills.
[6] Based on a study commissioned by Enterprise Singapore and the National Environment Agency's (NEA) published food waste for 2023. This figure is subject to change year on year.

Benefits of sustainability

While F&B companies are primarily focused on managing operational costs, sustainability should be incorporated as a long-term strategy. By embedding sustainability into business models, F&B companies can unlock growth opportunities, benefiting key stakeholders across the value chain.

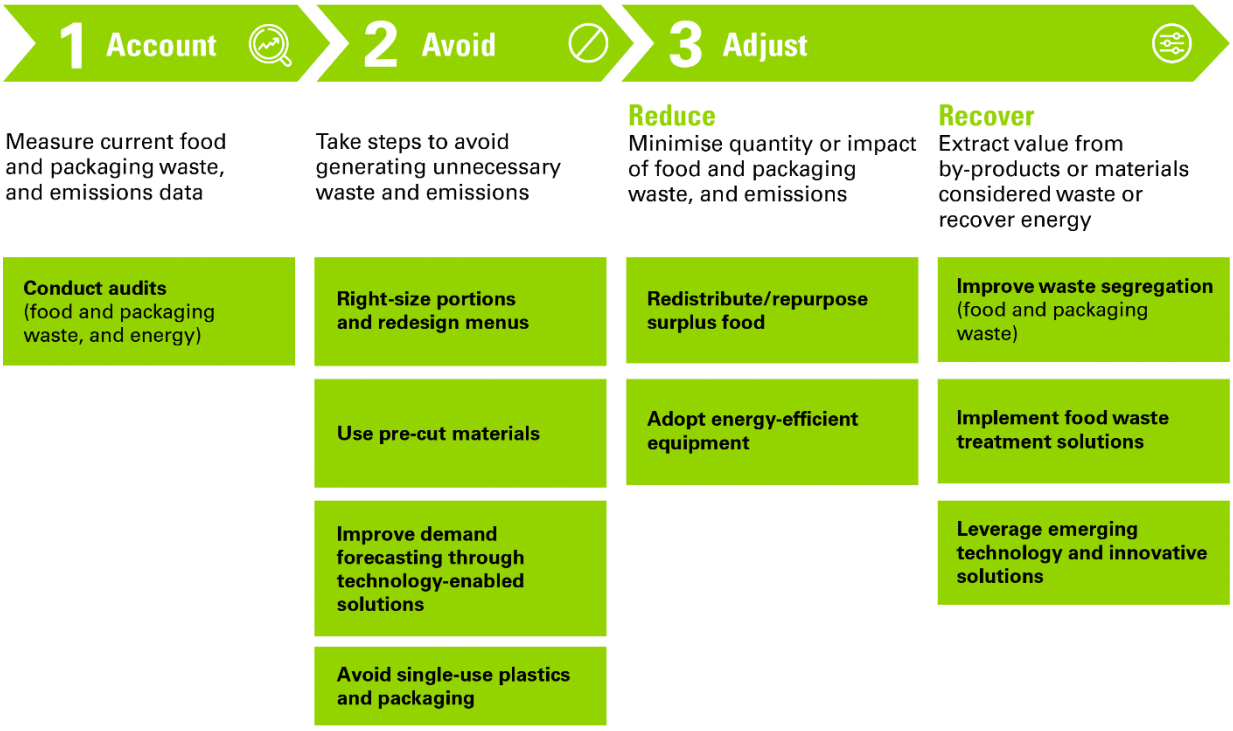
Key stakeholders and sustainability benefits

 SUPPLIERS	**Save resources and costs:** F&B companies can improve operational efficiency by identifying areas of excessive consumption. Reducing energy use or adopting energy-efficient appliances can lead to long-term savings. Additionally, optimising food inventory management and implementing waste-reduction strategies, such as right-sizing portions and using pre-cut materials, have been proven to lower costs through reduced disposal fees while avoiding unnecessary waste.
 INVESTORS  REGULATORS	**Access funding:** As investors and lenders increasingly prioritise sustainability, companies with strong environmental practices are better positioned to secure funding. Up to 65% of global investors believe that ESG will become standard practice within the next five years[7]. Additionally, banks are increasingly offering sustainability-linked loans, providing small and medium enterprises (SMEs) with additional financing options.
 CUSTOMERS	**Identify new growth opportunities and enhance brand reputation:** With 84% of Singaporeans expressing a willingness to pay more for sustainable products[8], adopting environmental practices can help F&B companies attract new customers. Implementing environmental initiatives can also improve brand image. For instance, Zest Bar in Seoul, Korea, was awarded Time Out Seoul's Bar of Tomorrow 2023 for its leadership in sustainability. At Zest, leftover ingredients were creatively repurposed – fruit pulp was transformed into cordial and unnecessary plastic materials were banned[9].
 REGULATORS  SUPPLIERS	**Build resilience to evolving regulations:** Staying informed and compliant with relevant legislation, such as the Resource Sustainability Act (RSA) and Mandatory Packaging Reporting Scheme (MPR), help companies avoid potential legal issues, fines and operational disruptions. Larger companies should be aware of the Singapore Exchange (SGX)'s climate reporting requirements. Smaller F&B companies could also be impacted as they may need to report data to their customers.
 EMPLOYEES	**Attract and retain talent:** By adopting sustainable practices, F&B companies can position themselves as desirable employers, fostering a more motivated and committed workforce.

[7] Unpacking Asia-Pacific Consumers' New Love Affair with Sustainability, Bain & Company, 2022.
[8] Unpacking Asia-Pacific Consumers' New Love Affair with Sustainability, Bain & Company, 2022.
[9] Zest leads the way as Seoul's first Bar of Tomorrow, Time out, 2023.

KICKSTART THE SUSTAINABILITY JOURNEY

This F&B sustainability roadmap is intended to provide companies with a structured framework for initiating action and developing their capabilities. The roadmap follows a three-stage approach, with each phase building on the previous one, starting with solutions that are easier to implement or that should be prioritised. Companies are encouraged to tailor their action plans to align with their specific needs and available resources; the implementation of these solutions need not follow a fixed sequence.



Understand:

Build sustainability capability and identify priority areas

- ☑ Understand key sustainability concepts and regulation requirements
- ☑ Use assessment tools and resources

Take action:

Focus on priority action areas and embed into business operations

- ☑ Dedicate resources
- ☑ Get funding or support
- ☑ Implement suitable solutions, set key performance metrics and measure progress
- ☑ Embed into long-term business strategy

UNDERSTAND PRIORITY AREAS AND PERFORMANCE

Key priority areas impacting the F&B industry include food waste, packaging waste and GHG emissions. Begin the journey by assessing the starting point and quantifying progress across these three areas.

Sustainability priorities for the F&B industry

Food waste	**Packaging waste**	**GHG emissions**

PRIORITY 1: FOOD WASTE

Food waste encompasses edible and inedible waste[10]. Edible waste includes items such as customer leftovers, scraps generated during food preparation and food products that have spoiled or past their expiration date. Inedible food waste may consist of bones, stones or pits and rinds.

Ingredients represent a major expense for F&B companies, making food waste a costly loss of valuable resources. In Singapore, when food waste is disposed of in regular trash bins, it is sent to Waste-To-Energy (WTE) incineration plants, where it is burned and the energy produced is used for electricity. While this process reduces the volume of waste, the resulting ash is sent to landfill.

The food production value chain generates GHG emissions that contribute to climate change, while the residual ash from incinerated food waste necessitates landfilling, further depleting space in landfills.

By implementing the recommendations in this playbook, F&B companies can:

- Save costs by using ingredients more efficiently
- Reduce waste collection and disposal fees
- Generate new revenue streams, such as by creating products from recovered waste

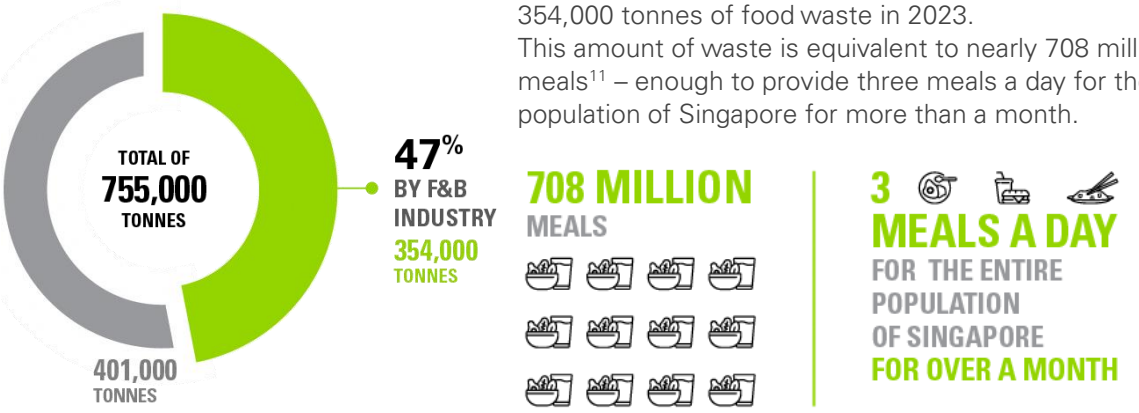
How is food waste created?

Common causes of food waste in the F&B industry include:

- **Overproduction and inaccurate forecasting:** To ensure menu availability or meet customer demand, F&B companies often order, stock or prepare more food than needed, leading to waste when food items are left unsold or pass their expiry date.
- **Portion sizes and plate waste:** Serving portions that are too large for customers to finish, along with allowing excessive self-service at buffets, can lead to substantial food waste. Additionally, consumer plate waste further exacerbates overall food wastage.
- **Demand for fresh produce:** The preference for fresh, uniform ingredients often results in shorter shelf life. Combined with inadequate storage practices, this can lead to increased food wastage.

How much food waste does Singapore's F&B industry generate?

FOOD WASTE GENERATED IN SINGAPORE (2023)



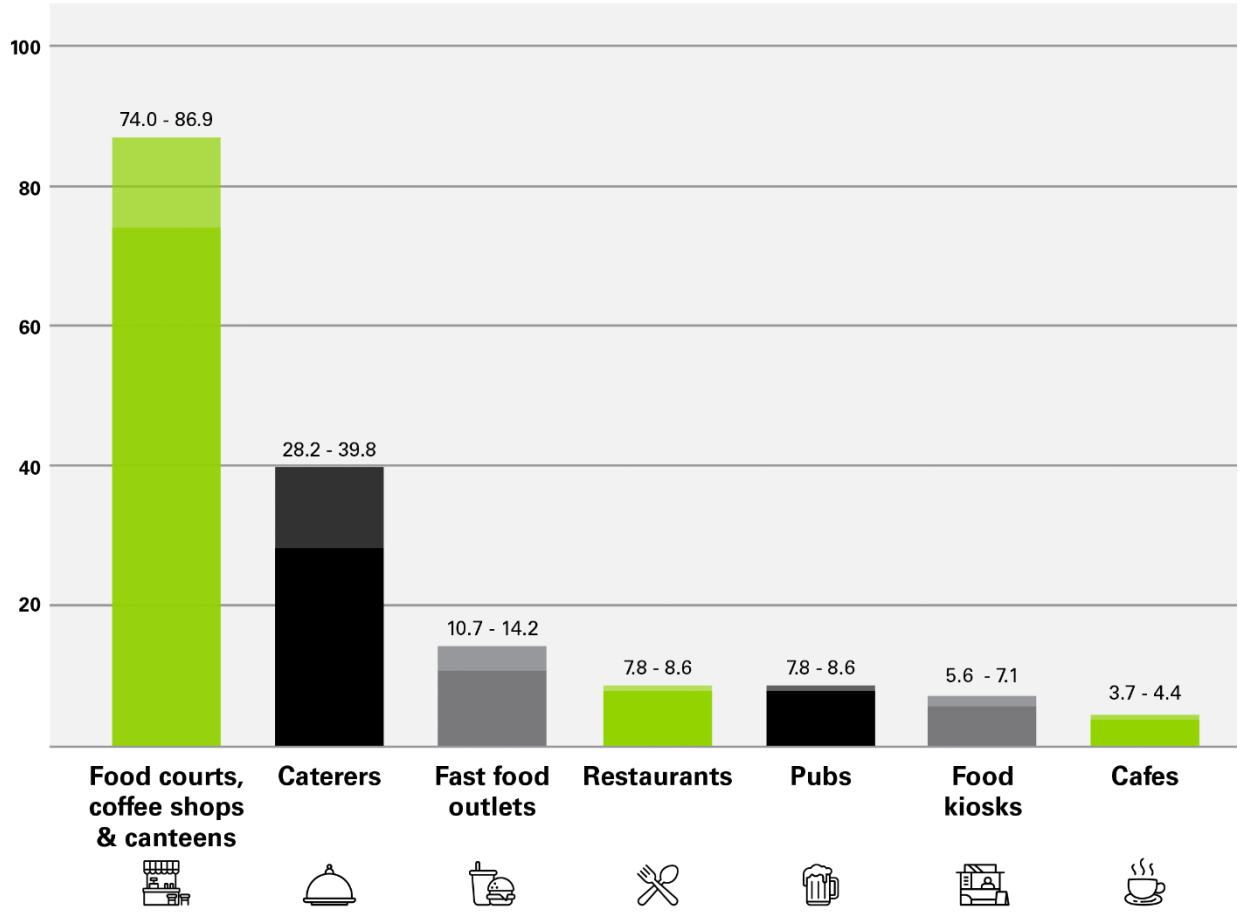
The F&B industry in Singapore generated approximately 354,000 tonnes of food waste in 2023.
This amount of waste is equivalent to nearly 708 million meals[11] – enough to provide three meals a day for the entire population of Singapore for more than a month.

[10] Food waste excludes grease trap waste or liquid waste, such as used oil.
[11] Assumes one meal weighs 0.5kg. The baseline of 354,000 tonnes includes inedible food wastes such as bones and is therefore an estimate. Total food waste from NEA's published data, 2023.

Food waste generated by types of F&B establishments

The F&B industry is made up of diverse companies, each generating different amounts of food waste. The table below illustrates the estimated average annual food waste produced by a typical F&B establishment in each industry segment. This data can serve as a benchmark for evaluating performance against industry peers within the same segment.

Average annual food waste (tonnes per year) generated by a F&B establishment in each industry segment[12]



[12] F&B establishment refers to an outlet within its respective SICC segment. The average waste generated was calculated from primary data provided by commercial building owners/operators, F&B companies and waste collectors. This includes data from F&B establishments in malls which captures a range of establishment types such as quick service and full-service restaurants. In the catering segment, some establishments may also serve as central kitchens for other downstream F&B companies, which may inflate their waste generation numbers due to the scale of their supply to multiple companies. The data includes consumer waste discarded at the premises but excludes consumer waste from takeaway orders that have been taken off-site.

PRIORITY 2: PACKAGING WASTE

Excessive packaging can result in additional costs for companies, including expenses for waste collection and/or disposal.

To address these issues, companies should review the types (e.g. plastic, paper), functions and quantities of packaging used to identify opportunities for reduction and efficiency.

Addressing packaging waste can help companies to:

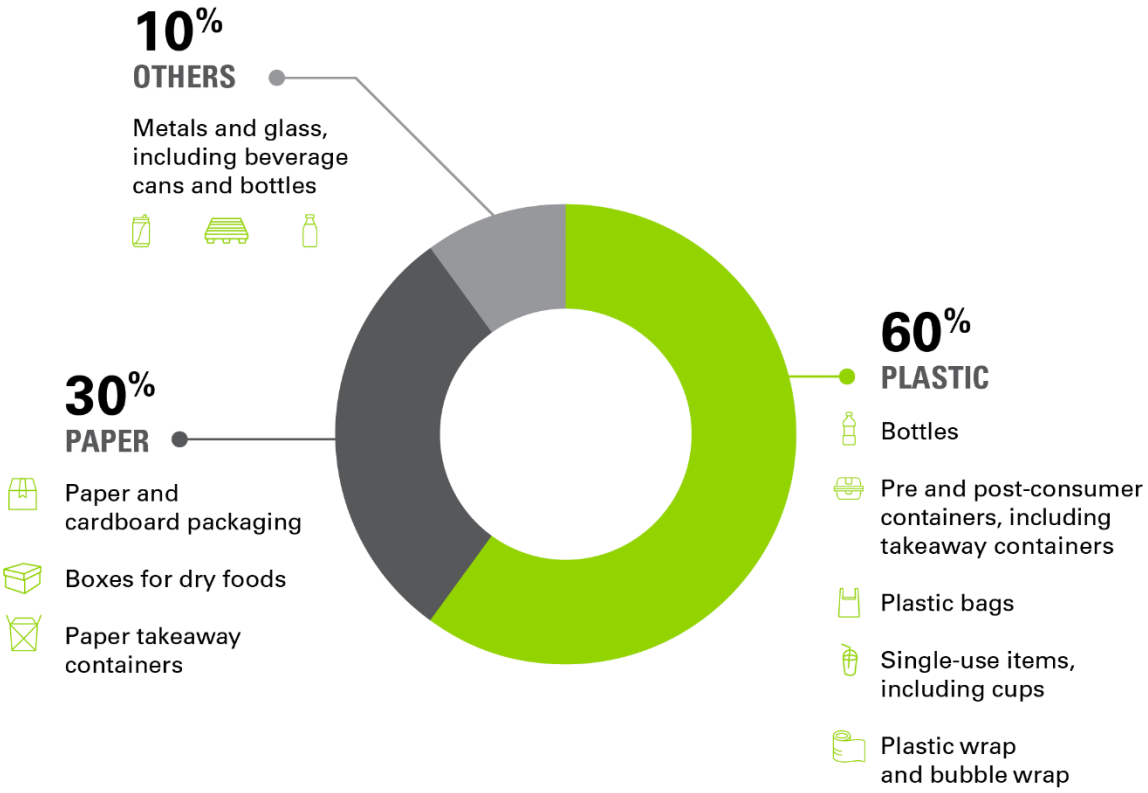
- Reduce procurement costs
- Reduce waste collection/disposal costs

How is packaging waste created?

Common causes of packaging waste within the F&B industry include:

- Single-use packaging: Items such as takeaway food containers are often used once and discarded subsequently.
- Overpackaging: Excessive packaging, such as double bagging, contributes to unnecessary waste.
- Lack of recycling knowledge: Despite the presence of blue recycling bins in Singapore, a lack of public understanding regarding their proper use, coupled with inadequate source segregation practices and contamination of recyclables, often results in recyclable packaging being incinerated.

Proportion of packaging waste types in Singapore (2022)[13]



[13] NEA, 2022

PRIORITY 3: GHG EMISSIONS

In a typical F&B company, GHG emissions can arise from various sources, including the use of gas and electricity for heating and cooking, transportation emissions associated with food delivery, and emissions resulting from the incineration of waste (includes gases produced and fuels required for incineration).

By taking a proactive approach to emissions reduction, companies can:

- Improve energy efficiency
- Reduce energy bills and operating costs
- Stay ahead of compliance requirements

SCOPE 1:

Emissions that come from sources owned or controlled by the company, such as fuel usage, on-site gas stoves, ovens and company-owned delivery vehicles.

SCOPE 2:

Emissions resulting from the consumption of purchased electricity, heating or cooling.

SCOPE 3:

All other emissions that occur within the company's value chain, including those from ingredients and food production, food waste and packaging disposal (e.g. incineration), and the transportation of goods by suppliers.

For F&B companies, most emissions reductions are expected to occur within Scope 3 emissions. Scope 3 emissions cover 15 different categories[14]. The primary opportunities for emissions reductions for F&B companies are concentrated in two categories: food and packaging waste (Category 5) and end-of-life of sold products (Category 12). Additional reductions may be achieved by addressing the other categories, particularly for more mature or diversified companies. Guidance on measuring GHG emissions is available in the Resources section.

[14] Scope 3 Calculation Guidance, Greenhouse Gas Protocol.

ACCOUNT

Upon defining the priority areas, the subsequent step involves assessing the company's performance by quantifying food waste, packaging waste and GHG emissions to establish a baseline. This provides a clear understanding of the current impact and helps identify areas for improvement.

1 Account

Measure current food and packaging waste, and emissions data

Conduct audits (food and packaging waste, and energy)

Measure food waste, packaging waste and energy use to establish a baseline

2 Avoid

Take steps to avoid generating unnecessary waste and emissions

Right-size portions and redesign menus

Reduce portion sizes to cut costs and waste. Adapt menus to minimise waste and create synergies by sharing ingredients across recipes

Use pre-cut materials

Purchase pre-cut ingredients to avoid food waste during preparation and save labour costs

Improve demand forecasting through technology-enabled solutions

Avoid over purchase and predict consumer demand to avoid waste

Avoid single-use plastics and packaging

Switch to reusable packaging to avoid generating excessive packaging waste

3 Adjust

Reduce

Minimise quantity or impact of food and packaging waste, and emissions

Redistribute/repurpose surplus food

Provide excess food to employees, redistribute food at reduced prices or donate surplus food to organisations

Adopt energy-efficient equipment

Upgrade to energy efficient appliances and implement energy saving behavioural practices

Recover

Extract value from by-products or materials considered waste or recover energy

Improve waste segregation (food and packaging waste)

Provide separate bins for food, packaging, recyclables with improved signage and education

Implement food waste treatment solutions

Install on-site treatment solutions like composters and digesters or partner with off-site providers

Leverage emerging technology and innovative solutions

Collaborate and implement digital or new solutions

ACCOUNT

SOLUTION

CONDUCT AUDITS: FOOD AND PACKAGING WASTE, AND ENERGY

Food waste audit:
Weigh and categorise food waste into edible and non-edible categories

Packaging waste audit:
Understand the amount of packaging waste created by material type and weight

Energy audits:
Understand energy consumption by consulting with energy providers

Companies are encouraged to conduct audits focusing on the three priority areas to measure their performance and identify areas for improvement. The initial audit establishes the baseline – a quantified starting point for progress tracking. Regular and ongoing audits are essential for assessing the effectiveness of waste and energy solutions, allowing companies to continuously refine their practices, make strategic decisions and effectively implement downstream solutions in the Avoid and Adjust categories.

Actions to take:

1

Decide between an in-house or external audit

The decision to conduct an in-house audit or engage an external provider should be based on available resources. Check with building owners to determine if previous audits have been conducted on the premises, which may be leveraged. For independent audits, both food and packaging waste can be assessed simultaneously through physical measurement on-site. If a physical audit is not feasible for packaging waste, an analysis of procurement data can be used.

2

Conduct an audit

TASK	FOOD WASTE	PACKAGING WASTE	ENERGY
REVIEW GUIDANCE AND TEMPLATE	Refer to the Food Waste Minimisation Guidebook for guidance and data collection template.	For a data collection template, access the NEA website and download the excel file for waste reporting.	Review Building and Construction Authority (BCA) and NEA guidance.
SET UP ROLES AND RESPONSIBILITIES	Assign clear roles to staff across all relevant areas, including kitchen preparation, retail, serving and dishwashing. Ensure each team member understands their responsibilities.		Designate the appropriate staff member to work with the energy provider.
TRAIN STAFF	Provide necessary training and equip staff with health and safety gear, such as gloves and masks, to safely conduct the audit and handle waste.		
COLLECT DATA	Weigh and categorise food waste into edible waste, such as leftovers and scraps, and non-edible waste, such as skins, shells, and bones. Include all food waste generated from kitchen preparation to the plate.	Measure packaging waste by total weight and material type, including plastic, paper, wood, glass and metal. Where possible, further categorise plastics by specific types.	Consult with energy providers to review metered electricity data.
	Measure total food and/or packaging waste over a period of one to three days, ensuring arrangements are in place to segregate waste from the outset. Schedule time to sort through the general waste, recycling, and food waste bins, while assessing contamination rates to ensure proper bin usage. Waste should be categorised by type, weighed and the data recorded centrally for tracking and analysis.		
GET SUPPORT	Partner with building owners and audit providers.		

3

Review audit findings to identify waste hot spots and areas for improvement

Integrate audit data with sales figures to adjust waste and energy metrics for fluctuations in sales volume, ensuring accurate comparisons over time. This integration will identify the areas of significant waste and high energy consumption, allowing for targeted improvements to reduce waste and optimise energy use.

4

Conduct regular audits to measure the effectiveness of implemented solutions

For SMEs, annual audits are recommended, while larger companies may benefit from conducting audits several times per year. Expanding the scope of audits to encompass more business segments will ensure a comprehensive assessment of implemented solutions.

5

Comply with RSA requirements and support industry best practices

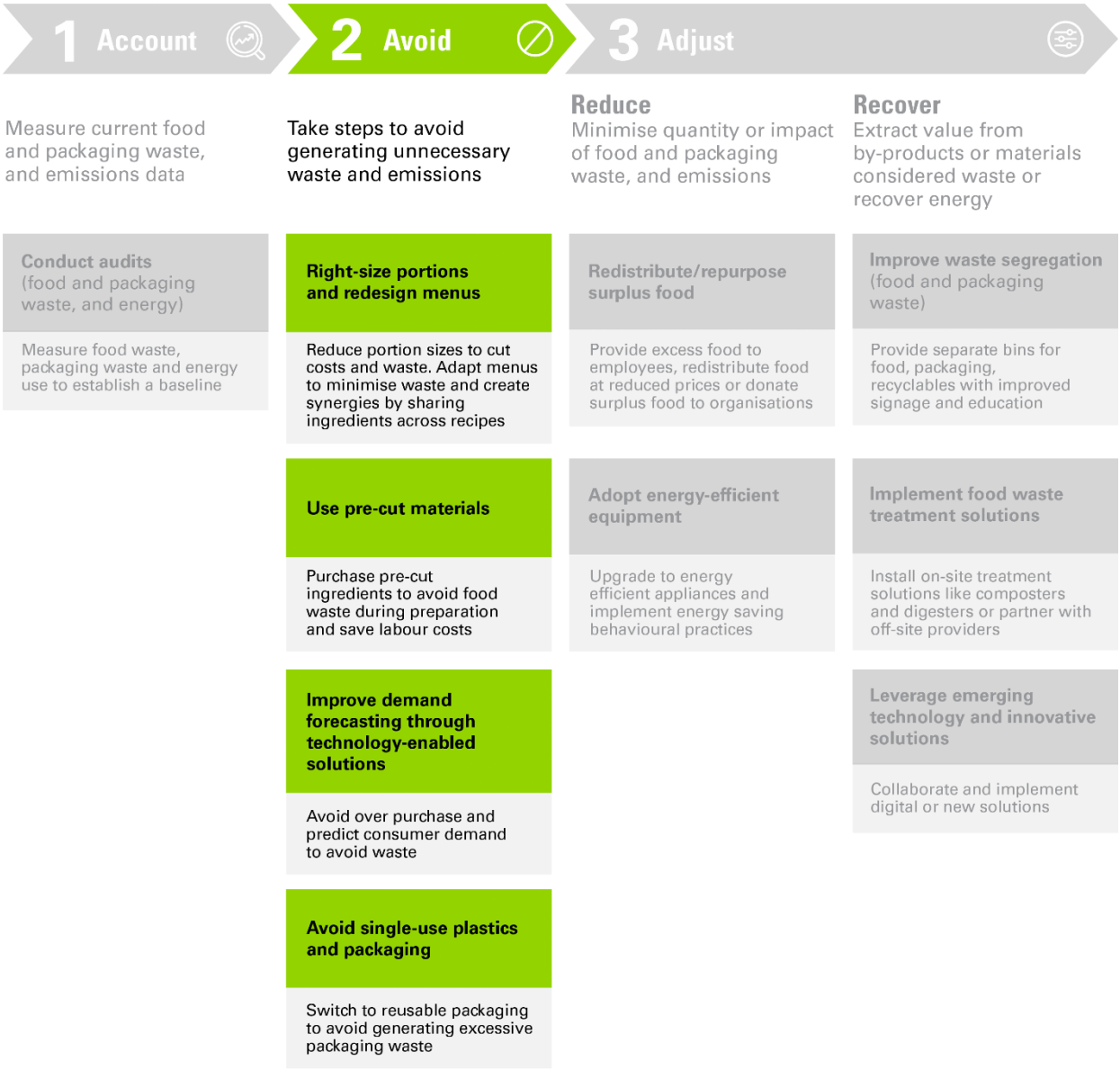
For companies located within RSA mandated buildings, use audit data to improve reporting, ensure RSA compliance and contribute to industry-wide benchmarks. Compare the company's performance against industry benchmarks to identify opportunities for improvement and align with best practices.

TAKE ACTION ON PRIORITY AREAS

This section provides detailed recommendations for addressing critical issues identified during the first step, Account. While it is advisable to follow the suggested sequence of solutions, adjustments may be made to better align with the specific needs and resources of the company.

AVOID

F&B companies can implement solutions to prevent waste from the outset and mitigate unnecessary expenditures or resource consumption.



AVOID

SOLUTION

RIGHT-SIZE PORTIONS AND REDESIGN MENUS

Use ingredients efficiently and adjust portion sizes to create more cost-effective and sustainable operations. By finding common meal components and adapting menus to minimise waste, F&B companies can lower costs and reduce their environmental footprint.

Why it matters

- Lower operational costs through more efficient use of ingredients.
- Reduce waste management expenses by minimising leftover food.
- Promote brand sustainability by aligning with customer demand for environmentally responsible practices and healthy serving sizes.

Actions to take

1	**Assess, adjust and implement flexible portion sizes** Conduct a review of portion sizes based on customer feedback, particularly relating to leftover ingredients or meals. Adjust portion sizes accordingly and offer flexible options that cater to different customer preferences, such as half or sharing options to reduce the likelihood of uneaten food.
2	**Redesign menus for low waste and conduct regular market testing** Use sales data to identify best-performing items to redesign menus and eliminate underperformers that contribute to food waste. Focus on versatile ingredients that can be used across multiple dishes to improve inventory management and regularly test new menu items in select locations to gather customer feedback. These insights can be used to refine portion sizes, adjust recipes and ensure new offerings meet customer demand and support sustainability goals.
3	**Train staff** Provide education to staff regarding the importance of portion control and introduce standardised systems, such as portion scoops, scales or pre-measured serving containers, to ensure the correct amount is used consistently.
4	**Monitor and review waste regularly** Establish a robust system for tracking food waste and measuring the impact of portion right-sizing and menu redesign efforts. This data can help refine portion sizes, adjust menu offerings and identify further reduction opportunities.

CASE STUDY

TURNING SALMON WASTE INTO WINNING DISHES

Fassler Gourmet, a seafood smokehouse, was generating one tonne of food waste every month. To address this, the company conducted an audit to identify the key sources of waste and understand how they could be reduced.

By shredding the flesh off salmon bones, Fassler Gourmet was able to recover approximately 250 kg of salmon each month. The team worked with Unilever Food Solutions Singapore on ways to create new recipes, and now use this salmon shred to produce patties and pies. This enabled Fassler Gourmet to reduce its monthly food waste by 25% and expand its product offering, increasing its revenue.

AVOID

SOLUTION

USE PRE-CUT MATERIALS

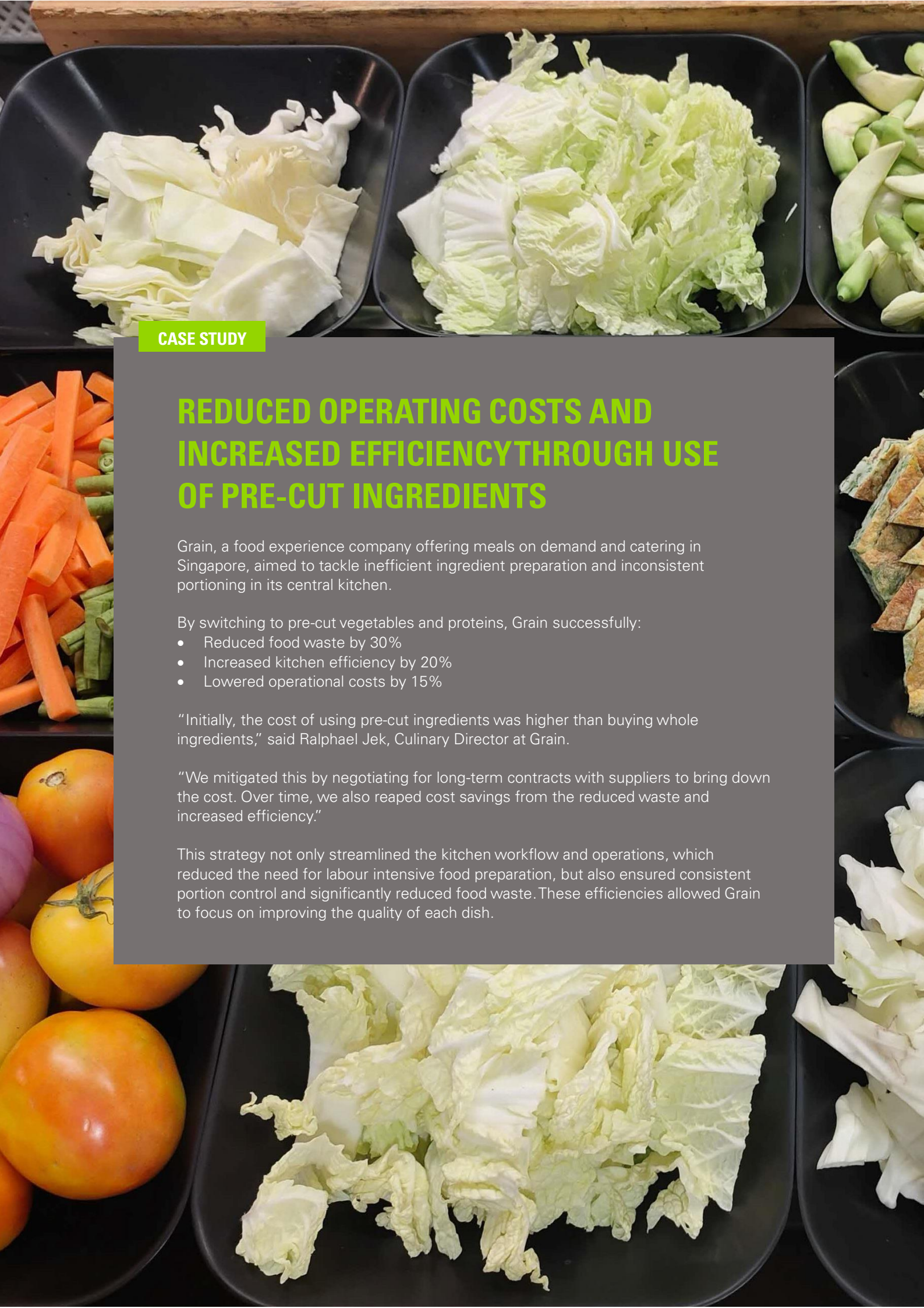
The practice of utilising pre-cut materials involves purchasing ingredients that have been chopped, sliced, diced, frozen, portion-controlled or otherwise prepared according to the specifications of each F&B company before delivery.

Why it matters

- Lower costs for F&B companies by minimising waste and associated disposal fees.
- Streamline kitchen operations, thereby decreasing manual labour and preparation time while improving overall efficiency.
- Enhance consistency in quality.

Actions to take

1	**Identify which ingredients and menu items could be pre-cut** Conduct a thorough analysis of the menu to determine which food items can be substituted with pre-cut alternatives. Emphasis should be placed on ingredients that require extensive preparation time and/or generate significant waste during the preparation process.
2	**Research and identify suppliers** Engage in discussions with existing suppliers or seek new suppliers that offer pre-cut solutions that meet specific operational needs.
3	**Redesign menu** Incorporate pre-cut foods into the menu design, which may also include resizing portions to further reduce waste.
4	**Prepare kitchen and train staff** Assess the suitability of existing food storage facilities for handling pre-cut materials, especially if frozen options are involved. Additionally, provide staff training on proper handling and storage procedures, with guidance from suppliers and the Singapore Food Agency (SFA).
5	**Implement and monitor** Establish systems to track cost savings and waste reduction associated with the procurement of pre-cut materials. This evaluation can help assess the effectiveness of these changes over time and identify opportunities to expand the use of pre-cut ingredients across other menu items.



CASE STUDY

REDUCED OPERATING COSTS AND INCREASED EFFICIENCYTHROUGH USE OF PRE-CUT INGREDIENTS

Grain, a food experience company offering meals on demand and catering in Singapore, aimed to tackle inefficient ingredient preparation and inconsistent portioning in its central kitchen.

By switching to pre-cut vegetables and proteins, Grain successfully:

- Reduced food waste by 30%
- Increased kitchen efficiency by 20%
- Lowered operational costs by 15%

"Initially, the cost of using pre-cut ingredients was higher than buying whole ingredients," said Ralphael Jek, Culinary Director at Grain.

"We mitigated this by negotiating for long-term contracts with suppliers to bring down the cost. Over time, we also reaped cost savings from the reduced waste and increased efficiency."

This strategy not only streamlined the kitchen workflow and operations, which reduced the need for labour intensive food preparation, but also ensured consistent portion control and significantly reduced food waste. These efficiencies allowed Grain to focus on improving the quality of each dish.

AVOID

SOLUTION

IMPROVE DEMAND FORECASTING THROUGH TECHNOLOGY-ENABLED SOLUTIONS

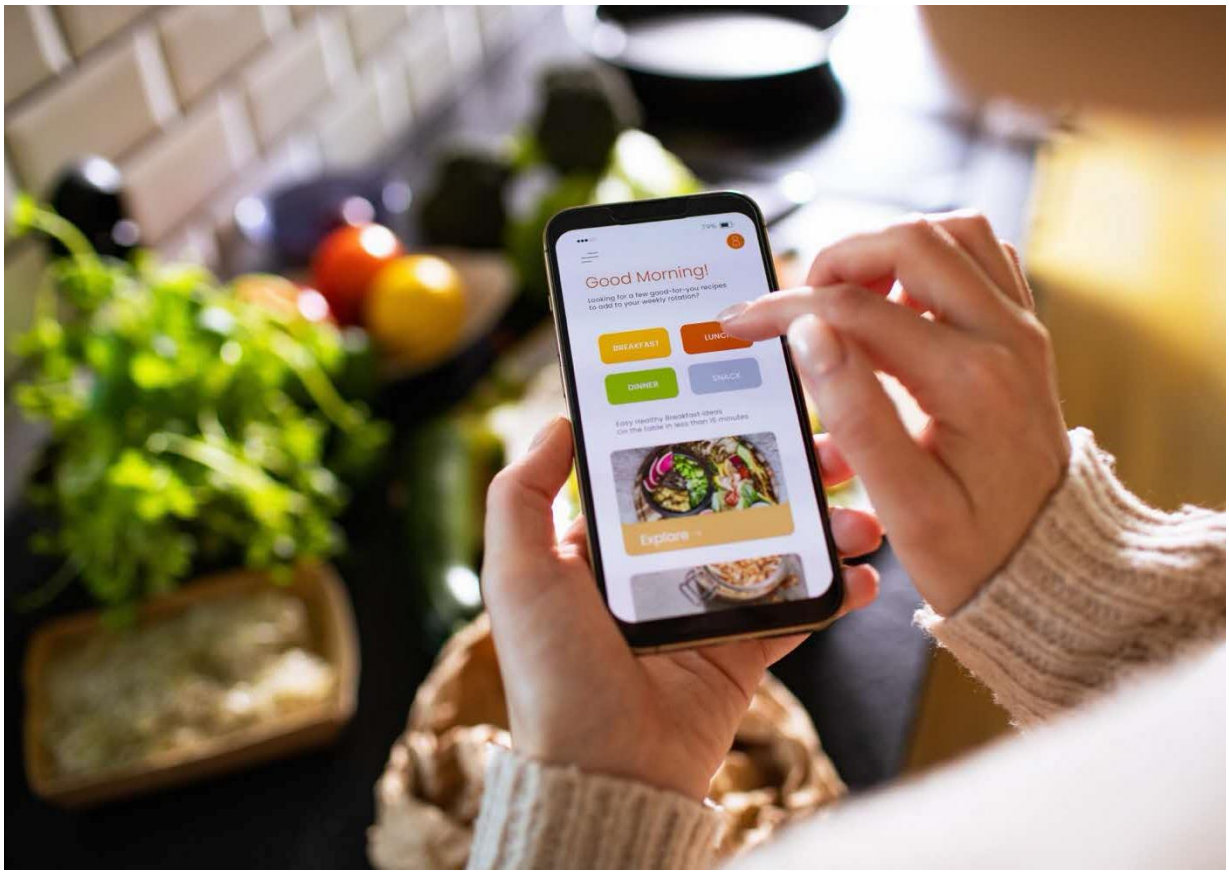
By leveraging historical sales data, market trends and sophisticated pattern identification and analytics, artificial intelligence (AI) solutions can forecast future demand with precision.

Why it matters

- Accurate demand forecasting is crucial for effective inventory planning and the minimisation of food waste. While implementing demand forecasting technology requires an initial investment, it can offer long-term financial benefits.

Technology-enabled, precise demand forecasting can:

- Improve inventory management and procurement decisions.
- Reduce costs associated with food waste disposal.
- Support better financial planning and strategic decision-making.
- Assist in menu design and portion management to reduce waste and increase customer satisfaction.



Actions to take

1. **Conduct pilot testing for selected solutions**
Conduct thorough research to identify demand-forecasting tools that align with the specific needs, scale and budget of the F&B company. Ensure that these tools can be seamlessly integrated into existing operations. It may be beneficial to partner with technology vendors who can customise their solutions to meet the company's unique requirements.

2. **Access training programmes offered by technology vendors**
Participate in training programmes that enhance the understanding of data analytics and demand forecasting among both employees and management teams. These trainings should focus on how to interpret and effectively utilise data to make informed decisions.

3. **Consolidate data**
Centralise historical sales data, customer feedback and relevant external factors, such as seasonal patterns and local events, to ensure that demand forecasts remain agile and responsive to changing conditions.

CASE STUDY

FORECASTING TECHNOLOGY HELPED NANDO'S SINGAPORE IMPROVE SALES PREDICTIONS BY 30%

Tenzo is a forecasting platform that leverages AI to forecast how busy a company will be. Nando's Singapore embarked on a pilot with Tenzo, providing the platform to managers across half their locations to understand if AI-based forecasts could improve sales prediction[15].

Within one year, Nando's saw a 15% increase in labour productivity and 30% improvement in their sales forecasting accuracy. Nando's subsequently rolled out Tenzo to all its outlets in Singapore. This helped each outlet plan its inventory and assess how much food should be prepared to avoid food wastage.

[15] How Tenzo helped Nando's Singapore improve labour productivity by 15% and forecast accuracy by 30%, Tenzo, 2023

AVOID

SOLUTION

AVOID SINGLE-USE PLASTICS AND PACKAGING

Reducing the reliance on single-use plastics and packaging can lower waste disposal cost, avoid generating more waste and enhance overall sustainability. By focusing on the principles of reducing, reusing and recycling, F&B companies can decrease their environmental footprint.

Why it matters

- Lower procurement and disposal costs associated with single-use packaging.
- Improve brand reputation among sustainability-conscious consumers.
- Reduce consumption of natural resources and decrease the need for incineration, contributing to lower environmental pollution.

Actions to take

1. **Assess current packaging practices**
   Conduct a thorough evaluation of current packaging methods, focusing on the types of materials and the volume of packaging used to identify potential areas for reduction.
2. **Reduce unnecessary packaging**
   Eliminate packaging materials such as polystyrene and expanded polystyrene, as well as dark- and black-coloured packaging that poses challenges for recycling and processing. Begin by removing the most common and easily replaceable items, such as plastic bags and unnecessary wrappers, and then gradually address more complex packaging types, including those made from mixed materials, such as paper lined with plastic. Initiatives such as providing carrier bags only upon request or making lids for drinks optional can further support this.
3. **Implement reusable packaging solutions**
   Explore and adopt reusable packaging alternatives, which may include encouraging customers to bring their own containers or offering reusable options on-site. This can be further supported by partnering with solution providers and industry associations to reduce adoption costs.
4. **Design and implement a return and reuse system**
   Develop a structured system for the return and reuse of packaging or collaborate with solution providers to establish dedicated return points. Incentives, such as discounts or loyalty points, can be offered to encourage participation. These initiatives should be implemented together.
5. **Educate and engage customers**
   Conduct education campaigns to raise customer awareness on the importance of reducing single-use plastics. These should emphasise the reduction of common packaging items, such as plastic bags or unnecessary wrappers. It is essential to encourage consumer participation in sustainability efforts through clear and consistent communication.

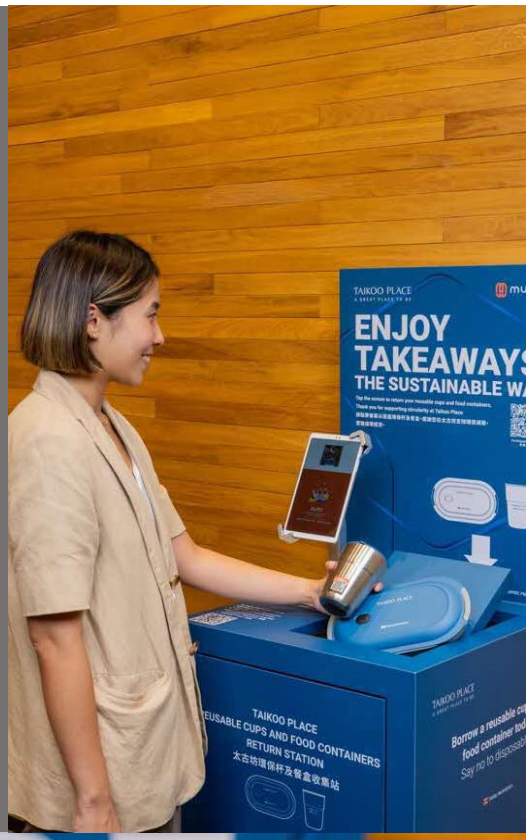
CASE STUDY

ELIMINATING SINGLE-USE PACKAGING IN MALLS

ION Orchard, a mall in Singapore, partnered with Muuse to implement a reusable takeaway container initiative to reduce single-use waste from participating cafes and food court.

The Muuse system allowed shoppers to scan a QR code to borrow reusable cups and food containers, and then return them within 30 days to be washed, sanitised and reused.

To date, the initiative has helped the mall to avoid more than 1,000 pieces of packaging waste in just a few months.



CASE STUDY

SWAPPING PLASTIC FOR COMPOSTABLE PACKAGING

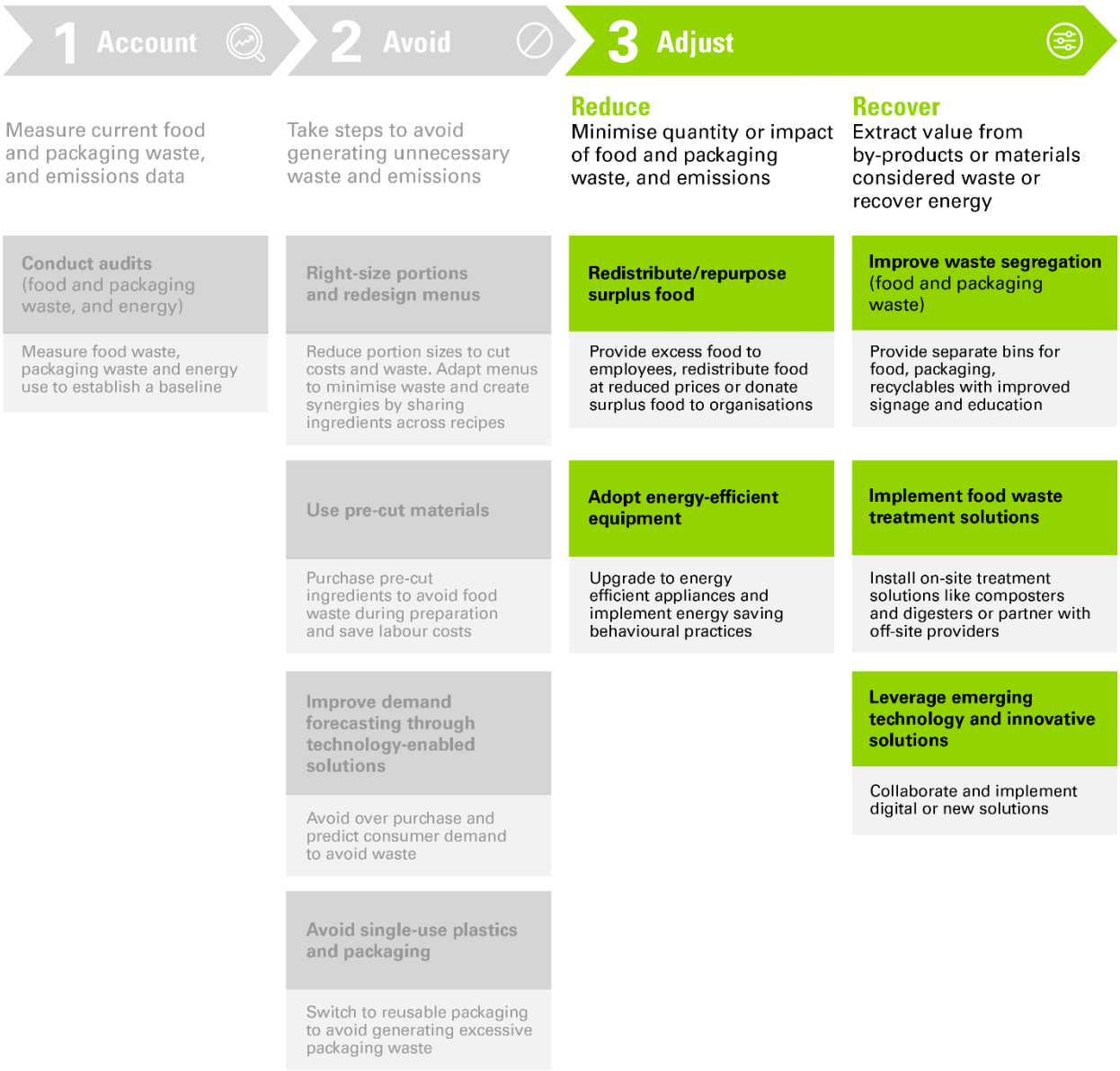
Alterpacks, a company offering home-compostable, plant-based packaging solutions, worked with Freshmart, a fruit and vegetable supplier, to replace 3,000 styrofoam trays and 20,000 plastic containers used for apples and paprikas with Alterpacks' packaging.

The switch resulted in 80% less carbon emissions than plastic, while keeping costs as close to traditional packaging as possible and ensuring no difference in how quickly fruit ripens. This proved that sustainability could come without compromising functionality.

ADJUST

After exploring solutions to avoid waste, F&B companies can adjust their operations or adopt solutions to reduce or recover unavoidable waste.

Reducing waste and emissions can lower disposal costs, conserve resources and improve efficiency. In instances where waste reduction proves impractical, it is advisable to explore methods for recovering value from by-products, which may offer new revenue streams and facilitate the adoption of innovative solutions and emerging technologies. While the proposed roadmap is designed to be flexible and adaptable to specific organisational needs, following the recommended sequence can be helpful as certain steps build upon preceding ones, thereby simplifying the implementation of future solutions.



ADJUST: REDUCE

SOLUTION

REDISTRIBUTE / REPURPOSE SURPLUS FOOD

Repurposing surplus food that remains safe for consumption is an effective strategy to minimise food waste. Solutions include:

- Donating or redistributing excess food at reduced prices.
- Distributing surplus food to employees.

Implementing donation-based solutions requires collaboration with various stakeholders, including food donation organisations, distribution platforms and digital hubs. Food donation partners can assist with the collection, storage and distribution of surplus food while digital solutions can streamline this process by facilitating transactions, managing inventory and tracking donations.

Why it matters

- Reduce costs of food waste disposal.
- Generate revenue through the discounted sale of food that would have otherwise not been sold.
- Promote a more sustainable and socially conscious brand image.

Actions to take

1	**Partner with a food donation organisation or join an existing programme** Partner with a recognised organisation to set up a regular food donation schedule or join an existing programme. Collaborate with other F&B tenants or companies to develop a centralised food donation system at the building or mall level, ensuring a structured approach is in place.
2	**Explore food redistribution options** Identify avenues for redistributing surplus food, such as selling excess items at reduced prices. Companies may partner with discount food retailers or use platforms that facilitate the sale of surplus food through online marketplaces or food-sharing apps. Centralising redistribution efforts with other F&B tenants at the building or mall level can improve efficiency.
3	**Stay informed and comply with relevant laws** Keep up to date with regulations, such as the Good Samaritan Food Donation Bill[16], and ensure adherence to food safety and donation guidelines.

[16] The Act aims to reduce food waste and increase food availability for redistribution to food-insecure communities. It also protects food donors from liability, provided they handle and redistribute food in accordance with the Act's guidelines. Good Samaritan Food Donation Bill - Singapore Statutes Online (agc.gov.sg), Singapore Statutes Online, 2024.

ADJUST: REDUCE

SOLUTION

ADOPT ENERGY-EFFICIENT EQUIPMENT

Adopting energy-efficient equipment and implementing energy-saving measures can help reduce total energy consumption and associated emissions across various energy sources, including electricity, gas and liquefied petroleum gas (LPG).

Solutions include:

- Installing or retrofitting energy-efficient appliances and upgrading equipment for lighting, cooking and refrigeration.
- Implementing smart controls, focusing on smart sensors, thermostats and demand-side management technologies, to optimise energy use in air conditioning and lighting systems.

Why it matters

- Reduce overall energy expenditure.
- Delayed upgrades can lead to higher cumulative energy costs.
- Reduce energy consumption and associated GHG emissions.

Actions to take

1	**Identify energy consumption hot spots** Conduct an energy audit to identify areas of high energy usage and inefficiencies. This assessment helps prioritise energy-saving measures. Refer to the 'Account' section for guidance on undertaking an energy audit.
2	**Install energy-efficient appliances** Based on the audit findings, replace energy-intensive appliances with energy-efficient alternatives. Guidance on suitable energy-efficient equipment for the F&B industry can be found through GoBusiness.
3	**Track energy and cost savings over time** Regularly monitor energy consumption through energy management systems or review energy bills to assess cost savings and identify additional opportunities for energy-efficiency improvements. Conduct periodic assessments to ensure ongoing optimisation of energy use.

CASE STUDY

INDUCTION HOBS REDUCED SPRINGLEAF PRATA PLACE'S ENERGY BILLS BY 15%

Springleaf Prata Place tapped into the Energy Efficiency Grant (EEG) to switch from gas to induction hobs. The switch has enabled some of the outlets to reduce emissions by approximately 20% and lower its utility bills by up to 15%, while ensuring greater consistency in cooking temperatures.

ADJUST: RECOVER

SOLUTION

IMPROVE WASTE SEGREGATION

Effective waste segregation is critical in minimising contamination and facilitating the recycling and recovery process.

Waste segregation solutions include:
Using a three-bin system to categorise and collect different waste types:

- Food waste
- Recyclable waste (plastic, paper, wood, glass and metals)
- General waste

This solution can be complemented by:

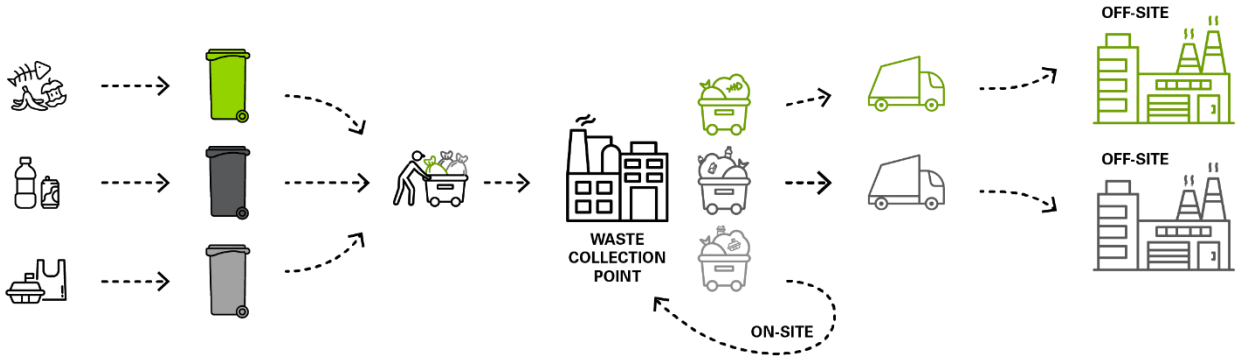
- Having clear and visible signage to educate and encourage consumers to use the appropriate bins.
- Training F&B staff on proper use of the three-bin system to ensure compliance and efficiency.

Why it matters

- Reduce waste management costs and help F&B companies save on disposal fees.
- Unlock potential revenue opportunities through the sale of recovered resources.
- Contribute to lower Scope 3 GHG emissions in the F&B industry.
- Prepare segregated waste for efficient food waste treatment systems or resource recovery processes.

Incorrect waste sorting results in contamination, which can render recyclable or recoverable materials unusable, leading to unnecessary incineration or landfill disposal. Proper waste segregation maximises resource recovery, supports sustainability initiatives, and improves overall recycling rates in the sector.

Segregation is the first stage in effective recycling. Recycling waste happens in three stages:



STAGE 1: SEGREGATION

Waste is separated into three streams at source level, i.e. F&B company site.

STAGE 2: CONSOLIDATION

Segregated waste is consolidated at larger waste collection points – these can be at the mall or building and are often shared with other tenants. Consolidated and segregated wasted is then picked up by waste collection providers.

STAGE 3: TREATMENT

Off-site:
Waste is collected and treated off-site.

On-site:
Waste is processed on-site, for example by using an on-site food waste treatment system.

Actions to take

1 Build capacity through training

Provide training on proper waste segregation aligned with industry standards, covering topics such as identifying bin types and understanding recyclable packaging. Training for food waste should include what can be processed and preparation methods, such as sorting, pressing and bagging. To support this, companies should develop and enforce standard operating procedures (SOPs) to guide staff. They should also educate consumers and other tenants. More resources for capacity building and training can be found in the Resources section.

2 Segregate waste into three streams

Segregating waste on-site into food waste, recyclable waste and general waste can be achieved using physical bins or separate bags. F&B companies can leverage technology by installing smart bins that automatically sort waste, reducing labour costs. Placement of these bins should include both back-of-house and dining areas. If smart bins are not used, clear signage should be installed to guide proper sorting.

3 Set up three-bin waste collection points

Once waste has been segregated, it is essential to maintain separation throughout the waste management process. These streams should be consolidated at larger waste collection points, where they are prepared for pick-up by licensed waste collectors/recyclers, or for on-site processing.

Comply with RSA requirements to mandate food waste segregation, with space allocated for on-site treatment or off-site arrangements and data reporting. These are outlined in the Resources section. Collaboration with building owners, mall operators and waste collectors is essential for implementing effective waste collection points. Even for F&B companies not subject to RSA regulations, adopting waste segregation practices for treatment or recycling is a valuable consideration.

CASE STUDY

QR SYSTEM FOR BETTER WASTE MANAGEMENT IN MALLS

At PLQ Mall, each tenant was assigned a unique QR code for waste disposal. When tenants deposited general waste or recyclables at the shared bin centre, they scanned their code, weighed their waste and indicated its type – whether it was paper, metal, plastics, glass or food waste.

As the waste data was linked to specific tenants, this helped the building management understand each tenants' footprint and guide waste reduction efforts.

CASE STUDY

FOUR-BIN SYSTEM FOR EFFECTIVE WASTE SEGREGATION

Changi Airport Group introduced a four-bin system at a food kiosk cluster within one of its airport terminals to facilitate resource recovery through proper waste segregation. The system was placed strategically near the tray return stations and featured four distinct bins: liquid waste, recyclables, food waste, and general waste.

To increase its effectiveness, several key features were implemented:

- Colour-coded bins for each waste category for easy identification
- Carefully calibrated bin openings to reduce contamination
- Direct channelling of liquid waste into floor traps for efficient handling
- Clear infographics placed near bins to guide users on proper waste sorting

Since the four-bin system was introduced in 2023, results have been encouraging, with 30 to 50kg of food waste diverted daily. To promote wider adoption of waste segregation, Changi Airport Group has been encouraging new F&B tenants to incorporate similar systems in their premises and plans to roll out the four-bin system across more food clusters throughout the airport.

CASE STUDY

MANDATORY RECYCLING AND COMPOSTING IN SAN FRANCISCO DIVERTED 80% OF WASTE FROM LANDFILL

San Francisco's mandatory recycling and composting law (2009) alongside the 'Fantastic 3' programme has significantly improved the city's waste segregation, achieving 80% waste diversion from landfill.

The programme required colour-coded bins across the city and all F&B establishments:

- Blue for recycling
- Green for composting
- Black for landfill

Mandatory training for all F&B staff, contractors and janitors was key to ensuring proper waste separation. Companies were required to provide easily accessible bins, particularly near main exits, to encourage correct usage.

F&B companies in San Francisco reduced their costs by up to 75% through adjusting the size or frequency of their landfill bin collections.

ADJUST: RECOVER

SOLUTION

FOOD WASTE TREATMENT SOLUTIONS

Food waste treatment systems can reduce the volume of food waste, recover valuable resources and contribute to sustainability goals. By utilising both on-site and off-site food waste treatment solutions, F&B companies can effectively manage their food waste and create new opportunities for resource recovery.

Why it matters

- Divert food waste from disposal and contribute to the circular economy by converting waste into valuable resources, such as compost or biogas.
- Minimise waste disposal costs by decreasing the volume of waste sent to incineration facilities and landfill from resulting ash.
- Strengthen sustainability initiatives and ensure compliance with waste management regulations where applicable, while also lowering emissions and improving overall environmental impact.

Actions to take

1 **Ramp up on-site food waste treatment capacity**
Larger companies or landlords should assess the feasibility of installing on-site food waste treatment systems to effectively manage food waste within their premises. This could involve upgrading existing infrastructure or adopting new technologies that align with current operational frameworks.

2 **Partner with off-site treatment facilities and explore alternative technologies**
Establish partnerships with off-site food waste treatment providers to optimise waste management through flexible cost models, such as pay-per-use arrangements. Additionally, explore alternative treatment solutions, such as vermicomposting or black soldier fly composting, to address specific waste management needs and ensure compatibility with existing facilities.

3 **Develop a commercialisation plan for recovered resources**
Improve the commercial viability of recovered waste products by reintegrating them into operations or selling them to create new revenue streams and boost sustainability credentials. Companies located in the same building can work with the F&B association and/or landlords to explore centralised/shared facilities, thereby reducing the need for individual on-site systems. Pay-per-use models for shared off-site facilities can further optimise cost management.

CASE STUDY

CLOSING THE FOOD WASTE LOOP

Frasers Property Singapore partnered with Life Lab Resources and Green Eco Technologies to launch Singapore's first-of-its-kind food waste valorisation programme for retail tenants across five of its malls. Under the pilot, segregated food waste from tenants was processed on-site with Green Eco Technologies' WasteMaster system. The resulting substrates can be transformed into microbial protein at Life Lab Resources' bio-refinery off-site, with the potential to be converted into aquaculture feed. Besides cutting down on waste sent to WTE plants, it also reduces the need for new natural resources to produce food, seamlessly integrating waste upcycling into the food production ecosystem and providing a sustainable avenue to mitigate GHG emissions.

After a successful pilot at Causeway Point mall in 2023 with tenants such as Bali Thai, Food Republic, and Ichiban Boshi, the pilot initiative was expanded to five malls. As of September 2024, more than 60 tenants, including additional tenants such as Don Don Donki, Koufu and Kopitiam have joined the programme, resulting in the collection of more than 205 tonnes of food waste.

ADJUST: RECOVER

SOLUTION

LEVERAGE EMERGING TECHNOLOGY AND INNOVATIVE SOLUTIONS

Emerging technologies and innovative approaches offer creative ways to address waste and energy challenges while driving business value. Adaptable to both small and large-scale operations, these advancements provide F&B companies with opportunities to:

- Optimise existing processes and systems.
- Recover value from waste and/or by-products.

Why it matters

- Unlock new revenue streams.
- Save costs through improved processes.

Actions to take

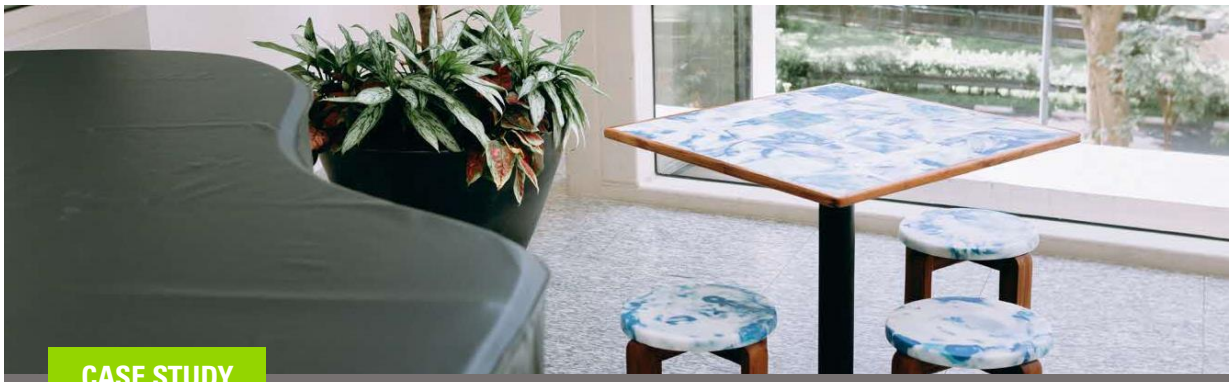
1 **Identify areas for innovation**
Clearly define the specific opportunity or challenge that needs to be addressed. This could include a hotspot identified during the audit (e.g. food by-product), a high-cost process affecting the company (e.g.recycling) or a strategic focus area that requires targeted action.

2 **Identify and implement new solutions**
Collaborate with partners and stakeholders to identify potential solutions or emerging technologies. This could include piloting digital tools, such as mobile apps or QR codes, to streamline waste sorting processes and encourage greater participation from customers or tenants.

CASE STUDY

GIVING FOOD BY-PRODUCTS NEW LIFE

Local cafes and restaurants have worked with other like-minded companies to reuse and upcycle food by-products rather than letting them go to waste. For instance, Bettr Coffee collaborated with the moonbeam co. to upcycle coffee grounds into new products such as cookies and granola. N&E Innovations also came up with a new way to use food waste, creating an additive for plastic called ViKANG99, which gives plastic wrap the ability to break down faster while adding antibacterial properties.



CASE STUDY

FROM PLASTIC BOTTLES TO FURNITURE

Foreword Coffee Roasters partnered with Semula to turn their empty plastic milk bottles into new materials for making furniture, wall cladding and decor. Empty bottles were washed, dried and flattened to be ready for upcycling.

Working in partnership with Semula, Foreword diverted about 271kg of empty plastic bottles from landfill and incinerators in 2023, or the equivalent of 4,166 bottles. Collectively, Semula and its partners have diverted 3.8 tonnes of plastic waste from landfills and incinerators.

KEY TAKEAWAYS

Sustainability is closely associated with resource optimisation. By embedding sustainable practices to reduce food and packaging waste and optimise energy use, companies can achieve long-term cost and resource savings, potentially unlock new revenue streams and position themselves for success in the long run.

Companies can begin by taking the following steps:

- Account: Conduct audit(s) to establish the baseline to track progress and identify areas for improvement.
- Avoid: Minimise the amount of waste generated by right-sizing portions and redesigning menus, using pre-cut ingredients, leveraging technology to improve demand forecasting, switching to reusable packaging and avoiding excessive packaging.
- Adjust: Fine-tune operations and implement solutions to reduce or recover unavoidable waste.
    - Reduce: Lower the quantity or impact of waste by redistributing/repurposing surplus food and adopting energy-efficient equipment.
    - Recover: Improve waste segregation to facilitate the recycling and upcycling of waste, enabled by food waste treatment solutions, emerging technology and innovative solutions.

Companies are encouraged to use this playbook as a guide and tap on the available resources to incorporate sustainability into their business.

ACKNOWLEDGEMENTS

This playbook was developed in consultation with NEA and the F&B industry.

Contributors include F&B companies and associations, CapitaLand, Changi Airport Group, Frasers Property, Lendlease, Sembwaste and solution providers.

Alterpacks

Bettr Coffee

Changi Airport Singapore

Fassler Gourmet

Frasers Property

Grain

Lendlease

Muuse

N&E Innovations

Semula

Springleaf Prata Place

the moonbeam co.

Unilever Food Solutions

RESOURCES

The resources section provides a comprehensive list of sustainability initiatives, including courses, programmes and grants designed to support F&B companies on their sustainability journey. It also offers insights into regulations that might impact companies and their key performance indicators (KPIs).

Legend of priority area(s) addressed by each resource:


FOOD WASTE


PACKAGING WASTE


GHG EMISSIONS

GUIDES AND ONLINE RESOURCES

Sustainability guides and online resources provide guidelines on best practices and tools to support F&B companies in their sustainability journeys.

SUSTAINABILITY GUIDES AND ONLINE RESOURCES	ABOUT
SUSTAINABILITY PLAYBOOK FOR ENTERPRISES - EMBARKING ON YOUR ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) JOURNEY 	Jointly developed by Enterprise Singapore, Singapore Business Federation and SkillsFuture Singapore, this playbook provides a step-by-step guide for companies to assess their ESG readiness.
FOOD WASTE MANAGEMENT WEBSITE BY NEA 	The website provides information on food waste management strategies, practical actions and guidebooks for the F&B industry.
FOOD LOSS AND WASTE PROTOCOL (FLW) BY THE WORLD RESOURCES INSTITUTE (WRI) 	A collaborative initiative providing standardised data collection methods to help companies and countries measure, report and reduce food loss and waste. It supports targeted efforts to reduce loss upstream (agriculture and transportation) and downstream (operations and consumption). Tools and resources are publicly available on the website, including industry specific guidance.
3R GUIDEBOOK FOR PACKAGING 	Jointly created by NEA and the Singapore Manufacturing Federation (SMF), this guidebook helps companies who need to comply with the Mandatory Packaging Report (MPR) scheme.
MANDATORY PACKAGING REPORTING (MPR) GUIDEBOOK 	Developed by NEA, this guidebook provides administrative guidance to companies in complying with the MPR scheme. It should be read in conjunction with Part 4 of the RSA.
DECARBONISATION FOR SINGAPORE ENTERPRISES- PLAYBOOK 	This guidebook shares the benefits for reducing emissions and how businesses, especially SMEs, can kickstart their carbon management journey. The playbook supplements the nationwide LowCarbonSG programme.

PROGRAMMES AND INITIATIVES

These programmes offer valuable resources and training to help F&B companies integrate sustainable practices into their operations. These initiatives are designed to help companies capture new opportunities in the green economy and demonstrate how sustainability can drive transformation.

SUSTAINABILITY PROGRAMMES	ABOUT
ENTERPRISE SUSTAINABILITY PROGRAMME (ESP) 	These subsidised training courses help local enterprises build awareness and knowledge of sustainability.
SME SUSTAINABILITY REPORTING PROGRAMME (SME SRP) 	The SME SRP launched by Enterprise Singapore in partnership with Deloitte, EY and RSM, supports local SMEs to develop their first sustainability reports.
ZERO WASTE MANAGER COURSE 	This course supports businesses to build competencies in waste management and integrate 3Rs - Reduce, Reuse and Recycle into organisational culture. Companies are encouraged to formalise waste reduction responsibilities and to appoint and train Zero Waste Managers to lead waste management and reduction efforts on their premise. It is targeted at companies covered under the Mandatory Waste Reporting (MWR) but is open to all interested participants.
LOWCARBONSG 	LowCarbonSG is a capability-building programme. It enables companies to start monitoring and where possible, reduce their carbon emissions. Companies that successfully measure and monitor their carbon footprints will be issued a LowCarbonSG Participant Logo.
SUSTAINABILITY-RELATED COURSES UNDER MYSKILLSFUTURE 	Companies can upskill their employees via MySkillsFuture. They can access more than 300 online sustainability-related learning courses supported by SkillsFuture Singapore.

PLASTIC ACTION (PACT), WWF-NO PLASTIC IN NATURE 	PACT is an initiative launched by WWF Singapore to help companies minimise waste and move towards a circular economy. It stems from the global WWF No Plastic in Nature Initiative. The programme provides guidance, best practice examples and an Alternative Material Tool (see partners and solution providers).
SINGAPORE GREEN LABELLING SCHEME (SGLS) 	SGLS is a labelling scheme that aims to help the public identify environmentally preferred products that meet certain eco-standards.

PARTNERS AND SOLUTION PROVIDERS

Collaborating with partners and solution providers offers F&B companies access to innovative solutions and expertise for tackling challenges, such as food waste, packaging waste and GHG emissions.

PARTNERS AND SOLUTION PROVIDERS	ABOUT
INNOVATION PARTNER FOR IMPACT (IPI) 	IPI is a subsidiary of Enterprise Singapore that drives innovation by providing companies access to advisory services and a global innovation ecosystem. Services and programmes include technology scouting and an Innovation Advisors Programme.
ALTERNATIVE MATERIALSTOOL 	This tool compares different materials to help companies select single-use packaging with a lower environmental footprint when reusable packaging is unavailable. F&B companies can access it without joining the initiative.
GREEN SOLUTIONS- ALLIANCE FOR SUSTAINABILITY INNOVATION (ASI), NANYANG POLYTECHNIC 	ASI is a collaborative platform to empower forward-thinking companies in sustainability. It provides an avenue for companies to exchange knowledge, experiences and best practices for their sustainability journeys.
FOOD MANUFACTURING CENTRE OF INNOVATION (FM COI) AT REPUBLIC POLYTECHNIC (RP) 	As part of the FM COI, FM COI@RP has established capabilities to provide food enterprises with product formulation, processing, packaging and shelf-life enhancement.
ZERO WASTE SG 	Zero Waste SG aims to drive Singapore towards zero waste through education and advocacy with a focus on food waste, plastic disposables, organisational waste and household recycling.
CHARITIES FOR FOOD DONATIONS 	Organisations such as The Food Bank Singapore, Food from the Heart and Free Food are committed to fighting food insecurity by facilitating efficient donation processes and redistributing surplus food to those in need.

GRANTS AND FINANCIAL SUPPORT

F&B companies can tap into a suite of grants and financial support to kickstart or accelerate their sustainability journey.

GRANTS AND FINANCIAL SUPPORT	ABOUT
ENTERPRISE DEVELOPMENT GRANT (EDG) 	The EDG supports projects to help companies innovate, grow and transform. This includes sustainability projects, such as sustainability strategy, resource optimisation, standards adoption and products, services and solution development.
ENTERPRISE FINANCING SCHEME (EFS) – GREEN 	The scheme supports project developers, system integrators and technology & solution enablers who develop enabling technologies and solutions to reduce waste, resource use or greenhouse gas emissions, especially in the sectors of clean energy, circular economy, green infrastructure and clean transportation, as well as green solution adopters.
ENERGY EFFICIENCY GRANT (EEG) 	The grant aims to help companies improve their energy efficiency by co-funding investment in energy-efficient (EE) equipment. The EEG will provide two tiers of support – a base tier to provide support for pre-approved EE equipment up to S$30,000; and an advanced tier to support companies for larger investments that drive greater energy efficiency (only available for selected sectors).
SUSTAINABILITY REPORTING GRANT(SRG) 	The SRG by Enterprise Singapore and the Singapore Economic Development Board supports funding for eligible Singapore-incorporated listed companies and large non-listed companies to produce their first sustainability report prepared in line with the International Sustainability Standards Board's (ISSB) standards prior to the start of the mandatory reporting requirements.
ADVANCED DIGITAL SOLUTIONS (ADS) 	The ADS initiative by the Infocomm Media Development Authority (IMDA) supports companies to adopt digital solutions to optimise costs, improve asset utilisation and build sustainable value chains.

GOVERNMENT POLICIES AND REGULATIONS

Understanding government policies and regulations is crucial for F&B companies looking to address food waste, packaging waste and GHG emissions. This section provides key resources to help companies navigate relevant standards and compliance requirements, ensuring they align with national sustainability goals and industry best practices.

REGULATIONS	ABOUT
RESOURCE SUSTAINABILITY ACT (RSA)	From 2021, developers of new large commercial and industrial buildings are required to allocate space for on-site waste treatment systems in their design plan. From 2024 onwards, mandated buildings will be required to segregate food waste for treatment and reporting. Mandated buildings are industrial and commercial buildings that generate large amounts of food waste, such as large shopping malls, hotels and food manufacturers.
MANDATORY PACKAGING REPORTING (MPR) SCHEME	The MPR scheme aims to minimise packaging waste and set the stage for the implementation of Singapore's upcoming Extended Producer Responsibility (EPR) framework for packaging waste management. EPR aims to make producers (e.g. brand owners, manufacturers, importers) responsible for the collection and end-of-life management of the products they put on the market. Companies that have an annual turnover exceeding SGD 10 million, carry on a business of supplying regulated goods in Singapore and import or use specified packaging are required to comply with the MPR scheme. Companies need to submit their packaging data, methodology document and a 3R plan (reduce, reuse or recycle packaging). Refer to the NEA website for more information.
BEVERAGE CONTAINER RETURN SCHEME	The beverage container return scheme (Scheme) aims to: • Increase recycling rate of beverage containers • Reduce amount of waste disposed of • Reduce carbon emissions • Raise consumer awareness about the importance of recycling and encourage good recycling practices The Scheme adopts an EPR approach to manage packaging waste in Singapore where beverage producers that manufacture or import pre-packaged beverages in plastic and metal containers will be made responsible for the collection and end-of-life management of the products that they put on the market.

	The Scheme incentivises consumers to return their empty beverage containers for recycling. A 10-cent refundable deposit will be applied on all pre-packaged plastic and metal beverage containers ranging from 150ml to three litres. When consumers return empty plastic or metal beverage containers to designated return points, such as reverse vending machines (RVM), they will claim a full refund of the 10-cent deposit. Beverage producers will pay for the collection and recycling of the empty beverage containers, and the scheme will be run by a licensed scheme operator that is a not-for-profit company formed by a consortium of beverage producers. Refer to the NEA website for more information.
SINGAPORE EXCHANGE REGULATION (SGX REGCO) ISSB STANDARDS[17] 	In line with the International Sustainability Standards Board (ISSB), SGX RegCo will incorporate the Singapore Financial Reporting Standards (IFRS) Sustainability Disclosure Standards into legislated reporting from FY2025. This builds on the existing climate reporting required for listed companies. SGX RegCo introduced a phased approach to mandatory climate reporting based on the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) effective from FY2022. From FY2025, the reporting will align to IFRS standards. Reporting will be mandatory for all listed companies, including reporting on Scope 1 and 2 emissions, with Scope 3 emissions disclosure following in FY2026. For large non-listed companies, these requirements will take effect from FY2027. Listed and large F&B companies may need to comply with these reporting obligations, while smaller F&B companies might be required to provide data if they are part of a reporting entity's supply chain.

[17] While the regulation and disclosure requirements for GHG emissions currently do not impact many F&B companies, they are expanding in scope and may involve some F&B companies in the future.

SUSTAINABILITY FRAMEWORKS AND STANDARDS

Sustainability frameworks and standards provide clear guidelines for F&B companies to disclose specific sustainability information, ensuring transparency and accountability. Adopting these standards helps businesses align with best practices, meet regulations and enhance credibility with stakeholders.

SUSTAINABILTY FRAMEWORKS	ABOUT
SASB STANDARDS FOR RESTAURANTS 	SASB standards are part of the ISSB and provide industry specific discourse standards, including restaurants. They help companies provide investors with relevant ESG information. SASB standards provide guidance on disclosure topics, metrics and technical protocols. SASB standards for restaurants cover food waste, packaging waste and GHG emissions.
GLOBAL REPORTING INITIATIVE (GRI) 	GRI standards enable companies to publicly report their sustainability impact in a common, credible way. GRI standards have three modules: universal standards, topic specific standards and industry-specific standards. F&B companies can reference topic-specific standards included in the indicator sections. There are no specific F&B industry standards. F&B companies should refer to the following topic specific standards: • GRI 306: Waste - provides guidelines for organisations to report and measure waste generation and resource efficiency. • GRI 302: Energy - helps organisations disclose information about energy consumption and reduction efforts. • GRI 305: Emissions - guides organisations to disclose their GHG emissions and reduction efforts.
GHG PROTOCOL 	The GHG Protocol is a global framework for measuring and managing GHG emissions. It tracks Scope 1, 2, and 3 emissions, helping companies to identify effective strategies for reducing their climate impact. It also provides tools to aid companies develop comprehensive inventories of their emissions.

KEY INDICATORS

Using measurement indicators enables the calculation of food waste, packaging waste and GHG emissions generated by the F&B company and facilitates the tracking of progress over time.

PRIORITY	INDICATORS	UNIT OF MEASUREMENT
Food waste	Total amount of food waste per year	**METRICTONNES PER ANNUM (KG/YR)**
Packaging waste	Total weight of packaging waste generated per material (plastic, paper, aluminium, glass and other packaging) per year	**METRICTONNES PER ANNUM (KG/YR)**
	Total packaging material procured per year	**$/YR**
GHG emissions	GHG emissions associated food and packaging waste: • Scope 3: Category 5- Waste • Scope 3: Category 12- End of life	**TCO_{2E}[18]**
	Scope 1 and 2 GHG emissions associated with energy consumption from operations	
	Total energy and consumed at F&B premises • Fuels • Electricity	**KWH-EQUIVALENT OR LITRES**

[18] This covers the reporting of six greenhouse gases covered by the Kyoto Protocol — carbon dioxide (CO2), methane (CH4), nitrous oxide, (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6).

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