



3R Guidebook for Hotels

Image courtesy of Arthur Yap, Singapore Tourism Board



SINGAPORE HOTEL ASSOCIATION



National
Environment
Agency

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Singapore Hotel Association (SHA)

The SHA is the umbrella body for hotels in Singapore. Its membership is made up of hotel entities which are represented by proprietors of hotels or its appointed representatives. Its current membership comprises 159 hotels which accounts for some 85% of total gazetted room count.

The SHA is currently headed by its Executive Director, Ms Margaret Heng, who is also the Chief Executive of SHATEC, the training arm of SHA.

Activities of SHA revolve around the following main themes:

- Research and Representations
- Manpower and Training
- Innovation, Productivity and Service Excellence
- Safety and Security
- Community and Member Relations

National Environment Agency (NEA)

Formed on 1 July 2002, the NEA is the leading public organisation responsible for improving and sustaining a clean and green environment in Singapore. The NEA develops and spearheads environmental initiatives and programmes through its partnership with the People, Public and Private sectors. It is committed to motivating every individual to take up environmental ownership and to care for the environment as a way of life.

By protecting Singapore's environment from pollution, maintaining a high level of public health and providing timely meteorological information, the NEA endeavours to ensure sustainable development and a quality living environment for present and future generations.

Visit <https://www.nea.gov.sg> for more information.



CHAPTER 1: INTRODUCTION

Overview of Solid Waste Management in Singapore

Over the years, Singapore's waste disposal quantities have increased significantly. From 1,260 tonnes of waste disposed per day in 1970, the amount of waste disposed of has risen more than seven times to more than 7,900 tonnes per day in 2020, and is projected to continue to increase in tandem as our population and economy grow.

Since 1979, much investment has gone into the building of waste-to-energy plants and landfills to manage the increasing amount of waste disposed. The waste-to-energy plants are designed to incinerate waste safely and are equipped with air emission cleaning equipment. These plants reduce the volume of waste by up to 90%, and recover energy to supply about 3% of Singapore's electricity demand. Ferrous and non-ferrous metals are also recovered from the incineration bottom ash for recycling.

The remaining ash is then transported to the offshore Semakau Landfill, the only landfill in Singapore.

If waste quantities continue to grow, there would be a need to build more waste-to-energy plants and offshore landfills. This presents a key challenge for land-scarce Singapore.



Tuas South Incineration Plant



Semakau Landfill

CHAPTER 1: INTRODUCTION

Strategies for a Sustainable Solid Waste Management

As a small city-state with limited space, Singapore has to ensure prudent use of land for continued economic growth. Building more waste disposal facilities to handle the increasing amount of waste will mean less land for other uses such as industries, housing, water catchment areas, transportation and recreation.

The Zero Waste Masterplan was launched on 30 August 2019 and maps out Singapore's key strategies to build a sustainable, resource-efficient and climate-resilient nation. This includes adopting a circular economy approach to waste and resource management practices and shifting towards more sustainable production and consumption.

Based on current waste disposal rates, Singapore's only landfill, Semakau Landfill, will run out of space by 2035. The Masterplan has set a new waste reduction target to reduce the daily amount of waste sent to Semakau Landfill by 30 per cent by 2030. This will help to extend Semakau Landfill's lifespan beyond 2035.

In addition, Singapore also aims to increase our overall recycling rate to 70 per cent, non-domestic recycling rate to 81 per cent and domestic recycling rate to 30 per cent by 2030 under the Sustainable Singapore Blueprint.

To achieve our vision, the National Environment Agency (NEA) has adopted a multi-pronged waste management strategy of waste minimisation. This is through the first 2Rs of reduce and reuse, maximising resource recovery through recycling, and volume reduction through incineration of all remaining incinerable waste to reduce waste sent to the landfill.

To achieve these targets, NEA will continue to engage and work in partnership with various organisations in the people, private and public sectors to plan and implement 3R and related educational programmes. The Singapore Hotel Association and its member hotels are among the NEA's valued partners working towards this end.

What Hotels can Do

The hotel industry in Singapore generates a substantial amount of waste each year. With gazetted hotel room revenue of S\$3.7 billion and a 3.9% year-on-year growth in 2017¹, there is great potential for waste minimisation. This guidebook aims to provide hotels with practical information and guidelines on how to plan and implement a 3R programme.

The case studies included in Chapter 6 of this guidebook will share the success stories of some hotels that have implemented the 3Rs.

¹ <https://www.stb.gov.sg/statistics-and-market-insights/MarketStatistics/Q4%202017%20Tourism%20Sector%20Performance%20Report.pdf>

CHAPTER 2: BENEFITS OF REDUCING, REUSING AND RECYCLING SOLID WASTE

What are the 3Rs?

The **3Rs** stand for:

- **Reduce** – to avoid waste at source so as to minimise the quantity of waste that needs to be treated or disposed of
- **Reuse** – to use an object or material again, either for its original or similar purpose, without significantly altering the physical form of the object or material
- **Recycle** – the process of transforming waste materials into reusable form which may or may not be similar to the original product



3R practices encompass all measures that minimise the amount of waste disposed of.

The preferred waste management practice is to **reduce** waste at source, i.e. to prevent waste from being generated. Where waste generation cannot be prevented other options such as **reusing** the item(s), followed by **recycling** of the waste should be considered.

Benefits to Hotels

Good waste management can make good business sense. The benefits of practising the 3Rs go beyond reducing the amount of waste to disposal sites. Minimising waste can provide competitive advantages to a hotel in a few ways:

Improved Resource Efficiency & Reduced Disposal Costs

Hotels consume and pay for resources (raw materials, consumables, energy, water, manpower) that translate into sales revenue. Such resources should thus be optimised and reused/redistributed where possible to minimise waste and maximise revenue.

For example, the actual cost of food waste is not just the cost of food ingredients wasted, but also includes the following:

i. Waste Collection & Disposal Costs

These costs can either be fixed or variable according to the amount of waste. On top of the haulage fees and waste disposal gate fees, fees for rental of waste compactors should be included where applicable; and

ii. Staff & Utilities Cost

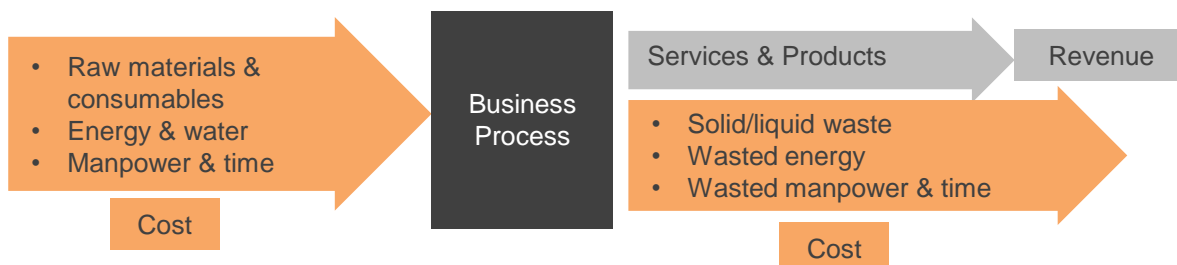
These costs include the proportion of food prepared that is eventually discarded multiplied by the estimated time spent by each staff in preparing all the food and the associated utilities cost (electricity/gas/water).



The true cost of food waste is higher than what it appears to be.

CHAPTER 2: BENEFITS OF REDUCING, REUSING AND RECYCLING SOLID WASTE

Waste is generated as a by-product and cost money to treat or dispose of. This is represented as show below.



Practising waste minimisation in a business process can help reduce business costs. This helps improve resource efficiency and cut down on waste handling and disposal costs.

Enhanced Corporate Image & International Reputation

Public awareness of environmental issues is growing around the world, and the environmental profile of a hotel forms an increasingly important part of its overall reputation.

Hotels which incorporate environmental considerations into their business operations will benefit from better corporate image which helps distinguish them in the marketplace as forward-looking and responsible service providers who are sensitive to environmental issues.

Benefits to the Environment

Practising the 3Rs is an effective way to protect our environment and conserve resources for the benefit of present and future generations.

Reducing waste at source leads to lower demand for virgin resources required to make new products, thereby conserving limited natural resources. Similarly, used products can be reused or recycled into new products, which would avoid further depletion of natural resources, reduce the amount of waste thrown away and lessen the need to build more disposal facilities.



An effective 3R programme will help to reduce the carbon footprint of an organisation.

Benefits to Singapore

Singapore has had to set aside increasingly more resources, including land to build disposal facilities, to manage the growing amount of waste. Singapore disposes about 3 million tonnes of solid waste a year, which is enough to fill more than 5,700 Olympic-sized swimming pools. This amount could have been significantly higher if Singapore had not ramped up recycling over the years.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

If your hotel already has a 3R programme in place, you may still use this Guidebook as a point of reference.

If your hotel is starting from scratch, this Guidebook would help you in developing and implementing a successful 3R programme for your hotel.

The steps are as follows:

- | | |
|---------|---|
| Step 1: | Obtain Top Management's Commitment and Support |
| Step 2: | Appoint a 3R Manager and Form a Green Committee / 3R Team |
| Step 3: | Conduct a Waste Audit |
| Step 4: | Evaluate Opportunities to Reduce, Reuse and Recycle |
| Step 5: | Develop a 3R Programme |
| Step 6: | Implement and Improve the 3R Programme |

Step 1: Obtain Top Management's Commitment and Support

Management support is vital for the success of any 3R Programme as 3R initiatives could require an investment in time and possibly finances. It could also entail changes in responsibilities of some hotel staff or in operational procedures.

A supportive management is crucial to the alignment of the environmental goals of all stakeholders, and supports the formation of a culture of practicing the 3Rs amongst all staff. Therefore, the first step would be to secure and project a clear and strong signal of the management's commitment to supporting any 3R efforts.

To put up a case to management, there is a need to show how embarking on a 3R programme is advantageous for your hotel e.g. in terms of cost savings and enhanced reputation. To estimate the potential savings in waste disposal cost, data on the amount of waste generated in your hotel would be required. This can be requested from the waste collector or by investing in a weighing machine. With the information, opportunities to reduce, reuse and recycle waste can be identified and the cost savings from the wasted raw materials/consumables can be estimated.

3R Policy Statement

To communicate the objectives of the 3R Programme to employees, and demonstrate corporate commitment, a 3R policy statement can be prepared, and it may include these main ideas:

- The reduction of waste at source is a key goal of the hotel.
- All waste items will be reused and recycled before considering disposal.

In the policy statement, you may also want to convey certain motivations for practising the 3Rs such as, service quality improvement, cost reduction, and being an environmentally-responsible corporate citizen. Your 3R policy statement can be part of your hotel's overall Environmental Policy.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

The following is an example of a policy statement.

Example of Policy Statement

1. *[Your hotel's name]'s policy is to reduce waste to the minimum levels that are economically and technically feasible;*

As both a responsible citizen and [hotel's name] employee, each individual is responsible for reducing waste, and for complying fully with all 3R programme goals established by the hotel;

Employees are encouraged to offer suggestions for further waste reduction in their own work areas, and in any other areas that they are familiar with.

2. *[Your hotel's name] is committed to excellence and leadership in protecting the environment. In keeping with this policy, we strive to increase resource efficiency and minimise adverse impact on the environment. By successfully reducing waste, we can also achieve cost savings in waste disposal.*

Signature _____

Date _____

Position [in Hotel Management Team] _____

The policy statement, endorsed by your management, should be disseminated to all employees and displayed prominently.

A meeting should be convened to explain the rationale and/or disseminate the information to staff. Other staff channels could be explored as well. (Posting it on a notice board could send a negative message about the management's commitment level to the 3R Programme). At the same time, the meeting would be a good platform to seek feedback and ideas from employees and retail tenants. This will send a positive signal, and the stakeholders are more likely to get involved and align their efforts to the policy.



Step 2: Appoint a 3R Manager and form a Green Committee/3R Team

The next step is for the hotel management to appoint a competent 3R Manager. The 3R Manager should ideally be an individual with a passion for protecting the environment and who possesses strong leadership and communication skills. He or she should also be someone who is knowledgeable about the hotel's operations, as well as its procurement and waste management procedures.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

The formation of a Green Committee or a 3R Team helps to ensure the success of the hotel's 3R Programme. Together with the 3R Manager, they will plan, develop and implement the 3R Programme for the hotel. The 3R Team should be well represented in terms of experience and knowledge of waste management issues. It should also comprise personnel from different departments as they are most familiar with the operations and culture within their department. Hotel departments that should be represented are as follows:

- Management/Executive Office
- Engineering /Maintenance
- Housekeeping
- Kitchens/Food & Beverage (F&B) outlets
- Stewarding
- Purchasing/Receiving
- Administration/Corporate Support
- Sales & Marketing
- Guest Relations

The 3R Team should be responsible for implementing and managing the 3R Programme, following the next steps in this Guidebook.

Role of Green Committee/3R Team

- Plan, develop and implement a 3R Programme specific for the hotel, including:
 - Displaying the 3R Policy in prominent locations
 - Setting of the goals and targets for the hotel's 3R Programme
 - Establishing 3R procedures to complement operational practices of the hotel
 - Organising programmes to train hotel staff in the 3Rs
 - Organising activities to raise overall awareness on the 3Rs
 - Engaging partners and guests in 3R initiatives
- Work out and propose a budget for the hotel's 3R programme
- Conduct waste audits to:
 - Determine baseline waste quantity and composition
 - Identify areas where waste can be reduced
 - Monitor waste output over time
- Monitor and ensure compliance with the established 3R procedures
- Establish an auditing and accounting system that reflects monthly waste management amounts and costs, as well as savings arising from waste avoided
- Generate reports on progress in meeting the goals and targets
- Keep management and staff informed of the progress in meeting the goals and targets for the hotel's 3R Programme
- Incorporate descriptions of the roles and responsibilities of the committee members

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Management's Role

- Appoint a 3R Manager to take charge of the 3R Programme and form a 3R Team to assist and support the 3R Manager in developing and implementing a 3R Programme for the hotel
- Inform hotel staff of the decision to implement a 3R Programme
- Support 3R team and hotel staff in establishing the goals and targets for the hotel's 3R Programme
- Meet with the 3R Manager and 3R Team regularly to monitor the 3R Programme's progress
- Lead by example: show interest and participate in 3R activities.

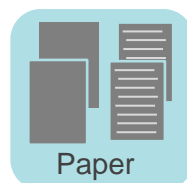
Step 3: Conduct a Waste Audit

What is a Waste Audit?

A waste audit is a structured process of identifying and quantifying the sources, amount and types of waste being generated in the hotel.

The objective of a waste audit is to profile the waste types by finding out information on:

- types of waste,
- quantity of each waste type,
- how they are generated,
- why they are generated,
- where they are being generated, and
- how they are managed after being generated.



Paper



Plastic



Glass



Metal

Doing this will help to identify areas of wastage, and uncover opportunities to reduce, reuse or recycle waste materials. It will also help collect baseline data for measuring the effectiveness of your 3R programme, after its implementation.

How to Conduct a Waste Audit?

Different types of waste are generated in different parts of a hotel. Walk through the different departments on unannounced days of operations to observe existing practices, examine the contents in general waste bins, talk to relevant operational staff, take stock of any waste reduction efforts that are already in place, and document findings. You can also get hold of purchasing records of raw materials, consumables and any other supplies to see what wastes would possibly be generated throughout the year.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Be sure to pay close attention to the areas and operations that tend to generate the largest amounts of waste. In general, wastes are usually generated in large quantities in these areas:

- Kitchens, F&B outlets and function rooms (mainly food and packaging waste);
- Guest rooms, and various hotel facilities for guests, such as the gym, swimming pool, etc. (mainly consumables and packaging waste generated by hotel guests);
- Offices, including business centres (paper and print cartridge waste, etc.); and
- Purchasing/receiving departments.

a) Create an audit checklist

Create a checklist for all waste types generated from each department. Auditing waste in each department separately makes sure that relevant 3R initiatives can be tailored for the respective department if needed. A sample audit checklist is shown below.

b) Collect waste samples

Determine a few days of the week to make unannounced collection of waste samples from all the departments.

To ensure that the waste samples are representative, collect a full week's worth of samples for each area. To avoid confusion, you may wish to collect waste samples from different departments on different weeks. For instance, collect waste samples only from F&B outlets in week 1, collect waste samples only from guest rooms in week 2 and so on.

Give clear instructions to staff and cleaners who will be doing the waste audit on the locations and types of waste they will be collecting and how to label the collection bags / bins for identification of waste sources. Supervisors will need to closely supervise the waste sample collection process.

Sample Audit Checklist

Types of waste	Point of origin	Disposal (kg/month)	Cost of disposal	Recycled (kg/month)	Cost of recycling	Other comments
Paper						
Carton boxes						
Plastic bottles						
Plastic packaging						
Glass						
Ferrous Metal cans						
Aluminium cans						
Food waste						
Garden waste						
Waste oil						
Others						
TOTAL						

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

c) Sort the waste

After the sample bags of waste are collected, labelled and recorded, the bags from each area are weighed and emptied onto a large plastic sheet. The waste materials can then be sorted into different types / categories according to the audit checklist.

d) Analyse the data and record the results

After sorting, each type of waste is then individually weighed and recorded.

Certain wastes may not be seen in the refuse bins during a waste audit, but have been identified as possible waste materials from purchasing records. In such cases, you may estimate the types and quantities of the wastes based on the volume of materials purchased throughout the year.

The 3R Team can then compile and enter all the data gathered into the checklists, by department, for analysis to reveal opportunities for 3R initiatives. When analysing the data, pay special attention to how these wastes are generated, why they are generated, at which point they are being generated, and how they are managed after being generated. These analyses will be useful when developing 3R strategies and procedures.

Step 4: Identify Opportunities to Reduce, Reuse and Recycle

4.1 Reduce and Reuse

After analysing the data from the waste audit, the 3R Team should be able to identify opportunities for intervention and develop strategies and procedures for 3R outreach and initiatives to target each waste type.

The waste reduction and reuse options listed in the next few pages are a compilation of what some other hotels have been doing. The 3R Team may go through and select the ones that are suitable for your hotel.



As some of these waste reduction options may result in higher water or energy usage levels, e.g. a lot more washing is required if a switch is made from the use of disposable items to reusable items, hotels may wish to weigh the costs and benefits of each option before embarking on the selected initiatives.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Kitchens and F&B Outlets

		Basic	Advanced
Plastic Waste	Reduce	<ul style="list-style-type: none"> Use reusable lids, instead of cling wrap, to cover food in coolers and steam tables. Do away with cellophane wrap for fruit baskets and gifts delivered to guest rooms. 	<ul style="list-style-type: none"> Use reusable metal or nylon coffee filters.
	Reuse	<ul style="list-style-type: none"> Reuse containers for in-house activities, e.g. reuse plastic beverage bottles/containers for keeping small items. 	-
Food Waste	Reduce	<ul style="list-style-type: none"> Place salad bar items in smaller containers and replenish when required. This reduces the amount of food that is discarded from salad bars after each meal. Inspect food service equipment for leaks and malfunctions, and repair or replace as needed to prevent food wastage. Purchase only what is needed as over-purchasing can result in spoilage. Audit food storage (e.g. returning jams to chiller after use) to prevent food spoilage and wastage. Design menus with interchangeable produce and other perishable ingredients among dishes. There will be less food waste even if there are fewer orders of a particular dish as the unused ingredients can be used for other dishes. 	<ul style="list-style-type: none"> Offer guests the option of ordering smaller portions to suit their appetites. This reduces the amount of leftover food waste on guests' plates.
	Reuse (Re-distribution)	<ul style="list-style-type: none"> Donate surplus food to food distribution organisations such as Fei Yue Community Services, Food Bank Singapore, Food from the Heart and Willing Hearts. The contact information can be found at this link. 	<ul style="list-style-type: none"> Use fresh food scraps left over from food preparation to make soups and stocks, instead of throwing them away.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Kitchens and F&B Outlets

		Basic	Advanced
Packaging Waste	Reduce	<ul style="list-style-type: none"> Use dispensers, small containers or dishes for sauces and condiments instead of individually wrapped packages to reduce packaging waste. Buy products with the least distribution packaging. 	<ul style="list-style-type: none"> Use dispensers or containers for sugar and butter instead of individually wrapped sachets.
Paper Waste	Reduce	<ul style="list-style-type: none"> Use cloth place mats and permanent coasters instead of paper place mats, paper doilies and cocktail napkins that need to be discarded after every meal. Use rags and sponges to wipe spills in the kitchen and on dining room tables instead of paper towels. Reuse menus and use boards to post daily specials to reduce menu printing costs and paper wastage. Offer paperless/digital receipts for transactions 	-
	Reuse	<ul style="list-style-type: none"> Reuse old menus and mats as training materials for in-house training. 	-
	Reduce	<ul style="list-style-type: none"> Use washable hats and aprons for kitchen staff instead of disposable ones. 	<ul style="list-style-type: none"> Offer draft beer in returnable and refillable kegs instead of glass bottles and cans.
Others	Reuse	<ul style="list-style-type: none"> Reuse worn table linen by remaking them into aprons, laundry bags or mattress covers. 	<ul style="list-style-type: none"> Re-dye tablecloths and napkins to match new colour schemes when re-modelling, rather than purchase new ones.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Guest Rooms, Laundry and Housekeeping

		Basic	Advanced
Plastic Waste	Reduce	<ul style="list-style-type: none"> Eliminate the use of plastic liners in ice buckets. Provide reusable laundry bags for guests instead of single-use plastic bags. Return laundered clothes in reusable garment bags instead of single-use plastic bags. 	<ul style="list-style-type: none"> Provide refillable water bottles or filtered drinking water dispensers instead of PET water bottles. Offer bottled water only upon request. Inform guests of efforts to provide amenities that have less impact on the environment.
	Reuse	<ul style="list-style-type: none"> Replace facial box tissues in bathrooms only when they are almost empty. Issue newspapers to guests only upon request to reduce the volume of discarded newspapers. Offer newspapers in centrally located places such as lobbies, restaurants, and newsstands. Provide e-newspapers instead of hard-copy newspapers. Eliminate the use of paper doilies and paper tray covers. 	
Paper Waste	Reduce	<ul style="list-style-type: none"> Replace facial box tissues in bathrooms only when they are almost empty. Issue newspapers to guests only upon request to reduce the volume of discarded newspapers. Offer newspapers in centrally located places such as lobbies, restaurants, and newsstands. Provide e-newspapers instead of hard-copy newspapers. Eliminate the use of paper doilies and paper tray covers. 	
	Reuse	<ul style="list-style-type: none"> Eliminate cardboard backing for laundered shirts. Use leftover sheets of note pads as scrap paper in hotel offices. 	-

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Guest Rooms, Laundry and Housekeeping

		Basic	Advanced
Packaging Waste	Reduce	-	<ul style="list-style-type: none"> Install refillable dispensers for bath soap, shampoo, hair conditioner, hand soap and hand lotion in guest rooms to eliminate leftover soap bars and plastic toiletries bottles. Provide disposable toiletries only upon request. Inform guests of efforts to provide amenities that have less impact on the environment. Provide reusable bedroom slippers instead of disposable slippers If your hotel's policy is to provide individually packaged amenities in all guest rooms, reduce the size of these amenities, such as the bar soap, to reduce the leftover quantities that are eventually disposed of.
		<ul style="list-style-type: none"> Provide non-essential items such as shoeshine kits and shower caps to guests only upon request. Offer slippers only upon request. If your hotel's policy is to provide slippers in all guest rooms, avoid wrapping the slippers in disposable plastic bags. 	<ul style="list-style-type: none"> Re-dye linen and carpets to match re-modelled décor, rather than purchase new ones. Rotate curtains to expose different portions to sunlight to extend their useful life.
Others	Reuse	<ul style="list-style-type: none"> Reuse clothes hangers left behind by guests for employee uniforms. Reuse flowers in guest rooms for floral and decorative arrangements in other hotel areas e.g. conferences and spa. 	-

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Offices

	Basic	Advanced
Paper Waste	<div>Reduce</div> <ul style="list-style-type: none"> Set the default printing and photocopying settings throughout the hotel to double-sided. Provide a guide to change the settings for documents that are required in single-sided format. 	<ul style="list-style-type: none"> Post instructions and diagrams on how to create the various types of formats that your office uses such as letterheads or specialised sizes or features. This reduces paper wastage due to ‘mis-prints’. Review distribution lists and update databases regularly to avoid over-production of marketing and publicity material. Cancel subscriptions of unwanted publications to reduce paper waste. Produce a guide on small and simple ways to save paper e.g. reducing line spacing and font size, setting narrower margins, etc. for staff. Track and monitor printing and photocopying volumes of each employee. Encourage staff to print only when necessary and proofread before printing.
	<div>Reuse</div> <ul style="list-style-type: none"> Reuse paper that has been printed only on one side. Reuse boxes to store items, and move equipment and supplies. 	

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Conference Facilities

		Basic	Advanced
Packaging Waste	Reduce	-	<ul style="list-style-type: none"> Use pitchers and small containers or dispensers for cream and sugar instead of individually wrapped sachets.
Paper Waste	Reduce	<ul style="list-style-type: none"> Supply note pads with limited sheets. 	-
	Reuse	<ul style="list-style-type: none"> Use leftover sheets of note pads as scrap paper in hotel offices, or donate to schools or local charities. 	-
Others	Reduce	<ul style="list-style-type: none"> Offer writing material on a side table for attendees to take instead of placing it at every conference table. 	<ul style="list-style-type: none"> Provide sustainable meeting packages: <ul style="list-style-type: none"> Provide water jugs or water stations for refilling of bottles instead of providing disposable water bottles Take back excess promotional materials for reuse/recycling Offer incentives, such as reduced disposal fees or faster teardown services, to convention exhibitors who minimise leftovers and take back excess materials.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Conference Facilities

		Basic	Advanced
Others	Reuse	<ul style="list-style-type: none">• Reuse potted floral arrangements purchased for special events for other hotel events.• Reuse table decorations (e.g. fresh floral bouquets) in meeting rooms or other areas of the hotel.	-

Reduce and Reuse practices for Landscaping

Basic			Advanced
Horti-cultural Waste	Reuse	<ul style="list-style-type: none"> • Leave grass clippings on the lawn to decompose into fertiliser. • Offer live plants slated for replacement to employees or donate them. 	-
	Reduce	<ul style="list-style-type: none"> • Return plastic seeding pots to nurseries. 	-

Reduce and Reuse practices for Purchasing

		Basic	Advanced
Packaging Waste	Reduce	<ul style="list-style-type: none">• Combine supply orders from various departments to reduce packaging waste and benefit from volume purchasing discounts.• Buy products in the largest quantity possible in one package. For perishable items, purchase only what is required. One large container of product utilises less packaging per unit than several smaller containers.	<ul style="list-style-type: none">• Work with vendors for customised solutions to reduce packaging waste, for example:<ul style="list-style-type: none">• Increase the shipping case size of certain items so that fewer cases are needed for the same number of items.• Tailor packaging to reduce overall packaging use, e.g. package beer in kegs instead of bottles/cans, eliminate cling wrap.• Deliver goods in reusable containers or other waste packaging (e.g. pallets, carton boxes, etc.) that are returned to suppliers for reuse.• Schedule deliveries such that supplies are immediately unpacked and packaging materials are returned to suppliers for reuse.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Reduce and Reuse practices for Purchasing

		Basic	Advanced
Packaging Waste	Reuse	<ul style="list-style-type: none"> Reuse packing materials, such as boxes, shipping peanuts, and bubble wrap. Allow staff to reuse unlabelled packaging materials for personal use, e.g. house moving and travel packaging. 	-
	Reduce	<ul style="list-style-type: none"> Rent items and equipment that are rarely used, rather than buy them. Repair items rather than purchase new ones. Buy products with recycled content to help conserve natural resources. 	<ul style="list-style-type: none"> Review buying records at least once a year to reduce over-purchasing of supplies. Chart the shelf life of items and purchase only when the item is needed. This reduces spoilage. Procure products and equipment that are reusable, refillable, durable and repairable. Over the useful life of the item, buying for durability and reuse will save money; and keeping materials in use longer will generate less waste over the long term. Negotiate for longer and more comprehensive warranties and service contracts when purchasing durable products.
Others	Reuse	<ul style="list-style-type: none"> Donate unwanted items that are still in working condition such as linen, blankets, old curtains, china and glassware to charitable organisations, or sell them to staff for reuse. 	-

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

4.2 Recycling

a) Identifying recyclables

For waste materials that cannot be reduced or reused, identify whether they can be accepted by local recyclers for recycling.

Generally, 50-65% of a hotel's waste is recyclable. The amount of recyclables generated depends on factors such as: type of hotel, occupancy, number and size of meal functions, bars, restaurants, lounge activity, conventions, guest and employee activities, and purchasing practices. An estimated quantity of each recyclable waste type should be available from a waste audit.

The type of recyclable wastes that is usually found in a hotel are listed in the table below. Do note that items sent for recycling should not have food or liquid residue, and should be rinsed, if necessary, to prevent contamination. Contamination lowers the value of recyclable materials, and materials that are badly contaminated cannot be recycled at all.

Common waste types	Paper	Office paper, cardboard boxes/packaging, newspapers, telephone books, magazines, brochures, posters, junk mail, shoe boxes, milk and juice cartons
	Metal	Used aluminium cans and containers, tin and steel cans and containers
	Glass	Used wine and beer bottles, sparkling or still water bottles, sauce bottles, jars (for cookies, jam, etc.)
	Plastic	Mineral water bottles, sauce bottles, detergent bottles, food containers, food and goods packaging, shrink wraps, plastic garment bags
Other waste types	Food	Raw and cooked food waste (excluding used cooking oil)
	E-waste	Photocopier and printer cartridges, electrical and electronic equipment of any kind to be discarded
	Lighting	Fluorescent lamps and compact fluorescent lamps
	Soap	Used soap bars
	Others	Used wooden pallets, horticultural waste

b) Selecting recycling service providers

Now that the potential recyclables and their estimated quantities in the hotel have been identified, the next step is to select a contractor to supply recycling bins and provide services for the regular collection of the recyclables.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

1. Common waste types (Paper, Metal, Glass, Plastic)

There are a number of recycling companies and waste disposal contractors in Singapore which accept the four common waste types for recycling. A list of collectors with recycling services can be found at this [link](#).

The hotel can either engage a contractor who can provide both recycling and waste disposal services, or engage two or more contractors who will provide recycling and waste disposal services separately.

Cost Components of Waste Disposal and Recycling Contracts

- Disposal Costs

Waste disposal service fees usually comprise three cost components:

- Container Rental Fee:** This is the monthly fee charged by the contractor for the rental of a compactor, an open top container, or waste bins on-site.
- Haulage Charge:** This is the fee charged by the contractor for collecting and transporting waste to a waste-to-energy plant for disposal.
- Disposal Tipping Fee:** This is the fee charged by a waste-to-energy plant / landfill for the amount of waste being disposed of. It is based on the weight of your hotel waste and the contractor will pass this fee to the hotel. As of May 2016, the disposal fee is \$77/81 per tonne. The fee standard can be found at this [link](#).

Some waste contractors may charge a flat fee, combining all three cost components, while some contractors will give a total monthly fee and provide a cost breakdown, depending on the contract agreed upon.

However, it is recommended for hotels to have a usage-based waste disposal contract, i.e. pay less when the hotel throws less and vice versa, as this would allow the hotel to reap immediate savings from any reduction in waste disposed of.

- Recycling Costs

For recycling service fees, there are also a few elements of costs and revenue involved:

- Container Rental Fee:** This is the monthly fee charged by the contractor for the rental of large recycling bins on-site.
- Haulage Charge:** This is the fee charged by the contractor for collecting and transporting recyclables to their material recovery facility or to other recycling companies for further processing.
- Processing Fee:** This is the fee charged by the contractor for sorting, baling and processing the recyclables.

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- iv. Revenue: There is a market value for some sorted and / or processed recyclables. When your contractor sells sorted and / or processed recyclables to traders / manufacturers, they will earn and keep this revenue.

Hotels may consider bundling waste and recycling collection services to reap cost savings from reduced amount of refuse. If the value of the processed recyclables is greater than the total cost of (i) to (iii), it is likely that the contractor will be able to offset part of the cost to the hotel. If the total cost is higher than the revenue, the contractor will charge a fee for the recycling programme.

To achieve a better price for recycling and waste disposal services, your hotel may like to invite a few companies to submit their bids and then choose the one(s) which can meet your needs at a better overall price.

If your hotel is small and does not generate many recyclables, you may wish to consider sharing recycling & disposal services with nearby businesses which also want to reduce their waste. This may help reduce the service cost.

Methods of collection

There are two methods of collection of recyclables.

For hotels which generate significant amounts of each waste type, they can adopt the **segregated collection system**, i.e. different collection bins for different types of materials. The other method is the **commingled collection**, i.e. all the recyclable materials are mixed and stored together.

Hotels should work with the collectors to come up with the collection method that best suits their needs.

2. Other waste types

There are separate collectors or suppliers that provide recycling solutions for the other less common waste types, such as food waste, electronic waste, lighting waste, and used soap bars.

Food waste

The preferred way to manage food waste is to avoid food wastage at the outset. NEA has developed various outreach materials on food waste minimisation and treatment. Organisations keen to embark on their own Food Waste Reduction programme may tap on the resources available [here](#). NEA and the Singapore Food Agency (SFA) have also worked with various industry stakeholders to publish [food waste minimisation guidebooks](#) for food retail establishments, supermarkets and food manufacturing establishments to reduce food waste across the supply chain.

NEA encourages both organisations and members of the public to donate their unsold and excess food to food distribution organisations. Food retail establishments can contact these organisations to make arrangements for the donation of their unsold and excess food.

Under the Resource Sustainability Act, owners and occupiers of commercial and industrial premises that generate large amounts of food waste will be required to segregate their food waste for on-site or off-site treatment from 2024.

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There are suppliers of on-site food waste treatment systems that can convert food waste into organic fertiliser/compost or non-potable water. The organic fertiliser/compost can be used for landscaping and gardening, while the non-potable water can be used for cleaning the system.

A non-exhaustive list of Food Distribution Organisations, Local Recycling Facilities and Suppliers of on-site food waste treatment system can be found at the [NEA Food Waste Management webpage](#).

For owners and operators of premises that are not able to adopt on-site treatment due to limitations such as space constraints, they may opt to send their food waste for off-site treatment in future upon completion of Tuas Nexus, Singapore's first integrated water and solid waste treatment facility.

To do so, they are required to engage an [NEA-licensed General Waste Collector \(GWC\)](#) with Class B licence for the transportation of segregated food waste to a licensed waste disposal facility for treatment. An example of a licensed waste disposal facility for the treatment of segregated food waste will be the upcoming food waste treatment facility in Tuas Nexus (expected to be operational in 2025).

More information on how to set up a food waste segregation workflow can be found in the [Food Waste Segregation and Treatment Guidebook](#).

Electronic waste (E-waste)

For any electrical or electronic equipment that cannot be reused or repaired, it should be recycled properly as e-waste contains small amounts of heavy metals and substances of concern.

Your hotel may engage e-waste recyclers directly or, if the amount is not large, the e-waste can be deposited at designated collection points (collection points can be found at this [link](#)).

For used copier and printer cartridges, your hotel may work with the supplier to take these back for reuse or recycling.

Soap waste

There are several organisations that collect used soap bars, to be sanitised and recycled into new soap bars to benefit impoverished communities in developing countries.

Other waste

For used wooden pallets, your hotel can work with suppliers to take back the pallets for reuse.

Horticultural waste produced from landscaping activities should be removed by the landscaper for recycling, or composted on site. Hotels can require landscaping contractors to recycle the horticultural waste by stating it in the specifications of landscaping contracts.

c) Selecting locations for recycling bins

The following are a few considerations for the placement of recycling bins. They should:

- Be easily accessible to staff or guests
- Match the type of recyclable waste produced at that location (e.g. food waste bin for kitchens, paper recycling bin for offices, etc.)
- Be placed together with general waste bins – to prevent misuse of the recycling bins for general waste

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Recycling bins to be placed at the front-of-house would need to be procured by the hotel as the recycling bins provided by the collector are more appropriately placed in back-of-house areas or bin centres.

Recommendations of types of recycling bins for different areas in a hotel are listed below.

Kitchens and F&B outlets	<ul style="list-style-type: none"> Food waste recycling bins/digester
Guest rooms, Laundry and Housekeeping	<ul style="list-style-type: none"> Recycling bins (for paper, metal, glass and plastic) placed next to waste bins in all guest rooms, and/or back-of-house sorting of general waste by chambermaids Soap waste recycling bin in Housekeeping
Offices (including business centres)	<ul style="list-style-type: none"> Paper recycling bin Ink cartridge recycling bin
Conference facilities	<ul style="list-style-type: none"> Paper recycling bin
Purchasing	<ul style="list-style-type: none"> Paper and plastic recycling bin for packaging waste

Step 5: Develop a 3R Programme

The 3R Team can develop a 3R programme for your hotel including:

- Targeted waste types for waste reduction, reuse and recycling,
- Details of the proposed 3R initiatives for targeted waste types,
- Estimated costs and / or cost savings involved,
- Estimated quantity of waste reduction (i.e. kg) for each waste type,
- Implementation schedule of the options (steps or phases and timing for implementation),
- Implementation requirements, such as equipment and manpower,
- Training of personnel involved,
- Measurable performance indicators and targets, such as waste reduction or recycling rate,
- Timeline for achieving the targets

In addition to the write-up of the programme, a summary table of the 3R Programme, similar to the one below, can be created for ease of reference for the 3R team.

Summary of 3R Programme

Waste Type	Area	Proposed 3R option (reduce/reuse/recycle)	Waste reduction/reuse/recycling goal (kg)	Estimated costs/savings	Start date	End date	Status

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Step 6: Implement and Improve the 3R Programme

For a successful implementation of the 3R Programme, the following are necessary:

Responsibilities and Resources

Firstly, there should be dedicated resources to see the 3R initiatives through. Clear responsibilities and authority should be assigned to appropriate personnel in all administrative, operating and maintenance areas. The 3R initiatives should be made part of the hotel's standard operating procedures.

The 3R Team should ensure that the various initiatives are carried out according to schedule.

Education and Promotion



Before launching the 3R Programme, the initiatives should be well communicated to all stakeholders, i.e. staff, management, guests and suppliers, to gain their support. They should be clear about the goals and objectives of the 3R Programme to ensure its success.

The following communication measures could be used for creating awareness and promoting participation:

Staff:

- Conduct briefing for all staff on 3R initiatives and how they can participate (e.g. 3R tips, location of recycling bins, how not to contaminate the recyclables, etc.) – for new staff, this should be part of an orientation programme
- Arrange special training for those who are involved with the handling of recyclable wastes, e.g. housekeeping, stewarding, etc.
- Make the 3R Programme (implementation schedule with goals) easily accessible through intranet or via notices/posters at prominent staff locations
- Display reminder notices at strategic locations, e.g. poster/e-message to encourage staff to reduce paper waste printing or photocopying areas, posters to remind staff to reduce food waste at staff canteen
- Make 3R tips available to staff through the intranet and emails
- Share and update 3R initiatives and waste reduction results periodically with staff

Guests:

- Make the hotel's environmental policy (and 3R Programme) available on the hotel's website, newsletters, and in-room directories
- Inform guests of the nearest recycling bins

Suppliers:

- Circulate the hotel's environmental policy to inform suppliers of the hotel's 3R efforts
- Regularly enquire with suppliers about environmentally friendlier options for their products

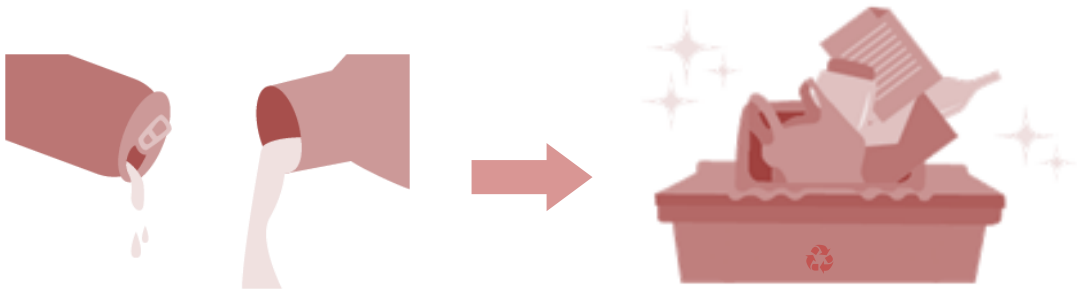
The official launch of the 3R Programme at the hotel should preferably be presided by the hotel Owner or General Manager to show top management's support and commitment.

CHAPTER 3: A STEP-BY-STEP GUIDE TO A 3R PROGRAMME

Monitoring, Evaluation and Improvement

To ensure a sustainable programme, the team should:

- Obtain monthly waste and recycling tonnage reports (this could be requested from the collector/s) to monitor waste reduction and recycling performances against the targets set
- Maintain records of waste disposal fees and recycling collection fees/revenue to calculate monthly cost savings in the form of reduced disposal costs and/or revenue obtained from the sale of recyclable items
- Conduct routine inspections of recycling bins to identify sources of contamination and misuse, if any



- Empower staff to monitor the programme for any new problems and feedback to the 3R Team
- Involve vendors and suppliers in discussions for 3R best practices
- Encourage guests to provide feedback or ideas to improve the hotel's 3R practices
- Conduct annual reviews of the 3R Programme – this includes a waste audit to identify new 3R opportunities, making changes to initiatives if needed and setting higher waste reduction/recycling targets

CHAPTER 4: MANDATORY WASTE REPORTING FOR LARGE HOTELS

The mandatory reporting of waste data and waste reduction plan by large commercial premises under the Environmental Public Health Act, starting with large hotels (with more than 200 rooms) and shopping malls (with net lettable area of more than 50,000 square feet), took effect on 1 Apr 2014.

The mandatory reporting requirement aims to better draw and sustain greater management attention on the amount of waste produced by the premises and help build greater awareness of the potential for improving their waste management systems.

More information, including the reporting templates, can be found at this [link](#).

Participation in the 3R Programme for Hotels will help these large hotels to meet the reporting requirements of mandatory waste reporting.

Methods of Data Collection

Hotels can choose one or a combination of the following three methods to properly measure the waste disposed and recyclables collected.

Method 1: Engage the waste collectors to provide waste and recyclables tonnages.

Method 2: Procure weighing equipment for in-house measurement of waste and recyclables generated on-site.

CHAPTER 5: CASE STUDIES

Case Study – Crowne Plaza Changi Airport

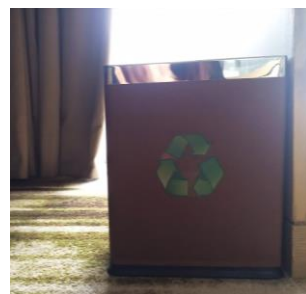
Crowne Plaza Changi Airport was designed with an eco-conscious approach, incorporating nature-inspired elements and using environmentally-friendly materials. The hotel's Environmental Management Committee (EMC), which consists of staff from various departments, spearheads green initiatives for the hotel.

Food waste recycling

The hotel uses a food waste digester to convert food waste into non-potable water which can be used for multiple purposes, such as general cleaning and watering plants. Food waste constitutes 11% of waste generated in Singapore. With the digester, the hotel has diverted about 114 tonnes of food waste annually from incineration.

Placement of recycling bin

To encourage recycling efforts by both guests and staff, recycling bins are provided in all its 563 guest rooms, by the swimming pool, lift lobbies, and in several offices.



Staff and guest engagement on the 3Rs

Employees actively participate in the hotel's green efforts, such as segregating food waste at the staff canteen for recycling. To educate staff on waste management in Singapore, the EMC conducted an educational tour to Semakau Landfill. The overwhelming amount of waste disposed made the staff more aware of the alarming rate at which the landfill was being filled and understood that they, too, should play their part in reducing waste in Singapore.

The hotel's environmental policy is displayed on the TV homepage in guest rooms to inform them about the sustainable actions taken by the hotel. There is also a communication board for employees to find out more about the hotel's green initiatives and get information on how they can do their part for the environment.



CHAPTER 5: CASE STUDIES

Case Study – ibis Singapore on Bencoolen

Located in the heart of Singapore's CBD, the multi-award winning ibis Singapore on Bencoolen offers 538 rooms that are suited for both business and leisure travellers. Boasting great service at budget-friendly prices, the hotel has easy access to major attractions in the city, whilst providing a variety of eco-friendly options for guests to take advantage of.



Use of refillables

ibis Singapore on Bencoolen is one of the few hotels in Singapore which uses refillable shampoo and body wash soap dispensers instead of the conventional disposable shampoo and body wash bottles; and refillable borosilicate water bottles. For the latter, the hotel allows hotel guests who participate in their Eco Clean programme to borrow or purchase a bottle and refill with either sparkling or still water with a water dispenser system provided by Lovearth (an eco-bottling solution by Dr Who Waterworks).

These practices reduce the amount of plastic waste that would have otherwise been generated from disposable amenities and drinking water bottles. Since the start of the programme, the hotel has seen over 6,000 bottles purchased or borrowed, and hence avoided the disposal of over 6,000 plastic water bottles.

Case Study – Regent Singapore

Regent Singapore has embarked on a journey towards a more sustainable future with hotel-wide green initiatives to promote environmental awareness, waste minimisation and energy efficiency.

Reduction in size of soap bars

Regent Singapore monitored the usage pattern of soap bars by its guests and determined that the previous size of 100g was too large. The hotel reduced the size of the soap bar to 50g instead, which helped reduce purchasing cost and waste (soap & packaging), with no negative feedback from guests..



Printing reusable notices

The hotel avoided printing 550 paper notices every month by standardising its fire alarm testing schedule to a fixed day and time. This allowed them to print the notices on vinyl which is reusable and lasts longer. With the success of this initiative, they have converted their Do Not Disturb cards, sustainability cards and newspaper door knob handles to the same material.



CHAPTER 5: CASE STUDIES

Case Study – Mandarin Oriental, Singapore

Aligned with one of our group-wide guiding principles ‘Acting with responsibility’, Mandarin Oriental, Singapore is committed to *Doing More for a Sustainable Future* and directing their efforts towards the wellbeing of the planet, of communities and of individuals through their Naturally Better programme.

The hotel has taken significant steps towards waste prevention through a series of initiatives such as encouraging digitalisation to go paperless, reducing print volume, use of refillables as well as partnering with local non-profit organisations to redirect surplus amenities from hotel operations.

Going Paperless and Reducing Print Volume

Mandarin Oriental, Singapore managed to reduce paper wastage through its Mandarin Oriental Digital Library, which enables guests to switch to e-paper from printed newspapers. The hotel has also digitalised its administrative process, which is a key step in waste prevention. Some of these processes include the digitalisation of in-room guest directories and the use of e-signature tools.

Use of Refillables

Plastic bottles in guestrooms have been replaced with glass bottles and individual travel-sized products have been replaced by wall-mounted bathroom amenity dispensers.

The hotel has commissioned an in-house water bottling plant where reusable glass bottles are refilled daily. The operations of the eco-friendly plant can provide clean drinking water for guests without the need for disposable plastic bottles. This is a sustainable shift in the provision of premium bottled water and an ode to environmental excellence.



Surplus Resources diverted from Waste

Through collaborations with local non-profit organisations, surplus amenities and used soaps are collected and redistributed to beneficiaries in Singapore. This initiative extends the lifespan of products and increases the circularity of products within the market.

CHAPTER 5: CASE STUDIES

Annual Waste Audit

The hotel also identifies opportunities to reduce its waste through waste audits and implementation of waste management initiatives.

An annual waste audit is conducted by trained colleagues from various departments to identify waste quantity and composition, as well as ways in which waste can be reduced, reused or recycled.

Monthly inspections are also conducted on waste bins and the compactor to ensure that the waste is thrown into the correct receptacle, and recyclable items are sorted out. The findings are discussed in meetings and corrective actions taken.



Supplier Engagement on the 3Rs

The hotel proactively communicates its responsible procurement policy to all its suppliers and engages them to support its sustainability efforts. Goods are delivered without packaging, or packaging material is taken back by suppliers for reuse.

For example, food products are delivered to the hotel in reusable baskets and transferred into the hotel's containers of various colours (for different products). Thus, no packaging materials are used for these products and the overall packaging waste has reduced significantly. In addition, disposable cardboard egg trays are changed to reusable plastic trays. The trays are provided by the supplier at a charge and rebates are credited to the hotel when trays are returned for reuse for future deliveries.



For More Information

More information can be found at:



- <https://www.nea.gov.sg/our-services/waste-management/overview>
- this QR code

Locations of collection points for electronic waste, Cash-for-Trash stations – where recyclables can be exchanged for cash, and food distribution organisations can be viewed at the following websites:

- Electronic waste [here](#)
- Cash-for-Trash stations and other recycling/collection points [here](#)
- Food Distribution Organisations, Local Recycling Facilities and Suppliers [here](#)

