Best Practices Guidebook

for Sustainable Consumption and Production in the Food & Beverage and Garment Sectors in Myanmar

PREVENT PLASTICS

switchasia

Funded by the European Union

Imprint

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Prevent Plastics

PREVENT PLASTICS

Started in May 2020, Prevent Plastics is a four-year project funded by the European Union with the aim to promote Sustainable Consumption and Production patterns in Myanmar through raised awareness and best practices on waste management. The project is a joint approach of sequa gGmbH, Myanmar Banks Association, STENUM Asia & Thant Myanmar.

To learn more, visit **https://preventplastics.org**

Project partners:

sequa

CMHL City Mart Holding Co., Ltd.

STENUM Asia

သန့်မြန်မာ THANT MYANMAR

SWITCH-Asia

switchasia

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SWITCH-Asia is a programme funded by the European Union (EU). Active since 2007, it seeks to promote Sustainable Consumption and Production (SCP) in the region.

To learn more, visit **www.switch-asia.eu**

Disclaimer

This publication has been produced with the financial support of the European Union. The contents of this publication are the sole responsibility of the Prevent Plastics project and can in no way be taken to reflect the views of the European Union.

Contents

1
Getting to know this guidebook 5

1.1 Introduction to this guidebook 7

1.2 Target group of this guidebook 8

1.3 Structure of this guidebook 10

2
Understanding waste 13

2.1 Waste, as a resource 15

2.2 Waste minimisation and prevention 17

2.3 The 7R principle of circular economy 19

2.4 The 3R initiative of waste management 22

2.5 Role of waste segregation in waste recycling 28

3
The food and beverage industry 29

3.1 Introduction to the food and beverage industry in Myanmar 31

3.2 Types of waste generated and its impact on the environment 33

3.3 Best practices for the food and beverage industry 37

3.4 Showcases of implementations 54

4
The garment industry 61

4.1 Introduction to the garment industry in Myanmar 63

4.2 Types of waste generated and its impact on the environment 65

4.3 Best practices for the garment industry 69

4.4 Showcases of implementations 83

1

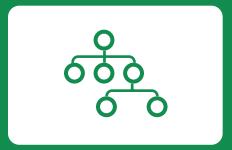
Getting to know this guidebook

1.1

Introduction to the guidebook

1.2

Target group of the guidebook



1.3

Structure of the guidebook

1.1 Introduction
to the guidebook

This guidebook has been prepared under the Prevent Plastics project, funded by the European Union SWITCH-Asia grants programme in Myanmar.

Myanmar has been facing considerable challenges with waste management. Rapid economic growth and urbanisation have led to severe problems resulting from an ineffective system for waste collection, transport, and disposal. One of the objectives of the Prevent Plastics project is to minimise waste in factories and promote Sustainable Consumption and Production (SCP) through its waste reduction program (WRP).

In the WRP, the Prevent Plastics team has conducted waste audits and provided actionable guidance to 87 factories on waste minimisation, water savings, energy savings, and implementing SCP best practices, including health and safety best practices.

This guidebook is a compilation of the best practices and findings observed during the audits, based on practical field experience, and aims to offer actionable guidance for minimising waste and reducing water and energy use. We observed that the garment, food and beverage sectors are major manufacturing industries in Myanmar; hence, this guidebook is focused on these two sectors.

1.2 Target group
of the guidebook

The main objective of this guidebook is to make the knowledge and experience gained from implementing Sustainable Consumption and Production (SCP) practices under the Prevent Plastics project available to a wider range of relevant stakeholders in the food & beverage and garment sectors.

This guide aims to help these stakeholders utilise and replicate the Prevent Plastics interventions.

The key target groups are:

SCP local consultants
of the Prevent Plastics project

After the conclusion of the project, this guidebook can serve as a reference for the most relevant measures implemented in Myanmar. It lists best practices for minimising waste and reducing water and energy use.

Local consultants can therefore use this guide to implement similar SCP measures in other factories, thereby ensuring the sustainability of the project's approach and extending the impact.

Industry Associations

in both the F&B as well as the garment industry sectors

These industry associations can use the guidebook to motivate, inform and guide their members on implementing SCP practices. The guide includes best practices for waste minimisation, water usage reduction, and energy efficiency, with numerous examples demonstrating how minimal effort can lead to attractive cost savings and contribute to more sustainable consumption and production.

Managers and Owners

of the various factories in both the F&B as well as the garment industry sectors

They can apply the SCP practices listed in this guidebook to their own operations. The guide presents the business case for such SCP practices and also provides actionable insights to help implement effective SCP measures in their factories.

1.3 Structure of the guidebook

The guidebook is designed in an easy-to-use manner, allowing for easy access of all technical information provided.

It can be used in four different ways:

- as an introductory guide to SCP in general for Food and Beverage sector and Garment sector
- as a collection of both general and sector-specific SCP issues and respective options for improvement.
- as a tool for learning how to assess and increase resource efficiency at an enterprise and
- as an overview of the SCP measures implemented by the Prevent Plastics project in Myanmar.

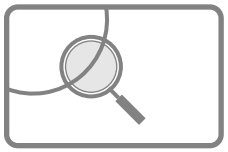
For those who wish to get an overview of specific measures implemented in Food and Beverage and Garment sector in Myanmar, the showcases in chapters 3 and 4 are particularly useful. They provide actionable guidance with examples of various approaches of Resource Efficiency (RE) and SCP and what investments (financial and in terms of materials etc.) are required and most importantly what gains can be achieved through implementation of the measure.

The manual is structured in a way that allows for either chronological reading, leading to a comprehensive understanding of the broad SCP context and specific problems, potentials and tools; or reading of single chapters only when referring to individual topics. As a starting point, the guidebook aims to change the perception of waste from being viewed as valueless rubbish to being recognised as a valuable resource. It highlights the importance of waste prevention at source rather than waste treatment and disposal. The best practices listed in this guidebook are based on 3R (Reduce, Reuse, Recycle) initiatives and SCP.

A detailed explanation of the structure of the guidebook is presented in the next page.

This guidebook consists of four chapters -

1



Getting to know this guidebook

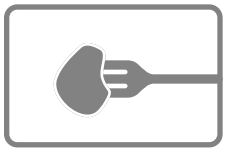
- Introduces the context of this best practices guidebook
- Explains the target audience and structure of this guidebook

2

Understanding waste

- Introduces the concept of waste as a useful resource, citing examples from the food and beverage and garment industries
- Highlights the importance of waste prevention and minimisation in the waste pyramid through the 7Rs of the circular economy and the 3R initiative

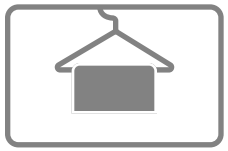
3



The food and beverage industry

- Describes the different types of waste generated in the food and beverage industry through process flow diagrams
- Provides actionable guidance to food and beverage industries for minimising waste generation, reducing water consumption, reducing energy consumption, and improving energy efficiency

4



The garment industry

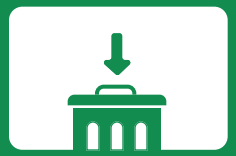
- Describes the different types of waste generated in the garment industry through process flow diagram
- Provides actionable guidance to the garment industries for minimising waste generation, reducing water consumption, reducing energy consumption, and improving energy efficiency

2

Understanding waste

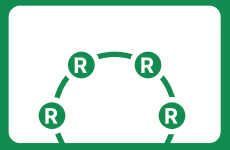
2.1

**Waste,
as a resource**



2.2

**Waste prevention and
minimisation**



2.3

**The 7R principle
of circular economy**

2.4

**The 3R initiative
of waste management**

2.5

**Role of waste segregation
in waste recycling**

2.1 Waste, as a resource

A common idea about waste is that it's valueless rubbish to be gotten rid of.

Either the resource (in the form of a product) should continue to be in use or post use, it could generate economic value when used to create new products. A change in mindset, from "managing" or "dealing with" waste towards optimum use of resources is a necessary part of a more sustainable future. What is commonly called "waste" is, in fact, a resource if it is put in the right place! This is because the material often holds value for generating economic gain when correctly and creatively used. There are many instances of using waste as a raw material or for creating new products.

Let's take a look at some examples to understand the concept of waste as a resource -

Example from the textile industry - fabric cut pieces.
In the garment industry, fabric cut pieces, often considered scraps or waste during garment production, can be transformed into new, valuable products such as scrunchies and tote bags. This method of utilising the resource (in this case: fabric) not only reduces waste but also creates additional revenue streams for manufacturers and designers.

Example from the food and beverage sector - whey (a by-product of cheese making).
In the food and beverage sector, whey (a by-product of cheese making) is a very good source of protein. Rather than discarding whey, some companies use it as a raw material to make protein drinks that they can sell at a premium. Whey is also used in powdered form in chocolate and sugar confectionery, bakery products, soups and sauces, baby foods, etc.

Therefore, treating "waste" as a resource can help create additional value for enterprises.

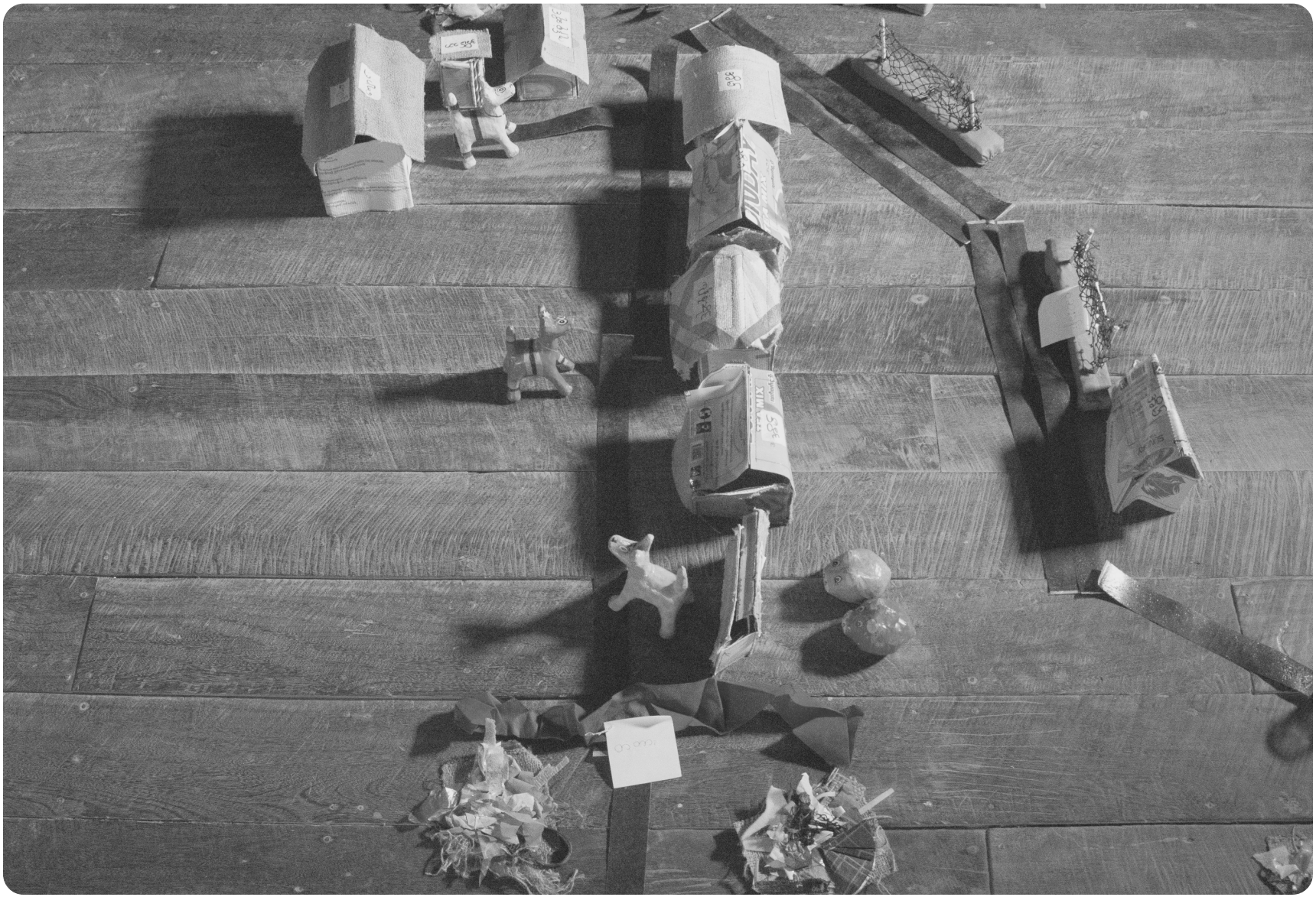


Figure 2.1

A miniature town made from odd bits and pieces of discarded waste

2.2 Waste prevention and minimisation

Waste management is a cross-cutting issue linked to other thematic areas such as health, poverty, food security, and sustainable consumption and production.

Un-managed waste, particularly wet waste, can spread infections and diseases, particularly amongst marginalised and poor communities. High amounts of food waste in the economy can lead to shortage of food for those with limited means. On the one hand, wastage of natural resources in production or consumption processes leads to additional extraction of fresh resources to make up for the loss due to wastage leading to environmental damage, and on the other hand the wasted resources can directly harm the environmental upon interacting with the environment.

Therefore, many varied approaches to address the waste problem need to be evaluated.

Figure 2.2

A stray dog watches plastic waste accumulate by the shore of a stream in Myanmar

2.3 The 7R principle
of circular economy

The 7R Framework of the circular economy could be implemented to minimise the waste generated at source.

The 7R's are explained below -

Rethink
This requires the re-imagining and questioning the use of a resource or a material in the first place.

e.g. – Do you really need that extra layer of packaging for the product – which gets discarded by the consumer?

Redesign
Can the design be modified to promote enhanced use of the resources/material consumed to make the product?

e.g. – Can a bar of soap packed with plastic and cardboard at a hotel room be replaced by a refillable liquid soap dispenser?

Reduce
This focuses on minimising resource use at source to ultimately reduce waste generation.

e.g. – Can a water-saving aerator be installed in taps to lower the water flow rate, hence reducing water wastage?

Figure 2.3

The 7R principle of circular economy

Reuse

Try to find ways in which this waste can act as a resource.

e.g. – Can a catalyst or reagent that is used just once and thrown be reused for a second time, perhaps in another process?

Refill

Services like refilling could be implemented in reducing the waste generated by using single use packaging containers.

e.g. - Can "Bring your own containers" schemes be promoted?

Repair

Rather than discarding or throwing away a damaged object, have it repaired so that the object continues to be in use. This not only reduces waste but also reduce fresh resources from being used to make a new object.

e.g. - Can the thrown jacket be repaired rather than thrown out?

Recover

As a final option, any leftover waste can be used to create new forms of energy or resources.

2.4 The 3R initiative
of waste management

The 7R principle of circular economy—Rethink/Redesign, Refuse, Reduce, Reuse, Repair, Refill and Recover—offers a comprehensive framework for sustainable waste management. Within this broader framework, the 3 Rs - Reduce, Reuse, Recycle - emerge as core actions that are essential for addressing waste and resource efficiency in a practical and impactful way.

By focusing on these three (3R) fundamental practices, we can simplify the approach to waste management while still aligning with the overarching goals of the 7R principle.

The 3 Rs are explained in greater details below -

Reduce
the waste as much as possible

In cases where waste cannot be eliminated completely, certain technologies or processes could be used to minimise/reduce the waste generation at source. Technologies and processes can be optimised to use materials more efficiently and generate less waste.

For instance, in manufacturing, optimising the cutting process can reduce fabric scraps. Minimisation efforts help in lowering the overall volume of waste that needs to be managed and disposed of.

Waste/resource monitoring plays a significant role in waste reduction. It helps identify where waste is generated most frequently, whether in production processes, packaging, or other areas. This identification not only highlights specific sources of waste but also reveals where resources are being used inefficiently. By understanding where resources are overused or wasted, targeted interventions can be implemented to address these issues. This leads to more efficient resource management hence leading to reduction in waste generation.

To help the industries in Myanmar monitor their resource use and waste generation, a web-based platform, **Ref-Track** was developed and launched under this project.

Visit **https://ref-track.com** to know more.

Reuse

resources to minimise the generation of additional waste

Reuse involves finding new uses for materials and products that would otherwise be discarded. It focuses on extending the lifecycle of the products. Consider the following examples -

Food & Beverage industry
Reusing packaging materials like glass jars and bottles for new products or for in-house purposes can reduce the need for new packaging and minimise waste

Garment industry
The water used for washing of garments in between process steps can be used in “cascades” such that the last rinse water of a batch of garments is used for pre-wash the next batch.

Figure 2.4

A user tries out Ref-Track on his iPad at its launch event in Yangon, Myanmar

This reuse of water does not compromise the quality of washing yet saves over 30% water and also reduces waste water generation.

Recycle

waste materials into new materials and objects

After reduction and reuse, recycling is the next waste minimisation option to be considered. Compared to reduction and reuse, recycling is more labour and energy intensive, and hence the least preferred compared to Reduce and Reuse. But it will still help a company save money and divert the waste from going into the landfill.

The reason recycling is placed at the bottom of the waste management pyramid is because it involves recovering materials that can be used as raw materials for purposes other than their original intent. While recycling reduces the need to exploit natural resources for new materials, it also enables waste materials to be repurposed and utilized as valuable resources, contributing to a more sustainable and resource-efficient economy.

Recycling could be internal or external recycling:

Internal recycling
The waste of one process could be reused in another process within the enterprise. The minimisation of waste would lead to maximisation of profits.

External Recycling
The collection and processing of waste materials from external sources, such as households or other industries, for use in new products. This includes traditional recycling programs where items like paper, plastic, glass, and metals are collected, sorted, and reprocessed into new materials.

Industrial symbiosis is another powerful way to reduce waste. It may be seen as a special kind of external recycling. Industrial symbiosis is an association between two or more industrial facilities or companies in which the waste or by-products of one become the raw materials for the other, in a linear cascading approach. It offers many economic benefits to companies. Its value can derive from -

1. selling or exchanging industrial waste,
2. saving costs on raw materials,
3. cutting expenses linked to waste disposal and,
4. expanding market reach and revenue from by-products.

To help facilitate industrial symbiosis in the industries of Myanmar, a digital platform, **Waste-to-wealth** was developed and launched to serve as an online waste exchange marketplace that would help divert waste from landfills and marine ecosystems to productive use.

To know more, visit **https://waste-to-wealth.com**.

Figure 2.5

A presentation being delivered on the Waste-to-wealth platform at its launch event in Yangon, Myanmar

2.5 Role of waste segregation
in waste recycling

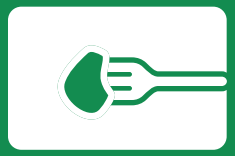
Waste segregation plays a crucial role in facilitating material recovery.

For example, in the garment industry, segregating fabric scraps by type and colour allows for more efficient recycling into new fibres or products. Similarly, in the food and beverage industry, segregating organic waste for composting can recover valuable nutrients for agricultural use.

By implementing effective waste segregation practices, the company can reduce their environmental impact, conserve resources, and contribute to a circular economy by recovering and reusing valuable materials. The value earned from sale of recyclable material is higher when the material is not contaminated or soiled. Here too, segregation at source will help immensely.

3

The food and beverage industry



3.1

Introduction to the food and beverage industry in Myanmar

3.2

Types of waste generated and its impact on the environment

3.3

Best practices for the food and beverage industry

3.4

Showcases of implementations

3.1 Introduction to
the food and beverage industry in Myanmar

In Myanmar, the food and beverage industry are rapidly expanding, fuelled by rising urbanisation and increasing consumer demand.

Recent reports indicate that the industry produces significant amounts of waste, including substantial quantities of packaging materials. The rapid growth of the food and beverage sector underscores an urgent need for enhanced waste management practices. Effective strategies are essential to mitigate the environmental impact of packaging waste and ensure sustainable development. This includes promoting waste minimisation, encouraging the use of reusable packaging alternatives, and improving waste treatment facilities to handle the sector's increasing waste volumes.

Figure 3.1

The food and beverage industry is a rapidly expanding industry in Myanmar

3.2 Types of waste generated
and its impact on the environment

The food and beverage manufacturing process encompasses several key stages, each generating distinct types of waste.

From the initial handling and storage of raw materials, through processing and packaging, to storage and distribution, various waste streams are produced. These include organic waste, packaging materials, and by-products, as well as wastewater and residuals from treatment processes. Understanding the types of waste generated at each stage is crucial for developing effective waste management strategies. The process flow diagram in **Figure 3.2** provides a visual representation of these stages, highlighting where and how waste is produced, thus offering insights into potential areas for improving waste minimisation practices.

The types of waste generated can be grouped into two main categories: solid waste and liquid waste. A detailed categorization of these waste types is presented in **Figure 3.3**. The waste generated by the food and beverage industry has diverse and profound effects on the environment.

During our project Prevent Plastics, intervention we observed that solid waste, including packaging materials such as plastics, glass, and metal, often ends up in landfills, where it contributes to soil and water contamination. Organic waste, such as food scraps, if not composted, can decompose anaerobically in landfills, releasing methane — a potent greenhouse gas that contributes to climate change. Liquid waste, encompassing wastewater from processing operations and chemical residues, poses a significant risk to water quality. When not adequately treated, this wastewater can lead to nutrient runoff, causing eutrophication in water bodies, which depletes oxygen levels and harms aquatic life. Furthermore, the discharge of chemical residues can disrupt ecosystems and contaminate drinking water sources.

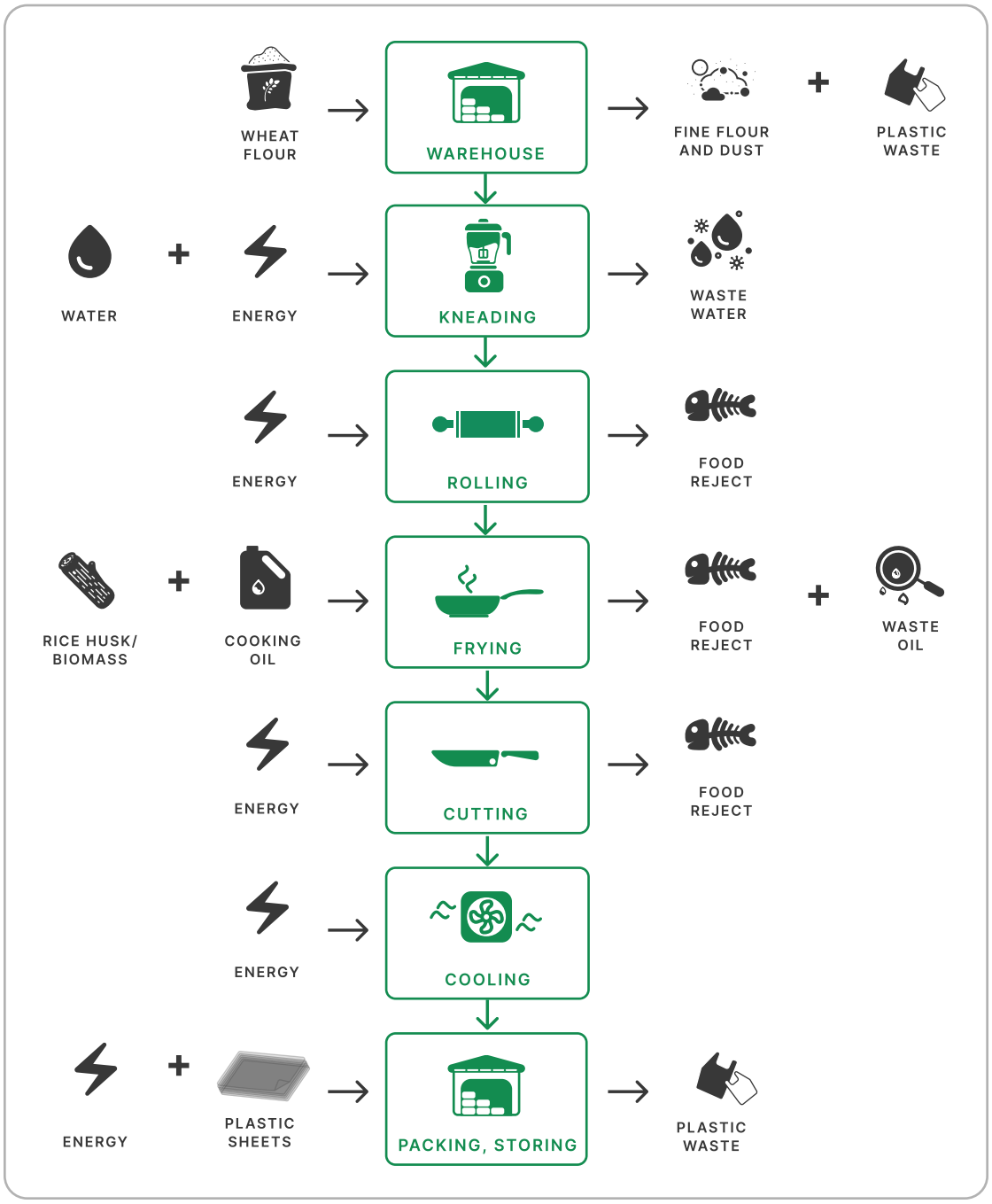


Figure 3.2

The process flow diagram for a generic F&B industry, depicting the various streams of waste within the industry

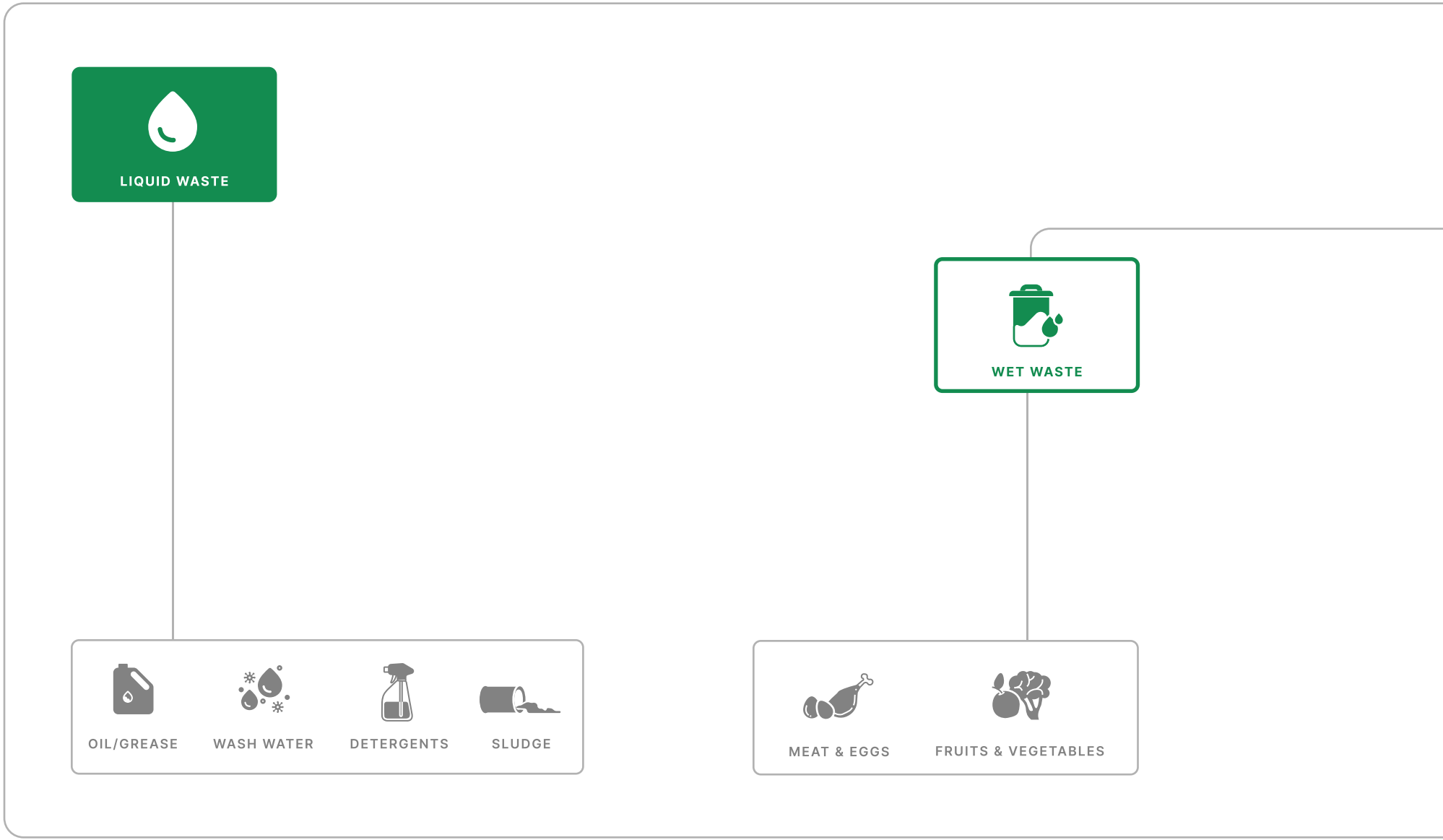
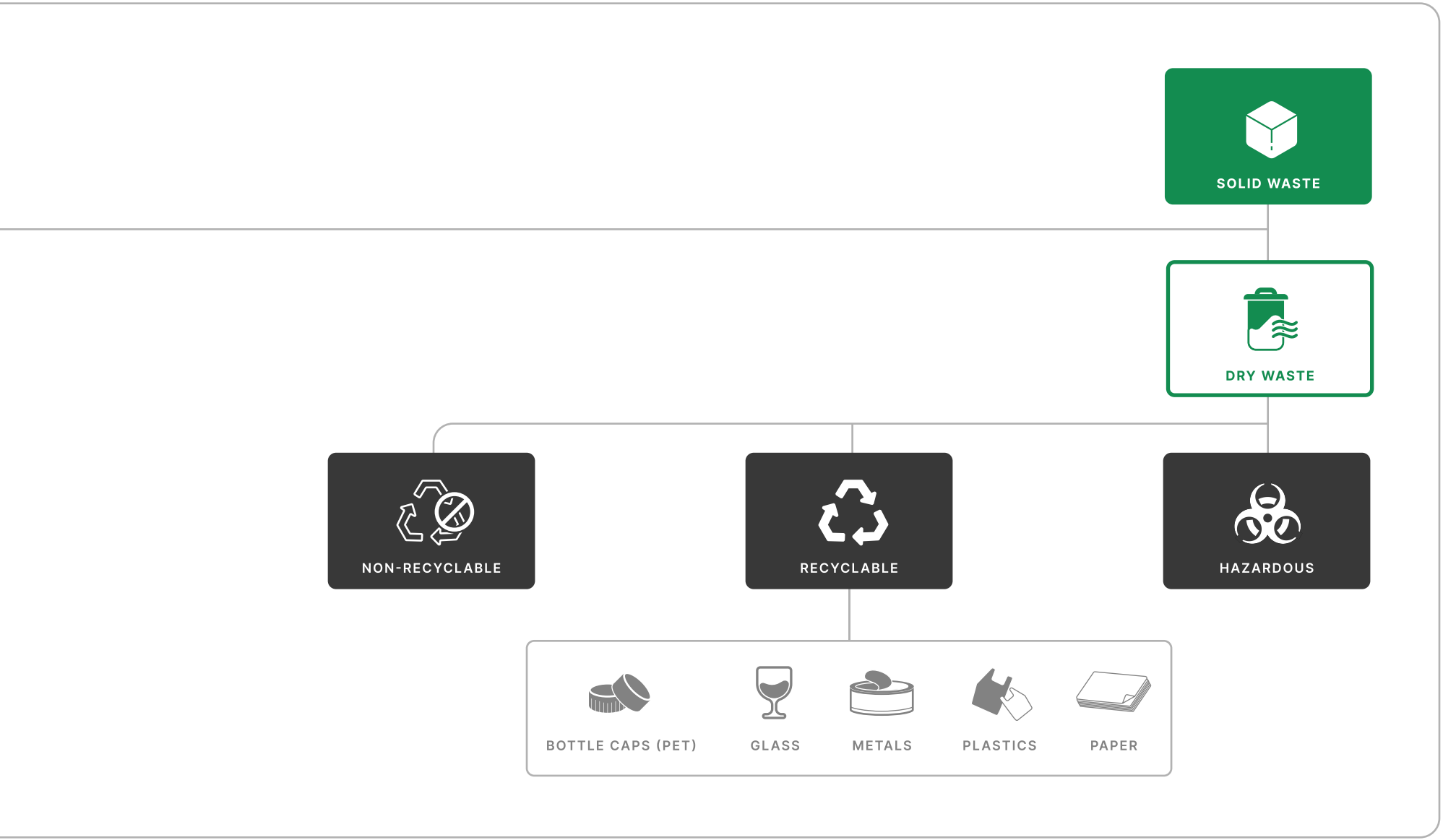


Figure 3.3

The various types of waste generated in the food and beverage industry


SOLID WASTE
DRY WASTE
NON-RECYCLABLE
RECYCLABLE
HAZARDOUS
BOTTLE CAPS (PET)
GLASS
METALS
PLASTICS
PAPER

3.3 Best practices
for the food and beverage industry

The following best practices are provided to assist factory managers, supervisors, and owners in effectively implementing Sustainable Consumption and Production (SCP) practices within their factories.

These guidelines can also be viewed as quick tips for streamlining operations, minimising waste, saving water, improving energy efficiency and enhancing overall operational efficiency and cost savings.

Figure 3.4

Switching to recyclable metal or paper containers to store and pack food, instead of plastic ones

3.3.1

Waste minimisation

Waste minimisation in the food and beverage industry is crucial as it helps reduce resource consumption and lowers disposal costs.

By optimising waste processing and recycling, companies can cut disposal expenses, avoid fines, and even generate revenue from recycled materials. This approach not only reduces costs but also promotes efficient and sustainable practices, making waste management both cost-effective and responsible.

Below are a few practical waste minimisation tips that food and beverage industries can adopt in their daily operations. Implementing these strategies can significantly reduce waste generation and create additional revenue:

In the food and beverage industry, waste generation hotspots can be grouped into three key activities -

Let’s take a look at the best practices for each of these hotspots in greater detail.

PURCHASING AND INVENTORY

- Inspect materials and products upon arrival and promptly return any damaged goods.
- Implement inventory management systems to accurately forecast demand and maintain optimal stock levels, reducing the risk of overstocking or stockouts.
- Use the First In, First Out (FIFO) method to ensure that older inventory is used before newer stock, which helps reduce spoilage.
- Conduct regular inventory audits to identify slow-moving or obsolete items. Adjust ordering practices based on inventory turnover rates.
- Store materials and products in their designated areas with proper shelving, temperature control, and humidity management to prevent damage and minimise waste.
- Choose durable and refillable materials and products. For example, opt for glass bottles instead of single-use plastic ones, and select bulk containers for ingredients that can be refilled to reduce packaging waste and minimise environmental impact.
- Collaborate with suppliers to minimise packaging or arrange for packaging take-back.

FOOD PROCESSING AND MANUFACTURING

- Streamline production processes to minimise excess material use and reduce trimming losses. Adjust production schedules to better match demand and avoid overproduction.
- Utilise by-products and side streams effectively, converting them into valuable products or alternative uses. For example, the pulp from juice extraction can be processed into fruit puree or used as a base for smoothies, jams, or fruit sauces.

- Implement systems to capture and repurpose by-products. For example, a bakery could use bread trimmings to make breadcrumbs or croutons.
- Measure ingredients accurately to prevent excess and spoilage.
- Implement stringent quality control measures to reduce defects and minimise rework.
- Continuously monitor and adjust processes to prevent waste.
- Perform regular waste audits and analyse data to identify areas for improvement and implement targeted waste reduction strategies.

PACKAGING

Packaging waste is a significant component of overall waste in food and beverage enterprises, comprising various materials such as plastics, cardboard, metal, and glass.

- Evaluate existing packaging materials and methods to identify opportunities for reduction. Determine which packaging is essential and which can be minimised or eliminated.
- Adjust packaging designs to use fewer materials without compromising product safety. Consider innovations such as compact designs or multi-functional packaging.
- Choose sustainable and recyclable packaging materials, such as biodegradable containers, paper-based materials, or reusable containers.
- Reduce the use of unnecessary layers in packaging. Avoid double-wrapping products and use streamlined designs.

- Use refillable or reusable packages and plastic cases instead of corrugated shipping boxes. Reuse packaging materials on-site wherever possible.
- Work with suppliers to reduce packaging waste. This can include requesting minimal packaging, returnable containers, and exploring bulk delivery options.
- Inform customers about the importance of reducing packaging waste and how they can contribute, such as by providing information on proper recycling or disposal practices.

3.3.2

Saving water

Water savings in the food and beverage industry are crucial due to the high cost and scarcity of water.

Efficient water use significantly reduces utility bills and lowers expenses related to water treatment. By adopting sustainable practices, companies can ensure compliance with environmental regulations, thereby avoiding fines and legal costs.

Moreover, demonstrating a commitment to water conservation can enhance a company's reputation, attract new business opportunities, and foster valuable partnerships. These efforts collectively contribute to substantial cost savings and promote long-term sustainability in the industry.

Implementing a few simple water-saving tips in its daily operations can lead to significant water and cost savings for the company. These steps are listed below -

- Ensure that water is turned off when not in use. Regularly check taps and motivate employees to turn off taps in process areas, kitchens, etc. A tap dripping at a rate of three drips per second can waste more than 35,000 litres of water annually.
- Regularly inspect pipelines, valves, and faucets for leaks and repair them promptly to minimise water loss.
- Use a bucket and timer system to perform “before” and “after” measurements for water wastage. This quantifies the amount of water saved and raises awareness among workers about the impact of small leaks.
- Install water meters to track water usage. Set key performance indicators to monitor progress and identify opportunities for reduction.
- Use dry methods such as brooms, brushes, and vacuums to remove waste before using water. This reduces the volume of water and wastewater needed.

- Use water cascading for rinsing tanks to save fresh water and reduce wastewater. This improves rinsing quality and efficiency.
- Install flow restrictors or flow control valves on process tanks to regulate water usage.
- Implement timers and pedals to ensure water is used only when necessary.
- Use conductivity meters to control water flow based on actual need.
- Mechanically or aerate rinse bath water to extend its life and improve efficiency.
- Use high-pressure washing systems to minimise wastewater generation.

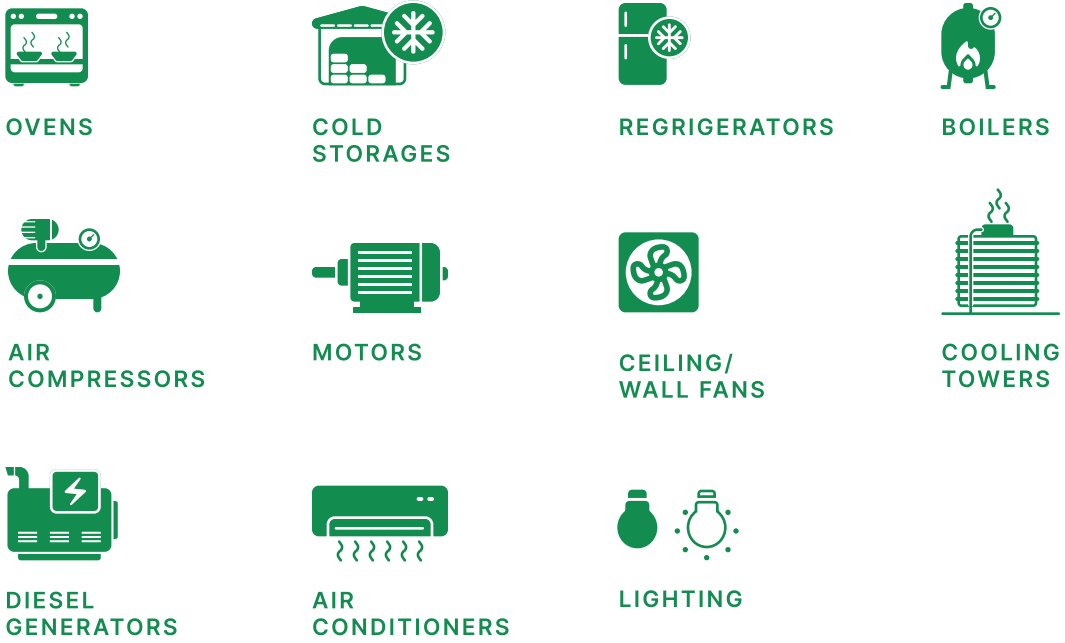
3.3.3

Saving energy

In the food and beverage (F&B) industry, even small steps towards energy conservation can lead to significant savings.

By implementing energy conservation measures, enterprises can achieve immediate benefits and build a foundation for more comprehensive energy efficiency improvements. Focusing first on energy conservation allows businesses to see quick wins and develop a culture of energy awareness, setting the stage for more advanced strategies that further enhance efficiency and reduce costs over time.

F&B industries use various types of equipment for processing, and each piece of equipment is supported by multiple engineering utilities. These equipment and associated utilities are typically the drivers of high energy consumption within the enterprise, so it is important to closely monitor their energy use and efficiency to achieve long-term cost savings. A few of the most commonly used equipment and utilities within F&B sector are listed below -



OVENS

- Avoid heat loss from the edges of the oven doors by replacing damaged or broken gaskets or seals with those that seal well.
- Always bake materials with the oven door closed, do not open doors unnecessarily.
- Use temperature control system. Operate the oven at the lowest acceptable temperature.
- Use clean and, if available, perforated trays for baking to increase the heat transfer and reduce the baking time.

COLD STORAGES

- Ensure doors are properly closed to prevent heat ingress into the cold storage. Replace damaged or broken gaskets or seals with ones that seal properly. Do not leave the door open when exiting the cold storage.
- Insulate the walls and roof of the cold room properly using PU foam spray or PUF panels to avoid heat gain. Install air curtains or PVC sheet curtains to prevent warm air infiltration during material movement.
- Store products in separate cold storage units if different storage temperatures are required. Maintain the optimum temperature settings for each cold storage unit according to the product requirements.
- Avoid underutilisation of cold storage.
- Insulate chiller pipelines to prevent energy loss and maintain them regularly.
- Maintain a uniform temperature inside the cold storage. Install temperature sensors at various locations to control chiller operation.

- Install lighting sensors in the cold storage to turn off the lights as soon as the door closes. Place light switches near the doors.
- Ensure that all lighting fixtures installed inside the cold room are LED-based.

REGRIGERATORS

- Do not keep refrigerator door open unnecessarily.
- Repair/replace damaged or broken door sealing of the refrigerator to prevent leakage of cold air.
- Set the temperature of the refrigerator as high as permissible within the standard range prescribed for product stored.
- Defrost the refrigerator regularly to avoid ice deposition.
- Ensure that the radiator of the refrigerator is at least 3 cm from any wall or obstruction to facilitate free air flow.

BOILERS

- Insulate exposed pipelines, the body of the boiler and its door with ceramic blanket or glass wool and waterproof cladding.
- Practice condensate recovery reducing freshwater usage as well as fuel consumption.
- Arrest any leakages in the steam/hot water distribution system including at steam traps.
- Clean burners, nozzles, strainers etc. regularly.

- Close burner air and/or stack dampers when the burner is off to minimise heat loss from the stack.

AIR COMPRESSORS

- Adopt a zero-leakage policy: compressed air leak from 1 mm hole at 7 kg/cm² pressure would mean power loss equivalent to 0.5 kW.
- Perform leakage tests periodically, ideally once a month, and include it in the monthly maintenance activities.
- Take air compressor intake air from the coolest location: every 5°C reduction in intake air would result in 1% reduction in compressor power.
- Reduce air compressor discharge pressure to the lowest acceptable setting: reduction of 1 kg/cm² air pressure would result in 6% input power saving.
- Consider alternatives to compressed air such as blowers for cooling, hydraulic rather than air cylinder, electric rather than air actuators and electronic rather than pneumatic controls to avoid compressed air use.
- Consider using controlled nozzle guns or tans-vector nozzle guns to reduce wastage of energy, without affecting air cleaning operations

MOTORS

- Instruct and create awareness among employees for switching off idle running motors to save energy.
- Ensure motor fins are cleaned regularly to prevent dust accumulation.

- Enclose exposed moving parts of motors, such as fans, to prevent hazards to shop floor personnel.
- Install automatic switches that turn off motors when there is no production load after a certain duration.
- Avoid under loading or overloading a motor as it will lead to a waste of energy; select motors which are optimal for the process.
- Do not load the motors less than 60% or more than 90% of rated capacity.
- Install automatic switches which turn off the motors when there is an absence of production load after a certain duration.
- Replace motors that have been rewound more than three times with new, energy-efficient motors (IE3 or IE4).
- Replace old or inefficient motors with new, energy-efficient (IE3 or IE4) motors one by one, particularly those with high running hours or high-power ratings. This will save energy, as energy consumption accounts for nearly 95% of the lifetime cost of motors, while the purchase cost is usually around 3% of the lifetime cost

CEILING/ WALL FANS

- Install 28-32 W brushless direct current (BLDC) motor ceiling fans or wall fans for 60% lower power consumption. BLDC fans also run three times longer on an inverter battery.
- Clean the fan regularly to ensure there is no dust accumulation.

COOLING TOWERS

- Schedule regular maintenance for the cooling tower, including cleaning the water, and repairing and maintaining the motor, fans, and blades.
- Check the flow rate periodically, compare it with the rated flow rate, and adjust it as needed.
- Algae can block the nozzles of the cooling tower, reducing the temperature drop across the tower. Clean the nozzles regularly and replace damaged ones to ensure more uniform water spraying. Improved water flow allows the cooling tower fan and pump to run for less time to achieve the same cooling effect, thereby saving energy.
- Replace broken fills periodically to maintain uniform water spray and improve the effectiveness of the cooling tower fan.
- Check the total dissolved solids (TDS) of the cooling tower water and top up with make-up water as necessary.
- Use corrosion and scale inhibitors in the prescribed quantity in the cooling tower feed water or sump, based on the quality of make-up water available.
- Control the fan speed according to the weather and season. During winter, when the outside temperature is low, reduce the fan speed. Choose one of the following options -

    a. Install a sump controller that automatically turns off the cooling tower fan when the desired temperature is reached.

    b. Install a variable frequency drive (VFD) on the cooling tower motor to control the fan airflow based on the return water temperature.

DIESEL GENERATORS

- Clean air filters regularly.
- Calibrate the fuel injection pump frequently.
- Utilize waste heat from diesel generator (DG) sets to generate steam, hot water, or power for an absorption chiller.
- Insulate exhaust pipes to lower DG set room temperatures, particularly if the DG set shares a room with other equipment or products.
- Maintain a steady load condition on the DG set and provide cold, dust-free air at the intake.
- Ensure there is secondary containment for diesel oil storage.

AIR CONDITIONERS

- Turn off the air conditioning when cooling is not needed.
- Close doors in air-conditioned rooms.
- Mount blinds outside windows, in addition to inside, to prevent heat gain.
- Set the air conditioner's temperature to 24ºC or higher; every additional degree of room temperature can save up to 6% of air conditioning-related electricity.

LIGHTING

- Label individual lighting fixtures and corresponding switches with numbers so that it is easier for personnel to identify them and switch them off when not needed.
- Create awareness among staff and workers about the efficient use of lighting and how switching off lights plays a significant role in power savings.
- Display awareness posters at several locations in the plant to motivate employees to switch off the lights. Allocate a team of one or two designated personnel to check and switch off the lights during non-working hours.
- Make the most of daylight, e.g., by installing polycarbonate sheeting in the roof as a skylight. Regularly clean windows and skylights to allow more natural daylight to reach the workspace.
- Use energy-efficient LED bulbs instead of incandescent bulbs.
- Employ targeted lighting (also known as 'task lighting') whenever delicate or precise work needs to be performed.
- Paint ceilings and walls white and use light-coloured flooring materials.
- Install occupancy sensors in restrooms, offices, and other rooms within the facility. Determining which lights are the most appropriate candidates for an occupancy sensor depends on how much electricity the light uses, the traffic within the area, and how often lights are left on. Occupancy sensors can conserve more than 20 percent of the annual energy usage of an individual lighting system, depending on the area.
- Use light timers and photo sensors to reduce the use of artificial lighting when natural sunlight from exterior windows or skylights is adequate.

3.3.4

House keeping and safety

- Carry out 5S activities, starting with sorting (1S) by identifying unnecessary items or those not frequently used. Remove (or discard) items that are not needed to free up valuable workspace. Designate a Red-Tag area for storing items that cannot be immediately disposed of, so others can collect and use these items as needed.
- Arrange items by category with clear visual tags so they can be easily located within 30 seconds.
- After completing sorting (1S), proceed with setting in order (2S), where sorted tools and materials are arranged in a manner that makes them easily accessible to workers. Ensure that frequently used components are placed closest to worktables or sections for ease of access. This reduces search time and prevents unnecessary purchases of items already in stock but not easily located due to disorganised storage.
- Enhance ventilation in the plant to allow natural airflow and restrict external disturbances from entering the shop floor.
- Provide masks to workers in areas with high fumes and smoke.
- Install potential hazard, danger, or slippery signboards near critical areas.
- Provide gloves, glasses, and other relevant PPE to workers for safety, and train them on their proper use when operating machinery.
- Encourage workers to wear all necessary PPE by explaining its advantages, such as protecting them from accidents, injuries, and hazards in the workplace.

3.4 Showcases
of implementations

The Prevent Plastics team has conducted waste audits and provided actionable guidance to 87 factories on waste minimisation, water savings, energy savings, and implementing SCP best practices, including health and safety best practices.

We have selected a few implementation showcases from the food and beverage industry, which are presented in the this chapter. These showcases highlight how the waste practices discussed in the previous chapter can enable factories to minimise resource use and achieve substantial cost savings in their operations.

Each showcase presents the before and after scenarios, along with the investment required, potential benefits, and payback period where applicable.

Reducing plastic waste by switching to alternative packaging solutions

Ah May Htwar
Yangon

FOOD & BEVERAGES

INVESTMENT

1,008,000
MMK

PAYBACK PERIOD

6
months

MONETARY SAVINGS

240,000
MMK (annually)

WASTE REDUCED

0.22
tonnes (PET bottles)

BEFORE

Export-quality peanut oil is packaged in PET bottles for large consumers, resulting in high volume of plastic waste

AFTER

Single-use PET bottles have been replaced with reusable and refillable, food-grade steel drums for packaging peanut oil for large-scale consumers. This change reduces plastic waste and provides monetary benefits.

Replacement of single-use plastic aprons with reusable cotton aprons leading to reduced waste generation and monetary savings

TTH (Myanmar) Co., Ltd.
Mandalay

FOOD & BEVERAGES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
30,000 MMK	**1** month	**180,000** MMK (annually)	**1800** apron pieces / month

BEFORE

Workers in food processing used single-use plastic aprons, contributing to significant plastic waste. This practice also added to operational costs due to the constant need for apron replacements.

AFTER

Workers are now using reusable cotton aprons, which resulted in reduced plastic waste and lower operational costs.

Elimination of single use plastic wraps in food packaging leading to waste reduction and monetary savings

TTH (Myanmar) Co., Ltd.
Mandalay

FOOD & BEVERAGES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
30,000 MMK	**N/A**	**Nil**	**~12000** LDPE packs

BEFORE

Single-use plastic wrap was used for packing desserts, resulting in the generation of a high volume of plastic waste and an added cost for the company.

AFTER

The use of single-use plastic wrap was eliminated by using alternative packaging solutions. The shift to alternative packaging reduced the plastic waste generation and has also resulted in cost savings.

Saving raw materials by utilizing reusable pellets to prevent moisture seepage from the floor

Easy Way By NooDi
Yangon

FOOD & BEVERAGES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
Low	Immediate	100,000 MMK (annually)	~12000 LDPE bags

BEFORE

- LDPE bags were used to store raw materials and prevent moisture.
- The LDPE bags contribute to a high volume of waste generation and increased cost.

AFTER

- A platform made of reusable pallets is laid to prevent moisture from the floor.
- This has helped eliminate the usage of LDPE bags and has resulted in cost savings.

Reduction in the use of virgin plastic by reusing trimmings waste in PET bottle production

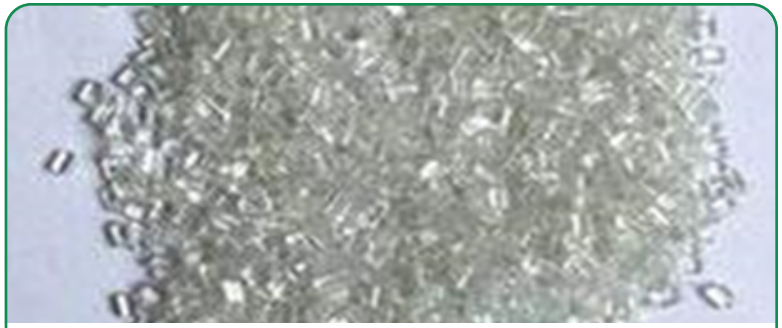
Ah May Htwar
Yangon

FOOD & BEVERAGES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
Nil	Immediate	1,278,000 MMK (annually)	3.96 tonnes (PET)

BEFORE

The plastic bottle moulding process generates 3,960 kg of trimmings waste annually.



AFTER

Approximately 48% of the trimmings waste is processed in a crusher unit to create granules, which are then reused to produce PET bottles, while the remaining 52% of the trimmings waste is sold to recyclers.

Enhancing workplace recycling and reuse by creating designated areas, implementing clear labels, and setting specific quantity limits to improve efficiency

Fook Hing Paper Packaging Limited
Yangon

PAPER & CARDBOARD

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	TIME SAVED
Nil	Nil	Nil	570 seconds / search

BEFORE

Various nuts, screws, and washers are stored in a single, cluttered box, making it difficult to locate specific items. On average, it takes approximately 10 minutes to find the correct parts.

AFTER

Repurposed ink cartridges from printers are now used as organised containers for screws and nuts. Each container is labelled with size, type, and category, reducing the time to find the correct item to just 30 seconds.

4

The garment industry

4.1

Introduction to the garment industry in Myanmar

4.2

Types of waste generated and its impact on the environment

4.3

Best practices for the garment industry

4.4

Showcases of implementations

4.1 Introduction to
the garment industry in Myanmar

In Myanmar, the garment industry is expanding rapidly due to increasing urbanisation and a growing focus on export markets.

However, this growth is accompanied by significant waste generation, including large volumes of textile offcuts, packaging materials, and wastewater from dyeing and finishing processes. Much of this waste is currently being sent to landfills, which heightens environmental concerns. To address these issues, it is crucial to implement robust waste management strategies. Effective measures include reducing waste through enhanced production techniques and adopting sustainable, reusable packaging solutions.

These approaches are essential for minimizing the amount of waste generated and mitigating the industry's environmental impact.

Figure 4.1

Fabric cut pieces are one of the most common types of waste generated from the garment industry

4.2 Types of waste generated
and its impact on the environment

The garment manufacturing process comprises several distinct stages, each contributing to different types of waste.

From initial material sourcing and preparation, through cutting and sewing, to final finishing and packaging, each phase generates specific waste streams. These include textile offcuts, packaging materials, and wastewater from dyeing and finishing processes. Recognising the waste produced at each stage is crucial for developing effective waste management strategies. A graphical representation of the manufacturing process for a generic product in the garment industry is provided in **Figure 4.2** to illustrate the different waste streams within the enterprise. The process flow diagram visually maps these stages, illustrating where and how waste is generated. This graphical representation highlights the opportunities for reducing waste and enhancing sustainability throughout the garment manufacturing process.

The types of waste generated can be grouped into two main categories: solid waste and liquid waste. A detailed categorisation of these waste types is presented in **Figure 4.3**. The mentioned waste types have significant environmental impacts — contaminated effluents and chemical residues pollute water bodies, harming aquatic life and affecting human health; synthetic fibres and chemical-laden materials contribute to soil contamination and persistent microplastic pollution. Improper disposal of sharp objects like needles poses injury risks to workers. Effective management and reduction of these waste types are essential for promoting responsible practices and minimising the industry's negative impact on the environment.

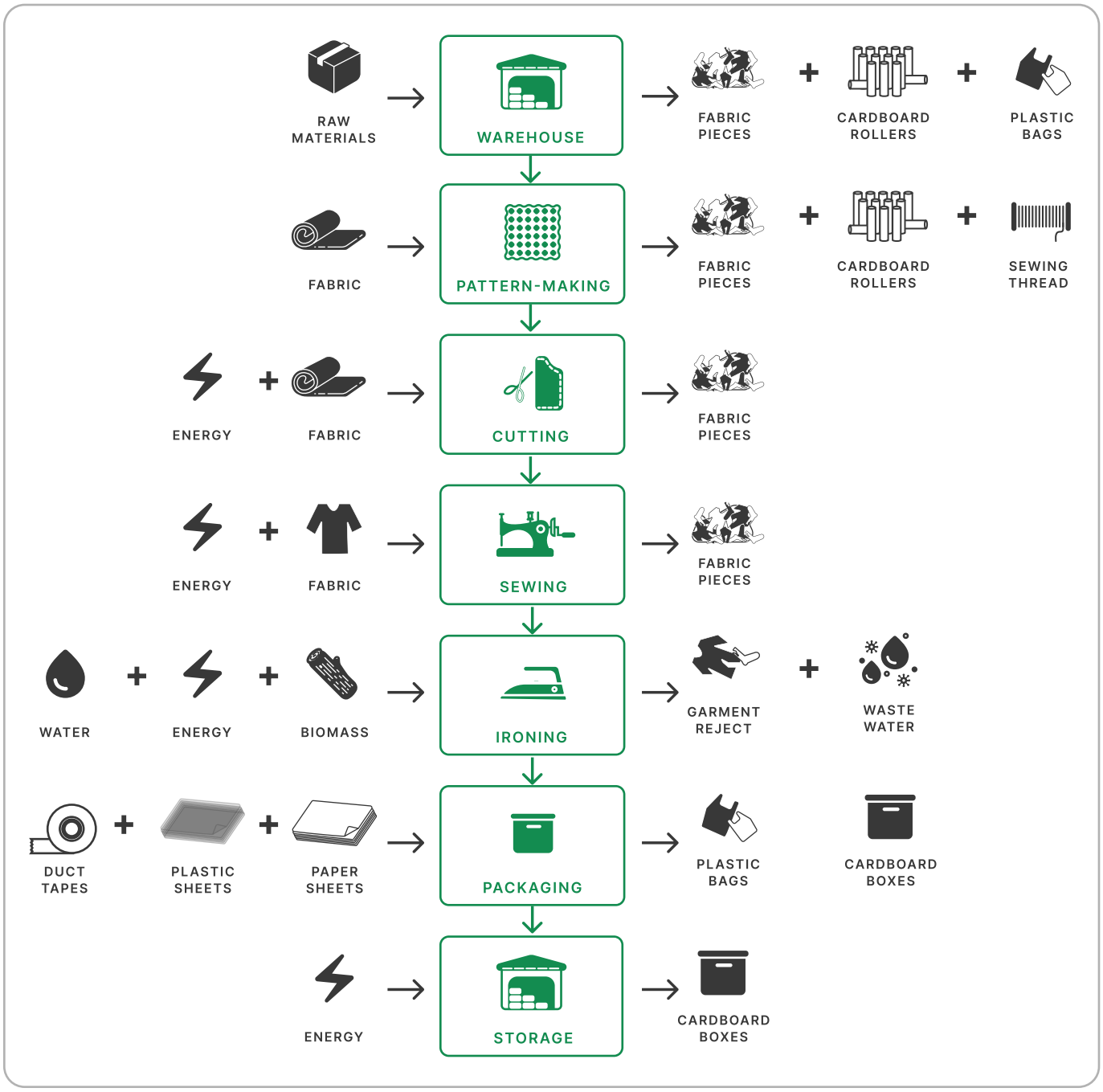


Figure 4.2

The process flow diagram for a generic garment industry, depicting the various streams of waste within the industry

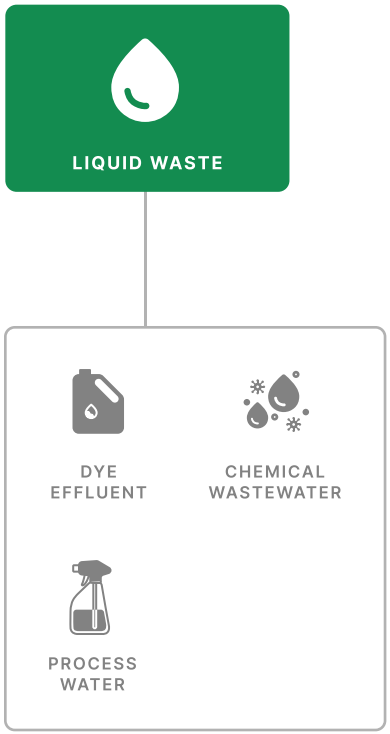
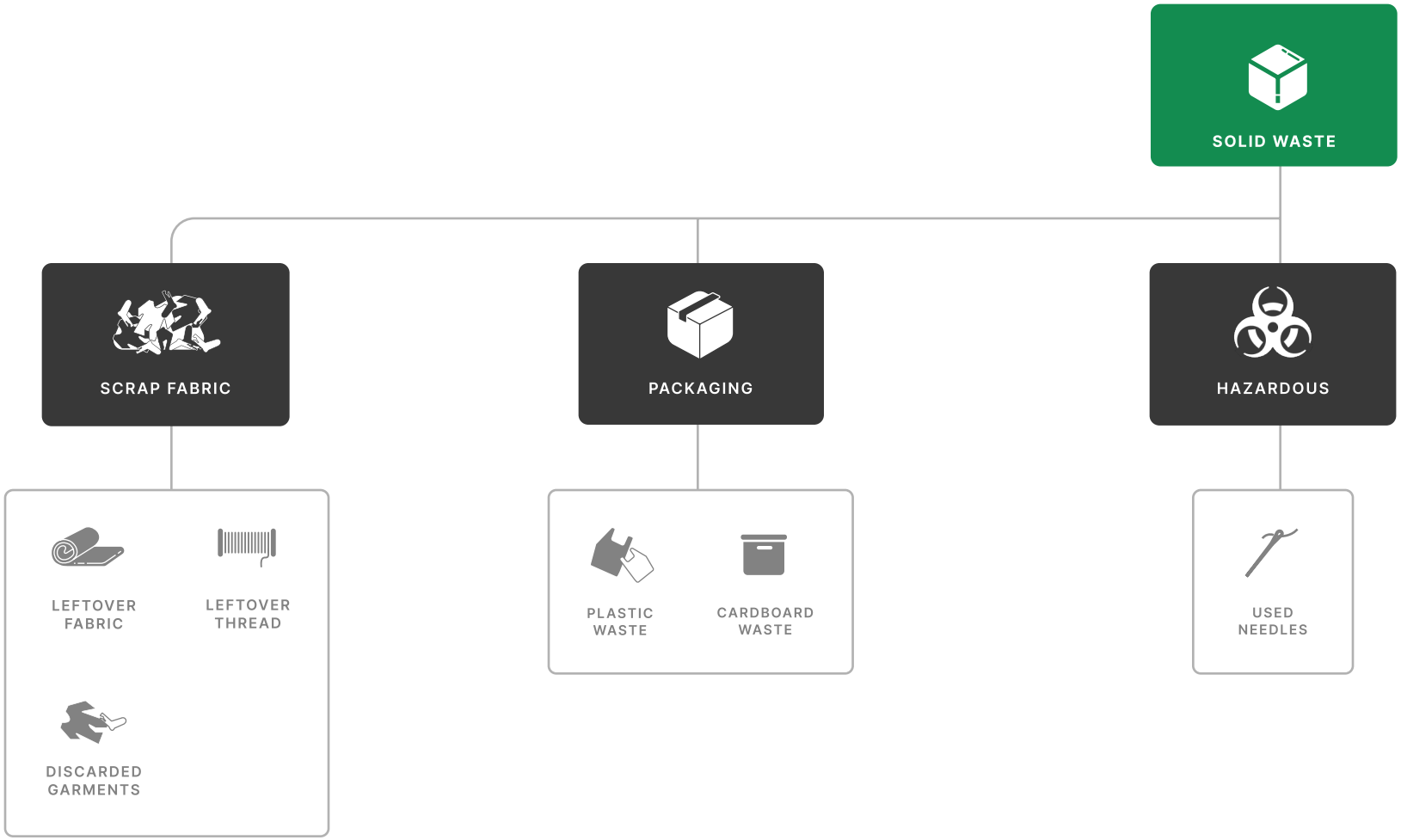


Figure 4.3

The various types of waste generated in the garment industry


SOLID WASTE
SCRAP FABRIC
PACKAGING
HAZARDOUS
LEFTOVER FABRIC
LEFTOVER THREAD
DISCARDED GARMENTS
PLASTIC WASTE
CARDBOARD WASTE
USED NEEDLES

4.3 Best practices
for the garment industry

The following best practices are provided to assist factory managers, supervisors, and owners in effectively implementing Sustainable Consumption and Production (SCP) practices within their factories.

These guidelines can also be viewed as quick tips for streamlining operations, minimising waste, saving water, improving energy efficiency and enhancing overall operational efficiency and cost savings.

Figure 4.4

Fabric waste from the garment industry can often be easily converted into new products such as tote bags

4.3.1

Waste minimisation

Minimising waste is essential for the garment industry, as it not only promotes environmental stewardship but also enhances operational efficiency and economic value.

From an economic perspective, waste minimisation leads to cost savings by reducing material expenses, lowering disposal fees, and improving production efficiency.

Below are a few practical waste minimisation tips that garment industries can adopt in their daily operations. Implementing these strategies can significantly reduce waste generation and create additional revenue.

In the garment industry, waste generation can be grouped into three primary types of waste as follows -

SCRAP FABRIC WASTE

PACKAGING WASTE

NEEDLE AND THREAD WASTE

Let’s take a look at the best practices for each of these hotspots in greater detail.

SCRAP FABRIC WASTE

- Educate employees on waste reduction techniques and the importance of minimising fabric waste in their daily tasks.
- Develop cutting plans that reduce the number of offcuts and optimise the use of each fabric roll.
- Implement efficient pattern grading techniques to ensure that different sizes are cut in a way that reduces scrap.
- Apply lean manufacturing principles to reduce waste generation at every stage of production, from design to final product assembly.
- Maintain optimal inventory levels to minimise fabric waste caused by excess stock.
- Use sustainable and recyclable fabrics that are easier to manage at the end of their lifecycle.
- Work with suppliers to minimise waste in the supply chain and explore options for returning or reusing fabric rolls with defects.

PACKAGING WASTE

- Educate employees about the importance of reducing packaging waste and encourage practices that minimise waste generation.
- Design packaging that uses the smallest amount of material necessary to protect and contain the product.
- Use modular designs that allow for easy stacking and handling, reducing excess packaging materials.

- Streamline packaging by removing non-essential layers, such as excessive wrapping or inner cartons.
- Combine multiple products into single packages where possible to reduce the total amount of packaging used.
- Ensure that packaging is appropriately sized for the product to minimise empty space and reduce material use.
- Develop closed-loop systems where packaging is continually recycled back into the production process.
- Establish programs to take back used packaging from customers for recycling or reuse.

NEEDLE AND THREAD WASTE

- Raise awareness amongst operators to use precise sewing techniques to minimise thread wastage. For example, ensure accurate seam allowances and minimise thread trimming.
- Fine-tune sewing machines to reduce thread overuse and optimise tension settings to prevent excessive thread waste.
- Use thread management systems to track and manage spool usage, ensuring that thread is used efficiently and reducing leftover spools.
- Perform routine maintenance on sewing machines to ensure needles are functioning correctly and avoid premature wear.
- Regularly inspect needles for wear and tear, replacing them before they break or cause defects.

- Use the appropriate type and size of needle for each fabric and sewing application to reduce breakage and wear.
- Minimise unnecessary needle changes by selecting the right needle for the entire production run or fabric type.

4.3.2

Saving water

Water savings in a garment industry are crucial due to the high cost and scarcity of water.

Efficient water use significantly reduces utility bills and lowers expenses related to water treatment. By adopting sustainable practices, industries can ensure compliance with environmental regulations, thereby avoiding fines and legal costs.

Moreover, demonstrating a commitment to water conservation can enhance a company's reputation, attract new business opportunities, and foster valuable partnerships. These efforts collectively contribute to substantial cost savings and promote long-term sustainability in the industry.

Implementing a few simple water-saving tips in its daily operations can lead to significant water and cost savings for the company. These steps are listed below -

- Ensure that water is turned off when not in use. Regularly check taps and motivate employees to turn off taps in process areas, kitchens, etc. A tap dripping at a rate of three drips per second can waste more than 35,000 litres of water annually.
- Regularly inspect pipelines, valves, and faucets for leaks and repair them promptly to minimise water loss.
- Use a bucket and timer system to perform “before” and “after” measurements for water wastage. This quantifies the amount of water saved and raises awareness among workers about the impact of small leaks.
- Install water meters to track water usage. Set key performance indicators to monitor progress and identify opportunities for reduction.
- Use dry methods such as brooms, brushes, and vacuums to remove waste before using water. This reduces the volume of water and wastewater needed.

- Use water cascading for rinsing tanks to save fresh water and reduce wastewater. This improves rinsing quality and efficiency.
- Install flow restrictors or flow control valves on process tanks to regulate water usage.
- Implement timers and pedals to ensure water is used only when necessary.
- Use conductivity meters to control water flow based on actual need.
- Mechanically or aerate rinse bath water to extend its life and improve efficiency.
- Use high-pressure washing systems to minimise wastewater generation.
- Start monitoring water consumption by installing own water meters. Set up key performance indicators to help track progress of water consumption reduction.

4.3.3

Saving energy

In the garment industry, energy consumption is a significant aspect of operational costs.

As energy prices rise and environmental regulations become more stringent, adopting effective energy-saving measures is crucial for maintaining competitiveness and achieving sustainability goals. By implementing targeted energy efficiency practices, garment manufacturers can reduce their energy consumption, lower operational costs, and enhance their overall sustainability profile.

Garment industries use various types of equipment for processing, and each piece of equipment is supported by multiple engineering utilities. These equipment and associated utilities are typically the drivers of high energy consumption within the enterprise, so it is important to closely monitor their energy use and efficiency to achieve long-term cost savings. A few of the most commonly used equipment and utilities within the garment sector are listed below -

SEWING MACHINES

BOILERS

EVAPORATIVE COOLERS

CEILING/ WALL FANS

AIR COMPRESSORS

MOTORS

LIGHTING

DIESEL GENERATORS

SEWING MACHINES

- Ensure sewing machines are regularly maintained and serviced. Well-lubricated and clean machines operate more efficiently and consume less energy.
- Clean machines regularly; dust and lint build-up can cause machines to work harder, increasing energy use.
- Encourage operators to switch off machines when not in use, even for short breaks. Installing auto-off timers can help ensure machines power down during inactivity.
- Position machines efficiently to reduce unnecessary movement and energy use.
- Design workflows to minimise machine idle time and optimise production efficiency.
- Consider upgrading old sewing machines to newer models with energy-efficient motors, such as servo motors, which can reduce energy consumption by up to 70% compared to conventional clutch motors.
- Set machines to optimal speed settings for different types of sewing tasks. Running machines at excessively high speeds can lead to unnecessary energy use and wear and tear.
- Invest in newer, more energy-efficient sewing machines that consume less power.
- Machines with variable speed drives can be more energy-efficient, as they adjust power based on workload.

BOILERS

- Insulate exposed pipelines, the body of the boiler and its door with ceramic blanket or glass wool and waterproof cladding.
- Practice condensate recovery reducing freshwater usage as well as fuel consumption.
- Arrest any leakages in the steam/hot water distribution system including at steam traps.
- Clean burners, nozzles, strainers etc. regularly.
- Close burner air and/or stack dampers when the burner is off to minimise heat loss from the stack.

EVAPORATIVE COOLERS

- Regularly clean or replace cooling pads, filters, and other components to ensure efficient operation. Clogged or dirty components can reduce airflow and cooling effectiveness.
- Seal any gaps or leaks in windows and doors to prevent cool air from escaping and warm air from entering, thus improving energy efficiency.
- Install ventilation systems to allow fresh, dry air to enter and to help expel humid air, reducing the load on the cooler.
- In high humidity seasons, use the evaporative cooler carefully to prevent excess humidity. Consider adding dehumidifiers to maintain optimal indoor humidity and improve cooling performance.
- Use shades, blinds, or curtains to minimise direct sunlight and reduce indoor heat gain, allowing the evaporative cooler to operate more efficiently.

- Ensure the water used in the cooler is clean to prevent scaling on cooling pads and maintain system efficiency.
- Periodically replace the water to avoid algae and bacterial growth, which can affect performance and energy efficiency.

CEILING/ WALL FANS

- Install 28-32 W brushless direct current (BLDC) motor ceiling fans or wall fans for 60% lower power consumption. BLDC fans also run three times longer on an inverter battery.
- Clean the fan regularly to ensure there is no dust accumulation.

AIR COMPRESSORS

- Adopt a zero-leakage policy - compressed air leak from 1 mm hole at 7 kg/cm² pressure would mean power loss equivalent to 0.5 kW.
- Perform leakage tests periodically, ideally once a month, and include it in the monthly maintenance activities.
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- Consider using controlled nozzle guns or tans-vector nozzle guns to reduce wastage of energy, without affecting air cleaning operations

MOTORS

- Instruct and create awareness among employees for switching off idle running motors to save energy.
- Ensure motor fins are cleaned regularly to prevent dust accumulation.
- Enclose exposed moving parts of motors, such as fans, to prevent hazards to shop floor personnel.
- Install automatic switches that turn off motors when there is no production load after a certain duration.
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- Replace old or inefficient motors with new, energy-efficient (IE3 or IE4) motors one by one, particularly those with high running hours or high-power ratings. This will save energy, as energy consumption accounts for nearly 95% of the lifetime cost of motors, while the purchase cost is usually around 3% of the lifetime cost.

LIGHTING

- Install energy-efficient task lighting, such as LED lights, to reduce the need for overhead lighting and provide focused illumination where needed.
- Label individual lighting fixtures and corresponding switches with numbers so that it is easier for personnel to identify them and switch off when not needed. Create awareness amongst staff and workers on the efficient use of lighting and how switching off the lights have significant role in power saving.
- Display awareness posters at several places in the plant to motivate employees to switch off the lights. Allocate a team of one or two nodal personnel who will check and switch off the lights during non-working hours.
- Make the most of daylight, e.g., by installing polycarbonate sheeting in the roof as a skylight. Regularly clean windows and skylights to allow more natural daylight to reach the workspace.
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DIESEL GENERATORS

- Clean air filters regularly.
- Calibrate the fuel injection pump frequently.
- Utilize waste heat from diesel generator (DG) sets to generate steam, hot water, or power for an absorption chiller.
- Insulate exhaust pipes to lower DG set room temperatures, particularly if the DG set shares a room with other equipment or products.
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of implementations

The Prevent Plastics team has conducted waste audits and provided actionable guidance to 87 factories on waste minimisation, water savings, energy savings, and implementing SCP best practices, including health and safety best practices.

We have selected a few implementation showcases from the garment industry, which are presented in the this chapter. These showcases highlight how the waste practices discussed in the previous chapter can enable factories to minimise resource use and achieve substantial cost savings in their operations.

Each showcase presents the before and after scenarios, along with the investment required, potential benefits, and payback period where applicable.

Waste segregation at source leading to waste recycling and income generation

Genesis Myanmar Garment Company Private Limited
Dagon Township (East), Yangon

GARMENTS & TEXTILES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
200,000 MMK	**1** week	**12,000,000** MMK (annually)	**20** tonnes (annually)

BEFORE

A single waste bin was placed in the factory for all types of waste, leading to the mixing of waste and resulting in landfill disposal.

AFTER

Colour-coded bins and waste segregation practices have been introduced in the factory. This improvement allows recyclable waste to be sold to recyclers, promoting effective recycling and income generation for the factory.

Waste segregation at source leading to waste recycling and income generation

Genesis Myanmar Garment Company Private Limited
Dagon Township (East), Yangon

GARMENTS & TEXTILES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
Nil	1 month	1,200,000 MMK (annually)	35 tonnes (fabric)

BEFORE

Fabric waste was mixed with general waste such as plastic and paper waste, which ends up in the landfill.

AFTER

Source segregation of different types of waste (fabric, plastic, and paper) has been introduced in various departments. The segregated fabric waste is sold to recyclers, resulting in effective recycling and income generation for the factory.

Implementation of waste management practices resulting in space optimisation and income generation

Shwe Sakar Company Ltd
Yangon

GARMENTS & TEXTILES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
Nil	Immediate	1,471,800 MMK (annually)	29.52 tonnes

BEFORE

Fabric waste was being mixed with other types of waste and stored in the waste storage area, ultimately ending up in the landfill.

AFTER

The mixed waste is segregated and organised into different sections for fabric cut pieces, cardboard rollers, plastic, and general waste. The segregated waste is then sold to recyclers, generating income.

Waste segregation at source leading to waste recycling and income generation

Shwe Sakar Company Ltd
Yangon

GARMENTS & TEXTILES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	WASTE REDUCED
Nil	Immediate	180,000 MMK (annually)	29.41 tonnes

BEFORE

Fabric waste was being mixed with other types of waste and stored in the waste storage area, ultimately ending up in the landfill.

AFTER

Separate bins for organic, recyclable, non-recyclable, and hazardous waste have been installed at canteen, offices, and receptions.

The waste bins are made from waste drums.

Diesel saving by installing Solar Street Lights

Diamond Dragon
Yangon

GARMENTS & TEXTILES

INVESTMENT	PAYBACK PERIOD	MONETARY SAVINGS	ENERGY SAVINGS
360,000 Ks.	2 months	3,212,000 MMK (annually)	1,382 litres (diesel)

BEFORE

The factory used to run a backup diesel generator set for 15 security lamps.

AFTER

15 security lamps were replaced with solar-powered LED lamps, resulting in diesel saving.

COLOPHON

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