LONG TERM WASTE MANAGEMENT PLAN 2021-2030

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MINISTRY FOR THE ENVIRONMENT,
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MINISTERIAL FOREWORD

This document outlines my Government's Waste Management Plan 2021-2030 – Towards a Mindful Society for a Better Future. As Minister responsible for waste management I will admit from the outset that Malta's performance in the waste sector has never been good and today we are practically the worst performers in the EU. As a nation we need to do much more to reduce the amount of waste we generate and maximise the amount of waste we recycle. Irrespective of our obligations as an EU member state, we need to do this for ourselves, our families and our country.

This document is a clear declaration and commitment that things will change. We want and we will achieve a quantum leap in performance. We shall be moving away from a consume and throw away societal mentality to a community behaviour that values the environment and minimises waste through a circular economy value chain that turns waste into a resource, generating electricity from unrecyclable waste and reducing landfilling. Whilst the plan is underpinned by a solid commitment by Government, this is simply not enough. We need you to work with us towards a mindful society that creates a better future for all.

For far too long have we been caught in the mantra that waste management is Government's business. This could not be further from the truth. We need to recognise that waste management is not only everyone's business but also everybody's responsibility.

Our consumption and production patterns and choices shape the amount and type of waste generated. We are the ones that determine our waste actions and hence the ones that can change the status quo. If we want a better future, we need to turn over a new leaf. We need a paradigm shift where waste becomes everybody's business. And indeed, it can be a profitable business! Reducing waste helps the environment but it also helps our pockets. Effective recycling generates business and employment and reduces the costs of waste management.

The harsh reality is that bad waste practices have led to the landfilling of waste that could have been avoided. Our landfill footprint clearly depicts the cost of drawn-out action, which we can no longer afford if we want to avoid the pain of further land take-up. We simply cannot continue mistreating our waste management responsibilities.

We are still in time to make things right...together. Government has committed an unprecedented amount of funds to the tune of half a billion Euro. In March 2020, we committed to design and build new waste treatment plants which would improve our recycling rates and increase our energy recovery to reduce landfilling. However, this is not enough and without a change in societal behaviour we will still lag behind our European peers. This is undeserved as we have shown that our country is able to rise to many a challenge and top the scoreboards amongst our European peers.

One of the main priorities in this Plan is waste prevention. Government is here to help anyone of goodwill to make the necessary change to become more waste centric in their own or their business' day to day behaviour. With a programme of measures amongst which incentives to promote repair and reuse activities to increase the longevity of products and harnessing the potential of IT solutions like online swap shops and food distribution apps, we aim to entice waste generators to minimise their waste arisings.

The time has come to recognise our responsibility to separate our waste at source. This applies to households and commercial establishments alike. To this effect, we have also planned a reform in our waste collection system, with a transition to a regionalised and harmonised national waste collection schedule that will provide the opportunity for investment in modern, less polluting and more conducive collection vehicles, and providing a standardised approach across the country.

Extended producer responsibility frameworks will be strengthened, responsibilising producers for the waste management of the products they place on the market. It is often said that producers will pass on these costs to the consumer who will end up with the wrong end of the stick. This could not be further from the truth for consumers influence what producers place on the market. Differentiated gate fees will be actively considered in order to incentivise waste separation efforts. Our aim is not to stifle competitiveness, but to make waste management a business opportunity for all whilst expecting everyone to embrace individual and corporate social responsibilities. Waste conscious consumers will trigger a demand for less packaging, compostable materials, reusable items and the like which can only be satisfied by producers who seize the moment of change.

Long-term change is brought about by collective effort, by working hand-in-hand with local Government, industry and the commercial sector, civil society, the consumers and all communities. Government is committed to incentivise sustainable behaviour from whichever sector of society wants to be an agent of positive change. The ball is squarely in our collective court. We can act responsibly or face the consequence of inaction. I am sure that there is an immense wave of goodwill that will realise that there is indeed a need for positive change, one which befits each and every one of us Maltese citizens and residents. This Waste Management Plan is a call to action to turn over a new leaf and harness the power of change to our individual, mutual and collective benefit. Carpe diem!

Aaron Farrugia
Minister for the Environment, Climate Change and Planning

EXECUTIVE SUMMARY

The Ministry for the Environment, Climate Change and Planning has developed a Waste Management Plan for the Maltese Islands 2021-2030, as mandated under the European Union Waste Framework Directive and as transposed in local legislation. As a backdrop, it must be noted that Malta's annual municipal waste generated per capita is currently higher than most EU countries, at an average of 621kg[1]. Landfilling is still the predominant waste treatment option and our recycling rate is the lowest amongst EU Member States[2]. The new Waste Package places even more onerous targets on Malta in terms of the amount of waste which has to be recycled and is allowed to landfill, as well as specific targets related to the recycling of certain materials not least paper, plastic, metal, glass and wood. The status quo is not an option. Waste prevention and improved management is not only a central aspect in supporting Malta's transition towards a resource efficient and circular economy, but also in reducing pressure on Malta's waste logistics and infrastructure and our dependence on either exporting waste or landfilling where land availability for such purpose is limited.

Through the Waste Management Plan, the Ministry's strategic objectives are to:

- Maximise the resource value in waste through different management options
- Innovate by designing waste prevention initiatives to lower Malta's per capita generation rate
- Reform the collection system to increase economies of scale, harmonise collection practices and modernise the collection fleet
- Build the necessary waste management facilities to treat recyclable, organic and residual waste to achieve Malta's targets
- Study the feasibility of an enhanced producer responsibility framework to complement Malta's transition to a circular economy and reflect further on the true cost of waste management
- Promote further the involvement of the private sector in waste management

The Waste Management Plan sets out a number of key priority areas that are aligned with the strategic objectives in order to ensure a robust and effective waste governance framework. An overview of Malta's obligations under the European Union waste directives is provided, as well as an update on where we stand today. In bridging the gap between Malta's current performance and the 2030 waste targets, a suite of ambitious measures is outlined in the Plan, structured as follows:

Waste Prevention as a Priority: The first key priority area is Malta's Waste Prevention Programme. The overall aim is to promote resource efficiency and entice waste generators to minimise their waste by creating a conducive landscape. This Chapter proposes a range of measures to incentivise greener business processes and prompt societal change towards smarter consumption patterns.

1 Source: Environment Resource Authority
2 https://ec.europa.eu/eurostat/web/products-datasets/product?code=sdg_11_60

Waste Collection Reform: For waste which is unpreventable, efficient collection systems must be in place. The Waste Collection chapter outlines measures which balance the collection frequencies of different waste streams to encourage source separation and the minimisation of residual waste. The chapter also sets out to reform waste collection services by moving towards a regionalised approach leading to increased economies of scale, and better utilisation of a modern vehicle fleet thus optimising investment costs.

Waste Management and Resource Optimisation: In order to support Malta's transition to a more resource efficient and circular economy, we must ensure that any waste generated is efficiently and effectively treated in order to minimise its environmental footprint whilst maximising its potential as a resource. This will be achieved through:

1) improving existing extended producer responsibility frameworks to establish a level playing field and to ensure that waste management costs are borne by producers. The feasibility of expanding EPR obligations to additional waste streams will be assessed;

2) implementing measures to incentivise waste prevention, harness source separation and reduce residual waste volumes from commercial entities and;

3) investing in both new and existing waste management facilities to ensure a modern and efficient waste infrastructure that not only meets Malta's current needs but will set in place the required treatment facilities for the future. Differentiated gate fees to reflect the true cost of the different fractions of waste and induce further waste separation will be considered.

In order to support the implementation of these initiatives, this Plan also puts forward a series of improvements to the monitoring, compliance and data management capabilities, largely based on strengthening capacity building including technological capacity.

The Ministry for the Environment, Climate Change and Planning will collaborate with a range of stakeholders in order to foster a culture of resource efficiency, create new business opportunities, invest heavily in necessary infrastructure and support voluntary initiatives which promote the prevention and sustainable management of waste. We will engage with stakeholders and collaborate across the public and private sectors to work together to make a difference and instill a culture of change that promotes waste prevention and sustainable waste management. New measures will include economic instruments, awareness-raising campaigns, new regulations, research and innovation and various other policy tools in order to incentivise waste prevention, source separation and correct management of waste generated on the Maltese Islands. The initiatives outlined in this Waste Management Plan will facilitate action by industry, Government, citizens and tourists. This implies the need for a collaborative approach from all those who generate waste in their personal, professional or corporate capacity and the assumption of responsibility for the management thereof. The proposed measures are intended to steer Malta towards reaching its EU obligations, reduce dependency on landfilling and export of waste, and transition Malta to a more resource efficient and circular economy. This for the benefit of Maltese society as a whole.

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SETTING THE SCENE: MAXIMISING VALUE FROM WASTE

The vision of the Ministry for the Environment, Climate Change and Planning is to maximise the inherent resource value in waste through holistic waste management solutions and by fostering societal change towards waste prevention. We aspire to progressively move towards a zero-waste scenario.

1.1. Towards a resource-efficient and circular economy

A circular economy approach can support the prevention of waste at all stages of a product's lifecycle; from design, production and distribution right through to use and disposal. Designing a product to be easily repaired or upgraded can maximise its use before it reaches its end of life. Purchasing and consuming with care such as; washing clothes correctly, keeping up with maintenance schedules and being amenable to make modifications and repairs, can extend the life of items while embracing SMART shopping principles can prevent food waste.

As many goods available on the market in Malta are imported, Malta is limited in terms of influencing product lifecycles. However, initiatives can be implemented at a national level to target the distribution, consumption and disposal stages; encouraging businesses, residents and tourists to minimise the amount of waste generated on the Maltese Islands. Finally, initiatives implemented at disposal stage can greatly improve the circularity of the Maltese economy, specifically through source separation and appropriate recycling facilities.

Over recent years, progress has been made on waste separation and the sustainable management of organic and recyclable waste. Both Government and the private sector have invested considerably in providing a kerbside service where such waste is collected from each household. Yet, not enough of the resident population have chosen to embark upon this journey. The status quo is not an option and it is vital that our efforts are redoubled not only to separate our waste but also on preventing products and materials from becoming waste too early in their economic lifetime. The prevention of waste can be achieved by limiting the consumption of single-use items, implementing smarter purchasing practices, embracing digitalisation and extending the lifetime of products such as clothing and electronics. The Ministry for the Environment, Climate Change and Planning is committed to implementing initiatives to limit waste generation while adding value to its enablers so as to assist the transition of Malta's economy towards a more circular and sustainable one. Through various strategic and interconnected measures, the promotion of resource efficiency can enhance environmental protection whilst creating the conditions for economic gains.

1.2. Scope and objectives

The Waste Management Plan for the Maltese Islands 2021-2030 has been developed in compliance with Article 28 of the EU Waste Framework Directive, which stipulates that each Member State shall establish a Waste Management Plan which "shall set out an analysis of the current waste management situation in the geographical entity concerned, as well as the measures to be taken to improve environmentally sound preparing for re-use, recycling, recovery and disposal of waste and an evaluation of how the plan will support

the implementation of the objectives and provisions of this Directive. [3]"

This plan will not only support Malta's overall transition towards a circular economy but will also support Malta's compliance with the Waste Framework Directive and the achievement of EU waste and recycling targets.

1.3. Strategic objectives

The strategic objectives identified for this Waste Management Plan are as follows:

- Maximise the resource value in waste through different management options
- Innovate by designing waste prevention initiatives to lower Malta's per capita generation rate
- Reform the collection system to increase economies of scale, harmonise collection practices and modernise the collection fleet
- Build the necessary waste management facilities to treat recyclable, organic and residual waste to achieve Malta's targets
- Study the feasibility of an enhanced producer responsibility framework to complement Malta's transition to a circular economy and reflect further on the true cost of waste management
- Promote further the involvement of the private sector in waste management

1.4. Key challenges

The Ministry for the Environment, Climate Change and Planning, in developing this Plan, has identified several key challenges to achieving an ideal waste management situation:

- Limited economies of scale. The Ministry's plan for regionalisation of waste collection and the centralisation of plants will aim to implement sustainable waste management practices which benefit from economies of scale.
- Demographic pressures from Malta's economic success but limited land size.
- Decoupling economic growth from waste generation, ensuring that whilst economic prosperity is retained, the amount of waste generated is reduced.
- Acknowledging the real cost of waste management and correlating this with the responsibility of those who generate waste. The Waste Management and Resource Optimisation chapter will outline the plan to rectify this challenge.

3 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098

- Public engagement to make conscious choices to prevent the generation of waste and to make a concerted effort to separate their waste at source. This will be addressed through waste prevention initiatives and educational campaigns.
- Robust management and data information systems. Malta's plan for robust Data Management, outlined in the relevant chapter, will aim to address this challenge.

1.5. Point of departure

In 2013, The Ministry for the Environment, Climate Change and Planning (MECP) developed a Waste Management Plan for the Maltese Islands for the period 2014 – 2020. This Plan included a series of measures to promote waste prevention, re-use, recycling and recovery in order to move waste in Malta up the waste hierarchy. These measures were established to guide Malta in its ambition and obligation of reaching EU Waste Management targets, including those for increased recycling, reduced landfilling, separate collection rate of specific waste streams and recovery.

In order to determine the progress achieved on the implementation of the waste prevention and management measures, the Ministry conducted a stock-taking exercise to track the status of measures, assess the progress achieved and to analyse opportunities for improvement. Throughout the exercise, each measure was monitored to understand its status, deadline and the way forward. In this sense, it proved a useful tool for reflection and planning and in helping define the key priority areas of the upcoming Waste Management Plan for 2021-2030.

MECP, together with key partners, successfully implemented 79% of the measures identified in the Waste Management Plan 2014-2020. The most significant completed measures included a new Mechanical Biological Treatment facility at the Magħtab complex, the nationwide roll-out of organic waste collections from households, a commitment on a new Waste-to-Energy facility, educational campaigns on sustainable waste management, and concrete plans for a Beverage Container Refund Scheme.

The previous Waste Management Plan (2014-2020) was written at a time when waste policy at the EU and international level were not specifically focused on the concept of the circular economy. These are now key drivers for EU waste and recycling policy. The new Waste Management Plan (2021-2030) will implement a range of measures to move Malta towards a more resource efficient economy.

1.6. Priorities

Key priority areas for the Waste Management Plan 2021-2030 have been identified in alignment with the strategic objectives. These are as follows:

- Waste Prevention
- Increasing Infrastructural Capacity

- Expanding Extended Producer Responsibility
- Modernising Waste Collection
- Regulating Commercial Waste
- Exploring Economic Instruments
- Strengthening Compliance and Enforcement

The Waste Management Plan for the Maltese Islands, 2021-2030, will set out various measures across these key priority areas to limit waste generation and support more sustainable waste management systems. This will be achieved through increased efficiency of existing waste management operations, ensuring producers are responsible for the waste that their products generate, a shift in behaviour regarding waste generation and management, and new facilities to support better management of waste; all of which will be supported by better data collection and management, and effective enforcement.

The new Waste Management Plan will be implemented to achieve our aim to maximise the inherent resource value in waste through holistic waste management solutions and by fostering societal change, in our aspiration to progressively move towards a zero-waste scenario.

1.7. Sustainable Development Goals

The United Nations Sustainable Development Goals (SDGs) provide a blueprint for mainstreaming global sustainable development maximising economic, social and environmental goals. Malta supports the alignment of its policies, plans and programmes towards the achievement of the United Nations SDGs. Waste prevention and management can support the delivery of the SDGs in various ways[4].

Malta's Sustainable Development Vision for 2050[5] sets out a long-term framework for advancing sustainable development in Malta whilst taking into consideration past shortcomings and achievements. This Waste Management Plan is particularly aligned with the Targets under Goal 12: Sustainable Production and Consumption. Having said this, the external benefits resulting from the plan will also support various other Global Goals.

4 https://wasteaid.org/wp-content/uploads/2016/05/swm-sus-goals-without-zlcomms.png

5 https://meae.gov.mt/en/Public_Consultations/MSDEC/Documents/Malta%27s%20Sustainable%20Development%20Vision%20for%202050.pdf

Goal 12: Sustainable Production and Consumption

Target 12.3 "To halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 2030."

In line with this Target, food waste features prominently in Malta's Waste Prevention Programme which includes a range of measures to reduce food waste at retail and consumer levels, as well as post-harvest losses. Some examples include banning food waste to landfill, prohibiting supermarkets from throwing away food following a voluntary industry agreement to limit food waste and educate consumers, research into reasons for food waste and loss at primary production, promoting 'gleaning', and supporting digital applications and channels for redistribution and food sharing initiatives. The plan also discusses measures which will indirectly help to reduce food waste such as promoting local and seasonal food and expanding education on cooking within schools and communities.

Target 12.5 "By 2030, substantial reduction of waste through prevention, reduction, recycling and reuse." This Plan aims to facilitate the prevention of waste and the reuse of materials by industry, government, citizens and tourists. The goal is to reduce the generation of waste food, electronics, textiles, single-use plastics, packaging, non-packaging paper, and waste from construction and demolition. The Plan proposes a range of measures to incentivise greener business processes and prompt societal change towards smarter consumption patterns. Efforts include economic incentives, legislative measures, the promotion of voluntary measures, capacity building, digitalisation, research and development, and education and awareness-raising. Some examples include supporting food redistribution initiatives, the establishment of a repair & reuse centre for repair and resale of second-hand items including textiles, electronics, toys and furniture, encouraging skills training for repair and reuse activities, promoting education and awareness on waste prevention across various sectors, and working to embed waste prevention into the curriculum. This Waste Management Plan also addresses specifically waste arising from commercial establishments. The intention is to implement measures to promote the prevention of waste and secure the correct separation at source to maximise the recycling potential of organic and recyclable waste from commercial entities. Incentives to increase waste separation at source leading to lower volumes of mixed waste and a higher recycling rate are at the core of the measures proposed therein. Furthermore, significant investment in new waste management infrastructure will not only boost Malta's recycling and help to achieve EU obligations but will also positively contribute to the delivery of the SDGs.

1.8. Effective Governance

The United Nations defines governance as the process of decision-making and implementation[6]. Decision-making and implementation regarding waste management in Malta is influenced by a structured framework of multi-level governance at an international, European and national level. At an international level, the United Nations Sustainable Development Goals (SDGs) provide a blueprint for mainstreaming global sustainable development maximising economic, social and environmental goals. An effective Governance system is key to Malta's success towards these goals. As a member of the European Union, Malta is also obliged to reach various targets on waste recycling. The Waste Management Plan for the Maltese Islands will be a key tool by which to reach these ambitious targets.

Governance at a National level refers to the way in which countries are managed and the systems which facilitate this management[7]. There are various key elements of good governance, which will be utilised as a framework by which to ensure the effectiveness of Malta's Waste Management Plan:

1. Political Will: Political will is a determining factor towards securing a properly governed waste management sector. Malta is at a juncture where difficult decisions need to be taken to ensure sustainable waste management. Such decisions need to be taken in a timely and equitable manner maximising economic, social and environmental goals.

2. Rule of Law: Good governance requires a fair, legal framework which is enforced fairly without prejudice. The Waste Management Plan will be reinforced by a regulatory framework to support the environmentally sound management of waste, with clear information to citizens and tourists, and supported by a robust enforcement system which is seen to ensure compliance thereto.

3. Transparency: The decision-making process should be transparent with clear information that is easy to access and to understand by those impacted. This Plan has been published for public consultation to give civil society and interested decision stakeholders a voice in the decision-making process. Studies supporting decision-making as well as data on performance will, as far as possible, be published for the necessary scrutiny. In the spirit of transparency, updates are also communicated via social media. To this effect, an effective data management system is proposed to enhance transparency in decision making, regulation and operations.

4. Accountability: In a good governance system, there should be clear accountability with specific roles assigned to distinct actors. Policy-making, regulatory and operational roles should be clearly assigned amongst the various players in the sector to ensure single point responsibility. Accountability does not only apply to public entities but is also applicable to private operators and individuals.

6 https://www.unescap.org/sites/default/files/good-governance.pdf
7 https://dictionary.cambridge.org/dictionary/english/governance

5. Participation: Good governance must encourage participation from the widest array of stakeholders. Key stakeholders in the prevention and management of waste in Malta include public bodies, citizens and tourists, the business community, industry and trade representatives, waste collectors, waste facilities, Producer Responsibility Organisations and environmental non-Governmental organisations. To this effect, the design of the Waste Management Plan has included various consultations with stakeholders. It includes various measures to encourage participation and knowledge sharing between stakeholders including workshops, online information and events focusing on various issues relating to waste.

6. Responsiveness: Good governance requires decisions to serve the best interest of stakeholders within a reasonable timeframe. The Waste Management Plan puts forward a wide range of initiatives and projects to address the issue of waste on the Maltese Islands, including new infrastructure. Waste collection schedules are also frequently updated in response to the varying requirements of different localities. It is the Ministry's aim to be able to respond in a timely and effective manner to issues which may arise from time to time.

7. Consensus Oriented: Decision makers understand the different, often conflicting, interests of stakeholders in a society and the challenge to reach a broad consensus. Both internal and external means of consensus building have been sought in the development of this Waste Management Plan involving a range of stakeholders and public consultation. In the absence of absolute consensus, the Ministry has the obligation to heed its accountability obligations and decide in a manner that fulfils the country's legal obligations with least impact.

8. Equity and Inclusiveness: Decisions must provide an opportunity for stakeholders to share in a proportional manner the responsibilities in reaching the goals of this plan. Moreover, the Plan will offer the opportunity for increased stakeholder involvement and participation in the delivery of the Plan's goals and objectives.

9. Effectiveness and Efficiency: Good governance mandates that actions should produce favourable results while utilising resources efficiently at the lowest possible cost. The new proposed waste infrastructure has been designed with efficiency in mind, both in terms of the use of resources, such as land, as well as in recovering the maximum resource value from waste. The Plan also places a strong focus on resource efficiency through waste prevention.

10. Capacity: Government needs to acknowledge and provide for the necessary human and financial resource capacity required to support the proper development and implementation of policy, more effective

compliance and enforcement of the regulatory framework and the efficient and effective operational measures for achieving Malta's targets and obligations.

11. Coherency: Coherency requires the development of policy, regulatory and operational measures that are in unison with each other and mutually reinforcing. Waste management is a sector which cuts across a number of policy areas and regulatory and economic sectors which need to support the objectives set out in this plan.

12. Sustainability: Good governance requires that decisions are made with the future generations in mind, so as not to compromise their future enjoyment of economic growth, social wellbeing, environmental quality and resource base. In doing so, all waste management initiatives should be designed to maximise economic, social and environmental goals.

2

PROGRESS

2.1. European Union Directives and Policy

The European Union has been instrumental in promoting resource efficiency and the circular economy. The two objectives of the EU Waste Framework Directive are "to prevent and reduce the negative impacts caused by the generation and management of waste" and "to improve resource efficiency[8]."

The EU Waste Framework Directive "lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use."

The EU also obliges Member States to apply the principles of the waste hierarchy, whereby waste prevention and re-use are the preferred options ahead of recycling and energy recovery, which will be reflected throughout this document. The objectives of this Waste Management Plan are shaped by Malta's local context and guided by relevant EU documents, including:

- The EU Waste Framework Directive[9]
- Directive on the reduction of the impact of certain plastic products on the environment[10] (also known as the 'Single-Use Plastics Directive')
- Circular Economy Package including the Strategy for Plastics in a Circular Economy[11] and Circular Economy Action Plan[12]
- The European Green Deal[13]
- A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy[14].
- Delivering on the UN Sustainable Development Goals – A comprehensive approach[15]

The measures set out in this Waste Management Plan support the implementation of the Waste Framework Directive, not least focusing on waste prevention, resource efficiency and environmentally sound management of waste generated on the Maltese islands.

8 https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm
9 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0098-20180705&qid=1593066746527&from=EN
10 https://eur-lex.europa.eu/eli/dir/2019/904/oj
11 https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf
12 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614
13 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
14 https://ec.europa.eu/clima/policies/strategies/2050_en
15 https://ec.europa.eu/info/sites/info/files/delivering_on_uns_sustainable_development_goals_staff_working_document_en.pdf

European Union Objectives

The following section analyses and quantifies all aspects pertaining to the management of waste in the Maltese Islands, including the current status with regards to the collection and management of municipal waste, hazardous waste, construction and demolition waste as well as commercial and industrial waste. This chapter also includes a thorough assessment of Malta's performance vis-à-vis the waste management targets emanating from EU legislation, as well as on the new legal obligations arising from the EU Waste Legislative Package adopted in 2018.

At the end of 2015, the European Commission adopted the first Circular Economy Package, which included revised legislative proposals on waste management to stimulate Europe's transition towards a circular economy with the aim to boost global competitiveness, foster sustainable economic growth and generate new jobs. As a result, the European Commission and the Council of the European Union undertook negotiations on six waste related legislation proposals, known as the Waste Package, as follows:

- The Waste Framework Directive - Directive 2008/98/EC on Waste
- The Packaging Waste Directive - Directive 94/62/EC on Packaging and Packaging Waste
- The Landfill Directive - Directive 1999/31/EC on the landfilling of waste.
- The WEEE Directive - Directive 2021/19/EU on waste electrical and electronic equipment
- The ELV Directive - Directive 2000/53/EC on end-of life vehicles; and
- The Batteries Directive - Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators.

During discussions, Malta held the Council Presidency for the six months from 1st January 2017 until the end of June of the same year. During this period, the Maltese Presidency obtained support to initiate talks with the European Parliament for the eventual adoption of the amendments to the Directives.

The Waste Legislative Package was published in the Official Journal of the European Union on 14 June 2018. It included new elements that brought more clarity to certain elements such as new, streamlined definitions, new requirements to strengthen the implementation of the waste hierarchy as well as new ambitious preparing for reuse, recycling and landfilling targets. In addition, the waste reporting regime has been reviewed whereby Malta as a Member State is now required to provide more accurate information on the waste generated and treatments, carried out both locally and abroad.

2.2. Setting the scene for each waste stream

Municipal Solid Waste (MSW)

Municipal solid waste (MSW) is one of the most challenging waste streams in Malta. It consists of a variety of waste, including that from households and from retail, administration, education, health services, accommodation and food services, and other services and activities which is similar in nature and composition to waste from households[16].

MSW encompasses a wide variety of fractions, including paper and cardboard, packaging material, glass, waste electrical and electronic equipment, textiles, medicines, edible oils, bulky waste, food waste and garden waste. As MSW may be generated from numerous sources, its composition is highly heterogeneous, making it particularly challenging to divert it away from landfill.

A key focus of this Waste Management Plan is to reduce the amount of MSW generated, promote source separation of key waste streams including food, plastics and WEEE which could be valorised as a secondary resource elsewhere. This section provides a brief background on food waste and plastic waste, two priority streams, as well as background on textile waste which will soon be subject to an EU regulation. Other subsets of MSW including WEEE and packaging are addressed under the section on Extended Producer Responsibility.

The diverse nature of MSW implies that various pieces of national and Union legislation govern either directly or indirectly the management of this waste stream. The main Union legal instrument is the Waste Framework Directive, which was extensively amended in 2018 with a view to reflecting the Union's ambition to move towards a true Circular Economy. The main novelties introduced in the amended Waste Framework Directive are as follows:

16 Recital 10 of Directive (EU) 2018/851 amending the Waste Framework Directive

a) A new definition for municipal waste, which includes waste from households and waste from other sources (e.g. retail, administration, accommodation and food services) which is similar in nature and composition to waste from households. Waste from different sources which is not similar to waste from households (e.g. waste from production, construction and demolition), is excluded from the definition of municipal waste.

b) New ambitious targets for preparing for re-use and recycling of municipal waste, which targets are coupled with stricter calculation rules requiring that a new, advanced waste data management system be developed in Malta (See Table 1: Current and new MSW targets).

Current target	New targets
■ By 2020, the preparing for re-use and recycling of household waste had to be increased to a minimum of 50% by weight	■ By 2025, the preparing for re-use and the recycling shall be increased to a minimum of 55% by weight ■ By 2030, the preparing for re-use and the recycling shall be increased to a minimum of 60% by weight ■ By 2035, the preparing for re-use and the recycling shall be increased to a minimum of 65% by weight

Table 1: Current and new MSW targets

c) New requirements to introduce waste prevention measures, amongst others, to reduce waste generation, food waste and litter, and to encourage the reuse of products. The introduction of such measures is coupled with the establishment of a monitoring and reporting system, with a view for the European Commission to consider the introduction of new specific targets for waste prevention.

d) Obligations pertaining to the setting up of systems for the separate collection of various streams including bio-waste, textile and hazardous wastes generated by households.

Another important piece of Union legislation amended in the context of the 2018 Waste Legislative Package is the Landfill Directive. The following are the main novelties introduced in the aforementioned Directive:

e) A new target whereby the amount of municipal waste landfilled is reduced up to a minimum of 10% of the total amount of municipal waste generated (by weight) by 2035; and

f) New waste streams which cannot be accepted in a landfill by 2030:

a. Waste streams such as paper, metal, plastic, glass, textiles and bio-waste which have been separately collected for preparing for reuse and recycling[17]; and

b. Member States shall also endeavour to ensure that all waste suitable for recycling or other recovery are not be accepted in a landfill.

This Long-Term Waste Management Plan establishes an extensive list of measures to not only reduce the amount of waste generated, but also to reform systems of collection and recycling of various waste streams. Not least of these are: EPR schemes for textiles and non-packaging paper, harmonised collection schedules for household recyclable waste, obligatory separation of organic and plastic waste from commercial establishments, a new Organic Processing Plant and new Materials Recovery Facility. The measures throughout this Plan will support the separate collection of various waste streams and increase the recycling rate, and hence divert recyclable materials from landfill. Diverting the above recyclable wastes away from landfill will reflect the principle of waste management hierarchy and support the attainment of the new targets emanating from the new waste legislative package. It will also support the legislative ban on recyclable material from landfill which is mandated through the revised Landfill Directive.

The generation of MSW has been increasing gradually over previous years as illustrated below. In 2011, around 247,000 tonnes of MSW was generated, rising to approximately 306,000 tonnes in 2018. This increase brought the amount of MSW generated per capita in 2018 to 621kg, an increase of 5% over seven years, from 593kg in 2011[18].

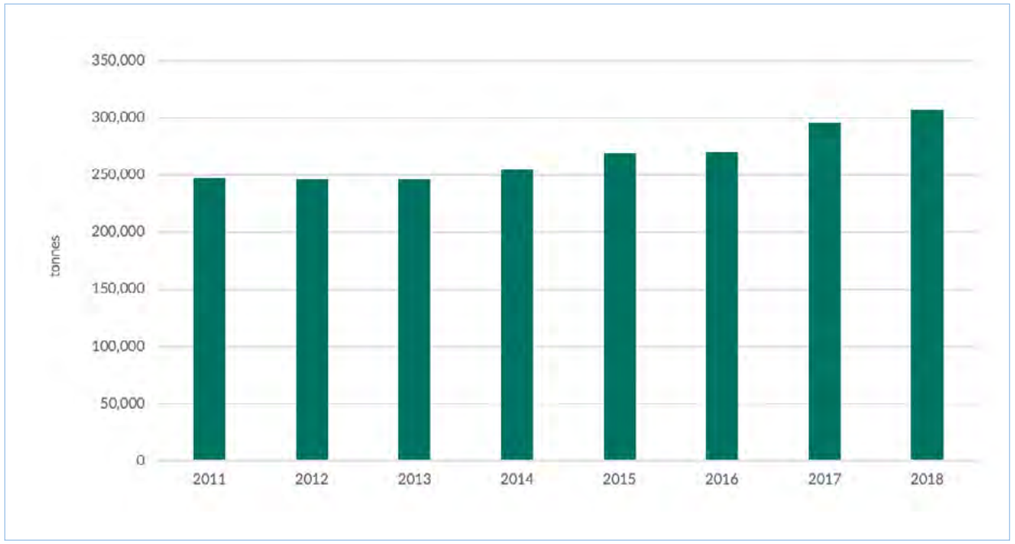


Figure 1: MSW generated over the period 2011 to 2018

17 This excludes waste resulting from subsequent treatment operations of the separately collected waste for which landfilling delivers the best environmental outcome in accordance with the Waste Hierarchy

18 Source: Environment and Resources Authority

Mixed municipal solid waste (which includes organic, residual and bulky waste) is collected through the systems organised and funded by the Local Councils, whilst the collection of recyclable waste (grey/green bag) from the Local Councils is financed by Producer Responsibility Organisations (PROs) for packaging waste. Collection systems vary between door-to-door kerbside collections for selected waste streams including co-mingled recyclables in grey/green bags, separate glass collections, organic waste in white bags, and residual waste in black bags as well as a bulky waste service upon request; or by means of centrally located bring-in banks including for paper, plastic, metal and glass operated by PROs or civic amenity sites for bulkier waste operated by Wasteserv Malta Ltd.

During the last quarter of 2018, Malta initiated the nationwide collection of organic waste from households. To this effect, in 2018 legislative amendments were carried out to introduce a fixed schedule for the collection of MSW from households, by specific fraction, obliging households to deposit waste according to the stipulated schedule.

The chart below indicates that between 2012 and 2018, the percentage of black bags as a total of household waste decreased from 90% to 71%; this implies an increase in source separation of recyclables. Indeed, the collection of recyclables (including glass) increased from 7% to 14%, and bulky waste collection rose from 3% to 4%. It is anticipated that the introduction of nationwide organic waste collections has offered further benefits, however, since the collection of the organic fraction started nationwide during the last quarter of 2018, the data provided does not capture its full effect.

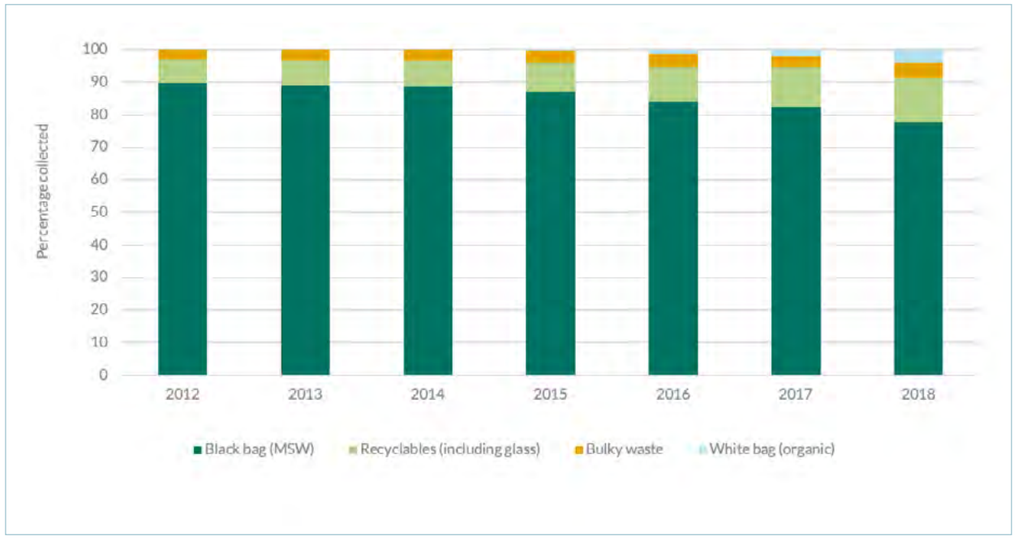


Figure 2: Collection of MSW by the Local Councils[19]

19 Figures on bulky waste from amounts reported by Civic Amenity Sites

Bulky waste generated by households, which also constitutes part of MSW, including furniture, mattresses and white goods, is either collected by Local Councils via the free door-to-door collection system or from the various civic amenity sites across the islands. As highlighted below, the lowest amount of bulky waste was recorded in 2012, where it accounted for 10% of all municipal waste generated, rising to 19% in 2018.

Additional collection systems of WEEE from households, are in place, and are provided by the Local Councils at no charge for households.

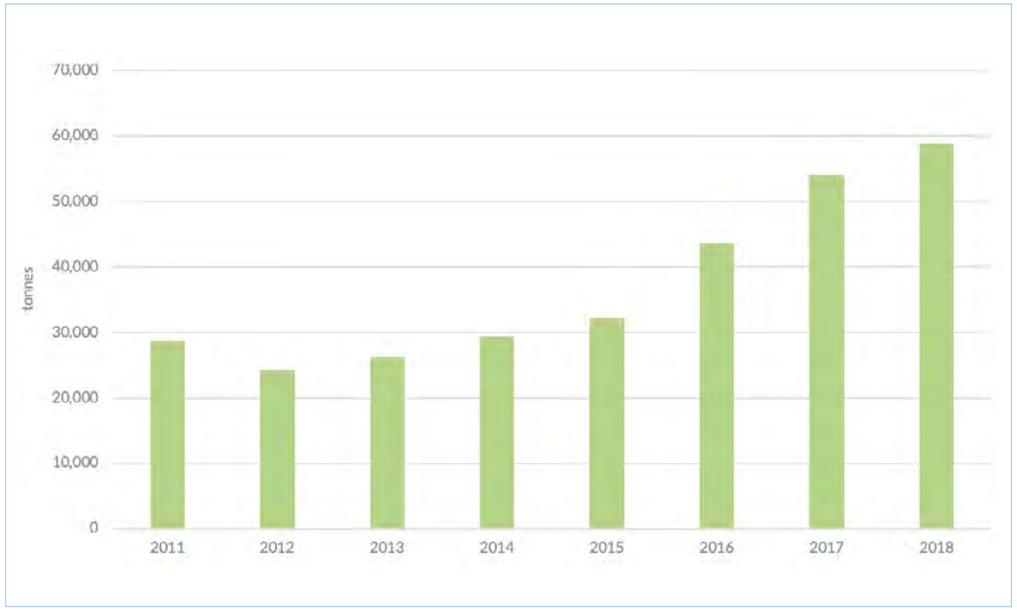


Figure 3: Bulky waste collected at Civic Amenity Sites over the period 2011-2018

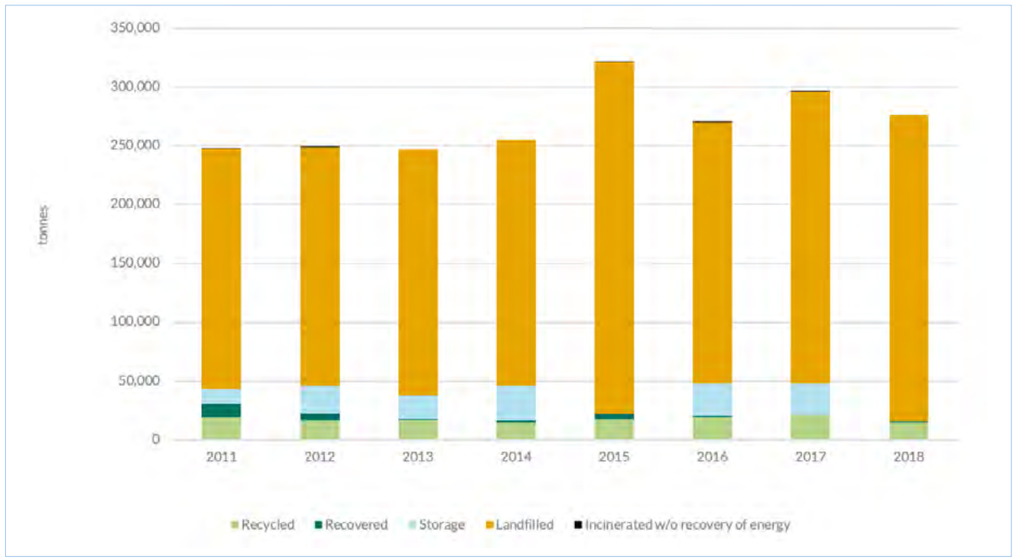


Figure 4: Treatment operations for MSW over the period 2011 to 2018

Treatment of municipal waste

Malta has, so far, depended heavily on landfilling as the most common treatment option for the management of municipal waste. This places considerable pressure on the limited remaining void space. The graph below also indicates that the amounts recycled throughout the period 2011 and 2018 have remained stable, with the recycling rate for household waste being 15% in 2018[20]. Such a low recycling rate indicates that Malta will not reach the 2020 recycling target of 50% for household waste.

Such high dependency on landfilling of municipal waste also implies that Malta is currently failing to achieve the target set out under the Landfill Directive for biodegradable municipal waste (BMW). The following chart provides an overview of the management of BMW in Malta over the period 2011 to 2018.

The data clearly shows that the default option for the management of BMW is local landfilling. The figure reported in 2015 is significantly higher in view that during the period of 2010-2014 circa 59,000 tonnes of wood were stored on site, which were subsequently landfilled in 2015. The chart below illustrates that Malta's performance is still far away from meeting the current EU Target on landfilling on BMW.

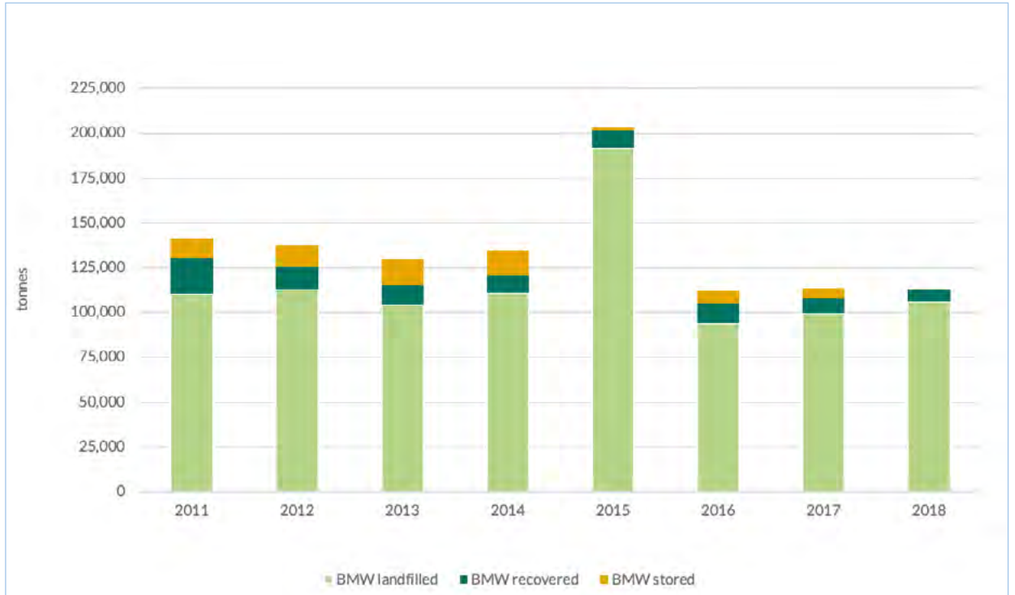


Figure 5: Treatment operations for BMW over the period 2011-2018

20 Provisional

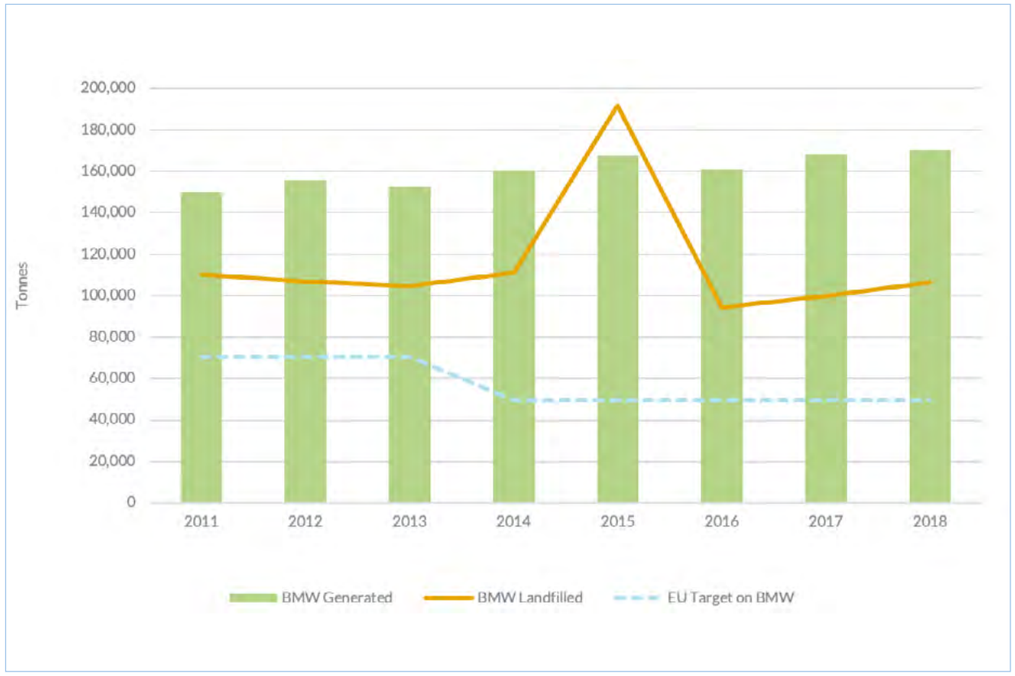


Figure 6: Malta's performance of current EU 2020 target on landfilling of BMW (2011-2018)[21]

Medical waste collected with MSW is incinerated locally without energy recovery. In October 2019, Wasteserv Malta Ltd. launched another initiative under the umbrella of the nationwide Sort It Out campaign. This initiative consisted in the collection of expired or unwanted medicines in designated bins located in most pharmacies, with a view to channeling this waste stream towards the most appropriate treatment option.

Municipal waste is a key focus of this Waste Management Plan both in terms of waste prevention initiatives, new policies to address waste from commercial entities, and the introduction of measures for effective separation and management of such waste.

21 The figure reported in 2015 is significantly higher in view that in the period of 2010-2014 circa 59K tonnes of wood were stored on site, which was subsequently landfilled in 2015.

Food waste

Food waste occurs at every stage of the supply chain, however an estimated 84%[22] of EU food waste occurs within households, restaurants, food service, retail and distribution. Households in Malta generate 135kg[23] of food waste per capita each year, yet there is currently limited national data on food waste generation in Malta at each stage of the supply chain.

Diagram 1: Food waste flow diagram

22 https://www.europarl.europa.eu/news/en/headlines/society/20170505STO73528/food-waste-the-problem-in-the-eu-in-numbers-infographic

23 https://eplca.jrc.ec.europa.eu/uploads/food_systems_report%203.pdf

In order to gather accurate data of food waste generated across the Union, Member States are required to report the quantities of food waste generated at all the stages of the food supply chain with a view to achieve the 30% food waste reduction target at Union level to be achieved by 2030. The Commission Delegated Decision supplementing the WFD sets out a common methodology and minimum quality requirements for the uniform measurement of levels of food waste. The amended WFD also calls on the Member States to adopt specific food waste prevention programmes within their waste prevention programmes. Food waste is highlighted as a key priority stream in the Chapter on Waste Prevention.

The United Nations Sustainable Development Goal 12.3 is to halve per capita food waste by 2030, and under the European Union Waste Framework Directive, member states should send no more than 10% of municipal waste to landfill by 2035. The success of the nationwide household organic waste project has supported Malta's progress towards achieving these goals and over the upcoming years we are committed to continuous improvement. Building upon previous nationwide awareness raising campaigns Don't Waste Waste and Sort it Out, we are taking additional steps to prevent food waste in Malta across various stages of the food supply chain, ensure correct source segregation of food waste, and invest in facilities to ensure resource recovery of food waste.

Over the period 2011-2018, Malta has seen an overall increasing trend in food waste generation over the period 2011 – 2018, as illustrated in the figure below.

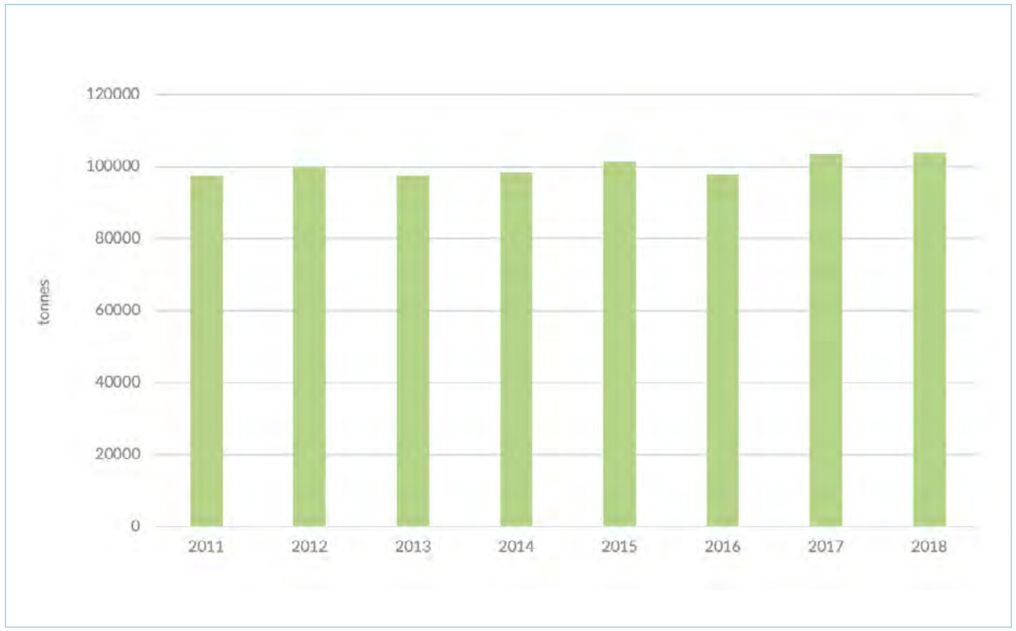


Figure 7: Food waste generated in Malta (2011-2018)

The data presented in the graph above includes direct measurements, particularly from primary production,

processing and manufacturing activities, as well as estimates of the food waste generated from other stages within the food supply chain. This is because food waste is being collected together with other waste streams, e.g. bio-waste and mixed municipal waste. As mentioned above, the new requirements emanating from the Waste Framework Directive oblige Member States to gather more accurate data on food waste, by means of applying different measurement methods for this waste stream.

The majority of the food waste generated during the period under review in Malta was landfilled, while the organic waste collected from households following the nationwide rollout in 2018 was processed via anaerobic digestion into renewable energy.

Plastic waste

Only 9% of the 8.3 billion tonnes of plastic waste generated globally by 2015 have been recycled[24]. In December 2015, the EU Commission adopted the first Circular Economy Action Plan which identified plastics as a key priority. 2017 saw the commitment of the EU to the goal of ensuring that all plastic packaging is recyclable by 2030[25] and the following year A European Strategy for Plastics in a Circular Economy[26] was adopted. This European Plastics Strategy focuses on the design and production of plastics and plastic products, ensuring that they fully respect reuse, repair and recycling needs.

In June 2019, the EU published a new Directive (2019/904) on the reduction of the impact of certain plastic products on the environment, also known as the 'Single-Use Plastics' Directive. The primary aims of this Directive are to prevent and reduce the impact of certain plastic products on the environment and on human health and promote the transition to a circular economy through innovative business models, products and materials.

The European Union defines a single-use plastic product as: "a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or re-used for the same purpose for which it was conceived."[27] The EU Single-use Plastics Directive targets the following items:

- beverage containers and bottles, their caps and lids;
- tobacco product filters;
- cotton bud sticks;

24 https://www.unenvironment.org/interactive/beat-plastic-pollution/

25 COM(2017) 650 An agenda for a more united, stronger and more democratic Europe https://ec.europa.eu/info/sites/info/files/cwp_2018_en.pdf

26 COM(2018) 28 A European Strategy for Plastics in a Circular Economy https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1516265440535&uri=COM:2018:28:FIN#footnote4

27 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904&from=EN

- packets and wrappers;
- sanitary items;
- plastic bags;
- cutlery, plates, straws and stirrers, cups for beverages and cup lids;
- balloons and sticks for balloons;
- food containers; and
- fishing gear.

UN Sustainable Development Goal 14, 'Life Under Water', promotes, through target 14.1, that "by 2025, [we are to] prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution[28]." Single-use items are significant contributors to marine litter as when these land-based sources end up in the ocean, they break up into smaller pieces, eventually becoming microplastics which can threaten marine life. Microplastics are also intentionally added to many consumer products such as cosmetics, as well as being released from plastic microfibers when synthetic clothing items are washed. The Single-Use Plastics Directive (SUP Directive) introduces measures (in Annex) to give priority to sustainable and non-toxic re-usable products and re-use systems rather than to single-use products, and to reduce the quantity of plastic waste generated.

Malta's Single-Use Plastic Products Strategy 2021-2030 sets out a number of measures aligned with the aims of the SUP Directive (2019/904). The implementation of the proposed measures in the Strategy shall involve several changes to the current regulatory regime, including amendments to current legislation, introducing new regulations, changes in permitting or licensing regimes and increased market surveillance and enforcement.

Another recent policy initiative by the Government that aims to tackle single-use plastics is the Beverage Container Refund Scheme (BCRS). The BCRS involves adding a deposit of EUR 0.10 per glass, metal or plastic beverage container, which is redeemable when the container is scanned through the barcode system of Reverse Vending Machines. The BCRS aims to increase the proportion of empty beverage containers returned by consumers, increase the re-use and recycling of these products, assisting Malta in achieving its targets both under national and EU legislation and helping to prevent littering, given that consumers are being encouraged to return empty beverage containers. Further detail is outlined in the Chapter on Waste Prevention.

At the national level, Malta faces similar challenges as the rest of Europe when it comes to consumption patterns, plastic waste generation, littering and the management of such waste. In Malta, plastic waste generation is increasing whereas recycling rates have remained quite stable.

The graph below shows how the amount of plastic waste generated in Malta has been steadily increasing throughout the period under review. The quantity of plastic waste generated per capita in Malta has increased from 63.0kg in 2011, up to 67.1 kg in 2018.

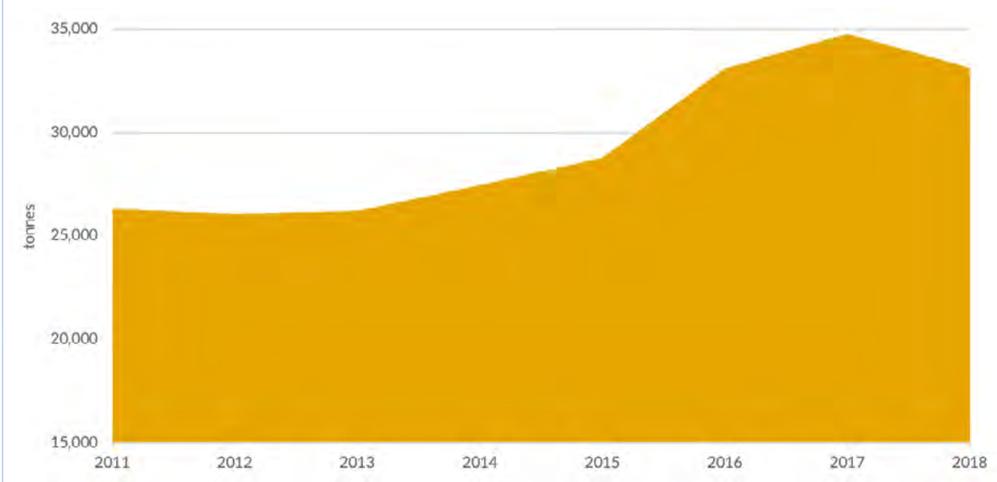


Figure 8: Generation of plastic waste in Malta (2011-2018)

28 https://www.un.org/sustainabledevelopment/oceans/

When it comes to the collection system for plastic waste, the image below shows the different routes currently in place in Malta. The collection system mainly varies depending on the generator (i.e. commercial and industry sectors or households).

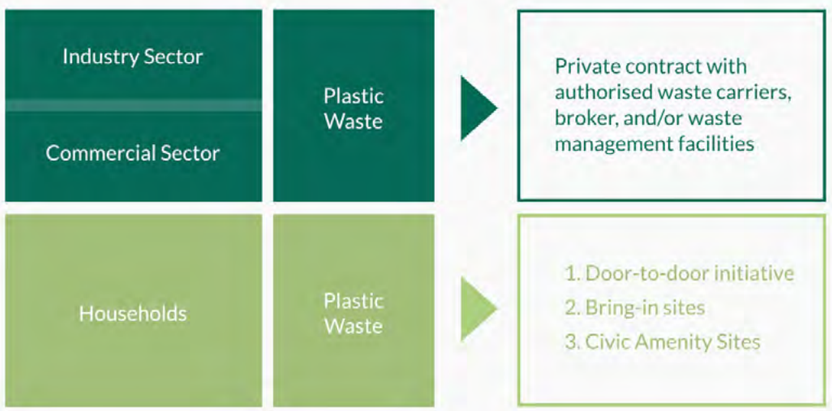


Diagram 2: : Collection of plastic waste in Malta

With regards to the treatment of plastic waste, it is it to be highlighted that a large fraction of this waste stream was directed to local landfills. 70% of plastic waste treated during the period under revision was subject to disposal by landfilling, while 28% was sent overseas for recycling or reached an end-of-waste status in Malta. Various policy measures are being put forward throughout this Waste Management Plan to drastically reduce the landfilling rate of plastics.

Textile waste

The global textiles industry place significant pressure on raw materials and water and has a significant environmental footprint due to the water, land, materials, energy and other resources required in the production of these items[29]. An additional environmental issue with regards to textiles relates to the microfibers that are released into waterways when synthetic textiles are washed and which add to the issue of microplastic load in our oceans.

Textiles also generate a significant amount of waste at their end of life which is often short as a result of fashion trends and the rise of fast fashion. The textile industry in the EU generates an estimated 16 million tons of waste each year[30] and more than 70% of clothing is disposed of in landfill or incineration. Currently less than 1% of clothing is closed-loop recycled back into new clothing[31]. Instead, around 12% of clothing is downcycled, or 'cascaded', into lower value items such as mattress stuffing and wipe cloths[32]. Furthermore, there are few countries in the EU with the infrastructure to recycle clothing, and technology is still being developed to recycle textiles at a large scale.

The EU Circular Economy Action Plan adopted in 2015 prioritises textiles as a key sector to be addressed. The Commission is developing a comprehensive EU Strategy for Textiles expected to be published in 2021, aiming to boost the EU market for sustainable and circular textiles. Anticipated measures include developing eco-design measures, improving the business and regulatory environment for sustainable and circular textiles, providing guidance to achieve high levels of separately collected textile waste, and boosting the sorting, re-use and recycling of textiles[33].

29 http://web.unep.org/environmentassembly/putting-brakes-fast-fashion

30 https://ec.europa.eu/easme/en/news/circular-economy-practice-reducing-textile-waste

31 http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf

32 https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy_Full-Report.pdf

33 Circular Economy Action Plan: https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

The updated EU Waste Package obliges all Member States to have in place separate collection of textiles by 2025. Measures proposed in this Waste Management Plan will facilitate the implementation of this requirement, whilst supporting the overall goals of the Circular Economy Action Plan.

Action to prevent textile waste will support the achievement of UN Sustainable Development Goal 12, Responsible Consumption and Production, specifically target 12.5 to "substantially reduce waste generation through prevention, reduction, recycling and reuse" by 2030[34]. Extending the lifetime of textiles and clothing, including repairing and repurposing can reduce the necessity to produce new textiles and clothing, saving key, as well as reducing waste.

The amount of waste textiles collected[35] in Malta during the period 2011–2018 is represented in the below figure. The data indicates that the collection of this waste stream increased significantly in 2017 and 2018. In 2017, around 1,000 tonnes of textile and clothing waste was generated in Malta[36], increasing to around 1,200 tonnes in 2018. These figures are more than double those from previous years. This increase is most likely due to the implementation of a new collection system for textiles introduced by a private operator.

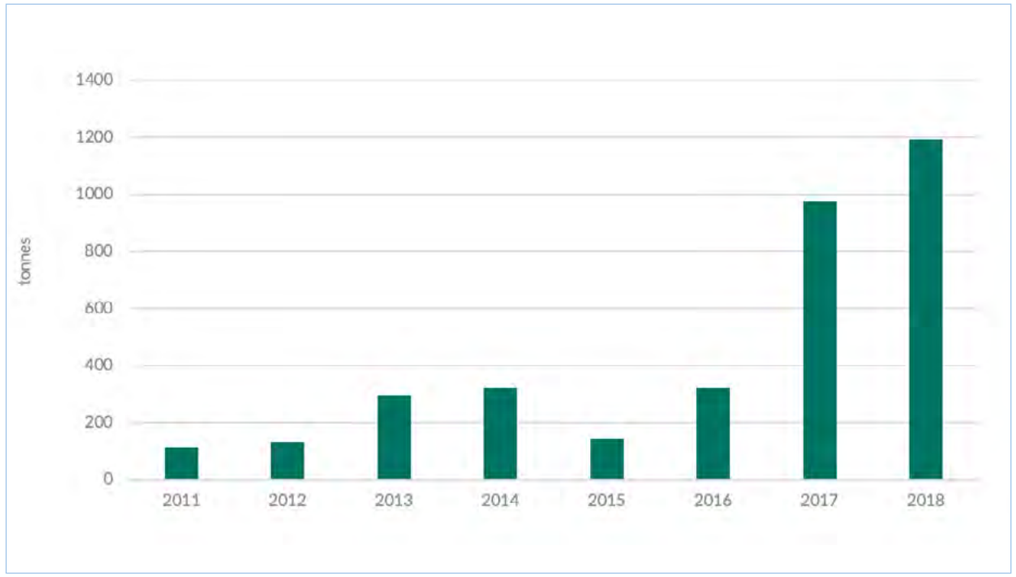


Figure 9: Textiles separately collected over the period 2011-2018

This number is anticipated to rise following measures to separately collect textiles generated in Malta, and

34 https://www.un.org/sustainabledevelopment/sustainable-consumption-production/

35 The provided data does not include textiles disposed of as mixed municipal waste (i.e. black bags).

36 https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_B3/Environment_Energy_Transport_and_Agriculture_Statistics/Documents/2019/News2019_024.pdf

thus, policy measures have been put forward to effectively prevent and manage such waste.

Although not many textiles and clothing items are produced in Malta, we still have an opportunity to do our part by addressing the 'use' and 'disposal' phase of a products lifecycle; preventing clothing and textiles from ending up in incinerators or landfills by extending the lifetime of items and promoting repair and reuse initiatives. Our vision is for clothing and textiles in Malta to be repaired and re-used to extend the item's life and then, once collected, be re-purposed into new items. This Waste Management Plan aims to address the cause of clothing and textile waste, including providing information on caring for clothes and textiles and extending their lifetime, supporting repair and reuse initiatives, the creation of secondary markets, and the promotion of good practices. The Plan will also discuss the potential for implementing Extended Producer Responsibility (EPR) requirements for textiles.

Extended Producer Responsibility (EPR)

Extended Producer Responsibility (EPR) is an environmental policy approach whereby producers bear the financial and/or organisational responsibility for the end-of-life stage of the products they place on the market. Such a principle is established in Union legislation through the Waste Framework Directive 2008/98/EC as transposed in the national legal framework via the provisions of the Waste Regulations, S.L.549.63. Waste streams in Malta currently subject to EPR requirements are Packaging and Packaging Waste, Waste Electronics and Electrical Waste, End of Life Vehicles, and Batteries and Accumulators.

The EPR principle is widely applied across the EU waste acquis, as it is reflected in Directive 2000/53/EC on End-of-Life Vehicles, Directive 2012/19/EU on Waste Electrical and Electronic Equipment and Directive 2006/66/EC on Batteries and Accumulators and Waste Batteries and Accumulators. Directive 94/62/EC on packaging and packaging waste will become an EPR piece of Union legislation as from 2025. To date, the implementation of the EPR principle in the management of packaging and packaging waste is voluntary, although many Member States including Malta have opted to shape their national laws according to this policy approach.

The new Waste Legislative Package adopted in June 2018 sets out minimum

requirements for Extended Producer Responsibility Schemes to operate within the EPR framework, with the aim to encourage development, production and marketing of products, which are easily re-usable, contain recycled materials, and are durable as well as repairable[37].

The following section provides an overview of the legal framework on EPR as well as of the current situation within the sector in Malta.

Packaging and Packaging Waste

Packaging is an essential component of our daily life, since it is widely used to contain, protect, present, handle and deliver goods. However, once packaging is removed it is discarded, thus resulting in significant amounts of waste generated, which need to be managed in an environmentally sound manner.

Across the European Union, around 170kg of packaging waste is generated per person per year[38]. Food and beverage packaging were also among the most commonly found items of marine litter across beaches in Europe and are key targets of the EU Single-Use Plastics Directive[39].

To this effect, Directive 94/62/EC on packaging and packaging waste and S.L. 549.43, the Waste Management (Packaging and Packaging Waste) Regulations set several targeted provisions with a view to prevent the generation and increase the recycling of packaging waste. S.L.549.43 places the responsibility of the waste-phase of the packaging placed on the market of Malta on the producers, who shall set up systems, either individually or collectively, for the collection and management of packaging waste and the return of used packaging. To date, packaging waste is mainly collected through the collection services provided for by the authorised PROs, i.e. door-to-door collection of recyclable waste, bring-in-sites and direct collection from certain commercial and industrial entities.

The Packaging and Packaging Waste Directive was amended in June 2018 as a crucial element of the new Waste Legislative Package. The main amendments carried out are:

37 As part of the minimum requirements, Malta will need to clearly define the roles and responsibilities of all relevant actors and, as a minimum, set quantitative waste management targets. In this context, Malta shall also ensure that adequate reporting systems are established with a view to gathering information as to placement on the market of products by producers, collection and treatment of waste generated, as well as data in line with the said quantitative targets. In case of collective fulfilment of producers' obligations, the amended Waste Framework Directive also requires that, amongst others, the fees charged to producers by PROs are modulated in such a way to reflect the costs of waste management performed in a cost-efficient manner, as well as to take account of products' recyclability, reusability, reparability and the presence of hazardous substances. Such organisations shall also make publicly available information concerning their governance and financial means, with a view to ensuring transparency of their operations. Such requirements shall apply to both new and existing extended producer responsibility schemes.

38 https://ec.europa.eu/eurostat/statistics-explained/pdfscache/10547.pdf

39 https://ec.europa.eu/commission/presscorner/detail/en/IP_19_2631

a) provisions on reuse have been incorporated, with a view to increase reuse of packaging across the EU.

b) New, ambitious recycling targets to be attained not later than 2025 and 2030, respectively.

Targets	2013[40]	2025[41]	2030
Overall recycling	55%	65%	70%
Plastic	22.50%	50%	55%
Wood	15%	25%	30%
Ferrous metal	50% (metals)	70%	80%
Aluminum		50%	60%
Glass	60%	70%	75%
Paper & cardboard	60%	75%	85%

Table 2: Packaging and Packaging Waste recycling target

The new recycling targets are coupled with stricter rules for the calculation of their attainment, which will require drastic changes in the data collection and reporting systems currently established in the Malta. This is addressed in the Chapter of Data Management.

c) Implementation of the EPR principle. As from 2025, the Member States are obliged to establish EPR schemes for all packaging. In Malta, the EPR principle already applies.

d) New reporting regime, whereby Malta shall report data on a number of additional elements according to stricter rules as per below[42].

40 Since Malta acceded the European Union in 2004, a specific time-derogation was granted to attain the 2008 targets by 31st December 2013.

41 The new targets are coupled with a time-derogation whereby MS may postpone the attainment of one of two material specific targets by five years, under specific conditions and without prejudice to the overall recycling targets.

42 Green boxes: reporting is mandatory should a Malta decide to attain adjusted levels of the recycling targets.

Diagram 3: Flow diagram of new reporting regime emanating from the amended PPWD

Packaging waste generation has been increasing gradually over the last few years as illustrated in Figure 10. In 2011, circa 53 thousand tonnes of packaging waste were generated, whilst 2017 figures indicate that approximately 69 thousand tonnes of such waste were generated, corresponding to an increase of circa 30% when compared to 2011 levels. Almost 69,000 tonnes of packaging material was placed on the national market in 2017, the majority being paper and board packaging at 31,684 tonnes and plastic packaging at 13,297 tonnes.

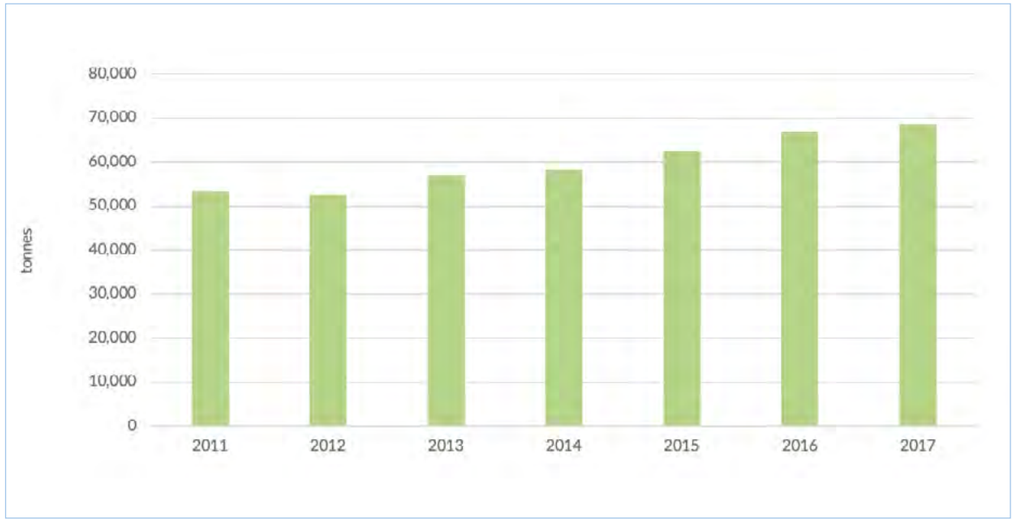


Figure 10: Packaging waste generation in Malta during the period 2011-2017

As indicated in the above section, the current EU targets require that Malta achieve an overall recycling rate of 55%. As illustrated in the below graph, since 2013 Malta has never attained the overall recycling target in terms of EU legislation.

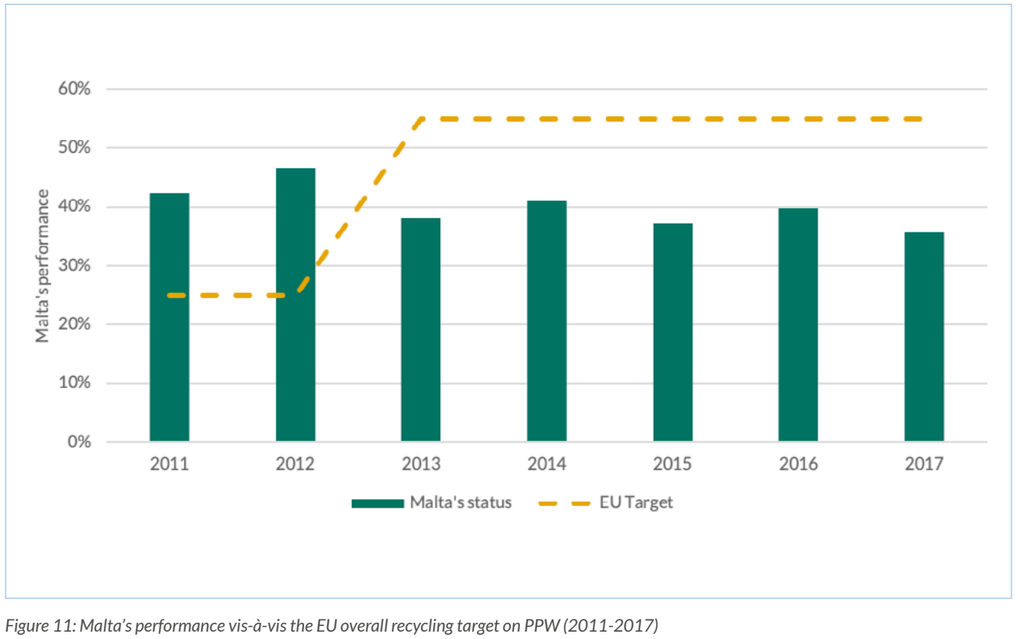


Figure 11: Malta's performance vis-à-vis the EU overall recycling target on PPW (2011-2017)

Malta's performance in terms of the material specific targets during the period 2011-2017 are graphically represented in Table 3 hereunder.

Stream	2011	2012	2013	2014	2015	2016	2017
Glass	17%	21%	49%	31%	20%	30%	29%
Plastic	29%	33%	23%	33%	29%	24%	19%
Paper & Cardboard	72%	77%	48%	56%	57%	60%	51%
Metals	30%	42%	34%	39%	25%	30%	42%
Wood	0%	1%	2%	7%	3%	0%	0%

Table 3: Malta's performance vis-à-vis the EU material specific recycling targets

The data indicates that Malta faces significant difficulties in complying with the stipulated targets. In this context, one is to note that Malta's recycling performance has not registered the desired improvement over the period under review and is, discussed in further detail in the EPR Section of Chapter 3: Waste Management and Resource Optimisation, under Packaging and Packaging Waste.

Through this Waste Management Plan, various measures will be in place to reduce the amount of packaging generated waste throughout the distribution and consumption stages, as well as ensuring effective separation and recycling of packaging.

Waste Electrical and Electronic Equipment

Waste Electrical and Electronic Equipment (WEEE) is one of the fastest growing waste streams in the EU. Electrical and electronic equipment often contains precious metals that require extractive mining. Therefore reducing the amount of electronics circulating the market can help to reduce the depletion of finite raw materials, as well as tackling the problem of excess electronical waste which contains hazardous components. This can be achieved through sharing or leasing initiatives, sustainable buying practices, and improving access to repair services.

The Waste Management (Electrical and Electronic Equipment) Regulations, S.L. 549.89 (herein after referred to as the WEEE Regulations) transposing Directive 2012/19/EU, aims to prevent or reduce the negative environmental effects resulting from the generation and management of WEEE by focusing on the sustainable production and consumption through the prevention, re-use, recycling and other forms of recovery of WEEE, with the objective to reduce the disposal of such waste. These regulations also seek to improve the environmental performance of all operators involved in the life cycle of EEE such as producers, distributors, consumers and operators involved in the collection and treatment of WEEE.

Regulation 7 of the WEEE Regulations obliges producers or producer responsibility organisations to achieve by 2021 a minimum collection rate of 65% by weight of the average weight of EEE placed on the market in the 3 preceding years. In addition to this target, the WEEE Regulations lay down recovery and preparation for re-use and recycling targets for the categories of EEE covered by the Regulations.

The removal of the eco-contribution mechanism in September of 2015 has resolved the standoff between Government and the operators in the sector, thus resulting in producers of EEE fully embracing their obligations emanating from the WEEE regulations. Consequently, in the last quarter of 2015, the two PROs for WEEE kick-started their operations and the register of producers of EEE held by the competent authority experienced a drastic increase.

To date, WEEE generated from households is collected primarily through systems financed by Local Councils. Collected WEEE is deposited at facilities operated by the local agency designated by the Minister, to then be handed over to the PROs according to their market share, at a price that reflects the total cost incurred

for collection and storage. The civic amenity sites operated by Wasteserv Malta are the current designated facilities for WEEE. In addition to this collection system, WEEE is also collected through take-back systems set up by producers as well as through collection systems organised by the PROs.

The majority of electrical and electronic equipment placed on the market in Malta consisted of large household appliances such as refrigerators, freezers, washing machines and air conditioner appliances; electric and electronic tools such as drills and saws, and consumer equipment including radio and television sets[43].

The amount of WEEE collected in Malta when compared to the EEE placed on the national market (POM) is still low. This indicates that from an operational perspective the system is yet far from maturity. In 2017, as indicated in Figure 12, Malta recorded the largest amount of WEEE collected. This resulted in a collection rate of 22%, which was below the national collection target of 45%.

The drop-in terms of placement on the market recorded as from 2016 is essentially due to a change in the source of the data[44]. It is also worth noting that the connection between EEE placed on the market and WEEE generated will also depend on the lifetime of the good. It is anticipated that electronical and electronic equipment in Malta already has a longer lifetime in comparison to other EU Member States, and a lifespan study of different categories of EEE is currently being undertaken which will further inform policy action in managing this waste stream more sustainably.

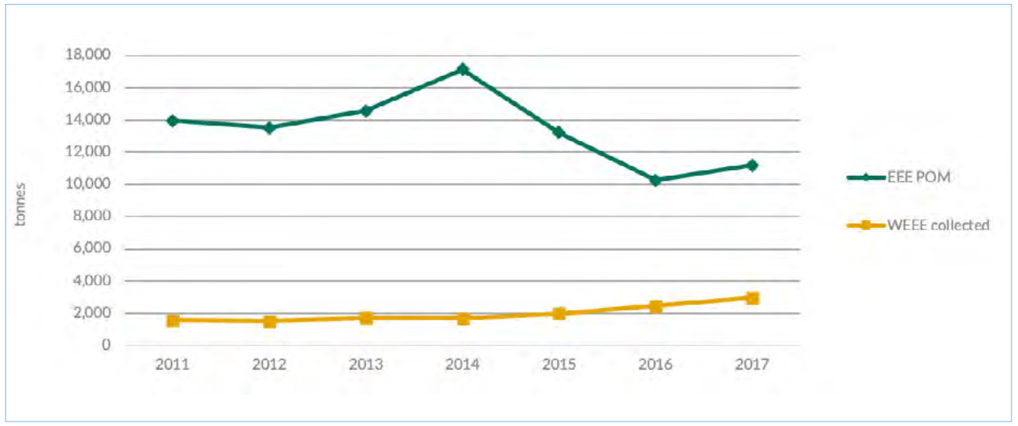


Figure 12: : Placement on the market (POM) of EEE vis-a-vis WEEE collected in Malta between 2011 and 2017

43 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Figure_2_Electrical_and_electronic_equipment_put_on_the_market,_by_category,_2016_(%25).png

44 Prior to 2016, placement on the market of EEE was calculated using trade statistics data provided by the National Statistics Office, which included data on imports as well as exports by HS Code, weight and quantities of EEE. As from 2016, in line with the provisions of the WEEE Directive, the national register of producers of EEE held by the Environment & Resources Authority (ERA) is used to calculate the placement on the market of EEE.

Malta's recycling performance in this sector was affected by the limited treatment capacity and dependence on exports of WEEE, which in turn were also driven by the market demand and value for such waste. These conditions have resulted in instances whereby amounts of WEEE collected in a specific year were kept in storage and exported for further treatment in the course of the following years. As a result, Malta has experienced cases where either:

- The amount of WEEE treated in a particular year exceeded the amount of WEEE collected during the same year, thus resulting in very high recovery and recycling rates; and
- On the contrary, in those cases were WEEE was kept in storage pending exports for further treatment, Malta attained very low recovery and recycling rates.

The current situation clearly indicates that Malta is experiencing a number of deficiencies from both an operational and an implementation perspective. These deficiencies are summarised EPR Section of Chapter 4: Waste Management and Resource Optimisation, under Waste Electrical and Electronic Equipment.

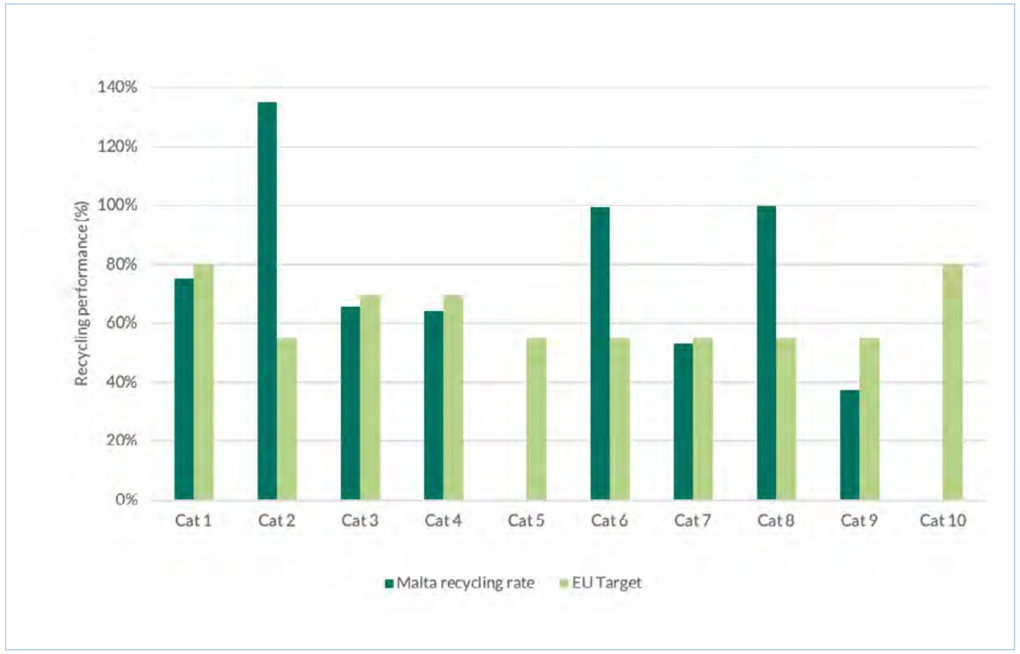


Figure 13: Malta's recycling performance compared to the EU's target per category for 2017

The Ministry will implement, in partnership with relevant stakeholders, a series of measures to limit the environmental pressure associated with EEE and WEEE by reducing the amount of waste generated including the promotion of good practices, as well as strengthening the implementation of EPR requirements for WEEE.

End of Life Vehicles (ELVs)

The Waste Management (End of Life Vehicles) Regulations (S.L. 549.36) brings into effect the provisions of Directive 2000/53/EC on end-of life vehicles. The aim is to minimise the environmental impacts of ELVs through better design of vehicles, increased waste prevention, reuse, recycling and recovery of materials, parts and components arising from dismantling and depollution of vehicles. It also aims at improving the environmental performance of economic operators involved in the life cycle of vehicles and, especially, the operators directly involved in the treatment of ELVs.

The ELV Regulations place the responsibility for the waste-phase of the vehicles upon certain economic operators, whereby the last holder/owner of an end-of-life vehicle can transfer it to an Authorised Treatment Facility (ATF) at no cost. ELVs can only be depolluted and dismantled at ATFs, which in turn are the only facilities that can issue Certificate of Destructions (CoDs) to the last vehicle holder/owner. To date, there are no Producer Responsibility Organisations (PROs) for ELVs established in Malta.

The following reuse & recovery and reuse & recycling targets are to be achieved by the economic operators:

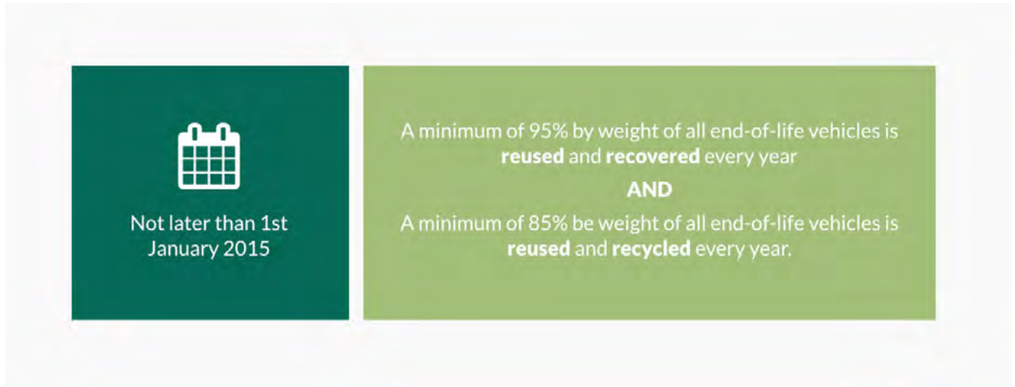


Diagram 4: Current ELVs re-use, recovering and recycling targets

Since December 2013, vehicle deregistration can only take place upon presentation of the CoD issued by an ATF. Results show that such reform has allowed to capture a greater number of ELVs scrapped in Malta. In 2017, the national legislation was amended to recognise the importance of co-operation amongst the main competent authorities, namely the Environment Resources Authority, Transport Malta and the Malta Competition and Consumer Affairs Authority, for the proper implementation of the ELV regime.

Limited amendments were carried out to the ELV Directive in the context of the new Waste Legislative Package, which mainly relate to the streamlining of the reporting regime across all waste Directives, as well as empowering the Commission to carry out a full review of this Union legal instrument. In this respect, by 31st December 2020, the Commission shall review the Directive, with a view to formalising a legislative proposal for its revision.

Data on the number of ELVs arising in Malta during the period 2011-2016 are presented in the chart below. The significant increase in the number of Certificates of Destruction (CoDs) issued in Malta between 2015 and 2016 is due to the number of ATFs operating in the country, which increased from one (1) facility operating in the period 2011-2013 to six (6) and seven (7), respectively. It is also to be noted that there exists a discrepancy between the number of vehicles scrapped and the number of CoDs issued during the period under review. As indicated in the previous section, depollution and dismantling of vehicles should only take place at ATFs, which are the only treatment facilities that can issue CoDs.

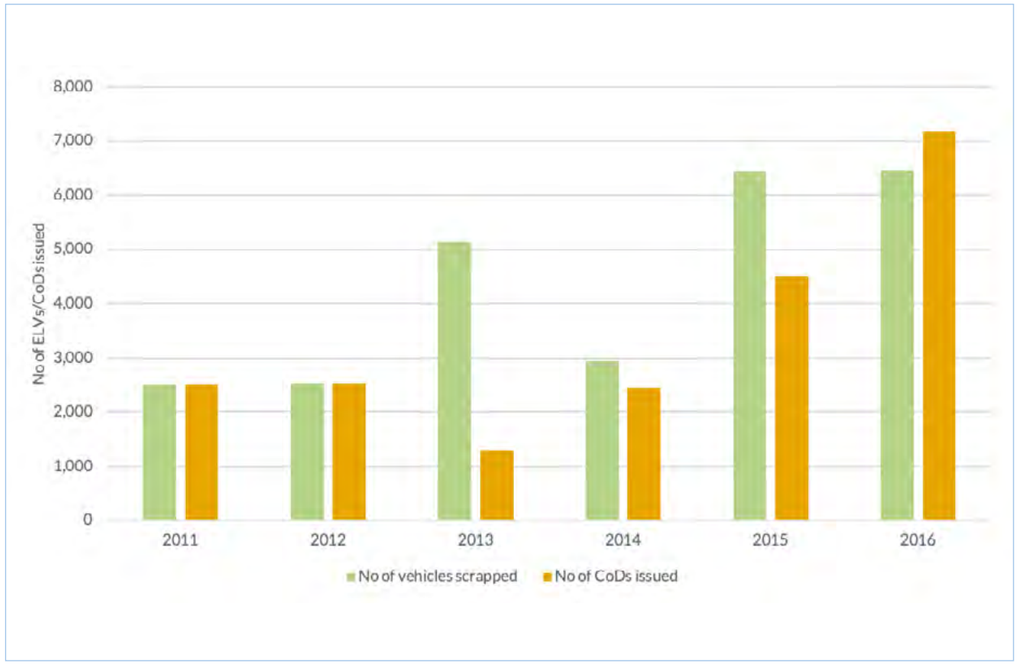


Figure 14: End-of-Life Vehicles arising in Malta during the period 2011-2016

As illustrated in the graph below, since 2015 Malta has not attained the stipulated targets emanating from the ELV Directive.

Figure 15: Malta's status vis-à-vis the ELVs EU targets

The implementation of the ELV Directive in Malta has been problematic due to a number of recurring issues, some of which had already been identified in the previous Waste Management Plan covering the period 2014-2020 and are outlined further. These issues are summarised in the EPR Section of Chapter 3: Waste Management and Resource Optimisation, under End of Life Vehicles.

Batteries and Accumulators

The placement of batteries and accumulators on the market in Malta is regulated through the Waste Management (Waste Batteries and Accumulators) Regulations (S.L 549.54), which bring into effect the provisions of Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators. The regulations seek to improve the environmental performance of batteries and accumulators, maximise the separate collection of waste batteries and accumulators and achieve a high level of recycling for all waste batteries and accumulators as well as to improve the performance of the activities of all economic operators, in particular producers and recycling facilities.

Waste batteries and accumulators fall within the extended producer responsibility regime, whereby producers of all types of batteries and accumulators are subject to the main legal obligations set out in S.L.549.54. Self-compliant producers or producer responsibility organisation acting on behalf of their members are obliged to achieve a collection rate of 25% by September 2012 and 45% by September 2016 for all waste portable batteries, whilst there are no stipulated collection targets for industrial and automotive batteries. The above-mentioned collection targets are coupled with the following set of minimum recycling efficiency targets:

Diagram 5: Current batteries and accumulators recycling targets

The removal of the eco-contribution mechanism in 2017 has resolved the standoff between Government and the operators in the sector, thus resulting in producers of batteries and accumulators fully embracing their obligations emanating from the Waste Batteries Regulations. Consequently, in 2017, an additional producer responsibility organisation began operating specifically for waste portable batteries and accumulators.

Limited amendments were carried out to the Waste Batteries Directive in the context of the new Waste Legislative Package, which mainly relate to the streamlining of the reporting regime across all waste Directives, as well as incentivising the application of the waste hierarchy. The European Commission recently launched the review of this Directive, which may result in proposals for its revision.

The portable batteries and accumulators placed on the national market during the period 2011-2018 are graphically represented below. This data indicates that the placement on the market of portable batteries and accumulators has remained rather constant throughout the years under review, fluctuating between 80 and 100 tonnes a year.

Malta attained the EU collection target for waste portable batteries and accumulators in both 2013 and 2015. However, Malta has yet to achieve the more stringent 2016 collection target.

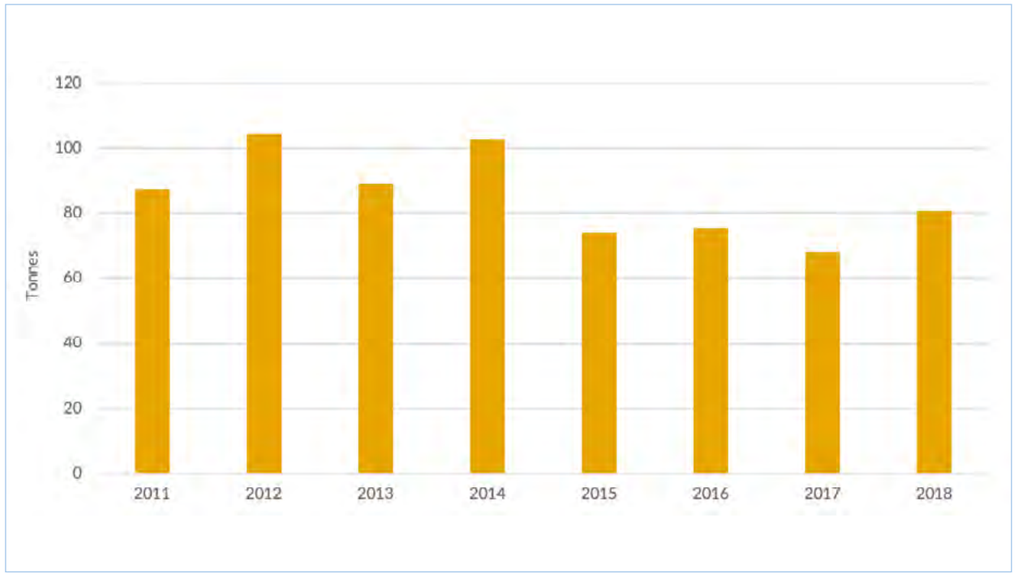


Figure 16: Placement on the market of portable batteries and accumulators between 2011 and 2018

Figure 17: Malta's collection rates recorded between 2011 and 2018

Commercial and Industrial Waste (C&I)

Industrial waste is generated from industrial processes such as manufacturing of goods and the extraction and treatment of minerals, while commercial waste principally arises from the tertiary or service sector (i.e. retails, catering establishments, hotels, etc.). It is imperative to note at this point that commercial waste from establishments such as retail outlets and restaurants are classified as MSW (as mentioned in section 1). The significant data gap on commercial waste has been acknowledged and various measures throughout this Waste Management Plan will address this gap going forward.

Commercial and industrial waste comprises of various waste streams, several of which are subject to specific legislation, targets or obligations, and are therefore addressed separately (e.g. packaging waste and WEEE).

The largest waste stream generated from commercial and industrial (C&I) sources was

sewage sludge, which represents one third of the overall C&I waste generated in Malta over the period 2011-2018, as illustrated in the graph below. Another large fraction of the commercial and industrial waste generated in Malta is of hazardous nature, which amounts to circa 38% of the total amount of such waste generated during the investigated period.

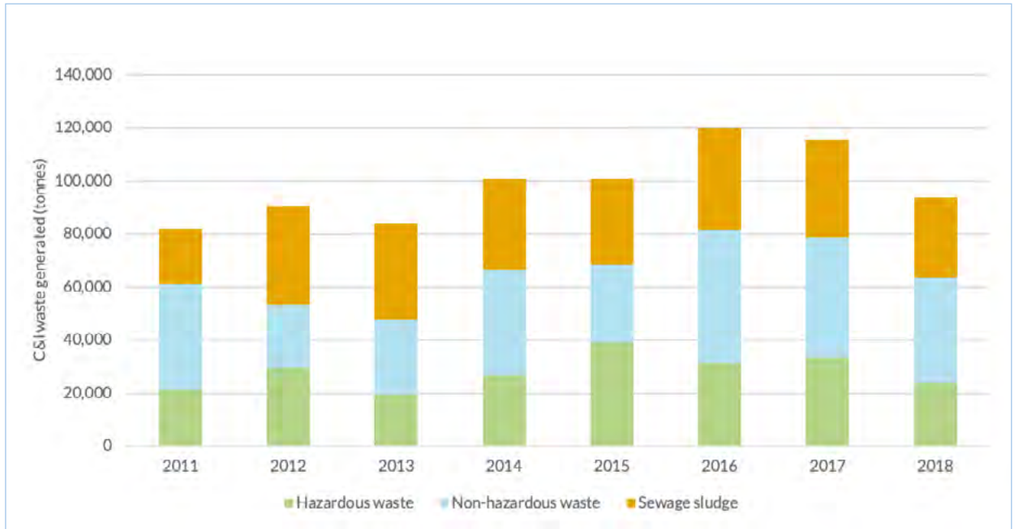


Figure 18: Sewage sludge over the total C&I waste generated (2011-2018[45]

45 2016 data does not include 100,576 tonnes of hazardous end-of-life oil rigs exported for recycling.

The chart below provides an overview of the quantities of commercial and industrial waste managed by treatment over the period 2011-2018.

Figure 19: C&I waste management over the period 2011 - 2018[46]

The data indicates that the most common treatment solution for such waste is landfilling (39.3%), followed by recycling (33.4%) and recovery (13%). It is worth repeating at this stage that data pertaining to waste generated from commercial establishments such as retail outlets and restaurants is not fully captured here.

All sewage sludge generated in Malta over the period under review was disposed of at the local landfill, which represents circa 14% of the total amount of waste landfilled in Malta during the said period. Thus, landfilling of sewage sludge has a direct and great impact on the landfill void space available on the Maltese Islands.

Given the limited local treatment capacity for hazardous waste, most of this waste was exported for recovery (including recycling) or disposal, while a small fraction was incinerated in Malta without recovery of energy. The wastes incinerated locally are mainly hazardous wastes resulting from organic chemical processes, solvents, paints, varnishes, and wastes from human or animal health care.

46 2016 data does not include 100,576 tonnes of hazardous end-of-life oil rigs exported for recycling.

End-of-Life Tyres

The ELV Regulations governs the management of tyres arising from the dismantling of ELVs. Other than this, there is no specific legislation regulating end-of-life tyres at the EU or national level.

Due to road safety requirements and regulations, tyres are replaced quite frequently, resulting in large volumes of end-of-life tyres generated across the Maltese Islands every year. Tyres must be treated in an environmentally sound manner and in this respect, end-of-life tyres have a considerable recovery potential, notably by way of recycling, particularly as they can replace the use of raw materials in other industrial or recreational uses.

The management of end-of-life tyres is subject to the provisions governing duty of care as laid down in the Waste Regulations, whereby the waste generator and/or holder has the responsibility to ensure that waste is managed in an environmentally sound manner. Furthermore, the Landfill Regulations prohibit the disposal of waste tyres (whole or shredded) at landfill sites.

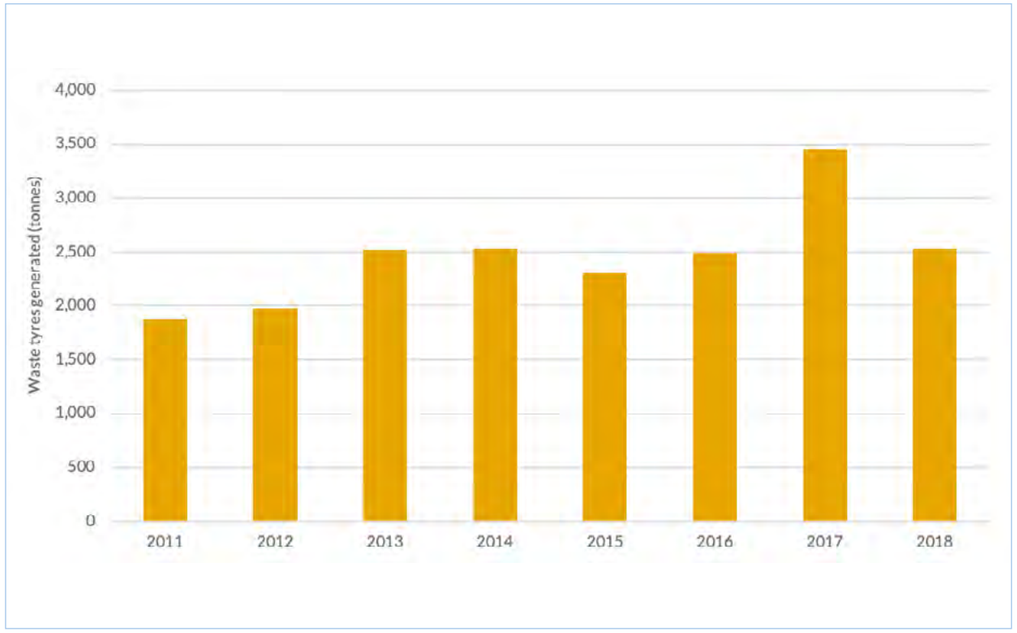


Figure 20: Waste tyres export treatment 2011-2018

The graph above illustrates the amount of end-of-life tyres generated in Malta during the period 2011-2018. According to the data held by the Environment & Resources Authority, most of these waste tyres were exported outside the EU for recycling and/or recovery other than recycling.

Generation of end-of-life tyres increased circa 35% from 2011 to 2018. Despite the high frequency of tyres replacement due to the wear and tear and road safety requirements, the data indicated that end-of-life tyres is not a major waste stream in Malta.

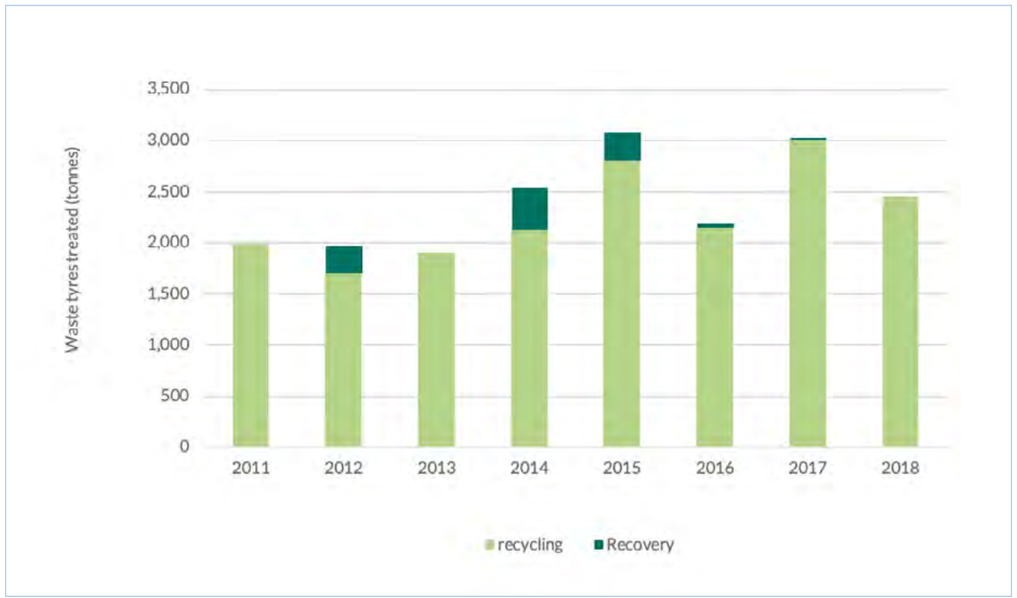


Figure 21: Waste tyres generated in Malta 2011-2018

Having said this, the lack of specific legal instruments governing waste tyres renders it problematic to determine the actual quantities of tyres placed on the national market and the resultant waste generated in order to assess current practices vis-à-vis the management of this waste stream. Therefore, this WMP deems it necessary to specifically address this waste stream as part of a widened EPR mechanism.

Waste oils

Considering the substantial amounts of waste oils generated in Malta, the hazardous nature and high recovery potential, it is imperative that such a waste stream be managed in an environmentally sound manner. To this effect, the Waste Regulations set specific rules with a view to prioritise regeneration and alternative recycling operations as the most environmentally sound treatment options. These rules stipulate that waste oils should be collected separately and not mixed with other oils and/or substances. In line with the amended Waste Framework Directive, Member States are required to report data on mineral, synthetic lubrication and industrial oils placed on the market, as well as waste oils separately collected. Such data on waste oils will be reviewed by the European Commission with a view to introducing additional waste treatment measures, new quantitative targets for regeneration of waste oil, and other measures to promote regeneration of waste oils.

Waste oils in Malta are mainly generated from garages, petrol stations and industrial facilities. Transfers of such hazardous waste within Malta are subject to the consignment note procedure, whereby transfers from the site of generation to the site of disposal or storage are to be notified to the competent authority. The average generation of waste oils in Malta during the period 2011-2018 stood at circa 13,000 tonnes.

Malta is highly dependent on the exports of waste oils for their environmentally sound management, particularly since there are no permitted facilities to recover such hazardous waste. The data graphically represented in clearly indicates that waste oils are mostly exported for recovery.

However, one is to note that the fate of waste oils is not always well documented, as certain outlets do not consistently follow the consignment note procedure for transfers of such waste within Malta.

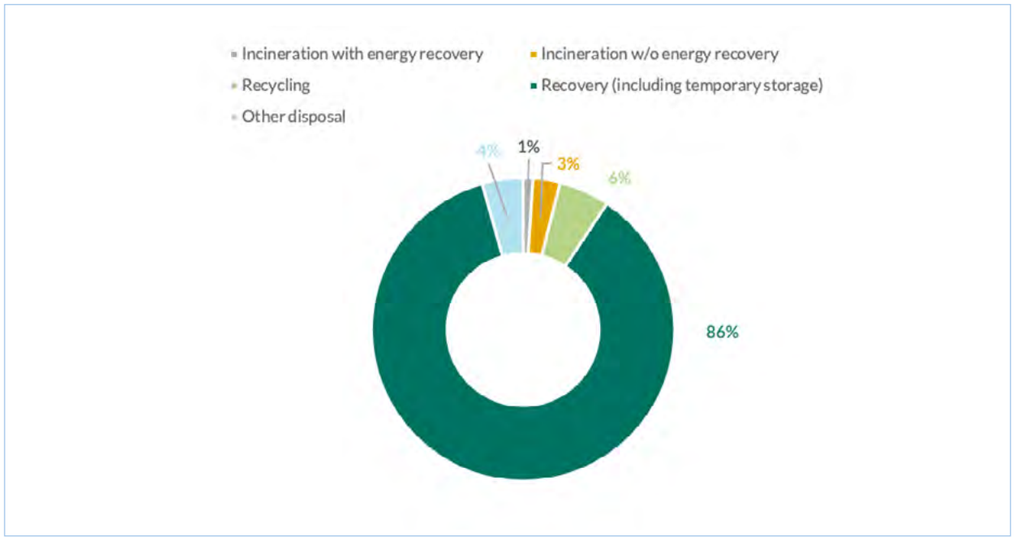


Figure 22: Treatment of waste oils 2011-2018

Construction and Demolition Waste (C&D)

The construction industry in Malta is responsible for around 80% of total waste generation each year, with more than 2,000,000 tonnes of C&D waste generated in 2017[47][48]. This makes C&D waste the largest waste stream generated in Malta by weight. Although the majority of construction waste is inert, its sheer volume poses a significant challenge in terms of void space required for backfilling, given the size limitations of the country. Hence, it is pivotal to manage it in an environmentally sound manner and in line with the Waste Hierarchy. There is therefore significant scope to encourage a change in practices within the industry to incentivise the reuse of materials as also advocated in the Construction and Demolition Strategy recently published by ERA. The reuse of material will also decrease the pressure on the extraction of raw materials such as hardstone and soft stone. In addition, if effectively exploited, the potential for recycling C&D waste could alleviate the pressure on natural resources and help establish this sector as a fully circular industry.

The Waste Framework Directive (2008/98/EC), as transposed by the Waste Regulations (S.L. 549.63), stipulates a minimum target of 70% recovery of waste arising from the construction and demolition activities by 2020. Furthermore, the European Commission will also be considering the setting-up of preparing for re-use and recycling targets for this waste stream with the aim of moving up the waste hierarchy and shifting towards a more circular economy. Malta shall also take measures to promote selective demolition in order to enable removal and safe handling of hazardous substances, facilitate re-use and high-quality recycling, and ensure the establishment of sorting systems for waste arising from the construction industry.

Furthermore, the Environment and Resources Authority has drafted a strategy, which focuses on the management of construction and demolition waste. The Construction and Demolition Waste Strategy for Malta aims to address current issues within the sector by implementing measures in the short, medium and long-term to efficiently make use of natural resources, facilitate their recovery and ensure sustainability within the sector. Further detail on this Strategy can be found in the Waste Prevention Chapter.

At the international level, Malta is party to both the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, known also as the London Convention and the 1976 Convention for the Protection of the Mediterranean Sea against Pollution (the Barcelona Convention). Malta is also a signatory to the 1976 Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea, commonly known as the Dumping Protocol and its 1995 amendments. These legislative instruments govern dumping at sea.

In Malta dumping at sea is regulated through the Deposit of Waste and Rubble (Fees) Regulations – S.L. 549.07, whereby only dredged material and inert material may be dumped at the designated offshore spoil

47 https://eracms.gov.mt/en/Documents/ERA%20-%20Construction%20and%20Demolition%20Waste%20Strategy%20for%20Malta%20VIS%204.pdf

48 In the same year around 9,000 permits were approved by the Planning Authority

ground located at Latitude 35°55.1 °N and Longitude 14°34.0 °E.

Disposal at sea in Malta is regulated through the Consignment Permit & Consignment Note procedure in line with regulation 14 of the Waste Regulations – S.L. 549.63. Following the issuance of a permit by the Environment and Resources Authority, the waste generator loads the barge for eventual dumping at sea. Actual monitoring of dumping operations from barges is carried out by Transport Malta, whereby movements and communications of vessels to the dumpsite are logged.

The boom in the construction sector recorded in the last few years has resulted in an increase in construction and demolition waste generated. One is to note that trends in the generation of construction and demolition waste in Malta mimic those in the EU, whereby it is also the heaviest and most voluminous waste stream generated. However, the amount of construction and demolition waste generated in Malta is higher than that of the EU, averaged to around 1.5 million tonnes annually and constituting approximately 80% of the total waste generated on the islands. Figure 23 indicates an increasing trend in the generation of this waste stream with 2017 recording the highest amount of construction and demolition waste generated over the period 2011 to 2018, whilst 2011 registered an overall low over the said period.

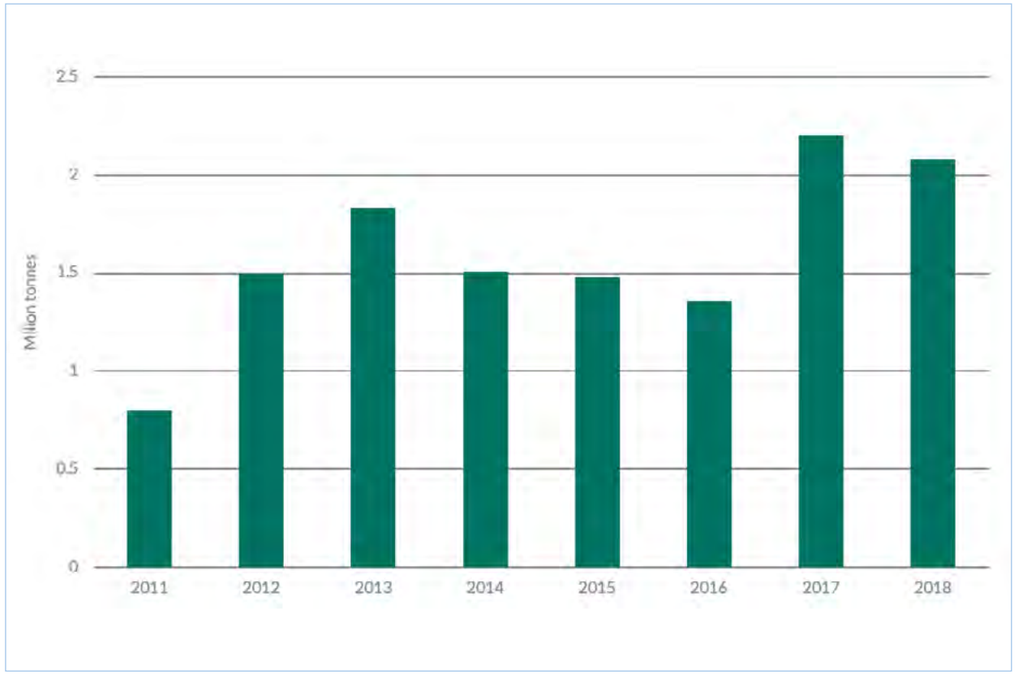


Figure 23: Generation of CDW over the period 2011-2018

Prior to 2013, Malta relied heavily on disposal rather than recycling as a means of managing this waste stream. Following the year 2013, there was a shift within the sector whereby backfilling, considered to be a recovery operation became the preferred option as seen in the graph below[49].

Having said this, intensive development and the subsequent large volumes of waste arising from excavations and C&D activities, coupled with the high reliance on backfilling of inert waste, is causing a significant problem vis-à-vis the lack of void space available on the Islands. The current situation indicates that in the coming years the volume of authorised void space might not meet the increasing demand for the backfilling of C&D waste. Through the Tax Credit (Construction Waste Recycling) Rules, S.L. 123.186, the Government announced a tax incentive, aiming to increase backfilling space, whereby operators of quarries authorised to accept C&D waste may claim a tax credit equivalent to 25% of the gross fees paid to them where the price of C&D waste accepted does not exceed €8 per tonne. This incentive applied for three years, between 2017 and 2019, and only those operators who had the necessary authorisations to accept C&D waste from third parties benefited from it. Although the main aim of such a tax incentive was to encourage excavation void owners to accept inert waste, thus increasing the available space for backfilling, the issue of not having enough space for the treatment of inert waste persists.

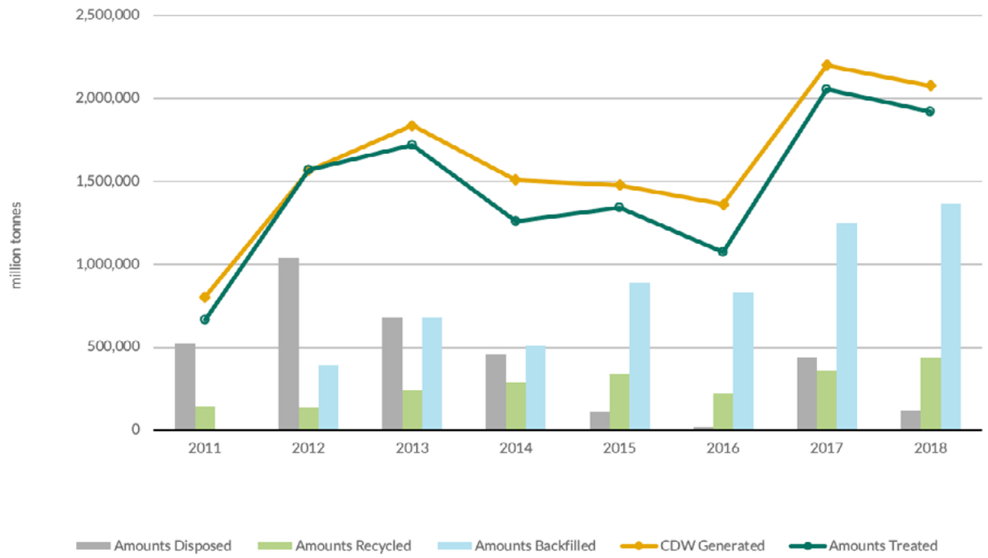


Figure 24: Trends in the treatment of CDW over 2011-2018

49 The highest rate of backfilling was recorded in 2018, amounting to 70% of the total construction and demolition waste treated in Malta.

Around 15% of construction and demolition waste generated is recycled annually, around 90% of which is recycled locally in the form of aggregates for concrete and roadworks; crushed material as 'torba', and other material used for renovation works. Metallic C&D waste generated such as iron, steel, copper and mixed metals, are exported for recycling, together with all hazardous waste streams generated from this industry. Disposal at sea is still the preferred option for sediment generated during dredging activities within our harbours as can be seen in the Annex[50].

Waste exports

Malta is heavily dependent on exports of wastes to ensure environmentally sound management. This is due to its specificities, which do not allow for the development of treatment solutions for several waste streams generated locally. Such exports are regulated by the Waste Management (Shipments of Waste) Regulations (S.L.549.65), which implement the provisions of Council Regulation (EC) No 1013/2006 on shipments of waste (WSR). The WSR establishes the control procedures for transporting waste within, into and out of the EU, with a view to ensure a high level of environmental and human health protection. This Regulation implements into EU law the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the OECD Council Decision on Control of transboundary movements of wastes destined for recovery operations.

Exports of non-hazardous, green-listed waste destined for recovery are subject to the simplified procedure laid down in Article 18 of the said Regulation, while exports of hazardous waste and all waste destined for disposal (where not prohibited) are subject to the notification procedure pursuant to Article 4. Hazardous wastes and the Basel Convention non-hazardous "Other Wastes" destined for recovery can solely be exported to EU and EFTA[51] countries, as well as OECD[52] Member countries, whilst exports of all waste intended for disposal are only allowed within the EU and EFTA area[53].

50 Compositional analysis is carried out on dredged material and results are then compared to the national dumping limit values established in ERA's Terms of Reference for the Management and Disposal of Dredged Material. Only non-hazardous dredged material, the composition of which is below the set limits, can be disposed at the designated offshore dumpsite. Currently, any hazardous dredged material is exported for disposal, however, treatment and recycling of such material is encouraged.

51 European Free Trade Association, which includes Iceland, Liechtenstein, Norway and Switzerland.

52 Organization for Economic Co-operation and Development

53 Shipments of waste destined for disposal in Malta are prohibited in accordance with the Waste Management (Shipments of Waste) Regulations. Such a prohibition was introduced in view of Malta's limited land space for disposal activities such as landfilling. The WSR mandates the European Commission to carry out a full review of this piece of Union legislation by 31st December 2020, which might result in a legislative proposal for its revision.

The graph below provides an overview of the amount of waste exported during the period 2011- 2018. The export of non-hazardous waste increased significantly in 2017 and 2018 compared to previous years[54].

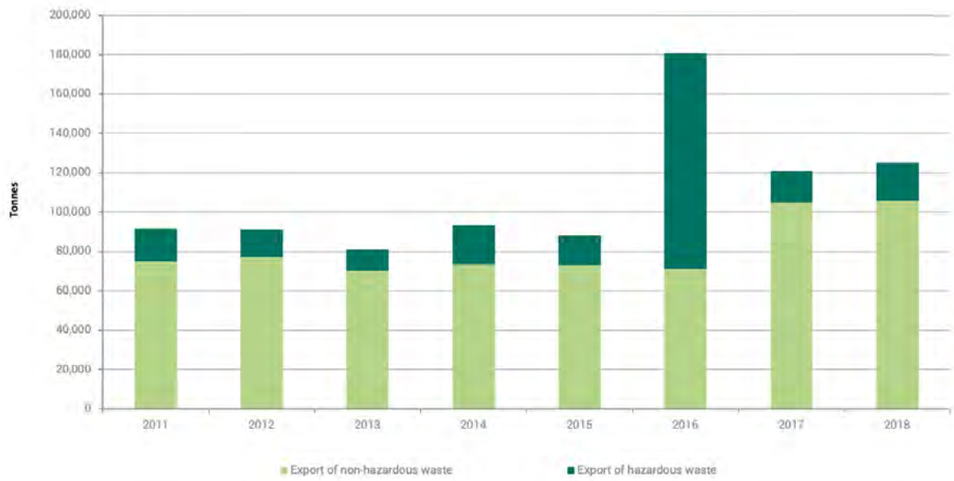


Figure 25: Exports of hazardous waste and non-hazardous waste during the period 2011-2018[55]

The non-hazardous, green-listed wastes exported over the period under review were all destined for recovery, whilst the majority of the hazardous waste and non-hazardous waste exported under the notification procedure laid down in Article 4 of the WSR (i.e. notified wastes) were destined for recovery operations as illustrated in the graph below.

54 This was a result of the export of circa 15,000 tonnes of non-hazardous dredged waste materials in 2017, whilst the 2018 figure is predominantly due to increased amounts of recyclables exported from Malta. On the other hand, the spike of hazardous waste exported in 2016 was due to the export of several end-of-life oil-rigs, which amounted to approximately 100,000 tonnes.

55 Figures on exports of non-hazardous wastes include the green-listed wastes exported under Art.18 procedure as well as certain categories of non-hazardous wastes subject to the notification procedure, notably Refuse Derived Fuel, Basel Convention non-hazardous "Other Wastes", mixed recyclables and, in the case of 2017 data, 14,298 tonnes of non-hazardous, unlisted dredged waste materials.

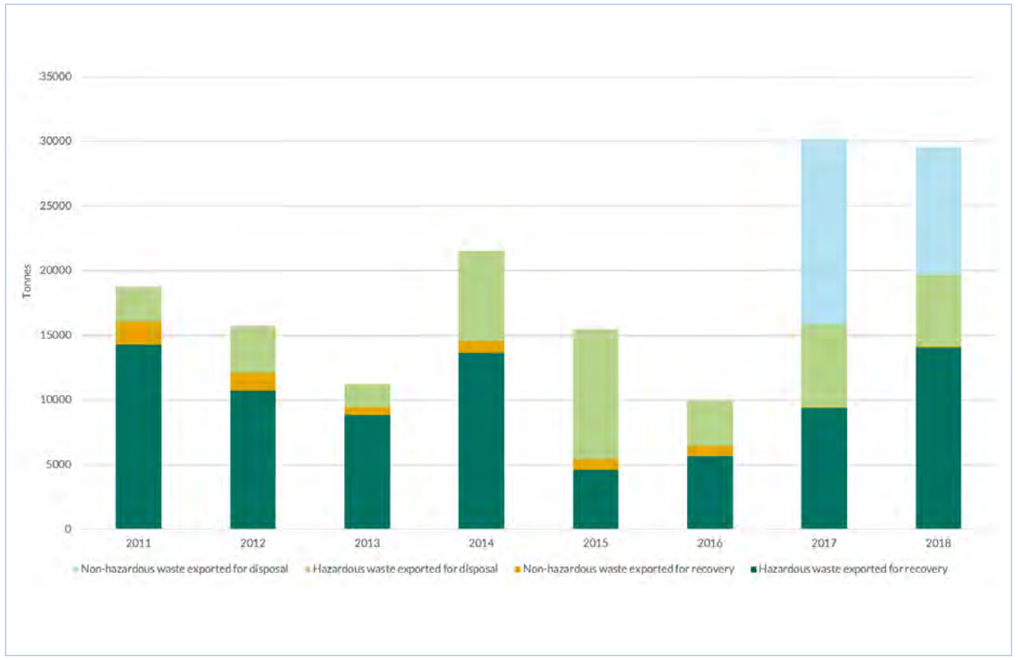


Figure 26: Exports of notified hazardous and non-hazardous wastes 2011-2018 [56]

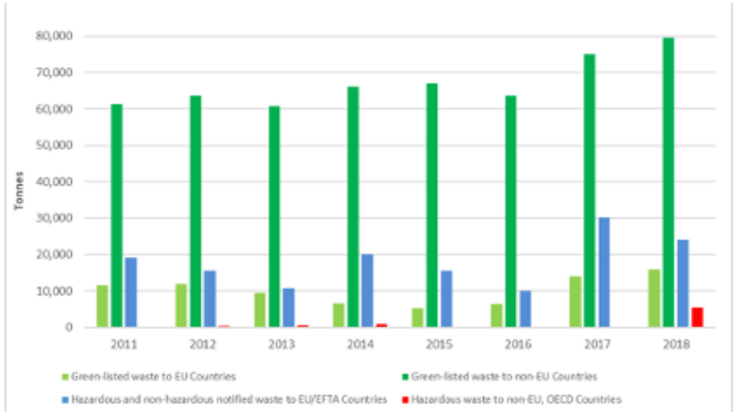


Figure 27: Export of waste by destination[57]

56 2016 data does not include the export of circa 100 thousand tonnes of oil rigs to a non-EU, OECD Member Country for recovery.

57 2016 data does not include the export of circa 100 thousand tonnes of oil rigs to a non-EU, OECD Member Country for recovery

The majority of green-listed wastes during the period 2011-2018 were destined for non-EU countries, whereas hazardous wastes were mostly exported to other EU Member States.

Exports of wastes, notably recyclables, are also driven by certain economic factors such as market value and demand, that are subject to significant fluctuations over time. In view of this, and taking into consideration the restrictions on imports of wastes imposed by an increasing number of third-party countries since 2017, as well as recently adopted stricter regimes governing exports of plastic wastes, Malta's dependency on exports of waste could represent a serious obstacle in terms of moving towards a true circular economy. It is therefore pivotal for Malta to increase the national sorting and pre-processing treatment capacity, notably for recyclable wastes, with a view to significantly increase the quality of the waste materials prior to export.

3

WASTE FLOW MODELLING

3.1. Modelling of waste management as a tool to help set policy

The management of waste in an effective and efficient manner is a challenge that all countries face. This is rightly a priority issue across Europe let alone at the national level. Reaching our EU targets with respect to waste will require substantial effort over the coming years. It is right that we acknowledge the fact that currently we are far from reaching these targets and without taking decisive action significant economic and environmental costs will be borne. However, it must also be recognised that setting out and establishing an efficient waste management system is a complex task that needs to take into consideration various factors including economic, technical and societal realities, whilst paying due cognisance to the environmental impacts of waste. Additionally, ensuring that the management of waste needs to adequately allow Malta to reach its sustainability and environmental goals at the EU and international level is a key consideration for Government.

To this end the utilisation of management policy tools such as materials flow modelling and in this case as applied to waste flows allows policy makers to identify the critical interventions needed in order to attain the aforementioned strategic objectives. This Chapter of the WMP will thus set out the high-level projections of future waste generation and treatment options available to Malta for the forthcoming decade and beyond. This is intended to serve as a basis for the formulation of policy measures outlined in subsequent chapters of this Plan consistent with the roadmap to achieve targets for municipal waste management in Malta.

The formulation of measures would be undertaken within the context of a gap analysis of the shortfalls of projected future results from the intended targets. Projections are presented for two scenarios as set out below: a baseline scenario featuring no changes from the current existing conditions with respect to policy, behaviour and infrastructure (Scenario 1). In an alternative future scenario, projections reflect a situation where new waste management plants announced in March 2020 are effectively commissioned (Scenario B). Gaps between the results of future scenarios and waste management targets would need to be filled by new measures, including those already contemplated by policy but not included in the alternative future scenario described above.

3.2. Projecting waste generation rate for the coming decade

As a first step, gaining an understanding of the trends in waste generation and the flow of wastes through the various treatment phases at the national level is an integral part of setting waste management policy.

As outlined in chapter 2 MSW consists of all waste collected from households via the kerbside collection as well as all waste of similar composition collected from businesses, commercial enterprises etc. For the purposes of the waste flow model all waste received at Wasteserv facilities have be included in the projections for waste generation.

Currently Malta generates around 300,000 tonnes of MSW every year. This figure includes the waste

generated from the resident Maltese population as well as the incoming tourists.

Modelling the generation of waste on a year by year basis for the coming decade can be expressed through the following equation:

$$W = e^{0.010t - 26.64}$$

Where the value of waste generated per day (W) is expressed as a function of growth over time (t) expressed in years.

This equation indicates that waste generation will increase year on year at a rate of 1% per capita per day such that by the end of decade it is projected that total volume of MSW generated in 2030 will be circa 423,000[58] tonnes.

To this end, in a status quo scenario where no interventions are undertaken by Government to alter the waste generation rate the consequences are stark for waste management in terms of economic, social and environmental costs. Available landfill void space is currently limited and without significant additional land uptake for landfilling as the management option of last resort a waste generation rate of 1% per annum is not sustainable.

It is important to note that the trends illustrated in the above figure take into account the observed behavioural changes resulting from the various waste campaigns undertaken prior to 2019 which collectively promoted separation of waste into the organic (white) and recyclables (grey/green) bags away from the black bag. The impact of these campaigns is expected to continue into the future and at least until 2030. The share of the

58 The waste generation projections take into account the following assumptions adjusted for the impact of the current COVID crisis:

- In 2020 tourism will fall to 20% of 2019 level, and returns to 2019 level by 2023
- In 2020 the population level falls back to 2018 level and continues to grow at 2% p.a. in the years thereafter
- The growth rate of total municipal waste will stabilise in year 2025, with this rate remaining constant in the years thereafter until 2030

other waste streams (bring-in sites, CA sites, street cleaning and other) from the remaining municipal waste generation is expected to remain unchanged. Projections for the middle of the decade and the end of the decade are provide in the table below.

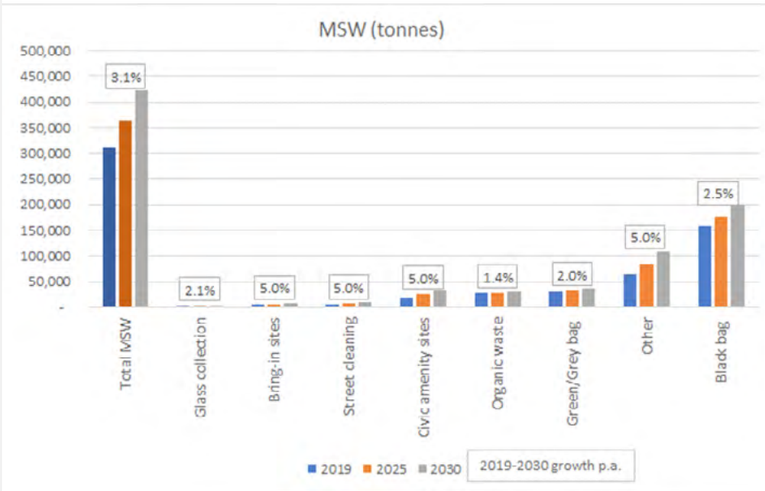


Figure 28: Waste projections by waste stream (2019 to 2030)

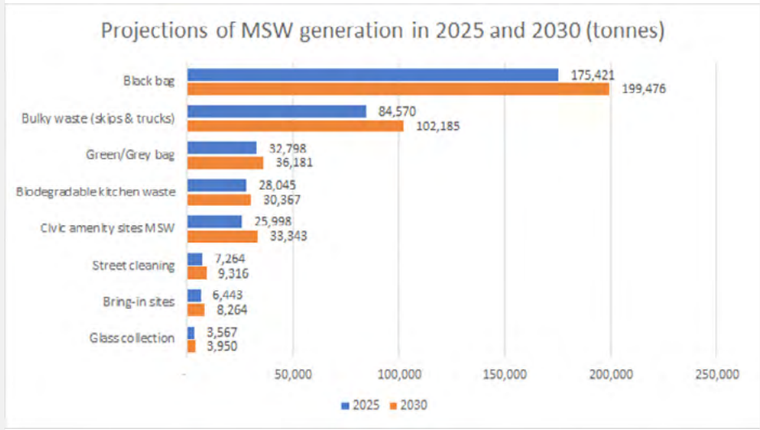
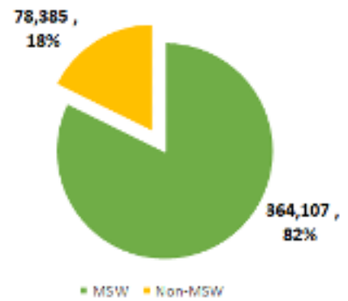
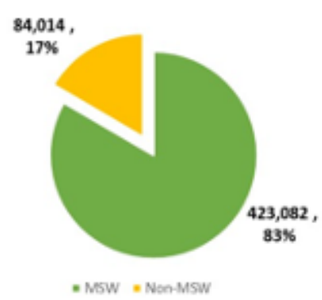


Figure 29: Projections of MSW generation in 2025 and 2030

These values provide a snapshot of the waste setting within a given year. The proportion across MSW and non-MSW is expected to remain similar when comparing the 2025 and 2030 situations, with a slight decrease in non-MSW as displayed below.

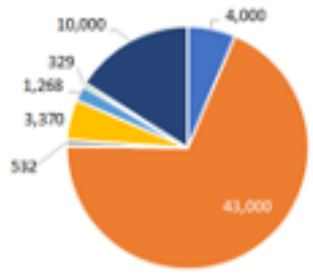


Total Waste received by WSM (tonnes): 442,492 tonnes in 2025

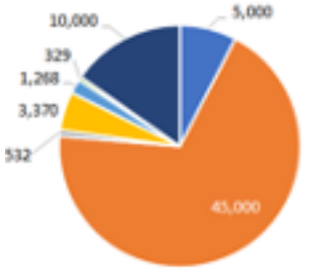


Total Waste received by WSM (tonnes): 507,096 tonnes in 2030

Figure 30: Projections of total waste received at Wasteserv plants in 2025 and 2030



Total Non-MSW received by WSM at 78,385 tonnes in 2025



Total Non-MSW received by WSM at 84,014 tonnes in 2030.

Figure 31: : Projections for non-MSW wastes received at Wasteserv Plants in 2025 and 2030

Non-Municipal Waste can be broken down into its own waste streams. These will remain constant over the years, with the only differences being in the WWTP sludge (orange, increase) and in Biodegradable garden and park waste (increase).

3.3. The Waste Flow Model

3.3.1. The waste management process

In the following section of this Plan, the two scenarios are explored and details provided for mid-decade (2025) and end of decade (2030). For each scenario, there is the consideration of the step-by-step process which must be followed for waste to be processed. The process is conceptualised in the flow chart below, which shows that when waste arrives at a facility, this will undergo intermediate treatment. Waste emerges as 'output waste', to make its way to the final destination, which can be one of the following: landfilling, recyclables to market, generation of compost, energy recovery, hazardous waste to market disposal, water and evaporation and disposal in quarry.

Black Bag	MN mechanical biological treatment plant, AD-Manure	RDF	Bulky metals	LDF	Landfilling
Green/Grey Bag	MN bulky line	Rejects	Bulky plastics	MKT-R	Recyclables to market
Civic Amenity Sites	Tal-Kus Material recovery facility	Digestate cover	Wood	D-COMP	Generation of compost
Bring-in Sites	Civic amenity sites	Digestate compost	WEEE	E-RECOVERY	Energy recovery
Glass collection	MMRF plant	Losses	End of life tyres	MKT-D	Hazardous waste to market disposal
Street Cleaning	Temporary storage and recyclables	Biogas	WWTP sludge	LOSS	Water and Evaporation
Biodegradable kitchen & canteen waste	Għallis Landfill	Electricity	Black bag	QUARRY	Disposal in quarry
Other MSW (mainly skips)	Marsa thermal treatment facility	Bottom ash	Green/grey bag		
Biodegradable garden & park waste	ECOHIVE Organics (OPP)	Fly ash	Glass		
WWTP sludge	ECOHIVE Energy (WtE)	Biodegradable kitchen/canteen waste	Street cleaning residues		
Pharmaceutical and clinical waste	ECOHIVE Hygienics (TTF), Including skip management facility (SMF)	Paper and cardboard	Material containing asbestos		
Abattoir waste	ECOHIVE Recycling (MRF)	Metals	Other C&D waste		
Agriculture, forestry and food prep waste		Plastics	...		
Waste oil and sludge					
Animal faeces, urine and manure					

Diagram 6: Conceptual waste management process flow

For the purposes of the waste flow model two distinct scenarios were established and modelled.

- Scenario 1 (S1): Status Quo: This scenario represents the baseline situation with current waste management practices remaining in place and no additional waste management interventions implemented for the forthcoming decade
- Scenario 2 (S2): The New Plants Scenario: This scenario sets Malta on a path which includes substantial investment in waste management options

3.3.2. Assumptions of the Waste Flow Model

The general assumptions of the waste flow model are that waste is generated in identical quantities across scenarios S1 and S2, and that this generation is not affected by any incremental behavioural changes taking place (particularly to those related to segregation of waste at source).

The waste flow model has been designed to capture all waste streams received at Wasteserv treatment facilities and flows between them, except for waste transferred to and from the Tal-Kus Transfer Station and Bulky Line and Multi Material Recovery Facilities (MMRF). This approach avoids duplication of information. Waste flows from Sant'Antnin Waste Treatment Plant (SAWTP) is also excluded as this model assumes that all operations in this plant would have been halted by 2025.

As for the plants themselves, this assumes that MMRF will be available in both scenarios and will be the site for glass storage (along with any other temporary storage site). Each plant's mass flows into each plant are modelled on the basis of the typical composition of waste received and design output shares, reflecting information available at the time of conducting this report. This model also assumes that all bulky waste can be treated at MN Bulky Line.

Additional assumptions pertaining to the S1 scenario are that MN will treat organics while applying any spare capacity to treating black bag, the remaining of which will be landfilled. This scenario has also assumed that recyclables shall be landfilled or exported directly, due to the fact that no treatment capacity is available. It is to be noted that Scenario A: Baseline would be in breach of existing legal obligations and hence has to be considered as a hypothetical scenario.

The S2 scenario, on the other hand, assumes that remaining black bags will not be landfilled, but shall first be sent to the Waste to Energy Plants (WtE), with the outputs of that facility making their way to landfill instead. Waste sent to the WtE is also expected to follow the order of preference based on its calorific value, hence the bulky waste is preferred over the black bag. Mass flows for the ECOHIVE energy (WtE) are not available at time of performing this exercise, hence they have been assumed, while those for the ECOHIVE organics (OPP) are based on the design parameters of the wet digestion process. In these scenarios, treatment of waste in private facilities is assumed to be not material to the overall performance of the system and to the gaps between performance and targets. The exclusion of these facilities from the model actually introduces an element of pessimistic bias in the results.

3.4. Projections over the years

3.4.1. Waste generation in 2025

As already highlighted in this chapter projecting out waste generation for the subsequent decade is a complex task. Utilising the waste flow model as described previously allows Government to plan accordingly for the necessary interventions in order to meet the waste infrastructure requirements.

Projections for MSW under S1 scenario

Under the S1 scenario total volume of MSW generated is projected to be 364,107 tonnes of which 327,875 tonnes representing 90% of all generated MSW will still need to be landfilled. Additionally, it is projected that 12,981 tonnes of recyclables will be sent to market (export), and 3,576 tonnes of projected MSW will be subject to energy recovery operations.

Summary for MSW by waste disposal option	Total (tonnes)	Share from total
LDF	327.875	90%
MKT-R	12,981	3.6%
D-COMP	-	
QUARRY	-	
E-RECOVERY	3,576	1.0%
MKT-D	12,521	3.4%
LOSS	7,153	2.0%
Total	364,107	

Table 4: Projected MSW generation in 2025 under S1 scenario

Projections for all wastes under S1 scenario

Projections for all wastes under the S1 scenario in 2025 indicated that annually 442,492 tonnes of waste will be generated. Of this, 375,548 tonnes will need to be landfilled, 13,240 tonnes of recyclables will be sent to market, 13,425 tonnes will be disposed on in quarries, and 4,059 tonnes will be subject to energy recovery processes.

Summary for total waste by waste disposal option	Total (tonnes)	Share from total
LDF	375,548	84.9%
MKT-R	13,240	3.0%
D-COMP	-	-
QUARRY	13,425	3.0%
E-RECOVERY	4,059	0.9%
MKT-D	12,915	2.9%
LOSS	23,305	5.3%
Total	442,492	

Table 5: Projected total waste generated in 2025 under scenario S1

Projections for MSW under S2 scenario

In relation to projected MSW generation in 2025 under the S2 scenario the waste flow model projects that 140,660 tonnes will be generated per annum by the middle of the decade. In terms of management of this MSW it is expected that 46,060 tonnes or 12.7% of all MSW will be recyclables sent to market and 52,297 tonnes or 14.4% subject to energy recovery processes as the new plants and infrastructure comes online.

Summary for MSW by waste disposal option	Total (tonnes)	Share from total
LDF	140,660	38.6%
MKT-R	46,060	12.7%
D-COMP	20,202	5.5%
QUARRY	-	-
E-RECOVERY	52,297	14.4%
MKT-D	8,669	2.4%
LOSS	96,218	26.4%
Total	364,107	

Table 6: Projected MSW generation in 2025 under S2 scenario

Projections for all waste under S2 scenario

It is projected that under in 2025 under the S2 scenario in respect of all waste 442,492 tonnes will be generated and of this 46,318 tonnes or 10.5% will be recyclables sent to market, 27,207 tonnes or 6.1% will be treated as compost, 13,425 tonnes (3.0%) disposed of in quarries, 53,226 tonnes or 12.0% subject to energy recovery processes.

Summary for total Waste by waste disposal option	Total (tonnes)	Share from total
LDF	184,343	41.7%
MKT-R	46,318	10.5%
D-COMP	27,207	6.1%
QUARRY	13,425	3.0%
E-RECOVERY	53,226	12.0%
MKT-D	9,063	2.0%
LOSS	108,908	24.6%
Total	442,492	

Comparison between the scenarios

Diagrams 7 and 8 present a visualisation of the differences between the two scenarios for the year 2025. It is clear that under the S2 scenario effectively treating the projected level of waste generation requires a more complex system of waste management. However as illustrated in Diagram 9 increasing the complexity of the waste management process allows for significant progress to be made in terms of reducing landfilling and increasing recycling. As the new plants come online the projected changes in landfilling are such that of the MSW generated 39% will have to still be landfilled under the S2 scenario compared to 90% under the S1 scenario. In relation to recycling it is projected that the recycling rate under the S2 scenario can increase from 4% to 18% of MSW.

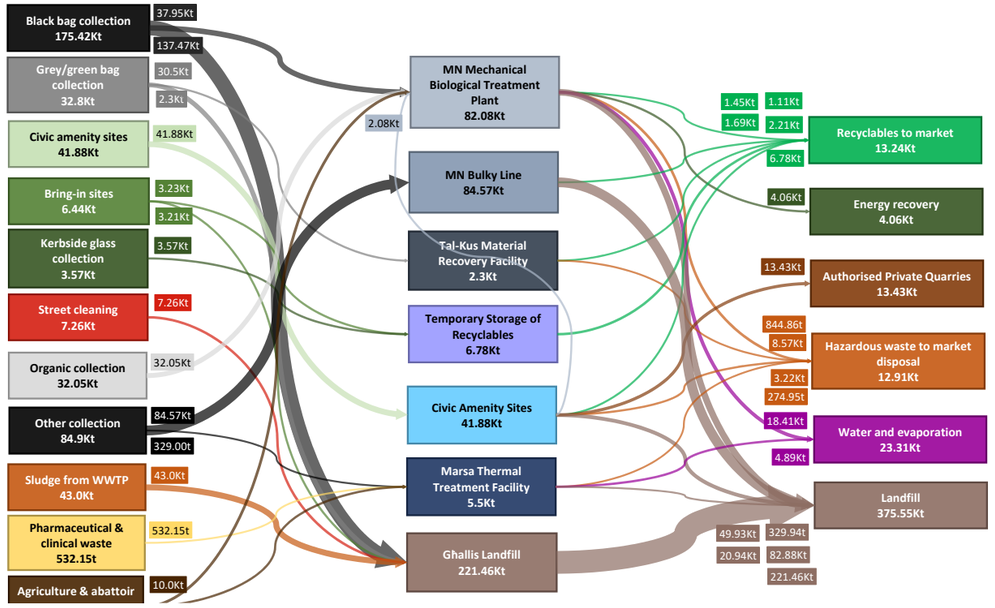


Diagram 7: Sankey diagram depicting waste flows from waste source, through facility to final destination, for S1 Scenario in 2025

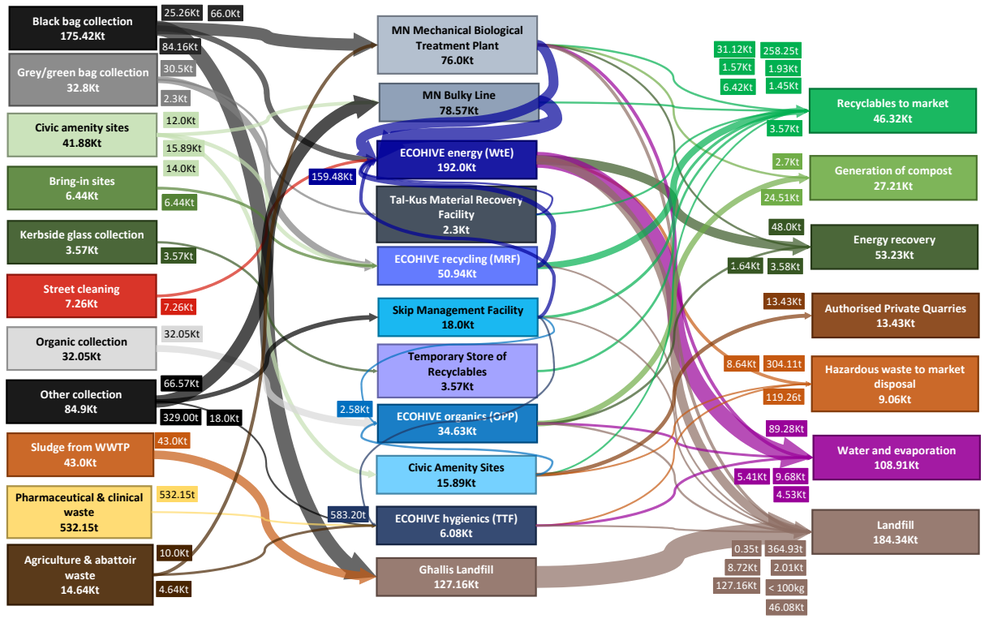
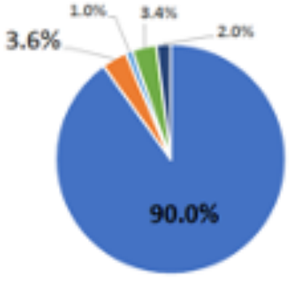
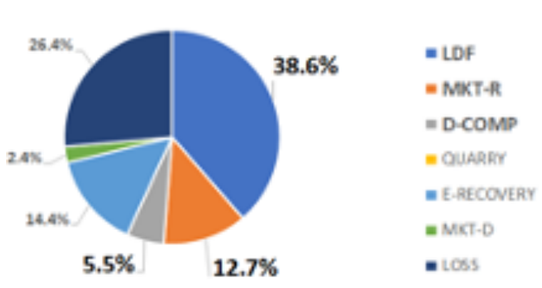


Diagram 8: Sankey diagram depicting waste flows from waste source, through facility to final destination, for S2 Scenario in 2025



S1 Scenario, 2025



S2 Scenario, 2025

Diagram 9: Waste composition in 2025 under the S1 and S2

Projections for waste generation in 2030 under each scenario will be explored in the following section.

Projections for MSW under S1 scenario

Under the S1 scenario it is expected that waste generation will continue to increase and as such waste management options will continue to rely heavily upon landfilling. It is expected that the volume of MSW that will need to be sent to landfill will be circa 383,580 tonnes or representing 90.7% of total MSW that is generated. In this hypothetical scenario recovery of material will remain low (around 15,258 tonnes or 3.63% of total MSW generated). Of the other current treatment options in 2030 energy recovery from MSW will remain below 1% with hazardous waste to market disposal from MSW remaining low also at around 3%.

Summary for MSW by waste disposal option	Total (tonnes)	Share from total
LDF	383,580	90.7%
MKT-R	15,258	3.6%
D-COMP	-	-
QUARRY	-	-
E-RECOVERY	3,761	0.9%
MKT-D	12,960	3.1%
LOSS	7,523	1.8%
Total	423,082	

Table 7: Projected MSW generated in 2030 under S1 scenario

Projections for all wastes under S1 scenario

Projections for all wastes generated under the baseline scenario of maintaining current treatment options show a similar pattern to that of projections for MSW. Landfilling will need to remain the most viable option for treatment with circa 85.5% of all waste generated ending up in landfill. The percentage of all waste being treated either by disposal to quarry or through recovery of materials in 2030 will both be around 3% of all waste generated. Energy recovery as per the situation for MSW will remain below 1%.

Summary for total waste by waste disposal option	Total (tonnes)	Share from total
LDF	433,616	85.5%
MKT-R	15,559	3.1%
D-COMP	-	-
QUARRY	15,647	3.1%
E-RECOVERY	4,284	0.8%
MKT-D	13,374	2.6%
LOSS	24,616	4.6%
Total	507,096	

Table 8: Projected total waste generated in 2030 under S1 scenario

Projections for MSW under the S2 Scenario

Looking at the situation when new plants are in place in 2030 the projections of MSW going to landfill indicate that 45% or 190,359 tonnes of MSW will end up in landfill. Recovery of material from MSW will be around 12.4% or 52,349 tonnes and circa 5.2% or 21,845 tonnes of MSW will be treated through composting. It is projected that approximately 52,800 tonnes of MSW will be treated through energy recovery by 2030.

Summary for MSW by waste disposal option	Total (tonnes)	Share from total
LDF	190,359	45.0%
MKT-R	52,349	12.4%
D-COMP	21,845	5.2%
QUARRY	-	-
E-RECOVERY	52,800	12.5%
MKT-D	8,717	2.1%
LOSS	97,012	22.9%
Total	423,082	

Table 9: Projected MSW generated in 2030 under S2 scenario

Projections for all waste under the S2 Scenario

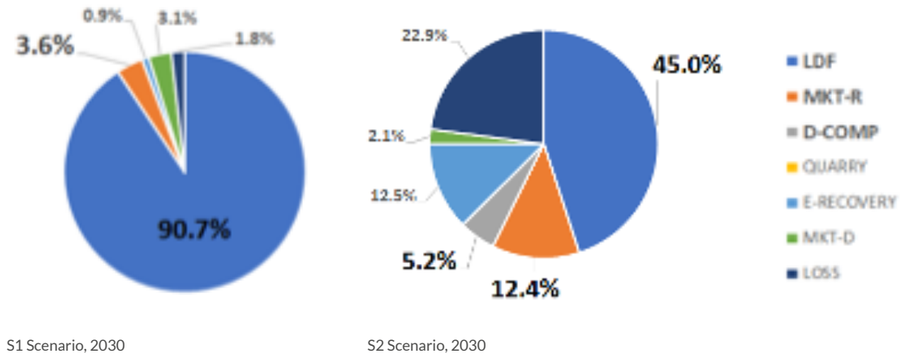
In relation to all wastes generated, by 2030 with the new plants in place, it is projected that around 236,120 tonnes or 46.6% will be landfilled. Recovery of materials from all waste types is projected to be 52,6250 tonnes or 10.4%. Around 29,000 tonnes of all wastes will be treated through composting and circa 15,000 tonnes will need to be disposed of in quarries. Energy recovery of materials from wastes are projected to be 53,869 tonnes.

Summary for total waste by waste disposal option	Total (tonnes)	Share from total
LDF	236,120	46.6%
MKT-R	52,650	10.4%
D-COMP	29,801	5.9%
QUARRY	15,647	3.1%
E-RECOVERY	53,869	10.6%
MKT-D	9,131	1.8%
LOSS	109,878	21.7%
Total	507,096	

Table 10: Projected total waste generated in 2030 under S2 scenario

The difference between the S1 and S2 scenarios in 2030

As illustrated in the graphs below, the main differences between the two scenarios is the remarkable decrease in the rate of landfilling. It is projected that landfilling with the new plants in place will drop from around 91% for MSW to circa 45%. Conversely the recycle rate with new plants is project to increase from 4% to 18% with respect to MSW.



S1 Scenario, 2030 S2 Scenario, 2030

Figure 32: Waste disposal in 2030 under the S1 and S2 scenarios

3.5. Required Changes to Achieve the 2030 Targets

The targets stipulated in the EU Directives have been outlined in Chapter 2 of the WMP. In summary the targets for MSW are:

- That by 2030, the preparation for re-use and the recycling of MSW (through separation at source, treatment at MRF, etc.) shall be increased to a minimum of 60% of total MSW generated by weight[59]
- That by 2035, the amount of MSW that is landfilled is to be reduced to 10% of total MSW generated by weight[60]

Given these targets and the projections as described in the previous sections of this chapter and under the assumption that Malta would obtain the aforementioned extension in terms of attainment of the targets the following actions would need to be undertaken.

Attaining the MSW targets will require a combination of behavioural changes by citizens coupled with investments in and improvements in plant operations and increasing plant capacities. Potential changes that are required include:

- Increasing separation of waste at source – there is a strong potential for improvement in the shifting of recyclables and organic waste from the black bag to the grey and organic bags
- Reducing rejects in the mass of MSW treated by WSM which can be achieved through (a) behavioural changes at source through shifting consumer trends towards products with high recyclable potential and (b) improvements in plant operations allowing a higher rate of separation of recyclable fractions
- Increasing segregation at source and treatment of bulky waste

Taking the above on board the projection of the two possible pathways for attainment of targets can then be plotted as per Table 11 below.

	Pathway A	Pathway B
Increasing separation of waste at source:	190,359	45.0%
(percentage of mass of black bag shifted to grey and organic bags)	55%	55%
Reducing rejects in the treatment process of MSW:	21,845	5.2%

Table 11: Percentage changes required to achieve targets (Scenario A assumes no incremental increase in skip management facility).

59 Malta, amongst other Member States, may obtain five additional years for attainment of the targets, such that a minimum of 60% of MSW is prepared for re-use and recycling by 2030

60 Malta, amongst other Member States, may obtain five additional years for attainment of the targets, such that the amount of MSW that is landfilled is lowered to 20% of the total amount of MSW generated by 2030

Treatment and disposal of MSW under pathway A would require the increased separation at source being met with increased capacity of material recovery facilities. Addressing capacity of waste to energy facilities would also be required to ensure that such capacities do not fall below 77% although this figure may fluctuate depending upon feedstock availability due to seasonal changes (i.e. the volume of waste generated is not uniform across the year and there are recognised peaks in waste generation).

Likewise, under pathway B certain parameters would need to be met. Namely bulky waste would need to be treated in a skip management facility or similar plant and the optimisation of the capacity of the waste to energy plant ensured to be around 80%.

Plotting out the MSW waste generated under both scenarios is detailed in Table 12 for pathway A and Table 13 for pathway B below.

Summary by waste facility	Total waste received (t)
MN MBT	-
MN Bulky	99,573
KUS-MRF	3,500
MRF	206,826
STORE	3,950
SMF	18,000
GHALLIS	39,663
OPP	69,408
WtE	148,344
TTF	583
QUARRY	
TOTAL	**589,848**

Summary for MSW by waste disposal	Total (t)	Share from total	2030 Target
LDF	**39,671**	**9.4%**	20%
MKT-R	**204,716**	**60%**	60%
D-COMP	**49,118**		
QUARRY	-	0%	
E-RECOVERY	44,277	10.5%	
MKT-D	6,706	1.6%	
LOSS	78,594	18.6%	
Total	**423,082**		

Table 12: MSW generation in 2030 under pathway A

Summary by waste facility	Total waste received (t)
MN MBT	-
MN Bulky	-
KUS-MRF	3,500
MRF	181,869
STORE	3,950
SMF	117,574
GHALLIS	35,727
OPP	72,186
WtE	147,637
TTF	3,809
QUARRY	
TOTAL	**566,252**

Summary for MSW by waste disposal	Total (t)	Share from total	2030 Target
LDF	**35,766**	**8.5%**	20%
MKT-R	**200,673**	**60%**	60%
D-COMP	**53,141**		
QUARRY	-	0%	
E-RECOVERY	44,721	10.6%	
MKT-D	6,841	1.6%	
LOSS	81,940	19.4%	
Total	**423,082**		

Table 13: MSW generation in 2030 under pathway B

3.6. Summary of waste flow projections

This chapter has set out a number of projections in terms of likely waste generation for the coming decade. Based on these projections it is estimated that the total MSW generated in 2030 will reach 423kt. Should Malta obtain an extension for MSW targets by 2030 the preparing for re-use and recycling of MSW would increase to a minimum of 60% of total municipal waste by weight and the amount of waste landfilled is expected is to be reduced to 10% of total municipal waste by weight.

In 2030 the 'black bag' is projected to constitute around 47% of total MSW generated which equates to 200kt of which 66kt would be treated at the Malta North treatment facility, 14kt would be processed through the waste to energy plant and the remaining having to be landfilled.

However, under the scenario where household behaviour is optimised the mass of black bag is expected to dramatically fall to 40kt. This change would result from improvements in separation at source coupled with higher recyclability of waste. In this scenario the shifts for the black bag to the grey bag results in an increase in the mass of the latter to increase from 36kt to almost 160kt. The mass of the organic bag would also increase from 30kt to 69kt. The capacity of the materials recovery facilities would have to increase to around 210kt per annum in order to treat waste generated from grey bags, bring-in sites and civic amenity sites.

As shown in the results of pathway B, segregation and treatment of the bulky waste plays an important role in attaining the 2030 targets. In addition to above-mentioned improvements, all bulky waste generated from skips and CA sites (almost 120 kt) would need to be segregated and treated to attain the 2030 recycling target.

All of these projections emanating from the waste flow model form a basis for the measures outlined in the following chapters of the WMP.

4

PREVENTING THE GENERATION OF WASTE

The core objectives of measures presented within this chapter are to promote resource efficiency and to reduce waste generation across sectors. These measures seek to incentivise greener business processes, and prompt societal change towards smarter consumption patterns. In presenting this chapter, Malta is also in fulfilment of the requirements of the EU Waste Framework Directive Article 9(1), as provided for in the revised Waste Framework Directive (2018/851), to provide a Waste Prevention Programme.

4.1. Waste generation and its prevention in Malta

The waste hierarchy places the prevention of waste as the primary action to be carried out. In the context of the Maltese Islands, this is particularly salient given national peculiarities which impact all subsequent stages of the hierarchy.

The waste streams which generate the greatest percentage of waste generation in Malta have been selected as the priority target waste streams: food (organic), packaging, non-packaging paper, single-use plastics, textiles, electric and electronic equipment (EEE) and construction and demolition material. The target streams account for the largest percentage of waste generated in Malta by weight, and therefore the impact of these wastes on the environment is significant. Action focused on these waste streams should therefore enable us to make marked progress in a relatively short period of time.

4.2. Waste Prevention Policy

The transition towards a more sustainable global economy has been pioneered at all levels of governance, including at a United Nations, European Union and National level. The United Nations Sustainable Development Goals provide a blueprint for global progress on economic, environmental, social and cultural aims. Preventing waste can help to reach targets relating to resource efficiency and marine life. In particular, Sustainable Development Goal 12 - Responsible Consumption and Production; "to substantially reduce waste generation through prevention, reduction, recycling and reuse" by 2030[61] and Goal 14 - Life Below Water: "to prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities" by 2025[62] will be guiding principles throughout Malta's Waste Prevention Programme.

The European Union has been instrumental in promoting resource efficiency and the circular economy. The two objectives of the EU Waste Framework Directive are "to prevent and reduce the negative impacts caused by the generation and management of waste" and "to improve resource efficiency[63]." The EU also obliges Member States to apply the principles of the waste hierarchy, whereby waste prevention and re-use are the preferred options ahead of recycling and energy recovery.

61 https://www.un.org/sustainabledevelopment/sustainable-consumption-production/
62 https://www.un.org/sustainabledevelopment/oceans/
63 https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm

National legislation transposes European commitments and establishes the regulatory framework within which waste operations are undertaken, all of which fall under the Environment Protection Act (CAP. 549). Whilst this Waste Prevention Programme focuses specifically on the reduction of waste generated, it is not the only instrument wherein waste prevention should be prescribed. Prospective national plans, programmes and projects should ensure alignment with this Programme and endeavour to embed these principles in other relevant policies. Other policy documents associated with waste prevention are in development at a local level – these include the Single-use Plastic Products Strategy, the Circular Economy Strategy, the Second National Action Plan for Green Public Procurement, and the Construction and Demolition Waste Strategy.

Malta's Single-Use Plastic (SUP) Strategy looks to protect the environment and human health from plastic pollution by reducing the consumption of SUP products and increasing the quality and quantities of SUPs collected for recycling. The objectives of the Construction and Demolition Waste Strategy for Malta (CDWS) are to address the current issues within the construction sector and all the various aspects these intersect with, and to increase the re-use and recycling of construction and demolition waste. The Second National Action Plan (NAP) for Green Public Procurement (GPP) takes a broader approach, with the incorporation of Circular Economy principles throughout a diverse range of goods and services. The mechanism is based on the strength of the public spending, as GPP ensures that there is a directing of this towards more environmentally friendly choices. It is also linked to the Circular Economy Strategy, which promotes the shift to a circular economy. This last strategy is of relevance to the Waste Prevention Programme, which had been developed to be closely aligned with the aims and priorities of the Strategy. This has been done by placing an emphasis on waste prevention through a closed loop system, with concepts of circular economy interwoven through the measures. Each of these documents should be considered as an offshoot of this Programme and therefore similar policy measures are not being reproduced in this chapter and should be pursued in parallel in order to maximise our efforts at reducing waste across all walks of life.

4.2.1. The Waste Prevention Programme for the Maltese Islands 2014 – 2020

The Ministry has successfully implemented several measures from the Waste Prevention Programme for the Maltese Islands 2014-2020, particularly focusing on outreach activities and communications via the Don't Waste Waste Campaign, the Saving Our Blue Campaign and the Unsolicited Mail Project, discussed below.

4.2.2. Don't Waste Waste Campaign

Waste Prevention and Recycling measures from the previous Waste Management Plan (2014-2020) were implemented through the nationwide Don't Waste Waste Campaign. Awareness-raising measures to prevent food waste such as to "promote food waste reduction in 30 radio, television and newspaper interventions" and to "seek strategic alliances with supermarkets to have authorised personnel available on their premises to advise customers on consumption patterns and wiser food purchase" were achieved through numerous articles, TV and radio adverts, and supermarket stunts. These supermarket stunts promoted food waste reduction by creating awareness about purchasing and consumption habits and engaging with customers at

supermarkets to advise on smarter food practices. Food waste prevention messages were also communicated through a roadshow across various localities with the support of a well-known chef who demonstrated how food scraps and leftover food can be integrated in new recipes to reduce wastage.

4.2.3. Saving Our Blue Campaign

Further waste reduction and litter prevention measures were carried out in 2019 with the launch of the Saving Our Blue Campaign. Through this campaign, the Ministry embarked on various outreach initiatives to raise awareness about the harmful impact of single-use plastics and littering in public places. Outreach initiatives included awareness raising events on local beaches, during which beach visitors were informed about the hazards of single-use plastics and improper waste disposal. Visitors were also encouraged to handpick littered items found on the visited beaches. During the same beach events, beach visitors were encouraged to sign pledges with commitments concerning the reduction of single-use plastics and offered the opportunity to exchange their single-use items with reusable ones. Attitudinal surveys on the use of single-use plastics on beaches were carried out to assess behavioural trends and identify means to address them. Other waste reduction activities held in 2019 as part of the Saving Our Blue Campaign include a series of educational activities on single-use plastics held in summer schools and collaboration with various NGOs to reduce the use of single-use plastics during organised events. Newer editions of the Saving our Blue Campaign will be launched yearly in the coming years, to continue raising awareness.

4.2.4. Unsolicited Mail Project

In order to prevent paper waste from unsolicited mail, the measure to "conduct a survey to establish the average amount of promotional/unaddressed mail received by households" from the previous Plan was achieved through a six-week monitoring exercise carried out by the Directorate for the Environment and Climate Change to estimate the amount of unaddressed mail received by households. The outcome of this survey will be utilised as a preparatory action ahead of further measures to reduce promotional or unaddressed mail included in this Programme. Outstanding measures such as the establishment of a Waste Prevention Measurement Index have also been encompassed into the new Waste Prevention Programme to aid in monitoring progress of waste prevention.

4.2.5. Waste Prevention

In the context of the aforementioned initiatives, the measures outlined in this Waste Prevention Programme will aim to facilitate the prevention of waste and the reuse of materials by industry, Government, citizens and tourists. This implies a collaborative approach from all who generate waste in their personal, professional or corporate capacity. Without the effort of the many, prevention of waste will remain an unreachable goal.

Through the Waste Prevention Programme, The Ministry's objectives are to:

- Foster a culture of resource efficiency by encouraging alternative choices that contribute towards sustainable consumption, changing attitudes towards preventing unnecessary use, and encouraging the repair and reuse of items rather than discarding them early in their economic lifetime.
- Create new business opportunities for greener products, repair services and secondary markets.
- Provide economic incentives to support society in transitioning towards voluntary prevention and reuse initiatives.

These objectives are the focus of this Waste Prevention Programme which will form part of the Waste Management Plan for the Maltese Islands 2021-2030 mandated under the EU Waste Framework Directive Article 9(1) as provided for in the revised Waste Framework Directive (2018/851), seeking the enactment of measures which "prevent the generation of waste". This programme promotes the minimisation of waste generated through the adoption of various measures which incentivise greener business processes, and prompt societal change towards smarter consumption patterns.

4.3. Measures for the Prevention of Waste

The Ministry for the Environment, Climate Change and Planning (MECP) will collaborate with a range of stakeholders in order to foster a culture of resource efficiency, create new business opportunities and support voluntary initiatives which promote waste prevention. MECP will engage with stakeholders, learn from specialised expertise and collaborate across public and private sectors to work together to make a difference and instill a culture change that promotes waste prevention.

The target waste streams will be tackled through measures that include awareness-raising campaigns, implementing economic incentives, new legislation to support waste minimisation initiatives and various other tools to incentivise waste prevention. Measures are organised by the policy tools employed, which are the following: Economic incentives; Legislative measures; Promoting voluntary measures; Capacity building; Digitalisation; Research and development; and Education and awareness-raising.

4.3.1. Economic incentives

Economic tools can be useful instruments to incentivise businesses and consumers to make sustainable choices by making these options more economically viable. Moreover, these instruments can also serve to fulfil the 'carrot and stick' approach, incentivising environmentally conscious behaviour, while recognising the cost of pollution of the status quo. Such initiatives under this programme will:

Support the establishment of a re-use and repair centre to promote such practices (WP_EI1). MECP would facilitate the creation of a centre where people can take items which are suitable for repair, upgrade or reuse. Initially such a centre, acting as a collection point for used products, would focus on clothing and electronics to expand further to furniture and toys at a later stage. The centre can also serve as a hub for skills

training or repairing items and will act as a blueprint for other re-use centres. Following an assessment of such feasibility, MECP will support the strengthening of existing repair and reuse networks and improve the capacity building to train people with skills to repair and repurpose key items in order to address skills gaps in this area. To this effect MECP will support NGOs, educational institutions such as MCAST and not for profit associations of traders and technicians to offer such initiatives in a structured manner.

Re-use, upgrade and repair activities will be promoted through positive economic incentives, quality assurances and warranties to improve confidence in second hand goods. MECP will also examine the possibility of extending these centres to provide for the sale of second-hand goods. In addition, such activities should be subject to a special permitting regime by the Competent Authorities with a view of setting specific criteria to ensure that health and safety, product and environmental standards are adhered to. The centre would allow for the acceptance of second-hand items, their repair and eventual resale. A feasibility assessment of various business models and investment appraisal for such a centre will be conducted to assess the most effective way forward. The feasibility study will assess costs, socio-economic impact and potential for waste prevention before a decision is made on the most viable way forward.

Develop fiscal incentives to promote repair and reuse activities (WP_EI2). In order to level the playing field in favour of repair and reuse initiatives MECP shall explore fiscal initiatives to make repair and reuse activities more economically viable. This would encourage society to repair and upgrade certain items prior to their disposal, increasing the lifespan of products rather than replacing them, and to hire equipment destined for occasional use rather than buying such equipment. We would also seek to lower the cost of

repair services for EEE such as IT equipment or textiles.

Make the case for a Waste Prevention Budget Line Item (WP_EI3). This would involve discussions with the Ministry of Finance to set up a waste prevention budget line which shall receive monies from the consolidated fund and from eco-taxation such that it could be used to incentivise the waste prevention initiatives described in this Programme.

Non-Packaging Paper

Digitise office procedures (WP_EI4). The Ministry will explore economic instruments to support the uptake of electronic document management systems and electronic systems and software which replace the need for paper. An example of such instrument could be rebates based on the eligible expenditure of such systems. At the same time, we will propose that paper becomes governed by the extended producer responsibility principle for producers who place this material on the market to be made responsible for the collection and recycling of paper.

Packaging

Encourage retailers to offer discounts for customers who bring their own containers (WP_EI5). This initiative could form part of the business' Corporate Social Responsibility, while also saving costs associated with the purchasing of new packaging. This measure would act as an economic incentive for customers to bring their own containers and cups for food, beverages and other products. Other economic activities to which this initiative could apply include cafes, take-aways and similar establishments. In order to support these initiatives, the Ministry will look to facilitate a promotional platform for green retail outlets that are identified and qualifiable for a green label.

Provide economic incentives to support packaging-free initiatives and products with less packaging (WP_EI6). For example, incentivising the purchase of unpackaged, loose or bulk items, such as loose fruit and vegetables, bulk nuts, grains and pasta, and products that can be sold without the outside packaging, such as toothpaste, cosmetics and soaps. This measure could also include incentives to encourage the use of refillable products including laundry detergent and other cleaning products. MECP will also explore fiscal incentives to ensure the prices of these items are competitive enough to attract consumers. This measure will also support the catering industry to limit excess waste when serving customers.

Construction and demolition waste

Exploring fiscal incentives targeting recycled materials in construction (WP_EI7). MECP intends to explore the potential to level the playing field and bring the price of recycled materials in line with that of virgin materials to reduce pressure on raw materials and incentivise the use of recycled materials. This

measure will be aligned with the C&D Strategy. MECP shall also consider a suite of initiatives that can be offered to entrepreneurs who set up shop to transform construction and demolition waste into a recycled alternative that can be placed on the market. MECP shall also review any impediments in exporting building elements made of reconstituted stone such that the market for such products can be widened.

4.3.2. Legislative measures

When the market alone fails to correct itself and negative externalities exist, Government has a role to play in encouraging positive change via legislation. Under this Waste Prevention Programme, MECP will:

Establish a set of waste prevention guidelines for all Government events (WP_L1). Leading by example, MECP will create a standardised set of waste prevention guidelines for events which can be tailored depending on the event type. This programme of best practice will include the longer-term view to incorporate an approved waste prevention programme into the planning and approval process as a mandatory requirement for the permitting of public events.

Food

Develop legislation for the diversion of food waste from landfill (WP_L2). MECP shall consult with relevant stakeholders, such as food giveaways and food banks, on the development of legislation on food waste. Such legislation will regulate a transfer mechanism in order to close all gaps when diverting food waste from landfill.

Limit retail and distribution outlets from discarding unsold food (WP_L3). Surplus food suitable for human consumption should not be thrown away and should instead be diverted to charity. This legislative initiative has proven successful elsewhere[64] and such a measure will be developed following consultation with relevant stakeholders and industry representatives.

Overcome barriers imposed by current legislation restricting the redistribution of food (WP_L4). Through collaboration with relevant authorities including the public health authorities, an assessment will identify any possible amendments to regulations which can simplify food waste prevention measures whilst ensuring that all safety protocols are observed.

Paper

Develop a regulatory framework to enable people to unsubscribe from unsolicited mail (WP_L5). A regulatory framework will be established to support any opt-out schemes for unaddressed mail. Such a framework would result in legislative action for non-compliance with databases of those who have opted

64 https://ec.europa.eu/food/sites/food/files/safety/docs/fw_eu-platform_20170331_pres-10.pdf

out, or who have placed physical stickers on mailboxes. Alongside this, MECP will initiate the process for the development of a digital platform for local magazines, whereby people can choose to 'opt in' to physical copies if requested. Companies will also be encouraged to distribute catalogues in appropriate locations (supermarkets, stationeries etc.) where people can make a conscious choice to take a copy; such companies should also take advantage of the internet and subscription options.

Support the creation of an online alternative to unaddressed mail (WP_L6). Government would support the development and maintenance of such a platform which should allow those who are interested in adverts in paper format to view these electronically. This measure is intended to support Measure WP_L5 and MECP will also encourage catalogue, directory and magazine publishers to move away from letterbox distribution towards online distribution.

Single-use plastics

Introduce legislation to prohibit the use of single-use plastics in public events (WP_L7). This measure can be introduced for single-use plastic items that will not be banned under the Single-Use Plastics Directive. Instead, event organisers should make use of reusable and washable products, including possibilities for introducing container refill systems for beverages and food.

Pilot a smoking ban on several local beaches (WP_L8). The purpose of this initiative would be to limit the amount of cigarette butts and cigarettes that are disposed of improperly and littered on beaches. This measure would reduce the amount of littered single-use plastics and their negative effects on the environment, while avoiding waste dispersal and ensuring waste pre-treatment prior to landfilling. A dedicated working group will be established to lead this initiative, including representatives from MECP, ERA, WSM, Superintendence of Public Health, MTA and MGOZ.

Construction and demolition waste

Amend the Building Regulations to mandate a minimum of 15% recycled materials in buildings (WP_L9). This measure would aim to increase the uptake of recycled materials in construction. This measure and all others relating to construction will be implemented to align with the Construction and Demolition Waste Strategy.

Remove barriers to the export of reconstituted stone products or powdered stone from construction and demolition waste where feasible (WP_L10). Recognising the inherent architectural and aesthetic properties of Maltese stone, MECP shall endeavour to remove restrictions on the export of reconstituted stone such that a wider market for such products may be developed.

4.3.3. Voluntary measures

Economic actors and civil society organisations can play an active role, on their own initiative, to implement voluntary actions aimed at preventing or reducing waste. The Ministry will encourage and support such initiatives where possible including the following:

Develop an eco-label or accreditation for supermarkets, retail stores and catering establishments participating in environmental initiatives (WP_V1). The label would be established in cooperation with relevant industry bodies and stakeholders, and criteria could include supporting the Green Champions programme, establishing packaging-free areas and promoting food waste prevention. Participating establishments would also be encouraged to undergo a voluntary waste audit and would benefit from recognition and a standardised ecolabel, as well as communication materials.

Prepare standardised waste prevention messaging for hotels and tourist accommodation (WP_V2). This measure will aim to promote good practices for tourists and be developed in partnership with relevant stakeholders including Wasteserv and the Ministry for Tourism. MECP will also explore the possibility of embedding into licensing agreements the requirement for the provision of recycling information in all tourist accommodations.

Introduce a voluntary industry agreement to encourage commitments to reduce waste across various commercial sectors (WP_V3). Some examples include offering loose vegetables, buy-in-bulk sections, water refill stations, displaying signs asking whether another bag is necessary, 'plastic-free aisles', educating on the difference between 'use by' and 'best before' dates, promoting SMART shopping, incentivising reusable cups for coffee and other beverages, sourcing local and seasonal produce, and developing a network of takeback containers for delivery. The voluntary agreement would be established in cooperation with relevant industry bodies and stakeholders, and participating establishments would benefit from recognition and a standardised eco-label, developed in partnership with relevant stakeholders.

MECP will also support and encourage voluntary agreements and information sharing across retailers, brands and civil society organisations to promote the prevention of textile waste. This can also include creating specialised re-sale outlets for commonly used items such as school uniforms, as well as establishing take-back schemes for recycling which include a takeback bin in clothing retailers. Similar initiatives include the UK Sustainable Clothing Action Plan[65] and Sweden Textile Initiative for Climate Action[66]. This support will also extend to International Agreements on sustainable fashion such as the Global Fashion Pact[67], an 'industry wide movement aimed at aligning the fashion industry with the UN Sustainable Development Goals'

65 http://www.wrap.org.uk/sustainable-textiles/scap
66 https://www.sustainablefashionacademy.org/STICA
67 https://thefashionpact.org/?lang=en

focusing on climate, biodiversity and oceans; as well as the European Clothing Action Plan[68] which brings together industry, Government and retailers to improve the sustainability of textiles across the lifecycle as well as a consumer-facing behaviour change campaign[69].

Food

Collaborate with farmers, volunteers and civil society organisations to encourage the practice of 'gleaning' (WP_V4). This would involve voluntary organisations collecting unsold or surplus food from farms to redistribute to communities in need. Gleaning networks have been successfully established in several countries including Belgium, France, Greece, Spain and the United Kingdom[70].

4.3.4. Capacity building

In order to support the waste prevention measures throughout this programme, The Ministry will implement a series of capacity building measures to improve resources and skills available to enable the shift towards a more circular economy. As the target of such action is Maltese society, this set of measures reaches across waste streams and instead focuses on people.

Nominate Green Champions to serve as spokespersons for waste prevention in businesses, schools and supermarkets (WP_CB1). Each organisation can nominate one or more 'Green Champions' to specialise in certain streams or be responsible for driving progress on waste prevention in general within the organisation. They will be trained by appropriate experts and will be involved, where practical, in outreach activities and events. Such nominations would be among the first set of measures to be implemented.

Develop a Continuous Professional Development Programme on Waste Prevention (WP_CB2). This programme will include collaboration with relevant stakeholders to promote and encourage skill-sharing and training, including skills for repairing electronics and repairing and upcycling textiles. Workshops, training and events which encourage re-purposing, repairing, re-use and re-sale of clothing and electronics, will be promoted and information communicated about the environmental benefits of extending the lifetime of items. The programme can also involve a series of knowledge-sharing and network-building workshops and activities on each of the various target areas: food, packaging, non-packaging paper, single-use plastics, textiles, electronics and construction. The purpose of these workshops would be to share knowledge on the environmental impacts, the benefits of waste reduction and how to prevent waste, as well as showcasing positive examples from the public and private sectors and civil society. These workshops could also be a forum to develop training and awareness programmes on the prevention of waste across sectors. Finally, stakeholders, experts and industry bodies can collaborate to promote dialogue exchange and establish

68 http://www.ecap.eu.com/
69 https://ec.europa.eu/environment/europeangreencapital/clothing-waste-initiative/
70 https://feedbackglobal.org/gleaning-network-eu-2/

training plans and awareness programmes for the prevention of waste across sectors, as well as organise sectoral workgroups to exchange best practice (and lead to the development of 'Best Practice' guides).

Establish a Waste prevention index (WP_CB3). MECP shall establish an index or a series of indices to measure waste prevention and to gather consistent data for the monitoring of progress towards achieving established targets. Such index will be aligned with EU waste prevention targets and reporting requirements[71]. This measurement index will also be utilised to monitor the progress of the plan, as well as contributing to efforts on Data Management.

Organise Ministry-led activities to promote waste prevention (WP_CB4); in collaboration with key stakeholders, such as textile up-cycling events, repair cafes and surplus food cooking events. This would be an opportunity for the Ministry to lead by example in the promotion of waste prevention activities. This could also include a campaign aiming to encourage the purchasing of seasonal, local produce as these not only have a lower carbon footprint in terms of food miles, but also typically require significantly less packaging in order to remain fresh. The campaign will include engagement with local farmers and producers, workshops, online communication and be combined with cooking roadshows on food waste. To this effect we shall work with educational institutions, farmers cooperatives and the Ministry for Agriculture to gather resources into delivering a consolidated message. Finally, we will target airport entry through communication of waste prevention messages and encourage water refill stations to replace plastic bottles. The feasibility of distributing reusable water bottles at this entry point will also be explored.

4.3.5. Digitalisation

Embracing digitalisation, through the use of online and mobile applications, is key to encourage the shift towards a more circular economy. Furthermore, digitisation, which is moving from paper-based methods to online methods, is also important to support waste prevention. Measures to embrace digitalisation for waste prevention include:

Rebrand and relaunch Reuse.com.mt, while exploring the option of developing or promoting apps with the same function (WP_D1). The website enables consumers to give away unwanted items to third parties, with various apps in existence with the same function of allowing users to upload unwanted food, toys, furniture or other items to the sharing platform, where other users can select to take for free. This kind of initiative helps people to save money and reduce waste, as well as fostering community participation. The reuse and repair centre outlined in Measure WP_EI1 can be a central location to facilitate such actions.

Explore the feasibility for a Government-wide swap shop to exchange furniture and office equipment within Government (WP_D2). This could be developed utilising an online platform categorised by Ministry

71 https://www.europarl.europa.eu/factsheets/en/sheet/76/resource-efficiency-and-the-circular-economy

and by product. For example, if a department needs new desks or IT equipment, they can first check the online platform for any vacant or unused desks prior to purchasing new ones; similarly, if a department has additional keyboards or mice, these can be utilised elsewhere.

Support the establishment of an online database of repair and re-use centres for information purposes (WP_D3). This would include swap shops, repair cafes and firms, second-hand shops, and charity and vintage shops; and promote the use of applications for sharing or donating textiles and electronics. Such an online database would make it easier for people to locate their nearest location for repair and can also be utilised to promote local re-use events.

Promote waste reduction activities online (WP_D4). The Ministry, through its digital channels shall promote cases of best practice in the area of waste prevention. We shall be asking those who are adopting such initiatives to provide us with information that can be shared across our digital platforms. We intend to have a stronger presence on social media, whilst also contributing to various digital news sites and sites of good repute in order to publicise the local opportunities available to consumers.

Food

Support the utilisation of digital channels and applications for food redistribution initiatives and food sharing initiatives within communities (WP_D5). Such initiatives could include connecting people directly with surplus food from farms or between communities which would otherwise be wasted. This surplus food could either be donated or sold, helping to reduce food waste at farm level as well as opening potential opportunities for farmers. Digital applications can also be utilised to facilitate the redistribution of food from

supermarkets to charities; or connecting citizens with surplus food made available from restaurants and supermarkets. Support for such applications will be in the form of fiscal incentives to develop and maintain the application and associated network.

4.3.6. Research and Development

Research is an important initial step prior to implementing certain initiatives as we first need to understand the drivers behind waste generation, the barriers to waste minimisation and the potential impacts of certain measures. Research may either be led by the Ministry or conducted in collaboration with students and researchers at the University and other higher education learning institutions. Knowledge gained through research can then be used to inform prioritisation of measures for waste prevention.

Conduct research into consumer knowledge and attitudes on different waste streams (WP_RD1); including ways to prevent food waste, reduce single-use plastics, how to correctly care for clothes, devices and appliances, the presence of microplastics in certain textiles, and what happens when an item reaches the end of its life. The research would also, importantly, identify actual or perceived barriers to repairing textiles and electronics instead of replacing them, purchasing second-hand items and reducing food and plastic waste. The survey could also help to identify several committed food waste savers who may opt to keep food waste diaries to track what type of food is being wasted, what quantity and reasons why. Surveys in retail outlets can help to better understand attitudes towards purchasing loose fruit and vegetables, bringing their own containers, buying items loose or in bulk, utilising outlets where items such as laundry detergent can be refilled, or asking for take-out beverages to be served in a reusable cup; while surveys on beaches can identify attitudes towards limiting the use of single-use items. This measure will produce reports outlining consumer responses relating to food waste, plastic waste, clothing waste and electronic waste. These reports will help to shape future campaigns and communications on these issues, as well as provide insight for suppliers and distributors in terms of excess packaging and waste.

Food

Identify source and reason for food waste occurring at the primary production level (WP_RD2), including farms, fish farms and food factories, in order to gain a better understanding of ways to prevent food waste. This research could include site visits, surveys, waste composition analyses and interviews and will be aligned with EU requirements for food waste measurement. Once we have a clearer understanding of the

reasons behind food waste at the production level, we can explore potential solutions to prevent waste from occurring. This research will produce a final report with conclusions on the causes and locations of food waste generation at production level in Malta and will enable the Ministry to identify appropriate responses. It is also envisioned that increased engagement with producers will support the implementation of food saving initiatives.

Develop a reporting methodology for monitoring food waste (WP_RD3), aligned with EU food loss and waste reporting requirements. Reporting can take place at every stage of the food supply chain, from production through to household consumption. Food waste reported can include both food thrown away and the amount donated or redistributed.

Paper

Survey number of households who would opt out of unaddressed mail, with preference for receiving it electronically (WP_RD4). The outcome of this survey will support the implementation of Measure WP_L5 creating a regulatory framework to support businesses and households choosing to opt out or unsubscribe from such mail.

Single-use and hidden plastics

Conduct a study into the use of, and impacts of banning the sale of, products containing microbeads (WP_RD5), such as microbeads in face scrubs and other cosmetics. A comprehensive understanding of the negative implications of these microbeads on the environment, and the practical implications of implementing a ban on the import and production of goods containing microplastics can be utilised to direct policy. Any further policy will be aligned with upcoming EU regulations.

Construction and demolition waste

Support research into the use of construction and demolition waste in road construction (WP_RD6). In collaboration with Transport Malta, Infrastructure Malta and the University of Malta, we shall endeavour to support research into how construction and demolition waste may be used as a means of substituting virgin material used in road construction and trenching backfilling. Should these prove to be viable, we shall work with the appropriate authorities for such construction methods to become the norm in specifications for such works.

4.3.7. Education and awareness-raising

According to the European Commission, the choices made by consumers can either support or hamper the circular economy. These choices are shaped by a range of factors including “the information to which

consumers have access, the range and prices of existing products, and the regulatory framework."[72] It is therefore important that consumers are aware of important issues to help guide them towards choices to minimise waste. The Ministry will facilitate education and awareness raising on issues of waste prevention through the following initiatives:

Revisit the national minimum curriculum to promote waste prevention learning (WP_EA1). Education is key towards a society that acts in the best interest of our environment and wellbeing. To this effect we shall be discussing with the Ministry for Education and specific learning institutes, private and public, on the possibility of including aspects of waste prevention in their curricula. This may include partnering with relevant stakeholders to introduce formal waste prevention education within schools and other educational institutions such as food waste prevention within the Institute for Tourism Studies. For example, ITS has recently undertaken an EU project on food waste prevention aimed at chefs. Promotion of waste prevention could also take the form of school visits and encouraging participation in such projects. Some examples include cooking classes, clothing design and repair workshops, how to reduce food waste at home, growing your own food, idea-sharing and creative workshops on preventing plastic waste and making mobile phones last longer. This programme can also extend to beach-cleaning and litter picking day trips. Such an initiative could be undertaken with Eko-Skola as an established partner in primary and secondary education.

Food

Organise a series of cooking roadshows and community cooking lessons (WP_EA2), in collaboration with stakeholders and local councils to promote local produce, healthy eating and food waste prevention across various localities. These roadshows will be Government-funded and will aim to engage citizens in practical ways to cook and eat healthier, as well as information on how to prevent waste when purchasing, cooking and storing food. Green Champions established under Measure WP_CB1 will also be encouraged to participate. We will also explore the possibility of hosting such activities as a practicum for undergraduate or postgraduate students following courses in consumer science and related disciplines. In this respect we shall be approaching educational institutions to determine whether it would be possible to include this initiative as a practicum in their mode of assessment.

Explore the feasibility of creating a waste reduction reality television series (WP_EA3). This reality series would include Maltese citizens and would follow individual progress on waste reduction efforts with a competition element to the show. The show will be hosted by a celebrity influencer and all citizens will have a chance to apply to be selected to take part. We shall sponsor a production house in producing a television show which would run for at least one season.

72 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614

Single-use plastics

Continue the Saving Our Blue Campaign, focusing on the existence of hidden plastics (WP_EA4). Education and awareness raising initiatives on reducing the consumption of single-use plastics will continue to be carried out through the Saving Our Blue Campaign. Initiatives will include events in beaches and public places, collaborations with industry and businesses and activities for the public, with the ultimate purpose of the Campaign to become a catalyst towards waste reduction and prevention, where it will seek to shift the behaviour of society from a reactive one to a proactive one. In terms of business and industry, the Campaign will seek to engage in further collaborations with different business stakeholders and NGOs to further encourage the transition to alternative and more sustainable products in day-to-day work operations, during organised events and in terms of products offered to the customer.

Education and awareness through the Saving Our Blue Campaign will also focus on additional items that are not easily recognised as single-use plastics, or that may contain an element of plastic which consumers may not be easily aware of. For example, coffee cups are often lined with plastic to keep them waterproof, even if these appear to be made of paper on the outside. This plastic lining makes coffee cups more difficult to recycle, as well as being a source of paper waste. This type of awareness raising can take place through social media, online platforms and broadcasting media among others, as part of the Saving Our Blue Campaign. A central component could be the dissemination of information on feasible prevention methods, alternatives and the promotion of re-use practices.

Textiles and electronics

Encourage the display of lifespan information and repairability information on electrical items at the point of sale (WP_EA5), particularly for large appliances such as refrigerators and washing machines, and consumer equipment such as mobile phones and laptops. As well as comparing appliances or devices by price, consumers would be given guidance on how long the product may last for, enabling them to make an informed decision when comparing value for money. This lifespan should also be incorporated into the warranty for repair. We will also advocate for an extended minimum warranty of electronic goods and the availability of repair services.

Promote existing rental and loan schemes for clothing (WP_EA6), particularly clothing for special occasions which otherwise would be worn only one or few times such as wedding dresses, ball-gowns, tuxedos and higher priced, designer items. We will also explore the potential to implement economic incentives to increase the use of such services.

Construction and demolition waste

Carry out awareness-raising efforts to support the uptake of recycled materials and greener construction practices (WP_EA7). This measure would involve general awareness raising amongst the public to improve overall knowledge on good practices when engaging in construction activities. In collaboration with key stakeholders and relevant industry bodies we will develop awareness raising programmes to support the key goals of the Construction and Demolition Waste Strategy.

4.4. Waste prevention measures at a glance

Measure code	Details
Short term measures (2021 to 2023)	
WP_EI1	Support the establishment of a re-use and repair centre to promote such practices
WP_EI3	Make the case for a Waste Prevention Budget Line Item
WP_EI5	Encourage retailers to offer discounts for customers who bring their own containers
WP_L1	Establish a set of waste prevention guidelines for all Government events
WP_L8	Pilot a smoking ban on several local beaches
WP_V1	Develop an eco-label or accreditation for supermarkets, retail stores and catering establishments participating in environmental initiatives
WP_V2	Prepare standardised waste prevention messaging for hotels and tourist accommodation
WP_V4	Collaborate with farmers, volunteers and civil society organisations to encourage the practice of 'gleaning'
WP_CB1	Nominate Green Champions, to serve as spokespersons for waste prevention in businesses, schools and supermarkets
WP_CB3	Establish a Waste prevention index
WP_CB4	Organise Ministry-led activities to promote waste prevention
WP_D1	Rebrand and relaunch Reuse.com.mt, while explore the option of developing or promoting apps with the same function
WP_D4	Promote waste reduction activities online
WP_RD1	Conduct research into consumer knowledge and attitudes on different waste streams
WP_RD2	Identify source and reason for food waste occurring at the primary production level
WP_RD3	Develop a reporting methodology for monitoring food waste
WP_RD4	Survey number of households who would opt out of unaddressed mail, with preference for receiving it electronically
WP_EA5	Encourage the display of lifespan information and repairability information on electrical items at the point of sale
Medium term measures (2024 – 2027)	
WP_L4	Overcome barriers imposed by current legislation restricting the redistribution of food
WP_V3	Introduce a voluntary industry agreement to encourage commitments to reduce packaging across various commercial sectors
WP_CB2	Develop a Continuous Professional Development Programme on Waste Prevention
WP_D2	Explore the potential for a Government-wide swap shop to exchange furniture and office equipment within Government
WP_D5	Support the utilisation of digital channels and applications for food redistribution initiatives and food sharing initiatives within communities
WP_RD5	Conduct a comprehensive study into the use of, and impacts of banning the sale of, products containing microbeads
WP_RD6	Support research into the use of construction and demolition waste in road construction
WP_EA4	Continue the Saving Our Blue Campaign, while educating consumers on the existence of hidden plastics
WP_EA7	Carry out awareness-raising efforts to support uptake of recycled materials and greener construction practices

Long term measures (2027 – 2030)	
WP_EI2	Develop fiscal incentives to promote repair and reuse activities
WP_EI4	Digitise office procedures
WP_EI6	Provide economic incentives to support packaging-free initiatives and products with less packaging
WP_EI7	Exploring fiscal incentives targeting recycled materials in construction
WP_L2	Develop legislation for the diversion of food waste from landfill
WP_L3	Limit retail and distribution outlets from discarding unsold food
WP_L5	Develop a regulatory framework to enable people to unsubscribe from unsolicited mail
WP_L6	Support the creation of an online alternative to unaddressed mail
WP_L7	Introduce legislation to prohibit the use of single-use plastics in public events
WP_L9	Amend the Building Regulations to mandate a minimum of 15% recycled materials in buildings
WP_L10	Remove barriers to the export of reconstituted stone products or powdered stone from construction and demolition waste where feasible
WP_D3	Establish an online database of repair and re-use centres for information purposes
WP_EA1	Revisit the national minimum curriculum to promote waste prevention learning
WP_EA2	Organise a series of cooking roadshows and community cooking lessons
WP_EA3	Create a waste reduction reality television series
WP_EA6	Promote existing rental and loan schemes for clothing

Table 14: Waste prevention measures at a glance

5

MODERNISING THE WASTE COLLECTION SYSTEM

We will implement a reform of how waste is collected which transitions towards a regionalised approach to address the lack of economies of scale. In doing so, we aspire to offer a better and differentiated service across all regions that will promote separation at source and help waste management facilities operate more effectively.

5.1. Background

Local councils in the Maltese Islands are empowered by law to have responsibility for the "collection and removal of all refuse from any public or private place" and for "good waste management" initiatives. Consequently, they are a key stakeholder in solid waste management and the achievement of waste-related targets.

Currently, 68 Local Councils across Malta and Gozo engage in contracts with licensed private waste collectors to provide collection services of residual waste and organic waste within their localities, based on a fixed schedule of collection of differentiated waste streams. Various challenges of the current waste collection model have been identified:

1. Reduced economies of scale
2. Fragmentation of responsibilities
3. Poor contract management
4. Restricted capacity to sustain upgrades in vehicles
5. Lack of standards
6. No accountability by local Government
7. Limited human resources at local level hinder fulfilment of role

In order to address the challenges of the current waste collection model, a reform of the collection model towards regionalisation is necessary to build critical mass, which would consequently allow for improved services to the community. This measure stems from a series of discussions and previous preliminary actions taken in preparation of this reform, as illustrated in the timeline below.

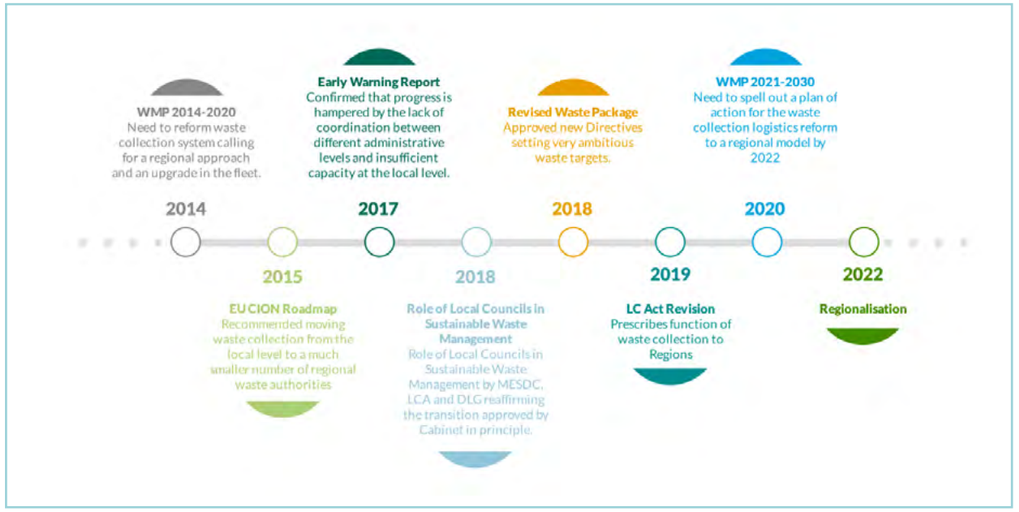


Diagram 10: Timeline of waste collection

5.2. Waste Management Plan 2014-2020

Malta's Waste Management Plan 2014-2020 identified the reforms required to be implemented in the waste collection system; calling for a regional approach and an upgrade in the fleet. In synthesis, the following actions were outlined in the Plan:

a) Upscaling to Euro 4/5 vehicles, increased frequency of fraction collections, increase in the length of contract and the regularising of workers' conditions;

b) Local councils are being encouraged to issue joint tenders for the collection of waste in order to take advantage of widened geographical coverages, thereby enhancing issues related to economies of scale (a regionalised approach);

c) Conducting a time and motion study to determine the realistic cost of waste collection including the realistic financial cost on which allocation will be based and on which tenders will be adjudicated;

d) The development of a mechanism for the introduction of fees from commercial establishments such that Local Councils can obtain revenue for the collection of such waste;

e) Piloting some initiatives in a selected geographical area.

5.2.1. European Commission Roadmap

The Roadmap for Waste Management[73] put forward by the EU Commission for Malta to reach its targets called for Government to **move towards a regionalised approach to waste collection**. A regionalised approach would shift responsibility for waste collection from the local authority level to a much smaller number of geographically wider regional waste authorities. This was in line with the principle and spirit of the Waste Management Plan 2014-2020 with corrective action recommended to be taken with immediate effect. Bearing in mind the number of waste collection contracts in place, each having their own unique termination date running till 2021, the 2018 timeline suggested by the Roadmap was considered to be too early. At this point it was recommended that a phased approach be adopted so that all waste collection is eventually transferred to the regions by 1 January 2022. This meant that, upon expiry of current waste collection contracts, Local Councils could only issue calls for tenders that would terminate by 31 December 2021. Provisions were to be made so that total migration to the regions is completed by 1 January 2022. No new contracts or extensions to existing contracts were made by any local council the effective date of which goes beyond 1 January 2022.

73 https://ec.europa.eu/environment/waste/framework/pdf/facsheets%20and%20roadmaps/Roadma_Malta.pdf

5.2.2. Early Warning Report

The European Commission's Early Warning Report for Malta[74] confirmed that progress is hampered by the lack of coordination between different administrative levels and insufficient capacity at the local level.

This report is based on national implementation reports for EU waste obligations[75].

The assessment[76] conducted by Eunomia, which underpins the early warning report, concluded that Malta still faces serious difficulties in its implementation of EU waste law. These difficulties were found to be predominantly due to lack of infrastructure and collection systems for recyclables and bio-waste. Progress was also found to hampered by the lack of coordination between different administrative levels and insufficient capacity at the local level, and more generally by a lack of incentives, including economic instruments, to prevent waste and improve recycling. Moreover, the Extended Producer Responsibility (EPR) scheme for packaging in Malta, along with its monitoring and enforcement, was found to be ineffective. These recommendations are being taken into consideration throughout this Plan.

A key priority action to support the implementation of EU waste law was to encourage joint working of municipalities, for example, in terms of infrastructure use and/or service procurement. This would address the issue of requiring minimum efficiency of scale to achieve value for money.

5.3. The Role of Local Councils in Sustainable Waste Management

In 2018, the Ministry for the Environment, Climate Change and Planning (formerly Ministry for the Environment, Sustainable Development, and Climate Change), the Local Council Association and the Department for Local Government representing the Ministry for Natural Heritage, Arts and Local Government (formerly Ministry for Justice, Culture and Local Government) reaffirmed the intention to move towards a more regionalised approach to waste collection and management. Together, a framework of action entitled "The Role of Local Councils in Sustainable Waste Management" was drafted and put forward for Cabinet's endorsement.

This document outlined the challenges faced by the current waste collection model and proposed a set of regionalised-based actions, aligning enforcement action to support the transition to this reform. The

74 SWD(2018) 421 COMMISSION STAFF WORKING DOCUMENT The early warning report for Malta https://ec.europa.eu/environment/waste/pdf/early_warning_report_MT.pdf

75 The report is based on information provided in national implementation reports for the 2013- 2015 period on: Directive 2008/98/EC on waste ('Waste Framework Directive'), Directive 2002/96/EC and Directive 2012/19/EU on waste electrical and electronic equipment ('WEEE Directive'), Directive 94/62/EC on packaging and packaging waste ('Packaging Directive'), Directive 1999/31/EC on the landfill of waste ('Landfill Directive'), and Directive 86/278/EEC on sewage sludge ('Sewage Sludge Directive') .

76 Eunomia Research & Consulting et al. (2018) 'Study to identify Member States at risk of non-compliance with the 2020 target of the Waste Framework Directive and to follow up phases 1 and 2 of the compliance promotion exercise. The early warning report: Malta.' https://ec.europa.eu/environment/waste/framework/pdf/Early%20Warning%20System_Final_Report.pdf

proposed policy measures within this Waste Management Plan 2021-2030 are set within this framework of action.

5.4. Revised waste package and new ambitious targets

The new EU Waste Legislative Package includes elements which provide more clarity including streamlined definitions, new requirements to strengthen the implementation of the waste hierarchy as well as new ambitious preparing for reuse, recycling and landfilling targets. The current and new targets are summarised in the table below.

Current target	New targets
■ By 2020, the preparing for re-use and recycling of household waste had to be increased to a minimum of 50% by weight	■ By 2025, the preparing for re-use and the recycling shall be increased to a minimum of 55% by weight ■ By 2030, the preparing for re-use and the recycling shall be increased to a minimum of 60% by weight ■ By 2035, the preparing for re-use and the recycling shall be increased to a minimum of 65% by weight

Targets	2013[77]	2025[78]	2030
Overall recycling	55%	65%	70%
Plastic	22.50%	50%	55%
Wood	15%	25%	30%
Ferrous metal	50% (metals)	70%	80%
Aluminium		50%	60%
Glass	60%	70%	75%
Paper & cardboard	60%	75%	85%

Table 15: Waste package targets

77 Since Malta acceded the European Union in 2004, a specific time-derogation was granted to attain the 2008 targets by 31st December 2013

78 The new targets are coupled with a time-derogation whereby MS may postpone the attainment of one of two material specific targets by five years, under specific conditions and without prejudice to the overall recycling targets.

Given that Malta failed to reach the current recycling and landfill targets, these ambitious new targets necessitate drastic, sustained and long-term action which also calls for an overhaul in the collection system towards achieving a more effective and sustainable waste collection and management model.

5.4.1. Local Council Act revision

In 2019, the Local Councils Act was amended. From the year 2022, waste collection functions will be the responsibility of the Regions. The Local Government Act mandates Regions with the responsibility for waste management (article 37B).

"The functions of Regional Councils shall be the following: (a) the issuance of a call for tenders for the service to local councils within them for waste management and this shall come into effect from the year 2022"

This amendment provides the legislative framework setting the scene for the implementation of regionalised waste reform and is considered to be a successful outcome of the entire suite of reforms required in the sector.

5.4.2. Waste Management Plan 2021-2030

There are several benefits associated with a regional model of waste collection, including:

- Enhanced economies of scale with 5 regions covering the whole of the territory;
- Collection schedules can be designed to better dovetail with capacities of treatment facilities;
- Potentially enables feasibility for the separate collection of an increased number of waste streams;
- Provides for an opportunity to invest and modernise the waste collection fleet;
- Centralises resources for better contract management and reporting; and
- Permits the introduction of standards and facilitates monitoring.

The Regions of Malta and Gozo are illustrated in the image below:

Diagram 11: New waste collection regions

5.5. Malta's Current Collection Approach and Current Plans for Reform and Regionalisation

5.5.1. Overview of Current Kerbside Collection Systems

Household waste in Malta has previously been collected by door-to-door services every day of the week except Sundays. In recent years, Malta has moved away from frequent collection of kerbside residual waste, to an approach where recyclable materials, organic waste and residual waste are collected multiple days each week.

Organic waste collections for households are consistent across all local councils of Malta (including Gozo), taking place each Monday, Wednesday and Friday. However, recyclables and mixed waste collection schedules and frequencies are not consistent, with collection frequency and days varying across localities.

Considering the varying collection days across localities, a total of six waste collection schedules are in operation across Malta and Gozo[79]. This is simplified to three operational collection schedules when considering only the number of collections per week, regardless of which days. This is summarised in Table 16 (noting that seasonal summer collections are provided in a small number of local councils).

79 Schedules listed at: https://www.wasteservmalta.com/homecollection

Code	Number of collections per week			Number of local councils
	Mixed waste	Organic waste	Mixed recyclables	
3-3-1	3	3	1	36
3-3-2*	3*	3	2	23
2-3-1*	2*	3	1	9

Table 16: Overview of waste collection frequency/schedules

**Note: One local council within three residual collections now has an additional Saturday residual collection running July – September (i.e. 3.25-3-2, taken as 3-3-2 for simplicity). Also, all 9 local councils with 2 collections per week now have an additional Saturday collection running June – September (i.e. 2.33-3-1, taken as 2-3-1 for simplicity).*

Household waste collections, except glass, are bag-based, with no solid containers provided or used. Glass has, until now, been set out in cardboard boxes or paper bags which are collected with the bottles. A number of bags for organic waste and recycling are provided to each household each year, typically by collection contractors. Additional organics bags can be purchased from shops or collected from Local Council headquarters. When the organic waste collection service was first implemented, 'starter packs' were distributed to residents; these contained 7 litre aerated food waste caddies for use in the kitchen, packs of compostable caddy liners, and communication materials, including a collection schedule and guidance on what can be placed in the bin.

5.5.2. Waste from small establishments to be collected with household waste

Commercial waste producers are known to utilise the household collection service in order to avoid charges - this is an endemic issue. While the extent of this is issue remains unclear, an analysis of total collected waste by weight over time indicates a strong seasonal pattern to waste generation, where additional waste is entering the household collection system over the summer tourist season; this is aligned with the known boost to commercial activity over tourist season. New measures will be proposed in this Waste Management Plan to incorporate commercial waste from small establishments to be collected in the same round alongside domestic waste to maximise efficiency.

5.5.3. BCRS to uplift a portion of recyclables

The implementation of a beverage container return scheme is at an advanced stage. The Beverage Containers Recycling Regulations came into force on 31 July 2020. The scope of beverages included in the scheme are:

Beverages in scope:

a) water and flavoured water;

b) non-carbonated soft drinks;

c) carbonated soft drinks;

d) ciders, beers and other malt beverages;

e) ready to drink coffee;

f) flavoured alcoholic beverages having an alcoholic content level which does not exceed 5%;

g) dilutables.

Beverage containers must be:

a) made out of:

a. steel, or
b. aluminium, or
c. glass, or
d. polyethylene terephthalate (PET); and

b) bottles or cans; and

c) with a capacity of between 0.1 litres and 3 litres

Provided that cartons, foil pouches, and high-density polyethylene (HDPE), and composite materials are explicitly excluded.

Once operational, the scheme will result in the diversion of beverage containers away from residual waste and packaging collections towards deposit return points. This should result in an improvement in overall recycling levels.

5.5.4. Responsibility of collection at present

Under current arrangements, Malta's 68 local councils organise collection of organics and residual waste, whereas two packaging Producers Responsibility Organisations (PROs) organise the collection of recycling and they compete to provide these services. This is aligned with the Packaging Regulations (S.L.549.43), which stipulated that PROs shall make arrangements with single Local Councils for the door-to-door collection of consumer packaging waste and for the provisions of bring-in-sites, which are to be financed by the PROs. There is currently a significant lack of economies of scale as well as uncertainty regarding the roles of the various stakeholders involved in the collection service.

The interaction between councils and PROs is considered in more detail in the section titled "Interaction between Councils and Extended Producer Responsibility Schemes". Implications of the move to transfer collection responsibilities from local councils to regional councils is also provided in this section.

5.5.5. Recycling performance

Despite significant changes to collection services over recent years, there is still significant opportunity for improvement in the level of engagement and degree of success of household recycling at source.

Data on historic collected tonnages of waste and bring site recycling are summarised in Figure 33.

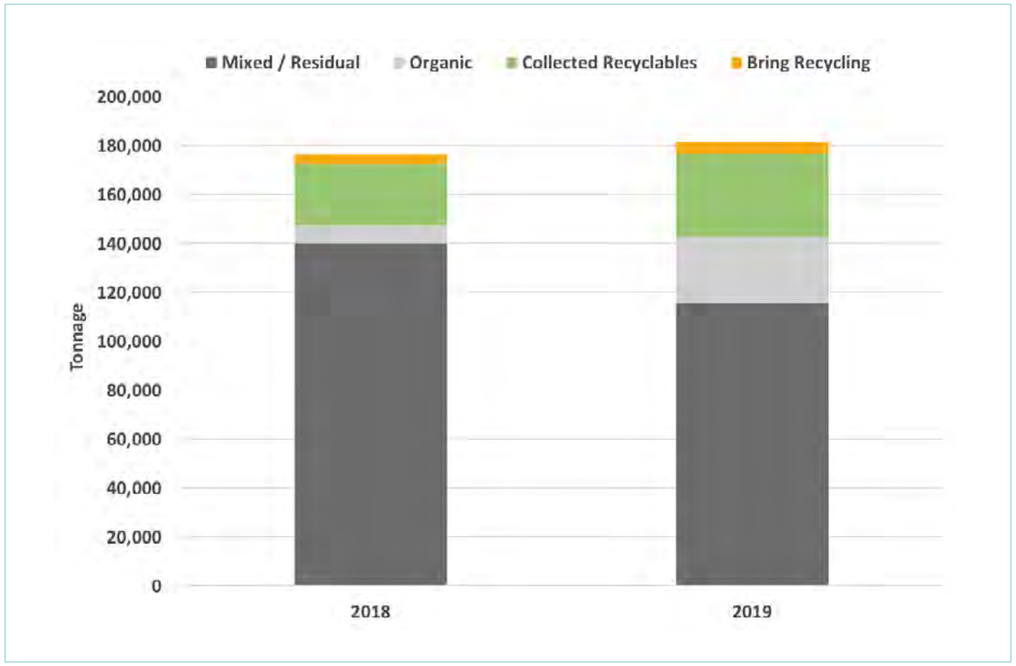


Figure 33: Malta Kerbside Collection and Bring Site Tonnages

Sources: Data for 2019 compiled from Wasteserv statistics for local council residual organic and recyclables collection tonnage [latest website link: https://www.wasteservmalta.com/statistics/waste_collection.aspx], plus estimate of bring site tonnage based on recent trend between 2017 and 2018 in NSO statistics [https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_B3/Environment_Energy_Transport_and_Agriculture_Statistics/Documents/2019/News2019_197.xls].

Total collected waste is shown month by month in Figure 35. The image clearly identifies a seasonal peak in waste generation during summer months, as well as the increased tonnage of organic waste collected once the collection system was rolled out nationally from November 2018. Overall, however, residual waste

remains the dominant collected waste stream.

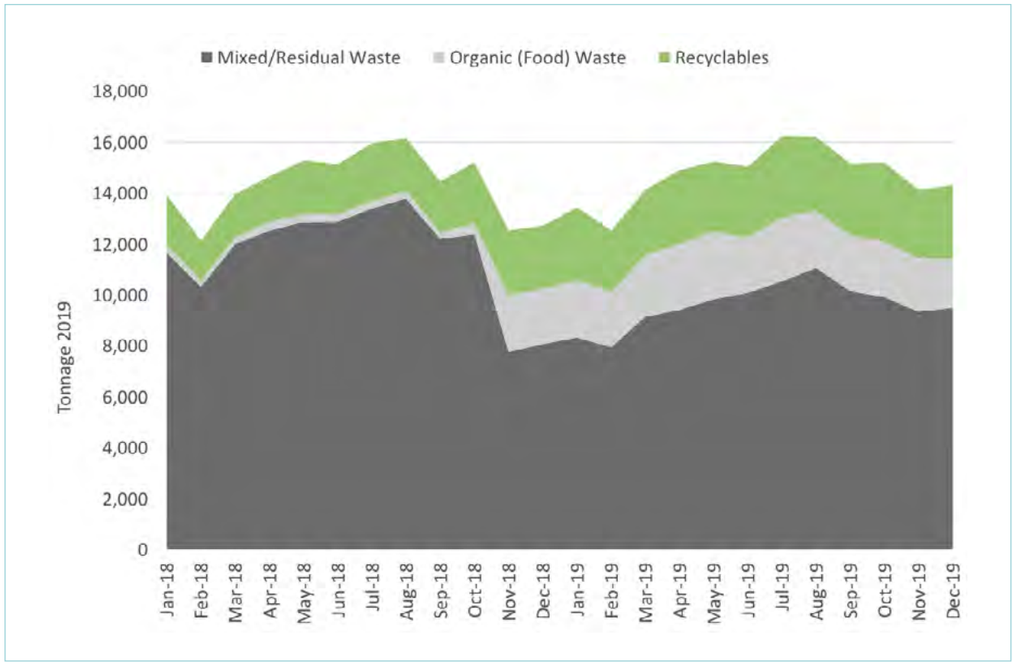


Figure 34: Total Local Council Collected Waste Across Malta/Gozo, 2018 and 2019

Source: Data for compiled from Wasteserv statistics for local council residual organic and recyclables collection tonnage [latest website link: https://www.wasteservmalta.com/statistics/waste_collection.aspx].

In order to attempt to understand which materials are not being effectively 'captured' for recycling (collected for recycling either through kerbside collections or bring-in sites), an analysis of available data provides the recycling capture rate analysis provided in Figure 36. The label of 'Total Captured' in the chart therefore describes the amount of material in that stream which is collected and recycled. The 'Total Not Captured' refers to waste which is collected but not recycled. The percentages on top of each bar represent the proportion of the overall collected material stream which is recycled.

It must be cautioned that the quality of data for household collections is not granular enough, due to the uncertainty of tonnage splits between household and commercial waste. Therefore, the available composition data may not accurately reflect household waste. Nevertheless, the overall picture presented in Figure 36 appears plausible based on what we know of Malta's performance. Performance for 2019 is a marked improvement over 2018 (and prior years), attributable to national roll out of organics collection and a concurrent uplift in collected dry recycling. Our analysis of performance for 2018 indicates the collected percentage was 21%, or just 15% sent for recycling once contamination and losses are accounted

for (compared to 36% and 29% respectively for 2019). If food waste is considered not recycled, then the percentages sent for recycling are lower at 11% for 2018 and 14% for 2019.

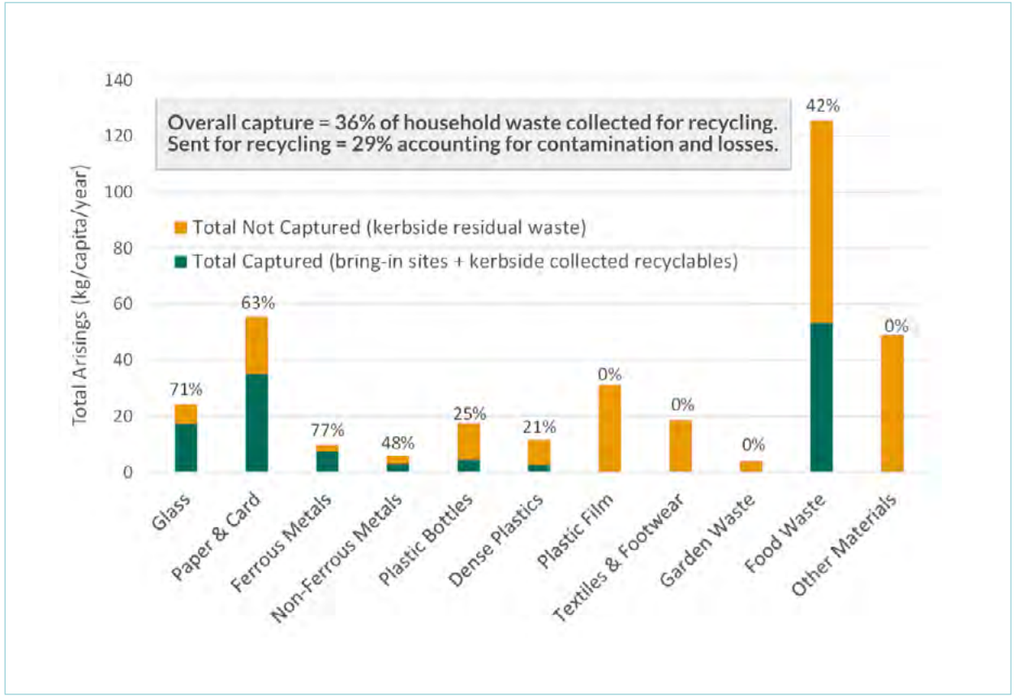


Figure 35: Malta Material Yields and Recycling Capture Rates [as Collected]

Note: Calculated based on compositional analysis undertaken to understand inputs to waste to energy facility. "Fines <10mm" as identified within the composition are assumed to be food. Detail on how this is calculated is provided in Appendix 0.

5.6. Rationale for Regionalisation of Waste Collection

With the population of individual local councils ranging broadly from 200 to 22,000, contracting for and organising waste collection on such a small-scale limits opportunities for optimisation and prevents economies of scale. Furthermore, the number of employees in individual local councils is typically very limited (three to four employees at a maximum) which limits the attention which can be given to waste services.

These issues can be countered through a move to some form of regionalisation of waste collection. This measure has been discussed within the relevant institutions in Malta over several years. In this case, local councils will fulfil their obligations by arranging for the regional waste authority to contract for, and administer, the waste collections.

Regionalisation provides the opportunity to contract for and organise collection at a higher more centralised level, allowing for improvements both in procurement and in day-to-day coordination of collection (and enforcement) services.

Depending on the collection systems to be operated, prescribing a harmonised collection schedule for all properties can introduce significant barriers to efficient collection system design. In organising collections on a larger scale, where the most appropriate (low cost / efficient) collection vehicle differs for different waste streams, or where certain streets are limited to only certain sized vehicles, it becomes necessary to zone neighbourhoods and collect different streams on different days.

On the one hand, it is possible to consider benefit from a harmonised collection schedule across all of Malta as this makes communications simpler and scheduling easier for people to understand. Nonetheless, it should also not be so difficult to communicate with residents in any individual local council, what the precise scheduling arrangements for their waste is, and keep the more national communications to broader points of principle (i.e. organic waste collection no less than a set number of days per week etc.).

Appropriate human and financial resources need to be allocated to each region. It should also be clarified that the contracting authority is to be held accountable for performance against targets, and what financial or other mechanisms should be administered based on performance.

In order to encourage improvements in recycling, several initiatives are being considered including sanctions which may be applied both to households/businesses, and also to regions themselves for not contributing effectively to regional targets. Legislation obliging every person to separate waste into designated fractions is also being considered.

The latest update to the measures from the 2014-2020 National Waste Management Plan, indicates that current collection contracts are being extended so that regionalisation will commence in January 2022.

5.7. Service Standards Selected for Modelling Waste Collection Systems

5.7.1. Description of Service Standards Selected for Modelling

In order to identify the best collection system, alternative scenarios were modelled. In the model selected, Service Standard 1 and 2 both have regionalised municipal areas, however the residual waste policies are different. For Service Standard 1 there is a concept of a restricted residual service, using a set volume of bags per household (e.g. households are allocated a quota of bags depending on their size after which any additional sacks would have to be purchased). In Service Standard 2 the residual policy is under the concept of Pay As You Throw. For both Service Standard 1 and 2, biowaste is as per the current service. There also needs to be a high level of community liaison and enforcement. Finally, commercial (household-like and not heavy industry) waste is included for waste flows in both options, assuming that the current system is in place

but is paid for.

For both service standards, packaging collections are different to the current service in that it is collected in three separate streams rather than two (paper, glass and plastic/metals).

In terms of the packaging collection responsibilities, alternative EPR options are discussed in a qualitative sense in Section 5.12. This section compares and contrasts the advantages and disadvantages of one or more PROs being responsible for the operational aspects of packaging collection. The modelling presented considers and summarises if there is likely to be a cost differential between these two standards.

Each service standard can be operationally put in practice in a number of different ways, depending on how collections are scheduled. The modelling option schedules are described in section 5.8.

	Baseline	Service Standard 1 (Restricted Residual)	Service Standard 2 (PAYT)
Municipal Areas	68 Local Councils	Regionalised: Central (including 13 Local Councils), Southern (14), South Eastern (15), Northern (12), Gozo (14)	
Packaging Collection Responsibilities	GreenPak and Green MT	Municipality Regions*	
Residual Policies (a transition plan over time to the service options presented here will be necessary)	2 to 3 collections per week	**Restricted Residual:** Households provided free of charge with a limited number of sacks per year, e.g. 52 sacks allowing for 1 collection per week. Extra sacks can be purchased at PAYT type rates. Residual vehicles collect from each street twice per week	**Pay-As-You-Throw**, unit-based pricing, i.e. pre-paid sacks. Residual vehicles collect from each street twice per week
Biowaste	3 collections per week	As per current service (3 collections per week)	

Packaging (individual collection streams identified)	Paper /plastic / metals (once or twice per week)	Paper (appropriate frequency to be determined in modelling, as is presented in Section 5.9). Plastic /metals (appropriate frequency to be determined in modelling, as is presented in Section 5.9). Glass (appropriate frequency to be determined). Glass set-out in non-returnable containment. **Note:** The packaging collection frequencies are set to provide sensible collection frequencies for residents, and also so that the space on vehicles is well utilised for an average day of collection (on a single tip basis per collection day)**
Community liaison & enforcement	Not modelled	High level of community liaison and enforcement
Trade / business waste	Some co-collection of trade waste occurs	Assume all currently co-collected trade waste remains but this becomes a paid for service
Deposit scheme	Not yet in effect	Packaging waste flows are adjusted to account for the diversion of containers to the deposit system. Deposit system costs not modelled.
Vehicle type	Mixture of vehicle sizes	To be determined in modelling – most appropriate vehicle types and sizes as appropriate to the service design
Bring-in sites	Present in most local councils	Increased service of 1 set (paper, plastic, glass, metal) per 3,000 inhabitants confirmed

Table 17: Selected Collection Service Standards Selected for Modelling

(*) Alternative EPR options are considered within this paper largely in a qualitative sense. The advantages and disadvantages of one or more PROs being responsible for the operational aspects of collecting packaging are discussed in Section 5.12. We also consider collection limitations and cost implications for EPR contracted collection services in Sections 5.9 and 5.14. This considers the situation of where our work leads to a view of optimised passes including mixtures of packaging and non-packaging on the same pass, then we model a further option which separates packaging as a separate service entirely (allowing for EPR scheme management of packaging collections).

5.7.2. Further Notes on Recommended Service Policies

The proposed "Service Standard 2" considers the following points:

- **Residual waste:** Residual household waste must be set-out for collection in clear see-through bags. This approach could create a social pressure for householders in Malta to properly separate materials for recycling and allows for the introduction of landfill/incineration bans on specific waste streams.
- **Organic waste:** Frequent (3 times per week) collection has already been introduced in Malta. Preliminary data analysis suggests that average captures of food waste (term used interchangeably with 'organic waste' in this document) in Malta are circa 42%. Use of the service will be encouraged by the residual waste policies above, but other initiatives might be considered in addition. It is understood that many apartment buildings do not have space for permanent bins for bulking/storage of food waste, and many streets have narrow pavements that preclude the use of kerbside caddies (typically 35 litre containers). Assuming that bio-waste is only set-out in single use bags would introduce the risk that bio-waste captures may be lower than in similar examples.
- **Engagement and enforcement:** It is assumed that a comprehensive community engagement programme is introduced in Malta alongside a comprehensive enforcement programme introduced with enforcement officers empowered to levy fines on community building management organisations where waste is not effectively separated, unlawfully set out for collection or where recycling and bio waste streams are contaminated.

Service Standard 1 may result in similar recycling performance to Service Standard 2.

5.8. Collection Schedule Options

A total of four collection schedule options are modelled for each of the two Service Standards, as summarised in Table 18.

Baseline Modelling		Service Standard 1				Service Standard 2			
Baseline	Future baseline	Schedule A	Schedule B	Schedule C	Schedule D	Schedule A	Schedule B	Schedule C	Schedule D

Table 18: Summary of Modelled Options

The individual schedules are described in the subsections below. These schedules describe the work the collection vehicles undertake each day. Notes on how these vehicle collection schedules impact on when individual households get their collections are provided in footnotes to the tables below.

5.8.1. Schedule A

Schedule A is visualised in Table 19.

Morning collections*	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
RCVs	Organic waste	Mixed waste	Organic waste	N/A	Organic waste	Mixed waste	N/A
Split-back RCVs	Region 5: Fibres & Containers	N/A	Region 1: Fibres / Containers	Region 2: Fibres & Containers	Region 4: Fibres & Containers	N/A	N/A

Evening collections*	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
RCVs	Organic waste	Mixed waste	Organic waste	N/A	Organic waste	Mixed waste	N/A
Split-back RCVs	Region 5: Fibres & Containers	N/A	Region 1: Fibres / Containers	Region 3: Fibres & Containers	Region 4: Fibres & Containers	N/A	N/A

Table 19: Visualisation of Schedule A - National contract for recyclables

Note: Glass is also collected at reduced frequency on certain days of the month, for instance during 11am-3pm.

**Approximately half of households in each region are collected in the morning, and half in the evening shift each day. The exception to this is recycling collections for regions 2 and 3 on Thursdays – where the entirety of region 2 is collected in the morning and the entirety of region 3 in the evening.*

This schedule applies the following principles to collection scheduling and vehicle selection:

- Certain areas in each region receive morning collections, other areas receive evening collections.
- Whether morning or evening, the organic and residual (mixed) waste collections are on set days of the week for every household:
  - Organic and mixed waste are collected as separate streams in single compartment RCVs. For each region, the same vehicle which collects organic waste on a Monday, then collects mixed waste on a Tuesday (and so on).
- The recycling collection is undertaken by a different fleet of vehicles which moves between regions and is therefore on a different day of the week for each of the five regions (Central, Southern, South Eastern, Northern and Gozo). Further detail on recycling collections is listed here:
  - Fibres (stream 1) and containers (stream 2, i.e. plastics+metals) are collected both at the same time into separate compartments in split-back RCVs;
  - Since there are five regions and only four possible recycling days (excluding Sundays and the mixed waste collection days), two regions will be collected on the same day – i.e. one in the morning and one in the evening.
  - The total number of packaging collection vehicles required is determined by the region (or paired regions 2 and 3) with the greatest resource demand for that vehicle size (highest numbers of households or most challenging streets etc.). Where a lower number of vehicles are required to complete the collection work in other regions, this will result in underutilisation of the full collection fleet on certain days of the week.
  - Under this schedule, it may be preferable for Gozo's recycling to be collected on Monday, so that the surrounding days are available for shipping the recycling collection fleet to and from the island. Ferry shipping costs (per lorry per trip) apply.
  - Each household will need to put out on to the street one week's worth of fibres and containers sacks at once, meaning larger volumes of material on pavements on recycling collection day, and larger storage requirements in households (since recycling is not collected on multiple days).
  - For the purposes of modelling, we assume a single location for where the recycling fleet operates from. We assume a central location on the island of Malta, with travel times to more peripheral regions needing to be taken into account.
  - Although not shown in the simplified visualisation, glass collection is also undertaken. We model that this is done using the same collection fleet as recycling, as an extra shift on certain days of the month, for instance during 11am-3pm.
- For schedule A, a total of 156 vehicles would be required: 85 RCVs for mixed waste and organic waste, and 71 split back RCVs for dry recycling.

5.8.2. Schedule B

Avoiding some of the issues of a roaming national recycling fleet, as in the previous schedule, an alternative is to use just one fleet of vehicles within each regional level, and for recycling to always be collected on Thursdays. This schedule is visualised in Table 20.

All households (am and pm)*	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Split-back RCVs	Organic waste	Mixed waste	Organic waste	Containers Fibres	Organic waste	Mixed waste	N/A

Table 20: Visualisation of Schedule B - Nationally harmonised schedule

Note: Glass is also collected at reduced frequency on certain days of the month, either as an additional shift (11am-3pm) or alongside organic collection by collecting glass into one compartment of the split back RCV and organic waste into the other.

**Approximately half of households are collected in the morning, and half in the evening shift each day.*

The main advantages of this schedule are:

- No fragmented responsibility. Each region is entirely responsible for all collected waste. One unified collection contract is let per region.
- Simplifies communication to residents.
- This schedule provides fully harmonised collection days across the country. According to Malta's experience so far, harmonisation of collection days looks to be more conducive to participation.

The following disadvantage still applies:

- Each household will need to put out on to the street one week's worth of fibres and containers sacks at once (on Thursdays), meaning large volumes of material on pavements on recycling collection day, and larger storage requirements in households (since recycling is not collected on multiple days).

This alternative schedule can be operated one of two ways:

- One solution (not modelled) would be to use the same RCVs collecting mixed and organic waste to visit each street twice on Thursdays – collecting containers on the first visit, and then returning to collect fibres.
  - The drawback is that this may cause issues with fibre sacks remaining in the street until collected on the second shift.

- Alternatively (as has been modelled), split-back RCVs could be used. These vehicles would collect organic waste into both compartments on Mondays, residual waste into both compartments on Tuesdays etc., and then collect fibres in one compartment and containers in the other compartment on Thursdays.
  - This means all bags are collected from each street in a single visit.
  - There is a slight disadvantage with reduced efficiency of using a split-back vehicle to collect the same waste stream for organics and mixed on the majority of collection days (slightly higher cost per vehicle, and a bit more surface area inside the vehicles has to be cleaned each day).
- For schedule B, 120 RCVs would be required to service mixed waste, organic waste and dry recycling collections.

5.8.3. Schedule C

A further option where split back vehicles are used in all cases, but the recycling streams are collected on different days from each other. This schedule is visualised in Table 21.

All households (am and pm)*	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Split-back RCVs	Organic waste Containers	Mixed waste	Organic waste Fibres	Containers	Organic waste Fibres	Mixed waste	N/A

Table 21: Visualisation of Schedule C – Split-back every day for recycling and organic

Note: Glass is also collected at reduced frequency on certain days of the month, see below.
**Approximately half of households are collected in the morning, and half in the evening shift each day.*

Notable advantages under this schedule are as follows:

- This schedule provides an increased number of recycling collections, which may be popular.
- Also, it provides flexibility that one of the 'fibres' days could be dedicated to glass collection, and therefore this could be a fully integrated service each week.
- Again, this schedule provides fully harmonised collection days across the country.
- For schedule C, a total of 93 split back RCVs are required to collect mixed waste and organics, or dry recycling and organics.

5.8.4. Schedule D

An additional collection schedule was considered which dispensed with harmonised collection days to allow food waste to be collected by small specialist vehicles each collection day (i.e. collecting food from half of one region on Mondays, Wednesdays and Fridays, and the other half on Tuesdays, Thursdays and Saturdays). The main advantages of this approach are that vehicles can be sized appropriately for the collection streams (including small tipper vehicles dedicated to the collection of organic waste) and appropriate numbers of vehicles can be purchased for each material stream depending on the collection requirements. These benefits can lead to significant cost savings. It is proposed that split-back RCVs (collection vehicles with two compartments that are loaded from the rear) are used to collect refuse one side and recycling on the other (alternating on different collection days between the two streams), and a separate food waste fleet.

Schedules appropriate to the vehicle selection above were designed in order to allow the best efficiency. This schedule is merely an indication of how these systems could work for the purposes of modelling, as contractors would design the schedule as part of the usual contract process.

Morning collections*	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Split-back RCVs	Mixed waste	Mixed waste	Mixed waste	Mixed waste	Mixed waste	Mixed waste	N/A
	Containers	Fibres	Containers	Fibres	Containers	Fibres	N/A
Small tipper vehicles	Organic waste	Organic waste	Organic waste	Organic waste	Organic waste	Organic waste	N/A

Evening collections*	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Split-back RCVs	Mixed waste	Mixed waste	Mixed waste	Mixed waste	Mixed waste	Mixed waste	N/A
	Containers	Fibres	Containers	Fibres	Containers	Fibres	N/A
Small tipper vehicles	Organic waste	Organic waste	Organic waste	Organic waste	Organic waste	Organic waste	N/A

Table 22: Visualisation of Vehicle Schedule D

Note: Glass is also collected at reduced frequency on certain days of the month.

**Approximately one sixth of households in each region receive a Monday morning collection of residual waste and container recycling. The subsequent sixths receive this collection on Monday evening, Wednesday morning, Wednesday evening, Friday morning, and Friday evening. The same cycle applies but for residual and fibre recycling on the other days of the week, ensuring that residual collection days for each specific household are staggered (i.e. a Monday morning collection will be paired with a Thursday morning collection).*

The schedule for each household for organic waste collection is similar, but each region is broken into 4 rather than 6 (since each household receives 3 organics collections per week, not two). Approximately one quarter of households in each region receive a Monday morning collection of organics. The subsequent quarters receive this collection on Monday evening, Tuesday morning, and Tuesday evening. This cycle then repeats for Wednesday/Thursday, and then again for Friday/Saturday.

A worked example of how Schedule D would work in practice is as follows:

- Mixed/residual and recycling: Residual and recycling is collected on 6 days each on both shifts, and because the vehicle has two compartments, the vehicle can collect refuse and recycling at the same time. Each property receives 2x visits per week (2x residual, 1 x fibres and 1x containers). Collections are spaced out so that a property receives the first recycling collection either Monday, Tuesday or Wednesday, and the second on either Thursday, Friday or Saturday (further detail is provided in the footnote to the figure above).
- Organics: Collected on 6 days each week on both shifts. Collections would be made Monday, Wednesday and Friday to half the properties and Tuesday, Thursday and Saturday to the other half.
- For schedule D, 81 vehicles are required: 47 split back RCVs for the collection of mixed waste and dry recycling, and 34 designated food waste vehicles.

5.8.5. Further Comparative Notes on Collection Schedule Options

The number of collections per week provided to each household under each of the vehicle collection schedules is provided in Table 23.

Collections per Week	Mixed/Residual	Organics	Recycling*	Total
Baseline (July 2019)	3	3	1.4	7.4
Schedule A	2	3	2	7
Schedule B	2	3	2	7
Schedule C	2	3	4	9
Schedule D	2	3	2	7
Notes	*Two recycling collections in schedules A-D = 1x collection for paper and card and 1x for plastics and cans, although these could be collected at the same time if using a vehicle with two compartments.			

Table 23: Collections per week

Each of these four vehicle collection schedules was modelled to examine the potential cost implications of implementation and the results can be seen in Section 5.10.

5.9. Modelling Results

5.9.1. Service Standard Modelling: Recycling Performance Results

The analysis indicates that:

- Malta is currently achieving a baseline collection rate (through kerbside and bring banks) of 36%, or 24% after sorting and contamination losses.
- With the introduction of a DRS, a high proportion of glass bottles, drinking cans and plastic drinks bottles are likely to divert to the DRS. Based on the assumed captures, the recycling rate increases to 38% (26.4% after losses).
- The recycling rate increases to 62% (56% after losses) in Service Standard 1 and 2. If the 3,925 business included in the modelling also switch to Service Standard 1 or 2, the recycling rate would increase to 39% (35% after losses). (Note process losses are modelled lower than the baseline in the Service Standard options, as materials are delivered in two streams rather than mixed).

The increase in capture in Service Standard 1 is driven through limiting the mixed/residual waste capacity, and through the introduction of a PAYT mixed waste system in Service Standard 2. The difference is that residents receive one sack per week free of charge in Service Standard 1 before having to purchase sacks.

Although the Service Standard options use different mechanisms to reduce residual waste, we anticipate that both Service Standards will have the same impact in terms of performance.

Material Stream	Baseline Capture Rate	2030 Packaging Target [80]	Capture Excluding Materials Diverted to DRS		Capture Including Materials Diverted to DRS	
			Post DRS	Option 1 and 2	Post DRS	Option 1 and 2
Glass	67%	75%	55%	82%	87%	95%
Paper & Card	62%	85%	62%	85%	62%	85%
Ferrous Metals	84%	60%	83%	85%	85%	86%
Non-Ferrous Metals*	55%	80%	31%	60%	64%	79%
Plastic Bottles*	29%	55%	22%	49%	40%	60%
Dense Plastics	24%		24%	58%	24%	58%
Plastic Film	0%		0%	39%	0%	39%
Textiles	0%	-	0%	19%	0%	19%
Garden Waste	0%	-	0%	0%	0%	0%
Food Waste	42%	-	42%	79%	42%	79%
Kerbside & Bring Recycling Rate, including food & DRS	36%	-	34%	57%	38%	62%
Less Contamination and Process Loss	25%	-	23%	55%	26%	56%

Table 24: Kerbside Capture Rates Used in Modelling and 2030 Capture Rate Targets

**Notes: The post DRS capture goes down because deposit-bearing containers are collected through the DRS from both the residual and recycling streams. Overall captures are higher when DRS materials are taken into account.*

The model yields and captures under Service Standard 1 and 2 are shown in graphical form in figures below. A comparison of captures across the baseline, post-DRS situation (i.e. after implementation of a deposit return scheme) and the Service Standard options. The label of 'Total Captured' describes the amount of material in that stream which is collected and recycled. The 'Total Not Captured' refers to waste which is collected but not recycled.

80 Note the packaging targets will also be met by recycling of other post- consumer waste streams

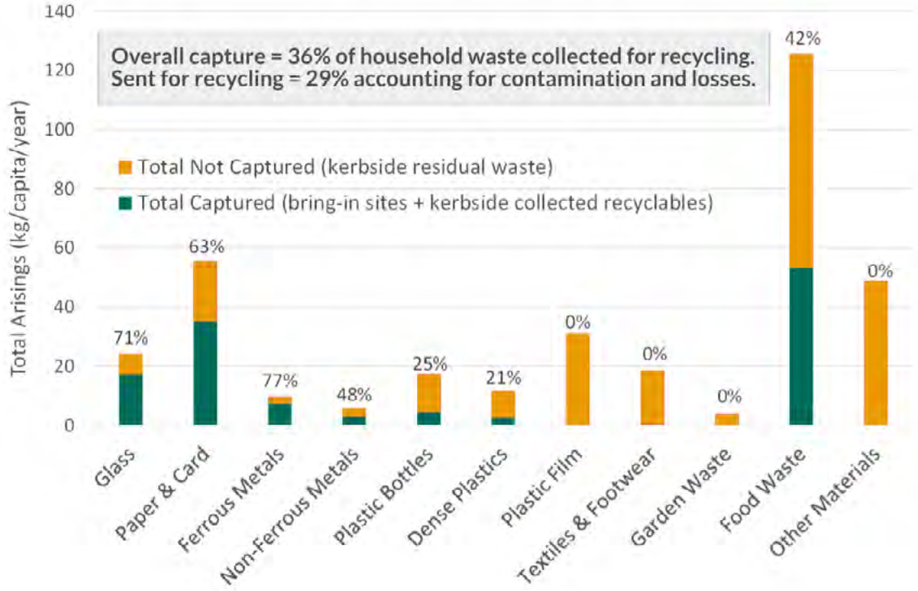


Figure 36: Malta Material Yields and Recycling Capture Rates under Service Standard 1 & 2 [as Collected]

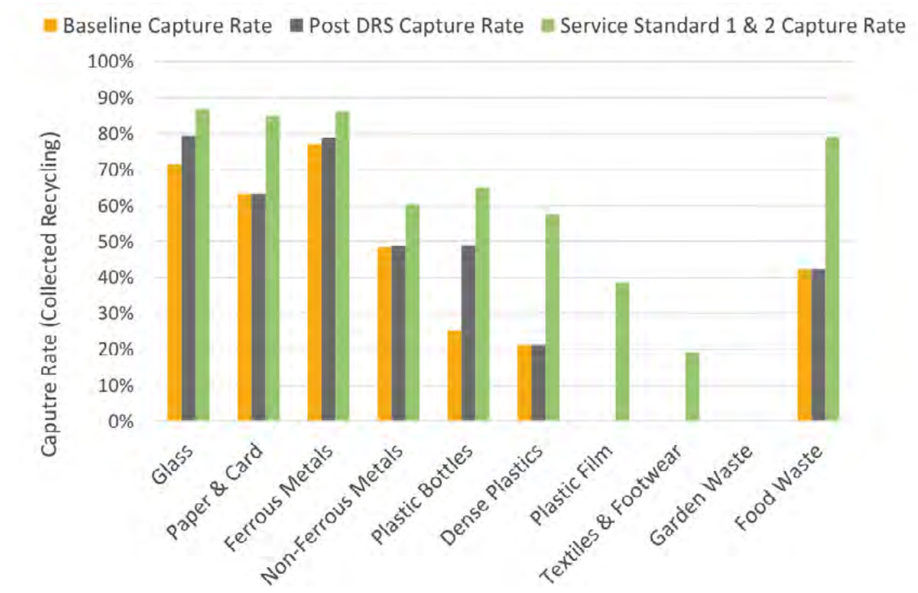


Figure 37: Malta Capture Rates Comparison across the Modelled Options

5.10. Service Standard and Schedule Options Modelling: Cost Results

5.10.1. Collection Cost Results

The cost implications for implementing collection schedules options A-D are shown in the chart below. The costs are presented as marginal costs relative to the current service (the 'baseline') to show whether Scenarios are more or less expensive than the current operations. This approach provides a reasonable way of comparing options in a given year, although the actual budget will differ.

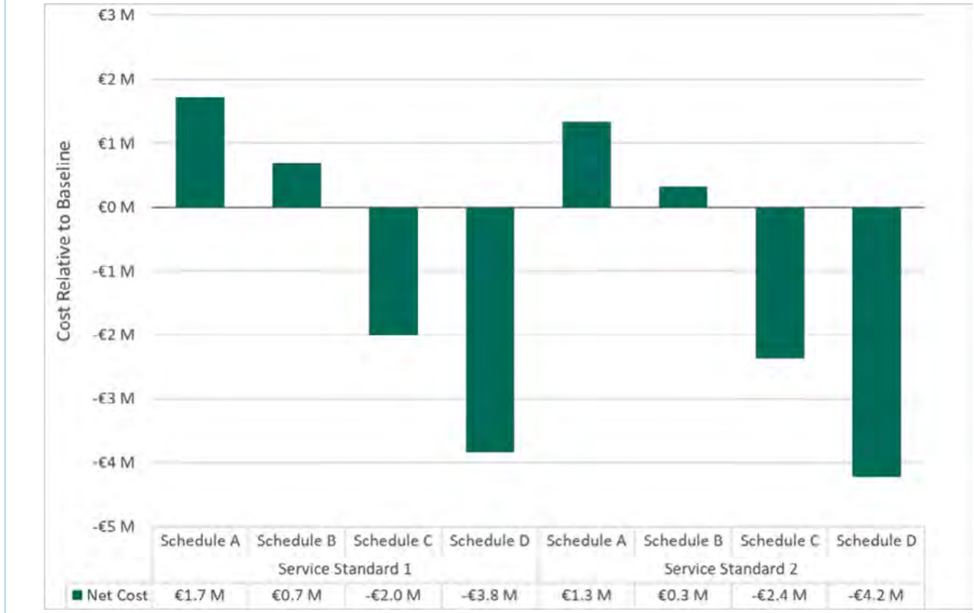


Figure 38: Collection Option Costs Relative to the Baseline (Costs in Millions)

The cost results show:

- There is a slight cost difference of c.€380k between Service Standards. This is because Service Standard 1 includes the purchase of sacks for residual waste, which means the costs or savings are slightly reduced compared to Option 2.
- Operating Schedules A and B would incur additional costs, whereas Schedules C and D are likely to deliver savings. The cost difference is due to Schedule C requiring fewer vehicles and staff, and Schedule D requiring fewer, less expensive vehicles. Vehicle costs in particular affect Schedules A-C because the shift to a fleet of larger vehicles increases the average cost per vehicle from €29k to €40k. In Schedule C, the reduction in the number of vehicles and staff costs are high enough that the savings exceed these

additional costs, whereas Schedule D uses a separate fleet of small specialised food waste collection vehicles that only slightly increase average vehicle costs.

- Only Schedule A could be operated fully coordinated and financed by the EPR scheme. In Schedules B and C organic waste and recycling are collected on the same vehicle, and in Schedule D the same vehicles are used to collect mixed waste and recycling. From the schedules considered here, savings were only achieved when all collections were contracted by the regional councils, i.e. in Schedules C and D.
- The annual marginal cost of operating Schedule A is far higher than any other Schedule. By operating a national recycling fleet separately from the regional fleet, the number of collection vehicles required is determined by the region (or paired regions 2 and 3) with the greatest resource demand. For comparison, Schedules A and B are very similar, but the requirement of a separate fleet and the additional travel times to regions from a central location in Schedule A, means 37 additional vehicles are required compared with Schedule B.

5.11. Alternative Fuel and Vehicle Technology

5.11.1. Electric Vehicles

Malta's collection fleet should consist of 10% electric vehicles and increase to 20% by 2025. This is to ensure that Malta achieves its national targets of 10% of energy consumption arising from renewable sources[81], the 10% procurement target for the share of clean heavy-duty vehicles[82], and the national target of 20% of the national vehicle fleet to be composed of non-conventionally fueled as set out in the Malta Transport Master Plan[83]. Electric vehicles are the main option considered as CNG, LNG and hydrogen technologies are not likely due to the infrastructure required for these alternatives[84].

A cost-benefit analysis in the UK showed that the costs of an electric refuse collection vehicle or 'eRCV' are comparable with a diesel RCV over an 8-year period[85]. Switching to eRCVs means higher initial capital costs but lower running costs. The findings of the study showed that capital purchase costs per vehicle (including infrastructure and vehicle costs) were 123% (€222,400) higher for electric than diesel options but saved 42% in operational costs (including fuel prices, maintenance, road tax).

81 Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (Text with EEA relevance) https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32009L0028

82 Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles https://eur-lex.europa.eu/eli/dir/2019/1161/oj

83 (2018) NATIONAL POLICY FRAMEWORK ALTERNATIVE FUELS INFRASTRUCTURE FOR TRANSPORT IN MALTA 2018-2030, 2018, https://mtip.gov.mt/en/Documents/NPF%20Malta.pdf

84 (2018) NATIONAL POLICY FRAMEWORK ALTERNATIVE FUELS INFRASTRUCTURE FOR TRANSPORT IN MALTA 2018-2030, 2018, https://mtip.gov.mt/en/Documents/NPF%20Malta.pdf

85 Tomes, T., and Williams, L. (2020) Ditching Diesel - A Cost-Benefit Analysis of Electric Refuse Collection Vehicles

The relative difference in price between diesel and electricity in Malta is comparable with the UK values used in the analysis (£1.20/l diesel and £0.14/kWh electric versus €1.22/l diesel and €0.13/kWh electric). However, the study results were based on average round distance of 97km a day in the UK, whereas in Malta it is only ~60km (although this will increase with a smaller fleet). This difference means that to gain the 'breakeven' point in order to recoup the higher capital costs (around 8 years for the UK study), vehicles would need to be operated over a longer period in Malta.

Given that one of the main costs of an electric fleet is the investment in infrastructure, it may be worth considering the conversion of the whole fleet rather than just the required 10%.

5.11.2. Technology

The cost of vehicle tracking is relatively low and can be achieved through an integrated device or using removable in-cab devices. Integrated devices can be purchased for as little as €100. The purchase and installation costs are around €300-€1000 for demountable devices, depending on the model. It will also be necessary to purchase a software package or pay for online access to be able to monitor devices and use the data. There are a number of off-the-shelf packages that can be purchased depending on the requirements of the tracking, e.g. whether it's simply for evidence if an accident occurs, management purposes or driving behaviour improvement; but these costs are likely to be on-going.

On-board weighing systems are fitted to vehicles either to assist with weight-based charging or to more accurately measure commercial waste co-collected with household waste. It can cost from around €1,000 up to €2,500 per vehicle.

The estimation of commercial weights is still practiced throughout Europe, so this isn't essential for every vehicle but could be considered for few in the fleet, which would allow bin weights to be checked when needed or the estimation method to be verified from time-to-time.

As of 2017, about one third of UK councils have cameras installed on vehicles. These offer real-time monitoring but are most effective in the event of an accident or as a tool to support the improvement of road safety. Packages range from around €300-€700 per vehicle. As with trackers, there is likely to be on-going costs to use accompanying software or for accessing imagery.

5.11.3. Bring-in Sites

Modelling has not been undertaken for the intended increased number of bring-in sites in future. Data is not available on the number of bring-in sites currently in place, nor the scale of increase needed to increase services to one set (paper, plastic, glass, metal) per 3,000 inhabitants. However, with a much lower number of bring-in sites compared to the number of properties, and also with bring sites being serviced at relatively low frequency compared to door-to-door collections, the scale of costs is considered to be much less significant than those for door-to-door collections.

5.12. Interaction between Councils and Extended Producer Responsibility Schemes

5.12.1. Current Approach in Malta

There are currently two packaging PROs operating in Malta. Packaging waste is mainly collected through the collection services provided for by the two PROs, i.e. door-to-door collection of recyclable waste, bring-in sites and direct collection from certain commercial and industrial entities. Recalling that the shift towards regionalisation was underpinned by the necessity to achieve greater economies of scale, the issue of whether to segregate the collection of recyclables within the regional councils' responsibilities as opposed to retaining the status quo was evaluated. A summary of the respective considerations is available in the table below 'Regional Council Collection vs PRO Collections.'

5.12.2. Options for Reform

Collection Responsibilities

The collection responsibilities for packaging within an EPR scheme can lie with either the regional councils or the PROs. One possibility would be to follow the German system and undertake a 'dual system', where one or more PRO(s) become responsible for providing the packaging waste collection and sorting services, as is the case today. The other option would be for regional councils to collect packaging waste, funded by the PRO(s).

	Regional Council Collections	PRO Collections Status Quo
Producer Fees	Regional councils will likely need to demonstrate that the costs they incur are 'no more than necessary': this is likely to require that they ensure procurement is genuinely competitive, that the service is benchmarked, or 'market-tested', periodically. Risk mitigation examples are available in similar systems whereby a representative of the PRO is entitled to observe the tender Board procedures for collection contracts. In practice, this might be more difficult in a situation where there are multiple PROs. The approach to covering "necessary costs" could be through assessment of outcomes of procurement, or through a formula-based approach. Note that producers would need to be given confidence that the services being put in place by regional councils were capable of delivering the required level of performance.	Where there is more than one PRO, a mechanism for 'apportioning' the overall costs of collection to each PRO will be established. In some systems (e.g. Germany, Austria), this can lead to short-duration contracts for collection (which might be expected to increase costs). There are some benefits to this system where regional councils simply do not want to provide packaging waste collection services. However, regional councils will need to provide other (separate) collection services anyway, and indeed, the existing law requires them to do so. Although producers may prefer a system where they feel more in control of the costs they need to cover, in practice, running a recycling service separately from organics and residual means the costs they incur might be higher under this system (and introduce a layer of administration – in terms of procuring separate contracts – which seems unhelpful).

Efficiencies	The integration of collection responsibilities for residual waste, bio-waste and packaging streams can allow for more efficient design and operation of collection systems, as well as ensuring the design of the service delivers high performance. In the current situation, national performance targets for recycling of municipal waste will need to be met so that there might be merit in cascading these targets down to the regional councils. This should make it more likely that packaging targets are met at the same time.	As noted above, in many cases, there might be separate providers of collection services for packaging, and collection services for other waste streams. This has the potential to lead to coordination problems. The same contractor would be responsible for service delivery only by chance rather than by design. In general, all the packaging collections are likely to be operated separately from the rest of the municipal waste collection services, and so duplication of resources and overheads is more likely. If there were to be a strict separation of some materials (such as packaging / no-packaging papers, or plastics), this would result in a doubling of containers and collection passes.

Ability to meet Targets	In the future, country-level targets may be cascaded down to local or regional councils, and so enhancing the recycling of all wastes, including packaging, will be important for regional councils in order to meet the targets for recycling of municipal waste. Furthermore, central Government, regional councils and other official actors (ERA etc.) can employ a wider range of policies and incentives, as well as regulatory activities and information campaigns, to drive up recycling rates of all wastes, including packaging, than PROs would be able to (e.g. landfill/ incineration taxes, pay as you throw systems, communications regarding how to use the recycling service, etc.).	At low packaging recycling rates, PROs may be able to manage targets reasonably well through a dual scheme system. However, at higher targets, simple provision of containment and collection opportunities is unlikely to achieve higher recycling targets without regional councils being incentivised to increase packaging recycling. To meet the future packaging recycling rate European targets, there may be a need to be sorting and extracting recyclables from mixed waste. PROs would only be able to achieve an efficient outcome with the cooperation of regional councils and/or their contractors.

Table 25: Regional Council Collection vs PRO Collections

5.12.3. Collection Responsibility Conclusions

In terms of meeting future European recycling targets, it appears that responsibility lying with the regional councils is preferable. However, this would mean changing the current system where PROs undertake the collection responsibility. The laws would need to be amended so it is clear that the Regional Councils would be mandated to provide the collections and so that minimum services standards are defined in order that it would give sufficient confidence to producers that collections would be sufficient that packaging recycling rates would be met. Producers would need to meet the costs of regional councils providing the collections (and sorting the materials). A system would need to be designed that gave producers the confidence that the financial costs they are responsible for would be no more than are necessary to deliver the service (i.e. the costs represent those which would be expected under an efficiently delivered service).

This would imply a proportional apportionment of costs amongst producers and their representative PRO based on their market placement, which stems from a system whereby costs are averaged over the entire collection regime rather than retaining the allocation of specific regional costs to a particular PRO. Of interest is the fact that an aggregated approach would, for example, apportion the costs related to the Gozo region, on a pro rata basis, as on a like with like basis it has higher transportation cost as a result of additional costs of the ferry crossing.

5.13. Implications for EPR Schemes where Regions take Responsibility for Collection

5.13.1. Single vs Multiple PROs

Currently, Malta has two operating packaging PROs. Some Member States – notably, Germany and Austria – have moved from a situation where there was previously a single PRO to a situation where there is a 'market for compliance', and more than one PRO exists. There are no examples (yet) of the reverse happening, though the UK is considering such a switch. Many Member States have a single PRO per waste stream including Italy, Belgium, France and Spain.

There have been arguments which supports the view that competition, with multiple PROs, leads to lower costs, and hence, reduced producer fees. However, fees in Austria and Germany decreased when switching from a single to a multiple PRO system yet remain among the costliest of schemes anywhere in Europe. Further, reductions in cost may have been influenced by other factors, and therefore cannot be pinpointed to the introduction of competition.

Moreover, competing PROs often compete to obtain evidence of compliance at the lowest costs, which may result in the exploitation of loop-holes and 'creative accounting'. The situation may also make it more difficult to ensure the absence of free-riders: estimates of free-riding in Germany's packaging scheme today vary from around 30-40% of the market. This is an important issue, as essentially multiple PROs are trying to compete in terms of the lowest price for service NOT compete for the best recycling rates.

Multiple PROs have to compete for producers, and therefore there is always some uncertainty on how many producers or how many tonnes of packaging material an individual PRO will need to manage – this makes longer-term investment decisions in infrastructure more complex. This is an extremely important consideration: the system for recycling plastics is likely to require significant change over the coming years. In situations where any given scheme is unclear as to how much material it has control over, it would be extremely difficult to enter into a contractual agreement for the long-term with a given quantity of feedstock for the recycling process. Single PRO systems, however, have greater potential to ensure investment because they have greater certainty of controlling a given quantity of material, and are assured (subject to their licence not being revoked) of controlling that material over a reasonable duration. This enables them to enter into longer-term agreements to supply feedstock. As a result of this, the risk is reduced, leading to a lower cost of financing, and the time over which any investment needs to be recouped can be extended. This makes investments viable where they would not have been under contracts of short-term duration. A situation where a single scheme controls feedstock is, therefore, more able to support these investments.

In the long term, it appears that the argument for multiple PROs is weakening. This is not to say that competition should not be present (and encouraged) in delivering collection / sorting / recycling services; indeed, a central scheme would be expected to make use of competition and its market position to secure competitive prices for quality outcomes. However, the rationale for competition in a bid to demonstrate compliance with a national level recycling target appears to be weakening.

5.13.2. Single vs Multiple Packaging EPR Scheme Conclusions

Retaining competition among PROs risks making it more difficult to bring forward the quality and scale of investment that will be required in order for Malta to meet its recycling targets in future. This is especially true in relation to plastics. This is not to say that arrangements could not be made to make it possible to retain competition, but also to deliver nationally relevant infrastructure.

Whatever the decision made, further to in-depth assessments, one should consider carefully the desirability of maintaining competition in the compliance market when the key objective is to ensure compliance with a required level of performance. As the rules regarding what EPR schemes must do become more prescriptive (what costs need to be covered, what targets need to be met, how fees should be modulated, etc.), so the rationale for competition weakens since it is no longer clear what the basis is for the competition to occur. Equally, what remains important is that costs of service provision are kept at efficient levels by ensuring that competition exists for the provision of waste management services themselves. It is not in the arena of 'demonstrating compliance' where a market will deliver value but in the arena of service delivery.

Finally, if the decision is made to move towards a single scheme – which UK experience suggests would be favoured by many larger producers and retailers (precisely because the alternative has failed to call forward investment) – it stands to reason that a longer rather than a shorter transition is likely to be less painful and traumatic. It follows that the earlier this decision is made, then the more time there will be for a smooth transition to be planned.

5.14. Conclusions

5.14.1. Summary of Findings on Collection Systems

Summary of Service Standards

This document considered two Service Standards, using different mechanisms to reduce the residual waste capacity for residents but are anticipated to have similar impact in terms of recycling performance. The results show that these Service Standards would both increase the kerbside and bring-site recycling rate from 36% to 62% (or from 25% to 56% when losses are accounted for) once fully implemented.

Malta may decide to initially switch only commercial properties to a restricted residual or PAYT system before rolling out fully to residents. In this instance, the recycling rate was predicted to increase to 39% for the 3,386 businesses included in the modelling. This would result in an overall 27% kerbside and bring recycling rate based on the current service (mixed recycling), based on 2018 data and accounting for process losses.

In comparing the costs of Service Standards, there was only a slight cost difference of ~€380k for the purchase of 2 rolls of 26 mixed/residual sacks per household required for Standard 1. The difference in cost for delivering either Service Standard will depend on:

- Changes in material treatment costs resulting from less residual waste and more recycling and food waste; and
- The costs of vehicles, fuel and staff, which will be defined by the scheduling and vehicle selection, which will ultimately be designed by Contractors.

5.14.2. Summary of Collection Schedule Cost Modelling

The cost modelling undertaken considered four alternative vehicle and schedule combinations (Schedules A-D). All schedules provided residents with 2x mixed waste and 3x organic waste collections per week. The differences are summarised in the table below.

	Schedule A	Schedule B	Schedule C	Schedule D
Recycling collections per week	2	2	4	2
Total collections	7	7	9	7
Service requirement 1: Set mixed and organic days in each region?	Yes	Yes	Yes	No
Service requirement 2: Mixed waste collected on a different day to organic waste and recycling?	Yes	Yes	Yes	No
Set recycling days for each region?	No	Yes	Yes	No
Shared fleet?	No	Yes	Yes	Yes
Mixed waste vehicle type	RCV	Split-back RCV	Split-back RCV	Split-back RCV
Organic waste vehicle type				Food Vehicle
Recycling vehicle type	Split-back RCV			Shares with mixed waste
Could be organised for a dual scheme?	Yes	No	No	No
Service Standard 2 – Cost Relative to the Baseline	€1.4M	€0.3M	-€2.4M	-€4.2M

Table 26: Differences between the schedules modelled

*Could be adapted to dual scheme

The modelling included four key changes from the baseline:

- Efficiency savings from regionalisation of c.€800 (~5%) assuming a 5% increase in collection round efficiency resulting from cross border working and the pooling of vehicles, although the rationalisation of depots and the pooling of management staff could mean lower overheads further savings.
- Efficiency changes from a change in fleet profile based on a significant shift in the fleet to predominantly large 26T collection vehicles, which will be more efficient (75% compared with 39% in the baseline).
- Changing from a single morning shift of an average 3.7 hours to an AM and PM shift. Sensitivity modelling showed this was critical to achieving savings in Schedule's A-D and made up nearly 60% savings in Schedule D.
- The proposed Service Options potentially means fewer overall collections. The costs results are based on 2x residual/mixed, 3x organic and 2x collections of recycling (1x collection for paper and card and 1x for plastics and cans), except for Schedule C, which has 4x recycling collections. Each property therefore receives 7 collections per week over 6 days, or 9 collections in Schedule C, rather than the current average of 7.4.

The greatest savings were achieved with Schedule D, where refuse and recycling were collected in different compartments on the same vehicle, with organic waste collected on a specialised food vehicle. Of all the

schedules considered, this solution required the lowest number of vehicles and is the only option that still resulted in savings when operated in a single shift. However, it does not meet the service requirements of consistent, harmonised collection days for mixed and organic waste throughout a region and fails to ensure mixed waste is not collected on the same day as organic waste or packaging. The packaging collections could also not be operated separately by a PRO because these materials would be collected in split-back RCVs with another material stream collected at the same time.

Schedules A-C are designed with the intention of ensuring mixed waste is not collected on the same day as other streams and that collection days are consistent/harmonised by region. For example, residual collections on Tuesday and Saturday, organics on Monday, Wednesday and Friday. Both Schedules B and C could be consistent at a national level, but in operating Schedule A residents will have a different recycling day in each region and some residents' recycling will be collected on a different shift to their mixed or organic waste. Other disadvantages of Schedule A include the high additional annual costs, low utilisation of the recycling fleet (between 15 and 50 vehicles could be left unused on working days), recycling vehicles only being used 4 days a week, the logistical challenges of shipping some of the fleet to Gozo each week and additional associated labour costs. By contrast, Schedule B has none of these disadvantages and whilst it is more expensive that the current service, it does cost considerably less than Schedule A.

Schedule C meets the service requirements and offers savings. By collecting recycling on the same pass as organics and on the 'free' day (Thursday) residents also receive more recycling collections each week. By spreading out recycling collections, this should reduce the volume of sacks and the second compartment could be used for glass on a Thursday, negating the need for additional glass collections. It can also be organised so residents always receive an AM or PM collection (not a mix of both) and can be harmonised nationally.

In the short term there is an argument for proposing Schedule B rather than Schedule C as the preferred option due to the clearer messaging to the public because single waste streams are collected on each day. This could allow for increased participation in recycling collections over a shorter period. Schedule B also leads to lower costs of collection for recyclable materials than Schedule C and hence producers/PROs would be more amenable to its acceptance. Schedule C is likely to be a preferred option in the longer term with cost savings and increased recycling collections, once there is confidence that the citizens will be comfortable with a more nuanced collection schedule.

Whilst harmonisation of collection schedules is a key concept of this Plan, it is recognised that some Local Councils experience specific circumstances which need to be catered for. It will therefore be at the discretion of the Regions to supplement collection services with the following:

(i) additional collections of organic waste only on Sundays, and

(ii) the introduction of smart waste solutions for residents as long as these are equipped with restricted access control.

The schedule guidelines will be used to define maximum and minimum levels of service within which regions can cater for the specific needs of individual Local Councils. Government also acknowledges that there are accessibility issues for split-back trucks in some localities and areas. In order to cater for accessibility issues, particularly in village cores, smaller collection vehicles will be included for areas which cannot be accessed by such vehicles. In this case, service providers may substitute split-back vehicles with 2 small-sized vehicles to service narrow roads and alleyways. In such areas, on days when two waste fractions are collected, for example plastic and metal or paper and cardboard, a single compartment vehicle will pass by twice, making two collections.

Finally, a transitory period for the phasing in of Euro 6 vehicles is also being considered. This will be considered commensurate with the depreciation of the Euro 5 collection vehicles up until 2025, noting that many waste collectors had recently invested in such vehicles.

5.14.3. EPR Packaging Collection Responsibility Schemes

Packaging collection has been included within the options and the vehicle systems considered. The options modelled resulted in fewer vehicles and the cost analysis illustrates the opportunity for savings to be made when regional councils contract for recycling collection alongside organic and residual waste collection.

From the collection schedules considered as part of the collection modelling, we have found that savings were only achieved when all collections were contracted by the regional councils, i.e. Schedules C and D. Schedule D resulted in the greatest savings of all those considered (overall savings were €1.8M per year compared to the next best vehicle system modelled), but this vehicle configuration could only be achieved through regional council contracted services due to mixed waste and packaging being collected on the same pass. Schedules C and D were comparable in terms of the savings for the residual and organics systems alone (€4.2M and €4.2M per year), but Schedule C would also need to be contracted regionally as organic waste and packaging are collected on the same vehicle.

In the only Schedule that could be operated as a dual scheme (Schedule A), the annual costs were considerably higher, although the mixed and organic waste costs alone were marginally lower.

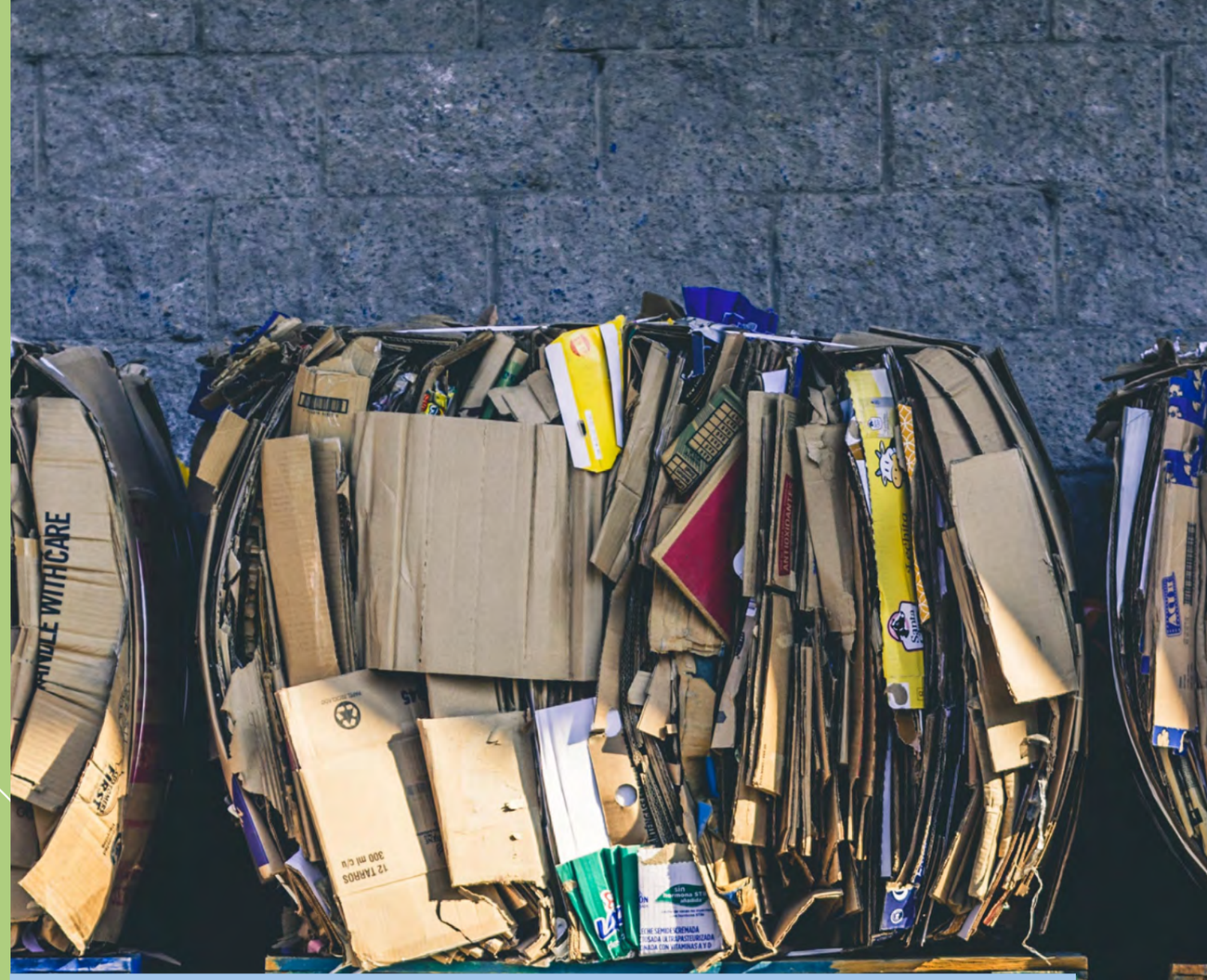
The results suggest it will be difficult to have a separate packaging fleet without increasing the overall costs when collection days are constrained. Collection reform provides an opportunity to look at collection services holistically, and – from the options considered here – the greatest savings both overall and for councils were achieved when all collections were integrated (i.e. all collection services contracted by the regional councils).

5.15. Waste collection measures at a glance

Measure code	Details
Short term measures (2021 to 2023)	
WC_1	Responsibility for collection to shift to regions, including collection of recyclables in order to achieve better economies of scale
WC_2	Disincentivise mixed waste generation by reducing its collection frequency to twice a week
WC_3	Harmonise collection on a national level to ensure the following minimum standards: ■ Organic waste – three times weekly ■ Plastic and metal – at least once weekly ■ Paper – at least once weekly ■ Glass – at least once a month ■ Mixed waste – not more than twice weekly
WC_4	Introduce separate collection of paper for better quality recyclate
WC_5	New collection vehicle fleet to service regionalised geographic areas, cleaner and more efficient performance and co-collection of certain fractions
WC_6	Waste collections to be carried out in AM and PM shifts to improve RCV usage and minimise total number of vehicles on the road
WC_7	High-level of community engagement and enforcement
Medium term measures (2024 – 2027)	
WC_8	Design standard see-through waste bags for enhanced enforcement and uniformity

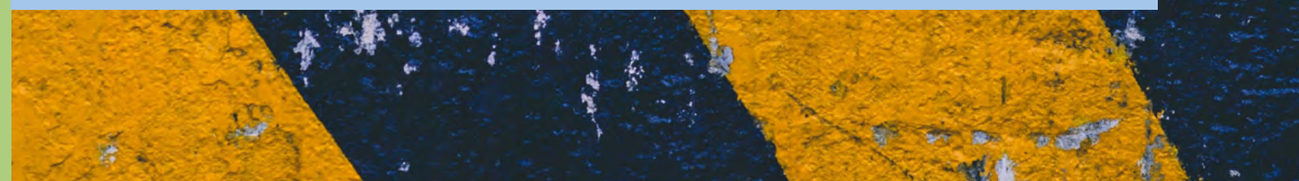
Table 27: Waste collection measures at a glance

WASTE MANAGEMENT AND RESOURCE OPTIMISATION



We will aim to ensure that waste generated is efficiently and effectively treated in order to minimise the environmental footprint and impacts of waste whilst also ensuring that we maximise the potential of waste as a resource.

With the delivery of this WMP we will invest and put in place modern and efficient waste infrastructure that not only meets our current waste needs but will set in place the required treatment facilities for the future. Our key objective is to ensure we divert potential resources away from landfill.



6.1. Maximising our management of wastes to ensure resource optimisation

Waste and the generation of wastes is a costly misuse of resources. Whilst waste generation is inevitable, Government can take necessary steps in terms of management in order to optimise and recover as much of the resource that wastes represent. This management must and will be done in line with the waste hierarchy. The proceeding chapter of this Waste Management Plan will thus set out how the Government will achieve effective waste management and resource optimisation for the forthcoming decade.

This chapter will cover several key areas of management: firstly, waste management infrastructure; secondly how an expanded system of Extended Producer Responsibility (EPR) can address significant management gaps; and thirdly how addressing commercial waste can help improve our management of wastes. Measures addressing each of these thematic areas will be put forward and explored in the corresponding sections.

Our ultimate aim is to ensure that waste generated is efficiently and effectively treated in order to minimise the environmental footprint and impacts of waste; a major part of this is ensuring that landfilling is the option of last resort. In achieving this, then resource optimisation will also be achieved.

6.2. Waste Management Infrastructure

6.2.1. Our current treatment infrastructure

Waste management and the required infrastructure to effectively and efficiently manage wastes generated remain a critical challenge for Malta and will do so for the forthcoming decade.

Currently Malta treats waste through a combination of treatment options including bring in sites; material recovery centre (Sant'Antnin); mechanical biological treatment plants; thermal treatment facility; WEEE storage facilities and as a least preferred option engineered landfills.

As we transition our economy away from a linear model to that more akin to a circular one it is right that we strive to make the necessary improvements to our waste treatment infrastructure in order to effectively manage wastes as a resource to be maximised. This chapter will therefore explore proposed future infrastructure requirements for Malta going forward in order to not only meet our obligations but also provide a cleaner, more sustainable and greener future the Island.

As a starting point to understanding the infrastructure requirements for the coming decade with respect to waste management and resource optimisation it is necessary to first assess what the current waste management capacities are. Characterising the various types of waste generated allows one to prioritising where investment in infrastructure is needed.

Wastes generated nationally can be classed as: (i) waste sent directly for export by the producer[86]; (ii) waste suitable for recycling and sent for export; (iii) residual wastes sent to landfill[87]; (iv) organic wastes collected for anaerobic digestion[88]; (v) waste generated by waste management and sewage treatment facilities that have a negative market value; (vi) wastes collected in civic amenity sites; and (vii) waste incinerated at the Marsa Thermal Treatment Facility (MTTF)[89].

In addition to the aforementioned categories of waste the current waste management activities applied in Malta can be summarised as follows: (i) collection activities (door to door collection of MSW, mixed dry recyclables, organic waste and bulky wastes) or delivery (bring in sites, civic amenity sites); (ii) separation activities either through material recovery facilities or mechanical treatment plant to extract recoverable materials; (iii) recovery of energy currently from anaerobic digestion and will be from the planned waste to energy plant; and (iv) disposal which is primarily to landfill currently but also via thermal treatment of selected wastes at Marsa.

86 Wastes sent directly for export by the producer - categories (i) & (ii) do not constitute an operational issue for Wasteserv. These wastes either have a positive market value and are managed directly by local industry (such as metals) or are hazardous wastes for which there are no local waste management solutions. There may be the option of utilising some of these wastes (nonrecyclable streams) as an energy source in a Waste to Energy (WtE) plant, and the scope for this is being explored in the context of the proposed plant currently in the initial stages of project development. Given the nature of such wastes (e.g. industrial solvents or sludges), it is unlikely that there is the possibility of synergy in terms of handling of such waste streams in tandem with those currently handled by Wasteserv, given that specialised equipment would be required.

87 Residual wastes sent to landfill, including black bag collection – category (iii) – are considered in more detail in Annex. Trends in the total production of waste sent to landfill are already considered in the national Waste Management Plan 2014-2020. The total mass sent to landfill in 2018 are just over 297,000 tonnes, with clear indications are that this figure is increasing given current trends in population density and economic activity

88 Organic wastes (category iv) collected in a segregated manner through the national roll-out of the separate collection of organic waste from households have improved the efficiency of anaerobic digestion processes, in terms of both energy generation and digestate quality

89 Wastes treated at the Marsa Thermal Treatment Facility – these wastes are dominated by the output from the Marsa abattoir, and efforts here are aiming to divert such output to the generation of animal by-products such as bone meal. However, this facility still treats a significant output of material in terms of clinical wastes from the hospitals, the incineration of a limited range of products from the industrial sector, and the occasional disposal of materials confiscated by the Authorities.

It is important to also recognise that these waste management activities have implications for infrastructure. The table below summarises these implications.

Objectives in descending order	Definition of Target Result	Implications in terms of waste management infrastructure requirements
1. Prevention	Reduction of volume and types of waste streams generated	Scope is to minimise need for waste management operations, limiting the need for further infrastructure. This is the subject of the Waste Prevention Chapter
2. Preparing for Reuse	Facilitation of reuse of materials and/ or products	Potential for reuse should be considered as part of facility operations
3. Recycling	Collection of an increased fraction (in terms of volume and range) of recyclable products	**Ensure capacity for collection and recovery of recyclables** in terms of volume and range. This requires development of additional facilities for material recovery for recycling i.e. Material Recovery Facility
4. Recovery of material	Recovery of material from waste	**Ensure capacity for recovery of recyclables** from unsorted wastes, and production of compost. This requires development of additional facilities for material recovery of recyclables and organic material i.e. Material Recovery Facility & Organic Processing Plant
5. Recovery of energy	Extract energy value from non-recyclable or non-recoverable wastes	**Ensure capacity for energy recovery** that is optimised in terms of output through development of Waste to Energy facilities
6. Disposal	Safe disposal of non-hazardous wastes for which there are no alternative treatments	This is the option of last resort that remains necessary for the foreseeable future. Waste management infrastructure must prioritise volume reduction of all material destined to landfill, and new engineering techniques are being adopted to maximise available void space

Table 28: Implications of waste management objectives

Objectives for improvement of waste management capacity may be summarised as follows:

- The need to promote waste prevention, and segregation of recyclables at point of source;
- The need to improve capacity for collection of pre-separated waste fractions, to optimise the value of such materials through reduction of contaminants at point of source, thereby improving revenue streams from recycling;
- The need to improve capacity for recovery of recyclable waste fractions through improved recovery facilities, and optimisation of operations to increase recovery rates and decrease reject rates;
- The need to increase efficacy of energy recovery, by providing infrastructure allowing energy recovery via thermal treatment, by improving feedstock for the anaerobic digestion plant, and providing scope for recovering energy from the output from material recovery facilities that may be classified as Refuse Derived Fuel; and
- The need to optimise the ultimate landfill disposal option by ensuring that wastes deposited have been reduced to the minimum volume possible, to maximise efficient use of void space.

In order to improve capacity for waste management, various projects are currently in different phases of development. These projects aim to achieve the following objectives:

- improving material recovery from both comingled and segregated wastes, to improve rates of recovery of recyclables, and divert wastes from landfill;
- optimisation of treatment of organic wastes, to improve energy recovery and drive the development of a viable compost;
- introduction of thermal treatment and energy recovery facilities, as an alternative to landfill as final disposal;
- increasing remaining landfill void space through adoption of specialised engineering techniques, and mitigating against further land uptake; and
- development of the support infrastructure required to support waste management operations, including logistics and transport infrastructure.

Diversion from landfill is a primary consideration in mitigating the environmental and economic cost of creating additional landfill void space. Besides the avoidance of generation of waste in accordance to the provisions of this Waste Management Plan, efficiency is expected to be driven through new and/or improved facilities introduced by the implementation of the ECOHIVE project. Preference should be given to maximising output of recyclables as being higher in the waste hierarchy.

At this point, a critical objective influencing project development is optimising use of available landfill void

space. The lack of adequate landfill void space required to satisfy demand is the determining factor driving the adoption of innovative engineering techniques to increase landfill void space on the existing footprint of approved existing landfill cells. This is essential as the use of landfill as a final disposal option is not going to be eliminated within the foreseeable future.

Location of existing facilities are currently concentrated in the Magħtab and Sant'Antnin complexes, an approved facility at Ħal Far, and satellite sites aimed towards collection and stockpiling of wastes. Existing policy aims towards the decommissioning of the plant at Sant'Antnin, given the proximity to large residential areas.

Selection of locations for new projects will involve application of the following criteria:

- Consolidation of existing waste management capacity in the same locality to facilitate synergy between operations, particularly within the ECOHIVE Complex which currently includes the Malta North facilities and the landfills;
- Reduce transportation costs (in environmental and economic terms) between facilities that are related in terms of flow of rejects and feedstocks;
- Reduce transportation costs of materials for export, in terms of transit from stockpiles to point of export, with the facility at Ħal Far being a strategic hub for stockpiling for waste export; and
- Site specific social and environmental considerations.

As project performance of waste management facilities are always dependent on feedstock quality, the above projects should be developed in parallel with the following initiatives:

- Awareness campaigns on waste strategy for both the public and industry to influence behaviours in terms of both generation of waste, optimal separation and preferred disposal options; this should be carried out in conjunction with a compliance promotion effort in order to improve enforcement results;
- Continued waste characterisation research to further refine project development and operational strategies, by improving understanding of waste generation trends and the corresponding waste management requirements to ensure that recycling and recovery targets are met;
- Review of collection strategies to optimise collection systems, and promote the collection of separate waste streams (e.g. mattresses, bulky furniture, green waste, etc.) to optimise process flows, reduce waste separation costs, and reduce transportation costs;
- Operational review to determine whether the rate of rejects can be reduced, and whether process flows can be optimised by reducing demand for transport between facilities, or to export.

6.3. Measures for improving waste infrastructure

As highlighted above the following measures with respect to waste treatment infrastructure will be implemented over the coming decade to ensure we divert resources away from landfill , with the key initiative being investment in treatment plants at the EcoHive Complex.

The rationale behind the investment needs relative to the proposed treatment plants at EcoHive complex has been outlined in this Chapter. The operation and maintenance costs of the treatment plants are not met by the revenue generated by the same operations, hence as the operator of last resort, Wasteserv Malta receives a subvention from the Government.

The proposed treatment plants are currently subjected to detailed technical evaluations on the basis of which design capacities and technologies will be fully identified. Nonetheless, the estimated capacities in kilotonnes per annum are outlined below, as well as under the relevant measure, although these are subject to revision revised following the detailed technical evaluations.

(a) Material Recovery Facility: 70kt annually;
(b) Waste to Energy: 192kt annually with flexibility to use only one line (96kt x 2 lines);
(c) Organic Processing Plant: 74kt annually with the possibility of extending capacity to 86.5kt;
(d) Hygienics for hazardous clinical and pharmaceutical waste: no estimates are available at this stage.

6.3.1. Ensuring recovery of materials

To improve recovery of recyclables through investment in Material Recovery Facility (WMRO_I1). Malta will improve recovery of recyclable materials through investment in a new facility with an estimated capacity of 70 kilotonnes per annum. This will enable Malta to up its game in terms of meeting our recycling targets. Currently we lose significant volumes of potentially recyclable materials which represents a failure in terms of waste management and a misuse of valuable resources. To this end the Government will seek to secure the appropriate level of investment in current Material Recovery Facilities at the plants operated by Wasteserv. This action is to be carried out over the period between 2024 and 2027.

6.3.2. Improving treatment of organic wastes

To improve anaerobic treatment of separately collected organic wastes though investment in an Organic Processing Plant (WMRO_I2). Since its national roll out in 2018 the collection of organic household waste has resulted in the effective collection of this waste stream. However, there remains inefficiencies in the systems for treating organic waste. This necessitates investment in new infrastructure for treating organic waste and thus actions will be designed to ensure fully circularity of the organic waste stream. Investments in the ECOHIVE Organics infrastructure will set Malta on the path to achieving circularity with respect to organic waste. The Organic Processing Plant will have a capacity of 74 kilotonnes annually with the possibility of extending capacity to 86.5 kilotonnes per annum.

Additional benefits from this measure will also allow for the recovery of energy through the ECOHIVE Energy plant infrastructure by capturing by-products of the organic waste treatment as well as eliminating as far as possible landfilling of organic waste. It is anticipated that this action will be undertaken during the second phase of the implementation of the WMP from 2024 to 2027.

6.3.3. Upgrading Thermal Treatment

To explore options with respect to the upgrading or relocation of the Marsa Thermal Treatment Facility (WMRO_I3). The Marsa Thermal Treatment Facility was inaugurated in 2007 and was designed to treat abattoir waste, clinical waste, and other hazardous waste streams that cannot be landfilled. The plant was established in order to meet our national needs with respect to thermal treatment of waste. Investment in the facility in recent years has included the deployment of an autoclave. This additional facility treats animal by product waste including the reuse of wastes as a fuel for the process.

However, in recognition of the need to continuously improve and modernize, the Government through the implementation of this measure will explore further options for the MTTF including the potential for relocation of the plant.

This action will be addressed during the first phase of the WMP from 2021 to 2023.

6.3.4. Improving efficiencies of waste management

Increasing remaining landfill void space through adoption of specialised engineering techniques and mitigating against further land uptake (WMRO_I4). Whilst the Government is fully committed to moving away from landfill it must also be acknowledged that landfilling will need to remain a necessary part of our waste management infrastructure. However, making better use of the remaining landfill space will be at the core of this action. This action will make use of the best available techniques in terms of engineering expertise in order to minimise the volume that non-recoverable wastes require with respect to landfilling. It is through this action that all efforts to avoid the need for extra land take for the purposes of treating and landfilling wastes will be achieved over the coming decade.

This is an ongoing action that will be implemented through the lifespan of the WMP.

6.3.5. Ensuring that we have the best possible infrastructure in place to support deployment of ECOHIVE

To develop required support infrastructure for existing waste management facilities, including road infrastructure to support the ECOHIVE complex (WMRO_I5). Delivery and the success of the ECOHIVE initiatives will require that adequate investment is made in terms of supporting infrastructure to waste management facilities. Making sure that the ECOHIVE complex is serviced with adequate road and other service infrastructure, such as a skip loading facility, will be a critical success factor for this WMP. As such the Government will be investing in this regard. Through this action the necessary investment will be secured.

The Government will undertake this action during the second phase of implementation of the WMP from 2024 to 2027.

6.3.6. Diversion from landfill and investing in Waste to Energy

Divert wastes away from landfill, and promote energy recovery from waste, through investment in a Waste to Energy plant (WMRO_I6). As mentioned previously investments in the ECOHIVE Energy infrastructure will be a cornerstone of our transition away from landfilling as well as moving towards circularity for resources. Having the necessary infrastructure to allow us to divert resources away from landfill is a critical part of the Government's waste strategy through turning waste which cannot be recycled or recovered into energy. In this regard investing in a Waste to Energy plant, through which energy can be recovered from the waste management process will be an integral part of the delivery of this WMP. The Waste to Energy plant will have two lines, each with a capacity of 96 kilotonnes per annum. This allows for flexibility to use only one line at 96 kilotonnes per year or both lines at 192 kilotonnes per year. Delivery of the Waste to Energy plant is envisaged during the second phase of the implementation of the WMP from 2024 onwards.

6.3.7. To improve understanding of changing terms in waste composition, and inform further decision making on waste management initiatives through waste characterisation exercises.

Characterise nature of waste to inform further decision making on waste management initiatives (WMRO_I7). Understanding the characteristics of waste generated is critical to ensuring that the appropriate infrastructure to treat such wastes are in place. To this end the Government will embark upon a process of continuous waste characterisation with a view to informing future decision making on waste management initiatives. This measure will be part of a decision-making process that will allow the Government to react in a more strategic manner with respect to infrastructure needs planning over the coming decade.

As with action WMRO_I4 this action is an ongoing priority and as such will be continuously worked on during the lifespan of the WMP.

6.3.8. A process of review and renewal to maximise operational efficiencies

Carry out periodic reviews of waste generation and treatment trends to increase operational efficiency and refine measures taken (WMRO_I8). Ensuring that operational efficiency is maintained in any process is a critical factor for success. Waste management is no different. Through a process of periodic review of waste generation and treatment trends, the Government will strive to ensure that efficiency is maintained throughout the lifespan of this WMP.

The periodic reviews will be undertaken every three years.

6.3.9. To assess the feasibility of introducing a hierarchy of fees for facility gate fees to ensure full cost recovery for operational and environmental costs.

To assess the feasibility of introducing a hierarchy of fees for facility gate fees to ensure full cost recovery for operational and environmental costs (WMRO_I9). Adequately accounting for the true cost of waste disposal is recognised as a challenge to overcome if Malta is to put in place a functioning waste treatment infrastructure. This is an extension of the polluter pays principle. Ensuring that gate fees fully recognise the cost to the State of appropriate waste treatment will be a key facet of the actions outlined in this WMP.

This action will be undertaken from 2024 onwards.

ECOHIVE

ECOHIVE, home to 4 new waste management plants. The biggest investment of its kind, and it will help us make the most of ALL our waste.

The process for a new high-level plant to replace the Marsa incinerator has started. In September 2020, Wasteserv in conjunction with MECP announced the launch of the new ECOHIVE project which will transform waste management infrastructure in Malta. The new facility will incorporate the best available technology. This will not only guarantee the ideal environmental performance but also the potential of green energy generation through the incineration process. In fact, it will be complementing the waste-to-energy plant and the organic waste plant which will be developed.

ECOHIVE energy ECOHIVE hygienics ECOHIVE organic ECOHIVE recycling

6.4. Waste Management Infrastructure measures at a glance

Measure code	Details
Short term measures (2021 to 2023)	
WMRO_I3	To explore options with respect to the upgrading or relocation of the Marsa Thermal Treatment Facility
WMRO_I4	Increasing remaining landfill void space through adoption of specialised engineering techniques and mitigating against further land uptake (ongoing)
WMRO_I7	Characterise nature of waste to inform further decision making on waste management initiatives (ongoing)
WMRO_I8	Carry out periodic reviews of waste generation and treatment trends to increase operational efficiency and refine measures taken (ongoing)
Medium term measures (2024 – 2027)	
WMRO_I1	To improve recovery of recyclable materials through investment in Material Recovery Facility.
WMRO_I2	To improve anaerobic treatment of separately collected organic wastes though investment in an Organic Processing Plant
WMRO_I6	To divert wastes away from landfill, and promote energy recovery from waste, through investment in a Waste to Energy plant
WMRO_I4	Increasing remaining landfill void space through adoption of specialised engineering techniques and mitigating against further land uptake (ongoing)
WMRO_I5	To develop required support infrastructure for existing waste management facilities, including road infrastructure to support the ECOHIVE complex.
WMRO_I7	Characterise nature of waste to inform further decision making on waste management initiatives (ongoing)
WMRO_I8	Carry out periodic reviews of waste generation and treatment trends to increase operational efficiency and refine measures taken (ongoing)
WMRO_I9	To assess the feasibility of introducing a hierarchy of fees for facility gate fees to ensure full cost recovery for operational and environmental costs

Long term measures (2027 – 2030)	
WMRO_I4	Increasing remaining landfill void space through adoption of specialised engineering techniques, and mitigating against further land uptake (ongoing)
WMRO_I7	Characterise nature of waste to inform further decision making on waste management initiatives (ongoing)
WMRO_I8	Carry out periodic reviews of waste generation and treatment trends to increase operational efficiency and refine measures taken (ongoing)

Table 29: Waste Management Infrastructure measures at a glance

6.5. Extended Producer Responsibility

6.5.1. The Principle and current status of EPR in Malta

Extended Producer Responsibility (EPR) as a policy tool is already established in Malta. However, as previously referenced, it is deemed given the waste challenges that we still face that an expanded scope of the EPR should be a cornerstone of waste management for the forthcoming decade.

EPR is an environmental policy approach whereby producers bear the financial and/or organisational responsibility for the end-of-life stage of the products they place on the market. Such a principle is established in Union legislation through the Waste Framework Directive 2008/98/EC as transposed in the national legal framework via the provisions of the Waste Regulations, S.L.549.63.

The EPR principle is widely applied across the EU waste acquis, as it is reflected in Directive 2000/53/EC on End-of-Life Vehicles, Directive 2012/19/EU on Waste Electrical and Electronic Equipment and Directive 2006/66/EC on Batteries and Accumulators and Waste Batteries and Accumulators. Directive 94/62/EC on packaging and packaging waste will become an EPR piece of Union legislation as from 2025. To date, the implementation of the EPR principle in the management of packaging and packaging waste is voluntary, although many of the Member States have opted to shape their national laws according to this policy approach.

According to Article 8(1) of the Waste Framework Directive, EPR measures "may include an acceptance of returned products and of the waste that remains after those products have been used." The Beverage Container Refund Scheme (BCRS) for metal, glass and plastic beverage containers is one model of EPR system, aiming to make both producers and consumers responsible for their packaging waste by creating a privately funded infrastructure for the collection of empty beverages containers. This will not only increase the separate collection of high-quality material for recycling but will also increase national efforts to reach recycling targets and reduce littering. The BCRS will also support compliance with Article 7(1) of the

Packaging and Packaging Waste Directive[90] which obliges Member States to take the necessary measures to ensure that systems are set up to provide for…the return…of used packaging…waste from the consumer…in order to channel it to the most appropriate waste management alternatives."

The new Waste Legislative Package adopted in June 2018 sets out minimum requirements for Extended Producer Responsibility Schemes[91] to operate within the EPR framework, with the aim to encourage development, production and marketing of products, which are easily re-usable, contain recycled materials, and are durable as well as repairable.

As part of the minimum requirements, Malta will need to clearly define the roles and responsibilities of all relevant actors and, as a minimum, set quantitative waste management targets. In this context, Malta shall also ensure that adequate reporting systems are established with a view to gathering information as to placement on the market of products by producers, collection and treatment of waste generated, as well as data in line with the said quantitative targets.

In case of collective fulfilment of producers' obligations, the amended Waste Framework Directive also requires that, amongst others, the fees charged to producers by PROs are modulated in such a way to reflect the costs of waste management performed in a cost-efficient manner, as well as to take account of products' recyclability, reusability, reparability and the presence of hazardous substances. Such organisations shall also make publicly available information concerning their governance and financial means, with a view to ensuring transparency of their operations.

The requirements should apply to both new and existing extended producer responsibility schemes.

Packaging and Packaging waste

Packaging waste generation has been increasing gradually over the last few years. In 2011, circa 53 thousand tonnes of packaging waste were generated, whilst 2017 figures indicate that approximately 69 thousand tonnes of such waste were generated, corresponding to an increase of circa 30% when compared to 2011 levels.

90 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01994L0062-20150526

91 An Extended Producer Responsibility Scheme is a set of measures taken by Malta to ensure that producers of products bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product's life cycle.

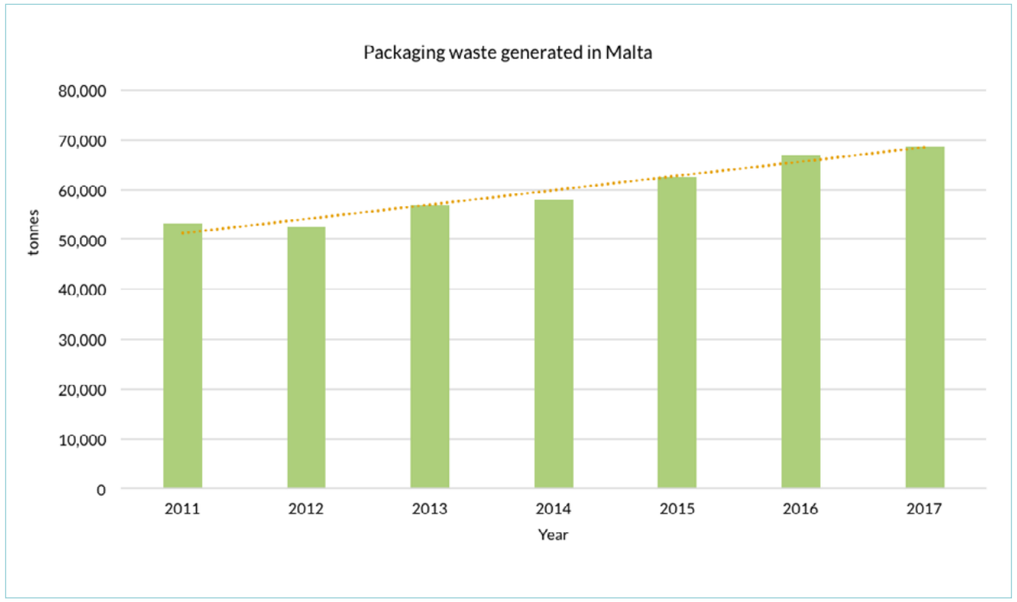


Figure 39: Packaging waste generation in Malta during the period 2011-2017.

To date, packaging waste is mainly collected through the collection services provided for by the two authorised Producer Responsibility Organisations, i.e. door-to-door collection of recyclable waste, bring-in-sites and direct collection from certain commercial and industrial entities.

The current EU targets require that Malta achieves an overall recycling rate of 55%. As illustrated in the below graph, since 2013 Malta has never attained the overall recycling target in terms of EU legislation.

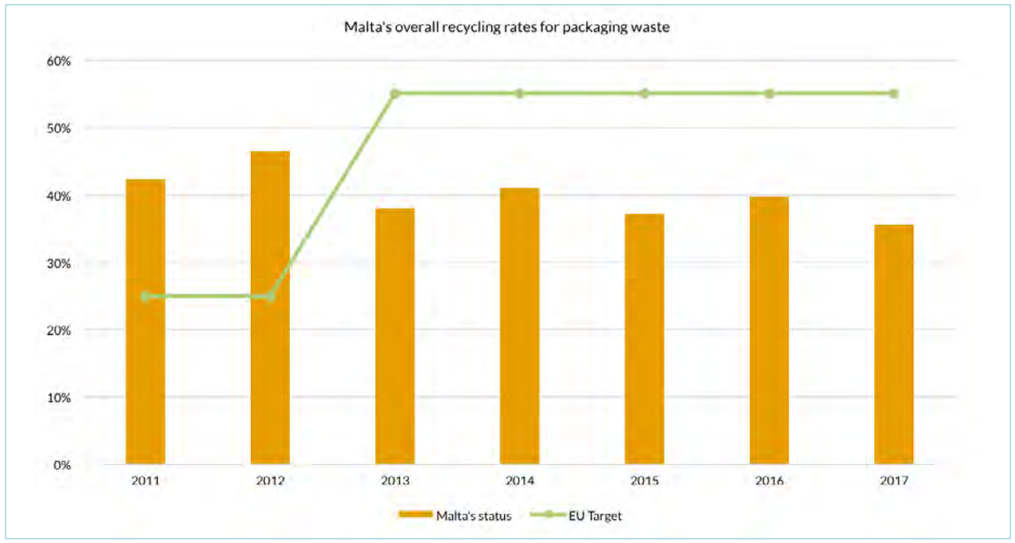


Figure 40: Malta's performance vis a vis the EU overall recycling target

The data provided clearly indicates that Malta faces significant difficulties in complying with the stipulated targets. In this respect, it is to be noted that the amended Packaging and Packaging Waste Directive sets new ambitious recycling targets that shall be achieved by Malta not later than 2025 and 2030. A comparison between the current targets and new sets of targets is set out in the table below:

Targets	2013	2025	2030
Overall recycling	55%	65%	70%
Plastic	22.5%	50%	55%
Wood	15%	25%	30%
Ferrous metal	50% (metals)	70%	80%
Aluminium		50%	60%
Glass	60%	70%	75%
Paper & cardboard	60%	75%	85%

Table 30: Current targets vis a vis the recycling targets on packaging waste

In this context, one is also to note that Malta's recycling performance has not improved over the period under review. From the presented data, substantiated by an extensive assessment carried out by the ERA in recent years it transpires that Malta's poor performance in this sector is the result of the following elements:

- Limited national recycling capacity, making Malta dependent on exports of recyclable wastes for their environmentally sound management. Such lack of national infrastructure was further exacerbated by the fire incident that occurred at the Sant'Antnin waste treatment facility;
- Weak implementation of the EPR principle in the management of packaging and packaging waste, particularly in relation to the financing of the management of packaging waste
- Insufficient separation of recyclables at source, resulting in large amounts of mixed household waste generated in Malta;
- Collection and management of recyclable wastes not performed in a cost-efficient manner; S.L.549.43 stipulates that PROs shall make arrangements with single Local Councils for the door-to-door collection of consumer packaging waste and for the provisions of bring-in-sites, which are to be financed by the PROs. On the other hand, S.L.549.63 (the Waste Regulations) places the obligation to set up systems for the separate collection of recyclable wastes upon the Local Councils. These provisions have translated themselves into a scenario characterised by a significant lack of economies of scale as well as uncertainty as to the roles of the various stakeholders involved in the collection service;
- Limited market surveillance, compliance and enforcement of producers' obligations, which has not

allowed to identify possible free riders and capture all packaging placed on the national market by the producers subject to S.L.549.43.

Waste Electronic and Electrical Equipment

The amount of WEEE collected in Malta when compared to the EEE placed on the national market (POM) is rather low. This indicates that from an operational perspective the system is yet far from maturity. In 2017, Malta recorded the largest amount of WEEE collected. This resulted in a collection rate of 22% which was below the national collection target of 45%.

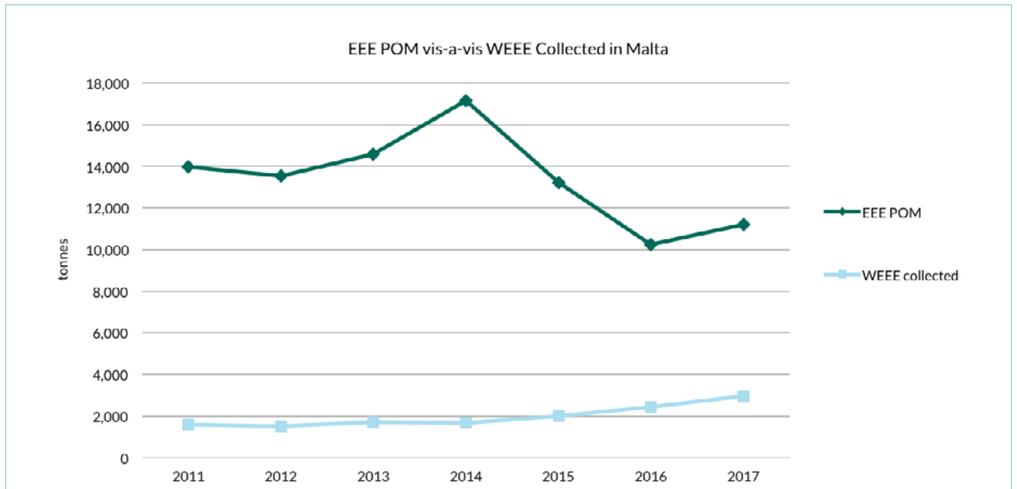


Figure 41: Placement on the market (POM) of EEE vis-a-vis WEEE collected in Malta between 2011 and 2017

To date, WEEE generated from households is collected primarily through systems financed by Local Councils. Collected WEEE is deposited at facilities operated by the local agency designated by the Minister, to then be handed over to the PROs according to their market share, at a price that reflects the total cost incurred for collection and storage. The civic amenity sites operated by Wasteserv Malta are the current designated facilities for WEEE. In addition to this collection system, WEEE is also collected through take-back systems set up by producers as well as through collection systems organised by the PROs.

Malta's recycling performance in this sector was affected by the limited treatment capacity and dependence on exports of WEEE, which in turn were also driven by the market demand and value for such waste. These conditions have resulted in instances whereby amounts of WEEE collected in a specific year were kept in storage and exported for further treatment in the course of the following years.

In addition, an extensive assessment carried out by the ERA on the whole sector clearly indicates that Malta is experiencing several deficiencies both from an operational and an implementation perspective. These deficiencies can be summarised as follows:

- Limited national recycling capacity, making Malta dependent on exports of WEEE for further treatment;
- Weak implementation of the EPR principle in the management of WEEE, particularly in relation to the financing of the management of WEEE;
- Modulation of fees by PROs carried out in a way which does not reflect the real costs for the management of WEEE;
- Collection and management of WEEE not performed in a cost-efficient manner;
- Potential market and governance framework failures within the WEEE sector, which in good part may reflect the smallness of the domestic market. This might lead to irregular market behaviour;
- Limited participation of private waste management operators and the dependency on the operator of last resort, that is Wasteserv Malta, to undertake activities that are not financially feasible and/or operationally practicable for PROs; and
- Limited market surveillance, compliance and enforcement of producers' obligations, notably concerning the fee structures implemented by the PROs and the shortcomings in the information reported by all the operators in the sector.

End of Life Vehicles (ELVs)

Data on the number of ELVs arising in Malta during the period 2011-2016 are presented below. The significant increase in the number of Certificates of Destruction (CODs) issued ELVs scrapped in Malta between recorded in 2015 and 2016 is due to the number of ATFs operating in the country, which increased from one (1) facility operating in the period 2011-2013 to six (6) and seven (7), respectively.

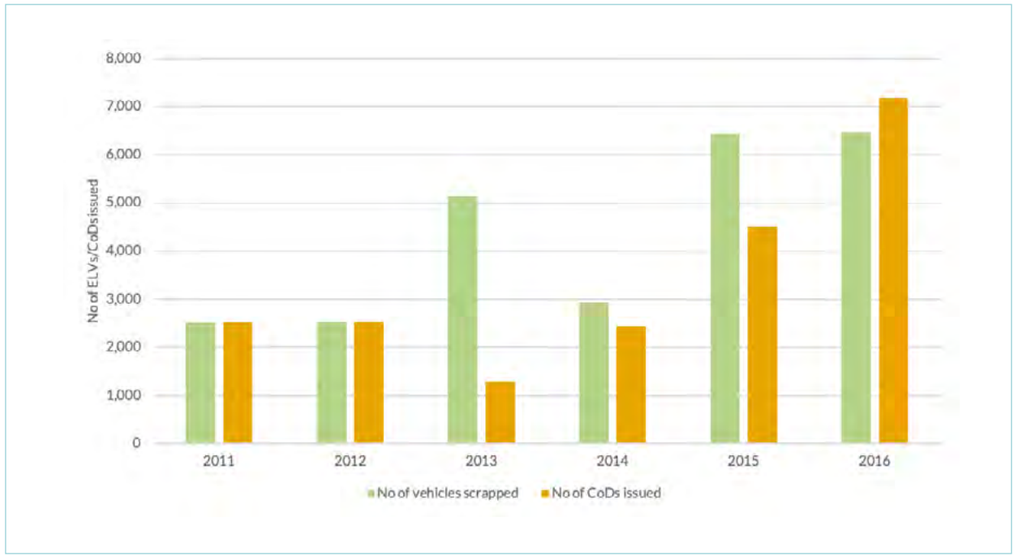


Figure 42: End of Life Vehicles arising in Malta during the period 2011-2016

As illustrated in the graph below, since 2015 Malta has never attained the stipulated targets emanating from the ELV Directive.

Figure 43: Status of attainment of EU targets

The implementation of the ELV Directive in Malta has been problematic due to several recurring issues, some of which had already been identified in the current Waste Management Plan covering the period 2014-2020. The above-mentioned issues are:

- Limited knowledge as to the implementation of the EPR principle in the management of ELVs at the national level. It is difficult to determine whether the economic operators have fully embraced their responsibilities emanating from the ELV Regulations due to the lack of assessments carried out by the responsible Authorities. More specifically, it is uncertain whether vehicles are transferred to ATFs at no cost for the last owner/holder and, if so, who is financing the collection and treatment of the ELVs arising in Malta, noting that a good share of ELVs bear a positive economic value;
- Do-it-yourself dismantling of vehicles and illegal scrap yards. Data discrepancies, notably on the number of CoDs issued vis-à-vis the number of ELVs scrapped in Malta, suggest that there might be instances whereby dismantling of vehicles takes place in private garages, unregulated workshops and illegal scrap yards;
- Issues of compliance vis-à-vis operations by the national ATFs. There exists a sizable room for improvement regarding the level of compliance of by the national ATFs with the relevant national legislation and their permit conditions;

- Poor quality of the data reported by the ATFs, both in terms of ELVs entering the facilities and traceability of the waste streams arising from depollution and dismantling of such vehicles. Such poor quality is essentially due to the lack of proper systems for record-keeping, lack of basic equipment (e.g. weighbridges) and insufficient knowledge of waste classification by the operators;
- Uncertainty whether vehicles designed and marketed for third country markets fully comply with Union standards.

Waste Batteries and Accumulators

The portable batteries and accumulators placed on the national market during the period 2011-2018 are graphically represented below, indicating that the placement on the market of portable batteries and accumulators has remained rather constant throughout the years under review, fluctuating between 80 and 100 tonnes a year.

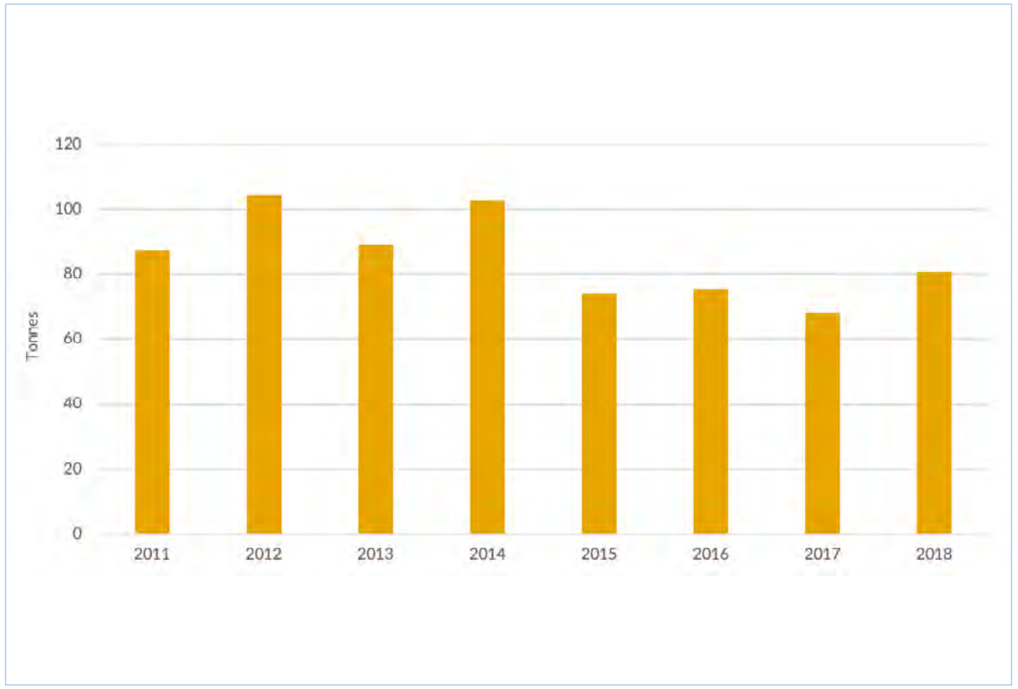


Figure 44: Placement on the market of portable batteries and accumulators between 2011 and 2018

It transpires that Malta attained the EU collection target for waste portable batteries and accumulators in both 2013 and 2015. However, Malta has never achieved the more stringent 2016 collection target.

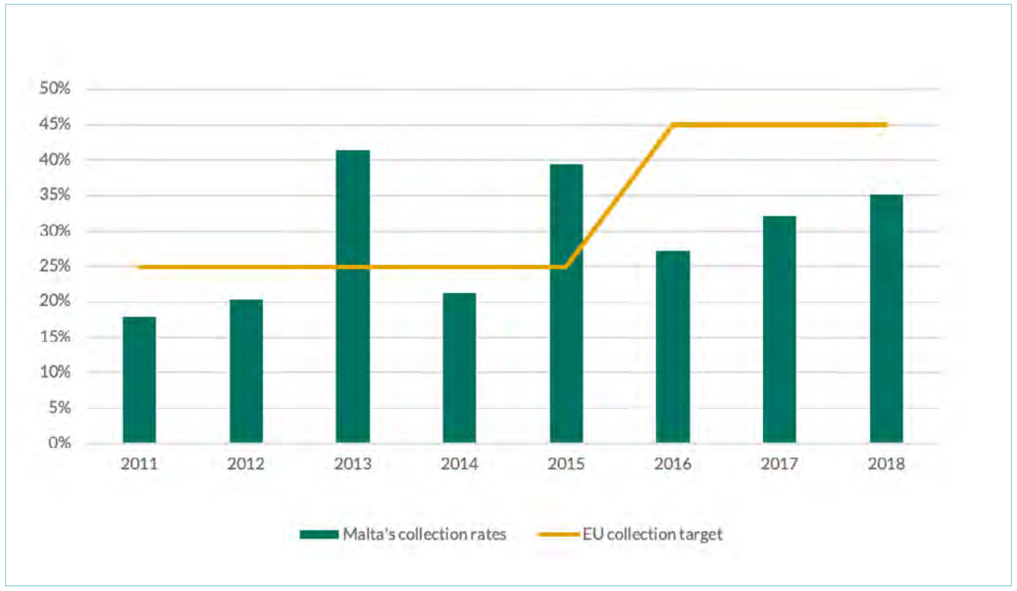


Figure 45: Collection rates of portable batteries recorded between 2011 and 2018

6.6. Measures for an expanded EPR

6.6.1. General Measures

The Government will be putting forward both general as well as more specific measures in relation to EPR. The more general measures as a collective are aimed at setting a baseline of information and knowledge from which dedicated actions related to EPR can be taken which address specific waste streams. An overall timeline of implementation of the measures is presented in the Annex.

Government will undertake a thorough review of the current legislative environment for EPR in Malta (WMRO_EPR1). This will include a full impact assessment on the potential socio-economic and environmental impact of any proposed amendments to the current EPR framework. It will also include a comprehensive study to assess the current practice of EPR implementation in relation to the management of waste batteries and accumulators.

Ensuring that producers and PROs bear the full costs of the management of the waste arising from the products placed on the national market (WMRO_EPR2). Government will be taking the necessary steps to ensure that financial costs of the management of the waste streams subject to EPR are borne by the producers and PROs including the costs for collection and treatment of waste streams and the costs of enforcement. Running in parallel and in order to support the fulfilment of the EPR obligations appropriate guidelines will be developed by the Government with respect to the financial contributions charged to producers by the PROs. This measure will be undertaken between 2021 and 2023.

Government will also take steps to where necessary restructure the nature and character of PROs to ensure the continued strengthening and improvement of the EPR at the national level (WMRO_EPR3). In this regard, it is envisaged that PROs should take the form of non-profit organisations made up exclusively of obliged industry, with the sole statutory aim of being able to fulfil the legal obligations falling upon its members. Such governance structure, which is based on best practices, is believed to have the potential to increase the overall efficiency of PROs' operations, since it is in the best interest of the members to fulfil their legal obligations in a cost-efficient manner. This measure will be undertaken between 2024 and 2027.

Enhancing cooperation with the Government entities responsible for competition and financial matters (WMRO_EPR4). The intention of this action is to enable the Competent Authorities to perform a regular and detailed monitoring of the national market vis-à-vis EPR obligations, to gain a clear understanding of the current sector and ensure a fully functional competitive market across the relevant economic operators and PROs.

Enabling better market surveillance, compliance and enforcement of producers' obligations (WMRO_EPR5). The Government acknowledges that improving EPR goes hand in hand with improving the surveillance and enforcement of EPR obligations. To this end, necessary steps will be taken to ensure the timely auditing of the operations of all producers and PROs. Auditing costs will be borne by the producers and the PROs. This action is anticipated to be implemented from 2024 onwards.

Improving reporting by producers and PROs on their operations (WMRO_EPR6). Actions to improve the reporting by producers and PROs in relation to their operations by means of enhancing the current national reporting and data quality system to ensure full traceability of products placed on the national market as well as the waste collected by producers and PROs will be undertaken as part of the suite of general measures. The timeline for implementation of this measure is anticipated to be between 2021 and 2023. Such a new, digital system will include the mandatory use of electronic registries and cover the entire treatment chain, from collection to final recycling. This measure, combined with improved market surveillance and enhanced compliance of producers' obligations (WMRO_EPR5), will decisively contribute towards the establishment of a fully functional EPR system in Malta.

Enacting national legal instruments on responsibility for waste management (WMRO_EPR7). The Government will consider enacting new legal instruments with a view to clarify the roles and responsibilities of all actors involved in waste management considering the entire life-cycle of products, including producers of products (also covering the responsibility of producers participating in PROs) in case of products subject to the EPR regime, waste producers/holders, waste collectors and establishments or undertakings which carry out treatment operations, including shipments of waste.

Develop a knowledge-sharing platform for specific waste streams across all stakeholders (WMRO_EPR8). Ensuring that all stakeholders that play a part in EPR have access to up-to-date information on EPR best practices will be critical for delivery of the expanded scope of EPR going forward. The aim of this action will be to promote knowledge sharing across all stakeholders, increase transparency in the sector and highlight issues vis-à-vis the implementation of the relevant policy instruments, with a view to improve efficiency in terms of cost reduction and performance of the entire sector. In this respect, it is being recommended that all key players be involved in this mechanism, including, but not limited to, the Regional Councils, the competent authorities and PROs. The Government will aim to have this platform in place by 2027.

Strengthening the capacity of the Environment and Resources Authority in the EPR sector (WMRO_EPR9). As a final general measure strengthening the ability of the CA to monitor and valuate the progress of EPR will be crucial to ensuring its success. The Government will look at ways of strengthening ERA as CA for waste regulation in terms of capacities and resources. This will be a priority measure for the Government and thus will be implemented from 2021 onwards.

6.6.2. Packaging and Packaging Waste

Packaging is a ubiquitous part of our daily lives. However, the incorrect disposal of it once we have taken our use from it is a significant waste challenge faced by all countries around the globe. In this regard given the significance of the impact of packaging waste it is right that as a key part of the WMP and particularly our actions on EPR continue to focus on addressing packaging waste. Nationally, the Government has enacted legislation to address this by putting in place provisions related to the management of packaging and packaging waste, aiming as a priority, at preventing the generation of packaging waste through better design and increased reuse, as well as at increasing recycling of packaging waste, thus minimising the final disposal of such waste[92].

Noting the above the following actions will be undertaken to ensure the continued management of packaging and packaging waste.

Promoting the establishment of systems to reuse packaging in an environmentally sound manner other than beverage containers (WMRO_EPR10). Due consideration will be given to the introduction of measures to promote the establishment of return systems for packaging at the level of producers (i.e. closed-loop systems). In this respect, the Government will work to identify the return systems currently in place as well as potential new systems which might be established, with a view to ensuring that such systems reuse packaging in an environmentally sound manner without compromising food hygiene and/or the safety of consumers. In view of this and considering that different legal and administrative regimes might apply, such system should be officially recognised and duly permitted by the Competent Authorities. This action will be implemented from 2021 to 2023.

92 S.L.549.43

6.6.3. Waste Electrical and Electronic Equipment (WEEE)

Waste Electrical and Electronic Equipment (WEEE) is one of the fastest growing waste streams in the EU. National legislation[93] aims to prevent or reduce the negative environmental effects resulting from the generation and management of WEEE by focusing on the sustainable production and consumption through the prevention, re-use, recycling and other forms of recovery of WEEE, with the objective to reduce the disposal of such waste.

These regulations also seek to improve the environmental performance of all operators involved in the life cycle of EEE such as producers, distributors, consumers and operators involved in the collection and treatment of WEEE.

Nevertheless, additional effort is needed if this waste stream is to be effectively managed in the forthcoming decade.

Reform in the management of WEEE collected from households (WMRO_EPR11). Understanding the management of WEEE collected from households remains a substantial challenge at the national level. In this regard the Government will look at putting in place reforms from 2021 onwards in terms of household WEEE collection through the utilisation of EPR. A key barrier is overcoming the issue of economies of scale. To this end the Government will reform the current bulky refuse system with a view to set up a system for the separate collection of WEEE from households and its subsequent management at a regional level through an open and transparent tendering procedure. The intent behind this measure is for the Regions to handle the organisational aspect and for the PROs to finance the service.

Determination of the lifespan of EEE in Malta (WMRO_EPR12). This will assist the Government to take a decision on whether Malta should review its current methodology for the calculation of the collection rate. This action will be implemented between 2021 and 2023.

Assessment of the real cost for the collection & management of WEEE (WMRO_EPR13). A thorough assessment will be made to calculate the actual cost incurred for the management of WEEE at the national level, particularly in view of an eventual increase in WEEE collected. Given the importance of setting a baseline of information in this regard the Government will be making this measure a priority to be implemented in the first years of the delivery of this WMP (2021 to 2023). The study shall also take into consideration newly emerging WEEE. The outcome of this study will be applied to determine the actual costs charged to producers and/or PROs.

Introduction of a pricing mechanism for WEEE (WMRO_EPR14) will also be introduced as part of the suite

93 The Waste Management (Electrical and Electronic Equipment) Regulations, (S.L. 549.89) transposing Directive 2012/19/EU.

of actions on WEEE. The current system will be coupled with more stringent controls by the competent authorities to enhance efficiency within the whole sector, in the form of price regulation. That is, in order to ensure that producers of EEE are financing the full cost of collection, treatment, recovery and environmentally sound disposal, the relevant authorities will be regulating the price to be charged to producers of EEE by PROs, guaranteeing the financial sustainability of the entire system in the long run. The fees charged to producers will be modulated depending on, inter alia, the durability, reusability and recyclability of the equipment. This action will be implemented from 2021.

Setting of standards for environmentally sound treatment of WEEE (WMRO_EPR15). In line with the WEEE Directive, the Competent Authority will require that all waste management operators in Malta apply mandatory standards on treatment of WEEE. Noting the importance and usefulness of such standards this measure will be implemented in the first phase of the delivery of this WMP from 2021 onwards.

Tackle the issue of larceny, do-it-yourself dismantling of WEEE and illegal scrap yards (WMRO_EPR16). This will be complemented by targeted enforcement activities with a view to discourage dismantling of equipment in private garages and unregulated workshops as well as regulating sound traceability of materials. This measure is a medium-term action to be implemented from 2024.

6.6.4. Waste Batteries and Accumulators

The Waste Management (Waste Batteries and Accumulators) Regulations (S.L. 549.54) brings into effect most of the provisions of Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators. These Regulations seek to improve the environmental performance of batteries and accumulators, by maximising the separate collection of waste batteries and accumulators and achieving a high level of recycling for all waste batteries and accumulators as well as to improve the performance of the activities of all economic operators, in particular producers and recycling facilities. Furthermore, these Regulations aim to ensure the smooth functioning of the internal market and avoid distortion of competition within the European Union.

The Waste Batteries and Accumulators Regulations apply to all types of batteries and accumulators irrespective of their shape, volume, weight, material composition or use, and applies also to those batteries incorporated in electrical and electronic equipment, as well as those accumulators incorporated in end of life vehicles.

These Regulations set out national targets for the collection and recycling of waste batteries and accumulators, while emphasising on the optimisation of collection and recycling practices in order to minimise costs and the negative impacts on the environment.

Producers of batteries and accumulators are required to provide for the financing of collection and treatment of waste batteries and accumulators. Such producers may wish to fulfil their obligations either individually or by participating in a waste batteries and accumulators compliance scheme.

The following targeted measure is being put forward with a view to enhance the current system:

Separate collection of waste batteries and accumulators (WMRO_EPR17). In order to facilitate recycling of waste batteries and accumulators, the separate collection of waste batteries and accumulators by (i) category or/and (ii) chemical composition will be made mandatory, through systems financed by the producers and/or PROs. It is envisaged that this action will be implemented from 2027 onwards.

6.6.5. End of Life Vehicles

End-of-life vehicles (ELVs) generate significant amounts of waste in Malta every year, which need to be managed in an environmentally sound manner. Legislatively this challenge is addressed through the Waste Management (End of Life Vehicles) Regulations at the national level the provisions of this legislation aim at minimising the environmental impacts of ELVs through means of better design of vehicles, increased waste prevention, reuse, recycling and recovery of materials, parts and components arising from dismantling and depollution of ELVs. It also aims at improving the environmental performance of all of the economic operators involved in the life cycle of vehicles and, especially, the operators directly involved in the treatment of ELVs.

In light of the aforementioned the following specific measures related to ELVs are to be undertaken as part of the implementation of the WMP broken down between legislative; compliance and monitoring; governance; research and development and education.

With respect to legislative actions the Government will be enacting two main actions to be undertaken in the first phases of the implementation of this WMP from 2021 onwards.

Guidance on the environmentally sound maintenance of vehicles (WMRO_EPR18) will also be published. These guidelines will be designed to provide clarity for stakeholders in terms of ensuring the correct dismantling of ELVs as well as covering areas such as shipments of used vehicles, parts and components and setting out requirements for used parts and components intended to be reused/sold in Malta.

Establishment of an environmental permitting regime for the automotive sector (WMRO_EPR19). The Government will establish a comprehensive environmental permitting regime to cater for those economic activities which could generate negative environmental impacts, with a view to set criteria and operational standards to prevent and/or mitigate any adverse consequences on the environment. To this effect, specific requirements for the storage and handling of, amongst others, automotive waste batteries and accumulators as well as waste oils arising from the repair and maintenance sector will be set.

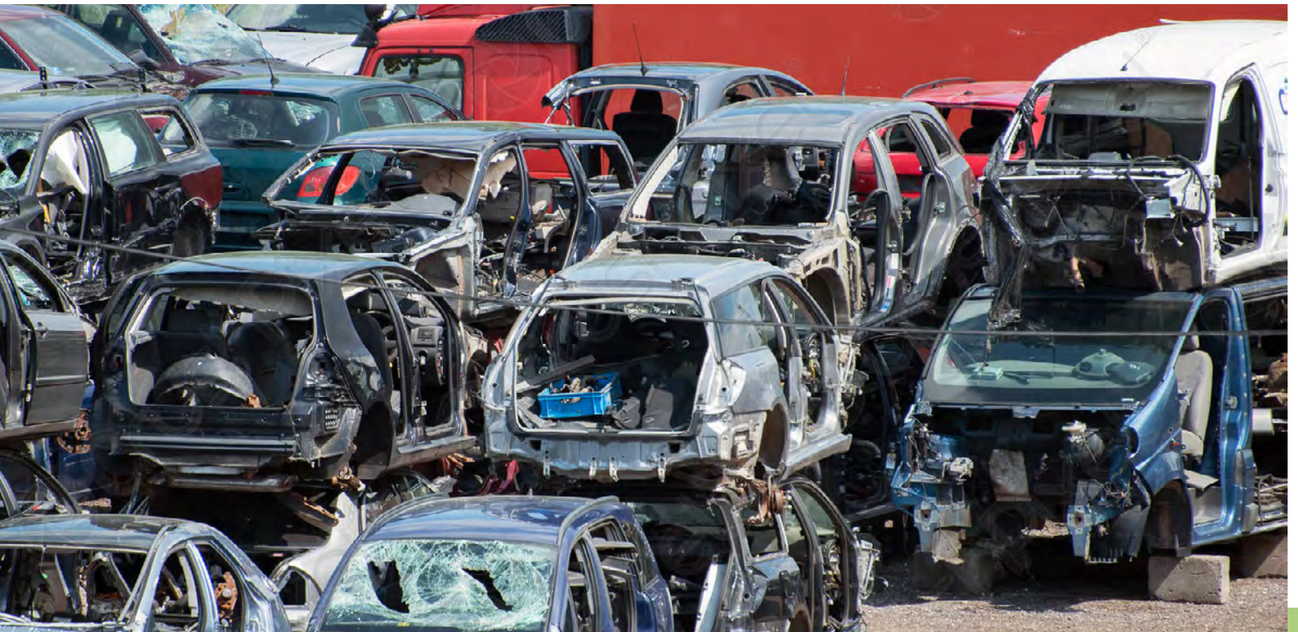
Tackling the issue of do-it-yourself dismantling of vehicles and illegal scrap yards (WMRO_EPR20). Through the identification of illegal scrap yards and targeted enforcement activities with a view to discourage dismantling of vehicles in private garages and unregulated workshops

Auditing the Authorised Treatment Facilities (WMRO_EPR21). The Environment and Resources Authority will endeavour to audit the national ATFs, with a view to certify that such operations comply with national legislation and permit conditions. Moreover, the audits will also verify that all the information reported by the ATFs to the Competent Authority cover all waste categories handled by the facilities, from the point of acceptance into the facility to the final treatment. Auditing costs will be borne by the operators of the national ATFs.

Undertake a comprehensive review and assessment of the ELV sector (WMRO_EPR22). This assessment will be aimed at assessing current practices vis-à-vis the implementation of the EPR. This will constitute an integral part of the overall review of the national legal framework on EPR and aim to identify potential actions to ensure that the said principle is fully reflected in the management of ELVs[94].

Launching nationwide awareness-raising campaign for ELVs (WMRO_EPR23). The Government recognises that all citizens and interested stakeholders alike need to understand the actions and policies that are being enacted if such measures are to be successful. To this end a nationwide awareness raising campaign will be undertaken with a specific focus on EPR for ELVs. The aim of the campaign will be increase awareness of the environmental impacts of ELVs and the consequences of the mismanagement of such wastes. The awareness campaign will be undertaken from 2024.

94 WMRO_EPR22 assessment will aim to assess whether EPR for ELVs is self-financing. The assessment will determine whether the system has the potential to work under all market conditions and identify potential measures to ensure that the national system is sufficiently flexible and resilient to adapt to any market disruption and whether the establishment of PROs is necessary.



6.6.6. Single Use Plastics and Fishing Gear

Single use plastics are a major waste challenge for all countries let alone Malta. To this end, the Government will utilise EPR as an additional tool in order to effectively address this environmental issue.

Introducing EPR schemes for a number of SUP products (WMRO_EPR24). The Government shall endeavor to introduce EPR Schemes for a number of targeted single-use plastic items and fishing gear in line with the spirit of the Single-Use Plastic Products Strategy for Malta and the provisions of Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment. The targeted products are tobacco product with filters, wet wipes, balloons, cups for beverages, beverage containers, packets and wrappers, as well as food containers. Producers of these targeted products shall be obliged to cover, amongst others, the cost of the collection of such waste products from public collection systems and the clean-up of litter as well as the cost for any awareness raising measures.

Additionally, acting to reduce pollution of the marine environment by limiting the environmental impact of fishing will also be tackled by an EPR system. These actions will be linked to and undertaken in support of the delivery of the national Single Use Plastic Strategy. This action will be undertaken from 2024.

6.6.7. Waste Oils

Waste oils are a hazardous waste stream that has a huge potential for recovery. To this end the Government will enact two measures to not only reduce the environmental impact of this waste stream but also maximise the resource potential of waste oils including engine oils, hydraulic oils and industrial oils. These measures will ensure that for the forthcoming coming decade the management of waste oils will be done in an as environmental sound manner as possible.

Enactment of national legislation establishing a national EPR scheme for waste oils (WMRO_EPR25). It is being suggested to consider enacting legislative measures to establish producer responsibility for waste oils, whereby producers shall use existing systems or set up new systems, either individually or collectively, or both, to provide for the return and/or collection of waste oils as well as their recovery in line with the Waste Management Hierarchy. To this effect, it is being recommended that ambitious national collection and recycling targets - to be achieved by producers or PRO/s - be set. As part of this measure, the establishment of a reporting regime for producers/PROs will also be considered.

Launching nationwide awareness-raising campaign for waste oils (WMRO_EPR26). A nationwide awareness-raising campaign will be launched to heighten the level of knowledge of the public community with regards to the environmental impacts generated by the mismanagement of waste oils, and to educate the public on the need to dispose of such waste properly.

6.6.8. End of Life Tyres

Enactment of legislation establishing a national EPR scheme for end-of-life tyres (WMRO_EPR27). Due to road safety requirements and regulations, tyres are replaced frequently, resulting in large volumes of waste tyres generated across the Maltese Islands every year, which need to be treated in an environmentally sound manner. In this respect, end-of-life tyres have a considerable recovery potential, notably by way of recycling, as they can replace the use of raw materials in other industrial or recreational uses. In view of this and in the absence of targeted European and national legislation governing the management of such waste, the Government will take action to address End of Life Tyres using EPR. This will be undertaken from 2021.

6.6.9. Waste textiles

Carry out a feasibility study to assess current practices, the need to establish an EPR scheme for textiles and potential alternative and/or additional measures (WMRO_EPR28) and identifying where applicable appropriate alternatively methods of addressing waste textiles. Waste textiles represent a significant environmental impact in terms of their management. At the EU level this is addressed through the provisions of the Waste Framework Directive which stipulates the requirement for a separate collection system for waste textiles. In this regard the use of EPR as tool to address waste textiles will be implemented as part this WMP. Ultimately the Government aims to divert waste textiles away from landfill. However, it must also be recognised that as a first step, given the potentially significant implications of such as system, that a thorough feasibility assessment of the introduction of such a policy is undertaken.

6.6.10. Non-packaging paper

Enactment of legislation establishing a national EPR scheme for non-packaging paper (WMRO_EPR29). Non-packaging paper represents a large share of paper placed on the market of Malta, which, upon becoming waste, needs to be managed in a cost-efficient and environmentally-sound manner. To date, such waste stream is not directly regulated and is being handled through systems financed by the PROs established for packaging and packaging waste. This has resulted in severe financial repercussions on the said PROs. The modalities whereby such an EPR scheme is established are yet to be decided and will be subject to public consultation once a concrete proposal is formulated.

The Government will enact appropriate national legislative measures to establish producer responsibility for non-packaging paper waste. Through the establishment of such an EPR scheme at the national level, producers will be required to use existing systems or set up new systems, either individually or collectively, or both, to provide for the collection of non-packaging paper waste as well as their recovery in line with the Waste Management Hierarchy. To this effect, it is being recommended that ambitious national targets - to be achieved by producers or PRO/s - be set. The above-mentioned targets will also be coupled with a reporting regime for producers and PROs.

6.7. EPR measures at a glance

Measure code	Details
Short term measures (2021 to 2023)	
WMRO_EPR2	Ensuring that producers and PROs bear the full costs of the management of the waste arising from the products placed on the national market
WMRO_EPR4	Enhancing cooperation with the Government entities responsible for competition and financial matters
WMRO_EPR6	Improving reporting by producers and PROs on their operations
WMRO_EPR7	Enacting national legal instruments on responsibility for waste management
WMRO_EPR9	Strengthening the capacity of the Environment and Resources Authority in the EPR sector
WMRO_EPR10	Promoting the establishment of systems to reuse packaging in an environmentally sound manner other than beverage containers.
WMRO_EPR11	Reform in the management of WEEE collected from households
WMRO_EPR12	Determination of the lifespan of EEE in Malta
WMRO_EPR13	Assessment of the real cost for the collection & management of WEEE
WMRO_EPR14	Introduction of a pricing mechanism for WEEE
WMRO_EPR15	Setting of standards for environmentally sound treatment of WEEE

WMRO_EPR21	Auditing the Authorised Treatment Facilities
WMRO_EPR19	Establishment of an environmental permitting regime for the automotive sector
WMRO_EPR27	Enactment of legislation establishing a national EPR scheme for end-of-life tyres
WMRO_EPR29	Enactment of legislation establishing a national EPR scheme for non-packaging paper
Medium term measures (2024 – 2027)	
WMRO_EPR1	Government will undertake a thorough review of the current legislative environment for EPR in Malta
WMRO_EPR3	Government will also take steps to where necessary restructure the nature and character of PROs to ensure the continued strengthening and improvement of the EPR at the national level
WMRO_EPR5	Enabling better market surveillance, compliance and enforcement of producers' obligations
WMRO_EPR8	Develop a knowledge-sharing platform for specific waste streams across all stakeholders
WMRO_EPR16	Tackling the issue of larceny, do-it-yourself dismantling of WEEE and illegal scrap yards
WMRO_EPR22	Undertake a comprehensive review and assessment of the ELV sector
WMRO_EPR18	Guidance on the environmentally sound maintenance of vehicles
WMRO_EPR20	Tackling the issue of do-it-yourself dismantling of vehicles and illegal scrap yards
WMRO_EPR23	Launching nationwide awareness-raising campaign for ELVs
WMRO_EPR24	Introduction of EPR schemes for a number of SUP products
WMRO_EPR25	Enactment of national legislation establishing a national EPR scheme for waste oils
WMRO_EPR26	Launching nationwide awareness-raising campaign for waste oils
WMRO_EPR28	Carry out a feasibility study to assess current practices, the need to establish an EPR scheme for textiles and potential alternative and/or additional measures
Long term measures (2027 – 2030)	
WMRO_EPR17	Separate collection of waste batteries and accumulators

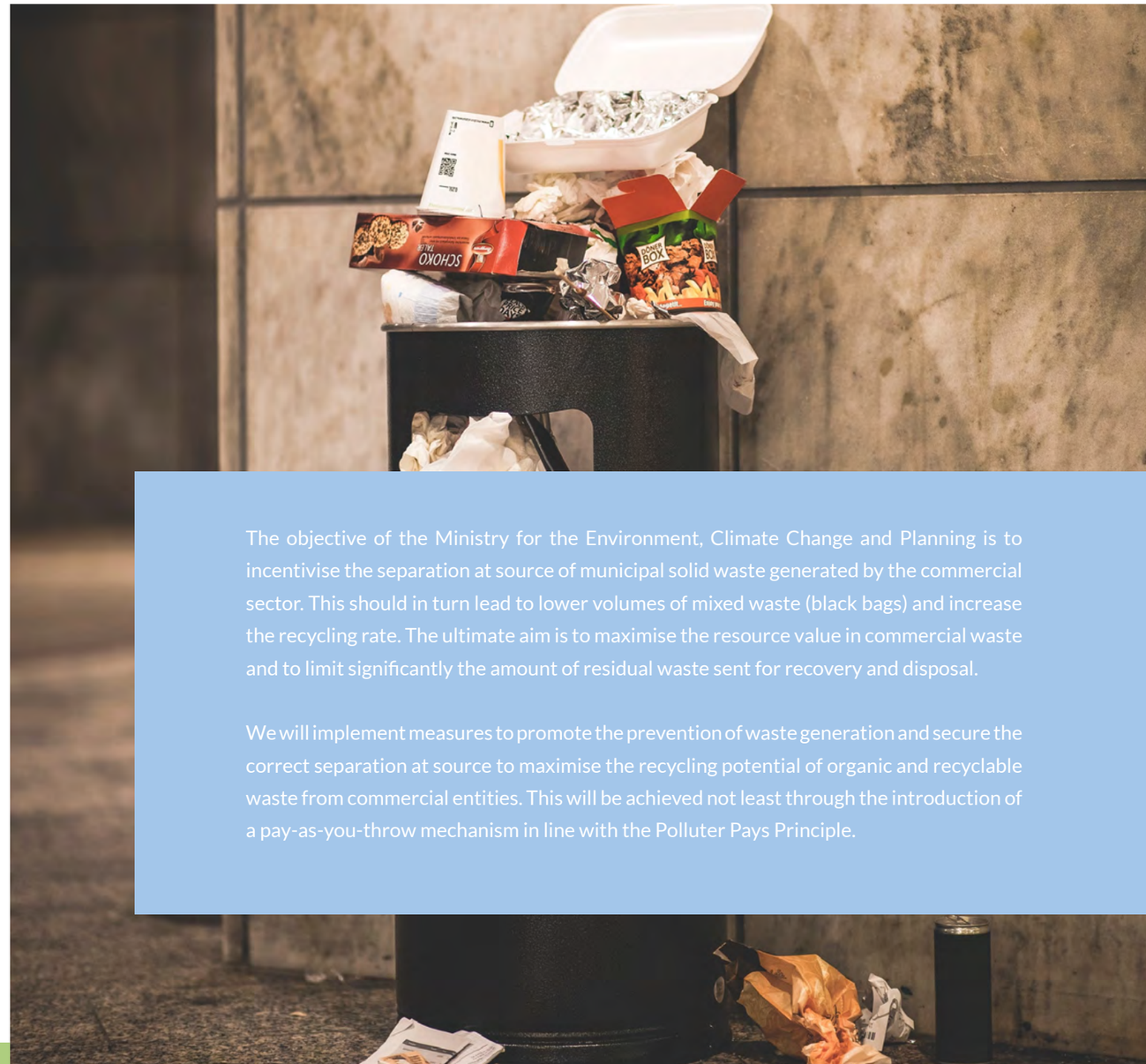
Table 31: EPR measures at a glance

6.8. Addressing Commercial Waste

6.8.1. The Commercial Waste Challenge

Commercial waste is defined in the Waste Regulations (S.L. 549.63) as waste which is generated "from premises used wholly or mainly used for the purposes of a trade or business or the purposes of sport, recreation or entertainment, excluding household waste, industrial waste and extractive waste[95]".

95 https://legislation.mt/eli/sl/549.63/eng/pdf



The objective of the Ministry for the Environment, Climate Change and Planning is to incentivise the separation at source of municipal solid waste generated by the commercial sector. This should in turn lead to lower volumes of mixed waste (black bags) and increase the recycling rate. The ultimate aim is to maximise the resource value in commercial waste and to limit significantly the amount of residual waste sent for recovery and disposal.

We will implement measures to promote the prevention of waste generation and secure the correct separation at source to maximise the recycling potential of organic and recyclable waste from commercial entities. This will be achieved not least through the introduction of a pay-as-you-throw mechanism in line with the Polluter Pays Principle.

Data pertaining to the generation of commercial waste is limited, since reporting obligations at a European Union (EU) level concern only municipal solid waste (MSW). MSW consists of waste from households and waste from other sources, such as retail, administration, education, health services, accommodation and food services, and other services and activities, which is similar in nature and composition to waste from households[96]. Hence commercial waste is perceived as a subset of MSW. However, the proportion of commercial waste that makes up the total MSW generated is unknown, as a number of commercial establishments make use of the collection systems which is financed by Local Councils and which is intended for domestic waste.

The amount of commercial waste disposed of as residual waste is considered to be significant. In 2018, 42,406 tonnes[97] of mixed residual waste was collected from commercial establishments who engaged private waste carriers and this is only a fraction of what is perceived to be generated. This means that commercial waste is an untapped valuable resource which, regrettably, is currently destined for landfilling. Thus, waste from commercial establishments needs to be separated at source to facilitate its processing at the designated treatment facilities thus diverting it away from landfill.

In the absence of a regulatory regime for commercial waste, many operators opt to dispose of their waste as mixed residual waste, often using the collection system provided by the Local Councils. Some larger establishments currently engage the collection services of a private waste carrier. However, the waste is generally co-mingled.

The lack of proper waste management practices in the commercial sector is translating into several issues not least a lack of a level playing field amongst commercial enterprises. The resultant implications of not addressing the proper management of commercial waste are outlined in Table 32.

96 Recital 10 of Directive (EU) 2018/851 amending the Waste Framework Directive

97 NSO, 2019. NSO News Release – Municipal Waste: 2018. (https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_B3/Environment_Energy_Transport_and_Agriculture_Statistics/Documents/2019/News2019_197.pdf)

Issues	Counter-implications
92.9% of Municipal Solid Waste (which includes commercial waste) was landfilled in 2018	More landfill space (**=land expropriation**) needed at a **premium cost** (not only financial) and consequent negative visual and sensory impact
Low waste separation rates in commercial establishments (if at all) – most waste is mixed in black bags	In order to achieve Malta's waste management targets, waste treatment plants in which Wasteserv is investing (and existing ones) require source-separated waste to operate efficiently. These will not produce desired results if waste is not separated at source and neither will the said targets be achieved.
Malta has not and will not reach targets for: ■ **Waste Framework Directive** ■ **Landfill Directive** ■ **Packaging and Packaging Waste Directive**	Infringement procedures might follow not only for 2020 but even beyond unless waste separation is not increased across the board (by commercial establishments and householders)
No regulatory framework for commercial establishments that also does not provide a level playing field amongst commercial operators	Waste in the black bag remains high implying higher rates of recovery or landfilling resulting in non-compliance with EU targets
Waste collection services by Local Councils were intended for households (even if LCs are legally obliged to collect all refuse), and their financial allocation is insufficient as a result of commercial waste	The waste collection system is under pressure with public funds 'subsidising' private operational costs.
Distorted level playing field between the larger establishments incurring costs for waste collection and smaller ones free-riding on the Local Council system	The lack of a regulatory framework discourages those who voluntarily separate their waste (mostly through corporate social responsibility)
Lower rates of participation from households as a result of inaction on commercial operators	Households often condemn commercial establishments for not doing their part and this tends to instigate reluctance in waste separation on behalf of the householders

Table 32: Issues and counter implications

These challenges can be addressed through a robust regulatory framework which, amongst others, mandates the separation of waste at source and introduces the pay-as-you-throw (PAYT) principle. This not only incentivises waste prevention as the best option but promotes waste separation at source by making it more expensive to generate increased volumes of mixed residual waste as opposed to separate organic

and recyclable waste. In the longer term, it is envisaged to introduce differentiated tariffs on waste bags, depending on type and size. In the shorter term free night-time collection service on weekends will be offered in "tourist areas" to entice source separation of organic waste from commercial establishments.

6.8.2. Commercial waste policy – current status and future needs

The Waste Regulations (S.L. 549.63) already ascribe the duty of care of waste to its producers and holders, but to date, there are no specific regulatory obligations on owners or operators of commercial establishments to separate such waste at source, nor to manage the waste they generate. The only waste-related regulatory instrument applies to catering establishments, defined as "restaurants, snack-bars, bars, nightclubs/ discotheques and kiosks" duly licensed by the Malta Tourism Authority (S.L. 409.15), and for hotels and licensed tourism accommodation facilities (S.L. 409.04). These establishments are specifically obliged by their permit to engage a third-party contractor to collect their waste. However, there is still no mandate to separate this waste at source. Furthermore, the enforcement of this provision requires strengthening as it is currently considered weak.

Government pledged to regulate waste generated by the commercial sector as part of Budget 2019 (Measure 55 – Budget 2019). This had already been identified as a point of action in the Waste Management Plan 2014-2020, but no action had been taken to the detriment of public finances.

6.8.3. Commercial Waste Measures

In order to address the negative implications and externalities associated with the current disposal model for commercial waste, a variety of measures are being proposed. These measures, to be implemented over three phases, will aim to move waste up the management hierarchy – through prevention and correct recycling – as well by reducing the reliance on limited landfill space. This will also support Malta's transition to a more circular economy.

Phase 1: Promote the voluntary separation of organic waste

Measures enacted in the short term will aim to encourage a shift in practices towards waste prevention and proper separation. This will transition to a regulatory obligation thereafter.

Explore the introduction of a service charge to implement the pay-as-you-throw concept (WMRO_CW1). This is the first step, intended to prompt preparatory voluntary action by commercial establishments to the reality that we must face up to.

In order to facilitate this transition, additional, free Saturday and Sunday collections of organic waste will be organised in tourism zones (WMRO_CW2). Such collections are anticipated to take place on Saturdays and Sundays between 01:00 and 05:00 to dovetail with commercial business hours in tourism zones defined

by Legal Notice 295 of 2007. Although the uptake of voluntary measures cannot readily be quantified, it is anticipated that participation will be forthcoming considering the collection service for separate organic waste from commercial establishments will be provided for free at a convenient hour, enabling the immediate disposal of such waste.

Provide training to commercial outlets on waste prevention and correctly implementing separation at source (WMRO_CW3). In order to support the first steps of the transition towards from the new regulatory framework for the commercial sector, the Ministry will be providing information on ways to minimise waste generation, including plastics and food waste, as well as how to correctly separate waste. Appreciating the current burden on the industry due to the COVID-19 pandemic, Government will invest resources into providing training to the industry on implementing separation-at-source, as well as ways to reduce waste generation. This will involve appointing technical people to support the industry to seek solutions to reduce waste and separate correctly in order to help keep costs sustainable. This measure will continue into the medium term.

These short-term measures are anticipated to lead to lower volumes of mixed waste (black bag) sent to landfill and hence increase the lifespan of the limited remaining landfill void space which is decreasing at an alarming rate. They will also result in an increase in the volume of organic waste which is separately collected for treatment in the upgraded Sant'Antnin facility from which clean energy is generated via a process of anaerobic digestion. The free Saturday and Sunday collection of organic waste from commercial establishments would also serve as an exercise upon which real data sets can be collected. These will enable the ground-truthing of approximated data in terms of waste generated by the commercial sector upon which operational models can be refined to reflect the true cost of waste management.

Phase 2: Ensure the mandatory separation of organic and recyclable waste from all households and commercial outlets

Following the measures to facilitate voluntary separation of organic waste for collection, a series of medium-term measures are being proposed to ensure the separation of organic and recyclable waste from commercial establishments. This should come into force in 2022, and it should also run in parallel with a number of actions listed in the long-term including the registration processes.

Mandatory separation of organic and recyclable waste from all households and commercial outlets (WMRO_CW4). Regulations will be introduced mandating all households and commercial waste owners and operators to segregate their waste at source. Failure to separate organic waste at source will be considered an offence. This will be coupled by heightening the enforcement capacity to reinforce the strength of the measure. It is not envisaged that this measure will place significant financial burden on the businesses, with the main cost at this stage occurring in the form of waste bags – a cost which at present they already incur, alongside the time to train staff on correct separation. The information provided under Measure (WMRO_

CW3) which will support establishments in waste prevention initiatives, has the potential to lower waste generation and associated costs.

Continued free Saturday and Sunday collection of organic waste (WMRO_CW2). Such collections of organic waste are anticipated to take place on Saturdays and Sundays between 01:00 and 05:00 from tourism areas as defined for the purposes of Legal Notice 295 of 2007. This service will be provided throughout 2022 or until dedicated smart waste bins are installed for such purposes.

Phase three: Introduce a Pay-As-You-Throw system

The pay as you throw (PAYT) system will be implemented to incentivise the prevention, and correct separation, of waste from commercial establishments as of 2023. PAYT is considered to be the building block of an efficient and effective operational model, flexible enough to cater for the diverse needs of the commercial sector, without impinging on the quality or cost of waste collection services provided to residents.

The PAYT system will enable commercial establishments to join the national effort to divert as much waste as possible away from landfill, whilst maximising the intrinsic resource value of waste and contributing to our waste targets. Conscious businesses who embark upon efforts to prevent waste and ensure separation at source will bear a lower cost of waste management than those who are more careless.

Refine methods for recovering the full cost of waste management (WMRO_CW5). In order to maximise existing collection logistics, two systems are proposed, intended to run in parallel and ensure full cost recovery, and which reflects the unit volume and type of waste generated. These two mechanisms are namely:

a) Commercial establishments currently engaging licensed waste carriers for the collection of waste through direct contractual agreements, can retain such model but must guarantee the separate collection of waste fractions;

b) Consolidating the waste collection service offered by local Government against an administrative fee.

Phase three continued: Reform the existing system of different waste bags particularly the black bag

Design new organic and residual waste bags to an approved standard and impose an eco-tax equivalent to cover the collection and treatment costs of its contents. Such waste bags would be transparent to enable swifter enforcement action based on the mandatory waste separation provisions. Subsequently, the system of black bags available at retail outlets without pre-payment features would be discontinued. This would require the amendment of the Eco-contribution Act.

Discontinue existing waste bags and introduce standardised waste bags (WMRO_CW6). The black bags are currently purchased at any retail outlet. The price of these bags is based solely on the cost of its production, importation and an excise duty, and does not feature any pre-payment for its collection or disposal. It is being proposed to discontinue this system and introduce a pre-payment feature based on the volume of the waste bag and the type of waste it should contain. For the purpose of the new model of waste separation for collection, new organic and residual waste bags will be designed to an approved standard, with the intention of distinguishing them from existing bags.

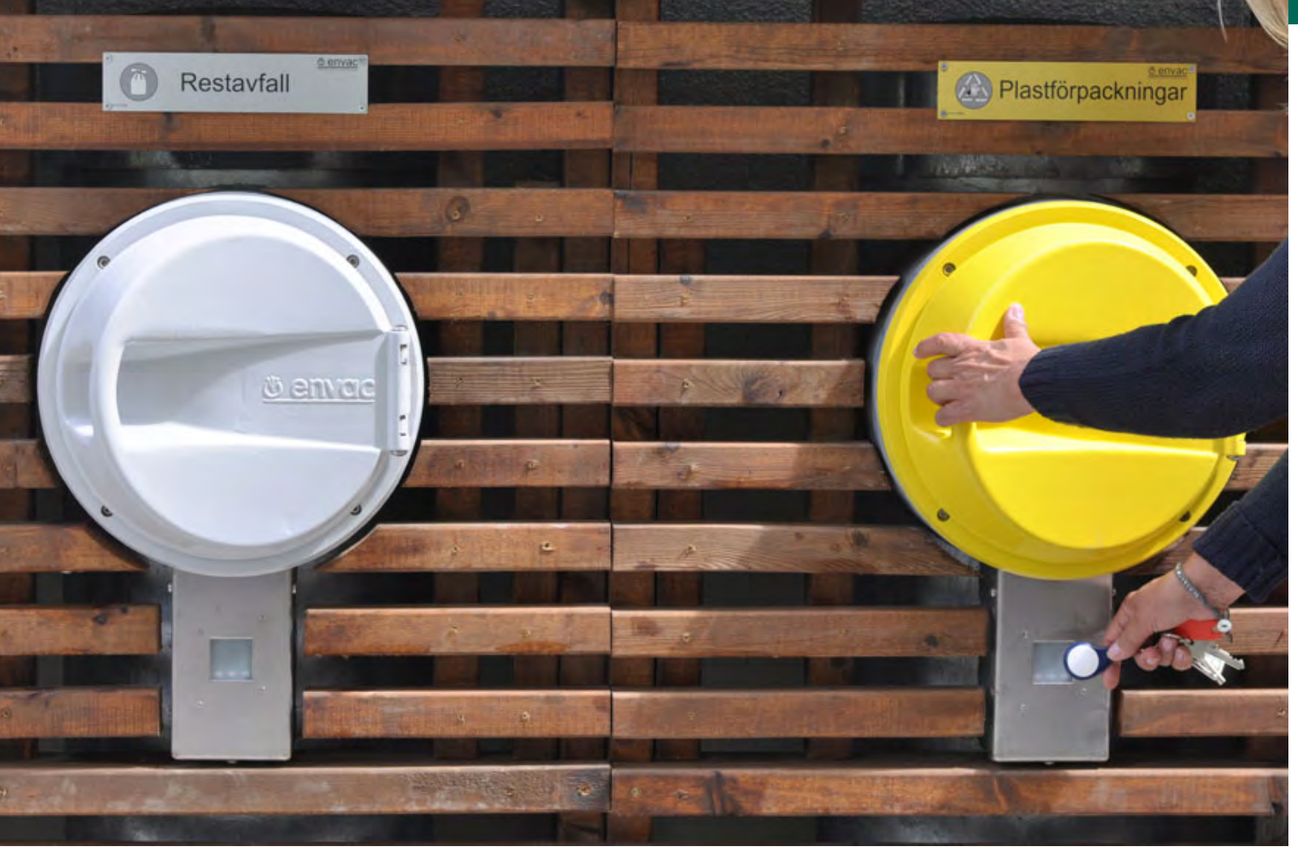
Amendments to the Eco-Contribution Act (WMRO_CW7). A pre-paid service charge will characterise the cost of the different bags which is intended to cover the collection and treatment costs of each waste stream. The inclusion of a service charge on waste bags shall implement the PAYT principle through unit-based pricing. Rates for residual and organic waste will be differentiated to incentivise the minimisation of waste and the separation of waste generated thereby having a realistic chance to meet Malta's waste management targets.

Provide a set amount of waste bags of residual and organic waste free of charge to residents through the ARMS database (WMRO_CW8). The proposed service charge would be applicable to households. Conscious that this can have a more significant burden on low-income households and in order to respect Government's choice not to impose waste charges on households, it is being proposed that a set amount of black waste bags for mixed and white waste bags for organic waste is provided for free to complement the current system. The ARMS database classifies buildings according to their current use, thereby permitting the easy identification of residential premises and the number of persons registered therein.

Publication of subsidiary legislation to regulate commercial waste (WMRO_CW9). The obligations of owners and operators of commercial establishments shall be set in subsidiary legislation to include the mandatory provisions to register their activity, the obligation to separate waste at source, and the exclusive use of waste bags compliant with national standards with a pre-paid fee for its collection and treatment.

Introducing Artificial Intelligence in commercial waste management to enable better tailoring of disposal methods to business hours (WMRO_CW10). Recognising that households and commercial establishments have different operational hours, it is intended to make the process for commercial establishments to deposit their waste as hassle-free as possible, without impinging upon street cleanliness. To this effect, smart waste depots for residual and organic waste will be set up, such that they may be accessed 'on demand' by commercial establishments through the integration of Artificial Intelligence. Local Councils will be responsible for identifying sites for the smart waste depots according to the density of commercial outlets.

Lead by example by ensuring that all Government buildings become more waste centric (WMRO_CW11). As part of the first phase of this programme, it is also proposed to include all Government buildings in these requirements such that Government may lead by example. This means that waste generated from



Government buildings would be subject to the same regulatory regime as that of commercial establishments thus ensuring a level business playing field in this respect.

These initiatives are part of the national effort to divert waste away from landfill, maximise the intrinsic resource value of waste, contribute to Malta's achievement of EU targets and to support in the transition towards a more resource-efficient and circular economy.

Registration of businesses identifying collection options in the transitory period (WMRO_CW12). In order to comply with the 'once only' principle for the request of data, the commercial establishments to be included will be those who are already registered with an entity of Government in terms of another regulatory provision. This would include establishments who handle food and who are already registered with the Public Health Department and for whom automatic registration would be possible. Once the Business Register, being compiled by Business First, is complete, then all establishments under this Register will be brought into the system automatically. Commercial establishments who already have contractual agreements with waste carriers shall be given the choice to retain this system. However, all other establishments will be obliged to subscribe to the collection organised by the Local Council.

6.9. Commercial waste measures at a glance

Measure code	Details
Short term measures (2021 to 2023)	
WMRO_CW1	Explore the introduction of a service charge to implement the pay-as-you-throw concept
WMRO_CW2	In order to facilitate this transition, additional, free Saturday and Sunday collections of organic waste will be organised in tourism zones
WMRO_CW3	Provide training to commercial outlets on waste prevention and correctly implementing separation at source
WMRO_CW4	Mandatory separation of organic and recyclable waste from all households and commercial outlets
WMRO_CW5	Refine methods for recovering the full cost of waste management
WMRO_CW6	Discontinue existing waste bags and introduce standardised waste bags
WMRO_CW7	Amendments to the Eco-Contribution Act
WMRO_CW8	Provide a set amount of waste bags of residual and organic waste free of charge to residents through the ARMS database
WMRO_CW9	Publication of subsidiary legislation to regulate commercial waste
WMRO_CW10	Introducing Artificial Intelligence in commercial waste management to enable better tailoring of disposal methods to business hours
WMRO_CW11	Lead by example by ensuring that all Government buildings become more waste centric
WMRO_CW12	Registration of businesses identifying collection options in the transitory period

Table 33: Commercial waste measures at a glance

7

ENSURING COMPLIANCE

The core objective of the measures described herein is to stimulate the shift of waste up the waste hierarchy, by facilitating, incentivising and enforcing compliance with obligations.

7.1. Monitoring and Compliance Background

A common theme across waste prevention, collection and management is the need to move waste up the hierarchy, to ensure that it is dealt with in the best possible manner. To do this, a strong suite of policies is in place and are proposed as part of this plan, however, inherent in this approach is the need for monitoring of waste practices, and for enforcement to ensure compliance to be put in place. This chapter outlines how this is to be done by considering the facilities management and dumping of waste, amongst parts of the process.

Facilities and waste obligations

Waste management entails a wide number of obligations, particularly those arising from EU legislation. These range across sources, streams and processes, while employing the varied waste infrastructure in order to achieve these obligations. The infrastructure serves to treat waste in a multitude of ways, including bring in sites; civic amenity sites; material recovery facilities; mechanical biological treatment plant; thermal treatment facilities; WEEE storage facilities and as a least preferred option engineered landfills. Diversion of waste from landfill is the unifying objective across this work.

Extended Producer Responsibility (EPR)

EPR is a concept which ensures that responsibility for the fate of a product still lies with the producer, with respect to the end-of-life stage of said product. Waste streams in Malta currently subject to EPR requirements are Packaging and Packaging Waste, Waste Electronics and Electrical Waste, End of Life Vehicles, and Batteries and Accumulators. As this Waste Management Plan proposes the development of this for a variety of waste streams, this chapter also includes measures targeting the EPR requirements at facilities. Such a principle is established in Union legislation through the Waste Framework Directive 2008/98/EC as transposed in the national legal framework via the provisions of the Waste Regulations, S.L.549.63.

Waste Dumping

Other than the issue of management of waste which is collected and in the process of being managed, local authorities must also contend with waste which has been disposed of inappropriately or illegally. This has been recorded by the authorities in various localities and sites over the years.

7.2. The policy context for Compliance

Enforcement

The Environment Protection Act places ERA as the competent authority for Compliance and Enforcement, with such responsibilities having been in fact consolidated into the Compliance and Enforcement Directorate. Among the policy priorities identified is the strengthening of enforcement itself, through increasing

the institutional capacity of ERA's Compliance and Enforcement Directorate, effectively enhancing the implementation of all the rest which follows. Some examples of ERA projects in the past pertaining to this include: The European Commission Structural Reform Support Service (SRSS) and numerous projects under the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL).

Waste Dumping

Legislation in place to target waste dumping is that of S.L.549.40, the Abandonment, Dumping and Disposal of Waste in Streets and Public Places or Areas Regulations Environment Protection Act (Cap. 549) and the Waste Regulations. S.L. 549.63 . The first, S.L.549.40, lays down fines which can be imposed on individuals found to be in breach of said legislation. The latter takes a more general approach to waste management across the islands.

7.3. Measures to Ensure Compliance

7.3.1. Waste Management Facilities

The next section will look at improvement of waste management facilities, with measures targeting one of the following three objectives:

- To maximise compliance in private waste management facilities and to improve their environmental performance:
- To ensure that all waste streams are disposed of appropriately:
- To improve efficiency and organisation of environmental data and reporting

Increasing compliance of current practices with the requirements of the EU will require increased efforts to ensure compliance through incentivisation and enforcement, while also providing the right platforms for communication. These measures are outlined below:

Setting up of economic incentives for waste management operators based on the compliance performance (MC_WMF1). Government shall set in place incentives for the Waste Management Industry, based on the compliance performance assessment conducted by ERA. As part of this, an 'environmental seal' will be granted to the operators which perform well, through investing in site equipment, collaborating in resolving local environmental issues and participating in pollution clean-up programs.

Implementation of an online platform for real-time collection and processing of data from waste management operators and digital contact with ERA (MC_WMF2). The creation of an online portal for real-time data analytics shall be implemented to collect, process and store data from operators thus ensuring traceability in real time of waste material flows; and provide information as to meet the reporting obligations of the waste management legislation. Such a system would also serve as an environmental information

system, thus fulfilling the requirements for the full implementation of the right to access environmental information. This reporting portal will be complemented by investment in technical and structural upgrades required for accurate data collection in sites operated by Wasteserv Malta; particularly the installation and operation of sound calibrated weighing bridges and investment in best available technologies for the sound measurement of incoming and outgoing waste. Operators shall also be facilitated with additional technological measures to enable direct and easier contact with waste experts at the Environmental and Resources Authority, such as an online customer service, for technical and educational support and to enable easier informative communication of waste management legislation, policies and updates to technical documents and guidelines.

Set up a system for publicly disclosing compliant and non-compliant offenders (MC_WMF3). The Environment and Resources Authority shall set up means by which it would publicly disclose names of offenders and/or businesses through ERA's official website when administrative fines and/or stop and compliance orders are issued.

Develop sector-based guidelines for good practice (MC_WMF4). Sector based guidelines shall be developed by ERA to aid both ERA officials and operators. These guidelines would lead to the creation of a level playing field across the sector, and while doing so, providing compliance assistance, including efforts to educate operators and the public to comply with the environmental regulations. Such sectoral guidelines would provide an overview of the waste management sector, types of waste, systems for reducing, collecting, treating and disposing of wastes, and the planning and implementing of such systems; and potential waste mitigation and management measures which may be adopted by the operators.

Set up incentives for waste management infrastructural and capacity-building investments for private operators (MC_WMF5). Targeted incentives will be provided to operators of waste management facilities (private facilities) when investing in upgrading equipment at their facilities. Not only would this lead to deductions in the bank guarantee of waste management facilities (stimulating compliance with permit conditions) but would also contribute to more accurate and reliable data being collected. Once the private sector expresses interest to engage in specific treatment activities in a feasible manner, there would not be the need for Government intervention. To this effect, Malta Enterprise has also included NACE Code E within which waste management activities fall as an eligible sector for financial assistance. Industry representatives are encouraged to facilitate investment in these, and other areas, which has not yet manifested despite no Government operations.

In addition to the above, landfill gate fees will be introduced. Having infrastructure in place to cater for waste streams is not enough. The next step is to ensure that waste reaches these facilities in the right way. Hence, there is the need for ensuring appropriate disposal as laid out in the following measures, which facilitate the attainment of such an outcome, particularly with problematic streams.

Set up a mechanism to facilitate access to EU funds for appropriate management of problematic waste streams (MC_WMF6). Government shall set a mechanism in order to facilitate the access to EU funds for all private operators so that waste streams such as gypsum, asbestos, and cement slurry, which are problematic to manage in an environmental manner are aptly catered for in the Maltese Islands.

Increase the administrative fee for de-registration of any vehicle not disposed of at an authorised treatment facility (MC_WMF7). Such fees are set out in the Registration and Licensing of Motor Vehicles Regulations (S.L. 368.02). The intention is to encourage individuals to properly dispose of their vehicles at Authorised Treatment Facilities rather than taking it to garages/facilities which are not ATFs.

Encourage the development of legal privately-owned storage depots for temporary storage of unsorted waste streams, including through an economic incentive (MC_WMF8). ERA will encourage the development of privately-owned storage depots for small-scale operations, whereby unsorted waste streams (such as bulky waste and waste collected through the service of skips) are temporarily stored for eventual re-use, recycling or recovery. Government shall introduce an economic mechanism, through which operators of such depots may benefit from a partial refund of costs associated with this activity.

Central to the operation of appropriate waste management is the data surrounding these actions. While a chapter is dedicated to the subject (See Chapter 5), the following measure is being proposed for its relation to enforcement and obligations.

7.3.2. EPR

As EPR includes the considerations extending beyond simply putting it into place, the measures required for the effective implementation of such an agreement involves both physical onsite changes, along with the more indirect actions pertaining to the technical expertise. These are outlined in the measures below:

Establish a centralised WEEE Collection point (MC_EPR1). This proposal would facilitate logistics for all relevant waste operators, Wasteserv Malta Ltd. as well as the Environment & Resources Authority (ERA). It would ensure smooth running of inspections in relation to WEEE. In addition, all other Civic Amenity (CA) sites would remain operative throughout the year whilst ensuring that storage capacities would not be exceeded, hence avoiding waste clutter in CA Sites.

7.3.3. Waste Dumping

Other than ensuring the responsibility of a products' fate remains that of the producer, the correct disposal of waste is also to be safeguarded. In order to achieve this, the following measures relating to waste dumping are being proposed:

Setting of responsibilities of the provisions laid down in S.L. 549.40 between the relevant competent authorities (MC_WD1). Taking into account the provisions laid down in S.L. 549.40, an exercise to clearly set out the subdivision of responsibilities between the relevant competent authorities shall be carried out between the ERA, the Local Enforcement System Agency and the Commissioner of Police. This would ultimately ensure that processes by different authorities are streamlined and do not impinge on one another's functioning.

Improving the legal framework in terms of enforcement of illegal waste dumping (MC_WD2). The current regulatory framework does not go into the required depth in tackling the issue of illegal dumping of waste within the Maltese Islands. Therefore, a thorough review of S.L.549.40, the Abandonment, Dumping and Disposal of Waste in Streets and Public Places or Areas Regulations shall be carried out, considering to repeal or amend the said Regulations in order to ensure that all matters related to illegal dumping are adequately catered for and fully aligned with the provisions of the Environment Protection Act (Cap. 549), the Waste Regulations, S.L. 549.63 and any other national legislation, particularly the Criminal Code (Cap. 9) and the Civil Code (Cap. 16).

Reform legislation to replace the current black bag with a transparent bag and delineate responsibilities between competent authorities (MC_WD3). This will ensure effective monitoring by all relevant responsible authorities, inter alia ERA, LESA and Police, and facilitate the involvement and collaboration of waste collectors to proper implement and enforce mandatory waste separation in Malta.

7.3.4. Institutional Capacity

While the role of enforcement has been placed in the hands of ERA, the need to strengthen the enforcement itself is seen. A variety of measures are thus being proposed to smoothen the implementation process for compliance and enforcement across the board. All the measures below are thus a part of ensuring that the set up necessary for compliance is in place, with measures ranging from enabling the overcoming of legislative and logistical hurdles to administrative considerations.

Increasing the administrative capacity of the Compliance and Enforcement Directorate (MC_IC1). This would involve an increase in the number of members available in the directorate, while enabling the shift from a reactive one to a more proactive, strategic and comprehensive one.

Reform of the waste legislation to reflect the national specificities (MC_IC2). This would involve the integration of elements which take into consideration both the need to transpose relevant EU Directives correctly and in a timely manner. It should also serve to facilitate daily operations of ERA officials by countering the country-specific hurdles.

Initiate Memoranda of Understanding to facilitate daily operations and formalise agreements (MC_IC3). ERA is to initiate a number of Memoranda of Understanding with various relevant competent authorities and

entities which functions are interlinked with those of ERA (e.g. Malta Customs Department, the Malta Police Force, etc.) in order to facilitate daily operations both from an operational point of view as well as formalising agreements in a clear and concise manner.

Strengthen the technological capacity of the ERA (MC_IC4). The ERA shall endeavour to invest in best available technologies and equipment, including inter alia tablets, GPS equipment, hand-held devices such as micrometres and personal protective equipment related to field inspections, so as to improve the effectiveness of the site inspections carried out by the Compliance and Enforcement officers.

7.4. Measures for ensuring compliance at a glance

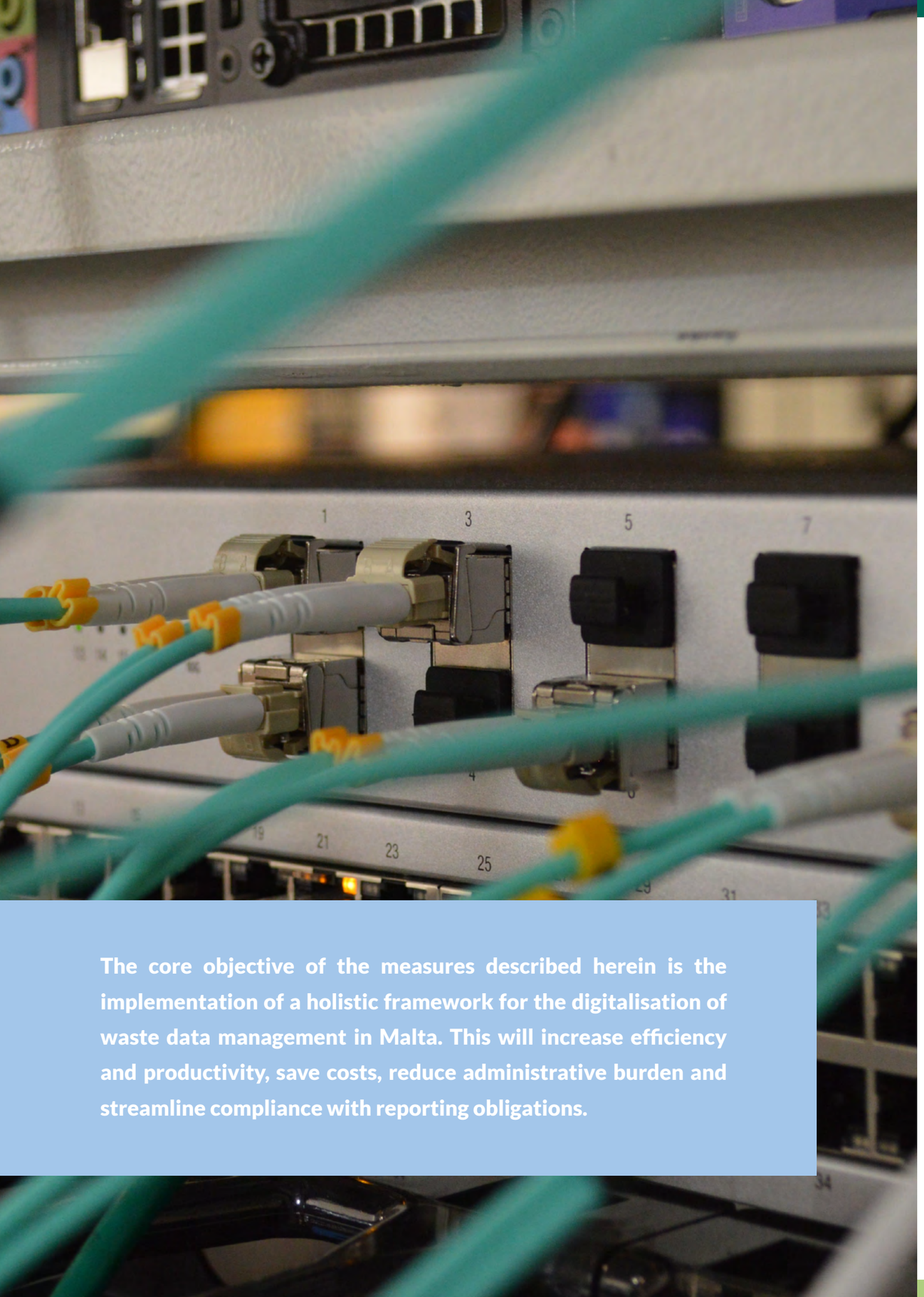
Measure code	Details
Short term measures (2021 to 2023)	
MC_IC1	Increasing the administrative capacity of the Compliance and Enforcement Directorate
MC_IC2	Reform of the waste legislations to reflect the national specificities
MC_IC4	Strengthen the technological capacity of the ERA
MC_WD1	Setting of responsibilities of the provisions laid down in S.L. 549.40 between the relevant competent authorities
MC_WD2	Improving the legal framework in terms of enforcement of illegal waste dumping
MC_WMF3	Set up a system for publicly disclosing compliant and non-compliant offenders
MC_WMF4	Develop sector-based guidelines for good practice
MC_WMF7	Increase the administrative fee for de-registration of any vehicle not disposed of at an authorised treatment facility
Medium term measures (2024 - 2027)	
MC_IC3	Initiate Memoranda of Understanding to facilitate daily operations and formalise agreements
MC_WD3	Reform legislation to replace the current black bag with a transparent bag, and delineate responsibilities between competent authorities
MC_WMF1	Setting up of economic incentives for operators based on the compliance performance

MC_WMF2	Implementation of an online platform for real-time collection and processing of data from waste management operators and digital contact with ERA
MC_WMF6	Set up a mechanism to facilitate access to EU funds for appropriate management of problematic waste streams
MC_WMF8	Encourage the development of legal privately-owned storage depots for temporary storage of unsorted waste streams, including through an economic incentive
MC_EPR1	Establish a centralised WEEE Collection point
Long term measures (2027 – 2030)	
MC_WMF5	Set up economic incentives for waste management infrastructural and capacity-building investments for private operators

Table 34: Measures for ensuring compliance at a glance

8

DATA MANAGEMENT



The core objective of the measures described herein is the implementation of a holistic framework for the digitalisation of waste data management in Malta. This will increase efficiency and productivity, save costs, reduce administrative burden and streamline compliance with reporting obligations.

8.1. Background

Accurate and timely data on waste generation, collection and treatment is an important tool for the Government to develop strategies, plans, policies and legislative measures relating to waste and recycling. Robust data can also be utilised to monitor the implementation of such strategies, plans, policies and legislative measures within the Maltese Islands. Waste data is also critical for the competent authorities, primarily the Environment and Resources Authority (ERA), to monitor the compliance of all waste operators with regards to their permit conditions and the relevant waste legislation.

ERA, as the environment regulator, is responsible for gathering waste data from economic operators, mainly from the following sources:

1. Authorised waste management facilities, including permitted quarries and IPPC installations;
2. Registered waste brokers;
3. Registered waste carriers;
4. Registered producers of products;
5. Authorised Producer Responsibility Organisations (PROs);

In addition, ERA manages databases capturing information on:

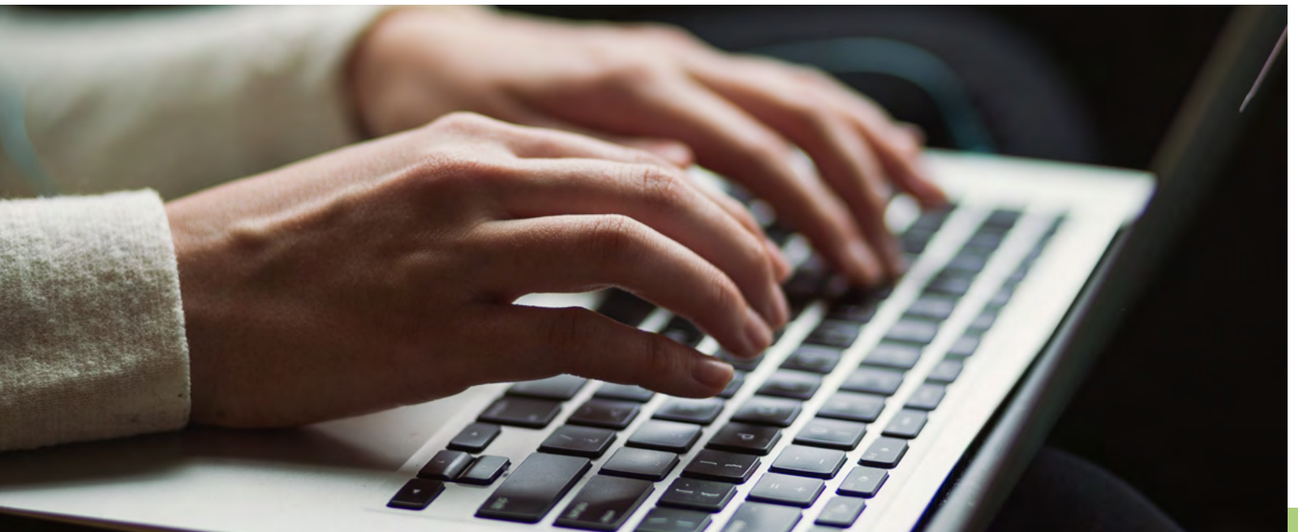
- movements in Malta of hazardous waste, waste electrical and electronic equipment (WEEE) and bulky waste, and
- shipments of waste.

To date, waste data is collected through physical reports or digital reports or spreadsheets submitted by the waste operators via email; a comprehensive summary of what data is collected can be seen in Table 35 below. All information collected by ERA is subsequently verified and where necessary, several clarifications are requested from the operators. Following such validation exercise, the data collected is inputted into the Waste Data Inventory held by ERA. The Waste Data Inventory aims to collate and analyse all waste data collected and is crucial for the estimation of key variables at a national level, namely waste generation in Malta and waste recovered, recycled or landfilled by Malta.

Source	Reporting Frequency	Overview of waste data reported
Authorised Waste Management Facilities	**Yearly** Data on the closing year shall be submitted to ERA by 31st March of the following year	Reporting is a requirement in the permit of the waste management facilities. The latter are to report according to format established by ERA, mainly on: a) The amounts of waste entering the facility; b) The amounts of waste leaving the facility; c) The amounts of waste stored on site of the facility; d) Origin of the waste; e) Fate of the waste; and f) Further specific information for facilities dealing with packaging waste, waste electrical and electronic equipment, waste batteries and accumulators, end-of-life vehicles, waste oils or for those holding an End-of-waste permit. The information is reported according to the classification system set out in the European List of Waste. The reporting template can be downloaded online from ERA's website. These reports may be made available to the public only upon request.

Registered waste broker	**Yearly** Data on the closing year shall be submitted to ERA by 31 March of the following year	Reporting is a requirement in the permit issued for waste brokers. Brokers are to report according to format established by ERA, mainly on the amount of hazardous and/or non-hazardous waste exported, following the classification systems set out in the European List of Waste. Brokers are to provide detailed information on: a) the date of the shipment of waste; b) the waste generator; c) final destination of the waste being exported; and d) the actual fate of such waste. The reporting template can be downloaded online from ERA's website. These reports may be made available to the public only upon request.
Permitted quarries	**Yearly**	Report according to format established by ERA, mainly on: a) inputs of construction and demolition (C&D) waste and excavation waste as well as inputs of asphalt/ tarmac waste and soil; b) information on the treatment of waste, including backfilling of C&D waste and excavation waste as well as any recycling operations; and c) outputs of material derived from C&D waste and excavation waste, mainly in relation to aggregates for concrete or roadworks as well as crushed material for torba or backfilling. The reporting format is set out in a Schedule of the permits of the quarries, which are available online. These reports may be made available to the public only upon request.

Authorised Producer Responsibility Organisations	**Quarterly** To be provided within 40 working days following the end of the specific period **Yearly** The yearly report on the closing year shall be audited and submitted to ERA by June of the following year, accompanied by a separate report, prepared by an independent auditor who is authorised by ERA to be engaged by the PROs, certifying the information and data reported to ERA	Reporting is a legal requirement under the various legislations regulating packaging waste, WEEE and waste batteries and accumulators as well as a condition included in the authorisation issued to the PROs. The reporting format is set out in an Annex to the authorisations of the PROs and the information to be reported by the PROs is enshrined in the legislation. Such information includes: a) Members (i.e. registered producers) participating in the PRO; b) List of authorised waste management undertakings/ establishments engaged by the PRO; c) Quantities of products placed on the market by members of the PRO; d) Waste collected by the PRO, through the various collection systems and take-back systems; e) Quantities of waste recovered by the PRO, backed by certification to proof the final fate of the waste. Only a specific part of the yearly report submitted by a PRO is made available to the public on ERA's website. In addition, part of the quarterly report submitted by a specific PRO is made available to the public only upon request.



Registered producers of products	**Yearly** Upon applying for renewal of their registration	Reporting for registered producers is a legal requirement under the various legislations regulating packaging waste, WEEE and waste batteries and accumulators. The information to be reported by the registered producers upon applying for a renewal is enshrined in the legislation. Such information includes: a) Quantities of a product placed on the market; b) Quantities of waste collected and eventually treated; c) List of authorised waste management undertakings/ establishments engaged by the producer; and d) General information on the registered producer (i.e. person/company). The Registers of Producers are publicly available on ERA's website. The Renewal Forms for registered producers are also available on ERA's website.
eWasp for the consignment and movement of hazardous waste, WEEE and bulky waste	**Ongoing**	ERA eWasp is a web-portal utilised by operators and the competent authority. Designed by ERA, the web-portal facilitates the procedure regulating the transfer of any hazardous waste, bulky waste and waste electrical and electronic equipment (WEEE). Any person or entity that intends to transfer hazardous waste, bulky waste or WEEE can either apply online for a Consignment Permit (CP) or renew the Permit online. The online application is verified by ERA and following the issuance of the CP, the applicant can immediately start to apply online the consignment note (CN), covering each transfer of hazardous waste, bulky waste or WEEE. The E-Forms provide various functionalities to the users, such as validation rules to assist them throughout the compilation of the form as well as the feature to upload and attach any necessary documentation. The system has enhanced record-keeping for the Authority as well as facilitated querying capabilities by ERA, thus ensuring better monitoring of waste material flows.

Table 35: Overview of waste data collated by ERA

ERA acknowledges that the current process faces several weaknesses in terms of frequency, reliability, accuracy as well as definitional issues. These shortcomings have been identified as:

- Data gaps between inputs and outputs of waste recorded by waste management facilities;
- Discrepancies in reported data, including inter alia inconsistencies between information reported by the waste operators and the databases held by the Authority;
- Missing information, particularly for critical variables such as origin of waste, final destination and the actual fate of the waste;
- Incorrect classification of waste;
- Lack of real-time data on waste flows and significant delays in reporting by operators;
- Inconsistencies in data related to transfer(s) and movement of waste, thus weakening the traceability of waste material flows;
- Gaps between the information reported by the economic operators and the delivery notes or disposal/ recovery certificates submitted by the same operators to the Authority;
- Lack of interoperability between the current reporting formats in place for the operators and the databases held by ERA;
- Certain reports are submitted in a format which requires manual inputting by ERA officers into the databases held by ERA;
- Lack of transparency on the sharing and accessibility of waste data reported by the operators; and
- Lack of adequate infrastructure to determine the weight of the waste entering or leaving an authorised facility.

In this context, the current system is rarely perceived to provide real benefit to the Government, ERA, as the regulator, and to the economic operators as providers of data.

8.2. Measures for better waste data management

The Ministry for the Environment, Climate Change and Planning recognises the critical importance of reliable data to ensure sustainable waste management decisions and policymaking. We understand the onus placed upon ERA for continuous improvements and accurate waste data reporting. In this context, the Government shall commit to implementing the following measures, in a three-stage approach:

First stage (to be implemented between 2021-2023):

Establish a mandatory electronic, web-based reporting platform for all waste operators (WD_1); namely waste management facilities, waste brokers, producers of products and producer responsibility organisations (PROs). This web-based reporting platform will enable operators to report data and any other relevant information held at their end in line with their permit conditions and relevant legislation.

The e-reporting platform will allow for better monitoring and compliance assessment by ERA; assisting in identifying irregularities, identifying sites which are not complying with their permitted capacities or those which are accepting waste for which they are not permitted. The platform will also facilitate investigation of potential illegal activity at an early stage to enable better enforcement. Such reporting systems shall be designed in a way to:

a) improve data quality requirements on waste operators and deliver added benefits to such registered and permitted undertakings or establishments;

b) capture the new reporting requirements emanating from the 2018 EU Legislative Waste Package, for both the operators and the competent authorities;

c) improve classification of waste from waste operators;

d) improve the quality and timeliness of reporting;

e) ensure a standard and harmonised format for reporting, based on transparent validation rules and requirements;

f) ensure high visibility of the e-reporting platforms to the users, inter alia using search engine optimisation and appropriate advertisement through Servizz.gov and ERA's website; and

g) ensure interoperability with systems already in place, namely eWasp and the Environment Resources Information System (ERIS).

Such e-reporting platform shall not exonerate economic operators from their responsibility of having internal, corporate systems in place for record-keeping. The competent authorities will prepare User Guidelines, standard requirements on reporting, its format and the classification of waste as well as organise comprehensive and forward-looking training programmes for all waste operators on the application of the e-reporting tools and the importance behind the correct classification of waste.

To develop and adopt legislative, regulatory, institutional and practical frameworks to ensure the better management of waste data (WD_2). Such frameworks would also make mandatory the use of electronic tools to facilitate administrative processes and services relevant for assisting waste operators to report information on their performance; facilitating the monitoring and compliance of such operators by ERA;

and disseminating environmental information to the general public in a more transparent, accountable and efficient manner. In addition, any legislative review should also consider amendments to the current Daily Penalties (Environment) Regulations, S.L. 549.72 and introduce tougher penalties for late and inaccurate data reporting by waste operators.

Improve integration between information systems across relevant Government entities (WD_3). Efficiencies in waste data can further improve through continuous collaboration between different Government entities and by improving the alignment and integration between these organisations' information systems. Institutional arrangements should also aim to maximise the opportunities for the sharing of waste data and intelligence between ERA, the Resource, Recovery and Recycling Agency (RRRA) and other public or private holders of waste data.

Second stage (to be implemented between 2024-2027):

Mandate all registered waste carriers to install GPS vehicle trackers to their RCVs (WD_4). In line with the Government's commitment to reform waste collection in Malta, it shall be a requirement for all registered waste carriers to install GPS vehicle trackers to their RCVs. This fleet tracking system shall ultimately be integrated within the overall nationwide waste data management system referred to in measure (WD_6).

Evaluate the feasibility of upgrading the current waste collection fleet to a modern fleet and live reporting at facilities (WD_5). The modern fleet could also incorporate onboard weighing scale systems. Government will also assess the viability of developing live reporting systems at the point of entry and exit of permitted facilities through the installation of automated weighbridges which would feed directly into the system. Such systems would assist in tracking all waste flows from the site of generation to its final destination in a comprehensive and effective manner.

Third stage (to be implemented between 2027-2030):

To develop, continuously maintain and update a nationwide Integrated Waste Data Management System (WD_6); a pioneering web-based technology which will be tailored to meet the evolving requirements of the competent authorities and waste operators. ERA, in close collaboration with other Government entities, shall be designated as the focal point responsible for collecting, managing and updating the information contained in the national waste data management system.

Such investment shall ensure that by 2030, Malta has in place a state-of-the-art infrastructure for the management of waste data that:

a) delivers added value in terms of data accuracy and reliability, ease of use and in managing data needs;

b) fully integrates with "e-Government" and "open data" governance frameworks in place at a national level.

The system will be well structured to inform evidence-based decision-making and policy development relating to waste matters, enhance early notification measures, support measuring and reporting of progress towards the achievement of relevant Union and national targets, and identify emerging environmental risks and vulnerabilities in the sector. The nationwide system shall promote and support public access to up-to-date, accurate and quality-controlled, comprehensive, standardised and functional information on waste. This information shall be made discoverable and accessible through a one-stop web access point in forms and formats meeting the needs of different users.

The newly developed system will contain historical and up-to-date data and information, as well as offer streamlined and transparent access to waste information, with the goal to enhance traceability of waste material flows in Malta. It will ensure that data flows can be accessed as well as shared by all relevant entities in a timely manner. Throughout the development of this system the Government will explore systems which can carry out automatic validation and that can provide for the extraction of data in the required format. The system shall also be designed to support early warning systems of significant issues. Cooperation amongst key entities and smarter use of integrated IT systems will be prioritised, which is also essential in tackling illegal activity.

The Government shall also endeavour to fulfil the following general measures throughout the implementation of all the three-stages, thus ensuring that the whole conceptual framework is built on the basic principles of consistency, necessity, customer focus, effectiveness, proportionality and transparency:

Stakeholder engagement during the development lifecycle of the integrated waste data management system and any ancillary electronic tools or platforms (WD_7). This will take into account best practices to ensure that the needs of the different targeted users are met. The needs shall be identified through a variety of user feedback mechanisms, including one-to-one meetings with key stakeholders, focus groups and surveys, a thorough evaluation of the effectiveness of the tools and any other foresight methodologies.

Facilitate access to EU funds for upgrading infrastructure with intelligent systems (WD_8). This will involve exploring existing mechanisms or the setting of new ones, including inter alia schemes, grants as well as national or EU funds that can be applied by Authorities as well as economic operators for the purposes of upgrading or integrating intelligent systems within their current infrastructure waste management.

Implementation of the above measures and this holistic framework for the digitalisation of waste data management in Malta will not only help to increase efficiency and productivity but will also save costs, facilitating the Authorities' and waste operators' back-office productivity; enhancing their user workflow, reducing administrative and ICT infrastructure costs and greatly simplifying compliance with reporting compliance for both the Authorities and the waste operators.

8.3. Measures for improving data management at a glance

Measure code	Details
Short term measures (2021 to 2023)	
WD_1	Establish a mandatory electronic, web-based reporting platform for all waste operators
WD_2	To develop and adopt legislative, regulatory, institutional and practical frameworks to ensure the better management of waste data
WD_3	Improve integration between information systems across relevant Government entities
WD_7	Stakeholder engagement during the development lifecycle of the integrated waste data management system and any ancillary electronic tools or platforms
WD_8	Facilitate access to EU funds for upgrading infrastructure with intelligent systems
Medium term measures (2024 - 2027)	
WD_4	Mandate all registered waste carriers to install GPS vehicle trackers to their RCVs
WD_5	Evaluate the feasibility of upgrading the current waste collection fleet to a modern fleet and live reporting at facilities
WD_7	Stakeholder engagement during the development lifecycle of the integrated waste data management system and any ancillary electronic tools or platforms
WD_8	Facilitate access to EU funds for upgrading infrastructure with intelligent systems
Long term measures (2027 – 2030)	
WD_6	To develop, continuously maintain and update a nationwide Integrated Waste Data Management System
WD_7	Stakeholder engagement during the development lifecycle of the integrated waste data management system and any ancillary electronic tools or platforms
WD_8	Facilitate access to EU funds for upgrading infrastructure with intelligent systems

Table 36: Data management measures at a glance

9

SETTING THINGS IN MOTION

This Waste Management Plan sets out the vision for waste management for the following decade. At its core is a set a strategic objectives aimed at maximising waste as a resource; promoting innovation in management and prevention of waste; setting in place the necessary reforms required to meet our goals and objectives; investing in our waste management infrastructure; enhancing our ambition to ensure the true costs of waste are reflected in policy and making sure polluters pay; and ensuring that Government and the private sector truly engage in a cooperative manner. The achievement of these strategic goals will set Malta on the path to resource efficiency and circularity.

This WMP has set out through the various chapters how Government will address the key waste challenges that Malta faces, and the necessary actions and measures needed to meet and exceed these.

Measures will incorporate a variety of policy tools, target diverse waste streams and will be spread out over the coming nine years. The various measures have been split based on the timeline of short term (2021-2023), medium term (2024-2027) and long term (2027-2030).

The first three years of the WMP will see the collaboration of Government with farmers in order to promote gleaning, hence preventing food waste at production level, while discussions will be held for the development of a Budget line on Waste Prevention. We will also enact legislation for a national EPR scheme for end-of-life tyres and non-packaging paper. During this time-period, an emphasis will be placed on seeing a tackling of commercial waste.

In the medium term, up until 2027, there will be support for the establishment of a re-use and repair centre to promote such practices. We will explore measures to limit the use of single-use plastics in organised and public events, while retail and distribution outlets will be discouraged from discarding unsold food. We will also crack down on the inappropriate disposal of WEEE and ELVs. A wide range of infrastructural changes will be made around this time, with investment in the following: Material Recovery Facility, Organic Processing Plant, Waste to Energy Plant along with enhancement of pre-existing infrastructure. EPR schemes will be taken a step forward, with their introduction across a number of new waste streams.

Long term measures will sweep across a variety of aspects. With the natural progression in technological developments, there will be a strong push for the digitisation of office procedures. The concept of EPR will be built upon further, with the enhancing of implementation in terms of packaging waste. The ultimate step in the process of food waste prevention, as worked towards over the many years prior will be the development of legislation for the complete diversion of food waste from landfill. Repair and reuse will also be given priority, by exploring various fiscal initiatives for this.

While the measures have been laid out in a way which intends to reflect the realities of the world, on the ground application could be a different story. Hence, an evaluation of the WMP will be integrated in its operation, to assess the effectiveness of the measures' implementation, to be carried out at different stages

of the strategy's timeline. This evaluation will take place through a preliminary, midway and end review. In each case, there will be close communication with the stakeholders involved in the direct actions of the measures. The assessment will be based on the type of policy instrument used, the stakeholders involved and whether the outcome can be measured. Such a process will ensure that the next cycle of waste management policymaking will be informed by outcomes of this WMP, ensuring successes are built upon and learnt from. This will continue to enable Malta to divert waste away from landfill, to help maximise the intrinsic resource value of waste, to contribute to Malta's achievement of EU targets, and to support in the transition towards a more resource-efficient and circular economy.

TECHNICAL APPENDIX FOR WASTE COLLECTION REFORM

- The following points briefly outline the background context of the collection cost results:
- The cost of vehicles, fuel, staff and sacks costs are annualised. Shipping costs to Gozo were estimated at €25 each way but the additional cost of labour and fuel for travel between Malta and Gozo were not modelled.
- Costs associated with the treatment of materials were not considered within the modelling and are not included in the results. However, these costs will change as there is less residual and more recycling and food waste.
- Glass is collected monthly in 57 councils, fortnightly in 12 councils and not collected in Mdina. The vehicles currently used to collect glass are the same as those used for the other waste streams. We have assumed the same approach of using an extra shift with the existing fleet across all schedules.
- Collections are currently generally operated in one shift per day. All schedules are based on two shifts per day. For example, 7-11am and 6-10pm. The shift duration for each Schedule was modelled as per the baseline. Staff costs were calculated on a full-time equivalent basis, where full-time is 40 hours per week.
- There are two efficiencies embedded within the options contributing to the cost results that are independent of the options:
  - Regional efficiency. We assumed a 5% increase in collection round efficiency could be achieved through cross border working and the pooling of vehicles that equates to a saving of c.€800 (~5%).
  - Vehicle size. The fleet modelled in all scenarios consists of 75% large, 10% small and 15% non-compaction vehicles. Using a higher proportion of larger vehicles is likely to be efficient as these vehicles have a bigger capacity and can complete a higher number of collections before filling. (For reference, the baseline consisted of 39% large [24-26T], 10% medium [12-24T], 15% small [7.5-12T] compaction vehicles and plus 36% non-compaction vehicles under 10T).
- There are additional benefits of regionalisation that are not accounted for through the collections modelling. For example, rationalising of depots and pooling management staff could mean lower overheads and potentials through greater purchasing power from bulk buying vehicles and other capital items.
- The detailed results are presented by material stream. Where vehicles are shared across services, costs were allocated based on the number of collections undertaken per week. For example, the baseline is made of 3x refuse, 3x organic and an average 1.4x recycling collections per week (based on July 2019 schedules); so 40% of costs (3 out of 7.4) were allocated to refuse, 40% to organics and 20% to recycling. Costs for glass have been attributed to recycling. Please refer to Table 20: Collections per week
- for full details of the number of collections relating to each Schedule.

Waste Flow Assumptions

Malta Waste Flow Modelling Assumptions

Baseline Material Compositions

Mixed/Residual Waste

The composition of mixed municipal solid waste from 2018 was provided in the Waste-to-Energy Data Analysis Report prepared for Wasteserv Malta[98].

The baseline tonnage data used in the modelling was from 2019 and there were significant changes to the service between 2018 and 2019 through the introduction of a nationwide food waste collection service in October 2018. Therefore, the 2018 compositional data was converted to the 2019 mixed waste composition shown in Table 0-1. This was achieved through accounting for the additional capture of food waste at the separate kerbside collection leading to food waste decreasing from 40% of the residual waste in 2018 to 32% of the residual waste in 2019. There were also some small variations in the other material streams.

Material Stream	2018 Mixed Waste Composition	2019 Mixed Waste Composition
Glass	3.7%	3.3%
Paper & Card	10.2%	9.2%
Ferrous Metals	1.4%	0.8%
Non-Ferrous Metals	1.3%	1.3%
Plastic Bottles	5.0%	5.7%
Dense Plastics	3.5%	4.1%
Plastic Film	10.4%	12.7%
Garden Waste	1.4%	1.7%
Food Waste	39.7%	32.3%
Wood Waste	1.0%	1.2%
Waste Electrical and Electronic Equipment	0.4%	0.5%
Tyres	0.0%	0.0%
Miscellaneous Combustibles	1.4%	1.7%
Textiles & Footwear	6.6%	8.2%
Miscellaneous Non-Combustibles	0.4%	0.5%
Hazardous Waste	0.8%	1.0%
Healthcare Waste	10.0%	12.4%
Fines (<10mm)	2.9%	3.4%

Table 0-1: Composition of Mixed Waste for 2018 and 2019

Door to Door Recycling

The composition of door to door recycling was calculated from the material recycling figures for municipal waste treatment provided in Table 3 of the National Statics Office (NSO) data[99] (Table 0-2) and the composition of 2018 MRF Rejects provided in the Waste-to-Energy Data Analysis Report prepared for Wasteserv Malta[100] and shown in Table 0-4. It is assumed that the NSO municipal waste treatment figures include both material outputs from the MRF and Mechanical Biological Treatment (MBT). Therefore, MBT values were removed from the totals to give MRF outputs.

As the NSO data did not provide a split between ferrous and non-ferrous metals, 2017 UK kerbside household recycling compositional data was used to provide a breakdown of metal into these fractions. It was assumed Malta would have a similar split of ferrous and non-ferrous metals as the UK of 74% and 26% respectively. Further, plastics were divided into plastic bottles and dense plastics using 2017/18 WRAP benchmarking data for England. Again, it was assumed Malta would have a similar composition of plastics as the UK, with 71% of plastics consisting of plastic bottles and 29% dense plastics.

98 Royal Society of Chemistry (2019) Waste-to-Energy Scientific Data Analysis Report, 2019

99 National Statistics Office Malta https://nso.gov.mt/en/News_Releases/Documents/2020/02/News2020_023.xls

100 Royal Society of Chemistry (2019) Waste-to-Energy Scientific Data Analysis Report, 2019

Table 3. Municipal waste treatment

tonnes

Waste treatment by waste type	2,014	2,015	2,016	2,017	2,018
Landfilling	**218,314**	**299,641**	**217,860**	**243,563**	**266,447**
Wood	48	73,294 [2]	8,534	5,615	8,575
Digestate from anaerobic digestion	3,892	2,798	6,780	8,324	8,586
Refuse-derived fuel	312	-	-	8,453	21,805
Rejects from mechanical treatment	44,290	38,891	69,840	74,187	82,696
Biodegradable garden and park wa	7,733	6,660	3,977	3,584	4,178
Mixed packaging	240	160	51	192	69
Mixed municipal waste	130,262	142,063	81,704	83,957	74,038
Street-cleaning residues	2,326	3,650	4,625	5,302	6,119
Bulky waste	29,211	32,108	42,014	53,719	58,726
Clothes/textiles	-	18	335	155	39
Other [1]	-	-	-	75	1,616 [3]
Material recycling	**19,278**	**17,947**	**18,856**	**20,649**	**20,285**
Paper and cardboard	10,236	10,345	10,555	7,660	7,112
Plastic	2,752	2,149	2,307	1,886	1,563
Metals	2,169	1,640	3,028	6,254	4,517
Glass	2,397	2,387	931	2,122	3,666
Waste electrical and electronic equi	1,359	1,205	1,741	1,295	1,881
Clothes/textiles	164	154	210	851	33
Other [1]	201	67	84	581	1,513
Incineration - energy recovery	**753**	**725**	**631**	**20**	**0**
Refuse-derived fuel	753	725	631	20	0
Incineration - disposal	**54**	**41**	**28**	**44**	**18**
Solvents, paints, inks, ahesives and	53	39	28	27	2
Other	0	2	-	17	16
Municipal waste treatment - Tota	**238,399**	**318,354**	**237,375**	**264,276**	**286,750**

[1] Includes hazardous waste

[2] Wood that was landfilled in 2015 is made up of wood which was generated from 2010 to 2015 and was being held in storage.

[3] Includes hazardous burnt refuse derived fuel that was exported for disposal.

Table 0-2: National Statistics Office Municipal Waste Treatment Table used for Compositional Analysis[101]

101 National Statistics Office Malta https://nso.gov.mt/en/News_Releases/Documents/2020/02/News2020_023.xls

Material	Municipal Waste Treated (Including MBT)	Municipal Waste Treated (Excluding MBT)
Glass	21.7%	27.1%
Paper & Card	42.2%	45.1%
Ferrous Metals	19.7%	15.7%
Non-Ferrous Metals	7.1%	5.6%
Plastic Bottles	6.6%	4.7%
Dense Plastics	2.7%	1.9%
Total	**100%**	**100%**

Table 0-3: Effect of Removing MBT Treated Materials on Material Composition

Waste Stream	Rejects from mechanical sorting of separately collected recyclables in MRFs
Glass	0.9%
Paper & Card	60.3%
Ferrous Metals	0.9%
Non-Ferrous Metals	1.2%
Plastic Bottles	7.1%
Dense Plastics	5.9%
Plastic Film	11.8%
Garden Waste	0.0%
Food Waste	0.1%
Wood Waste	0.1%
Waste Electrical and Electronic Equipment	0.2%
Tyres	0.0%
Miscellaneous Combustibles	1.1%

Textiles & Footwear	1.2%
Miscellaneous Non-Combustibles	0.0%
Hazardous Waste	0.2%
Healthcare Waste	0.3%
Fines (<10mm)	8.9%
Total	**100%**

Table 0-4: Composition of MRF Rejects from Waste-to-Energy Data Analysis Report used for Compositional Analysis

Through combining the known composition of the MRF outputs and the composition of the MRF rejects a total composition of the door to door recycling was calculated and is shown in Table 0 5. It was assumed that the introduction of the food waste service between in October 2018 would have no impact on the composition of dry recyclables collected door to door. Therefore, the total door to door 2018 compositional data was applied to 2019 tonnages.

9.1.1. Bring Bank Recycling

As 87% of bring bank material is collected separately, the proportion of each material in this fraction was available in the 2018 NSO tonnage data[102]. The compositions calculated for door to door recycling (Section 0) were applied to the remaining 13% of bring bank material that is collected as mixed recycling. These two fractions were combined to give a total bring bank composition, which was then applied to 2019 tonnage data.

9.1.2. 2019 Compositions

Table 0-5 shows the final compositions calculated as described above and used for the different waste streams in 2019.

Waste Stream	Mixed Waste (Residual)	Door to Door Organic Composition	Door to Door Recycling Composition	Bring Bank Recycling Composition	Total
Glass	3.1%	0.0%	18.2%	58.6%	**6.9%**
Paper & Card	9.1%	0.0%	50.2%	22.9%	**15.7%**
Ferrous Metals	1.0%	0.0%	10.7%	4.0%	**2.7%**
Non-Ferrous Metals	1.4%	0.0%	4.1%	1.5%	**1.7%**
Plastic Bottles	5.8%	0.0%	5.5%	8.4%	**4.9%**
Dense Plastics	4.1%	0.0%	3.3%	3.6%	**3.3%**
Plastic Film	12.7%	0.0%	4.0%	0.5%	**8.8%**
Garden Waste	1.7%	0.0%	0.0%	0.0%	**1.1%**
Food Waste	32.3%	100.0%	0.0%	0.0%	**35.6%**
Wood Waste	1.2%	0.0%	0.0%	0.0%	**0.8%**
Waste Electrical and Electronic Equipment	0.5%	0.0%	0.1%	0.0%	**0.3%**
Tyres	0.0%	0.0%	0.0%	0.0%	**0.0%**
Miscellaneous Combustibles	1.7%	0.0%	0.4%	0.0%	**1.1%**

102 National Statistics Office Malta https://nso.gov.mt/en/News_Releases/Documents/2020/02/News2020_023.xls

Textiles & Footwear	8.2%	0.0%	0.4%	0.1%	**5.3%**
Miscellaneous Non-Combustibles	0.5%	0.0%	0.0%	0.0%	**0.3%**
Hazardous Waste	1.0%	0.0%	0.1%	0.0%	**0.6%**
Healthcare Waste	12.4%	0.0%	0.1%	0.0%	**7.9%**
Fines (<10mm)	3.4%	0.0%	3.0%	0.4%	**2.8%**

Table 0-5: Compositions Used for 2019

Baseline Tonnages

9.1.3. Door to Door Mixed Waste and Recycling

Publicly available Wasteserv 2019 tonnage data[103] was used for door to door mixed waste and recycling tonnages. The 2019 compositional analysis detailed in Table 0-5 was then applied to these data providing the baseline tonnages per material stream shown in Table 0-6.

Overall process loss (including contamination) was assumed to be 34% for door to door recycling and bring bank material that is collected as mixed recycling. Process loss was calculated as the total tonnage of material rejected from the MRF, as a percentage of total material input into the MRF. Contamination was the percent of non-target material within collected recycling.

9.1.4. Bring Bank Recycling

Bring bank recycling tonnages for 2014 to 2018 were taken from NSO data[104]. As there as an observed 10% annual growth in the tonnages collection at bring sites from 2016 to 2018, it was assumed that this trend would continue. Therefore, the bring bank tonnages used for 2019 was the 2018 tonnages plus 10%.

103 Wasteserv Malta Wasteserv Malta Statistics, https://www.wasteservmalta.com/statistics
104 National Statistics Office Malta https://nso.gov.mt/en/News_Releases/Documents/2020/02/News2020_023.xls

Material Stream	Mixed	Organic	Recyclables - D2D	Recyclables - Bring	Total
Glass	3,558	0	6,182	2,706	**12,446**
Paper & Card	10,452	0	17,022	1,058	**28,532**
Ferrous Metals	1,139	0	3,621	185	**4,945**
Non-Ferrous Metals	1,563	0	1,399	68	**3,031**
Plastic Bottles	6,664	0	1,859	388	**8,911**
Dense Plastics	4,734	0	1,110	165	**6,009**
Plastic Film	14,633	0	1,351	24	**16,008**
Garden Waste	1,998	0	1	0	**1,999**
Food Waste	37,228	27,372	8	0	**64,608**
Wood Waste	1,376	0	16	0	**1,393**
Waste Electrical and Electronic Equipment	600	0	17	0	**617**
Tyres	58	0	0	0	**58**
Miscellaneous Combustibles	1,954	0	124	2	**2,079**
Textiles & Footwear	9,428	0	132	2	**9,562**
Miscellaneous Non-Combustibles	546	0	2	0	**548**
Hazardous Waste	1,101	0	23	0	**1,125**
Healthcare Waste	14,341	0	31	1	**14,373**
Fines (<10mm)	3,975	0	1,019	18	**5,012**
Total	**115,348**	**27,372**	**33,918**	**4,619**	**181,257**
Total excl. Contamination	**115,348**	**27,372**	**31,623**	**3,648**	**181,257**
Total excl. Process Loss	**115,348**	**27,372**	**22,631**	**2,212**	**181,257**

Table 0-6: Baseline Tonnages for 2019

Post-DRS Baseline Tonnages

The introduction of a DRS would significantly alter the total waste and the composition of waste collected through door to door and bring bank services. We have assumed that the introduction of a DRS would not alter HWRC tonnages, as these generally target different materials. Market data for 2019[105] was provided for those containers targeted by the DRS and a summary of the data is shown in Table 0-7.

Material	Total Tonnages on Market (tonnes)	Assumed Proportion of Household Waste	Assumed Household Waste (tonnes)
Glass	5,573	70%	3,901
Ferrous	43	70%	478
Non-ferrous	683	70%	30
PET Bottles	4,492	70%	3,144
Total	**10,791**	**70%**	**7,554**

Table 0-7: 2019 Market Data for Materials Targeted by DRS

We have assumed that 70% of glass, metal and PET containers on the market within the DRS scope are from households (on the basis of consumer surveys reported for the UK by WRAP[106], in the absence of specific data for Malta), totaling 7554 tonnes of material available for DRS. The remaining 3237 tonnes is assumed to be commercial waste.

It is assumed that DRS will capture materials from the mixed waste, door to door recycling and bring bank services, and that the amount of each material within the scope of the DRS will be proportional to the total amount of that material within each service.

It has been assumed that capture of materials by the DRS will be 90% for all materials from all streams, based on the 90% collection target set for 2025 in Malta. With this DRS capture rate the amount of material that would be diverted to DRS from each stream is shown in Table 0-8.

105 BCRS Malta Business Plan

106 WRAP (2019) Drinks Recycling on the Go, https://wrap.org.uk/sites/files/wrap/OTG%20Drinks%20Containers%20Final%20Report%20ENG017-012.pdf

Material Stream	Mixed Waste	Door to Door Recycling	Bring Banks
Glass	1,004	1,744	763
Ferrous Metals	99	315	16
Non-Ferrous Metals	14	13	1
Plastic Bottles	2,116	590	123

Table 0-8: Amount of Material Diverted to DRS from each Service

Through removing the tonnages diverted to DRS in Table 0-8 from the baseline tonnages in Table 0-6, a post-DRS 2019 baseline was created and the tonnages for each service are shown in Table 0-9.

Material Stream	Mixed	Organic	Recyclables - D2D	Recyclables - Bring	Total
Glass	2,554	0	4,438	1,942	8,935
Paper & Card	10,452	0	17,022	1,058	28,532
Ferrous Metals	1,039	0	3,306	169	4,514
Non-Ferrous Metals	1,550	0	1,387	68	3,004
Plastic Bottles	4,548	0	1,269	265	6,081
Dense Plastics	4,734	0	1,110	165	6,009
Plastic Film	14,633	0	1,351	24	16,008
Garden Waste	1,998	0	1	0	1,999
Food Waste	37,228	27,372	8	0	64,608
Wood Waste	1,376	0	16	0	1,393
Waste Electrical and Electronic Equipment	600	0	17	0	617
Tyres	58	0	0	0	58
Miscellaneous Combustibles	1,954	0	124	2	2,079
Textiles & Footwear	9,428	0	132	2	9,562

Miscellaneous Non-Combustibles	546	0	2	0	548
Hazardous Waste	1,101	0	23	0	1,125
Healthcare Waste	14,341	0	31	1	14,373
Fines (<10mm)	3,975	0	1,019	18	5,012
Total	**112,115**	**27,372**	**31,256**	**3,716**	**174,458**
Total excl. Contamination	**112,115**	**27,372**	**29,141**	**2,935**	**174,458**
Total excl. Process Loss	**112,115**	**27,372**	**20,855**	**1,779**	**174,458**

Table 0-9: Post-DRS 2019 Baseline Tonnages

A.1.1.1. Capture Rates

The capture rates for targeted materials were calculated for the baseline and post-DRS baseline as shown in Table 0-10. The capture rates are almost identical for the baseline and post-DRS baseline if materials captured by DRS are not included, even though the total amount of recyclables captured through door to door collections and bring banks is reduced in the post-DRS baseline (Table 0-9). If materials captured by DRS are included, capture of glass, metals and plastic bottles increases, with an increase of 24% for plastic bottles.

Scheme	Baseline	Post-DRS Baseline (Excluding material captured in DRS)	Post-DRS Baseline (Including material captured in DRS)
Glass	71%	71%	79%
Paper & Card	63%	63%	63%
Ferrous Metals	77%	77%	79%
Non-Ferrous Metals	48%	48%	49%
Plastic Bottles	25%	25%	49%
Dense Plastics	21%	21%	21%
Food Waste	42%	42%	42%

Table 0-10: Capture Rates Calculated for Baseline and Post-DRS Baseline Cost Modelling Assumptions

Baseline Data

The data used for the modelling with was provided in the files "Questionnaire to Local Councils on Waste reform updated 25-08-2020.xlsx" and "Malta-Eunomia Collections Data compilation FINAL.docx" is summarised in the tables below.

Tables refer to:

- 'Data points' – the number of councils that provided information;
- 'in data' – data received – i.e. totals or averages derived from the provided information; and
- 'across all' – the total number assumed for all councils in the region.

We have assumed that collections data received was representative of the data not received. This means data gaps for councils not providing data were filled with the average of data received from other local councils by region.

Region	Local Councils	Data Points: Households	Households in Data	Households across all Councils	Data Points: Commercial Premises	Commercial Premises in Data	Commercial Premises across all Councils
Central	13	11	47,265	55,859	7	550	1,021
Southern	14	13	36,800	39,631	3	33	154
South Eastern	15	14	34,011	36,440	8	285	534
Northern	12	10	28,866	34,639	6	279	558
Gozo	14	14	15,969	15,969	9	719	1,118
Total	**68**	**62**	**162,911**	**182,538**	**33**	**1,866**	***3,386**

Notes: *Assumed 250 shops/businesses in Valletta, St Julians, Sliema, Zebbug Gozo and St Pauls Bay.

Table A-1: Baseline Statistics – Properties

Region	3-3-1 Households	3-3-2 Households	2-3-1 Households	Average Collections per Week	Average Days per Week	Data Points: Hours Worked	Hours Worked per Day
Central	17,064	38,794	0	7.5	6.1	11	3.3
Southern	25,473	14,158	0	7.3	6.0	13	3.6
South Eastern	28,538	7,902	0	7.2	6.0	14	4.2
Northern	1,267	33,372	0	7.9	6.0	12	4.1
Gozo	15,969	0	0	7.0	6.0	12	3.3
Total	**88,311**	**94,227**	**0**	**7.4**	**6.0**	**62**	**3.7**

Table A-2: Baseline Statistics – Schemes Operated (July 2019) and Working Arrangements

Region	Local Councils	Total Properties	Data Points: Vehicle Numbers	Vehicles in Data	Vehicles Rescaled to Total Councils	Properties per Round per Day	Properties per Hour per Day
Central	13	56,880	9	29.0	41.9	1,667	503.6
Southern	14	39,785	13	28.0	30.2	1,602	450.3
South Eastern	15	36,975	13	36.0	41.5	1,068	256.0
Northern	12	35,197	12	32.5	32.5	1,429	346.2
Gozo	14	17,087	12	20.0	23.3	854	262.9
Total	**68**	**185,924**	**59**	**145.5**	**169.4**	**1,353**	**365.3**

We have assumed that this number of vehicles relates to the number of collection rounds per week providing collection services for all material streams, including recycling and glass.

Table A-3: Baseline Statistics – Vehicles and Productivity

Region	Local Councils	Data Points: Vehicle Numbers	Data Points: Vehicle Sizes	Large [24-26T]	Medium [12-24T]	Small [7.5-12T]	Very [>10T non-compaction]
Central	13	9	6	8 (42%)	3 (16%)	1 (5%)	7 (37%)
Southern	14	13	7	9 (60%)	3 (20%)	1 (7%)	2 (13%)
South Eastern	15	13	7	4 (21%)	2 (11%)	4 (21%)	9 (47%)
Northern	12	12	6	3 (18%)	1 (6%)	4 (24%)	9 (53%)
Gozo	14	12	9	10 (59%)	0 (0%)	4 (22%)	3 (19%)
Total	**68**	**59**	**35**	**33.5 (39%)**	**9.0 (10%)**	**13.5 (16%)**	**30.0 (35%)**

We have assumed that this number of vehicles relates to the number of collection rounds per week providing collection services for all material streams, including recycling and glass.

Table A-4: Baseline Statistics – Vehicle Types

Modelling Assumptions

The data used for modelling scenarios is provided in the tables below.

Region	Baseline (Average)	Mixed Waste: Scenarios A-D	Organic Waste: Scenarios A-C	Organic Waste: Scenarios D-E	Recycling: Scenarios A-D
Large [24-26T]	39%	75%	75%	0%	75%
Medium [12-24T]	10%	0%	0%	0%	0%
Small [7.5-12T]	16%	10%	10%	0%	10%
Very [>10T non-compaction]	35%	15%	15%	100%	15%

Table A-5: Vehicle Types

The baseline organic set out data is based on previous work undertaken for Wasteserv in 2018 analysing organic performance. Neither participation nor set out data was available for mixed waste or recycling and were adapted from available UK data.

- Mixed waste set out is expected to increase in options as collects decrease from 3x to 2x per week. However, the change is likely to be fairly small as Service Standard 1 (Restricted Residual) and 2 (Pay-As-You-Throw) restrict the amount of mixed (residual) waste through sack volume limits and/or charging.

- Organic (food) waste set out is also expected to increase with the introduction of residual restriction.
- Recycling set out is expected to increase but the increase depends on the option.
  - In Schedules A and B residents receive 1x collection each of fibres (paper and card) and containers (plastics and metals). As both streams are collected at the same time, we would expect the set out of materials to be very higher.
  - In Schedule C, residents receive 2x collections each of fibres and containers over four days. The set out is likely to be higher than the baseline but lower than other schedules as there are twice the number of opportunities to remember to put out recycling for collection.
  - Schedules D and E are also based on 1x collection of fibres and containers. As each stream is collected on a different day, the set out will be lower than if they were collected together.

Region	Mixed Waste	Organic Waste	Recycling
Baseline	70%	32%	70%
Schedules A & B	75%	60%	90%
Schedule C	75%	60%	70%
Schedules D & E	75%	60%	80%

Table A-6: Set Out Assumptions

Set out is an important assumption as it indicates the number of properties collected from on average on a round, which is a key productivity assumption underpinning the results. Together with the shift length, it is a key factor in determining resources (vehicles and staff) and resource costs.

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