European Environment Agency

Municipal waste management in Malta

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Context
The Topic Centre has prepared this working paper for the European Environment Agency (EEA) under its 2012 work programme as a contribution to the EEA's work on waste implementation.

Contents

Highlights

- The overall treatment of MSW in Malta is characterised by high amounts of landfilling (82 %) and low amounts of recycling (13 %) in 2010;
- Material recycling has been increasing steadily, reaching 7 % of the generated MSW in 2010 compared to about 0 % in 2001;
- With total MSW recycling being as low as 13 % of the generated amount in 2010 and a very unstable recycling performance the previous years, Malta would need to make an exceptional effort in order to fulfil the target of 50 % set out in the Waste Framework Directive;
- The Solid Waste Management Strategy of 2001 sets the general framework of waste management in Malta and paved the way for substantial institutional and organisational changes. As a result of this, the Malta Environment and Planning Authority and WasteServ Ltd were established in 2002 to take responsibility for the operation of waste management systems in Malta;
- 'Bring In' sites were introduced in multiple locations in Malta in 2003, in an effort to improve the source separation of recyclable waste;
- The Eco-Contribution Act (Act XII of 2004) is promoting the producer responsibility principle, imposing a levy for waste deriving from producers' (or importers') operations.

1 Introduction

1.1 Objective

Based on historical MSW data for Malta and EU targets linked to MSW in the Waste Framework Directive, the Landfill Directive and the Packaging Directive, the analysis undertaken includes:

- The historical performance on MSW management based on a set of indicators,
- Uncertainties that might explain differences between the countries' performance which are more linked to differences of what the reporting includes than differences in management performance,
- Relation of the indicators to the most important initiatives taken to improve MSW management in the country, and
- Assessment of the future possible trends and achieving of the future EU targets on MSW by 2020.

2 Malta's MSW management performance

The first 'Waste Management Policy', issued in 1998 incorporated principles such as the sustainability principle and the waste hierarchy (waste minimisation, reuse, recovery etc.). Nevertheless, the implementation of this policy did not meet any of its goals and was largely compromised owing to several reasons (Ginige et al., 2010). During the pre-accession period to the EU, it became clear that several issues concerning waste management in Malta needed to be resolved. This prompted the Maltese government to develop 'A Solid Waste Management Strategy' in 2001 (Malta, 2001a). This new policy was based on the previous 'Waste Management Policy' and provided a framework to improve the previous strategy and to enable the government to incorporate the necessary regulatory changes required by the EU. At the same time, another document titled 'Space for Waste – The Waste Management Subject Plan' was published one month later, providing details of how the policy presented in the previous document would be executed from 2001 to 2010 (Malta, 2001b).

Malta joined the EU in 2004 and managed to obtain special derogation periods related to targets in the Landfill Directive, the Packaging Directive and the WEEE Directive due to the fact that Malta was lagging behind other EU Member States in waste management practices. A thorough revision of the current strategy was deemed necessary (Ginige et al., 2010). The impending revision of the 'Solid Waste Management Strategy' for the period 2006-2010 was considerably delayed, and was eventually published in 2009 in the form of two new consultation documents by the Ministry of Resources and Rural Affairs expanding the timeframe from 2008 to 2012 (Malta, 2009a, 2009b). The fact that the revision of the 'Solid Waste Management Strategy' came so late was severely criticised by several organisations (non-governmental, political, environment agency) but it enabled the inclusion of the fundamental principles of the Waste Framework Directive (2008/98/EC) and set the appropriate policy context for the Maltese waste management for the years to come (Ginige et al., 2010).

The generation of MSW in Malta has been continuously increasing since the beginning of the previous decade and reached a peak in 2008 with 276 000 tonnes, following a downward course over the following two years. An important parameter that affects MSW arising in Malta is the considerable tourism sector which constitutes a large share of the national GDP (NSO, 2011). Consequently, the reduction in MSW can be directly linked to a large extent with the observed drop in tourist arrivals and nights spent in hotels during the years 2009 and 2010 (Eurostat, 2012). Table 2.1 shows the development in Tourism of Malta in nights spent by non-residents in hotels and similar establishments. The 2003 NSO Hotel Waste Survey indicates that, on average, a tourist generates almost double the waste generated by a Maltese resident. While a Maltese resident living in a

household generates an average of 0.68 kg of waste daily, a tourist residing in a hotel produces an average 1.25 kg of waste each day (Malta, 2009a).

Table 2.1 Total number of nights spent by non-residents in hotels and similar establishments in Malta for the years 2002-2010

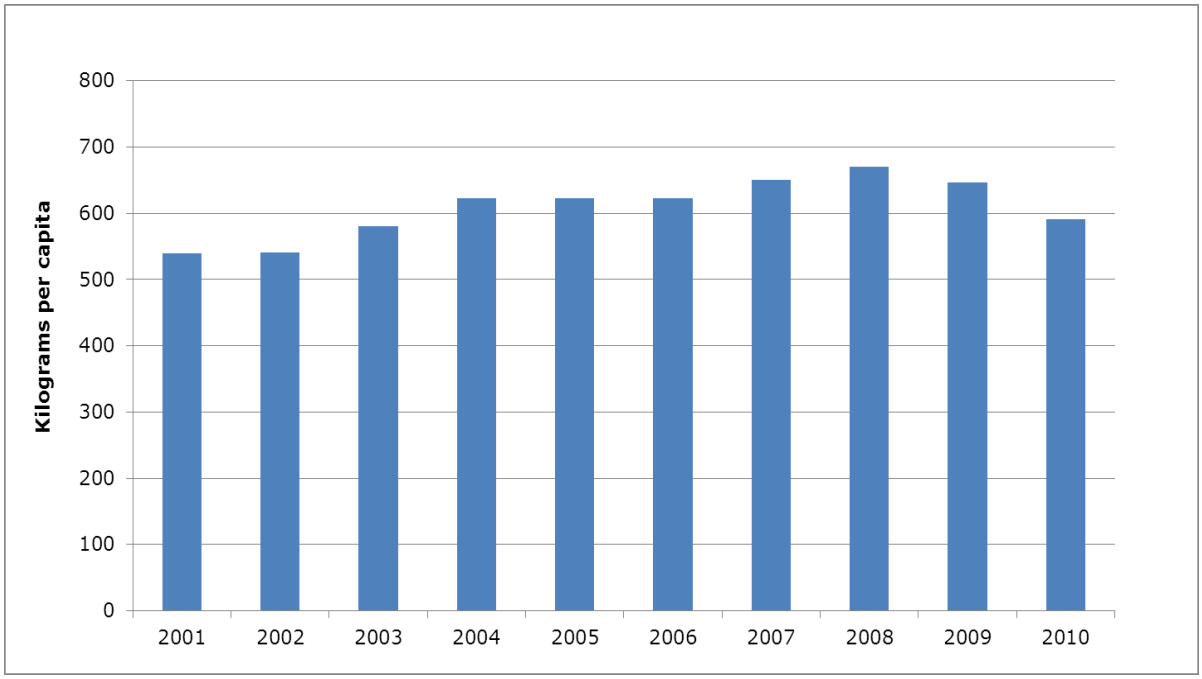
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Nights spent in Malta	7 019 163	7 301 242	7 387 568	7 217 567	6 978 360	7 584 615	7 415 908	6 389 661	7 065 374

Source: Eurostat tourism statistics (2012)

2.1 MSW Indicators

Figure 2.0 shows the development of MSW generation per capita in Malta from 2001 to 2010. There has been an increase throughout the years 2001-2008, where MSW generation peaked at 670 kg per capita. In the following years there is a rapid decline, dropping to 591 kg per capita in 2010. A possible explanation for this decrease might be the economic recession.

Figure 2.0 MSW generation per capita in Malta



Source: Eurostat, 2012

Malta is within a group of EU countries which still maintains high rates of landfilling. The amount of MSW landfilled in 2010 was 202 000 tonnes, equivalent to 82 % of the total generated MSW. The peak amount of MSW landfilled was 266 000 tonnes in 2008. A modest development in recycling has been observed but very low rates still remain, while incineration of MSW is not practiced at all in the country. In 2010, the generated amount of MSW was 246 000 tonnes but there was only information for the management of 234 000 tonnes. There is no conclusive information available regarding the remaining 12 000 tonnes.

Shown below are some indicators regarding the development of MSW management in Malta. Since 1999, data quality has been improved due to weighing of the waste amounts at the treatment sites (Eurostat, 2010).

2.1.1 The recycling of MSW from 2001 to 2010

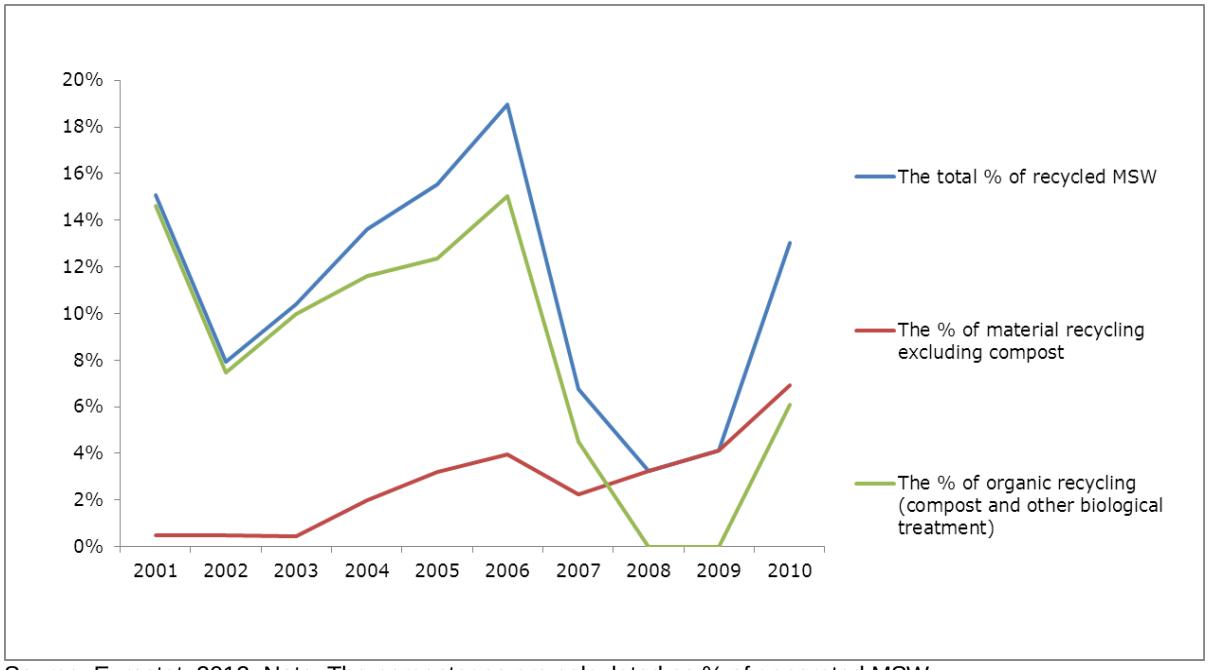
Figure 2.1 shows the development of recycling of MSW in Malta related to total recycling, material recycling and organic recycling (compost and other biological treatment). As can be seen in Figure 2.1, recycling has been experiencing considerable fluctuations throughout the years but has remained consistently lower than 20 %.

Material recycling was very low before 2004, at about 1 000 tonnes, when it started growing steadily until 2006 and reached a 10-fold increase, equal to 4 % of MSW. There was a drop in the following years due to the refurbishment of the recycling facility which started in 2007 and was finalised in February 2008 (Eurostat, 2010). After that, recycling rates picked up again to 4 % in 2009 and in the following years even rose to 7 % (or 17 000 tonnes), which is the highest rate achieved so far in Malta.

The biggest share of recycling in Malta is attributed to organic recycling which was already quite high in 2001, at 15 % of the generated MSW. In 2002, organic recycling dropped significantly but soon picked up and reached 15 % again in 2005. The sharp decrease in 2007 is due to the refurbishment of the composting facility which started in the course of 2007 and continued throughout 2008 and 2009. In fact, the composting facility was shut down in the years 2008 and 2009, receiving no organic MSW at all (Eurostat, 2010). In 2010, there was a moderate recovery of organic recycling, of around 15 000 tonnes, reaching 6 % of MSW.

It is obvious that the total recycling of MSW in Malta is primarily dominated by organic recycling, whereas material recovery has only been increasing slowly in recent years. In 2010, the recycling rates for material and organic recycling were low, at 7 % and 6 % respectively. Material recycling has only recently shown a strong dynamic, improving its performance from 4 % to 7 %. On the other hand, organic recycling has been much higher in the past which means that there is already a basis for organic recycling. Overall, there is considerable room for improvement both for material recycling and organic recycling.

Figure 2.1 Recycling of MSW in Malta

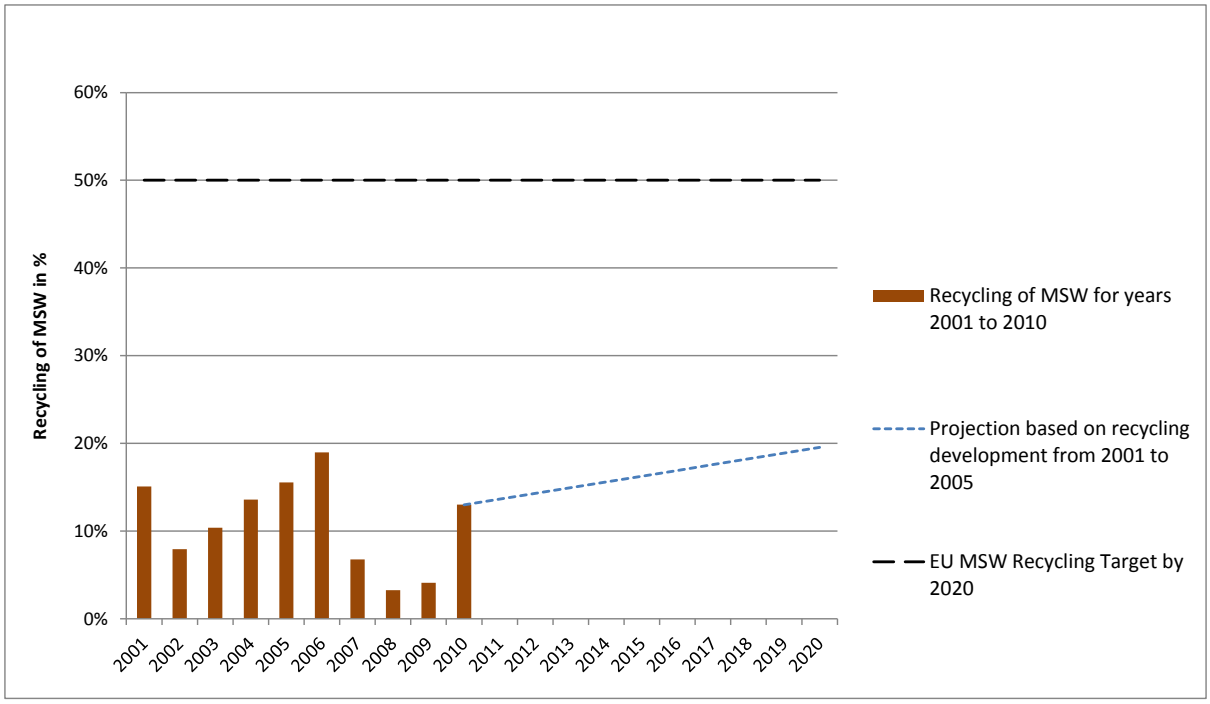


Source: Eurostat, 2012. Note: The percentages are calculated as % of generated MSW

2.1.2 The yearly increase rate of recycling of MSW

In order to assess the prospects for Malta to meet the 50 % recycling target as set out in the Waste Framework Directive[1], a scenario has been calculated which assumes that recycling in the period 2010 to 2020 develops with the increase rates of recycling in the period 2001-2005. Scenarios based on the years 2006-2010 and 2001-2010 were unfit to produce any useful results because of the fact that the recycling facilities were temporarily closed down or operated in reduced capacity (2007-2009) due to refurbishment activities, and not because the Maltese recycling effort has deteriorated for other reasons. In Figure 2.2 the projection is presented based on a linear regression of the recycling rates for the time period 2001-2005, in order to indicate the prospects that the EU recycling target of 50 % by 2020 (WFD, 2008/98/EC) can be met.

Figure 2.2 Three scenarios for future recycling of MSW in Malta



Source: Calculation by Copenhagen Resource Institute (CRI), based on Eurostat, 2012

It has to be kept in mind that this scenario is very simplistic and do not take into account any planned policy measures. In addition, it is based on one calculation methodology for recycling of municipal waste (MSW recycled/MSW generated, using data reported to Eurostat) whereas countries may choose to use another methodology to calculate compliance with the 50 % recycling target of the Waste Framework Directive. The scenario in Figure 2.2 should therefore be interpreted only as to give some rough indications and assessment of the risk of missing the target.

The projection in Figure 2.2 clearly shows that Malta would need to make an exceptional effort in order to fulfil the target of 50 % set out in the Waste Framework Directive.

Taking a closer look at Figure 2.2 it is possible to observe a steady growth in recycling rates between the years 2002-2006, before the recycling and composting facilities suspended their operation.

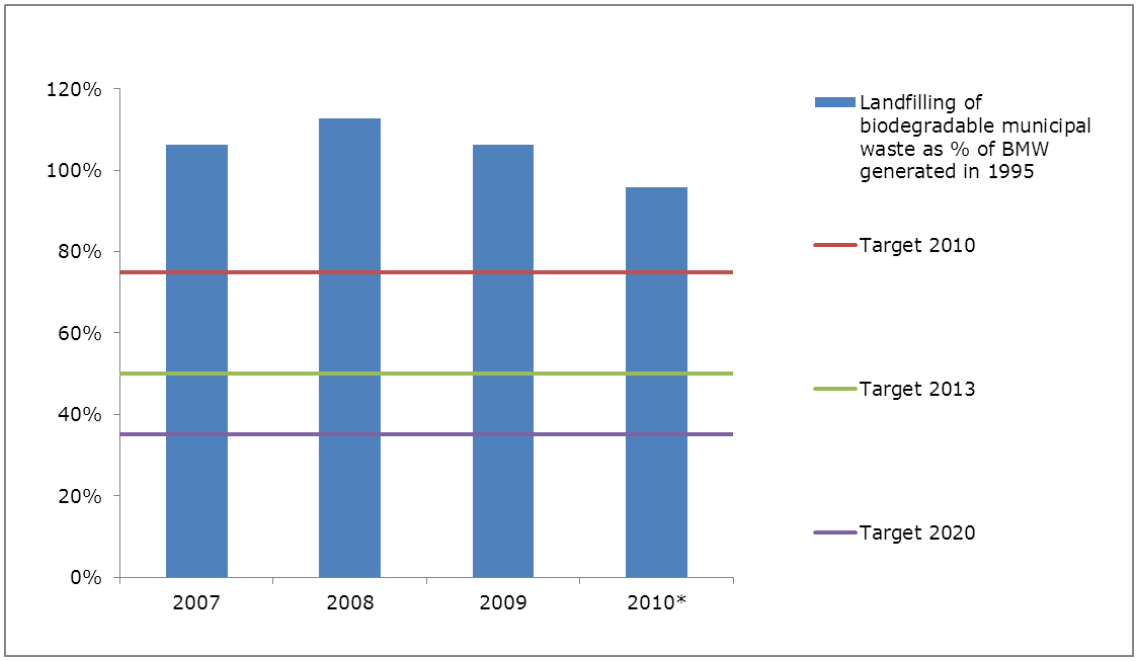
[1] The EU's updated Waste Framework Directive from 2008 (EU, 2008) includes a new 50 % recycling target for waste from households, to be fulfilled by 2020. In 2011, the European Commission decided that countries can choose between four different calculation methods to report compliance with this target. One of these methods is to calculate the recycling rate of MSW as reported to Eurostat (EC, 2011).

Although this development trend is dynamic and shows potential, it is still not enough to achieve the 2020 target of 50 %. In 2010, recycling operations resumed, making use of the state-of-the-art refurbished facilities, but the total recycling rate was still lower than it had been in 2006. Malta needs to raise its recycling levels in the period 2010-2012 with 3.7 percentage points annually in order to meet the recycling target of the Waste Framework Directive.

2.1.3 Landfilling of biodegradable municipal waste

According to the EU Landfill Directive, Member States generally have to reduce the amount of biodegradable municipal waste (BMW) landfilled by a certain percentage by 2006, 2009 and 2016. However, Malta has been given a four year derogation period and thus has to meet the targets by 2010, 2013 and 2020. The targets are related to generated amount of BMW in 1995, in which Malta generated 141 000 tonnes BMW. Malta has reported the landfilled amount of BMW to the European Commission for the years 2007, 2008 and 2009 (EC, 2012). In 2009, the landfilled amount was 150 000 tonnes, surpassing the BMW amount of 1995 and accounting for 106 % of the generated amount in 1995, showing an increase in BMW landfilled instead of a decrease as required by the EU Landfill Directive's targets. However, the main reason for this increase has been the fact that BMW could not be diverted away from landfill throughout the years 2007-2009 due to the composting facility being closed while it underwent refurbishment (Eurostat, 2010).

Figure 2.3 Landfilling of biodegradable MSW in Malta



Source: EC, 2012 and CRI calculation. *The figures for 2010 are CRI estimations. Note: The target dates take into account Malta's 4 year derogation period

In Figure 2.3 the amount of landfilled BMW in 2010 is calculated by subtracting the increase in amount of MSW going to composting and digestion (Eurostat, 2010) from 2009 to 2010, from the amounts of BMW being landfilled in 2009.

It can be observed from Figure 2.3 that the amounts of BMW landfilled have been higher than the reference levels of 1995 in the previous years and only in 2010 is a slight reduction estimated, equal to a drop of 10 percentage points. Nevertheless, BMW levels going to landfill are considerably high and the 2010 target of 75 % was not met according to the estimated data. Consequently, a very large effort has to be undertaken in the following years if Malta aims to fulfil the 50 % and 35 % requirement by 2013 and 2020.

2.1.4 Regional differences of MSW recycling from 2001 to 2010

There is no regional data for recycling reported to Eurostat by Malta.

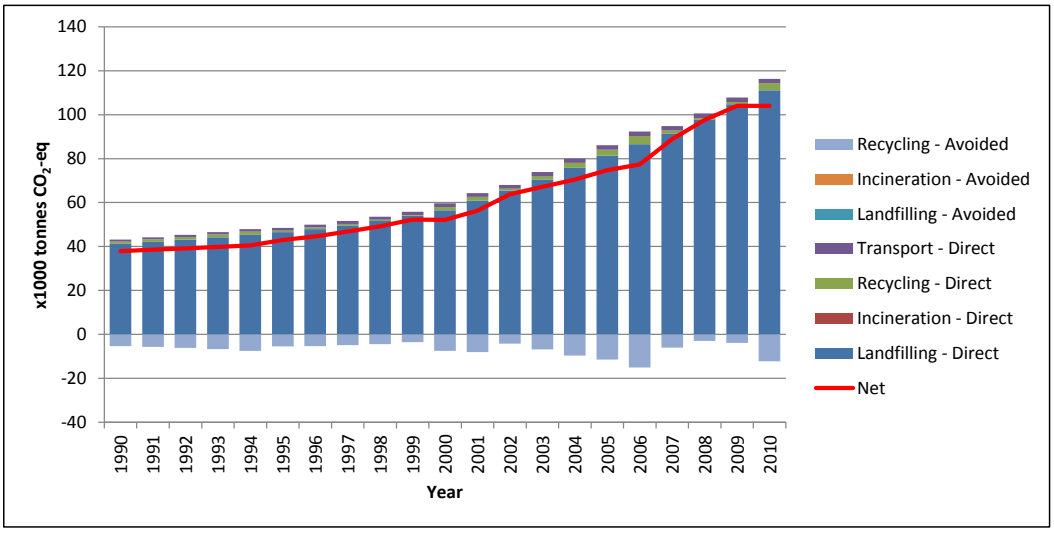
2.1.5 The relation between landfill tax level and recycling level of MSW

There is no tax for landfilling in Malta and the management of MSW is covered by a general tax (Malta, 2009a).

2.1.6 Environmental benefits of better MSW management

Figure 2.7 shows the development of GHG emissions from MSW management, calculated by using a life-cycle approach. The graph shows the direct emissions, the avoided emissions and the net emissions of the MSW management. It is obvious from Figure 2.7 that direct emissions from landfilling have been constantly increasing since 1990, while the net greenhouse gas emissions are slightly moderated by the emissions avoided by increasing recycling mainly from 2004 and onwards.

Figure 2.7 GHG emissions from MSW management in Malta



Results presented in this figure should not be used for the compilation of GHG reporting (national inventory report of the IPCC) or compared with IPCC figures, as the methodology employed here relies on life cycle thinking and, by definition, differs from the IPCC methodology

Assumptions concerning the production of Figure 2.7

All the GHG emissions (positive values) represent the direct operating emissions for each waste management option. These direct operating emissions have been calculated with the use of the IPCC methodology for landfills and incineration and life cycle modelling for the other technologies (recycling, bio-treatment and transport).

For the indirect avoided emissions (negative values), the calculations integrate the benefits associated with the recovery of energy (heat and electricity generated by incinerators, electricity generated by the combustion of landfill gas or methane from anaerobic digestion). Other avoided emissions include the benefits of recycling of food and garden waste, paper, glass, metals, plastics, textiles and wood in the municipal solid waste. Recycling is here assumed to include material recycling and bio-treatment. Avoided emissions of bio-treatment include fertilizer substitution. All processes generating electricity are assumed to substitute electricity mix of Malta in 2009. Processes generating heat are assumed to substitute average heat mix for the EU-25 in 2002. The electricity mix and heat mix are assumed to remain constant throughout the whole time series. The compositions of the MSW disposed in landfills, incinerated or recycled respectively are based on ETC/SCP, 2011. In an Eionet consultation process, initiated by the EEA in 2012, Malta updated the compositions of the landfilled and recycled MSW for 2010. The complete methodology is available from ETC/SCP, 2011.

Since 2004, two new landfill sites have been deployed in Malta offering upgraded engineering solutions of gas collection systems in order to collect the harmful greenhouse gases which are produced naturally by organic waste (WasteServ, 2012). Nevertheless, there is no observable reduction in the greenhouse gases avoided by landfilling.

2.2 Uncertainties in the reporting

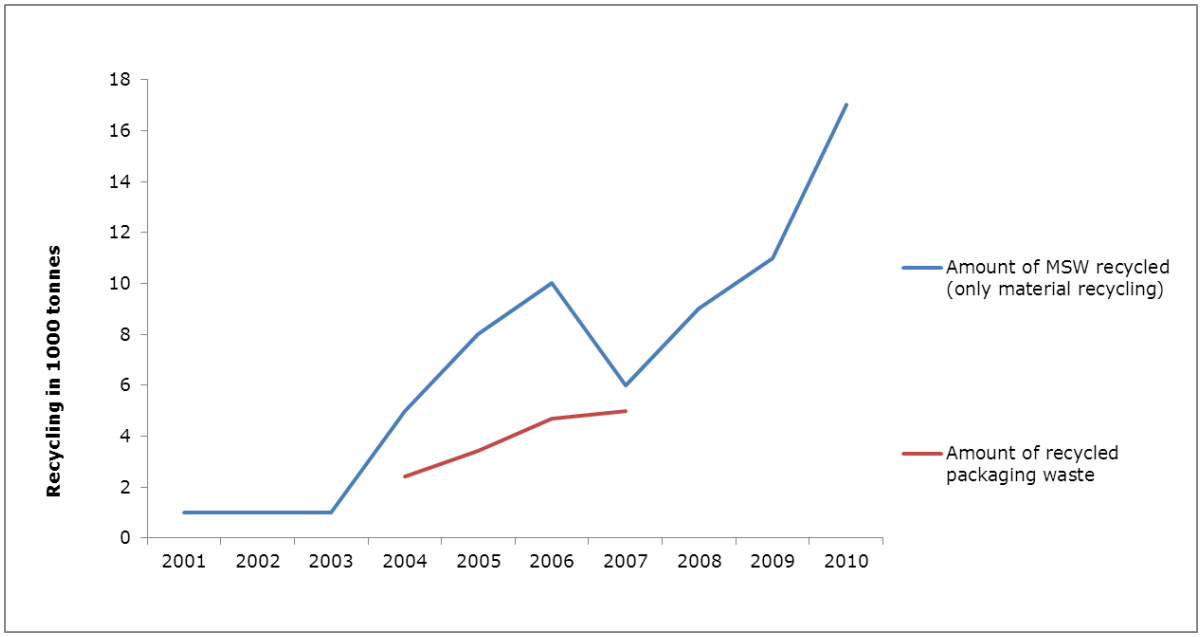
Some uncertainties or differences included in the reporting of MSW can result in different recycling levels. One example of such differences which may influence the recycling rate of MSW could be the extent of packaging waste from households and similar packaging from other sources which is included in the reported recycling of MSW. Most Member States have producer responsibility schemes on packaging waste. Private operators of these schemes do not always report on the sources of the packaging waste, and packaging waste from households is therefore not always reported to Eurostat as MSW.

In the case of Malta, Figure 2.8 reveals that the management system for packaging waste was only slightly affected by the partial closure of the recycling facility due to refurbishment in 2007 (Eurostat, 2010).

While the amount of material recycling of MSW dropped by 4 000 tonnes between 2006 and 2007, the respective amount of recycling of packaging waste increased by 300 tonnes overall. This suggests that material recycling as a part of a producer responsibility scheme for packaging is prioritised in the waste management operations in Malta. The abrupt increase in MSW recycling from 2003 to 2004 can be largely attributed to the introduction of a deposit scheme on beverage packaging in the same year.

Unfortunately, there is only a limited availability of data for packaging waste (2004-2007), so conclusions cannot be drawn with absolute certainty, but it seems that a reasonable part of the recycled packaging waste is included in the reported recycled amount of MSW.

Figure 2.8 Comparison of packaging waste recycled and material MSW recycled



Source: ETC/SCP, 2012 and Eurostat, 2012

2.3 Important initiatives taken to improve MSW management

The pre-accession Maltese waste management system was largely problematic and failed to address vital issues of contemporary practice (Ginige et al., 2010). Several fundamental changes needed to take place for the re-organisation of the whole waste management sector in order to meet EU requirements. The environmental strategy of 2001 'Solid Waste Management Strategy' laid the foundation for major institutional and organisational changes, by introducing specialised authorities to the regulation, monitoring and facilitation of waste management activities in the country.

In 2002, the Malta Environment and Planning Authority (MEPA) was established, with major roles including the issuing of licences or permits for waste management facilities and activities; monitoring and inspection to ensure that license or permit conditions are being adhered to and enforcement action is being taken if they are not (Malta, 2001a). Moreover, in 2002, WasteServ Malta Ltd, an autonomous waste management services agency was established. The company is responsible for organising, managing and operating integrated systems for waste management including integrated systems for minimisation, collection, transport, sorting, reuse, utilisation, recycling, treatment and disposal of solid and hazardous waste (WasteServ, 2012).

In 2003, in association with local councils, WasteServ established numerous 'Bring-in' sites where the public could deposit clean, source-separated recyclable materials, in an effort to facilitate recycling and boost the collection of materials for recycling (Malta, 2009a). Gradually, WasteServ handed over the responsibility for the collection and maintenance of the 'Bring-in' Sites to local councils. In order to continue to provide the recycling services to the public, the local councils enrolled to already established producer responsibility schemes and passed their operation and maintenance costs of the 'Bring-in' sites to them accordingly (WasteServ, 2012).

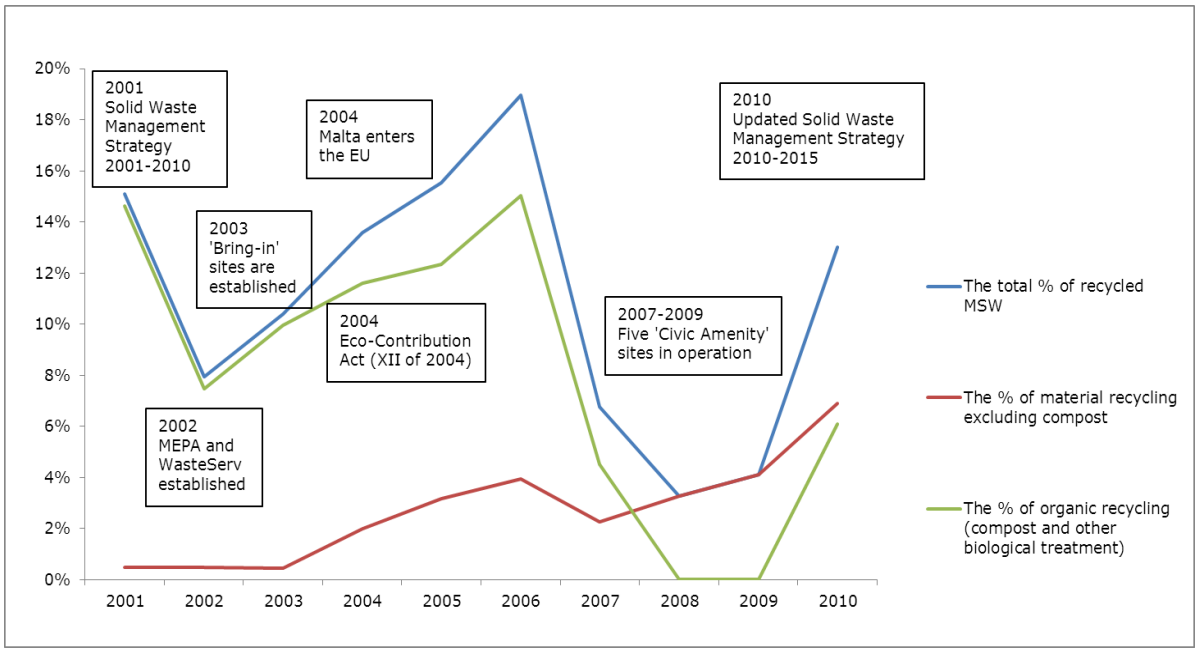
In 2004, the Maltese government introduced the Eco-Contribution Act (Act XII of 2004) imposing a levy on products which generate end-of-life products or waste, with the ultimate aim of ensuring better disposal/re-use/recycling management. The levy has to be paid by producers or importers of products falling within its scope (MEPA, 2012). The Eco-Contribution Act places pressure on

producers (or importers) to either develop recovery schemes or pay for the costs incurred by the government when the specific product ends in the general waste stream (Malta, 2009).

In 2006, two new state-of-the-art engineered landfill sites replaced all the previously uncontrolled dumping sites. Additionally in 2008, together with the 'Bring-in' sites, recycling efforts were enhanced by means of the 'Recycle Tuesdays' initiative through which the collection of plastic, paper and metal for recycling became available on a door-to-door basis, thus further reducing the amount of household waste being landfilled (WasteServ, 2012). In the meantime, five Civic Amenity sites were introduced between 2007 and 2009. Through these facilities, WasteServ managed to collect more than 84,000 tonnes of separated bulky waste from households. Another important milestone was the development of the Sant'Antnin Waste Treatment Plant, which started its operations in 2008 and was inaugurated in November 2010 (WasteServ, 2012). The effect of this new facility is thus not yet reflected in the data.

In 2010, a renewed 'Solid Waste Management Strategy' came into force promoting the adoption of 9 policy objectives for improving waste management performance in Malta. Policy objectives include: urging for waste minimisation (setting a target of 1.5 % waste generation reduction per annum), the promotion of producer responsibility, and calling for more recycling and separation of biodegradable waste. In order to achieve this, the government has called for significant investment to facilitate the development of new specialised waste processing facilities (Malta, 2010).

Figure 2.9 Recycling of MSW in Malta and important policy initiatives



2.4 Future possible trends

The projection in Figure 2.2 indicates that Malta would need to make an exceptional effort in order to fulfil the target of 50 % set out in the Waste Framework Directive.

Nevertheless, Malta is eligible to ask for a special derogation period under Article 11 (3) of the EU Waste Framework Directive in which it can intensify its efforts for increased recycling. Increased recycling capacity will be needed and the Maltese government is already working towards this direction by planning expansion of facilities and increasingly involving the private sector in the provision and management of facilities for recycling (Malta, 2010). Another inherent obstacle for recycling expansion is the small scale of the Maltese market which makes recycling expensive. Local

production does not make use of recyclable materials, so that the recycled quantities need to be exported from the country (Malta, 2009a). For this reason, if better access to European recycled raw materials market could be established, recyclers in Malta would be eager to further increase domestic recycling and consequently push the recycling rates in Malta upwards.

References

EC, 2011: Commission Decision of 18 November 2011 establishing rules and calculation methods for verifying compliance with the targets set in Article 11(2) of Directive 2008/98/EC of the European Parliament and the Council

EC, 2012: Member States' reporting to the Commission according to Council Directive 1999/31 of 26 April 1999 (Landfill Directive) and Commission Decision 2000/738/EC concerning a questionnaire for Member States reports on the implementation of Directive 1999/31/EC on the landfill of waste. . E-mail from the Commission to the EEA on 16 February, 2012.

ETC/SCP, 2011: Bakas, I., Sieck, M., Hermann, T., Andersen, F. M., Larsen, H. and Reichel, A. (ETC/SCP, 2011). Projections of Municipal Waste Management and Greenhouse Gases. ETC/SCP working paper 4/2011. Copenhagen, Denmark, 89 pp.

Eurostat metadata, 2010, 'Waste database municipal waste'
http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/env_wasmun_esms_an1.pdf

Eurostat, 2012: 'Waste database municipal waste'
http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/database
Accessed May 2012

Eurostat tourism statistics, 2012, 'Tourism database'
http://epp.eurostat.ec.europa.eu/portal/page/portal/tourism/data/database

Ginige T., Sparks N. and Formosa S., 2010, ''Waste not Want not' - Sustainable Waste Management in Malta', 6/3 *Law, Environment and Development Journal* (2010), p. 354, available at
http://www.lead-journal.org/content/10354.pdf

Malta, 2001a, Ministry for the Environment, 'A Solid Waste Management Strategy for the Maltese Islands'

Malta, 2001b, Ministry for the Environment, 'Space for Waste: The Waste Management Subject Plan'
http://www.mepa.org.mt/LpDocumentDetails?syskey= 18

Malta, 2009a, Ministry for Resources and Rural Affairs (MRRA), 'Waste Management Plan for the Maltese Islands for the Period 2008-2012 – Consultation document'
http://www.mrra.gov.mt/files/uploaded/files/Waste%20Management%20Plan%20for%20the%20Maltese%20Islands.pdf

Malta, 2009b, Ministry for Resources and Rural Affairs (MRRA), 'A Solid Waste Management Strategy for these Maltese Islands – Consultation document'
http://www.mrra.gov.mt/page.aspx?id=123

Malta, 2010, Ministry for Resources and Rural Affairs (MRRA), 'A Solid Waste Management Strategy for these Maltese Islands – First Update

MEPA, 2012, Malta Environment and Planning Authority
http://www.mepa.org.mt/waste-ecocont

National Statistics Office (NSO), 2011, 'Malta in figures 2011'
http://www.nso.gov.mt/themes/theme_page.aspx?id=36

WasteServ, 2012, 'Landfilling in Malta
http://www.wasteservmalta.com/articles.aspx?aid=368