

# Municipal waste management in Cyprus



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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.

**Disclaimer**

This ETC/SCP working paper has been subjected to European Environment Agency (EEA) member country review. Please note that the contents of the working paper do not necessarily reflect the views of the EEA.

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# Highlights

## **Most important factors behind the development of MSW recycling**

- The National Strategic Solid Waste Management Plan (2002) reflects the legislative targets (based on the Landfill Directive) and introduces a framework of standards on MSW management.
- The total recycled MSW as a percentage of generated MSW doubled in the decade between 2001 and 2010, increasing from around 10 % to 20 %, with a sharp increase from 2009 to 2010. In general, recycling in Cyprus is at a relatively low/medium level, but there is a very slow steady increase.
- According to existing trends and tentative projections, Cyprus will need to make an exceptional effort in order to fulfil the 50% recycling target of the Waste Framework Directive by 2020.
- Cyprus displays high levels of MSW generation and focus on minimisation is a priority for the country.

# 1 Introduction

## 1.1 Objective

Based on historical MSW data for Cyprus and EU targets linked to MSW, 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 Cyprus' MSW management performance

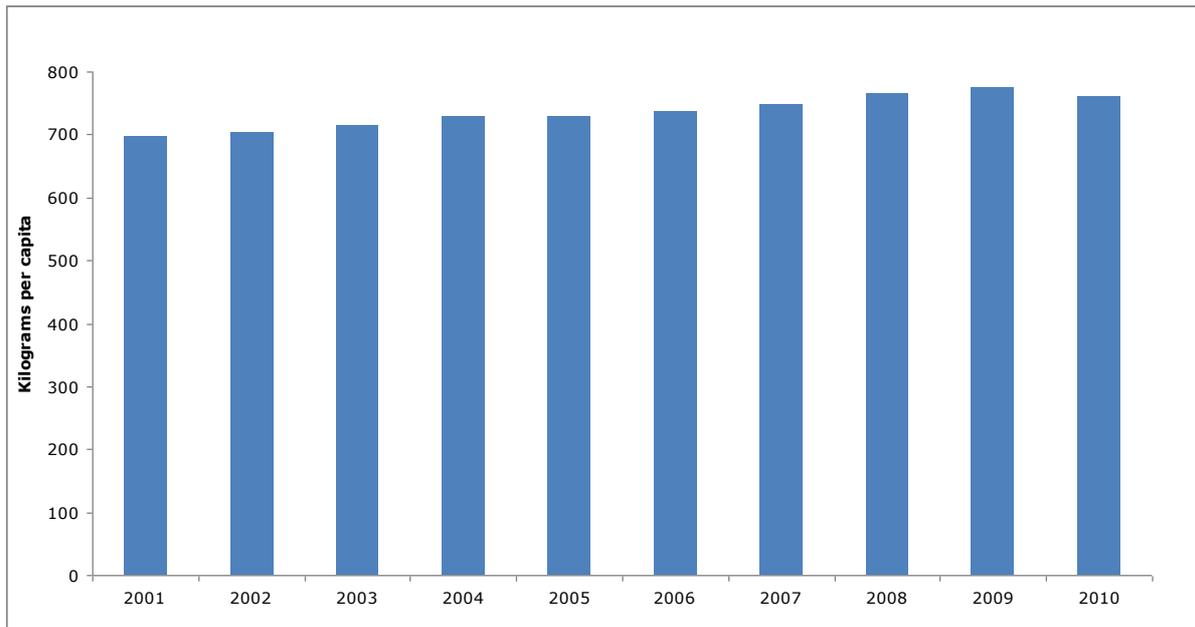
Cyprus is a relatively small country in the EU. The generation of MSW increased in Cyprus with 25 % between 2001 and 2010, with a peak in 2009. Per capita MSW generation is one of the highest in the EU (760 kg/cap in 2010), well above the EU average. The main aim of the authorities in Cyprus is to reduce these high generation rates, which are based on socioeconomic drivers (EEA, 2010). Another reason for the high generation of MSW could be the high tourist activity in the country.

Regarding the treatment of MSW, the waste management system in Cyprus is constrained by the lack of appropriate facilities to treat waste or hazardous waste (for example, there are no waste incineration plants in Cyprus). As a result, the overriding option for MSW management is landfilling which takes up around 80 % of the generated waste.

### 2.1 MSW Indicators

Figure 2.0 shows the development of MSW generation per capita in Cyprus from 2001 to 2010. There is a slow but gradual increase throughout the years from 669 kg per capita in 2001 to 760 kg per capita in 2010. Data for the years 2009 and 2010 are a Eurostat estimate.

**Figure 2.0 MSW generation per capita in Cyprus**



### **2.1.1 The recycling of MSW from 2001 to 2010**

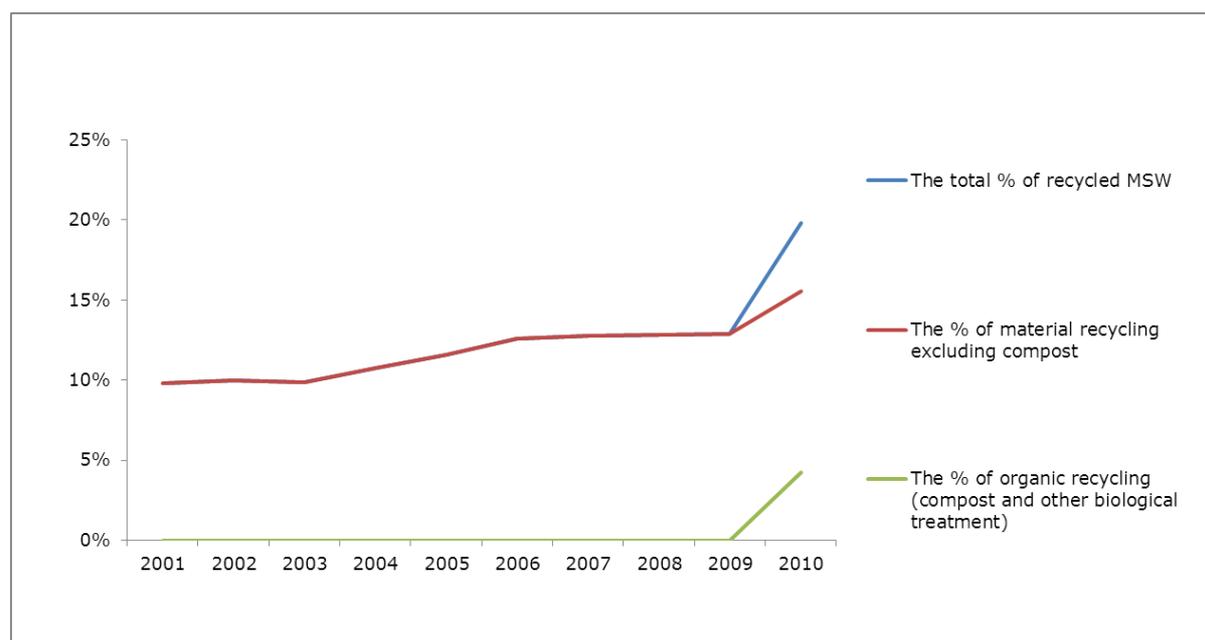
In figure 2.1, the recycling rate of MSW in Cyprus is shown. The graph is split in three parts, namely:

- The total % of recycled MSW;
- The % of material recycling excluding compost;
- The % of organic recycling (compost and other biological treatment).

The total recycled MSW as a percentage of generated MSW doubled in the decade between 2001 and 2010, increasing from around 10 % to 20 %. In general, recycling in Cyprus is at a relatively low/medium level, but there is a very slow steady increase. Cyprus has displayed a moderate increase in the recycling levels until 2009 and then a much sharper increase occurred in the last reporting year where biological treatment (composting or anaerobic digestion) jumped from zero to 4 % and material recycling increased with 3 percentage points.

Between 2001 and 2009, recycling in Cyprus consisted only of materials other than organic waste and displayed only a minor increase (around 3 percentage points). Therefore, the big increase in performance in both organic and material recycling in 2010 could be a sign of an increased effort in Cyprus regarding MSW management.

**Figure 2.1 Recycling of MSW in Cyprus<sup>1</sup>**



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

### **2.1.2 The yearly increase rate of recycling of MSW**

Instead of looking at the actual recycling level of MSW, this indicator shows how fast the recycling level of MSW has increased per year during the last five and ten years. Such an indicator could give due credit to countries which began with a low starting level, but where new initiatives now have been successfully implemented. The indicator could indicate whether or not the yearly increase rate of recycling is sufficient to reach the 50 % targets of the EU legislation by 2020. Figure 2.2 shows the recycling in Cyprus as a percentage of the generated MSW, for the years 2001-2010. In order to get an indication of the future recycling in the country, a simple linear regression is applied to three datasets:

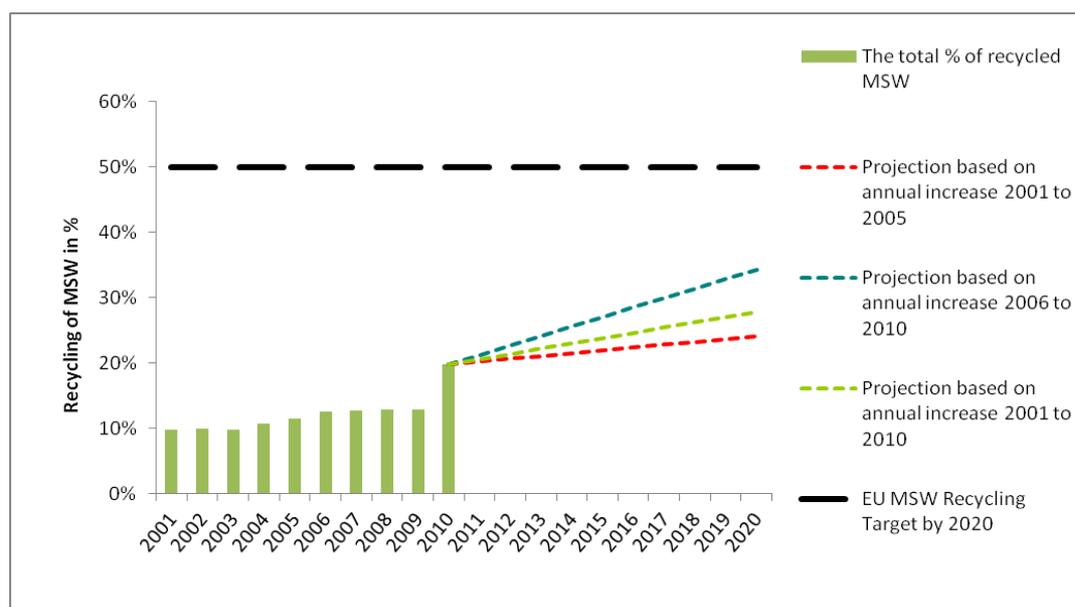
- 2001 to 2005;
- 2006 to 2010;
- 2001 to 2010.

The linear regression line, calculated for each of these datasets is extended to 2020, the target year in the Waste Framework Directive (WFD). The results show that Cyprus increased its effort for recycling in 2006-2010 compared to the previous years and if this latest effort is maintained, Cyprus could achieve higher recycling in 2020 than if the projection is based on the years 2001-2005. However, in all three scenarios, Cyprus is not expected to reach the 50 % target<sup>2</sup> in 2020.

<sup>1</sup> Recycling is presented as % of generated MSW

<sup>2</sup> The EU's 2008 Waste Framework Directive (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). This methodology is used here.

**Figure 2.2 Future recycling of MSW in Cyprus – three scenarios**



Source: Eurostat, 2012

It has to be kept in mind that these three scenarios are very simplistic and do not take into account any planned policy measures. In addition, they are 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 scenarios in Figure 2.2 should therefore be interpreted only as to give some rough indications and assessment of the risk of missing the target.

### 2.1.3 Landfilling of biodegradable municipal waste

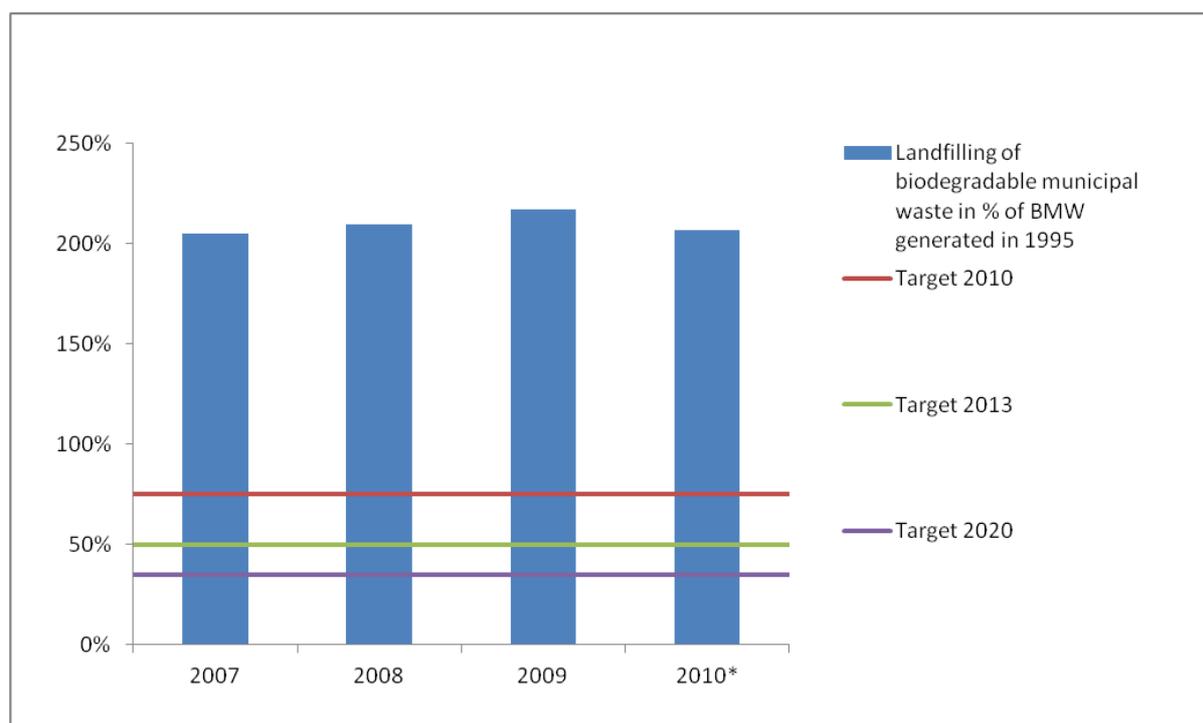
There are only reported figures available for 2006, 2007, 2008 and 2009.

According to the EU Landfill Directive, Member States have to reduce the amount of biodegradable municipal waste (BMW) landfilled to a certain percentage by 2006, 2009 and 2016. The targets are related to the generated amount of BMW in 1995. The indicator can be used to assess the prospects of Cyprus for meeting these targets. The target years for Cyprus are 2010, 2013 and 2020, since Cyprus has been granted a derogation period for the fulfilment of the Directive's targets due to the fact that the country put more than 80 % of the collected municipal waste to landfill in 1995. Furthermore, if this indicator is linked with the indicator on organic recycling, it would be possible to estimate whether the biodegradable waste that is not landfilled is either recycled or incinerated.

Cyprus has not reported any composting of MSW before 2010. In 2010, 4 % of MSW was composted. In order to estimate the amount of BMW landfilled in 2010, the reported composted MSW amount is subtracted from the 2009 figure for biodegradable MSW landfilled.

In figure 2.3, it is clear that Cyprus is landfilling a lot more biodegradable waste than generated in 1995, namely more than double. This is caused not only by the fact that landfilling is still the dominant treatment path in the country, but also by the large increase in BMW generation since 1995. The landfilled quantity was increasing until 2009, when organic waste recycling began. The figure for 2010 is a calculated figure, but it seems that Cyprus will need to make an exceptional effort in order to fulfil its first target for 2010 and it will be very difficult for the country to succeed on the following targets. The fact, however, that organic recycling has begun shows a clear way for Cyprus to improve.

**Figure 2.3 Landfilling of biodegradable MSW in Cyprus**



Source: EC, 2012 and own calculation\*. The figures for 2010 are estimated by Copenhagen Resource Institute (CRI). The target dates take account of Cyprus' 4 years derogation period.

#### **2.1.4 The relation between landfill tax level and recycling level of MSW**

This indicator tries to correlate the introduction and level of a landfill tax with the development of recycled MSW, through the diversion of waste from landfill. However, no information on such a tax is available for Cyprus.

#### **2.1.5 Environmental benefits of better MSW management**

This indicator shows the environmental benefits of better MSW management indicated by the greenhouse gas emissions over time.

Cyprus is not included in the current MSW model on GHG emissions, developed by the EEA and ETC/SCP, due to lack of data. When the MSW/GHG model is updated after the Eionet-review of the model (April-May 2012), new information might arise for Cyprus and the modelling of GHG emissions from MSW in Cyprus would be possible. In the absence of relevant information MSW management in Cyprus will be modelled based on a set of assumptions in order to fill the data gaps. However, results are not available yet.

## **2.2 Uncertainties in the reporting**

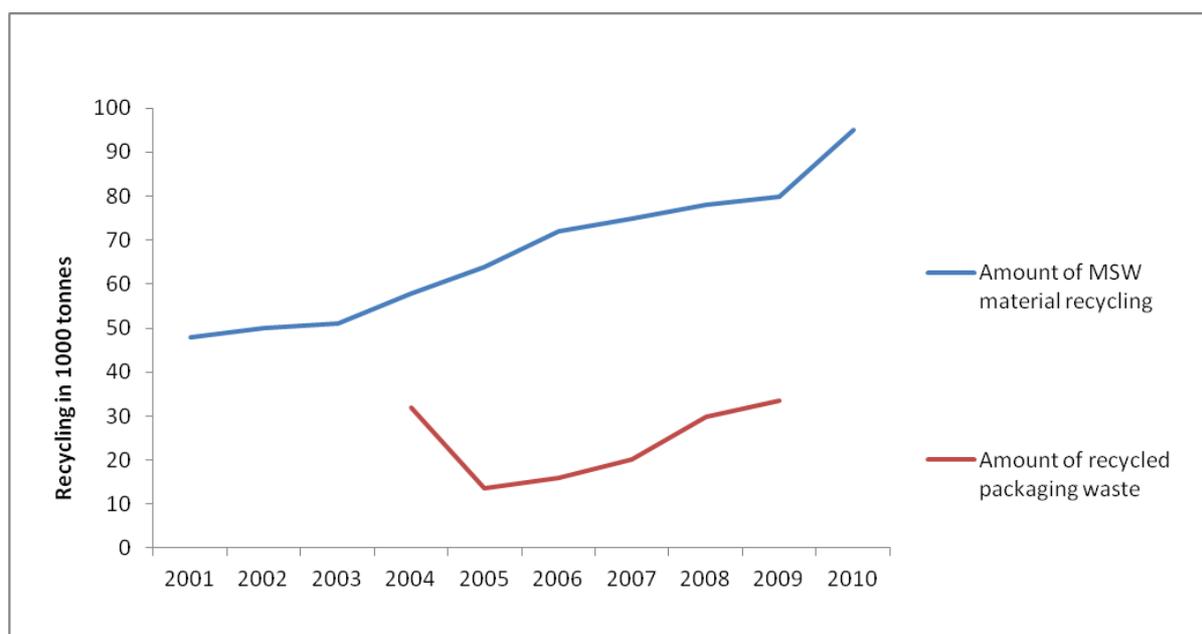
Some uncertainties or differences included in the reporting of MSW can result in different recycling levels. Two examples of such differences are the amount or proportion of packaging waste included. Another factor could be MSW sent to Biological Mechanical Biological Treatment (MBT), where the whole amount received at the MBT plant in some countries is reported as recycled MSW. In other countries it is in fact only the actual amount recycled after the MBT, which is included and not the amount subsequently sent to landfilling or incineration.

It seems that there are some major differences regarding how much recycling of packaging waste the different Member States include in their reporting of MSW. This difference is due to the fact that

most Member Countries, including Cyprus, have producer responsibility schemes and the packaging waste is therefore not always regarded or reported to Eurostat as MSW.

In the case of Cyprus, the amount of MSW recycled is higher than the packaging waste recycled, according to figure 2.4. However, there is no clear correlation between the two: for example, the sharp decrease in packaging waste recycled between 2004 and 2005 does not seem to affect the level of MSW recycled. For the remaining years, the two datasets seem to develop almost parallel. There could be multiple explanations for the different trend in 2004-2005, e.g. the drop in packaging waste recycling could originate from sources other than MSW. The data do not allow for a conclusion whether Cyprus includes packaging waste when reporting on recycling of MSW.

**Figure 2.4 Comparison of packaging waste recycled and MSW recycled from 2001 to 2010**



Source: Eurostat, 2012

It seems that the composition of material recycled MSW and packaging waste recycled is similar: they both target the same material fractions, namely paper, glass, metals and plastic, but precise numbers do not exist except for some estimations (UNDP, 2009).

There are no MBT plants operating in Cyprus, so this source of uncertainty does not qualify for this country.

## **2.3 Important initiatives taken to improve MSW management**

Cyprus has transposed the EU Directives related to waste in the national legislation. A national strategic solid waste management plan has existed since 2002, which reflects the legislative targets (based on the Landfill Directive) and introduces a framework of standards on MSW management. No waste prevention programme or information on economic or other instruments supporting the waste hierarchy has been found for Cyprus.

According to the analysed information, it seems that Cyprus does not use any of the stronger policy instruments used in other countries to reduce landfilling of biodegradable municipal waste and to enhance recycling of MSW, such as landfill taxes or bans, introduction of mandatory separate collection, economic incentives for households to recycle or reduce waste. This could explain the very slow increase in MSW recycling.

The recycling sector in Cyprus is based on private initiatives. The establishment and operation of Green Dot Cyprus (2006) as the only collective recycler in the country and, very recently, the operation of an advanced Material Recovery Facility for sorting mixed waste are the most important initiatives.

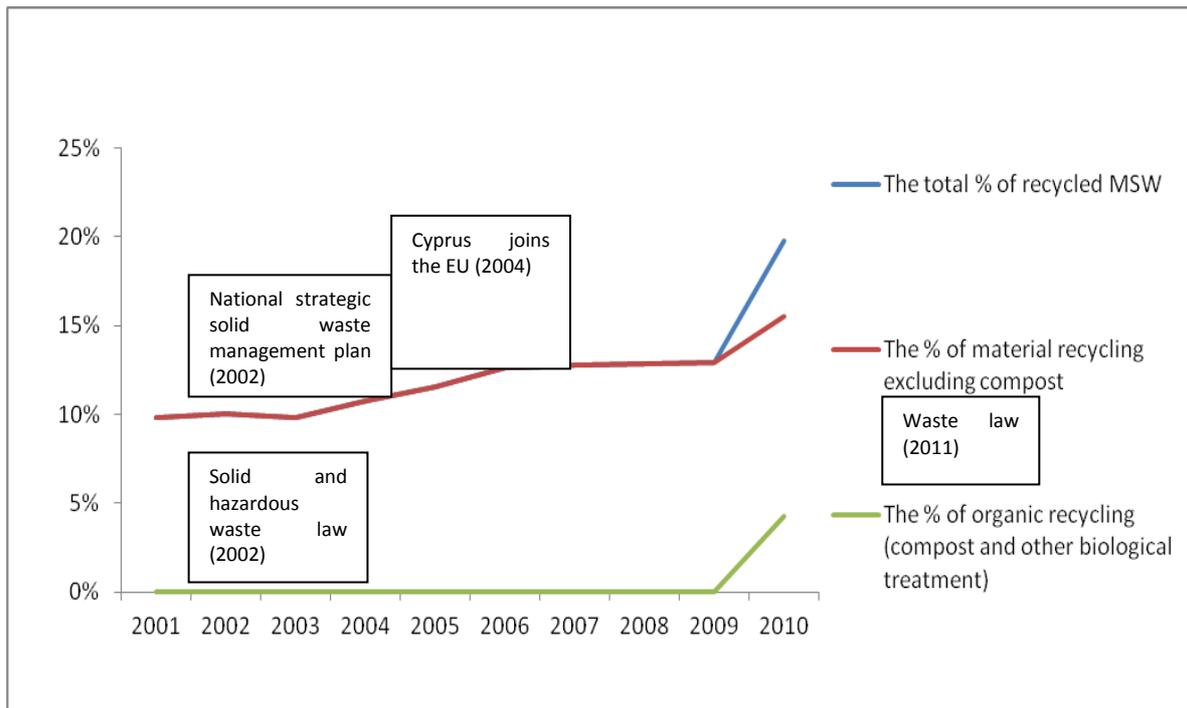
Existing pieces of legislation for Cyprus include (with a short description):

- Solid and hazardous waste law (2002): Aims at (among others, issues relevant to MSW) prevention of waste quantities and environmental impacts, establishing an integrated and optimised national waste management system, sufficiency of Cyprus to manage its wastes, standardisation and monitoring of all operations within the waste management system, establishing a waste management strategy including treatment options and targets for waste management (with special focus on biodegradable and packaging waste), introduction of the 'polluter pays principle', regulating the transboundary movement of waste, organising the public administration of the waste management system, adoption of the Eurostat nomenclature.
- Waste law (2011): Aims at the transposition of EU Directives, including the Landfill Directive and the Waste Framework Directive.

Regarding future trends, Cyprus identifies the very high level of MSW generation as one of the most important issues. This level cannot be explained solely by the MSW generation rate's correlation to GDP, but could also be partly attributed to touristic activities. Other identified problems are that the responsibility for different waste streams lies within two different ministries and also the difficulties and the time consuming efforts to enforce producer responsibility for various waste streams (EEA, 2010).

Cyprus will focus on waste minimisation to combat the very high MSW generation rates. In terms of treatment, Cyprus claims that stricter enforcement of the existing legislation will be applied (EEA, 2010).

**Figure 2.5 Recycling of MSW in Cyprus and important policy initiatives**



## 2.4 Future possible trends

Figure 2.2 includes an attempt to forecast possible developments in the recycling levels in Cyprus. Although the forecasting is performed in a simple manner, all three scenarios project that the country will fall short of the MSW 50 % recycling target of 2020. As Cyprus recycled 121 000 tonnes of MSW (out of 611 000 tons) in 2010, corresponding to approximately 20 %, the country would need to increase its recycling rate by 3 percentage points annually. For indicative purposes only, that would mean Cyprus needs to increase its recycling by more than 18 000 tonnes of MSW annually, provided that the waste generation remains constant.

Therefore, there is a need for Cyprus to intensify its efforts for recycling. No information has been found on initiatives to increase recycling in the near future.

Another incentive for Cyprus to increase recycling, and composting specifically, is the implementation of the Landfill Directive. As shown in figure 2.3, Cyprus will need to make an exceptional effort in order to fulfil the 2010 target and to align with the other Landfill Directive targets.

In general, although Cyprus has transposed all EU legislation, it faces difficulties in its implementation, mainly due to lack of infrastructure, mixing of responsibilities among the authorities and absence of sufficient monitoring of the waste management system.

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