

EUROPEAN UNION



Committee of the Regions

File Note on Circular Economy Package for the Territorial Impact Assessment Workshop

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Summary

On 2 July 2014, the European Commission presented a legislative proposal including new targets for municipal waste reuse/recycling, packaging waste recycling, and keeping recyclable waste from being landfilled.

As a basis for discussion, the present status of the European waste management systems and potential effects of the new targets are summarised. Waste generation remained stable in the past two decades in the EU, while a general shift away from landfilling took place. In 2012, one third of the EU Member States (MS) have achieved Municipal Solid Waste (MSW) recycling target beyond 40%, and were close to achieving the 50% target due by 2020. Half of the EU MS, however, still landfilled more than 50% of waste. At regional level the material recycling/composting/digestion rates of the majority of the regions ranged from as low as 5% and as high as 70%.

Barriers against gaining high recycling rates in particular exist in regions with an annual per capita GDP of less than 20,000 €, sparsely populated regions, very densely populated regions and urban aggregates, and regions at the eastern and southern rim of the European Union.

The introduction of more ambitious new waste targets has the potential for substantially further decreasing the environmental impacts of the European economy, and creating new jobs. It, however, must be highlighted that regions which have difficulties to achieve high recycling rates today will probably not reach the new recycling targets until 2030.

Without additional supporting measures, the new targets could cause undesired effects on the territories, such as: an increase in waste management costs, an increase of traffic to transport waste to waste management facilities, a decrease of the quality of recycled materials and consequently an increase in the amount of hazardous substances dissipating from the economy to the environment.

Introduction

On 2 July 2014, the European Commission adopted the “Circular Economy Package” consisting of Communication on Circular economy (COM (2014)398) and the Proposal for a Directive (COM (2014)397). This package, among others, reviews recycling and other waste-related targets in the EU Waste Framework Directive 2008/98/EC, the Landfill Directive 1999//31/EC and the Packaging and Packaging Waste Directive 94/62/EC.

The aim of the proposal is to help turn Europe into a circular economy, boost recycling, secure access to raw materials, and create jobs and economic growth. The main elements of the proposal include new targets for municipal waste reuse/recycling, packaging waste recycling, and keeping recyclable waste from being landfilled. In addition, the package includes food waste prevention measures.

In order to discuss the viability and effects of the new targets, the Committee of the Regions is organising a Territorial Impact Assessment workshop on 9 September 2014 in Brussels. The information in this report will be used as a basis for discussion at this workshop.

Chapter 1.1 “Status of implementation of EU legislation in EU Member States” shows that waste generation remained stable in the past two decades in the EU, while a general shift away from landfilling took place. One third of the EU Member States (MS) have already achieved the MSW recycling target of 50% due by 2020. Half of the EU MS, however, still landfill more than 50% of waste.

Progress in the past decade in recycling rates is primarily due to a steady increase in material recycling, especially of glass, paper and cardboard, metals, plastic and textiles. In total, the majority of Member States are on a good track to achieve the EU’s 2020 municipal waste and packaging recycling targets.

At regional level, the EU waste management system and the majority of the regions are well on the way to operating a low environmental impact system, supporting the material efficiency of the European economy by substantial recycling rates. However, as highlighted in chapter 1.2 “The impact of current waste legislation”, some regions can much easier reach high recycling rates than others. Thus, the material recycling/composting/digestion rates of the majority of the regions are evenly distributed between as low as 5 % and as high as 70 %.

The potential to implement effective recycling systems often depends on the demography and type of territory. Barriers against achieving high recycling rates exist in particular in regions with an annual per capita GDP of less than 20,000 €, sparsely populated regions, very densely populated regions and urban aggregates, and regions at the eastern and southern rim of the European Union.

Evidence shows that EU targets and national targets are drivers for better municipal waste management and are necessary to move the country away from landfilling practices, but regional policies and local implementation play key roles in establishing effective waste management systems.

As shown in chapter 1.3 “

Outlook: likely consequences, impacts and feasibility of the new targets proposed by the EC on ² July 2014”, the introduction of more ambitious waste targets has the potential for substantially further decreasing the environmental impacts of the European economy, and creating new jobs. However, it must be highlighted that those regions that have difficulties to achieve high recycling rates today are likely to not reach the new recycling targets until 2030. They will also have difficulties to reach the new recycling targets any time later.

Also, it has to be taken into account that the costs of implementing these targets may be higher than anticipated by the Impact Assessment of the European Commission. Moreover, without additional supporting measures the new targets could cause undesired effects on the territories, such as: an increase in waste management costs, an increase of traffic to transport waste to waste management facilities, a decrease of the quality of recycled materials and consequently an increase in the amount of hazardous substances dissipating from the economy to the environment. In order to create the markets for recycling materials the competition with primary materials’ suppliers must be addressed. Further action is needed in regions with strong barriers against affordable compliant waste management. Special care must be taken to prevent illegal ways of achieving high recycling rates by informally landfilling or incinerating non-recyclable waste.

In order to achieve the proposed targets while preventing possible negative impacts, substantial investments, incentive-programmes and programmes for preparing proper framework conditions will be required. The necessary infrastructures, framework conditions, stakeholder participation, and markets need to be established while preventing the recycling system from moving towards downcycling. Particular attention should be given to the regions where the

implementation of waste management systems is still insufficient to achieve existing targets.

Finally, based on the collected data, chapter 1.4 “Conclusions and recommendations for the TIA workshop” offers a series of recommendations for the focus of the CoR’s Territorial Impact Assessment workshop, such as: indicators for monitoring and evaluation of impacts of revised targets on regions, types of territories where most problems are expected to arise, and those points requiring further discussion.

1. European Waste Legislation: implementation, impacts and future development

The EU legislation of the last two decades has certainly provided the driving force for better waste management in EU member countries, and the comparison of the landfilling and recycling rates across Europe is evidence of the importance of proper implementation of national and regional instruments for waste management, as recent data show (EEA 2013, Eurostat 2012).

1.1 Status of implementation of EU legislation in EU Member States

In order to show the broadness of the achievements of the EU Member States and the regions, we want to give a summary to which degree the waste targets set in the Waste Framework Directive 2008/98/EC, the Landfill Directive 99/31/EC and the Packaging Waste Directive 94/62/EC have been met in the different EU territories. The information presented in chapter 2.1, Annex I, shows the following:

Municipal Solid Waste recycling rates

The recycling targets as expressed in the Waste Framework Directive (50% recycling of MSW by weight by 2020) are reported by Member States in two different ways, thus either by excluding or including composting and anaerobic digestion to total material recycling¹. In both cases, the outlook is not optimistic. When composting and material digestion are included in the calculation:

- One third of EU countries reported recycling levels above 40% in 2012. Among these, just 4 countries have already achieved the 2020 target.
- Two thirds of EU countries reported recycling levels below 40% in 2012, thus they will need to make an extraordinary effort in order to achieve the target of 50% recycling by 2020, and the 70% target by 2025.

If anaerobic digestion and composting are excluded from reporting, recycling rates fall below 50% in every EU country.

¹ (see Annex I, chapter 2.1.1.1 “Waste Framework Directive 2008/ 98/ EC”, graph 2 and graph 3)).

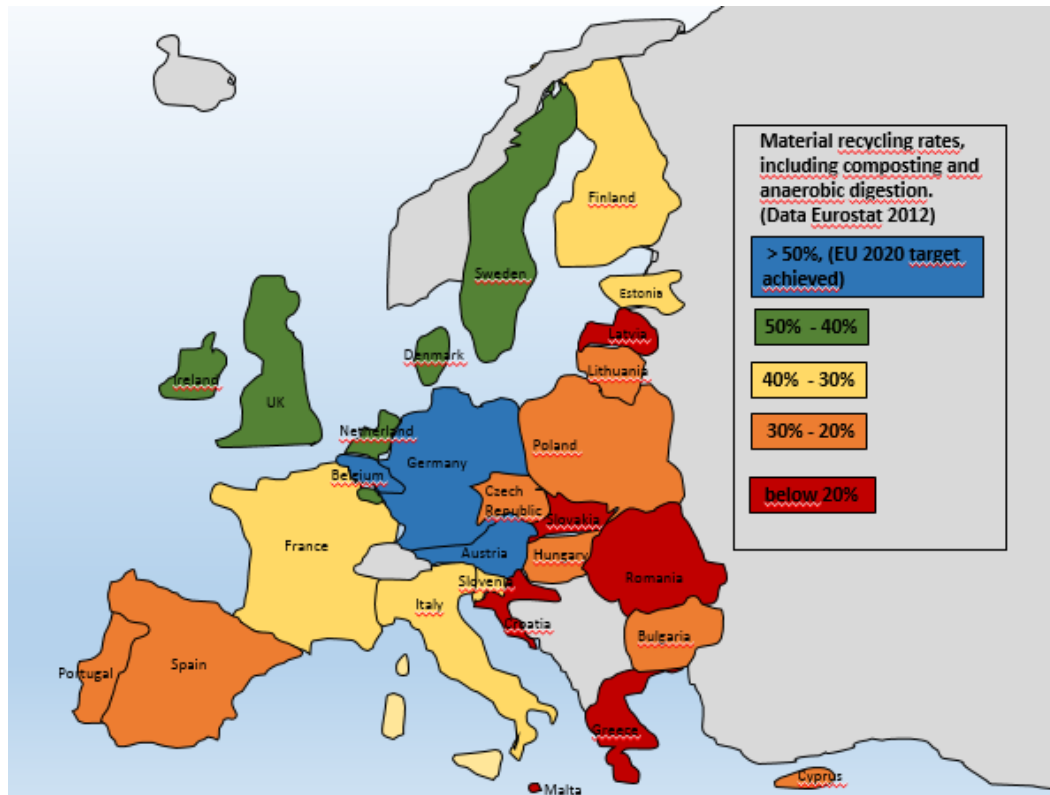


Figure 1: Material recycling rates in EU 28 in 2012.

Packaging recycling rates

(EU target: 70% by weight by 2020, for several packaging recycling types)

EU Member States show generally a good response to requirements for packaging waste recycling, and a general improvement in the past decade can be observed².

One third of EU Member States have already achieved, or are on their way to achieving the EU's 2020 and 2025 targets (overall packaging). There is evidence that systems for collection and sorting of packaging waste such as glass, paper, metals are becoming common across Europe, but this also raises questions concerning the feasibility of further improvements: when looking at singular targets, some implementation difficulties can be observed (e.g. for plastic waste and wooden waste). Possible barriers towards full implementation include: failures in the collection system, lack of market demand for recyclates, technical limitations of the recycling process, and lack of end of quality criteria for recyclates. These may result in an increased demand for incineration rather than proper material recycling.

² see Annex I, chapter 2.1.1.3.

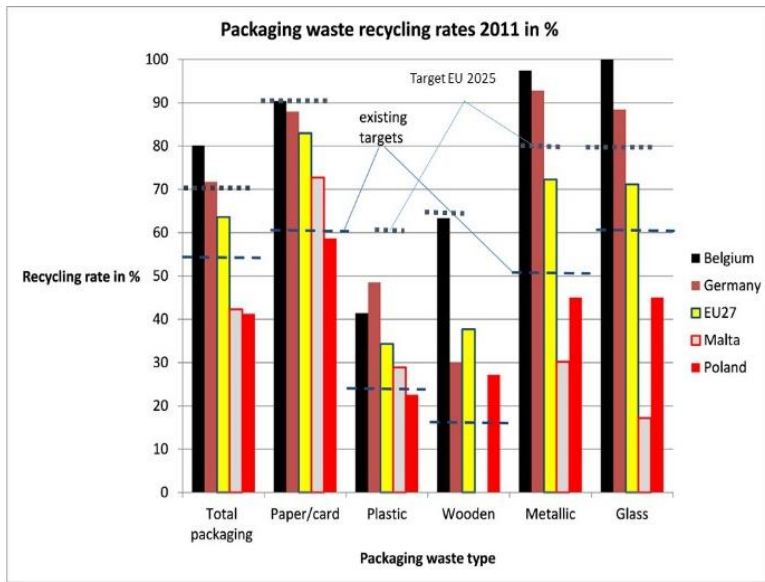


Figure 2: Packaging waste recycling rates by packaging types in 4 selected EU Member States and the EU27-average for the year 2011 (data source: Eurostat 2014, Hogg et al. 2014a).

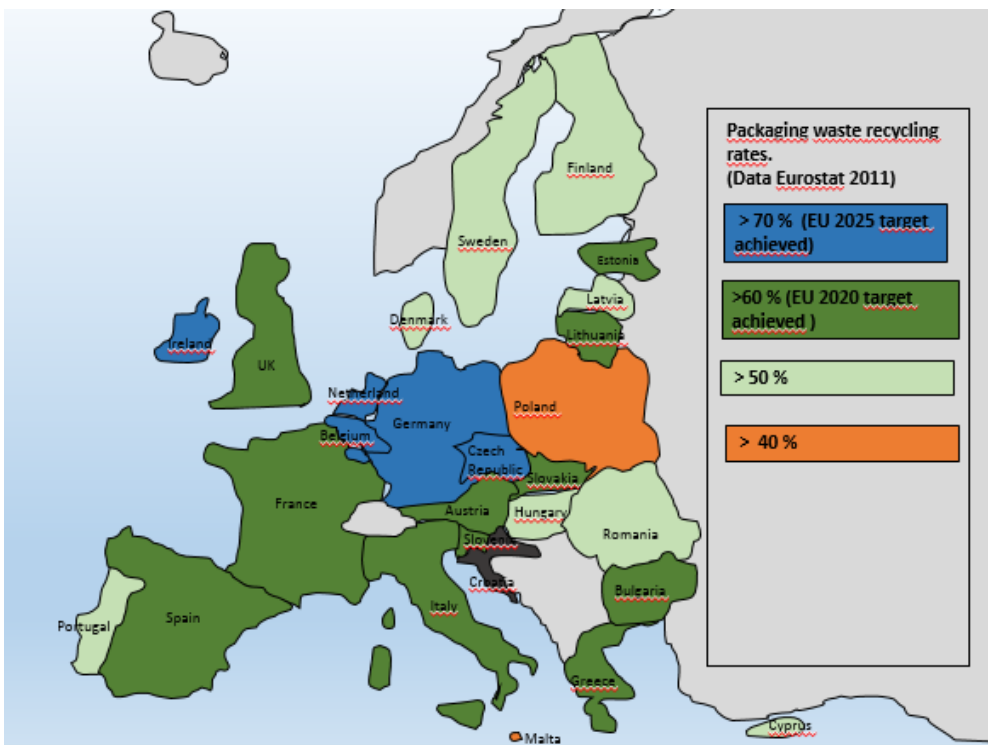


Figure 3: Packaging waste recycling rates in EU 27 in 2011.

Landfilling and landfill diversion of biowaste

The Landfilling Directive sets a reduction target for biowaste by 35% in 2016 compared with the last 15 years. In the “Proposal for a Directive COM(2014)397 final”, new targets are proposed to phase out landfilling by 2025 for recyclable waste (including plastics, paper, metals, glass and bio-waste) in non-hazardous waste landfills, corresponding to a maximum landfilling rate of 25%.

At least half of the EU countries are making good progress in diverting waste from landfill, and there has been an overall shift from landfilling in the waste hierarchy in the past decade³. Seven Member States have already met the recently proposed target of 25%, whilst another seven countries are making good progress as they landfill between 40% and 60% of generated waste, and have generally managed to substantially reduce the amount of landfilled waste in the past decade. The remaining Member States have not yet achieved major progresses in the past decade and still landfill more than 60% of their waste (with peaks of 80%). It seems unrealistic for these Member States to meet the EU’s 25% target by 2025.

Data on biowaste diversion of Member States reflect those on landfilling: seven countries had already achieved the 2016 target of 35% by 2010, while among the countries that could rely on a derogation period more than half have been unable to achieve the 2010 target. There is also evidence that countries with a high rate of landfilling have typically not entirely transposed the EU directives into national legislation, and suffer also from ineffective collection systems, lack of proper waste management plans, and reliance on landfilling and existence of illegal dumping practices.

Significant increases in the generation of municipal waste and consequently biodegradable municipal waste have occurred in some countries (e.g. Cyprus, the Czech Republic and Slovakia). The absence of common EU quality standards or end-of-waste criteria for generated compost/digestate, the absence of limitations on total landfilled waste, as well as the lack of 100% coverage of MSW collection (e.g. Estonia, Lithuania) are identified as some of the main barriers for achieving landfilling targets.

For countries already performing well in terms of landfilling, the introduction of landfilling bans and taxes generally seems to have had a good impact on increasing recycling.

³ See Annex I chapter 2.1.1.4.

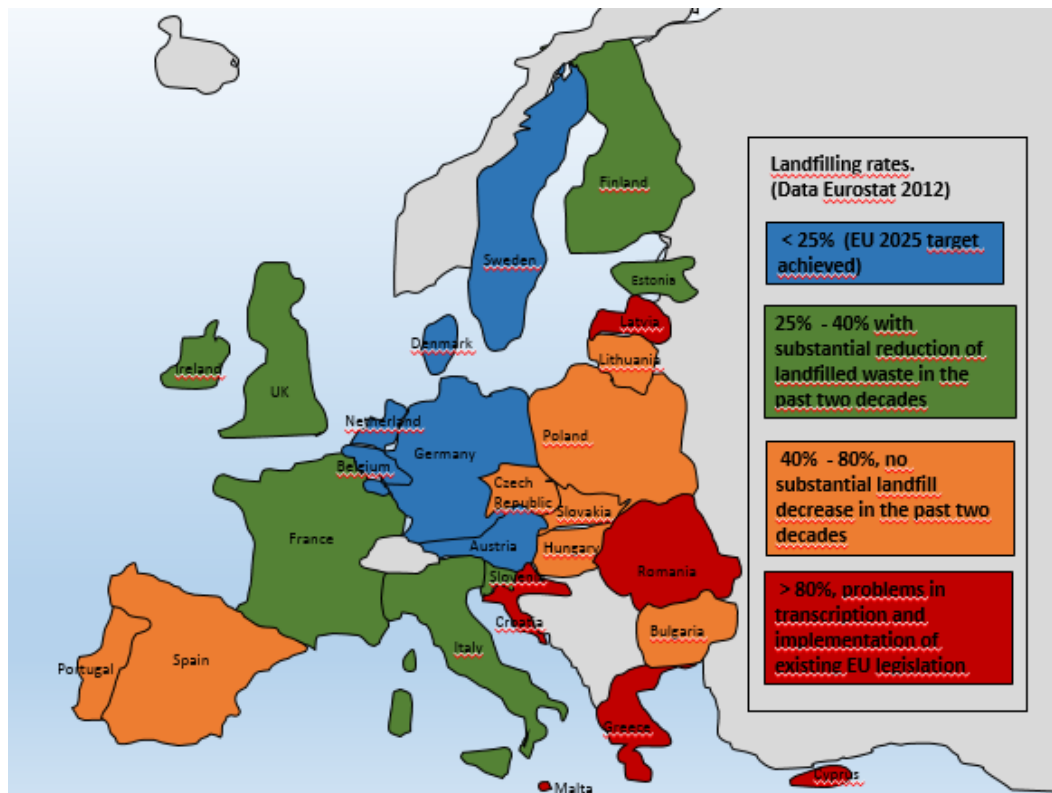


Figure 4: Landfilling rates in EU 28 in 2012

Feedback of the Member States on the implementation of old and revised targets of the Waste Framework Directive 2008/98/EC, the Landfill Directive 99/31/EC and the Packaging Waste Directive 94/62/EC

Data⁴ shows that EU legislation has been to a large extent transposed into national legislation, with some exceptions, but the EU still struggles with practical implementation and enforcement, due to a combination of structural, institutional and constitutional constraints.

Feedback of EU Member States on new waste management targets proposed by the European Commission (2014a) in principle supports the setting of new clear recycling and landfilling limitation targets. However, there is also widespread concern if the proposed targets can actually be met (with more optimistic expectations for packaging waste), especially in terms of costs and excessive monitoring, and on the effects on the quality of recycling.

⁴ Annex I, chapter 2.1.3.

Are the difficulties in a country specific or region specific issues?

The analysis of data⁵ gives an overview on the variation of regional landfilling and recycling rates for municipal waste in a number of EU countries, and shows that difficulties in implementing EU waste legislation are partly regional, and partly country specific⁶. Two situations can be identified:

1) First, in countries characterized by low recycling rates and high rates of landfilling (beyond 70%), there are no substantial differences in recycling among regions, indicating implementation issues at a national level and lack of local policies.

2) Second, as recycling increases and landfilling decreases, it can be observed as national recycling rates are generally not reflected at regional level, where recycling rates can vary significantly (e.g. Austria, Belgium, Germany, and the UK). Typically, the implementation of waste management practices has different potential and impacts depending on regional characteristics⁷. The variation in municipal waste recycling between a country's regions seems to be both due to variation in the recycling of materials and bio-waste. In general, there is evidence that:

- Rural areas have higher organic recycling;
- High-density urban areas (e.g.: Brussels, Vienna, Hamburg, London, Paris) have lower recycling rates and problems in implementing recycling systems;
- Even cities with more than 20 years of experience in separate waste collection and recycling systems such as Vienna, Berlin, Cologne, Hamburg, London and Paris seem to have difficulties in achieving recycling rates of more than 50%;
- Municipalities with less than 10.000 inhabitants are more likely to achieve the 70% recycling targets (with peaks of 80%), although positive results are reported for urban aggregates with population between 1.000 and 20.000 inhabitants.

⁵ Annex I chapter 2.1.2.

⁶ See chapter 2.1.2 Annex I.

⁷ See Annex II.

Summary status of implementation of waste legislation

There is evidence that suggests that, whilst municipal waste generation has remained stable in the past decade, the following points can be noted:

- A general shift away from landfilling has taken place, although half of the EU Member States still landfill more than 50% of produced waste, including big fractions of biological waste. These countries are mainly located in the southern and eastern rim of Europe. Some of these countries still have problems with the transposition on EU waste legislation into national directives.
- There have been substantial increases in the proportion of municipal waste recycled, but the overall figures suggest much improvement is required: for total material recycling, just one third of EU MS is on track to achieve (or has already achieved) the EU's 2020 targets of 50%. All Member States seem to be far away from achieving the 2030 target of 70%.
- Progress in the past decade in recycling rates is primarily due to trends in recycling of materials, especially glass, paper and cardboard, metals, plastic and textile. This is reflected in the overall good performances for packaging waste recycling. Most countries have already met, or are close to meeting, the EU's 2020 or even 2025 targets.
- Singular packaging targets reveal difficulties for recycling certain materials, such as plastic or wooden waste, often linked to the feasibility of recycling such materials. This poses questions concerning the achievability of revised targets, and which options Member States will adopt in order to achieve these targets (e.g. preference for incineration).
- EU targets and national targets are the overall drivers of better municipal waste and are necessary to move the country away from landfilling practices, but regional policies and local implementation have a key role in the effectiveness of the waste management system.
- There is widespread concern if the proposed targets actually can be met (with more optimistic expectations for packaging waste), especially in terms of costs and excessive monitoring, and on the effects on the quality of recycling.
- The potential to implement effective recycling systems can be related to the demography and type of territory.

Relevant indicators (Annex III):

Waste Indicators: Waste indicators are a measure of waste management performances and allow better monitoring, comparability of data from different countries, estimation of environmental impacts, and are a prerequisite for implementing an "early warning system".

Population density, type of territory (rural vs urban, high vs low populations).

1.2 The impact of current waste legislation

The impact of current waste legislation on the waste management systems of the EU regions is quite different. Municipal waste generation can vary from less than 200 to more than 1,000 kg per capita per year. One quarter of the regions have virtually phased out landfilling of untreated municipal waste, while another 37% still rely on landfilling more than 50% of municipal waste. There are about as many regions with virtually no recycling of municipal waste as regions with a material recycling/composting/digestion rate of more than 70%. The majority of the regions, however, are evenly distributed between material recycling/composting/digestion rates between 5% and 70%⁸.

Comparing the municipal waste material recycling rates of the 211 regions for which data are available with their annual per capita GDP reveals a general trend that higher affluence (higher per capita GDP) leads to higher recycling rates (see Figure 5). A minimum per capita GDP of 20,000 €/year seems to be necessary to achieve material recycling rates above 40%. However, a per capita GDP above 20,000 €/year does not guarantee a high recycling rate. Above the 20,000 €/year threshold, other factors than the region's affluence become limiting and need to be addressed. One of these limiting factors is population density.

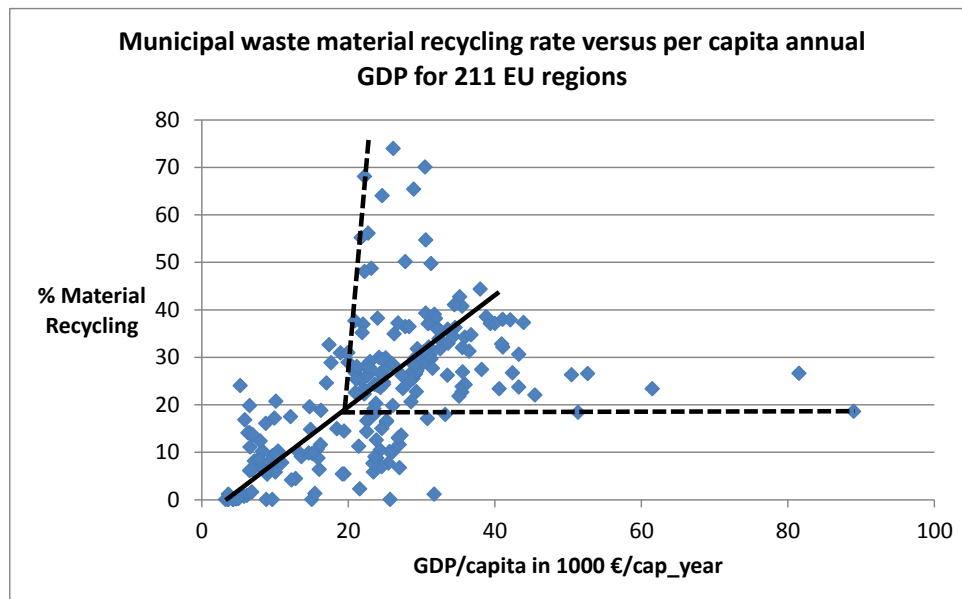


Figure 5: Effect of regional affluence on municipal waste material recycling rates in 211 regions (data: Eurostat 2014)

⁸ see Annex I, chapter 2.2.

Total recycling rates (material recycling, composting and digestion combined) are highest in regions of moderate population density (see Figure 6).

A low population density may be a limiting factor for achieving high recycling rates. The specific costs for collecting and transporting municipal waste are also higher in sparsely populated regions. Therefore, it is likely to be more costly to achieve high recycling rates in these areas. But also a high population density (such as in large towns) is a limiting factor for achieving high recycling rates. In regions with very high population density there is not enough space for installing all the bins for the separate collection of the different municipal waste types, and for home-composting, leading to a high generation of residual waste that is difficult to recycle.

Regions with an early uptake of internet access show some tendency towards higher recycling rates⁹. An early technology uptake and good infrastructure development consequently seem to constitute supporting factors for increased recycling rates.

In several EU Member States, especially in eastern and southern Europe, existing EU waste legislation has not yet been fully implemented. The benefits of a full implementation of existing EU waste legislation in the EU-27 by the year 2020 were identified as: reduced environmental impacts, reduced consumption of primary raw materials and job creation (Monier et al. 2011)¹⁰.

⁹ see graph 30 in chapter 3.2.3 Annex I.

¹⁰ see also chapter 2.2.1.

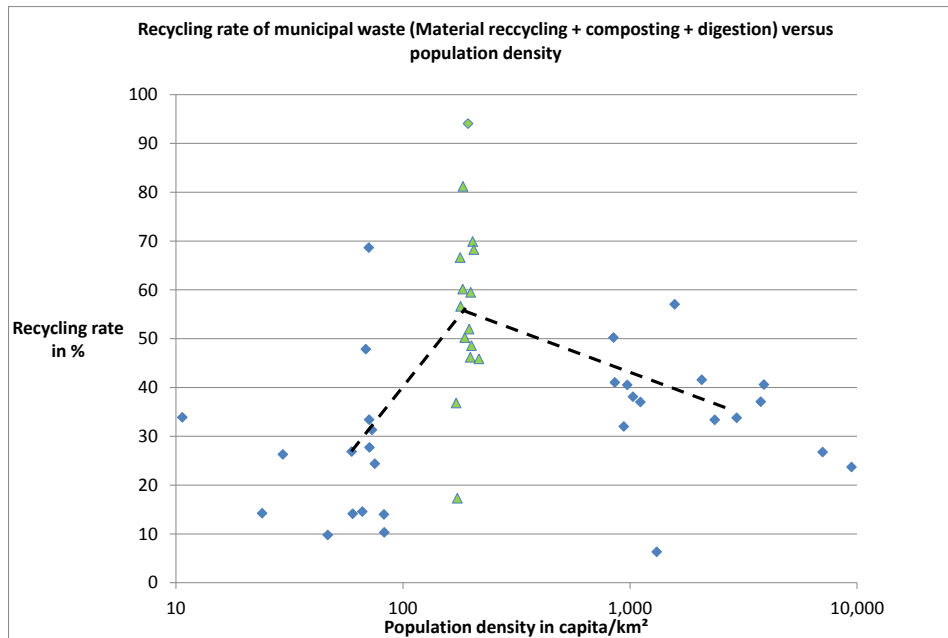


Figure 6: Effect of population density on the municipal waste total recycling rate for the year 2011 (15 regions with lowest population density + 15 regions with population densities around the median of 132 regions + 15 regions with highest population densities) (data: Eurostat (2014))

Although doubts exist as to whether the new targets are achievable, and if the costs are higher than expected in the Commission's Impact Assessment, the full implementation of EU waste legislation is expected to have the following impacts:

- By applying waste prevention measures the generation of waste could be substantially reduced.
- By introducing and improving separate collection systems, by improving waste treatment, by actively discouraging landfilling and by developing recycling markets, the amount of waste recycled and secondary material produced could be increased. This would lead to a reduction of primary material consumption and related environmental impacts. Biodegradable waste is composted and, if unpolluted, can be used as a fertiliser.
- By improved separate collection systems and waste treatment also the share of waste that is used as secondary fuel could be increased without polluting the environment. Waste can be incinerated in specialised incineration plants with sophisticated pollution control and waste to energy utilisation. Biogas from biological treatment plants and landfill-gas could be collected and used as fuel for power and heat generation.
- Waste prevention, increased recycling and improved treatment together reduce the amount of waste to be landfilled. Compliant landfill-systems tend to use landfills with a smaller specific area consumption per tonne of waste landfilled. It is therefore estimated that the total area consumption for the

waste landfilled in the year 2020 in the EU-27 in a fully compliant system would be 64% smaller than in a system without increasing compliance above the year 2008 level. This in turn would result in lower pressure on biodiversity.

- Keeping biodegradable and other reactive waste from landfills, and equipping landfills with base, side and cover lining and leachate control additionally reduces the emissions of pollutants such as heavy metals or soluble/volatile organic compounds from landfills into air, water and soil and reduces the emissions of dust and stench.
- In a fully compliant system, no waste, and especially no hazardous waste – such as waste from electric and electronic equipment (WEEE), or batteries from end-of-life-vehicles (ELV) – would be illegally exported. If waste is exported, it would be treated at the same environmental standards as if it would be treated within the EU.
- Some 1.6 billion tonnes of material would be recycled annually helping to save primary materials and energy and creating jobs.
- The impact of waste on human health for all EU-citizens would be reduced to almost zero, leading to increased life expectancies.
- The impact on animals and plants, on biodiversity and nature-protected-areas would be much reduced.
- Greenhouse-gas emissions would be reduced within the waste management sector and by replacing primary energy and materials in other sectors by an estimated total of 215 Mt CO₂ per year.
- Emissions of ecotoxic, acidifying, eutrophying and ozone depleting substances would be substantially reduced (Monier et al. 2011)

Summary: impact of current waste legislation

Evidence as to the current impact of waste legislation on EU regions suggest that:

- The majority of the regions are evenly distributed between material recycling/composting/digestion rates of between 5% and 70%.
- A minimum per capita GDP of 20,000 €/year seems to be necessary to achieve material recycling rates above 40%. However, a per capita GDP above 20,000 €/year does not guarantee a high recycling rate.
- Low and very high population density may be a limiting factor for achieving high recycling rates mainly due to specific costs for collecting and transporting municipal waste, and lack of space for installing all the bins for the separate collection respectively.
- Regions with an early uptake of internet access show some tendency towards higher recycling rates.
- Full implementation of EU legislation by 2020 brings several environmental, economic and social benefits, including a potential of 1.6 billion tonnes of material recycled annually, helping to save primary materials and energy and creating jobs.

Relevant indicators (see Annex III): Municipal waste material recycling VS per capita annual regional GDP, access to ICT services

1.3 Outlook: likely consequences, impacts and feasibility of the new targets proposed by the EC on 2 July 2014

The revised targets proposed within the Proposal for a Directive COM (2014) 397 will have different degrees of applicability, feasibility and expected impacts, varying from country to country but also from region to region. In general, much will depend on the level of implementation already achieved and “experience” with waste management. In addition, average national recycling and landfilling rates are most of the time not representative of regional achievements, and regional potential to reach targets can vary significantly within the same country.

Furthermore, it must be also stressed that a number of Member States had not achieved full transposition of the relevant legislation as of 2011 (e.g. Greece, Czech Republic, Poland, Estonia, Slovakia, Slovenia and Hungary), or had not achieved full implementation (as it can be argued for all Member States still landfilling the majority of produced waste)¹¹. Thus, a number Member States are already lagging

¹¹ See chapter 2.111 Annex I.

behind in the transposition and implementation of old targets, and big efforts are expected from these countries to catch up with EU legislation.

1.3.1. The EC Impact assessment on revised EU waste targets

The European Commission in its Proposal for a Directive COM (2014) 397 proposes the recycling/maximum landfilling targets shown in Table 1. The expected impacts of those targets, by the European Commission, can be seen in the Impact Assessment (Hogg et al. 2014a) and its Summary (SWD (2014) 208 final). The main points of this impact assessment are briefly presented and discussed in this section. The expected effects of the revised targets and the accompanying measure “administrative simplification, early warning systems” as estimated by the impact assessment are shown in

Table 2, as well as the expected effects of the target combination recommended by the impact assessment. This target combination is called “option 3.7”. In this option the landfill targets are extended to all waste types which are similar municipal waste. Also recommended by the impact assessment are an accompanying programme simplification, improved monitoring and diffusion of best practices. However, no cost estimates are provided for this accompanying programme.

Table 1: The European Commission’s proposals for new recycling/maximum landfilling targets from July 2014 (European Commission 2014a)

Option	Scope of target	New targets for the years		
		2020	2025	2030
Option 3.1-2	Recycling/reuse target for municipal waste		60 %	70 %
Option 3.2	Re-use/recycling targets for packaging waste	60 %	70 %	80 %
Option 3.3	Maximum landfilling targets of plastic/paper/glass/metals		25 %	5 %
Option 3.4	Option 3.1-2 + Option 3.2 + Option 3.3	All above targets		

Table 2: Estimated expected effects of the new municipal / packaging waste targets proposed by the European Commission plus the effects of option 3.7 which is recommended by the Impact Assessment (European Commission 2014b)

Option	Scope of target	Expected Effects				
		Financial costs (NPV 2014-2030) in billion € (1)	External costs (NPV 2014-2030) in billion € (2)	Net social costs (1+2)	Jobs (FTEs in 2030)	GHG (2030) in million tonnes CO ₂ eq
Option 3.1-2	Recycling/reuse target for municipal waste – high	-8.41	-8.49	-16.91	137,585	-39
Option 3.2	Re-use/recycling targets for packaging waste	-11.2	-8.45	-19.66	107,725	-20
Option 3.3	Maximum landfilling targets for plastic/paper/glass/metals	5.64	-0.65	4.99	46,165	-13
Option 3.4	Option 3.1-2 + Option 3.2 + Option 3.3	-12.65	-13	-25.65	177,637	-44
Option 3.7	Option 3.1-2 + Option 3.2 + Maximum landfilling targets for all waste similar to municipal waste	-10.70	-18.3	-29	?	-62

Note: Negative financial costs = net revenues (→ revenues are higher than the financial costs); Negative external costs = net external benefits
Abbreviations: NPV = net present value, FTEs = full time equivalents, GHG = greenhouse gas emissions

Whilst social benefits, job creation and a reduction in greenhouse gas emissions are undoubtedly connected with high recycling rates, some caveats with the costs and benefits of high recycling rates and the expected effects shown in

Table 2 need to be mentioned.

1. The proposed recycling targets are derived from stakeholder feedback, sophisticated modelling and experience gained in leader-regions. Reasonable doubt can be raised if the majority of the EU regions can achieve the recycling targets shown in Table 1 in the given timeframe, or at all. Whilst 14 German regions and 1 Flemish region have already achieved the proposed recycling targets for municipal waste in 2011, 25 German and 4 Flemish regions did not, in spite of intensive decade long programmes to achieve high recycling rates. Especially densely populated areas even in Germany have encountered problems in achieving municipal waste recycling rates above 50%.
2. Sophisticated separate waste collection systems – that is mainly door-to-door collection for different waste types and take-back systems for used products – are necessary to achieve high recycling rates at high product quality. However, many consumers need incentives to use such systems.
3. Those regions aiming for high recycling rates will increasingly find it necessary to separate, clean and treat waste types which are more difficult to recycle, such as waste from compound materials.
4. In some regions operators of incineration plants, mechanical-biological treatment plants, or landfills, may lower their prices down to marginal costs to prevent losing market shares. This may hamper the increase of material recycling. In order to remove this barrier, public administrations may be forced to pay for the sunken investment costs of overcapacities created by more recycling. In other regions incineration capacity for treating the non-recyclable waste is still missing. Construction of the necessary capacity may be handicapped by lack of supply security.
5. Overcapacity in some regions, and lack of capacity in other regions, may facilitate waste being trafficked over long distances (e.g. from southern Italy to northern Germany), accompanied by the corresponding environmental impacts.
6. The recycled material may not have sufficient quality for regional production industries (e.g. such as those specialised in manufacturing of high quality goods), but might find markets in other countries and continents, as there quality criteria and costs for material cleaning are lower. An example is the recycling of European plastic and paper waste in China. This again causes substantial traffic and environmental impacts.
7. The drive for higher recycling rates may be a driving force for downcycling – for recycling more of lesser quality. When more “dirty” materials are recycled the environmental and resource benefits may be lower than expected. In order to prevent downcycling, stringent quality assurance

systems may be necessary to keep the quality of the recycling material high and to prevent a dissipation of hazardous substances.

8. An increase in the recycling rate may also be limited by a maximum share of recycling material, which can be used in new products, or by the lack of products which can use certain recycling material types. Research and development may be necessary for developing materials which can be recycled more easily, as well as products which can use recycling material. Incentives may be necessary to get such materials and products on the market.
9. The European Commission expects that the costs for increasing the municipal waste recycling rate from 50% to 70% are lower than the costs for treating the corresponding waste by more traditional means. In the Impact Assessment of the newly proposed recycling targets, the costs for installing and operating a waste collection and treatment systems which is necessary to increase the municipal waste recycling rate from 50% to 70% seem to be rather underestimated, and the savings from a reduced utilisation of the existing waste collection and treatment system seem to be overrated. The impact assessment expects that the collection costs for a high recycling rate are lower than the collection costs for a lower recycling rate. It also assumes that variable and fixed costs of the existing systems are saved (Hogg et al. 2014 a,b,c, Gibbs et al. 2014 a,b,c). In any case substantial amounts of money needs to be invested in establishing the required separate waste collection and recycling infrastructure, in getting final consumers using the collection infrastructure correctly and in establishing the required markets for recycling material.
10. Recycling can act as job-creator as long as the value generated by recycling is bigger than the costs of the recycling. This is especially true when recycling material can replace primary material imports. However, as shown above, the impact assessment may have underestimated the costs for increasing the recycling rate and therefore overestimated the job-creation effect.

1.3.2. EU 2025 waste targets and impacts on incineration practices

Also of relevance are the possible effects of the revised landfill and recycling targets on incineration. The target for banning the landfilling of most of the plastics and paper requires that a major part of the plastics and paper which cannot be recycled and a major part of the residual municipal waste needs to be incinerated. In regions where no or little incineration capacity exists, additional incineration capacity may be required. Waste incineration plants show a substantial economy of

scales. Incineration plants with a treatment capacity of less than 100.000 tonnes/year are considerably more expensive per tonne of waste treated than bigger plants. At a recycling rate of 70%, in order to avoid excessive costs, the catchment area of a municipal waste incineration plant should cover at least 600.000 people. Especially regarding the islands of southern Europe this is seldom the case. Illegal landfilling and non-compliant waste incineration may be the consequence of the excessive costs for smaller islands.

In regions that have switched from landfilling to incineration of municipal waste the increased recycling targets may have the opposite effect. The increased recycling targets may reduce the demand for waste incineration and lead to over-capacities. Increased waste transport between regions lacking in incineration capacities and regions with over-capacities may be the consequence.

1.3.3. Evaluation of recycling target values and timing

With respect to the target of 70% municipal waste recycling by 2030, at the current growth rate the EU as a whole would reach this target in the year 2035. Only applying some additional measures for accelerating the increase of the recycling rate would make 2030 reasonable as a target year. However, it needs to be taken into account that the low-hanging fruits are going to be picked first. Therefore it can be expected that the marginal increase in a country's recycling rate will slow down when it approaches higher recycling rates.

At a regional level, less affluent, sparsely and very densely populated areas are constrained in meeting high municipal waste recycling rates.

With respect to packaging, the proposed 80% target for the recycling of packaging waste seems not too far away from the 63% already achieved by the EU (based on the average in 2011). Belgium claims to have already achieved the new target. Given the already long tradition of packaging waste collection and treatment in Germany and the intensive measures to support these systems there (such as obligatory deposit refund schemes), it is questionable whether the majority of the EU Member States will be able to achieve the German level of 72% packaging waste recycling, not to mention the Belgium recycling rate of 80%.

The breakdown of the packaging waste recycling targets to the different packaging waste types (see Figure 2) shows that the targets for paper, metallic packaging and glass are near to the existing German achievements. The targets for plastic and wooden packaging, however, are much higher than the achievements in both Germany and Belgium. While it can be expected that some progress is possible with plastic and wooden packaging, too, this raises questions as to whether the EU as a whole can be better in 16 years than Germany is today with plastics, and Belgium is with wooden packaging.

1.3.4. Measures to be taken to achieve the proposed targets

It is likely that the new waste management targets can be only achieved with massive waste management programmes aimed at:

- Activating the full food waste prevention potential along the whole life chain of food.
- Getting consumers used to recycling products and placing these in the correct collection points.

- Establishing a comprehensive system of taking back used products and of separately collecting several different waste types as far as possible door-to-door.
- Establishing a comprehensive system of treatment for reuse and recycling, while making more conventional treatment options and landfilling less attractive.
- Establishing a stricter system of quality control for reuse of products and recycling material.
- Establishing the respective markets for reuse products and recycling material.

In order to establish such systems:

- The economic affluence of regions with annual per capita GDPs of less than 20,000 € need to be increased.
- All stakeholders need to be subject to information campaigns and strongly motivated.
- Solutions for economically viable separate collection in less populated areas need to be found
- Barriers against intensive separate collection in urban areas need to be removed.
- Solutions for preventing overcapacities of incineration need to be found in some regions, while new incineration capacities for waste parts which cannot (currently) be recycled must be established in other regions.
- An economic basis for the necessary investment and operation of separate waste collection and treatment for reuse/recycling systems has to be found.
- The legal framework for a more developed recycling material quality assurance system has to be established.
- Materials and products that can be recycled and that can use other recycled materials have to be increasingly developed.
- Incentives need to be introduced which might provide a driving force for the replacing of non-recyclable materials by recyclable materials.
- The image of recycling materials needs to be improved, and incentives for using recycling materials over other non-recyclable primary materials need to be introduced.

1.3.5. Revised waste targets and jobs

The EC Impact Assessment document shows that more than 180.000 direct jobs related to waste management could be created by 2030, when the option named as “3.7” (see Table 1 and

Table 2) would be fully implemented in the EU. Most of the jobs will be created in the larger MS which not yet have achieved high recycling rates (Spain, Poland, Portugal, Romania, Slovakia and Check Republic).

Data shows the potential for job creation in several sectors:

- The employment opportunities in the recycling sector are related to the collection, materials handling and processing of manufacturing products. Jobs could be created particularly in territories still lacking waste treatment plants, where the increased waste targets are expected to increase the number of waste management facilities.
- The need to find economically and technically feasible solutions for achieving revised targets could result in the creation of high qualified jobs in the field of research and development of waste recycling technologies. A study on waste related projects funded within the EU's 7th Framework Programme (FP7) highlighted that at least 714 EU institutions and 340 million euros were involved in waste related research between 2007 and 2011. This research explored not just new recycling technologies (including improved sorting or reprocessing), but also industrial waste reduction as well as waste-to-products and waste-to-energy technologies. Also, in the new EU wide research & development programme, Horizon 2020, many resources are allocated to research on waste technologies through dedicated topics and calls for proposals.
- Finally, revised targets can also provide incentives for the creation of jobs related to reuse, repair and upcycling as second hand markets, repair centres, etc.

Thus, revised waste targets have the potential to boost job creation in the areas of waste management, waste recycling, repair and reuse, but also in research related fields.

1.3.6. Food Waste Prevention

The European Commission in its Communication “Towards a circular economy: a zero waste programme for Europe”, COM(2014) 398 proposes a non-binding 30% food waste prevention target for the year 2025. This target has also major implications for the municipal waste recycling targets and the ban-of-landfilling targets as food waste constitutes a major part of the compostable biogenic waste. The 30% food waste prevention target corresponds to the full food waste prevention potential (European Commission 2014a).

A 30% reduction of food waste generation would require massive behaviour changes and massive changes within the economy as a whole. To achieve the targets in respect to preventing food waste generation in just 10 years seems rather unrealistic. There are examples of successful food waste prevention programmes with quantified results, especially from the United Kingdom. At European level, the EU is still in the process of establishing a baseline for measuring the success of food waste prevention programmes¹². Therefore too little is known on what would be a realistic food waste prevention target.

Summary

- At the current growth rate the EU as a whole would only reach MSW recycling targets in the year 2035. However, some deceleration must be expected when approaching higher recycling rates.
- As many regions in “pioneer” countries (e.g. Germany, Belgium) do not manage to achieve recycling rates at the level of the new targets, doubts might be raised with respect to EU regions with less experience in waste management. Particular concerns can be raised for regions with annual GDP less than 20,000 €/capita, regions with population densities of less than 100 capita/km² and big cities such as Vienna, Hamburg, Brussels, etc. Concerns can also be raised about Member States which are still struggling with the transposition and implementation of EU’s 2020 waste targets.
- In estimating the effects of the implementation of the new waste targets, the European Commission expects positive outcomes for several costs (financial, external, social, environmental) and substantial job creation.
- The increase of waste targets could cause side effects, such as an increase of incineration practices (both legal and illegal), increase of illegal landfilling, increase of traffic to transport waste to waste management facilities, and more generally a decrease of quality of recycled material, market saturation, and competition of primary material suppliers.
- In any case the new waste targets can only be achieved by applying strong policies able to influence products design and purchase, market development, as well as awareness, motivation and education of waste generators.
- A target of activating the full waste prevention potential in all economic sectors in all the EU in only 10 years has to be qualified as extremely ambitious.
- Creation of jobs can be expected in the area of waste recycling (e.g. waste collection, sorting and reprocessing), material re-manufacturing, material reuse, repair and upcycling, and in the area of research.

Indicators (see Annex III): All.

¹² <http://www.eu-fusions.org/>.

1.4 Conclusions and recommendations for the TIA workshop

1.4.1. Relevant ESPON indicators

On the basis of the lessons learnt from the evidence we have considered, a series of indicators are proposed for the development of the TIA workshop (see table of indicators in the Annex III), comprising waste indicators as well as ESPON QUICK SCAN indicators. These are selected in relation to regions territorial characteristics, picking up where possible also ESPON QUICK SCAN “Types of regions according to NUTS 2 statistical region”, in order to ensure familiarity with the tools to the participants.

The ESPON QUICK SCAN indicators reported in the table can be recommended to:

- Monitor the state of implementation of waste targets (waste generation, recycling, incineration, landfilling rates).
- Estimate the potential for implementing appropriate waste management systems in certain regions (e.g. organic waste generated, municipal waste material recycling VS per capita annual regional GDP, population density, Innovation, Entrepreneurships, access to IT services, type of region).
- Quantify risks deriving from illegal waste management activities and monitor environmental impacts (e.g.: estimation of illegal incineration practices, pollutants in soil, water and air, conservation of natural heritage).
- Estimate potential impacts of the implementation of the revised targets (e.g. a high regional incineration vs. national incineration rate can suggest potential for increase in traffic in the short-term, as more waste will need to be diverted from landfill to other available treatment plants).
- Identify potentially undesired situations, as the increase of traffic due to increase in the amount of transported waste towards waste management plants (regional incineration vs. national incineration rate), or the increase in the amount of generated waste, especially in touristic regions with lack of waste management facilities (overnight stays).

Proposed indicators should be applied with a particular focus on the following regions, identified as the most problematic for the implementation of waste revised targets:

- Less affluent regions with an annual GDP of less than 20.000 € per capita;
- Regions with a low population density;
- Regions with a very high population density;
- Regions which lag behind in the acceptance of technological innovation;
- Regions at the eastern and southern rim of the European Union;
- Touristic regions and islands.

1.4.2. Points for further discussion

In principle the objectives to increase the recycling of municipal waste and packaging waste, decrease recyclable waste from being landfilled, decrease marine litter and to decrease food waste generation require many common measures. For all these objectives, a comprehensive system of separate collection of different waste streams needs to be established and used by the consumers, based on a willingness to reduce environmental impacts. However, the benefits from decreasing waste generation, from decreasing littering and from increasing recycling rates are well understood, generally accepted and need not be discussed. What needs to be discussed is:

- How much food waste prevention can be realistically achieved (and by what efforts) by 2030? What are realistic and affordable food waste prevention targets for the different regions?
- How much municipal waste recycling rates can be increased (and what efforts can achieve targets) by 2030? What are realistic affordable municipal waste recycling rate targets for the different regions?
- Which additional investments in terms of money, hardware, technologies, motivation programs, markets and organisations are needed to implement a waste management system which covers all waste generated - meeting waste prevention and recycling targets and keeping all recyclable waste from landfill?
- Can these actions actually be done for free as expected by the European Commission, or might additional funds be necessary?

Further issues which need to be discussed are:

- Should there be different recycling targets for different countries/regions in order to adapt to the different recycling potentials, or would this create market distortions?
- Sparsely populated areas (below 100 capita/km²) need good solutions for a cost efficient separate collection system.
- Very densely populated areas (above 500 capita/km²) need good solutions for finding the space for the different separate waste collection bins within the household (and near the houses for collection) plus an efficient alternative for home-composting.
- Islands in the south of Europe need to find good solution for managing produced waste.
- What shall be the basis for the recycling rate: amount of recycling material actually reused in new products over total amount of material put on the market? Or something else?
- Definition of recycling targets not only in terms of recycling rates but also in terms of recycling quality and numbers of cycles achieved.
- Should SMEs be exempt from registration and reporting obligations?

Summary of conclusions and recommendation for the TIA workshop

Based on collected data, a series of recommendation for the focus of the workshop are proposed. These are presented as:

- Indicators for the monitoring and evaluation of effects deriving from the implementation of the revised waste targets (see Annex III).
- A series of territories where problems are expected to arise.
- A series of open questions to discuss the most critical points regarding impacts and effects of implementation of revised waste targets.

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