



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 6.12.2006  
COM(2006) 767 final

**REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN  
PARLIAMENT**

**ON THE IMPLEMENTATION OF DIRECTIVE 94/62/EC ON PACKAGING AND  
PACKAGING WASTE AND ITS IMPACT ON THE ENVIRONMENT, AS WELL AS  
ON THE FUNCTIONING OF THE INTERNAL MARKET**

[SEC(2006) 1579]

## INTRODUCTION

When Directive 94/62/EC on Packaging and Packaging Waste (hereinafter the “Packaging Directive”) was adopted, little information on the costs and benefits of packaging and packaging waste management was available. Such information started to be compiled when more emphasis was put on cost-benefit analysis and impact assessment, before the last revision of the Packaging Directive was launched. However, at this time the focus of the cost-benefit analysis was put on the effects of the revised directive, i.e. on the effect of increasing recycling. This was done by calculating the costs and benefits of increasing recycling from the 1998 recycling levels to optimal recycling rates.

During the legislative process, the European Parliament and the Council called upon the Commission to present a more complete evaluation of the overall impacts of the directive in a report on the implementation of the Packaging Directive and its impact on the environment, as well as on the functioning of the internal market<sup>1</sup>. This report should also assess options for further measures on packaging prevention and address other relevant issues in the framework of the Sixth Environmental Action Programme.

This report gives an ex-post assessment of environmental, economic, social and internal market aspects of the directive and an evaluation of the need for complementary measures for the prevention and recycling of packaging waste and the free circulation of packaging in the internal market.

The report also takes into account the Communication on the Thematic Strategy on the prevention and recycling of waste<sup>2</sup> and the proposal to revise waste framework legislation<sup>3</sup> adopted by the Commission on 21 December 2005.

### **1. EX-POST ASSESSMENT OF THE IMPACTS OF THE PACKAGING DIRECTIVE**

In order to prepare this report, two studies were commissioned: one on the environmental, economic and social impacts<sup>4</sup> and another one on the internal market aspects of the directive<sup>5</sup>. Both studies were subject to intensive stakeholder consultation which is documented on the Commission's website<sup>6</sup>. Additionally, the European Environment Agency also prepared a pilot study on the effectiveness of packaging waste management systems in selected countries<sup>7</sup>.

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<sup>1</sup> Art. 6(8) and 6(9) of Directive 94/62/EC on Packaging and Packaging Waste, text of this clause in Annex I to this Report.

<sup>2</sup> COM(2005)666 final.

<sup>3</sup> COM(2005)667 final.

<sup>4</sup> Study on the Implementation of Directive 94/62/EC on Packaging and Packaging Waste and Options to Strengthen Prevention and Reuse of Packaging, Ecolas and Pira for the European Commission 2005, [http://europa.eu.int/comm/environment/waste/studies/packaging/050224\\_final\\_report.pdf](http://europa.eu.int/comm/environment/waste/studies/packaging/050224_final_report.pdf); Annexes: [http://europa.eu.int/comm/environment/waste/studies/packaging/050224\\_final\\_%20report\\_annexes.pdf](http://europa.eu.int/comm/environment/waste/studies/packaging/050224_final_%20report_annexes.pdf); Information on stakeholder consultation: [http://europa.eu.int/comm/environment/waste/studies/packaging/implementation\\_background.htm](http://europa.eu.int/comm/environment/waste/studies/packaging/implementation_background.htm).

<sup>5</sup> Study on the Progress of the Implementation and Impact of Directive 94/62/EC on the Functioning of the Internal Market, Perchards and FFact for the European Commission 2005, [http://europa.eu.int/comm/enterprise/environment/reports\\_studies/studies/report\\_packaging\\_direct.pdf](http://europa.eu.int/comm/enterprise/environment/reports_studies/studies/report_packaging_direct.pdf).

<sup>6</sup> [http://europa.eu.int/comm/environment/waste/studies/packaging/implementation\\_background.htm](http://europa.eu.int/comm/environment/waste/studies/packaging/implementation_background.htm).

<sup>7</sup> Effectiveness of packaging waste management systems in selected countries: an EEA pilot study, EEA Report No 3/2005, [http://reports.eea.eu.int/eea\\_report\\_2005\\_3/en](http://reports.eea.eu.int/eea_report_2005_3/en).

As far as possible, the studies include information on all 25 Member States. However, a large part of the tasks focused on the evaluation of the implementation of the directive in the past, when the ten new Member States were not yet members of the European Union. Information on the packaging waste management in the new Member States before accession is scarce. Therefore, large parts of the analysis had to be limited to the fifteen EU Member States who were members before 1 May 2004 (hereinafter “EU15”).

This section gives a summary of the findings of these studies and an evaluation of these results by the European Commission. A more detailed explanation is given in the annex to this report.

### 1.1. Overall impacts related to packaging

Packaging is a relatively small but not insignificant product and waste stream. In 2002, around **66 million tonnes of packaging waste** were generated in EU15. This is around 5% of total waste generation. Packaging waste accounts for around 17% of municipal waste by weight<sup>8</sup> and between 20% and 30% by volume<sup>9</sup>. However, weight is not the best indicator for the environmental impacts of packaging waste and the impacts of packaging throughout its life cycle. The overall environmental impacts of packaging are in the order of magnitude of one to a few percent of the overall economy. For example, the greenhouse gas emissions related to packaging consumption in the EU15 are estimated at around 80 million tonnes of CO<sub>2</sub> equivalent per annum<sup>10</sup>. This is around 2% of total greenhouse gas emissions of EU15. The share of packaging for other environmental impacts, such as air acidification, fine particles and eutrophication is of a comparable magnitude.

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<sup>8</sup> Assuming that around half of the packaging waste originates from municipal waste, total municipal waste accounts for approximately 200 Mt in EU15.

<sup>9</sup> Estimate based on studies indicating that the volume of packaging has a significantly higher share of municipal waste than its weight. Very frequently, a figure of 30% by weight and 50% by volume is quoted. However, as the 30% are clearly an over-estimate, also the figure for the volume was reduced. For more information see: <http://www.merit.unimaas.nl/tep/reports/ppwd-synthesisreport.pdf>; <http://www.mindfully.org/Sustainability/EPR-Extended-Producer-Responsibility.htm>.

<sup>10</sup> Bio Intelligence and O2 for the European Commission 2003, Study on external environmental effects related to the life cycle of products and services, p. 91, [http://europa.eu.int/comm/environment/ipp/pdf/ext\\_effects\\_finalreport.pdf](http://europa.eu.int/comm/environment/ipp/pdf/ext_effects_finalreport.pdf). The study estimates the per capita greenhouse gas emission at 216 kg CO<sub>2</sub> per annum.

## 1.2. Packaging recycling, recovery and incineration at waste incineration plants with energy recovery<sup>11</sup>

Packaging recycling<sup>12</sup> is not a new waste management option. For some packaging fractions, recycling always took place because it was cheaper than disposal. Significant amounts of packaging were recycled as a result of national legislation and programmes even before the Packaging Directive took effect. Out of the 66 million tonnes of packaging waste, around **36 million tonnes or 54% were recycled in 2002**. Compared to 1997, this is an increase of 9 million tonnes and an increase of the recycling rate by 8%. This increase mainly took place in the Member States where recycling levels were initially low. Packaging **recovery and incineration at waste incineration plants with energy recovery** increased from 31 million tonnes or 52% in 1997 to **41 million tonnes or 62%** in 2002.

In 2002, all of the 75 different targets applicable to EU15 have been achieved<sup>13</sup>.

Recycling and recovery of packaging waste have led to positive environmental effects on most parameters. This includes **greenhouse gas savings of around 25 million tonnes of CO<sub>2</sub> equivalent** (around 1 million tonnes as a direct result of the Packaging Directive) and **resource savings of around 10 million tonnes of oil equivalent** (around 3 million tonnes as a direct result of the Packaging Directive) as a result of recycling and recovery of packaging waste compared to a scenario where all packaging waste was sent to landfill or incineration without energy recovery, which corresponds to around 0.6% of total EU15 greenhouse gas emissions in 2002, or between a third and a half of the total greenhouse gas emissions of countries like Denmark, Ireland or Sweden. Taking into account the difficulty to achieve the 8% reduction target under the Kyoto Protocol, this is a significant contribution. Other major environmental benefits relate to reduced emissions of particulate matter, decreased acidification and less disamenity effects (traffic noise, odours, visual disturbances etc. affecting the population living around landfills and incinerators).

Recycling resulting from the Packaging Directive and national programmes and legislation is not significantly more expensive than if the same material had been sent to disposal. The total costs of packaging waste management<sup>14</sup> in 2001 were evaluated in three scenarios. In a scenario corresponding to the real recycling and recovery rates in 2001, the costs were estimated at 6.6 to 6.8 billion €. However, even in a scenario of zero packaging recycling and

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<sup>11</sup> For reasons of simplicity and readability, “recovery and incineration at waste incineration plants with energy recovery” is referred to in this report as “recovery” even though this also includes incineration at waste incineration plants with energy recovery, which is in most cases a form of disposal pursuant to the terminology of Directive 75/442/EEC on waste.

<sup>12</sup> In the following text, much of the focus of the analysis is on recycling in the sense of the recycling definition of the Packaging Directive (“the reprocessing in a production process of the waste materials for the original purpose or for other purposes including organic recycling but excluding energy recovery”). This includes in essence material recycling, some of various recycling methods sometimes called chemical or feedstock recycling and organic recycling. The choice to focus on recycling was made because of the assumption that the main effect of the Packaging Directive is an increase in recycling rates. The effect on recovery and incineration at waste incineration plants is deemed much smaller, as this rather depends on national decisions whether or not to build waste incinerators for waste management in general rather than the direct effect of the Packaging Directive. The cost-benefit patterns of incineration with energy recovery are also considered to be less favourable than those of recycling for most of the packaging waste fractions covered by current recycling programmes.

<sup>13</sup> For details see Annex II, table 1.

<sup>14</sup> Recycling and energy recovery plus disposal of the remaining part of packaging waste with mixed municipal or industrial waste.

100% disposal, disposal costs would have been around 6.1 billion €. In a scenario with the likely levels of packaging recycling in the absence of the Packaging Directive, the total costs of packaging waste management were estimated at 6.6 billion €. Taking into account the uncertainty of any such estimates, it can be concluded that the additional **costs** related to the recycling obligations of the Packaging Directive **are not higher than several hundred million € per annum**. These additional costs are likely to grow smaller as the implementation of EU legislation improves the environmental conditions under which disposal of waste takes place in the EU, for example as a result of the implementation of Directive 1999/31/EC on the landfill of waste<sup>15</sup>.

The cost of reducing 1 tonne of CO<sub>2</sub> equivalent through packaging recycling has risen from 12 €/t in 1997 to 23 €/t in 2001 (compared to emission trading market prices ranging from about 9 to around 12.5 €/t of CO<sub>2</sub> between October 2005 and October 2006<sup>16</sup>). Since packaging recycling has also other environmental benefits, it can be classified with a relatively high degree of certainty **among the most cost-efficient options to reduce CO<sub>2</sub> emissions and other environmental impacts**. There are, however, major differences between various packaging materials and applications. Studies also indicate that an increase of recycling targets beyond the current levels would not be cost-effective<sup>17</sup>. Geographical differences between the Member States influence the results on cost-effectiveness only to a minor extent.

The impact on certain industry and private sectors can however be larger than the above figures might suggest as the directive implies a shift of the costs of waste management from the public (especially local authorities) to the private sector (that is now co-financing the management of packaging waste) and internal administration costs incurred by companies are not included in the above estimates.

The **direct and first round indirect employment** rate in the packaging recovery and recycling industry is estimated at 42,000 full-time job equivalents. This number needs to be compared to possible job losses in the waste disposal sector as a result of macroeconomic effects (the funds spent on recycling are not available for spending on other economic activities – such effects will decrease as disposal costs increase). It is unclear how many jobs may have been affected as a result of these effects. **Overall, the employment balance is likely to be neutral or slightly positive.**

The main impact of recycling obligations of the Packaging Directive on the internal market was a stabilisation of collection and recycling markets. Differences between the Member States in financing for recycling were levelled out to some extent as all Member States have put in place financing mechanisms to support packaging recycling. Recently, internal market problems arose through divergent interpretations of the voluntary or obligatory nature of material identification systems pursuant to Article 8 of the Packaging Directive and Decision 97/129/EC.

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<sup>15</sup> Directive 1999/31/EC, OJ L 182 of 16.7.1999, p. 1.

<sup>16</sup> Figure as of 11 October 2006, [www.pointcarbon.com](http://www.pointcarbon.com).

<sup>17</sup> In particular RDC/Pira for the European Commission 2003 available at: <http://europa.eu.int/comm/environment/waste/studies/packaging/costsbenefits.pdf>.

### **1.3. Packaging prevention**

Prevention of packaging at source is far more complex than recycling. Recycling is one of the available waste management options, with other options including recovery or disposal. Prevention not only influences the entire life cycle of packaging from raw material extraction to disposal, but also the life cycle of the packaged products. Any more substantial changes in volumes of packaging placed on the market can only be achieved through changes in production, consumption and distribution patterns. This is reflected in the limited success of all prevention measures undertaken so far. Although there seems to be some decoupling of packaging waste generation from GDP growth, in almost all Member States the absolute quantity of packaging waste is increasing. Prevention measures such as enforcement systems for the essential requirements, packaging prevention plans and strong producer responsibility systems might have had some effect on the reduction of packaging generation. However, the overall patterns of packaging waste generation are not significantly different between the Member States applying different prevention tools and the Member States applying none of these tools.

The European Parliament has raised the issue of using a Packaging Environmental Indicator (PEI) for the purpose of packaging policy. Such an indicator is a conceptual tool that measures the environmental impact of packaging and produces a simple result allowing to improve packaging and facilitate the selection between different packaging systems. The main advantage of PEI is that it gives guidance on key environmental impacts to be considered in life cycle assessment and life cycle thinking approaches. Nevertheless, practical constraints make it difficult to use PEI in order to identify single numbers which could be used to justify favouring one type of packaging over another or to inform the consumer. Therefore, it seems appropriate to focus the potential use of PEI on giving guidance to companies using life cycle approaches rather than trying to calculate single numbers on the basis of this tool. Such application of PEI could be integrated into the framework of a future conformity assessment procedure.

There are no indications that the current levels of heavy metals and other hazardous substances present in packaging pose any particular risks to health and the environment. Therefore, it appears unlikely that a further reduction of heavy metal limits would result in significant health and environmental benefits.

Prevention targets may seem appealing due to their apparent simplicity. However, their implementation raises a number of problems which are not less complex than other measures. In particular, weight-related targets would pose in disadvantage heavier but not necessarily less environmentally friendly packaging materials. Targets applied equally to every producer would disfavour those producers who already use the minimum possible amount of packaging. For such producers, further reductions may lead to product spillage which is often likely to cause significantly more environmental damage than the possible environmental benefits related to savings on packaging.

Landfill bans and landfill reduction targets have a similar effect as recycling targets in redirecting waste streams. However, they need to be seen in relation to which waste management option could possibly be used subsequently to achieve the greatest environmental benefit. Recycling targets cannot be simply replaced by landfill bans and landfill reduction targets if this would result in an increase of incineration at the detriment of recycling and the overall environmental benefits of the Directive.

## 2. THE IMPACT ON THE INTERNAL MARKET

The Directive has brought about a significant convergence between Member States' recycling rates, and the notification procedure has allowed to solve many internal market issues before they became a real problem. However, despite the directive's aim to contribute to the functioning of the internal market and to reduce trade barriers, these goals have not yet been fully achieved for all types of packaging. Past experience and ongoing cases show that unilateral measures adopted in different Member States still pose problems by requiring market operators to adapt their packaging to the requirements of each individual Member State which makes it more difficult for them to benefit from business opportunities within the internal market by selling the same product in the same packaging in different markets. In particular, the infringement procedures in the beverage sector show that national measures can lead to distortions of competition and in some cases partitioning of the internal market, which contradicts the objectives of the directive. The beverage packaging sector has signalled such impacts from mandatory deposit systems for non-refillable containers (e.g. in Germany). The German case also highlights that the phase of a changeover from one deposit system to another is critical for market operators, since legal and factual insecurities can lead to instabilities in the market. Besides, the use of taxation to drive packaging policy can potentially disrupt the internal market if the taxes are applied in a way that protects local producers.

The Commission is committed to react on any measures that risk disrupting the functioning of the internal market and are not environmentally justified, and will further evaluate the need to clarify or amend the provisions of Articles 5 and 7 of the Packaging Directive in order to facilitate the free circulation of goods within the internal market.

The Commission also considers that a proper enforcement of the essential requirements will further contribute to create a level playing field. Lack of progress on essential requirements represents a major problem in the implementation process of the Directive with respect to the internal market. All Member States have duly transposed the essential requirements, but only three Member States (the UK, France and the Czech Republic) have put an enforcement mechanism in place. The enforcement of essential requirements will bring additional benefits in terms of prevention, recycling and reduction of hazardous substances in packaging. Evidence shows that countries monitoring compliance with the essential requirements (France and the UK) have achieved similar levels of decoupling of growth in packaging use from GDP as the countries which have implemented packaging prevention plans (e.g. Belgium and Spain).

For these reasons, the Commission reiterates its commitment to promote a proper implementation of the essential requirements in relation to both Article 9 and 18 of the directive. Besides, Member States could use the enforcement of essential requirements as a priority in setting their waste prevention programmes.

Finally, despite the progress achieved so far, the remaining uncertainties regarding some of the definitions of packaging and the reporting procedures need to be clarified, also with respect to ensuring a level playing field for all economic operators. The Commission will continue to work in partnership with the Member States to address these issues.

### **3. PACKAGING REUSE**

Reuse systems for packaging operate very successfully for transport packaging. However, most of the debate on packaging reuse in the European Union focuses on consumer beverage packaging (roughly 20% of total packaging by weight<sup>18</sup>). The question of whether and by how much reusable consumer beverage packaging is preferable to one-way packaging is subject to lively debates. Many life cycle assessment studies have been conducted on this subject. There is a reasonably strong agreement on the fundamental patterns of the results but the absolute values differ to some extent. Most studies found reusable packaging to be better in situations with generally low transport distances and high return rates, and one-way packaging to be better in situations with generally high transport distances and low return rates.

Given this background, it seems currently neither possible nor appropriate to propose harmonised measures to encourage reusable consumer beverage packaging at the Community level.

However, there is evidence that the beverage sector of the internal market is becoming increasingly partitioned as a consequence of unilateral measures taken at Member State level to promote environmental concerns related to packaging. For example, refill systems can be more difficult to apply over long distances and can lead to additional costs for importers that have to adapt their packaging to the specifications of each individual Member States' market. In general, appropriately designed national measures encouraging reusable packaging have environmental benefits. On the other hand, such measures can have impacts on the internal market. Finding a right balance between the involved economic and environmental interests remains one of the main tasks in this sector. Therefore, with respect to beverage packaging, the Commission will further evaluate the need to clarify or amend the provisions of Articles 5 and 7 of the Packaging Directive in order to facilitate its free circulation within the internal market.

### **4. NEED FOR COMPLEMENTARY MEASURES**

The Packaging Directive has contributed to reducing the environmental impact of natural resources' use through packaging prevention, reuse and recycling. It also created a more stable economic framework for separate collection of packaging waste and its recycling and recovery. In this way, it has created business opportunities and a number of new jobs. Any future plans to review the directive should aim at preserving and increasing those benefits while improving the efficiency of packaging and packaging waste management through simplification, streamlining in line with the 'better regulation' initiatives by the Commission and the Council Presidencies and preventing the possible negative impacts on the internal market.

#### **4.1. Prevention and reuse**

As shown by the ex-post assessment of the directive, the scope for measures on prevention and reuse in isolation from the packaged product is relatively limited. Any measure that is effective on prevention or reuse will also have impacts on packaged goods and their production, distribution and consumption patterns as well as on trade within the internal

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<sup>18</sup> Estimate on the basis of GVM data for Germany, personal communication.

market. The studies used for the preparation of this report do not show a clear preference for one of the options to encourage prevention and reuse of packaging.

Therefore, a flexible approach to preventing packaging waste should be taken at the European level that encourages Member States to take action while leaving them the choice of the most appropriate instruments and measures. The proposal to incorporate in the waste framework legislation an obligation for Member States to develop waste prevention programmes tabled by the Commission in the context of the Thematic Strategy on the prevention and recycling of waste provides such a flexible instrument. The Commission is ready to support Member States in drafting their national prevention plans.

In order to achieve good implementation of the Packaging Directive and with a view to the improved functioning of the internal market, it is important that all actors contribute to the efficient functioning of the system of notification provided by Article 16 of the directive.

#### **4.2. Recycling and recovery targets**

Article 6(8) of the Packaging Directive calls for this report to be accompanied, as appropriate, by proposals for a revision of the provisions related to prevention and reuse of packaging. Article 6(5) provides that “not later than 31 December 2007, the European Parliament and the Council shall [...] fix targets for the third five-year phase 2009 until 2014 [...]”.

The targets contained in Article 6 of the Packaging Directive have recently been revised<sup>19</sup>. A new set of targets for recovery and recycling has been adopted and is to be attained by the end of 2008. At the same time, due to the specific situation in the Member States which joined the European Union on 1 May 2004, Directive 2005/20/EC<sup>20</sup> postpones the attainment of the “2008 targets” until 2012 for seven Member States, and until 2013, 2014, and 2015 for one Member State in each of these years.

The assessment contained in this report is based on the data and information collected around the years 2001 – 2002. The latest report on the implementation of waste directives (including the Packaging Directive) covers a period between 2001 and 2003, while the subsequent report for years 2004 – 2006 will be available in 2008 at the earliest. This report could possibly provide information needed to reassess the levels of 2008 targets. Member States still have to make a lot of progress to implement the existing targets. Only once the situation as regards packaging waste management in the New Member States becomes clearer and the data for the subsequent reporting periods are available to the Commission, will it become possible to assess the environmental, economic and social impacts of a potential new set of targets.

Therefore, it appears premature to propose new recycling and recovery targets at a stage when the previous set of targets has only recently been transposed into national legislation and the latest implementation deadline for those targets is as late as 2015<sup>21</sup>. There are also no indications that the cost and benefit patterns for different levels of packaging recycling and recovery have changed significantly since the new targets agreed in 2004 were set. It is therefore considered that the levels of the targets decided in Directive 2004/12/EC should remain valid well beyond 2008.

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<sup>19</sup> Directive 2004/12/EC, OJ L 47 of 18.2.2004, p. 26.

<sup>20</sup> Directive 2005/20/EC, OJ L 70 of 16.3.2005, p. 17.

<sup>21</sup> Directive 2005/20/EC, OJ L 70 of 16.3.2005, p. 17.

## 5. CONCLUSIONS

The ex-post assessment of the impact of the Packaging Directive on the environment shows an increase of packaging recovery and incineration at waste incineration plants with energy recovery by 9% and an increase of packaging recycling by 8% between 1997 and 2002. At the same time, all the targets established in the directive were met in 2002. Recycling of packaging had positive environmental effects, including greenhouse gas savings and resource savings. Other environmental benefits include reduced emissions of particulates, decreased acidification, less traffic noise, odours, visual disturbance etc. These are noticeable and significant benefits of the industry's efforts to implement the requirements of the Packaging Directive. The data demonstrate that the additional costs related to the recycling obligations of the Packaging Directive as compared to other waste management options (e.g. disposal) are not significantly higher and show a decreasing trend. The costs for packaging recycling are in the same order of magnitude as the most cost-efficient alternatives to reduce CO<sub>2</sub> emissions and other environmental impacts.

The Commission considers that the recycling and recovery targets contained in the Packaging Directive are currently optimal and should remain stable to enable all the Member States to catch-up with these targets. A substantial progress on prevention can only be achieved through the application of measures tailored to specific conditions in which packaged goods are marketed such as, for instance, consumption and distribution patterns. Incorporating in waste framework legislation an obligation for Member States to develop waste prevention programmes as proposed by the Commission in the context of the Thematic Strategy on the prevention and recycling of waste constitutes an appropriate instrument to promote waste prevention in general as well as prevention of packaging waste in particular.

In the longer term, recycling of packaging waste must be seen in the general framework of EU waste recycling policy as defined in the Thematic Strategy on the prevention and recycling of waste. The Commission intends to include an assessment of the progress made by the Member States in preventing, recycling and recovering waste in the 2010 review of the Thematic Strategy on the prevention and recycling of waste. This assessment shall build, *inter alia*, on an update of the assessment of the impacts of the Packaging Directive and take into account the progress of the Member States towards the increased recycling rates set by the European Parliament and the Council in the 2004 review of the Directive.

There is evidence (particularly in the beverage sector) that the Directive has not yet fully achieved its internal market objective. This is partly due to incorrect implementation of the provisions of the Packaging Directive, but also due to the increasing number of unilateral measures leading to a partitioned market. Therefore, the Commission will further evaluate the need for action that could be taken on the EU level to avoid constraints as regards the internal market in the future. Progress towards the proper enforcement of the essential requirements and harmonized definitions and reporting procedures across Member States will further contribute to the creation of a level playing field for all economic operators.



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**COMMISSION STAFF WORKING DOCUMENT**

**ANNEX TO THE**

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## COMMISSION STAFF WORKING DOCUMENT

### Annex I

#### **Text of the review clause in Article 6(8) and (9) of the Packaging and Packaging Waste Directive 94/62/EC, as amended by Directive 2004/12/EC**

“8. The Commission shall, as soon as possible and no later than 30 June 2005, present a report to the European Parliament and the Council on the progress of the implementation of this Directive and its impact on the environment, as well as on the functioning of the internal market. The report shall take into account individual circumstances in each Member State. It shall cover the following:

- (a) an evaluation of the effectiveness, implementation and enforcement of the essential requirements;
- (b) additional prevention measures to reduce the environmental impact of packaging as far as possible without compromising its essential functions;
- (c) the possible development of a packaging environment indicator to render packaging waste prevention simpler and more effective;
- (d) packaging waste prevention plans;
- (e) encouragement of reuse and, in particular, comparison of the costs and benefits of reuse and those of recycling;
- (f) producer responsibility including its financial aspects;
- (g) efforts to reduce further and, if appropriate, ultimately phase out heavy metals and other hazardous substances in packaging by 2010.

This report shall, as appropriate, be accompanied by proposals for revision of the related provisions of this Directive, unless such proposals have, by that time, been presented.

9. The report shall address the issues in paragraph 8 as well as other relevant issues in the framework of the different elements of the 6th Environmental Action Programme, in particular the Thematic Strategy on Recycling and the Thematic Strategy on the Sustainable Use of Resources.

The Commission and the Member States shall, as appropriate, encourage studies and pilot projects concerning points 8(b), (c), (d), (e) and (f) and other prevention instruments.”

## Annex II

### **Detailed evaluation of the impacts of the Packaging and Packaging Waste Directive and options to strengthen prevention and reuse of packaging**

#### **1. OVERALL IMPACTS RELATED TO PACKAGING**

Packaging is a relatively small but not insignificant product and waste stream. Although it represents only a small share of the economy, trade and distribution of goods is difficult to imagine without packaging. By allowing trade and distribution, packaging is a crucial factor for the product choice and the wealth that we all enjoy. With its turnover of around 100 billion € annually<sup>1</sup>, the packaging industry is also an important economic actor in the EU and an employer for around 1.35 million employees<sup>2</sup>. However, packaging also causes environmental impacts and generates waste. The purpose of the Packaging Directive is to minimise these impacts and ensure that packaging waste is managed in an environmentally responsible way. By harmonising national policies, it shall also ensure that these national policies are compatible with each other and do not result in distortions of the internal market.

In 2002, around **66 million tonnes of packaging waste** were generated in EU15. This is around 5% of total waste generation (1,300 million tonnes excluding agricultural waste). However, the weight of waste is not a good indicator for the environmental impacts of packaging waste and the life cycle impacts of packaging. Some of the heavy waste streams, such as construction and demolition waste, are inert and relatively unproblematic whereas particularly problematic and hazardous waste often occurs in small quantities. Most packaging waste is neither inert<sup>3</sup> nor hazardous<sup>4</sup>. However, packaging waste is widespread in the economy and tends to arise in almost every company and in all households. It is also responsible for a significant share of littering. Out of municipal waste, packaging waste accounts for around 17% by weight<sup>5</sup> and between 20% and 30% by volume<sup>6</sup>.

The overall environmental impacts of packaging are in the order of magnitude of one to a few percent of the overall economy. Bio Intelligence/O2 2003<sup>7</sup> estimated the per capita greenhouse gas emissions related to packaging consumption in the EU15 at around 216 kg CO<sub>2</sub> equivalent per annum. This adds up to around 80 million tonnes or 2% of total greenhouse gas emissions of EU15. The share of packaging in other environmental impacts such as air acidification, fine particles and nitrification is of a similar magnitude. IPTS 2005<sup>8</sup> concludes that items such as packaging, even if not particularly visible in analyses taking

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<sup>1</sup> EUROOPEN estimate, personal communication.

<sup>2</sup> EUROOPEN estimate, personal communication.

<sup>3</sup> Exceptions are e.g. glass and ceramics packaging waste.

<sup>4</sup> Exceptions are e.g. packaging waste which was filled with hazardous products such as pesticides.

<sup>5</sup> assuming that around half of the packaging waste is from municipal waste, total municipal waste is around 200 Mt for EU15.

<sup>6</sup> Estimate based on studies indicating that the volume of packaging has a significantly higher share of municipal waste than its weight. Very frequently, a figure of 30% per weight and 50% per volume is quoted. However, as the 30% are clearly an over-estimate, also the figure for the volume was reduced. <http://www.merit.unimaas.nl/tep/reports/ppwd-synthesisreport.pdf>;

<http://www.mindfully.org/Sustainability/EPR-Extended-Producer-Responsibility.htm>.

<sup>7</sup> Bio Intelligence and O2 for the European Commission 2003, Study on external environmental effects related to the life cycle of products and services, p. 91, [http://europa.eu.int/comm/environment/ipp/pdf/ext\\_effects\\_finalreport.pdf](http://europa.eu.int/comm/environment/ipp/pdf/ext_effects_finalreport.pdf).

<sup>8</sup> [http://europa.eu.int/comm/environment/ipp/pdf/eipro\\_draft\\_report2.pdf](http://europa.eu.int/comm/environment/ipp/pdf/eipro_draft_report2.pdf), p.99.

integrated final consumer expenditures as a starting point, are nevertheless a relevant aspect which requires attention.

## **2. PACKAGING RECYCLING, RECOVERY AND INCINERATION AT WASTE INCINERATION PLANTS WITH ENERGY RECOVERY<sup>9</sup>**

Packaging recycling is not a new waste treatment option and most of the current recycling activities would have taken place even in the absence of the Packaging Directive. The directive has resulted in the increase of the recycling rates, in particular in those Member States where recycling levels were low before its implementation. This chapter examines the impacts of packaging recycling, recovery and incineration at waste incineration plants with energy recovery in general as well as the specific impacts related to increased recycling levels resulting from the implementation of the Packaging Directive. An overview table of key figures is given in chapter 2.6.

### **2.1. Recycling rates and rates for recovery and incineration at waste incineration plants with energy recovery**

Out of the 66 million tonnes of packaging waste, around **36 million tonnes or 54% were recycled in 2002**. Compared to 1997 levels, this is an increase of 9 million tonnes and an increase of the recycling rate by 8%. This effect may appear small. However, the numbers demonstrate that much packaging recycling would have taken place for economic reasons, even in the absence of legislation, and that many Member States had already adopted their own policy measures on packaging recycling before the directive took effect. For these reasons, it is supposed that the directive had no effect on recycling rates in 7 out of 15 Member States.<sup>10</sup> In the remaining 8 Member States, however, the increase is clearly visible, with the recycling rates rising up to even 30% in some of these Member States.

Packaging **recovery and incineration at waste incineration plants with energy recovery<sup>11</sup>** increased from 31 million tonnes or 52% in 1997 to **41 million tonnes or 62%** in 2002.

The achievement of the targets of the directive did not pose any major problem. Although in 2001 three targets were missed by a small margin, **in 2002 all of the 75 different targets applicable to EU15 have been attained.**

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<sup>9</sup> For reasons of simplicity and readability, “recovery and incineration at waste incineration plants” is referred to in this report as “recovery” even though this also includes incineration at waste incineration plants, which is in most cases a form of disposal pursuant to the terminology of Directive 75/442/EEC on waste.

<sup>10</sup> These conclusions are based on a scenario. For details of the scenario, see Annex II, p. 90 of Ecloas/Pira 2005.

<sup>11</sup> Recovery is the sum of recycling and energy recovery; pursuant to Court cases C-228/00 Commission v Luxembourg and C-458/00 Commission v Germany, incineration at waste incineration plants with energy recovery is a disposal option if its main purpose is to dispose of the waste. During the last revision of the Packaging Directive, it was nevertheless decided to include such incineration into a combined target for recovery and waste incineration at incineration plants with energy recovery.

Table 1: Rates for recovery and incineration at waste incineration plants with energy recovery and recycling rates in 2002

	Overall recovery and incineration at waste incineration plants with energy recovery 50% <sup>12, 13</sup>	Overall recycling 25% <sup>14</sup>	Glass 15% <sup>33</sup>	Paper 15% <sup>33</sup>	Metals 15% <sup>33</sup>	Plastics 15% <sup>33</sup>
Austria	75	66	86	80	67	30
Belgium	91	70	93	78	86	29
Denmark	94	57	90	61	44	16
Finland	61	49	49	61	50	15
France	62	45	52	64	53	15
Germany	78	74	86	88	80	49
Greece	33	33	24	68	10	3
Ireland	35	35	48	35	35	17
Italy	56	51	53	59	54	23
Luxembourg	62	57	83	60	79	28
Netherlands	61	57	79	69	80	16
Portugal	50	36	35	50	53	9
Spain	50	44	36	60	39	20
Sweden	67	65	88	70	68	20
United Kingdom	50	44	34	59	39	19

## 2.2. Environmental benefits

Packaging recycling has led to positive environmental effects on most parameters. This includes **savings of around 10 million tonnes of oil equivalent** (around 1 million tonne as a direct result of the Packaging Directive) and **around 25 million tonnes of CO<sub>2</sub> equivalent** (around 3 million tonnes as a direct result of the Packaging Directive). Such savings correspond to around 0.6% of total EU15 greenhouse gas emissions in 2002, or between a third and a half of the total greenhouse gas emissions of countries like Denmark, Ireland or Sweden. The results differ significantly between materials: around two thirds of the reductions of greenhouse gas emissions are related to glass recycling. Roughly one sixth of the reductions is related to plastics and metal recycling respectively. Paper recycling was not considered because available data do not allow a comparison between greenhouse gas

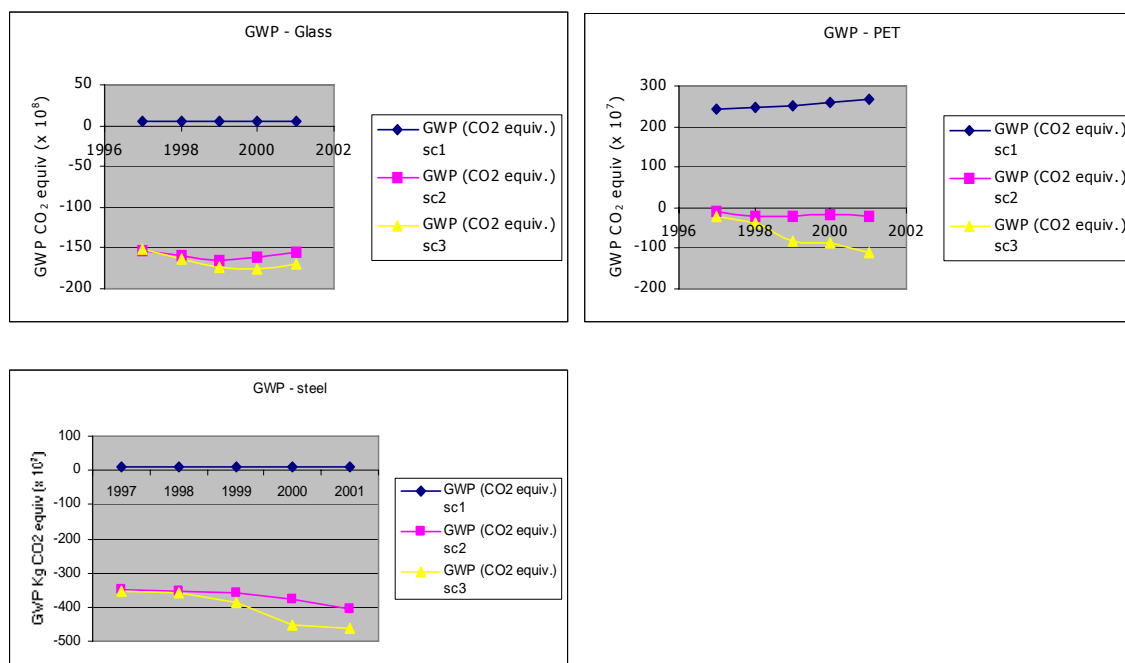
<sup>12</sup> 25% for Greece, Ireland and Portugal.

<sup>13</sup> The rates for recycling and recovery and incineration at waste incineration plants with energy recovery include available data on wood and therefore do not necessarily correspond to the sum of the other four materials.

<sup>14</sup> Not applicable for Greece, Ireland and Portugal.

emissions from paper production and paper recycling plants. Moreover, paper as a renewable material is in principle neutral with respect to greenhouse gas emissions.

Diagram 1: Global Warming Potential in kg of CO<sub>2</sub> equivalent related to packaging waste management for glass, PET and steel in EU15 under three scenarios (SC 1: no recycling, SC 2: likely recycling levels in the absence of the Packaging Directive, SC 3: 2001 recycling levels)



Other major environmental benefits include reduced emissions of particulate matter, decreased acidification and less disamenity effects (traffic noise, odours, visual disturbances etc. affecting the population living around landfills and incinerators). The reduced disamenity effects mainly relate to the avoidance of landfills and incinerators. Other effects are also (e.g. reductions of greenhouse gases) or mainly (resource savings, reductions of particulate matter release, decreased acidification etc.) the result of the replacement of virgin materials by recycled materials in new products (reduced production of virgin materials resulting in less environmental impacts).

### 2.3. Economic impacts

Such options of waste management as packaging recovery and incineration at waste incineration plants with energy recovery resulting from the Packaging Directive and national programmes and legislation are not much more expensive than sending the same material to disposal. Ecolas/Pira 2005 conclude that packaging recovery and incineration at waste incineration plants with energy recovery **causes around 4% to 9% of additional costs compared to no recovery and around 3% compared to a likely scenario in the absence of the Packaging Directive**. Based on two different calculation methods, the study estimates the total costs of packaging waste management in 2001 at 6.6 to 6.8 billion €. Out of these costs, 3.7 billion €<sup>15</sup> is related to the 53% of packaging waste recycled in that year. The amount of 0.55 billion € is related to the costs of the 7% of packaging waste sent for recovery and

<sup>15</sup> Financing need (gross cost of 5.3 billion € minus 1.6 billion € from the sale of secondary material).

incineration at waste incineration plants with energy recovery and 2.3 billion € are the disposal costs for the remaining 40% of packaging waste. The costs for the disposal of all packaging waste in a scenario with no packaging recycling or recovery are estimated at around 6.17 billion €. In the absence of the Packaging Directive<sup>16</sup>, the costs would have been around 6.6 billion €.

Table 2: Costs of packaging recovery and incineration at waste incineration plants with energy recovery and recycling.

		Year	1997	1998	1999	2000	2001
Total financing need for recycling		bn. Euros/y <sup>(1)</sup>	2,9	3,1	3,3	3,5	3,7
	the gross costs of packaging recycling	bn. Euros/y <sup>(1)</sup>	4,1	4,4	4,8	5,0	5,3
	minus the revenue from the sale of secondary raw materials	bn. Euros/y <sup>(1)</sup>	-1,16	-1,3	-1,4	-1,5	-1,6
Total financing need for incineration with energy recovery		bn. Euros/y <sup>(1)</sup>	0,52	0,52	0,55	0,57	0,55
Total financing need for disposal of remaining packaging waste		bn. Euros/y <sup>(1)</sup>	2,6	2,7	2,6	2,4	2,3
Total financing need for packaging waste management		bn. Euros/y <sup>(1)</sup>	6,1	6,3	6,5	6,5	6,6

(1) In real prices of 1998

In line with these estimates<sup>17</sup>, the additional costs generated by the Packaging Directive are evaluated at around 200 million € annually. This figure is, however, affected by a substantial degree of uncertainty. A variation of just a few percent in either the financing need for recycling or the alternative disposal cost could mean that the costs for packaging recycling might actually turn into (financial) benefits or that the net costs might double or triple (compare diagram 1). Therefore, it only appears safe to conclude that the **net costs resulting from the recycling obligations of the directive are of several hundred millions of euro at the most**. Furthermore, it is important to understand that net costs depend significantly on the types of packaging collected and recycled in the national recycling systems<sup>18</sup>.

It should also be noted that the additional costs are likely to grow smaller as the implementation of EU legislation improves the environmental conditions under which disposal of waste takes place in the EU, for example as a result of Directive 1999/31/EC on the landfill of waste.

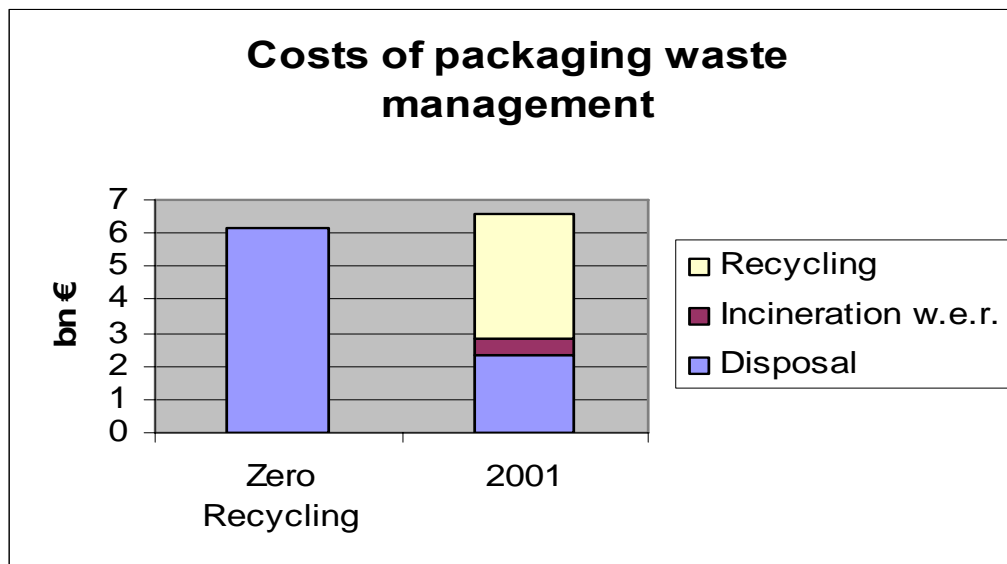
<sup>16</sup> This includes costs for recycling, which would have happened in the absence of any legislation or recycling programmes (because it is cheaper to recycle the material than to dispose of it) and for additional recycling which is the result of national programmes and legislation in place before the Packaging Directive.

<sup>17</sup> Higher estimate of 6.8 million € for the 2001 costs of packaging waste management minus 6.6 million € for the scenario of packaging waste management costs in the absence of the Packaging Directive.

<sup>18</sup> In particular, some of the pre-existing national programs collect materials and applications which are likely to be more expensive than what is needed for the fulfilment of Community obligations.

As the Directive implies a shift of the economic burden of waste management costs from the public to the private sector and the estimates exclude internal administration costs, the impact on industry and the private sector could be larger than the figures might suggest.

Diagram 2: Costs of packaging waste management in a theoretical scenario of zero recycling compared to 2001 packaging waste management costs



#### 2.4. Cost-effectiveness of packaging recycling

On the basis of the above estimates, the cost of **reducing 1 tonne of CO<sub>2</sub> equivalent through packaging recycling** has risen from 12 €/t in 1997 to **23 €/t in 2001**. This compares to a market value of a tonne of CO<sub>2</sub> in the framework of market prices ranging from about 9 to around 12.5 €/t of CO<sub>2</sub> between October 2005 and October 2006<sup>19</sup>. However, the reduction of greenhouse gas emissions is not the only environmental benefit of recycling. In other words, if the cost of reducing one tonne of CO<sub>2</sub> equivalent was 12 €, these 12 € would not only reduce one tonne of CO<sub>2</sub> but at the same time 10 tonnes of oil equivalent, 13 kg of SO<sub>2</sub> etc. Due to uncertainties related to the net cost figures, also the costs per unit of environmental improvement should be assessed with caution. However, it appears safe to say that the **costs for packaging recycling are in the same order of magnitude as the most cost-efficient alternatives to reduce CO<sub>2</sub> emissions and other environmental impacts.**

#### 2.5. Social impacts

The **direct and first round indirect employment** in packaging recovery and recycling is evaluated at 42,000 full-time job equivalents. However, increased expenditure on packaging recovery means that there is less expenditure on packaging waste disposal and on activities in other economic sectors. It is unclear how many jobs may be lost due to this effect. Information on the nature of waste management employment is limited and appears somewhat contradictory. Therefore, it remains unclear to what degree packaging recycling can provide additional net employment and initial routes into employment for the socially excluded and the low skilled. There are some indications that industry-financed recovery schemes have a

<sup>19</sup> Figure as of 11 October 2006, [www.pointcarbon.com](http://www.pointcarbon.com).

relatively higher impact on low-income people than tax-financed schemes. This is because low-income people spend more on packaged goods and those goods are likely to reflect the costs for packaging waste management in their price. In the case of financing via progressive taxes, this effect may be levelled out to some degree.

## 2.6. Key figures on the environmental, economic and social impact of packaging recovery and the Packaging Directive (EU15 in 2001)

Reduction of greenhouse gas emissions due to total recycling	25 million tonnes of CO <sub>2</sub> equivalent
Total financing need for packaging waste management	6.6-6.8 billion €
Total financing need for packaging waste recycling	3.7 billion €
Total net costs for additional recycling resulting from the Packaging Directive	Around 200 million €
Costs per tonne of CO <sub>2</sub> equivalent saved through packaging recycling	23 €/t CO <sub>2</sub> equivalent
Direct employment and first round indirect employment in packaging recycling	42,000 FTE jobs
Net employment change as a result of the Packaging Directive	Likely to be close to neutral or slightly positive

## 2.7. Sensitivity analysis of environmental and economic impacts

All the cost and benefit figures are **sensitive to a number of parameters** which can alter the results if individual cases are investigated. Most importantly, costs and benefits of recycling differ significantly between **materials and applications**. It makes sense to recycle clean and easily recyclable applications as a priority. For other applications, collection and recycling will not necessarily prove beneficial, neither from an environmental nor from an economic point of view. Therefore, the optimal recycling level will be the sum of all applications for which recycling is beneficial and which can be collected at a reasonable cost (a principle applied in the RDC/Pira 2003<sup>20</sup> study).

The second important parameter is the **alternative disposal method**. As the net cost of recycling is calculated from the difference between disposal and recycling costs, the result will be different depending on whether the disposal method is incineration or landfill. It will also differ between old installations and installations fulfilling the latest Community requirements. Therefore, recycling levels were particularly low in countries with cheap but often inadequate landfills. The benefits of recycling will also differ depending on the set of variables related to the two alternative disposal methods, and on the materials concerned (e.g. for plastics, incineration with energy recovery can replace primary fuels; for glass, incineration will create no additional environmental benefit).

<sup>20</sup> <http://europa.eu.int/comm/environment/waste/studies/packaging/costsbenefits.pdf>.

Compared to the two major sensitivity parameters mentioned above, RDC/Pira 2003 and Ecolas/Pira 2005 found out that **geographical conditions play only a secondary role** in shifting the cost/benefit balance. In other words, where the same packaging is collected and recycled with the same method and replaces the same alternative disposal method, the costs and benefits are likely to be similar, regardless of the geographical location. Different transport modes and distances may influence the overall environmental impacts of packaging recycling, but all available information sources show that transport distances must be very long before the impacts of transport are able to counterbalance the environmental benefits of recycling<sup>21</sup>. As far as the costs are concerned, transport costs have not been an obstacle to the increasing internationalisation of recycling markets. Therefore, it is also unlikely that these costs play a major role in shifting the cost/benefit balance of packaging recycling. An exception might be the collection of material from very scarcely populated areas, small islands with few inhabitants etc. However, such areas will normally play an insignificant role in a Member State's overall waste generation, as they are normally inhabited by only a minor share of the population. Moreover, there is no requirement to set up separate packaging waste collection systems in such areas. It appears that there may also be cost differences in countries with substantially lower labour costs; this issue was not investigated, however.

## **2.8. Internal market impacts of recycling targets**

The main effect of recycling obligations of the Packaging Directive on the internal market was the stabilisation in collection and recycling markets. Before the entry into force of the directive, several Member States had initiated ambitious programmes on packaging recycling, whereas other Member States had no recycling programmes in place. In particular, when the German Packaging Ordinance first appeared, there was a great concern that the collection and recycling subsidies provided by the scheme could destroy embryonic recycling activities in the neighbouring countries. Large quantities of collected material could not be fully absorbed by the German recycling market and the surplus had to be exported.

The Packaging Directive was supposed to level out these imbalances by setting common recycling targets within a range defined by the directive. Member States can exceed the maximum recycling targets if they prove to have appropriate capacities for recycling and recovery and avoid distortions of the internal market. National measures setting higher targets must be approved by the Commission. However, the recycling or recovery capacities can also be identified outside the national borders because it would be incompatible with the internal market and trade rules to oblige Member States to recycle materials within their own borders. As the markets for recycling and recovery are international, it was very difficult to show that higher targets set in a Member State distort the internal market. Therefore, all applications for higher targets have so far been approved by the Commission<sup>22</sup>.

Since the implementation of the Packaging Directive by the Member States and the creation of financing mechanisms for collection and recycling, trade imbalances in secondary materials have been considerably reduced. Additional financing and stabilisation of supply have also led to the expansion of the recycling markets. In spite of occasional signs of

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<sup>21</sup> Ecolas/Pira 2005, p. 62 f.

<sup>22</sup> The measures notified by Austria, Belgium and the Netherlands by way of which these countries exceed the maximum targets as laid down in Article 6(1) of Directive 94/62/EC were confirmed in Commission Decision 1999/42/EC for Austria, 1999/652/EC and 2003/82/EC for Belgium, and 1999/823/EC for the Netherlands. The texts of these Decisions can be found at: [http://europa.eu.int/comm/environment/waste/packaging\\_index.htm](http://europa.eu.int/comm/environment/waste/packaging_index.htm).

saturation of markets (in particular of the glass market), the additional material could have been absorbed without major problems. More recently, competition from outside the Community has put more cost pressure on the European recyclers.

### 3. PACKAGING PREVENTION

Prevention of packaging at source is far more complex than recycling. Recycling is one of the waste management options which can be selected as a result of the choice between sending waste for recycling, recovery or disposal. Prevention does not only influence the entire packaging life cycle from raw material extraction to disposal but also the life cycle of the packaged products. Each material has its own specific environmental impacts throughout its life cycle and sometimes heavier materials cause less environmental harm than lighter alternatives. It is also over-simplifying and often incorrect to conclude that less packaging is better for the environment, since in many cases less packaging means more damage to the packed product. Therefore, weight reduction of packaging should not be an objective in itself. Consequently, packaging prevention in the sense of this report is defined as **reducing environmental impacts related to product-packaging systems throughout their life cycle by working on packaging design or by influencing consumption patterns related to packaging.**

Packaging is firmly linked to the production, consumption and distribution patterns of our society. Packaging is needed to deliver an increasing volume of produced and traded goods. Therefore, any substantial changes in packaging consumption can only be achieved through changes in production, consumption and distribution patterns, which go far beyond a policy limited to packaging only. Such an approach forms part of the Community policy instruments such as the Thematic Strategy on the sustainable use of natural resources, the Sustainable Development Strategy, or Integrated Product Policy<sup>23</sup>. Therefore, the policy of packaging prevention focuses on reducing the environmental impacts of packaging for a given product in a given economic and market context.

In general, packaging is not produced as a good in itself but as a tool to allow the distribution of other packaged goods. Packaging constitutes a cost factor, and preventing packaging is thus in the interest of the producer of the packaged good. At the same time, packaging is also an important tool to attract consumer attention (branding, marketing etc.). To serve this last purpose, more packaging may be used to contain goods than actually needed for their protection during distribution. To a certain extent, packaging is needed to inform consumers and to ensure competition. This function of packaging is also reflected in the essential requirements of the Packaging Directive<sup>24</sup>. Taking into account all the above functions of packaging, it is often difficult to draw an exact line between the acceptable use of packaging as a marketing tool and an unnecessary “over-packaging”.

This chapter investigates a number of different approaches to packaging prevention applied in the Member States as well as the new approaches suggested by the European Parliament and

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<sup>23</sup> Communication on Integrated Product Policy, COM(2003) 302 final, available at: <http://europa.eu.int/comm/environment/ipp/ippcommunication.htm>.

<sup>24</sup> “Packaging shall be so manufactured that the packaging volume and weight be limited to the minimum adequate amount to maintain the necessary level of safety, hygiene and *acceptance for the packed product and for the consumer*”, Packaging Directive, Annex II (1), first indent.

the Council in Article 6(8) of the Packaging Directive. The potential contribution of a proper implementation of Essential Requirements is discussed in Section 4.

### **3.1. Packaging prevention plans**

Packaging prevention plans are documents that companies with sales of packaged goods exceeding certain minimum thresholds are required to draw up in order to demonstrate that they have taken measures to prevent packaging at source. There is no obligation in the Packaging Directive to draw up such plans, but some Member States have introduced such requirements in their national legislation. The requirements applicable in Belgium, Italy, the Netherlands, Slovakia and Spain are described in Ecolas/Pira 2005. Some of these Member States have combined the obligation to draw up prevention plans with a standstill or reduction target with respect to the relationship between packaging and the packaged product (see also chapter 3.5).

The overall patterns of packaging waste generation are not significantly different between the Member States applying different prevention tools and the Member States applying none of these tools. Although it is likely that all of the applied measures have had certain prevention effect (the relative prevention targets have been met in most cases), none of them seems to have led to major changes.

The required effort to draw up the plans seems to be limited. The costs of monitoring and formulation of prevention plans in the Netherlands under the 1991 covenant were estimated at around 5.5 million € annually. Additional staff requirements for public authorities are limited: in Belgium, the equivalent of 1.5 full time persons was needed to monitor the implementation of the plans. The quality of the plans has improved over time and a vast majority of the more recent plans have been approved without major revisions.

### **3.2. Packaging environmental indicator**

A Packaging Environmental Indicator (PEI) is a conceptual tool that measures the environmental impact of packaging and produces a simple result which facilitates packaging improvement and selection between different packaging systems. It uses a streamlined life cycle assessment methodology to measure the environmental impact. The idea of using such an indicator for the purpose of packaging policy originated in the European Parliament during the latest revision of the Packaging Directive.

So far, PEI has not been used as an obligatory element in packaging policy. There is no clear definition of the detailed conditions of its use in a policy framework. There are also no experiences with practical application in such a context. Therefore, this chapter considers the concept as relatively flexible in its possible use and tries to identify ways in which it could be optimally used in the context of the Packaging Directive, without excluding any possible other ways of application.

The main advantage of PEI is that it gives guidance on key environmental impacts to be considered in life cycle assessment and life cycle thinking approaches. Compared to general regulations in favour of certain types of packaging, it also allows a more flexible consideration of individual cases. Nevertheless, practical constraints may make it difficult to identify single numbers which could be used to favour one type of packaging over another or to inform the consumer. These constraints include:

- **Scope of PEI:** If PEI is limited to sales packaging, the results may be incorrect with respect to the total packaging system (i.e. including transport and grouped packaging). This is because a reduction in sales packaging must in many cases be compensated by an increase in transport and grouped packaging to guarantee that the packaged good reaches the retail points intact. Furthermore, if PEI is limited to packaging, the results may be incorrect with respect to the total packaging-product systems. CE Delft estimates that, on average, the environmental impact of packaged products is ten times higher than that of packaging. Therefore, in some specific cases the overall environmental impact of packaging-product systems could increase, while the impact of packaging itself would be reduced. Typically, such a situation would take place when less packaging results in more damaged products.
- **Assumptions on key parameters:** For several key parameters, there are no universally valid values or approaches to determine such values. For example, the source of electricity for packaging production can fundamentally change the results. For instance, it would neither be correct to assume that all packaging is produced from the same average mix of European electricity production, nor to assume that a particular packaging production plant can be associated to a particular power plant or the electricity mix of the country in which it was produced. Similarly, it would not be possible to determine in advance the distribution scenario, i.e. where and to whom the product will be distributed and sold.
- **Difficulty to adapt PEI both to big and small companies:** The level of analysis needed to calculate PEI will have very different impacts on the companies depending on their size. For big companies with a limited number of products sold in high volumes, a simple standard PEI may be very easy to apply. However, due to the simplification, the results might not reflect the real environmental impacts and more sophisticated tools could be much more pertinent for such companies. For small companies or for companies with a high number of products sold in small volumes, a simple PEI may be the only feasible approach. However, for many small companies without any experience in environmental assessment, even the use of such a simple tool can constitute a significant burden.

In Ecolas/Pira 2005, a number of possible options and three exemplary PEI tools were tested and evaluated by stakeholders. Stakeholders' reactions reflected uncertainty on the exact purpose of this tool. A simple version of PEI may be relatively easy to apply, but the simplification ignores many important aspects which have a significant influence on the validity of results, in particular if packaging is considered in isolation from the packaged product. There were also concerns that requirements to collect data for the purpose of calculating PEI may create a significant burden, in particular for smaller companies.

Therefore, it seems appropriate to focus the potential use of PEI on giving guidance and tools to companies using life cycle approaches rather than trying to calculate single conclusive numbers on its basis. Such guidance could consist of identifying key parameters, such as greenhouse gas emissions or the amount of waste generated, as suggested by the European Parliament. Furthermore, tailored and simplified life cycle tools should be encouraged for use by companies which wish to use them.

### 3.3. Producer responsibility

Producer responsibility is defined by the OECD as “a policy approach for which producers accept significant responsibility (financial and/or physical) for the treatment or disposal of post-consumer products”<sup>25</sup>. Contrary to more recent recycling directives, the Packaging Directive does not contain an obligation for the Member States to transpose the directive by implementing the principle of producer responsibility. Nevertheless, most Member States have introduced legislation based on this principle. The most prominent exemptions are Denmark and the Netherlands: both these countries finance their recycling efforts for household packaging mainly through municipal taxes, although both also have voluntary agreements with industry in place. Some of the new Member States also use approaches alternative to producer responsibility systems (e.g. financing of recycling efforts through packaging taxes) or are in the process of setting up producer responsibility schemes.

There are major differences between the various types of applied producer responsibility systems. These differences concern both the operation and financing of separate collection and recycling. Only in Austria and Germany, the collection is operated under the direct responsibility of the producer responsibility system (through contracts with waste management companies). In most of the other Member States, separate collection from households is organised under the responsibility of municipal authorities. Some producer responsibility schemes cover only household packaging waste, some schemes cover both household and industrial packaging waste, and some collect and recycle exclusively industrial packaging waste.

The systems in Austria, Belgium and Germany cover the entire cost of collection and recycling. Most other systems cover only the additional costs to municipalities, such as the costs which arise from a difference between the collection and recycling of packaging and a situation where packaging is not collected separately and sent to disposal. In most countries, contributions to producer responsibility schemes are collected at the level of packagers or fillers. In the case of foreign products, economic operators placing a product on the market of a given Member State are to cover the costs. Other countries use a shared producer responsibility concept where contributions to the system are levied at different points in the packaging chain from material producers to distributors. The United Kingdom uses a specific form of producer responsibility where recycling is financed via a tradable certificate scheme (PRNs – packaging recovery notes).

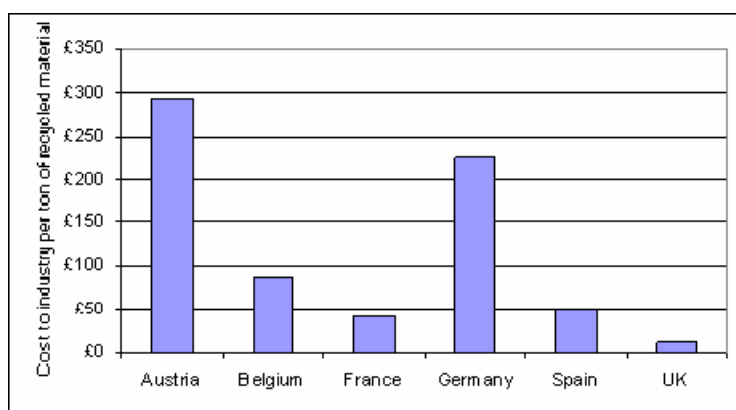
Producer responsibility schemes have contributed to increasing the packaging recycling rates. However, also countries without producer responsibility systems have achieved high recycling rates, in particular for materials with a low recycling cost. As a result of a large variety of financing systems, also producer responsibility fees vary significantly. Nevertheless, these differences have had only a limited impact on the internal market, mainly because within a Member State the same level of fees applied both to domestic and imported products. On the other hand, differing reporting obligations may constitute a significant burden for smaller companies<sup>26</sup>.

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<sup>25</sup> Extended Producer Responsibility: A Guidance Manual for Governments, ENV/EPOC/PPC(2000)16/FINAL, p.9.

<sup>26</sup> Perchards 2005, p. 185 ff.

Diagram 3: Cost of producer responsibility schemes to industry per tonne of recycled material<sup>27</sup>



By internalising the waste management costs into the product price, producer responsibility seeks to create incentives to prevent packaging waste. Whether or not these incentives have indeed led to a reduction in packaging waste generation is difficult to evaluate. According to OECD 1998<sup>28</sup>, the amount of packaging in circulation in Germany decreased by 500,000 tonnes between 1992 and 1993 after the German Packaging Ordinance and the relatively high licence fees for DSD have been introduced. Since then, packaging consumption increased again and today neither the per capita packaging consumption nor the current trends in packaging consumption in Germany are significantly different from those observed in other Member States. In most other Member States, however, the fees are significantly lower. Therefore, any effects of the fees on packaging generation are likely to be smaller than in Germany.

The next important aspect of producer responsibility systems is their effect on competition. Producer responsibility schemes, in particular in the household packaging sector, often hold a dominant position in their market. For example, in Austria and Germany the collection and recycling of packaging is organised by, respectively, ARA and DSD. These systems have strong market positions (although successful competitors such as Interseroh and Landbell have established themselves in Germany). Similar situation developed also in other Member States. The Commission has investigated the compatibility of packaging waste management systems with Articles 81 and 82 EC Treaty (anti-trust). The main concerns relate to the following issues:

- Preventing anti-competitive practices such as market sharing, price fixing and the exchange of other sensitive information,
- Ensuring choices between several waste management systems for the companies obligated under national legislation to recycle their waste,

<sup>27</sup> Associate Parliamentary Sustainable Waste Group. Producer Responsibility. An investigation into the strategic issues and environmental and economic impacts related to the implementation of Producer Responsibility legislation in the United Kingdom, March 2004. PSWG0101A: 27 May 2004.

<sup>28</sup> Extended Producer Responsibility, phase 2, Case study on the German Packaging Ordinance, ENV/EPOC/PPC(97)21/REV2, p.25.

- Avoiding exclusive arrangements of all kinds without solid and convincing economic justification.

In total, the Commission has adopted four formal decisions<sup>29</sup> in this area and resolved a number of other cases informally. These decisions accept exclusivity arrangements only if there is an objective economic justification (e.g., the need to recoup investments made). The following principles arise from the decisions:

- No service, no fee: Dominant systems must only charge obligated companies for services that they actually provide (i.e. the recycling of waste). In particular, they may not charge them fees based on the entire amount of packaging placed on the market if only a part of that packaging is handled by the dominant system (and the remaining part is handled by a competitor).
- An “all or nothing” rule (i.e. the requirements for obligated companies to enter into contracts for either the entire amount of their packaging or nothing) can only be accepted in exceptional cases.
- Contracts between packaging waste management systems and waste management companies must be limited in duration to enable the re-negotiation of contracts and to allow competitors to make better offers.
- In case of dominant systems operating non-duplicable collection infrastructures (in particular in the household packaging waste sector), competitors must be given access to the collection infrastructure under fair conditions.

The aim of the Commission is to allow for increased competition and thus achieve lower prices for consumers. Following the discussions with the national competition authorities, the Commission has summed up these competition principles in a Working Paper published in September 2005 and can be found at:

<http://europa.eu.int/comm/competition/antitrust/others/waste.pdf>.

### **3.4. Heavy metals and other hazardous substances**

Article 11 of the Packaging Directive provides that “[...] the sum of concentration levels of lead, cadmium, mercury and hexavalent chromium present in packaging or packaging waste shall not exceed [...] 100 ppm by weight [...]”. Annex II, third indent of the Packaging Directive provides that “packaging shall be so manufactured that the presence of noxious and other hazardous materials [...] is minimised”. In Article 6(8)(g), of the Packaging Directive, the European Parliament and the Council have requested the Commission to assess “efforts to reduce further and, if appropriate, ultimately phase out heavy metals and other hazardous substances in packaging by 2010”.

In most cases, the four regulated heavy metals are present in packaging only as minor impurities. Where they occur in quantities close to or above 100 ppm, their presence is often

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<sup>29</sup> Commission decision of 16 October 2003, *ARA, ARGEV, ARO*, OJ 2004 L 75/59 (Article 81 EC) – appeal pending; Commission decision of 17 September 2001, *DSD*, OJ 2001 L 319/1 (Article 81 EC) – appeal pending; Commission decision of 15 June, 2001, *Eco Emballages*, OJ 2001 L 233/37 (Article 81 EC); and Commission decision of 20 April 2001, *DSD*, OJ 2001 L 166/1 (Article 82 EC) – appeal pending.

due to the use of recycled materials. In the case of glass packaging, the sources are lead-containing foils from old wine bottles (these foils are banned since 1993; however, the lead is still present in the recycling circuit every time the cullet is recycled), lead crystal (a 330 gram lead crystal ashtray in one tonne of lead-free cullet is enough to bring the entire batch of recycled glass to a content of 100 ppm) and other lead glass (e.g. TV screens). In the case of plastic crates and pallets, the main source of heavy metals is pigments used in the past and banned in the meantime. For recycled glass and plastic crates and pallets, exemptions from the 100 ppm limit have been adopted<sup>30</sup>.

Deliberate additions of the regulated metals in packaging can be contained in such applications as solders in metal packaging, in some inks and wood treatment substances, pigments for decorated glass etc. However, such additions normally comply with the 100 ppm limit of the directive, and are becoming increasingly rare. Nevertheless, there still seem to be packaging items on the market with concentrations above the 100 ppm (e.g. Ecolas/Pira 2005 reports cases of plastics packaging nets with heavy metal containing pigments).

The technological feasibility of a further reduction of the regulated heavy metals depends on the use of recycled materials and on the background content of the metals in the primary raw materials used. Most materials and applications should be able to respect lower limit values. Nevertheless, there is no full picture on the materials and applications for which decreased heavy metal content could be problematic. In those cases, the only alternative would be to lower the input of recycled material or to switch to other packaging materials. In applications where the metals were added deliberately in the past, far higher concentrations than 100 ppm occurred. Therefore, a strict control of the existing limit should be sufficient to phase out these applications.

The risks related to the presence of the regulated heavy metals will depend on the material. In particular in inert materials such as glass, the risks are minimal. For other materials, no scientific information is available on environmental or human health risks of concentrations between 10 and 100 ppm. In any case, for packaging which comes into contact with food, more stringent legislation applies<sup>31</sup>.

During the preparation of the Ecolas/Pira study, the Commission has also invited stakeholders to present information on other hazardous substances which are of concern for packaging applications. However, very little information was submitted or could be found in other sources. The main substances assessed were antimony (antimony trioxide is a flame retardant synergist and a PET<sup>32</sup> catalyst) and chlorine (contained in PVC<sup>33</sup>). For antimony trioxide, a

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<sup>30</sup> Commission Decision 1999/177/EC of 8 February 1999 establishing the conditions for a derogation for plastic crates and plastic pallets in relation to the heavy metal concentration levels established in Directive 94/62/EC on packaging and packaging waste, OJ L 56 of 4 March 1999, p.47; Commission Decision 2001/171/EC of 19 February 2001 establishing the conditions for a derogation for glass packaging in relation to the heavy metal concentration levels established in Directive 94/62/EC on packaging and packaging waste.

<sup>31</sup> For such packaging, more stringent rules are laid down in food contact legislation, such as Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC and their implementing measures. Commission Directive 2002/72/EC of 6 August 2002 relating to plastic materials and articles intended to come into contact with foodstuffs is the most relevant example of specific limits in an implementing measure.

<sup>32</sup> Polyethylene terephthalate.

<sup>33</sup> Polyvinyl chloride.

risk assessment is still ongoing. For PVC, some discussions have been held as a follow-up to the Green Paper on Environmental Issues of PVC<sup>34</sup>.

### **3.5. Prevention targets and landfill bans**

Given the complexity of some of the debates on other waste prevention measures, prevention targets or landfill bans seem to be appealing due to their simplicity. Nevertheless, their implementation raises a number of questions which are not less complex than other measures.

Prevention targets must be defined using a valid indicator. As outlined in the introductory part of section 3, packaging must be seen in the context of the entire packaging system and the packaged product. The weight of the packaging is not necessarily the most valid indicator to assess the environmental impact of packaging. On the other hand, indicators related to the environmental impacts will also be difficult to define and measure. The enforcement of prevention targets can pose a problem for the Member States because it is unclear how such targets could be translated to individual companies. If all companies were required to reduce packaging to the same degree, there could be a problem for companies which have already used their reduction potential (and advantage to those who have not). If the obligation applies only to certain companies, this may lead to distortions of competition and internal market problems (in particular, if the obligations differ between the Member States).

Practical experience with prevention targets is mixed. Relative standstill obligations related to the type of packaging used for a particular product have generally been met (Belgium, Netherlands, Spain). Overall quantitative waste prevention targets were not effective in all cases studied by Ecolas/Pira 2005. An example could be the target in the 5<sup>th</sup> Community Environmental Action Programme of 1993 aiming to stabilize the annual municipal solid waste generation at an average of 300 kg per capita. This target was largely missed and today's municipal solid waste generation in EU15 is close to double that figure.

Landfill bans do not prevent packaging at source but rather divert packaging waste from landfills to other disposal or recovery options. Landfill bans and landfill reduction targets have a similar effect as recycling targets in redirecting waste streams. However, they need to be seen in relation to which waste management option could possibly be used subsequently to achieve the greatest environmental benefit. Recycling targets cannot be simply replaced by landfill bans and landfill reduction targets if this would result in an increase of incineration at the detriment of recycling and the overall environmental benefits of the Directive.

### **3.6. Overall evaluation of packaging prevention measures**

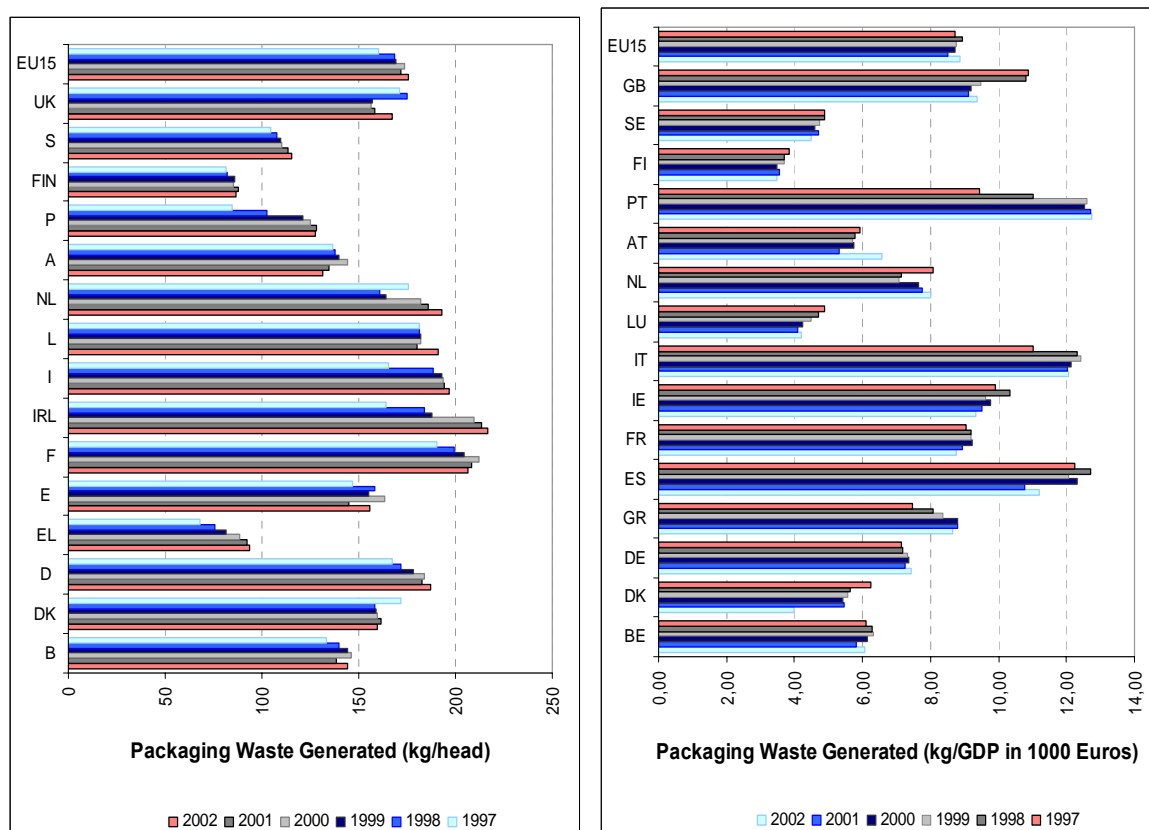
In terms of per capita packaging waste generation, there are major differences between the Member States. Finland and Greece generate less than 100 kg per inhabitant, whereas Ireland and France generate more than 200 kg. In terms of packaging per unit of GDP, Finland, Luxembourg and Sweden have the lowest and Portugal, Italy and Spain the highest per capita packaging waste generation levels. These absolute figures should, however, be interpreted with caution. A study by the Nordic Council has shown that some of the differences are due to

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<sup>34</sup> Green Paper on environmental issues of PVC, COM(2000)469, available at: <http://europa.eu.int/comm/environment/waste/pvc/index.htm>.

different interpretations of the packaging definition and due to different data collection methods<sup>35</sup>.

Diagram 4: Packaging waste generation in kg/capita and kg/unit of GDP



In almost all Member States, the absolute amount of packaging waste still seems to be on the increase. However, also in almost all Member States, a relative decoupling of packaging generation from GDP growth has been noted, as the increase in packaging is slower than the increase of GDP<sup>36</sup>.

The effectiveness of the existing packaging prevention measures is difficult to evaluate because it is not possible to know which developments would have taken place in the absence of these measures. Although it is likely that all of the applied measures have had certain prevention effect, none of them seems to have led to major changes. Therefore, it is also impossible to identify clearly which prevention measures are more effective than others.

<sup>35</sup> A survey of Nordic Packaging Data Collection Methods, <http://www.norden.org/pub/miljo/miljo/sk/TN2003562.pdf>.

<sup>36</sup> GDP is used as an indicator because data are easily available. In reality, only around 50% of GDP relates to packaged goods. The unit improvement of packaging may also be masked by changing consumption patterns.

Diagram 5: Packaging waste generation and GDP in EU15

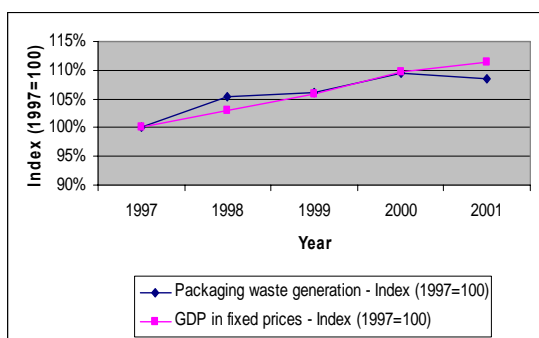
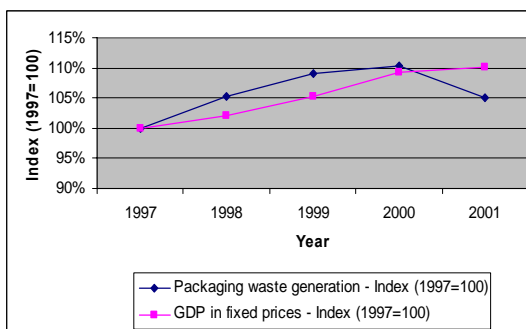
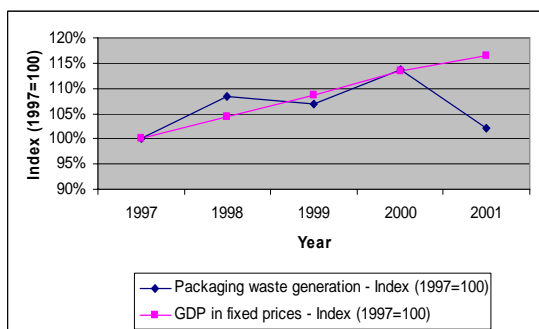
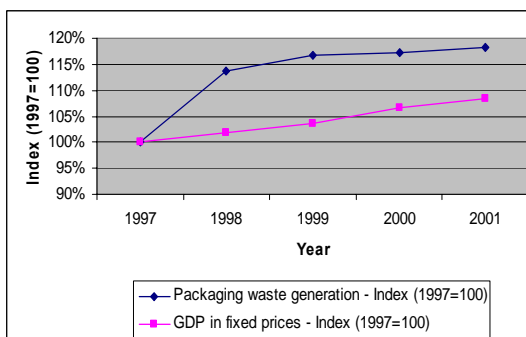
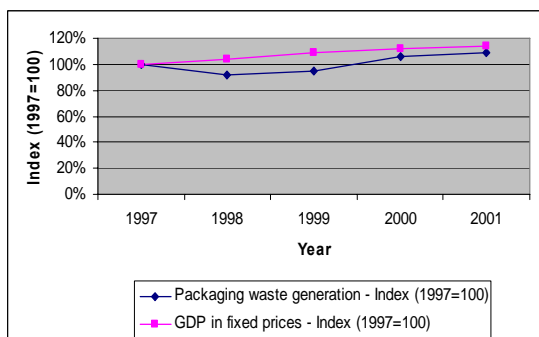


Diagram 6: Packaging waste generation and GDP in countries with waste prevention plans



Spain

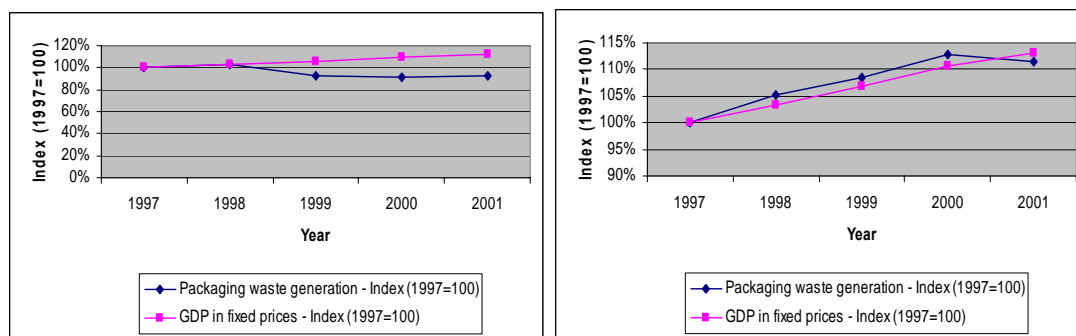
Belgium



Netherlands

Italy

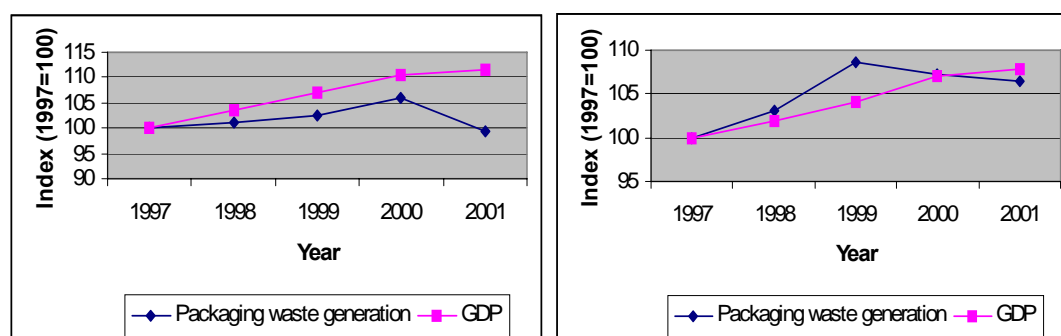
Diagram 7: Packaging waste generation and GDP in countries applying market surveillance in the context of the essential requirements



United Kingdom

France

Diagram 8: Packaging waste generation and GDP in countries with strong producer responsibility systems



Austria

Germany

#### 4. ESSENTIAL REQUIREMENTS

Essential requirements were introduced in the view of creating a level playing field in the packaging sector, while pursuing the environmental objectives of preventing waste, increasing recycling and reducing the content of heavy metals and hazardous substances. Next to the limit values for four heavy metals contained in Article 11 of the Packaging Directive, the essential requirements in Annex II are the most concrete provisions on prevention in this directive. These requirements foresee that packaging “shall be so manufactured that the packaging volume and weight be limited to the minimum adequate amount to maintain the necessary level of safety, hygiene and acceptance for the packed product and for the consumer”<sup>37</sup>. Furthermore, packaging must be either reusable or recoverable (either in the form of material recycling, energy recovery or organic recycling). The presence of noxious and other hazardous substances shall be minimised.

The essential requirements form a part of the New Approach elements of the directive. The New Approach consists in limiting the requirements in directives to relatively general key

<sup>37</sup> Packaging Directive, Annex II (1), first indent.

provisions. Producers must be able to demonstrate conformity with these requirements. One way to do this is by using harmonised CEN standards, which should give an automatic presumption of conformity. In 1996, the Commission gave a mandate to CEN to prepare a series of harmonised standards for the Packaging Directive. However, as a result of major concerns raised by some Member States, the first set of standards was only partially approved as harmonised standards in 2001<sup>38</sup>. For the remaining standards, the second mandate was issued. On 19 February 2005, the references to the full set of six harmonised standards were published in the Official Journal<sup>39</sup>.

However, progress in the proper monitoring and enforcement of the essential requirements has been rather slow. All Member States have duly transposed the Essential Requirements, but only three Member States (UK, France and the Czech Republic) have put an enforcement mechanism in place. Because of the limited enforcement at the European level, a thorough assessment of the effectiveness of the essential requirement is currently not possible. However, evidence shows that countries monitoring compliance with the essential requirements (France and the UK) have achieved similar levels of decoupling of growth in packaging use from GDP compared with countries which have implemented packaging prevention plans (e.g. Belgium and Spain). To a certain degree, packaging prevention plans are similar to declarations on conformity with the essential requirements (see chapter 3.1). Both instruments require companies to demonstrate how prevention has been achieved in their particular case. In both cases, there are certain core requirements (more or less concrete), but the way to achieve these requirements is largely left to the companies.

The main purpose of the standards should not be to disqualify packaging but to enter into a dialogue with producers to improve it. Perchards 2005 reports that the standards are applied by most big companies, even in countries without enforcement systems. The application of the standards has led to many improvements of packaging while most of the issues raised in controls by enforcement authorities could be resolved without the need for action in the courts. A stricter interpretation of the essential requirements would most likely increase the need for prosecution. It would, however, also increase the risk for different interpretations within the internal market.

Other CEN standards cover the requirements of reusability or recoverability of packaging and are even more limited than the requirements for prevention. There have also been discussions on the minimum trip rates for reusable packaging, the minimum percentage of a packaging item that must be recyclable to consider the whole item recyclable, the minimum calorific value to consider a packaging item recoverable in the form of energy recovery and the types of biodegradation to consider a packaging item biodegradable. The standards offer solutions to these issues, but clearly not everyone can be satisfied with them. The cost implications of applying the packaging standards have been assessed by EUROPEN at around 200,000 € per company annually (for a company with a range of 2,000 different packaging applications).

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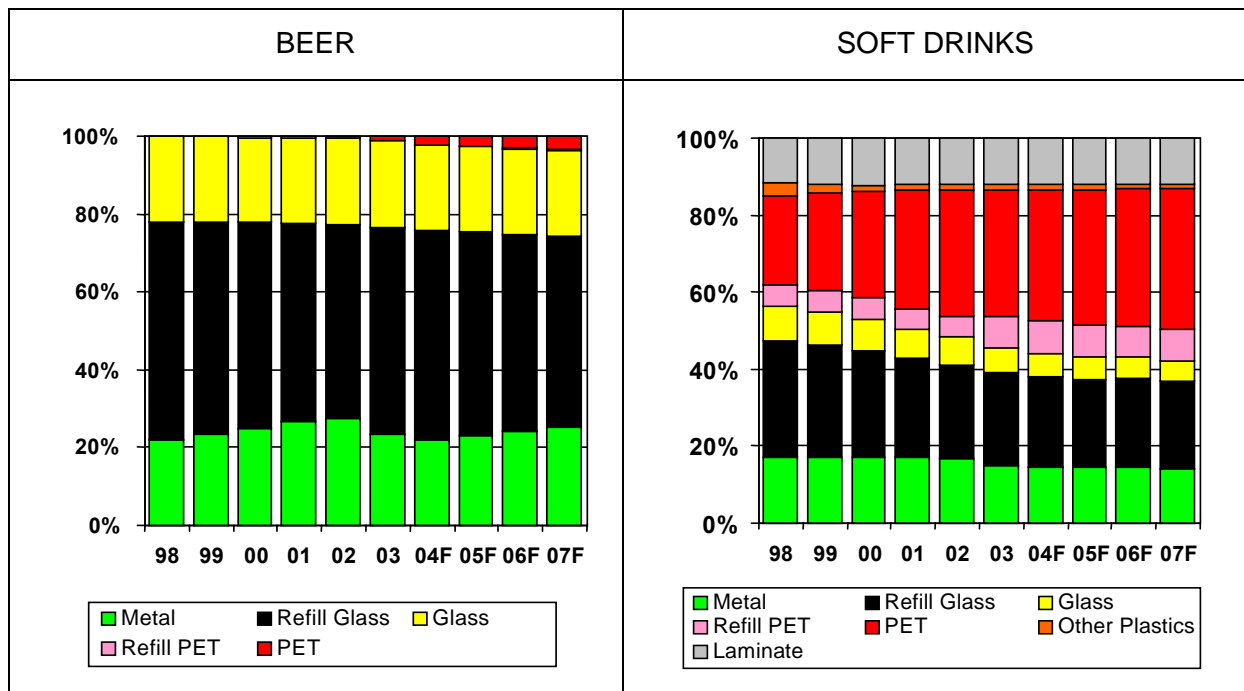
<sup>38</sup> Commission Decision 2001/524/EC of 28 June 2001 relating to the publication of references for standards EN 13428:2000, EN 13429:2000, EN 13430:2000, EN 13431:2000 and EN 13432:2000 in the Official Journal of the European Communities in connection with Directive 94/62/EC on packaging and packaging waste, OJ L 190 of 12 July 2001, p. 21.

<sup>39</sup> Commission communication 2005/C 44/13 in the framework of the implementation of the European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, OJ C 44 of 19 February 2005, p. 23.

## 5. PACKAGING REUSE

Reuse systems for packaging operate in several packaging segments. Some of them function very successfully and without a political support. This is in particular true for transport packaging such as crates and pallets but also for beverage packaging in the hotel, restaurant and café sector. However, most of the debate in the European Union focuses on consumer beverage packaging (around 20% of total packaging by weight<sup>40</sup>). It is estimated that today such systems are no longer commercially viable without a political support since they are absent or only of marginal importance in those Member States where such a political support does not exist. At the same time unilateral measures taken at Member State level in order to introduce beverage packaging reuse systems have a potential to partition the internal market.

Diagram 9: Market share of refillable and one-way packaging in Europe



### 5.1. Reusable packaging

The question whether and by how much reusable consumer beverage packaging is preferable to one-way packaging is subject to lively debates. Many life cycle assessment studies have been conducted on this subject. There is a reasonably strong agreement on the fundamental patterns of the results but the absolute values differ to some extent. The difference stems from a number of factors such as a type of electricity used for packaging production (hydropower or from coal), packaging distribution patterns (over long or short distances), etc. Moreover, there are significant differences between various applications of packaging. Reusable PET packaging does not have the same properties as reusable glass packaging, beverage cartons, or cans. Some of the values also change over time due to modifications in packaging, increases in recycling rates etc.

<sup>40</sup> Estimate on the basis of GVM data for Germany, personal communication.

Most studies found reusable packaging to be environmentally more beneficial in situations where transport distances were small and return rates high, while one-way packaging performed better in specific situations with generally high transport distances and low return rates.

As observed in the beverage sector, national policy measures can have an impact on the internal market because refill systems can be more difficult to apply over long distances and lead to additional costs, especially for importers that have to adapt their packaging to the specifications of the individual Member States' markets. Therefore, any effective measures to protect refill systems will favour local production over imports from long distances.

The most effective measures aiming to protect refillable packaging systems included bans or authorisation procedures for one-way packaging. However, such measures were incompatible with article 18 of the Directive, which provides that "Member States shall not impede the placing on the market of their territory of packaging which satisfies the provisions of this Directive". As there was no reason for which one-way packaging could not satisfy the provisions of the Directive, a ban on certain types of one-way beverage packaging in Denmark had to be repealed. An infringement procedure against the Netherlands related to a prior authorisation procedure for one-way beverage packaging is currently ongoing.

Article 5 of the Directive allows Member States to "encourage reuse systems of packaging, which can be reused in an environmentally sound manner, in conformity with the Treaty". This limits the freedom of Member States to measures which are in line with articles 28 to 30 of the Treaty. Following the jurisprudence of the Court, in order to be justified for reasons of environmental protection such measures must be appropriate, necessary and proportionate to the aim pursued<sup>41</sup>. In this context, the most famous national measure was the 72% reuse quota for refillable packaging which was in force in Germany until May 2005, subject to the Court's ruling in case C-463/01. However, the Court refrained from pronouncing itself on the legality of the quota itself.

## 5.2. Return and collection systems

Measures concerning the return and collection of packaging waste are based on Article 7 of the Packaging Directive. This article foresees that Member States shall take the necessary measures to set up such systems for used packaging and/or packaging waste. Article 7 also allows the use of deposit systems for one-way packaging. However, the same article provides that such systems shall apply to imported products under non-discriminatory conditions. In judgements C-463/01 and C-309/02, the Court took the view that "*Article 7 of the Packaging Directive leaves it to the Member States to choose (a collection system) provided that the systems chosen are designed to channel packaging to the most appropriate waste management alternatives and form part of a policy covering all packaging and packaging waste*"<sup>42</sup>.

Certain conditions have to be observed as regards system which are newly introduced and replace older systems: "*The new system must be equally appropriate for the purpose of attaining the objectives of Directive 94/62. In particular, where the new system is (...) a deposit and return system, the Member State must ensure that there are a sufficient number of*

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<sup>41</sup> ECJ judgement in Case C-303/86.

<sup>42</sup> ECJ judgement in Case C-309/02.

*return points so that consumers who have been charged a deposit when buying goods in non-reusable packaging can recover the deposit even if they do not go back to the initial place of purchase*<sup>43</sup>." In the case of the German one-way deposit, the Commission took the view that the limitation of the take-back obligation to packaging of the same type, shape and size as sold in a retail point had led to a fragmentation of German take-back systems (so-called "island solutions") which made it more difficult for imported products to be sold on the German market.

In addition, it follows from the Court's jurisprudence that the changeover to the new system must take place without a break and without jeopardising the ability of economic operators in the sectors concerned to participate in the new system as soon as it enters into force. In this respect, the Court underlined that "*the national rules must (...) afford the producers and distributors concerned a transitional period sufficient to enable them, before the deposit system enters into force, to adapt to the requirements of the new system*"<sup>44</sup>."

### **5.3. Fiscal measures**

Several Member States have introduced fiscal measures to protect refillable beverage packaging. Article 15 of the Packaging Directive provides that in the absence of Community measures aiming to promote the implementation of the objectives set by this directive, Member States may introduce economic instruments in line with the relevant provisions of the Treaty. Measures of a purely fiscal nature need to be assessed under Article 90 of the Treaty. This article does not contain any requirements for an environmental justification of tax exemptions or reduced tax rates. Therefore, national measures on this basis were generally found compatible with Community legislation and have become more widely applied in the Member States. Nevertheless, technical specifications linked to fiscal measures also need to be assessed under Articles 28-30 of the Treaty. Such technical specifications were found incompatible with the Community law, e.g. in the case of documentation procedures for the recycled content of packaging in the context of a Belgian draft law on eco-taxes.

Perchards 2005 points out that all measures other than bans and authorisation procedures might have slowed down the decline of reusable consumer beverage packaging but none of these measures was able to stop this decline.

Given the effects on the internal market in the beverage sector of the different regimes applied in the Member States, the Commission will evaluate the need to clarify the provisions of Articles 5 and 7 of the Packaging Directive.

## **6. LEGAL ASSESSMENT OF THE IMPLEMENTATION AND INFRINGEMENT PROCEDURES**

Article 16 of the Packaging Directive provides that, with the exception of purely fiscal measures, national measures relating to the directive must be notified to the Commission and the other Member States at the draft stage, following the procedure of Directive 98/34/EC. The Commission and the Member States may issue detailed opinions or observations on such measures. In this way, many national measures have been examined at a draft stage and gave the possibility to the Commission, the national authorities and the other interested parties to present their views on their compatibility with the Community law. This enabled to solve

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<sup>43</sup> ECJ judgement in Case C-309-02.

<sup>44</sup> ECJ judgement in Case C-463/01.

certain issues of incompatibility of notified national measures with EC law before legislation was enacted. In cases where the notifying Member States did not comply with the Commission's position, the latter launched infringement procedures, in particular on the impact on the internal market of national measures aiming to encourage reuse systems in the beverages sector. In addition, infringement procedures have been launched for late transposition and relatively minor issues relating to definitions included in the directive.

Perchards 2005 has identified 29 issues related to the restrictions of the free movement of packaging (notifications, infringement procedures, issues raised informally). Out of these issues, 17 have been resolved permitting the free movement of goods, two in favour of the Member States, and five of these cases concerned packaging taxes.

Five issues remain unresolved. Three of these issues relate to the German one-way deposit system and one to the application of prior authorisation procedure to one-way packaging in the Netherlands. In all these cases, the Member States concerned are in the process of adapting their implementation measures. The fifth of the above unresolved issues has arisen due to divergent implementation of Decision 97/129/EC on packaging identification systems in the new Member States. Article 3 of this decision provides that packaging materials shall be identified on a voluntary basis: *The use of the numbering and abbreviations of the identification system (...) as laid down in the Annexes (of this Decision) shall be voluntary for the plastic materials, the paper and fibreboard materials, the metals, the wood materials, the textile materials, the glass materials, and the composites mentioned in the respective Annexes. A decision whether to introduce on a binding basis the identification system for any material or materials may be adopted in accordance with the procedure laid down in Article 21 of Directive 94/62/EC.*

However, some of the new Member States have introduced obligatory identification of packaging materials in their legislation. This means that packaging without material identification which is legally put on the market in one Member State cannot be put on the market in the concerned Member States. As the marking and identification system is neither used to any significant degree by consumers nor by recyclers, there is also no environmental justification of making it obligatory. For this reason, the concerned Member States were invited to align their legislation to Decision 97/129/EC as soon as possible.

Overall, Perchards 2005 concluded that the notification procedure has worked well, with infringement procedures and Court judgements leading to a significant degree of clarification of the legal framework applicable for national measures. Nevertheless, significant concerns remain among stakeholders that the framework of Directive 98/34/EC is insufficient to reflect their views and interests. Certain packaging industry sectors consider that Directive 94/62 insufficiently guarantees the free circulation of goods using their packaging. Non-governmental organisations and certain economic operators consider that the directive neither prevented the decline of beverage refill systems nor gave the necessary freedom to Member States to take their own measures.

## **7. CROSS-BORDER SHOPPING**

In particular in the beverage sector, price differences between Member States have led to increases in cross-border shopping of private consumers. This is partly but not only related to packaging policy in some Member States. Typically, Scandinavian consumers buy products in other Scandinavian countries, Germany or the Baltic countries. Some practical problems have arisen in this context (e.g. application of one-way deposits, calculation of recycling rates). However, this is a matter to be addressed mainly on a national level, if appropriate in co-ordination between the concerned Member States.