

# **Local and regional action for tackling plastic waste**

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# List of Acronyms

|       |                                                         |
|-------|---------------------------------------------------------|
| BOT   | Build-Operate-Transfer                                  |
| C&D   | Construction and Demolition                             |
| E&EE  | Electrical and Electronic Equipment                     |
| EPS   | Expandable Polystyrene                                  |
| HD    | High Density                                            |
| LD    | Low Density                                             |
| LRAs  | Local and Regional Authorities                          |
| MRF   | Materials Recycling Facility                            |
| MS    | Member States                                           |
| NGO   | Non-Governmental Organisation                           |
| PE    | Polyethylene                                            |
| PMD   | Plastic bottles, metal cans and tetrapak drink packages |
| PP    | Polypropylene                                           |
| PPPs  | Public-Private Partnerships                             |
| PVC   | Polyvinyl Chloride                                      |
| RCV   | Refuse Collection Vehicle                               |
| RDF   | Refuse Derived Fuel                                     |
| RWSLS | Residual Waste Sanitary Landfill Sites                  |
| WFD   | Waste Framework Directive                               |









# Summary

The Waste Framework Directive (WFD) and the Directive on packaging and packaging waste requires Member States (MS) to ensure that suitable return, collection and re-use or recovery systems for used packaging and/or packaging waste are set up, and to achieve specific targets in the recycling and recovery of packaging waste and of specific materials within packaging waste, including plastic. Local and regional authorities (LRAs) are responsible for the management of municipal non-hazardous solid waste across MS, and are thus directly involved in the implementation of the Directives.

The scope of this report is to identify and analyse initiatives directly involving LRAs in the prevention and/or management of post-consumer plastic waste. To this end, the report addresses a wide range of plastic waste management issues, focusing on measures directly involving LRAs in their implementation.

An inventory of initiatives involving LRAs and focusing on the whole life-cycle of plastic waste (from prevention to appropriate treatment and re-use/recycling, including producer responsibility/cost recovery of public waste management) is included in Part 1.

The second part of the report (Part 2) offers a typology of plastic waste management measures implemented at local and regional level, based on the evidence provided through the initiatives outlined in the inventory. The overarching criterion used for the categorisation of the identified measures is the *level of involvement of LRAs* in plastic waste management-related activities. Two additional criteria, i.e. the *financing scheme* applied and the *type of intervention* in terms of complexity of action were used to provide a more detailed typology.

By applying the overarching criterion, four main types of initiatives were identified, as follows:

- A. Initiatives organised and implemented by LRAs using their own resources, in terms of both human (expertise) and financial (single financing source) capital.
- B. Initiatives jointly organised and implemented by LRAs and waste management companies, through Public-Private Partnerships (PPPs).
- C. Initiatives designed by a producer responsibility company and implemented jointly with LRAs.

D. Initiatives in which the LRAs involved mainly use outsourcing in the implementation of the plastic waste collection/treatment/recycling activities.

By considering the ‘financing scheme’ and ‘type of intervention’ criteria within each of the above types of initiatives, further sub-categories were created.

Five projects are selected for further analysis based on this typology and ensuring geographical representation of MS. Part 3 provides a detailed description of the five case studies selected.

The first case study, the *Larnaca automatic sorting unit* in Cyprus, is an example of a jointly organised and implemented initiative involving an LRA, a waste management company, and an intermediary agency. It refers to the construction and operation of a mixed waste mechanical sorting and processing unit, capable of automatically separating plastics from other recyclable streams. The unit is part of an integrated waste management project, implemented in line with the national Strategic Framework on waste management, and its operation has so far been successful, processing 95,000 tonnes of mixed waste and recovering plastics included in the mixed municipal waste by approximately 39.2% in the winter and 58.5% in the summer (by weight). Among its main success factors are the long-term multi-level planning of actions, the high-level political support, the involvement of the private sector at an early stage of implementation, and the use of an intermediary agency with co-ordination and monitoring functions.

The second case study, the *Hellenic Recovery Recycling Corporation (H.E.R.R.Co) blue bins network* in Greece, demonstrates how a producer-responsibility organisation established by packaging operators managed to rapidly expand its network of inter-connected city-level separate waste collection projects by closely collaborating with local authorities both within the organisation and in the implementation of the projects. The initiative led to the recycling/recovery of more than 430,000 tonnes of packaging waste in 2009, the direct collaboration with about 30 Recycling Sorting Centres (RSC), and the provision of services to approximately 8 million citizens in Greece. Key to its success were the long-term planning of the collection and recycling system, the strong ownership and involvement of local authorities, the importance given to awareness-raising and information activities, and the choice to build on the existing capacities and expertise of the local authorities involved.

The third case study, the *City of Amsterdam trial collection of separated plastic* in the Netherlands, refers to a pilot initiative aiming at determining the most suitable collection practice in terms of efficiency, effectiveness and user

acceptance, which has been organised and implemented by a municipal authority using its own resources. The pilot managed to successfully overcome opposition from supporters of waste incineration (a well-established tradition in Amsterdam), achieve high levels of user-acceptance, and collect more plastic waste than originally planned. The main success factors were the national level political support to selective waste collection systems, the past experience of the citizens with similar systems for other packaging waste (such as paper and glass), the setting of feasible targets to be achieved within a reasonable timeframe, and the attention given to awareness-raising and information actions.

The fourth case study, the *Separate waste collection system in Piatra Neamt* in Romania, demonstrates how a local authority with limited resources can establish a fully operational separate waste collection system by outsourcing all actions across the waste management value chain, from design and construction to operation and supervision of the facilities and activities. The initiative led to the establishment of a network of 943 collection points serving the needs of about 40 apartments each, and to high user-acceptance. The collection system is part of a broader, integrated waste management system comprising a wide range of facilities such as sorting and recycling plants, a composting plant, a construction and demolition (C&D) waste processing unit, and a sanitary landfill. Success factors include the long-term planning of operations, the ability of the local and national authorities to build on the results of relevant past initiatives and to effectively follow up on each activity implemented in the target region, the security and adequacy of funding, and the use of international expertise in the design and implementation stages.

The fifth case study, the *Ban on disposable cutlery and crockery in Munich* in Germany, demonstrates how coherent and systematic efforts to regulate aspects of public events organisation can have a significant positive impact on waste prevention. The initiative managed to reduce the overall quantity of waste produced during public events in Munich, from 11,000 tonnes in 1990 to about 760 tonnes in 2006. Moreover, it achieved the development of new business opportunities locally for the provision of dishwashing and other related services to organisers, and a change in the behaviour of locals and visitors in terms of waste generation. Besides the continuity in political support, its success was due to the facilitation of the implementation of the ban through the provision of reasonably-priced alternatives to disposable practices, the use of trained inspectors following well-defined procedures, and also EU and global changes in waste and environmental policy favouring prevention actions and more sustainable lifestyles.

In Part 4, recommendations on the findings of the analysis are outlined with respect to: (i) framework conditions for effective action by LRAs; (ii) actions

deserving more attention by LRAs with regard to plastic waste prevention, life-cycle approach, re-use/recycling and producer (cost) responsibility; and (iii) aspects to be considered within the EC Green Paper on plastic waste from a local and or regional perspective, in particular for the promotion of most-advanced LRA actions.

# Introduction

According to the European Parliament and Council Directive on packaging and packaging waste (the ‘Directive’ from now onwards)<sup>1</sup>, MS are obliged to take the necessary measures to ensure that suitable return, collection and re-use or recovery systems for used packaging and/or packaging waste are set up. Appropriate systems need to be open to the participation of: (i) the economic operators of the sectors concerned (producer responsibility); and (ii) the competent public authorities. Since LRAs bear the responsibility for the management of municipal non-hazardous solid waste across MS, they are directly involved in the implementation of the Directive.

The Directive, with a view to harmonising national measures tackling the management of packaging and packaging waste, set clear targets for the recycling and recovery of packaging waste and of materials contained within packaging waste. Targets include:

- by no later than 30 June 2001:
  - o recovery, or incineration at plants with energy recovery, of 50% to 65% by weight of packaging waste; and
  - o recycling of 25% to 45% by weight of the totality of packaging materials contained in packaging waste (with a minimum of 15% by weight for each packaging material);
  
- by no later than 31 December 2008:
  - o recovery, or incineration with energy recovery, of at least 60% by weight of packaging waste;
  - o recycling of 55% to 80% by weight of packaging waste; and
  - o recycling of at least 60% of glass, paper and board, 50% of metals, 22.5% of plastics, and 15% of wood contained in packaging waste.

However, later deadlines were set for almost half of the MS<sup>2</sup>, with specific derogations having been granted to Greece, Ireland and Portugal (31/12/2011),

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<sup>1</sup> Directive [94/62/EC](#) as amended by Directives [2004/12/EC](#) and [2005/20/EC](#), and Regulations (EC) No [219/2009](#) and (EC) No 1882/2003.

<sup>2</sup> 2006 report on the implementation of Directive 94/62/EC on packaging and packaging waste.

the 10 new MS (31/12/2015), as well as Bulgaria and Romania (as defined in their respective Treaties of Accession).

The Directive obliges MS to take appropriate action to prevent the creation of packaging waste, and to ensure packaging placed on the market complies with a set of essential requirements<sup>3</sup> related to: the weight and volume of packaging, to attain the required level of safety, hygiene and acceptability for consumers; the level of hazardous substances and material content in the packaging material and its components to be minimised; and the packaging design, taking future reuse or recovery into consideration. The Directive also requires MS to develop information systems (databases) with data on packaging and packaging waste, to facilitate the monitoring of progress towards the set targets.

The EU mid- to long-term waste management policy is reflected in the Waste Framework Directive<sup>4</sup> (WFD) where additional re-use and recycling targets are set for MS. These include:

- by 2015, separate collection systems should be established for at least paper, metal, plastic and glass.
- by 2020:
  - o an increase, by at least 50% by weight, of the following processes: (i) preparing for re-use; and (ii) recycling of waste materials from households and possibly from other origins, if these are similar to waste from households. Such waste streams should include at least paper, metal, plastic and glass.
  - o an increase, by at least 70% by weight, of the following processes: (i) preparing for re-use; (ii) recycling; and (iii) other material recovery, of non-hazardous construction and demolition (C&D) waste<sup>5</sup>.

Additionally, with a view to monitoring and assessing progress in the implementation of waste prevention measures, the WFD requires MS to determine appropriate specific qualitative or quantitative benchmarks.

The scope of this report is to identify and analyse initiatives directly involving LRAs in the prevention and/or management of post-consumer plastic waste. An inventory of such initiatives (Part 1), focusing on the whole life-cycle of plastic

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<sup>3</sup> As per Annex II of the Directive 94/62/EC.

<sup>4</sup> Directive 2008/98/EC on waste.

<sup>5</sup> Excluding naturally occurring material defined in category 17 05 04 in the list of waste.

waste (from prevention to appropriate treatment and re-use/recycling, including producer responsibility/cost recovery of public waste management) is used to derive a typology of plastic waste management measures implemented at local and regional level (Part 2). Based on this typology and ensuring geographical representation of MS, five projects are presented in detail (Part 3). Finally, recommendations on the findings of the analysis are drawn in Part 4, including issues related to: framework conditions for effective action by LRAs; actions deserving more attention by LRAs with regard to plastic waste prevention, life-cycle approach, re-use/recycling and producer (cost) responsibility; and aspects to be considered within the EC Green Paper on plastic waste from a local and or regional perspective, in particular for the promotion of most-advanced LRA actions.





# 1. Inventory of local and regional initiatives

## 1.1 Methodological remarks on the compilation of the inventory

A total of 37 plastic waste management initiatives were identified at the EU level. The bibliographic search was undertaken in English, French, Greek, Italian, and Spanish. The geographic breakdown of the initiatives included in the inventory is reported in Table 1.

**Table 1 – Breakdown of initiatives by country**

|                  |          |           |          |           |          |
|------------------|----------|-----------|----------|-----------|----------|
| <b>AT</b>        | <b>2</b> | <b>ES</b> | <b>3</b> | <b>MT</b> | <b>1</b> |
| <b>BE</b>        | <b>2</b> | <b>FI</b> | <b>-</b> | <b>NL</b> | <b>1</b> |
| <b>BG</b>        | <b>1</b> | <b>FR</b> | <b>2</b> | <b>PL</b> | <b>1</b> |
| <b>CY</b>        | <b>2</b> | <b>HU</b> | <b>-</b> | <b>PT</b> | <b>2</b> |
| <b>CZ</b>        | <b>2</b> | <b>IE</b> | <b>1</b> | <b>RO</b> | <b>2</b> |
| <b>DE</b>        | <b>1</b> | <b>IT</b> | <b>5</b> | <b>SE</b> | <b>-</b> |
| <b>DK</b>        | <b>1</b> | <b>LT</b> | <b>-</b> | <b>SK</b> | <b>1</b> |
| <b>EE</b>        | <b>-</b> | <b>LU</b> | <b>1</b> | <b>SL</b> | <b>-</b> |
| <b>EL</b>        | <b>3</b> | <b>LV</b> | <b>1</b> | <b>UK</b> | <b>2</b> |
| <b>Total: 37</b> |          |           |          |           |          |

The selection of initiatives was based on the following criteria:

### Representativeness

The selected initiatives address a wide range of plastic waste management issues, focusing on the following types of intervention:

- Prevention of plastic waste, such as: awareness-raising campaign promoting re-usable bags; ban on disposable plastic items, e.g. cups and plates; or change in citizens' habits/daily practices regarding consumption of plastic items.
- Treatment of plastic waste, such as: sorting of packaging waste; processing of separated plastic waste; recycling of plastic material; or energy recovery. Under this type, particular attention was given to the identification of solutions higher up in the waste hierarchy, e.g. re-use of plastic, though these cases were found to be rare (such as the trial collection of separated plastics in Amsterdam, the Netherlands, or the

plastic bottles reclaiming scheme in Chesterfield Borough Council, UK). Priority was also given to initiatives involving life-cycle considerations in the selection of appropriate treatment facilities or processes for plastic waste (e.g. the new municipal waste management facilities in Larnaca, Cyprus, which are able to achieve a recovery rate of up to 90% and allow decisions to be made on the quality of the sorted plastics, as well as on the prioritisation of material recycling, energy recovery or disposal), although these cases were also found to be rare.

- Producer responsibility/cost recovery for public waste management, such as the Green Dot or other similar collective systems for the alternative management of packaging waste.
- Combined prevention and producer responsibility initiatives, such as the voluntary agreements between the Ministry of the Environment of Luxembourg and the local non-profit packaging waste management agency.
- Combined treatment and producer responsibility initiatives, such as the Danish Agreement on the use of Polyvinyl Chloride (PVC) and the WUPPI plan to collect and sort PVC from C&D waste.

#### *Direct involvement of local and regional authorities*

Regional/local authority-led initiatives were given priority and constitute the majority of selected examples. National initiatives were also considered when clearly addressing the local/regional level and directly involving LRAs. Few records were discharged because evidence of this involvement could not be documented (e.g. introduction of a plastic bag levy in national legislation in Ireland, Belgium and other MS). However, alongside regions and municipalities, the term ‘authority’ was interpreted to encompass any public unit, structure, institution or organisation at the local or regional level, having an official and public role in local/regional administration, notably in waste management (for example Municipal Environmental/Waste Services, as well as development agencies, unions of municipalities, etc).

Geographical representation was also considered, with an effort being made to achieve a comprehensive spatial coverage across the EU. In total, initiatives from 21 countries have been included in the inventory.

## 1.2 The inventory

|                           |                                                        |
|---------------------------|--------------------------------------------------------|
| <b>AT_1</b>               | Ban on disposable tableware at public events in Vienna |
| <b>Authority</b>          | City of Vienna                                         |
| <b>Type of Initiative</b> | Prevention of plastic waste                            |

*A plastic waste prevention initiative of the city of Vienna focusing on public events.*

Following a new provision in the Vienna Waste Management Act in effect from 1 January 2011, the city of Vienna obliges public event organisers to introduce the concept of reusable tableware wherever food and/or beverages are provided. The obligation applies to events of more than 1,000 participants (or more than 500 if it takes place in venues of large capacity) taking place on property owned by the city. To facilitate the work of organisers, the city provides a template pattern for events waste plans, an information sheet on waste plans, and collection sheets for catering. Washing of reusable dishes can be done on-site with the use of mobile dishwashers. The dishes are usually provided by the caterer or through a reusable dishes and/or cups rental system.

*Sources: [okoevent website](#); [Prewaste report on Münchner Einwegverbot \(2011\)](#); [Vienna city Environmental Protection website](#)*

|                           |                                                          |
|---------------------------|----------------------------------------------------------|
| <b>AT_2</b>               | Separate collection of plastic packaging waste in Vienna |
| <b>Authority</b>          | City of Vienna                                           |
| <b>Type of Initiative</b> | Treatment of plastic waste                               |

*A separate waste collection system, well-adapted to the local context and targeting plastic packaging in the city of Vienna.*

The first Vienna plastic packaging waste separate collection system dates back to 1989. Starting from the collection of plastic film and yoghurt cartons, the scheme gradually evolved to reach its current state after a series of adjustments in the size and focus of the collection activities; since 2004, the system targets only plastic bottles and other hollow plastic containers. Small-size plastic waste is collected together with the mixed municipal waste and transferred to a thermal facility for energy recovery. The Vienna Municipal Department for Waste Management, Street Cleaning and Vehicle Fleet constantly monitors and evaluates performance, suggesting actions for further improvement. For example, with the aim of improving the use of the system by citizens, the city

recently changed the lid of the collection bins, adding a lock that prevents users from throwing in bags of residual (mixed) waste and other material that might reduce the quality of the collected fraction. Moreover, in collaboration with the recycling company ‘Altstoff Recycling Austria’, a new campaign encouraging waste separation was launched; the campaign was specifically targeted at young people by means of a recent Austrian hit single, adapted to better explain the colour-coded recycling system.

Sources: [Vienna city website](#); [FFact Management consultants 2006](#)

|                           |                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------|
| <b>BE_1</b>               | Soft plastics sorting and recycling at the Atomium renovation site                        |
| <b>Authority</b>          | Brussels Institute for Management of the Environment – IBGE-BIM (Brussels-Capital region) |
| <b>Type of Initiative</b> | Treatment of plastic waste                                                                |

*A waste sorting and recycling pilot initiative focusing on soft plastics collected from the Atomium construction site.*

The IBGE-BIM designed and implemented a pilot action for the collection, sorting and recycling of plastic waste from the C&D sector. The pilot was part of the APRICOD project, co-financed by the EC Life initiative. Collection and sorting activities took place in the Atomium renovation site, while recycling was outsourced to facilities in Germany due to the lack of relevant infrastructure in the region. Using manual collection and sorting techniques, a total of 2.16 tonnes of tarpaulins (material used in the sandblasting process) and packaging material were treated separately from other waste streams. The on-site activities were carried out without significant additional labour since soft plastics were easily recognised and sorted; likewise, recycling of soft plastic waste was relatively cheap, amounting to about half the cost of landfilling. Nevertheless, transportation costs to Germany raised the overall cost of the action to non-financially viable levels.

Sources: [APRICOD project guide \(2006\)](#); [IBGE-BIM website](#)

|                           |                                                            |
|---------------------------|------------------------------------------------------------|
| <b>BE_2</b>               | Collection of agricultural plastic films in Namur Province |
| <b>Authority</b>          | <i>Bureau Economique de la Province de Namur (BEP)</i>     |
| <b>Type of Initiative</b> | Treatment of plastic waste                                 |

*An inter-municipal waste collection initiative focusing on agricultural plastic films.*

The BEP organises an annual collection of agricultural plastic waste in the Province of Namur, in response to a regional by-law obliging retailers to take the waste back without charge, and wholesalers and importers to arrange or finance an appropriate collection mechanism. Throughout the entire Province, municipal authorities designate collection areas – usually a recycling container park, or a municipal deposit – and often provide a dedicated line for information and co-ordination purposes. The collection normally lasts one week and targets a relatively high collection rate (above 50%, in line with the provisions of the regional by-law). Agricultural plastic waste must comply with specific requirements in order to be accepted for recycling: only stretch silage films, frost-protective films and bunker silage films are suitable; they must be dry, brushed, contaminant-free (i.e. without forage, beet, barbed wired or rope) and arranged in bales not exceeding 20 kg. Residual waste is taken to energy recovery facilities. Farmers are asked to bear the cost of bringing their plastic waste to the collection sites, but no further charge is applied to them. The BEP receives a grant from the Walloon Region’s Government to cover reception (renting of the containers), transport and treatment costs (fee per tonne of waste given to the recycler). The recycler undertakes to wash and grind the waste films, before selling them on the market for recycled products. Information and promotion of the collection is undertaken through local press releases, mail notifications (usually from the municipalities involved) and dissemination of a booklet published by BEP. Since the launch of the activity in 1999, the collected quantities of plastic waste have been increasing each year to reach a total of 670 tonnes in 2010 and 707 tonnes in 2011.

Sources: [ACRR report \(2004\)](#); [BEP website](#)

|                           |                                                                             |
|---------------------------|-----------------------------------------------------------------------------|
| <b>BG_1</b>               | Public-private initiative for reducing plastic bags and the amount of waste |
| <b>Authority</b>          | Sofia Municipality                                                          |
| <b>Type of Initiative</b> | Prevention of plastic waste                                                 |

*A plastic waste prevention initiative based on waste reduction agreements between big commercial shops and Sofia municipality.*

Since 2006, Sofia municipality has signed agreements with shopping centres and big commercial shops to promote sustainable waste management practices and, in particular, to reduce the use of plastic bags, with a view to minimising both waste quantities and the overall impact on the local environment. The response of the private business has been positive. The joint public-private initiative faced the challenge of convincing people to switch to more sustainable consumer habits; the local market responded with a variety of actions such as charging a price for the use of plastic bags, replacing plastic with biodegradable bags, and introducing new packaging materials, which facilitate the recycling process.

Source: [IBGE-prewaste project \(2010\)](#)

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| <b>CY_1</b>               | Green Dot Cyprus household packaging recovery system              |
| <b>Authority</b>          | 22 Municipalities and 30 Communities in Cyprus                    |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management |

*A household packaging waste recycling/recovery system, focusing on three main waste streams: PMD (plastic bottles, metal cans and tetrapak drink packages), paper and glass.*

Green Dot (Cyprus) Public Co Ltd is a non-profit organisation aiming at organising and implementing a collective recycling system for packaging waste. The household packaging waste management system comprises collection, sorting in three streams (PMD, paper and glass), and recycling or (energy) recovery programmes, developed in co-operation with the targeted local authorities. Green Dot Cyprus implements a door-to-door collection system for the PMD stream. With the use of sub-contractors operating waste collection vehicles, PMD is transported to waste management plants to be sorted out in different fractions, before being forwarded to recyclers and the recycling market. The selected kerbside collection system requires close co-operation with the municipalities and communities involved (to ensure that

sorting at source follows appropriate specifications, local regulations forbidding citizens to throw non-recyclable materials in the designated bins, have, for example, been brought into force). Also, local authorities have the legal obligation to financially contribute to the system, to counter-balance the benefits arising from the implementation of the Green Dot recycling/recovery system, e.g. reduction of municipal waste needing disposal in landfills.

Sources: [Green Dot Cyprus website](#); [PRO Europe brochure \(2010\)](#)

|                           |                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------|
| <b>CY_2</b>               | Larnaca automatic sorting unit                                                                       |
| <b>Authority</b>          | All local authorities in Larnaca and Famagusta Districts and the Larnaca District Development Agency |
| <b>Type of Initiative</b> | Treatment of plastic waste                                                                           |

*A state of the art mixed waste mechanical sorting and processing unit, automatically separating plastics from other recyclable streams.*

Local authorities in Larnaca and Famagusta Districts together with a private waste management company (Helector S.A.) and an intermediary agency (Larnaca District Development Agency - LDDA) have engaged in a PPP for the operation of the new municipal waste management plant in Kochi. The waste management facilities feature a state of the art Mechanical Sorting and Processing Unit for mixed waste, which allows a fully automated optical separation of plastic waste from other recyclable streams. The unit is capable of automatically identifying the type and composition of waste using infrared spectrum analysis, and of sorting the separated waste into up to ten different fractions, according to their specific absorption frequencies. The facility has the technology to recover up to 90% of the plastic contained in the mixed stream. Moreover, it can sort plastic waste (as well as other waste fractions) to different quality levels. Operators are thus given the option to decide on the optimal treatment approach based on life-cycle considerations, e.g. calibrate the automatic selection so as to maximise material recovery rate (more plastic sold to the market for re-use/recycling, though at lower prices), or to maximise the quantities used for the creation of refuse-derived fuel (RDF) sold to cement factories for energy recovery (in case of market demand), etc.

Sources: [Wasman Project website](#); [LDDA-WASMAN State of the Art report \(2010\)](#)



|                           |                             |
|---------------------------|-----------------------------|
| <b>CZ_1</b>               | New Sorting Line in Jihlava |
| <b>Authority</b>          | Jihlava Municipality        |
| <b>Type of Initiative</b> | Treatment of plastic waste  |

*A waste sorting and processing project focusing on plastic and paper, jointly developed and implemented by a private company (ASA) and the Jihlava municipal services company.*

In 2010, a new sorting line started operation in Jihlava municipality. It is managed by the joint venture ASMJ s.r.o., a PPP involving the waste management company A.S.A. and the ‘Služby Města Jihlavy’ (SMJ) municipal services company. The facility receives secondary raw materials collected from local authorities, companies and external contractors, such as PET, foils, etc., as well as paper (e.g. newspapers, magazines, packaging paper, etc.) and is capable of processing at least 10,000 tons of plastic and paper annually, fully meeting the needs of the region. The collected waste is separated to different waste streams. Each fraction undergoes preliminary processing, e.g. pressing, before being forwarded to other waste treatment and recycling units in the country or abroad.

Source: [ASA website](#)

|                           |                                                                    |
|---------------------------|--------------------------------------------------------------------|
| <b>CZ_2</b>               | EKO-KOM packaging waste collection, separation and recovery system |
| <b>Authority</b>          | More than 5,900 local authorities in the Czech republic            |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management  |

*A packaging waste collection, separation and recovery scheme involving a producer responsibility company and a large number of local authorities throughout the country.*

EKO-KOM is a producer responsibility organisation dealing with packaging recovery and implementing, together with local authorities, waste management companies and recyclers, a waste collection, separation and recovery scheme. EKO-KOM is supervised by, and reports to, the Czech Ministry of the Environment. The involvement of local authorities in the scheme is regulated by the Packaging Waste Collection and Recycling Contract. By signing this contract, local authorities (or waste management companies and other recyclers) agree to implement packaging waste collection, sorting and recovery activities (either within their municipal waste management systems or as waste



management contractors) and to keep track, on an official record, of quantities of packaging waste collected and recovered. Based on the reported quantities, the financial contribution of EKO-KOM to the system (covering the cost of separate packaging waste collection/treatment services) is then calculated. Moreover, the parties to the Contract agree to run joint optimisation projects with a view to improving the system, in terms of efficiency, citizen participation and cost-saving. EKO-KOM provides additional services related to statistics, advisory support, training and research.

Sources: [EKO-KOM website](#); [PRO Europe brochure \(2010\)](#)

|                           |                                        |
|---------------------------|----------------------------------------|
| <b>DE_1</b>               | Ban on disposable cutlery and crockery |
| <b>Authority</b>          | City of Munich                         |
| <b>Type of Initiative</b> | Prevention of plastic waste            |

*An effective plastic waste prevention initiative of the city of Munich focusing on disposable cutlery and crockery.*

The city of Munich ban on disposable cutlery and crockery (plastic cups, forks and knives, paper/plastic plates) at large-scale public events dates back to 1991. The waste prevention scheme targets big events involving many thousands of people, such as the beer festival (*Oktoberfest*), the Christmas market, *Auer-Dult Faire*, and the Munich City Marathon, but also medium-scale events of 200-300 people. In the first case, participants are requested to pay a returnable deposit for the cutlery and crockery they use. Returnable bottles used for beverages are also promoted. Organisers of smaller events are offered the option to hire crockery and dishwasher services through a municipal official contractor (Mobielspiel e.V.). The initiative has achieved a significant reduction in the quantities of plastic waste generated during city events (for example, waste generated in *Oktoberfest* was reduced from 11,000 tonnes in 1990 to 550 tonnes in 1999, while waste quantities dropped by about 50% between the 1991 and 2004 events). Moreover, it has had a systemic effect, shifting citizen habits from disposal to reuse practices.

Sources: [IBGE-prewaste project \(2010\)](#); [Local Government of Munich website](#); [Oktoberfest 2011 press release](#)

|                           |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| <b>DK_1</b>               | The WUPPI Plan                                                                                 |
| <b>Authority</b>          | Over 80 municipalities in Denmark                                                              |
| <b>Type of Initiative</b> | Treatment of plastic waste - Producer responsibility/cost recovery for public waste management |

*A waste collection and recycling scheme focusing on rigid PVC in C&D waste.*

WUPPI, a recycling company established on the initiative of a group of Danish manufacturers of PVC building products, has developed in collaboration with local authorities, a collection and recycling scheme for rigid PVC in C&D waste. The scheme is in line with the agreement regarding the use of PVC in Denmark, which has been endorsed by the MoE, the Danish Employers' Confederation, the Industrial Council, the Danish Plastics Federation, and PVC-related retailers. WUPPI provides containers at designated municipal collection sites (bring points) where companies and households can dispose of their PVC waste. At municipal container parks, households and small companies can deposit their PVC waste free of charge, while a fee is applied to large companies for deposit and collection. Containers are transported and emptied in designated collection stations; their content is inspected and upon approval forwarded to sorting and treatment plants abroad (in Sweden and Germany). Approximately 75% of the Danish Municipalities have joined the scheme.

Sources: [WUPPI website](#); [Danish MoE report on PVC strategy \(1999\)](#)

|                           |                                                                    |
|---------------------------|--------------------------------------------------------------------|
| <b>EL_1</b>               | Agricultural plastic waste management                              |
| <b>Authority</b>          | Developmental of Messinia-Developmental Anonymous Company (DM-DAC) |
| <b>Type of Initiative</b> | Treatment of plastic waste                                         |

*A pilot waste collection and preliminary treatment initiative focusing on agricultural plastics and involving local authorities and farmers.*

The pilot action for the collection and baling of agricultural plastic waste (including 'black' plastic waste, such as pipes) was implemented under the framework agreement on the management of agricultural plastic waste, which has been endorsed by four municipalities (Avlonos, Gargaliani, Kyparissia and Filiatra), the local union of agricultural cooperatives and the DM-DAC. The implemented activities were in line with the 'Plan for the documentation and management of agricultural plastic waste' elaborated by the DM-DAC. The action resulted in the collection of some 350-400 tonnes of plastics from the

owners of local greenhouses and low-cover cultivations. The initiative aims to replace current unsustainable practices, such as the burning of agricultural plastic waste.

Source: [ANMESAE Local Authority website](#)

|                           |                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------|
| <b>EL_2</b>               | The Hellenic Recovery Recycling Corporation (HE.R.R.Co) blue bins network                        |
| <b>Authority</b>          | The Central Union of Municipalities in Greece (KEDE) and the majority of Greek local authorities |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management                                |

*A packaging waste recycling initiative implemented through a collaborative scheme involving a producer responsibility company and the majority of Greek municipalities.*

The blue bins network is a packaging waste recycling system focusing on plastic, paper, glass and metal cans. It was introduced in Greece by HE.R.R.Co, a producer responsibility company involving as shareholders, packaging operators and a representative of Greek municipalities (KEDE, holding 35% of the shares). The strong involvement of KEDE in the company is justified by the need for close collaboration with local authorities. For the implementation of the blue bins network initiative, the company may co-operate with municipalities in either one of the following two forms: (i) jointly, where municipalities are responsible for recyclable waste collection and final disposal, while HE.R.R.Co undertakes processing, information and management activities; and (ii) independently, with municipalities putting in place and operating their own packaging waste recycling and recovery project, and HE.R.R.Co paying them a fee calculated on the basis of the quantities of recovered materials, as certified by relevant documents. So far, more than 600 municipalities throughout Greece have joined the HE.R.R.Co blue bins network initiative.

Sources: [REPT \(2009\)](#); [HE.R.R.Co website](#); [PRO Europe brochure \(2010\)](#)

|                           |                                                                                                                                               |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EL_3</b>               | ‘Rewarding recycling’ collective system for alternative packaging waste management                                                            |
| <b>Authority</b>          | Municipalities of Athens, Thessaloniki, Piraeus, Patra and Irakleio and other Greek Local Authorities (in consortium with the private sector) |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management                                                                             |

*A small-scale packaging waste recycling initiative jointly developed by private companies and local authorities to run in parallel with waste recovery schemes of a larger size.*

The ‘rewarding recycling’ scheme is a collective waste management system involving private companies whose activity is linked with packaged goods (e.g. supermarkets, E&EE suppliers, etc.) and local authorities (municipalities of Athens, Thessaloniki, Piraeus, Patra and Irakleio). The system, approved by the Ministry of the Environment in 2008, uses high-technology equipment in an integrated application, which facilitates the collection, sorting and preliminary processing of packaging waste (plastic, metal, glass and paper), and at the same time offers an incentive to consumers to recycle. Currently, a network of collection centres (Rewarding Recycling Centres - RRCs) has been set up in strategically selected busy locations (e.g. outside supermarkets or schools, in squares or urban parks, etc.); plans for a six-year expansion to 900 collection centres have also been made. Citizens bringing plastic or other material packages to the RRCs are rewarded with an incentive, either in the form of a voucher to be used for future purchases in collaborating consumer stores or in the form of a donation to a charity.

Sources: [REPT \(2009\)](#); [Rewarding recycling system website](#)

|                           |                                                             |
|---------------------------|-------------------------------------------------------------|
| <b>ES_1</b>               | Campaign to reduce plastic bag usage - Plastic Desembólsate |
| <b>Authority</b>          | Alcalá la Real local authority                              |
| <b>Type of Initiative</b> | Prevention of plastic waste                                 |

*A plastic waste prevention campaign focusing on the reduction of the use of plastic bags in the local market of Alcalá la Real.*

In March 2008, the Council of Alcalá la Real launched a campaign to reduce the use of plastic bags, hence the volume of plastic waste ending up in landfills. The main tool used in the campaign was the distribution of plastic-free bags. The bags were made with a very resistant material, which extended their life span, allowing everyday use. The bags had a printed message, stating that ‘Every year more than half a billion plastic bags are used around the world and only 1% are recycled. The others take hundreds of years to degrade’. Together with the bags, 2,000 leaflets were handed out to the citizens of Alcalá. The leaflets bore the message: ‘Goodbye to the plastic bag’; they explained the problems associated with plastic bags and highlighted the significant damage that can be caused by plastic bags to the environment, especially to marine species and ecosystems. Moreover, an environmental show was broadcast in the local radio. The response of local citizens to the information campaign was positive; three years later, the use of recyclable bags in Alcalá has become common.

Sources: [WASMAN project website](#); [Alcalá la Real Community campaign webpage](#)

|                           |                                                                |
|---------------------------|----------------------------------------------------------------|
| <b>ES_2</b>               | AUTOREWASTE - Automatic system for selective recovery of waste |
| <b>Authority</b>          | Alcázar de San Juan Town Council                               |
| <b>Type of Initiative</b> | Treatment of plastic waste                                     |

*A demonstration initiative focusing on the introduction of automated technologies in plastic waste sorting.*

The Alcázar de San Juan Town Council co-ordinated the implementation of a demonstration project, funded under the EC Life initiative, focusing on the automatic segregation and selection of plastic waste. The project, based on the technical expertise of the participating private companies (Cespa G.R., MMP Progreso and Servitecnica Digital), developed a label containing a microchip able to store information such as the chemical composition of plastic items; by

placing the label on plastic containers, automatic sorting of plastic containers was demonstrated to be feasible and highly reliable. The project partners built a prototype automatic sorting unit for plastic waste in the municipal waste facilities of Consermancha, able to identify, separate and classify different types of plastic containers (such as PET, PVC, Polyvinyl, etc.) according to their chemical composition.

Source: [AUTOREWASTE Life project database website](#)

|                           |                                                                         |
|---------------------------|-------------------------------------------------------------------------|
| <b>ES_3</b>               | Municipal waste prevention and waste minimisation campaign in Santpedor |
| <b>Authority</b>          | Municipality of Santpedor                                               |
| <b>Type of Initiative</b> | Prevention of plastic waste                                             |

*A waste prevention information and awareness-raising campaign focusing on public events and mainly addressing plastic and paper.*

In 2008, the Municipality of Santpedor – in collaboration with the regional government of Catalonia, the waste agency of Catalonia and the Català recycling centre – launched an initiative to raise awareness and inform citizens, commercial shops and local festival organisers about waste prevention, notably plastic and paper. The campaign cost was approximately 14,000 EUR. Activities aimed at reducing waste at public events; reduction targets were set for plastic bags (10%), advertising posters (35%) and disposable cups (80%). Among the implemented actions are: practical advice to citizens on how to help avoid receiving free publicity mail; introduction of a municipal fee on advertising posters; campaign to prevent unnecessary use of plastic or carton cans and encourage the use of bottles or other packages made of glass; and encouragement of the use of reusable cups at festivals and other public events.

Sources: [Waste prevention campaign website](#); [IBGE-prewaste project \(2010\)](#)

|                           |                                                                    |
|---------------------------|--------------------------------------------------------------------|
| <b>FR_1</b>               | SYMIRIS selective plastic waste collection                         |
| <b>Authority</b>          | Syndicate of Municipalities of the Region of Rambouillet (SYMIRIS) |
| <b>Type of Initiative</b> | Treatment of plastic waste                                         |

*An initiative for the collection and treatment of plastic waste focusing on processing solutions high up in the waste hierarchy.*

Since 2000, SYMIRIS has organised the separate collection of plastic waste in 19 recycling container parks targeting households and small companies. The plastic waste can be deposited without charge; once collected, it is transferred to the SYMIRIS processing plant where it is sorted manually to facilitate treatment solutions as high up in the waste hierarchy as possible; fractions recovered correspond to the materials that can be sold to outlets, i.e. polyethylene (PE) films, rigid PE and polypropylene (PP - pieces of garden furniture, bucket, bins), pipes and windows frames. The collection rate of plastic waste is 800 tonnes per annum. About half of the collected materials are PE films. Residuals account for about 30% and mainly comprise dirty plastics and/or pieces, which include other materials e.g. material with metal inclusions (such as screws). A very small amount of PVC, both pipes and frames, is also collected (in total about 2-3 tonnes/month). PVC pipes are transferred to a processing unit in the Netherlands, for future re-use as new pipes. PVC frames undergo treatment for the removal of rubber and metallic elements, before the plastic components are recovered. PE and PP items are initially sorted and then granulated for extrusion and future use in the construction of large plastic equipment (usually furniture).

Source: [ACRR report \(2004\)](#)



|                           |                                                                        |
|---------------------------|------------------------------------------------------------------------|
| <b>FR_2</b>               | AVEYRON collection and recycling scheme for agricultural plastic films |
| <b>Authority</b>          | General Council of Aveyron                                             |
| <b>Type of Initiative</b> | Treatment of plastic waste                                             |

*A collection and recycling scheme for agricultural plastic waste, based on a joint agreement including a local authority, a private company and a local agricultural cooperative.*

The General Council of Aveyron organised, through a four-year agreement, a joint initiative with the private company SOPAVE (since 2006 affiliated to the waste management company SITA, part of the Suez environment group) and the Local Agricultural Syndicate (LAS) for the collection and recycling of agricultural plastic films. Each collaborating party has a clear role, with the Council providing funding, LAS coordinating collection and SOPAVE being responsible for transportation, processing and recycling. Collection is bi-annual and lasts two to three weeks. Farmers throw their plastic waste (mainly films) on a collection platform, which feeds into a container with compaction facilities, to reduce their volume and thus transportation costs.

Source: [ACRR report \(2004\)](#)

|                           |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| <b>FR_3</b>               | COURCON container park                                                                         |
| <b>Authority</b>          | Community of Municipalities of Courçon (CMC)                                                   |
| <b>Type of Initiative</b> | Treatment of plastic waste – Producer responsibility/cost recovery for public waste management |

*A joint initiative for the collection and recovery of Expanded Polystyrene (EPS) waste, based on voluntary collaboration between a group of local authorities and a private company.*

In 2002, CMC initiated collaboration with the private company ISOBOX Technologie (I-Tech) for the collection, processing and recycling/recovery of EPS waste. Specifically, the group of local authorities provided space in their recycling container park for I-Tech to construct a wooden shed and install a container for the collection of EPS waste. The container was donated by the association of EPS packaging companies (ECO PSE, the French branch of EUMEPS – European Manufacturers of EPS Packaging). Collection is supervised by the recycling park personnel to make sure it is clean and white in colour. Households and small companies can deposit their EPS waste free of charge. I-Tech undertakes to transport the collected plastic waste back to its



facilities for processing. It is either granulated and re-used as new packaging material or compressed and sent to the Netherlands for further processing before re-use.

Source: [ACRR report \(2004\)](#)

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|---------------------------|----------------------------------------------------------------------------------------|
| <b>IE_1</b>               | Dublin city marathon goes green                                                        |
| <b>Authority</b>          | Dublin City Council                                                                    |
| <b>Type of Initiative</b> | Treatment of waste – Producer responsibility/cost recovery for public waste management |

*An initiative for the recycling of plastic waste at major events.*

Dublin City Council (DCC) jointly organised with a producer responsibility company (REPAK) and a domestic waste collection service provider (Grayhound), the collection and recycling of waste, mainly plastic bottles and cups, produced during the Dublin city marathon event. Collection was arranged by Grayhound and DCC and included the placement of green bins at the beginning and end locations of the race; the DCC Cleansing Department placed additional bins by water stations on the route. Sorting and recycling of the collected plastic waste was implemented in collaboration with REPAK under the framework of the agreed strategy on the recycling of packaging waste, i.e. with the use of recycling service providers registered by REPAK and based on the payment by REPAK of a financial subsidy (Repak Packaging Subsidy) for the collected quantities of plastic waste. The initiative contributed to DCC's receiving the award of Local Authority of the Year 2010, at the REPAK Recycling Awards.

Sources: [REPAK website](#); [PRO Europe brochure \(2010\)](#)

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|---------------------------|------------------------------------------------|
| <b>IT_1</b>               | Fontemagna City (modern public water fountain) |
| <b>Authority</b>          | Municipality of Castelfidardo                  |
| <b>Type of Initiative</b> | Prevention of plastic waste                    |

*An innovative plastic waste prevention initiative focusing on the reduction of the use of plastic bottles for drinking water.*

In 2010, the municipality of Castelfidardo, in the Marche region, introduced the concept of Fontemagna City, which is a modern public fountain offering tap water to citizens and visitors with the aim of reducing the use of plastic bottles. The installation cost of the facility was 34,000 EUR. The fountain supplies on

average 1,600 litres of water per day, reducing the daily consumption of plastic bottles by more than 1,000. After one year of operation, the results of the initiative indicated a significant reduction in the use of plastic bottles, with savings of about 400,000 PET bottles of 1.5 litres, equivalent to about 120,000 kg of PET (30 g/bottle). The public developed a positive opinion about the initiative and at the nearby municipality of Numana citizens voted at a referendum in favour of installing a Fontemagna City. The installation faced the opposition of some traders' associations.

Source: [IBGE-prewaste project \(2010\)](#)

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|---------------------------|-----------------------------------------------------------------------------|
| <b>IT_2</b>               | Porta la sporta (Bring your bag) campaigns                                  |
| <b>Authority</b>          | 'Associazione dei Comuni Virtuosi' (Association of virtuous municipalities) |
| <b>Type of Initiative</b> | Prevention of plastic waste                                                 |

*A waste prevention initiative promoting local awareness-raising campaigns aiming at preventing the use of plastic bags.*

The 'Associazione dei Comuni Virtuosi' was set up in 2005 on the initiative of four municipalities; since then it has quickly spread out to include more than fifty local authorities throughout Italy. Local authorities joining the association are required to sign a statutory declaration, which commits them to sustainable development policies and actions, including the implementation of communication activities promoting the use of re-usable, non-plastic bags. These awareness-raising campaigns to abolish the use of plastic bags target all citizens and are organised by the municipalities with the involvement of shopping centres, supermarkets and big commercial shops. The association provides common communication tools to all members, such as a special logo.

Sources: [porta la sporta campaign website](#); [EWWR 2009 Associazione dei comuni virtuosi case study](#)

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| <b>IT_3</b>               | CO.RE.PLA agreement for collective collection of plastic waste    |
| <b>Authority</b>          | Some 6980 Italian local authorities and their associations        |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management |

*A joint initiative by producer responsibility organisation CO.RE.PLA and Italian Provinces to promote the selective collection of plastic waste.*

The producer responsibility organisation CO.RE.PLA invited Italian provinces to join forces in supporting the selective collection of plastic waste. Those authorities that agreed, committed, through an agreement with CO.RE.PLA, to: (i) encourage the engagement of public and private collectors in plastic waste sorting activities; (ii) invest in a recycling/recovery plant to process plastic packaging waste; (iii) contribute financially to the implementation of selective collection activities for plastic waste; (iv) support the CO.RE.PLA awareness-raising campaign on plastic packaging management good practices; and (v) collaborate with companies identified by CO.RE.PLA to recycle the collected plastic waste. On the other hand, CO.RE.PLA undertook to be responsible for the: (i) organisation and supervision of the transfer of the collected plastic waste to selected regional recyclers; (ii) running of awareness-raising and information campaigns on the market and post-market use of plastic packaging, targeting all stakeholders across the value chain, i.e. producers, users and consumers; (iii) provision of training to the staff of public and private collection companies; and (iv) encouragement of separate collection of plastic waste in the private sector, through the organisation of awards for enterprises achieving the best results in either selective collection or recycling of packaging (e.g. the ‘Ecological enterprise’ awards, the ‘Waste: Reduction and Recycle’ awards, etc.).

*Sources: [ACRR report \(2004\)](#); [CO.RE.PLA website](#); [CO.RE.PLA presentation \(2008\)](#); [PRO Europe brochure \(2010\)](#)*

|                           |                                     |
|---------------------------|-------------------------------------|
| <b>IT_4</b>               | Fair Hotel reducing packaging waste |
| <b>Authority</b>          | Piemonte Region                     |
| <b>Type of Initiative</b> | Prevention of plastic waste         |

*An initiative for the prevention of plastic waste from reduced packaging within the hotel business.*

In 2006, the Piemonte Region in co-operation with the Municipality of Acqui Terme and the local Health Authorities, launched an initiative targeting 4,032 hotels in the Acqui Terme area, with a view to reducing packaging waste production. The Fair Hotel initiative involved the monitoring of waste production during ‘business as usual’ activities at local hotels and the identification and promotion of 12 good practices for reducing packaging waste. The action had a total cost of 39,000 EUR and resulted in an annual reduction of plastic waste by 210 kg.

Sources: [IBGE-prewaste project \(2010\)](#)

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|---------------------------|-----------------------------------------|
| <b>IT_5</b>               | Self service detergents in large retail |
| <b>Authority</b>          | Piemonte Region                         |
| <b>Type of Initiative</b> | Prevention of plastic waste             |

*An innovative waste prevention initiative focusing on plastic bottles.*

In 2006, the Piemonte Region, together with large retail chains and detergent manufacturers, launched an initiative to change consumer behaviour with regard to packaging of goods. The initiative involved the creation of a series of products sold to consumers unpacked. Buyers are provided with a container for the detergents only at their first buy; afterwards they are encouraged to bring their containers along and fill them in using special machines installed inside the stores. The action targeted 4,200,000 people and encouraged the re-use of detergent containers, thus preventing the creation of plastic waste. As a result of the initiative, 60% of the detergent sold in collaborating stores is purchased by means of a re-used bottle. The initiative was allocated 357,000 EUR but since 2009 it is no longer dependent upon regional funding. Among the problems faced were the monitoring of the use of detergents and of the empty bottles, as well as the cleaning of the machines. Success factors included the positive co-operation of the staff working in the stores, and the focus on large retailers with volumes ensuring amortisation of the dispensing machines cost within a short period of time. Sources: [IBGE-prewaste project \(2010\)](#)

|                           |                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------|
| <b>LU_1</b>               | Voluntary agreement to promote reusable shopping bags                                           |
| <b>Authority</b>          | Ministry of the Environment                                                                     |
| <b>Type of Initiative</b> | Prevention of plastic waste - Producer responsibility/cost recovery for public waste management |

*A waste prevention initiative focusing on plastic bags, jointly planned and implemented by a producer responsibility company and the Luxembourg environmental administration.*

The Luxemburg's Ministry of the Environment and Valorlux, a non-profit producer responsibility company focusing on packaging waste, have signed a series of voluntary agreements on the prevention of packaging waste, specifically aiming at the introduction of reusable bags. The first two agreements had a two-year duration and were followed by a four-year accord, running up to 2012; in total, the agreements covered consecutive periods from 2004, and until 2008 promoted the use on the local market of about 600,000 recyclable bags ('eco-sacs'). The bags can be purchased in local supermarkets and food stores. The initiative targets a market share of re-usable bags of at least 51%; promotional campaigns are foreseen to reach the target.

Sources: [IBGE-prewaste project \(2010\)](#); [Ministry of the Environment of Luxembourg-Valorlux Environmental Accord 2008-2012](#)

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| <b>LV_1</b>               | Latvijas Zaļais punkts (LZP) packaging waste recycling system     |
| <b>Authority</b>          | Various local authorities                                         |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management |

*A collaborative packaging waste recycling initiative involving multiple agreements between a producer responsibility company and local authorities.*

The packaging waste recycling system of LZP is based on a series of agreements with local authorities regulating the collection, sorting and recycling practices that are implemented in each administrative territory, in line with a multi-annual action plan approved by the national competent authority, the Latvian Environmental Protection Fund. Separate collection systems are developed in each local administration, on the basis of the operational capacity and the waste management system of the local authority concerned. More specifically, each local authority indicates to LZP the waste management company(ies) selected to carry out the waste collection task and LZP signs partnership agreements with this/those company(ies) for the separate selection

of packaging waste. Collected recyclables are transported abroad for further processing. The multiple party collaboration model applied by LZP secures the support and commitment of the local authorities involved as well as better control over contracted waste management companies and recyclers. The collection process is co-funded by LZP. Additionally, LZP organises public awareness-raising campaigns together with local authorities.

Sources: [LZP website](#); [PRO Europe brochure \(2010\)](#)

|                           |                                          |
|---------------------------|------------------------------------------|
| <b>MT_1</b>               | Bring-In Sites                           |
| <b>Authority</b>          | Various local councils in Malta and Gozo |
| <b>Type of Initiative</b> | Treatment of plastic waste               |

*A waste collection and separation initiative focusing on dry recyclable waste and involving local authorities and a waste management company.*

WasteServ Malta Ltd, a waste management company operating in Malta, developed a system for the collection of dry recyclable waste together with local councils from the islands of Malta and Gozo. The Bring-In Sites initiative was launched in 2003. It comprises a network of waste collection sites with four containers in different colours: blue for plastic, white for paper, brown for glass and black for metal. A separate collection scheme is applied to transfer the recyclables to Sant'Antnin Waste Treatment Plant for further processing (hand sorting) before being sent for recycling to specialised facilities in Malta and abroad. Since the beginning of the initiative, the number of Bring-In Sites has substantially increased, reaching 226 locations at the end of 2008; a target has been set to reach 400 sites with the support of EU Structural Funds. The collected quantities of plastic waste at the Bring-In Sites exceeded 500 tonnes in 2007.

Sources: [REPT \(2009\)](#); [WasteServ Malta website](#); [IBGE-prewaste project \(2010\)](#)

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|---------------------------|----------------------------------------|
| <b>NL_1</b>               | Trial collection of separated plastics |
| <b>Authority</b>          | City of Amsterdam                      |
| <b>Type of Initiative</b> | Treatment of plastic waste             |

*A pilot initiative for the collection and separation of plastic waste, organised by a local authority with a view to determining the most effective plastic waste recycling practice.*

In 2010, the city of Amsterdam organised a 1-year pilot initiative for the separate collection of plastic waste in selected districts (Centre, West, East, and New-West districts). The project focused on the collection of plastic bottles, tubes and bags, as well as of various types of plastic containers. The pilot intended to estimate the quantities of plastic waste that are feasible to be collected from the streets of Amsterdam, as well as to get feedback on the most effective collection and separation practice. Several approaches were used for collection, including the use of containers at street level, of underground containers capable of compressing the waste, and of traditional house-to-house collection using bags. The city collaborated with Nedvang, a producer responsibility foundation contributing financially to the separate collection and recycling process. The collected recyclables were processed in waste treatment facilities with a view to recovering plastic as a raw material to be re-used as packaging or in new products (e.g. dashboards, tennis balls, fleece tops, etc.). An information campaign targeting Amsterdam residents was organised by the city prior to the launch of the initiative.

Sources: [City of Amsterdam website](#); [Plastic heroes \(Foundation Nedvang\) website](#)

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| <b>PL_1</b>               | REKOPOL selective collection system                               |
| <b>Authority</b>          | 165 municipalities in Poland                                      |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management |

*A selective packaging waste collection system jointly developed by a producer responsibility recycling/recovery organisation (REKOPOL) and 165 Polish municipalities.*

Rekopol Recovery Organisation S.A. (REKOPOL), a producer responsibility company, has developed a packaging waste selective collection system involving 165 Polish municipalities and four inter-municipality associations. The system provides for the signing of co-operation agreements between REKOPOL, local authorities, and public utility services; these agreements



specify the role of each partner and regulate the provision of financial and other input. More specifically, local authorities are responsible, by law, for carrying out selective collection of packaging waste in their territory, while REKOPOL undertakes to support them in this process through: (i) the provision of advisory services on the development of the selective collection system in each administrative area; (ii) the provision of advice on waste recycling issues, including on the potential of selling the recyclable materials on the market; (iii) educational and awareness-raising activities targeting citizens; and (iv) co-financing of the system, providing a fee per tonne of recyclable material that is collected and preliminarily processed for recycling (the fee varies according to the type of waste and market prices of materials). Local authorities use containers and/or bags to collect plastic waste, mainly PET and other bottles and containers, films and bags. The collected plastic waste is sorted into individual fractions and compressed before being forwarded to treatment facilities for further processing and recycling/recovery.

Sources: [REKOPOL website](#); [Senzimir Foundation \(2011\)](#); [PRO Europe brochure \(2010\)](#)

|                           |                                                                                                                                                        |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PT_1</b>               | Development of plastic waste collection schemes at construction sites in Porto Metropolitan area                                                       |
| <b>Authority</b>          | LIPOR - <i>Serviço intermunicipalizado de gestão de resíduos do grande Porto</i> (Inter-municipal waste management service of Porto Metropolitan Area) |
| <b>Type of Initiative</b> | Treatment of plastic waste                                                                                                                             |

*A local authority-led waste collection and recycling pilot initiative, focusing on plastics collected from construction sites.*

LIPOR, an inter-municipal waste management service company, developed and implemented a scenario-based pilot action for the collection, sorting and recycling of plastic waste from the C&D sector. The pilot was part of the APRICOD project, co-financed by the EC Life initiative and tested three alternative plastic waste scenarios as regards the type of collection practice applied: (i) supervised use of drop-off sites (with 30m<sup>3</sup> boxes) by companies without charge; (ii) supervised on-site use of big bags (of 2m<sup>3</sup>) by a preselected group of companies, with appropriate arrangements made between LIPOR and the companies, prior to the collection of the filled bags; (iii) supervised on-site use of boxes (of 15 or 30m<sup>3</sup>) by a preselected group of companies. The collected plastic waste was transferred by LIPOR to its sorting centre and separated into three fractions: packaging plastic waste, non-packaging plastic waste and residuals (contaminants). Supervision of the depositing/collection



process by LIPOR included an evaluation of the quality of the plastic waste, mainly in terms of contamination level. The pilot showed that it is feasible to compensate the high collection, transportation, sorting and quality assurance costs of the approach with the revenues accrued from recycling.

Sources: [APRICOD project guide \(2006\)](#); [LIPOR website](#)

|                           |                                                                                                                                                        |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PT_2</b>               | ECOFONE                                                                                                                                                |
| <b>Authority</b>          | LIPOR - <i>Serviço intermunicipalizado de gestão de resíduos do grande Porto</i> (Inter-municipal waste management service of Porto Metropolitan Area) |
| <b>Type of Initiative</b> | Treatment of plastic waste                                                                                                                             |

*A waste collection and recycling service focusing on plastic, paper, glass and metal.*

In 2000, LIPOR launched an appointment-based recyclable waste collection service, using a dedicated telephone line (Ecofone). The initiative targets four different waste streams: plastic, paper, glass and metal. Beginning with households and small retailers, the system was soon expanded to schools. Collection is carried out by LIPOR staff, following a daily waste collection schedule (excluding Sundays). Different coloured bags are provided by LIPOR for each waste stream to facilitate separation at the sorting plant. The Ecofone service is provided free of charge. The collected materials are processed and baled at LIPOR's sorting plant, before being forwarded to the market for sale. Each month, about 9 tonnes of good quality plastic waste (about 40% PET bottles and 60% PE films) are collected through approximately 2,000 collections. LIPOR runs a communication campaign in collaboration with the Portuguese Green Dot Society that contributes some 50% of the campaign costs. In 2010, 10 years after its launch, the project collected some 2,600 tons of recyclable waste, with some 2,200 clients frequently using the service.

Sources: [ACRR report \(2004\)](#); [LIPOR press release for the 10<sup>th</sup> anniversary of ECOFONE](#)

|                           |                                                  |
|---------------------------|--------------------------------------------------|
| <b>RO_1</b>               | Separate waste collection system in Piatra Neamt |
| <b>Authority</b>          | Piatra Neamt municipality                        |
| <b>Type of Initiative</b> | Treatment of plastic waste                       |

*A separate waste collection initiative operating on the basis of a PPP involving a local authority and a waste management company.*

Piatra Neamt municipality, in collaboration with a private waste management company (SC Bratner Servicii Ecologice SA), operates an integrated system for the separate collection and recycling of waste, targeting four waste streams: plastic and glass; paper and cardboard; organic waste; and residual waste. The initiative has been co-financed by ERDF (2000-2006) and is the follow-up of a previous pilot project, co-financed by the Danish Environmental Protection Agency and Piatra Neamt municipality and focusing on awareness-raising on selective waste collection, waste prevention and recycling. A network of 943 collection points has been established, each comprising different coloured containers of 660 litres. In total, 1,102 containers are used for the collection of plastic and glass waste. The collection points have been designed to serve the needs of about 40 apartments. Different service fees are applied to households (0.69 EUR per person per month) and companies (7.14 EUR per m<sup>3</sup> of separately collected waste) for the collection of waste. The system is considered successful with a service fee collection rate for households of about 90%.

Sources: [IBGE-prewaste project \(2010\)](#); [BALKANWASTE project Romania report \(2010\)](#)

|                           |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| <b>RO_2</b>               | BACAU selective waste collection                                                               |
| <b>Authority</b>          | Bacau municipality                                                                             |
| <b>Type of Initiative</b> | Treatment of plastic waste – Producer responsibility/cost recovery for public waste management |

*A selective waste collection initiative implemented through a PPP involving a local authority, a producer responsibility company, and a waste management company*

BACAU, a PPP involving Bacau municipality, the waste management company SC SOMA and the producer responsibility company Eco-Rom Ambalaje, designed and implemented a selective packaging waste collection system targeting a pilot area of approximately 11,000 citizens (about 3,000 apartments). The system is based on a kerbside collection scheme, using a set of containers (of 1.1m<sup>3</sup>) and bins (of 240 litres) facilitating the separate

collection of three waste streams: plastic, paper/cardboard and glass. The collected waste is transported by compacting trucks. An awareness-raising campaign based on the use of posters and the dissemination of leaflets has been conducted and some 54% of the population has responded positively to the scheme. Within the system, the municipality provides public space for the collection sites as well as sanitation services to keep streets and public spaces clean; the waste management operator undertakes separate waste collection, transportation and recycling, as well as the supply of related equipment (bins and containers); and Eco-Rom Ambalaje provides funding for the required infrastructure for separate collection (containers), as well as support in the design and implementation of communication and information campaigns. The municipality collects a sanitation fee from local citizens/beneficiaries and pays the operator on a monthly basis for the waste management services provided.

Sources: [Eco-Rom Ambalaje website](#); [BALKANWASTE project Romania report \(2010\)](#)

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| <b>SK_1</b>               | ENVIPAK separate waste collection                                 |
| <b>Authority</b>          | More than 400 municipalities                                      |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management |

*A simple model of separate waste collection focusing on packaging waste, jointly implemented by a producer responsibility company and local authorities.*

ENVI-PAK, a producer responsibility company involved in packaging waste, runs a joint initiative with local authorities to establish separate packaging waste collection systems throughout Slovakia. A co-operation contract, signed by ENVIPAK and the local authorities involved in each system, regulates the input and tasks allocated to each party; by the end of 2010, ENVIPAK had officially established collaboration with more than 400 municipalities. The co-operation contract aims that the municipality: (i) receives advisory services by ENVIPAK on the design of a separate packaging waste collection system adapted to local conditions; and (ii) undertakes to implement such a system, either by its own means or by using a contractor (waste management company). ENVIPAK agrees to provide: (i) direct financial support to municipalities to cover all expenses accrued from the separate collection and subsequent recycling of packaging waste (based on actual expenses made); (ii) professional advice in separate waste collection, based on relevant international experience; and (iii) support in organising awareness-raising and educational campaigns to promote local participation in the system.

Sources: [ENVIPAK website](#); [PRO Europe brochure \(2010\)](#)

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| <b>UK_1</b>               | Reclaiming plastic bottles in Chesterfield                        |
| <b>Authority</b>          | Chesterfield Borough Council                                      |
| <b>Type of Initiative</b> | Producer responsibility/cost recovery for public waste management |

*A bring-in scheme for the collection of plastic bottles and cans for recycling, involving a local authority and a recycling charity ('Sheffield Reclaim').*

As part of its multi-material recycling activities, Chesterfield Borough Council (CBC) runs an initiative to separately collect, sort and recycle plastic bottles and cans. CBC has created a network of 80 bring-in sites of two sizes: 'main' sites, which are located outside supermarkets and public car parks and have large containers suitable for depositing several different recyclable materials; and 'mini' sites, located inside resident areas and with small containers. A mixed waste stream of plastic bottles and cans is collected in designated containers situated in a network of 24 main bring-in sites. Collection of the plastic waste from the containers is carried out by 'Sheffield Reclaim', a recycling charity providing employment opportunities to people with learning difficulties or other disabilities. The collected waste is transferred to a sorting plant for the removal of steel cans and the manual separation of plastic items. The sorted plastic waste is then baled mixed and sold to recycling companies. Further sorting into more fractions is expected to be made possible in the near future, following the installation of a new manual sorting line. Revenues accrued from the recycling activities go to the charity. The separate plastic waste collection and recycling system is reported to be well appreciated by local residents and visitors.

Sources: [RECOUP website](#); [Chesterfield Borough Council website](#)

|                           |                                                                                 |
|---------------------------|---------------------------------------------------------------------------------|
| <b>UK_2</b>               | Plastic bottles mixed 'kerbside' and 'bring-in' collection and recycling scheme |
| <b>Authority</b>          | Kirklees Metropolitan Council                                                   |
| <b>Type of Initiative</b> | Treatment of plastic waste                                                      |

*Plastic bottles mixed kerbside and bring-in collection schemes run by a local authority using in-house resources.*

Kirklees Metropolitan Council (KMC) has organised a plastic bottle collection scheme serving more than 170,000 households; the system uses both bring-in and kerbside facilities. Recycling skips placed in a network of five bring-in

sites are used for the collection of plastic bottles; the sites are located throughout the district, at household waste and recycling centres. In addition, a refuse collection vehicle collects and compacts recyclables from the kerbside. The plastic waste collected from both schemes is transferred to a Materials Recycling facility run by a private waste management company for manual sorting and baling as mixed bottles, before being sold to the recycling market. KMC runs several information campaigns about its plastic waste collection schemes, including: the distribution to all households of an annual collection planner containing information about the kerbside scheme; the delivery to all households of a quarterly newsletter with information about the performance of the schemes; occasional bus adverts; and door-to-door campaigns.

Sources: [RECOUP website](#); [Recycle for Kirklees website](#); [Kirklees Council website](#)



## 2. Typology

### 2.1 Typology of initiatives directly involving LRAs in tackling plastic waste

The initiatives included in the inventory in Part 1 are categorised according to the *level of involvement of LRAs* in activities related to the management of plastic waste (overarching categorisation criterion). The following levels of involvement are identified:

- initiatives where LRAs take full responsibility for implementation and funding;
- outsourced initiatives; and
- collaborative schemes:
  - organisation/design and implementation is jointly undertaken by LRAs and producer responsibility organisations, waste management companies or other stakeholders;
  - organisation/design is undertaken by a producer responsibility organisation while implementation is jointly shared by the producer responsibility organisation and LRAs.

A more detailed typology is developed by considering two additional criteria:

- (i) The *financing scheme* applied, with either: (a) a single financing source (e.g. own funds, national funds); or (b) a multi-part co-financing mechanism, such as a PPP or shared public co-financing (own funds coupled with direct co-financing by another administrative level and/or co-financing through Structural Funds).
- (ii) The *type of intervention*, in terms of complexity of objectives and approach. Two sub-categories are identified: (a) integrated actions including a combination of awareness-raising/information, collection, sorting, and recycling/recovery; and (b) actions targeting a single process, e.g. information campaigns, collection schemes.

The overarching criterion (level of involvement of LRAs) categorises the initiatives included in the inventory according to four main types (A-D), as described below. Within each type of initiative, sub-categories are created by

considering the ‘financing scheme’ and ‘type of intervention’ criteria, as outlined below.

- A. Initiatives organised and implemented by LRAs using their own resources, in terms of both human (expertise) and financial (single financing source) capital. These can be either integrated actions (usually combining the first two stages of the recycling system, i.e. information campaigns with separate collection schemes) or actions targeting a single waste management process. Typical examples of such initiatives are plastic waste prevention activities and separate collection/sorting schemes (usually involving bring-in and/or kerbside collection systems).
- B. Initiatives jointly organised and implemented by LRAs and waste management companies, through PPPs. The funding scheme applied is complex (multi-part), usually involving direct co-financing by another administrative level together with co-financing through Structural Funds, as well as contributions from the private sector. This category includes both integrated actions and actions targeting a single process, usually waste sorting (including pre-processing). Typical examples of such initiatives are the construction and operation of plastic waste sorting/recycling facilities, and actions in which the LRA involved is responsible for collection, sorting and preliminary treatment, while the waste management company is responsible for recycling and/or recovery activities.
- C. Initiatives designed by a producer responsibility company and implemented jointly with LRAs. Such initiatives are based on a multi-part co-financing mechanism, and usually include a shared responsibility agreement, with both parties financing the recycling scheme and running awareness-raising/information campaigns, LRAs carrying out collection and sorting processes, and the producer responsibility company providing advice and market links facilitating recycling/recovery of the collected material. This category includes integrated actions.
- D. Initiatives in which the LRAs involved use mainly outsourcing in the implementation of the plastic waste collection/treatment/recycling activities. Funding can be either through own sources (single type) or with co-financing by producer responsibility companies (multi-part type). This type includes mainly actions targeting a single process, though in some cases even integrated actions are outsourced. Such initiatives usually involve a prevention campaign outsourced to a communication company, or a separate waste collection/sorting/recycling collaboration agreement



with a producer responsibility company, in which the involvement of LRAs is limited to co-financing only.

The proposed typology is summarised in Table 1.

**Table 1 – Proposed typology**

|               | <b>Level of involvement of LRAs</b> | <b>Financing scheme</b>                                  | <b>Type of intervention</b>                         |
|---------------|-------------------------------------|----------------------------------------------------------|-----------------------------------------------------|
| <b>TYPE A</b> | FULL RESPONSIBILITY                 | SINGLE FINANCING SOURCE                                  | INTEGRATED ACTION<br>or<br>ACTION on SINGLE PROCESS |
| <b>TYPE B</b> | COLLABORATIVE                       | MULTI-PART CO-FINANCING                                  | INTEGRATED ACTION<br>or<br>ACTION on SINGLE PROCESS |
| <b>TYPE C</b> | COLLABORATIVE                       | MULTI-PART CO-FINANCING                                  | INTEGRATED ACTION                                   |
| <b>TYPE D</b> | OUTSOURCING                         | SINGLE FINANCING SOURCE<br>or<br>MULTI-PART CO-FINANCING | INTEGRATED ACTION<br>or<br>ACTION on SINGLE PROCESS |

## 2.2 Selection of initiatives for a detailed description

Five of the initiatives included in the inventory under Part 1 are described in more detail in Part 3 of the report, with the intention of providing a deeper analysis of stakeholders involved, implementation procedures, practical difficulties faced and costs, as well as other relevant aspects such as the results of evaluations or plans for follow-up action, when available.

The selection of the case studies is based on: (i) the comprehensive coverage of the outlined types (A, B, C and D) and (ii) a balanced geographical representation of LRAs.

The following initiatives were selected for further analysis:

1. CY\_2: Larnaca automatic sorting unit (Type B)
2. EL\_2: The Hellenic Recovery Recycling Corporation (HE.R.R.Co) blue bins network (Type C)
3. NL\_1: City of Amsterdam trial collection of separated plastics (Type A)
4. RO\_1: Separate waste collection system in Piatra Neamt (Type D); and

5. DE\_1: Ban on disposable cutlery and crockery in Munich (Type A).

## 3. Case Studies

### 3.1 Larnaca automatic sorting unit (Cyprus)

#### 3.1.1 Background

Plastic waste management in Cyprus is governed by Law 215(I) 2002 regarding Solid and Hazardous Waste, and Law 48 (I) /2006<sup>6</sup> on recycling of packaging and packaging waste. It is based on the country's Strategic Framework on waste management, with a planning horizon of 2020, and aims at establishing integrated and sustainable management plans for each and every waste stream, upgrading solid waste management procedures, and ensuring the protection of the environment and public health. The Framework places emphasis on prevention, re-use and recycling of waste, and foresees the construction of Residual Waste Sanitary Landfill Sites (RWSLS) to address the needs of all Cypriot administrative districts, including the Larnaca – Famagusta districts.

The construction of waste management facilities in Larnaca<sup>7</sup> – comprising a RWSLS, a mechanical treatment and sorting unit, a composting unit, and a Material Recovery Facility (MRF) – began in 2005, with co-financing provided by the EC (Cohesion Fund), the Government of Cyprus (National Funds) and the construction company and waste operator Helector S.A. (private funds). The pilot operation of the facilities started at the beginning of April 2010.

As regards the baseline situation prior to the operation of the Larnaca automatic sorting unit, the share of plastics in municipal waste was about 13% and the average national recovery rate for plastics (as a percentage of total waste produced) was only 0.40%, corresponding to approximately 2.4 tonnes of plastic waste recovered per year. In general, approximately 87% of the produced waste was transported to landfills (Cyprus Statistical Service, 2007).

#### 3.1.2 Synopsis

- ▶▶ The construction of the mixed waste mechanical sorting and processing unit, automatically separating plastics from other recyclable streams, is part of an integrated waste management project implemented in line with Cyprus' Strategic Framework on waste management.

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<sup>6</sup> Modification Law about packaging and packaging waste – harmonisation with the Directive [94/62/EC](#) as amended by Directives [2004/12/EC](#) and [2005/20/EC](#), and Regulations (EC) No [219/2009](#) and (EC) No 1882/2003

<sup>7</sup> Serving both Larnaca and Famagusta Districts

- ▶▶ The unit contributed to reaching the set objectives related to the national recycling target for plastic (also for packaging waste) and to the requirements of the local authorities in terms of the recovery rate of plastic. The operation of the unit is so far successful and from the first year of its functioning has addressed the needs of all local authorities involved.
- ▶▶ Main achievements include the processing of 95,000 tonnes of mixed waste during the first year of operation and the recovery of approximately 39.2% in the winter and 58.5% in the summer of plastics included in the mixed municipal waste.
- ▶▶ The Larnaca sorting unit is an example of a jointly organised and implemented initiative involving an LRA, a waste management company, and an intermediary agency. Its success is due to the long-term multi-level planning of actions, the high level political support, the involvement of the private sector at an early stage of implementation with clear specifications and terms of collaboration, and the use of an intermediary agency to coordinate and support the involvement of local authorities as well as to control the performance of the private operator.

### **3.1.3 Stakeholders involved**

The main stakeholders involved in the operation of the Larnaca waste management facilities are the municipalities and communities of Larnaca and Famagusta districts, the Larnaca District Development Agency (LDDA), and the private operator Helector S.A. The allocation of responsibilities among the three groups of actors is governed by a BOT type of PPP. More precisely:

- (i) Local authorities are responsible by law for the collection, transportation and disposal of municipal solid waste; they own the rights of the collected waste and supervise the operation of the automatic sorting unit through a commission constituted by representatives of the municipalities and communities involved. In addition, they pay a monthly fee to the operator of the waste management facilities, according to the quantities of collected waste.
- (ii) LDDA is responsible for the financial administration of the system, i.e. monitoring of accounts and collection of fees from municipalities.
- (iii) Helector S.A handled the construction of the facilities and is responsible for a 10-year operation and the daily management of the system. This includes the management and exploitation of the recovered materials; in fact, any potential gain from the selling of

recovered materials is received by Helector S.A. on top of the monthly fees collected by the local authorities.

The Ministry of Interior is responsible, together with local authorities, for the overall design of the municipal solid waste collection and treatment system, including the selection of the appropriate waste management infrastructure.

### **3.1.4 Description of the initiative**

#### *Objectives and implementation procedures*

The automated sorting unit was constructed with a view to facilitating the attainment of the national recycling target for plastic, i.e. 22.5% by weight by the end of 2012. It has the capacity to receive 160,000 tons of mixed municipal waste per year, thus in full operation is expected to handle about 25% of the waste produced in Cyprus. According to the waste plant operation agreement, the unit is required to recover at least 45% by weight of plastic included in the mixed municipal waste.

The unit is equipped with a fully automated optical recognition system, capable of identifying the type and composition of waste using infrared spectrum analysis, and of sorting the separated waste into up to ten different fractions, according to their specific absorption frequencies (spectrum signatures). The separation is done through optical splitters of near infrared range; the spectrum of the waste is recorded by passing a beam of infrared light through the mixed municipal waste coming in the unit.

As soon as the mixed municipal waste comes into the reception area of the unit, it undergoes mechanical separation based on its size and weight. The light fraction includes mainly low density (LD) PE such as plastic bags, PVC foils, and pieces of rubber, as well as paper, cardboard, and pieces of fabric. The heavier fraction includes (as regards plastic waste) high density (HD) PE and PP, and PET. Both fractions are led into the optical separation unit. The non-separated part of the light fraction is processed as refuse-derived fuel (RDF), while the residual of the heavy fraction ends up in the sanitary landfill.

The unit can sort plastic waste (as well as other waste fractions) to different quality levels, according to the calibration of the optical separators. Hand separation is minimised but not eliminated: it is used as a countermeasure to

specific sorting problems, such as those linked with black bags, which cannot be detected by the automatic separator<sup>8</sup>.

LDDA and local authorities actively support the operation of the facilities through policy initiatives, such as those of the Interreg IV C Wasman project, foreseeing, among other things, the organisation of a series of information and awareness-raising actions targeting the Chamber of Commerce and Industry and the Importers, Retailers and Transporters of E&EE and Packaging, with a view to gradually phasing out the sale of black plastic bags on the national market.

### *Results*

In the first year of operation of the unit, a total of 95,000 tonnes of mixed municipal waste was processed; this figure is expected to increase to above 115,000 tonnes in 2012. As regards plastic waste, the performance of the automated sorting unit is summarised in Table 3.1. Taking into account the average share of plastics in mixed municipal waste (about 13%), the recovery of plastic material included in the mixed municipal waste reaches approximately 39.2% in the winter and 58.5% in the summer<sup>9</sup>. These percentages are expected to increase through time, as more experience is gained in the operation of the unit.

**Table 3.1 – Larnaca automated sorting unit performance indicators for plastic waste**

| <b>Waste Stream</b>  | <b>Recovery Rate<br/>(% of mixed incoming<br/>waste)</b> | <b>Market<br/>Price €/ton</b> | <b>Season</b>               |
|----------------------|----------------------------------------------------------|-------------------------------|-----------------------------|
| <b>LDPE</b>          | 3.5 – 4.5                                                | 0-50                          | <i>All year</i>             |
| <b>PET</b>           | 0.9 – 1.2                                                | 300 - 430                     | <i>November –<br/>April</i> |
|                      | 1.8 – 2.0                                                |                               | <i>May – October</i>        |
| <b>HDPE – PP</b>     | 0.7 – 0.9                                                | 150 – 250                     | <i>November –<br/>April</i> |
|                      | 0.9 – 1.1                                                |                               | <i>May – October</i>        |
| <b>Total Plastic</b> | <b>&gt;5.1 – &lt;7.6</b>                                 | N/A                           | N/A                         |

Source: Helector S.A. (2011)<sup>10</sup>

<sup>8</sup> The colour black absorbs all frequencies of the infrared beam, hence black bags become mixed with other recyclable streams.

<sup>9</sup> Not counting RDF used for energy recovery.

<sup>10</sup> Interview with the Larnaca waste facilities production manager, Mr Saravelakis.

## *Costs*

The construction cost of the Larnaca waste management facilities, including the RWSLS, was over 66 million EUR; it was co-financed by the Cohesion Fund (approx. 30.8 million EUR), national resources (approx. 10.4 million EUR) and Helector S.A. (22 million EUR). Operational costs for a 10-year period are estimated to be approximately 100 million EUR.

Operational costs are covered by a service charge paid out on a monthly basis by each local authority, as well as by the income generated from the selling of recovered materials. The service charge varies according to the quantities of waste produced; indicatively, on May 2010 it was 74.59 EUR per ton of waste (tax and financial administration costs included). On the other hand, service charges set the basis upon which each local council decides on the amount of tax to be paid by the households for Municipal Solid Waste Management (MSWM)<sup>11</sup>, usually ranging from 200 EUR to 250 EUR per year, for a total annual collection amount of approximately 12-15 million EUR.

### **3.1.5 Analysis**

#### *Assessment of achievements*

The operation of the unit is successful so far as proven by the performance indicators presented in Table 3.1. The objectives of the initiative related with the recovery rate of packaging and plastic waste have been achieved and in some cases exceeded. Regardless of the seasonal variations, the contribution of the sorting unit to the national recycling target for plastic, as well as for packaging waste, is far beyond the unit's proportional share; in fact, considering that the unit processes about 25% of the total waste produced in Cyprus, the amount of plastic recovered during the summer season counts for more than half of the quantity required to reach the national target. Moreover, the operation of the unit is on average in line with the plant agreement, as regards the plastic recovery target. The unit fully addresses the requirements of the local authorities in terms of total waste quantities sorted and processed.

The unit operators have managed to sort out different qualities of plastic waste by appropriately calibrating the automatic selection, and have thus facilitated the making of decisions on the optimal treatment approach. As experience in the operation of the unit grows, such decisions will be able to include life-cycle and market considerations; as an example, the unit could maximise the recovery of high quality plastics, appropriate for the manufacturing of new plastic products

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<sup>11</sup> Including collection, transportation, treatment and disposal costs.

(in line with the revised WFD), or maximise the creation of RDF, sold to cement factories for energy recovery, in case of market demand.

### *Success factors and lessons learnt*

Key to the success of the Larnaca sorting unit has been the **long-term multi-level planning of actions**, involving EC funding and policy framing, central government strategic planning on waste management, local authority management and local implementation. The design and construction of the facilities has been a long-term process, a great part of which was devoted to licensing procedures and **local consultations**. In this context, equally important at the governance level has been the **high political support**, especially with regard to the councils of the local authorities in Larnaca and Famagusta districts.

Given the technical complexity of the facilities and the highly specialised expertise required for the success of the design and operation of the automated sorting unit, a crucial success factor at the implementation level has been the **early involvement of the private sector**. Moreover, with the support of the central government administration, a set of **clear specifications and terms of collaboration** contributed to a win-win agreement among actors and the development of a successful PPP.

In addition, the **use of an intermediary agency** to coordinate and support the involvement of local authorities, as well as to control the performance of the private operator added transparency, facilitated the exchange of experiences at policy level and accelerated the decision-making process.

### **3.1.6 References and further reading**

- Cyprus Statistical Service (2009), [Waste related data](#).
- Enviroplan S.A. (2002), 'The strategic plan for solid waste management in Cyprus', Cyprus.
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## 3.2 The Hellenic Recovery Recycling Corporation (HE.R.R.Co) blue bins network (Greece)

### 3.2.1 Background

In 1994, a voluntary initiative was undertaken by a number of industries mainly in the food and chemical sectors to reduce packaging waste by both introducing new packaging designs and facilitating packaging waste recovery and recycling (Jacobsen & Kristoffersen, 2002). The Hellenic Recovery Recycling Association, a non-profit organisation, forerunner of the producer responsibility company HE.R.R.Co, was set up for that purpose.

The HE.R.R.Co blue bins network<sup>12</sup> was developed in compliance with the provisions of Law 2939/01 on packaging and packaging waste,<sup>13</sup> which sets the framework of obligations of packaging operators in Greece. In 2003, it was granted a six-year license to operate by the central government, and in 2009 this was renewed until 2015<sup>14</sup>.

In 2007, by a Joint Ministerial Decision<sup>15</sup>, national waste recycling/recovery targets were set, in line with the EC Directive on packaging and packaging waste. The target for plastic recovery is 22.5% by weight and should be reached by the end of 2011.

### 3.2.2 Synopsis

- ▶▶ The HE.R.R.Co blue bins network is a separate collection initiative comprising several inter-connected city-level projects, aiming at contributing to the national recycling targets for packaging waste.
- ▶▶ Implementation led to the expansion of the network across the country by means of continuous investment support, and to the fulfilment of packaging operators' and local authorities' legal obligations with regard to waste recycling/recovery.
- ▶▶ Main achievements include the recycling/recovery of more than 430,000 tonnes of packaging waste in 2009, direct collaboration with about 30 Recycling Sorting Centres (RSC), and the provision of services to approximately 8 million citizens in Greece.

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<sup>12</sup> Formally named as Collective Alternative Management System 'RECYCLING' or C.A.M.S. RECYCLING

<sup>13</sup> Harmonising Greek legislation with the Directive [94/62/EC](#); it was amended by [Law 3854/2010](#).

<sup>14</sup> By means of Ministerial Decision No. 118019/18-3-09.

<sup>15</sup> Decision No. 9268/469/2007.

- ▶ The blue bins network is a good example of collaborative action designed by a producer responsibility company and implemented jointly with LRAs. Its success is mainly due to the long-term planning of the collection and recycling system, the strong ownership and involvement of local authorities, the importance given to awareness-raising and information activities, as well as to specific implementation strategies, such as the choice of building on the existing capacities and expertise in waste collection of the local authorities involved.

### **3.2.3 Stakeholders involved**

HE.R.R.Co is a producer responsibility not-for-profit company founded in December 2001 by industrial and commercial enterprises involved in the supply of packaged products to the Greek market or in the manufacturing of various packaging items. Among its current shareholders is also a representative of Greek municipalities (KEDE) that holds 35% of the shares.

Greek local authorities, through their municipal services or the competent Solid Waste Management Agencies (operating jointly by several municipalities), are responsible by law for the collection, temporary storage, transport, treatment, recovery and disposal of municipal waste, in line with the regional plans for the management of solid waste.

The National Organisation for the Alternative Management of Packaging and other products, operating under the supervision of the Greek Ministry of the Environment, Energy and Climate Change, provides HE.R.R.Co (and other producer responsibility companies) with a license to operate its services valid for six years. Moreover, together with the ministry, it coordinates national efforts towards the attainment of the recycling and recovery targets.

### **3.2.4 Description of the initiative**

#### *Objectives and implementation procedures*

HE.R.R.Co aims at fulfilling the legal obligations of affiliated packaging operators and local authorities, contributing at the same time to the attainment of the national recycling/recovery targets as regards packaging waste.

The blue bins network consists of numerous recycling projects, each jointly agreed, planned and implemented with collaborating municipalities, on the basis of six-year co-operation agreements in which municipalities are responsible for recyclable waste collection and final disposal, while HE.R.R.Co undertakes processing, information and management activities. HE.R.R.Co may also co-

operate with municipalities wishing to act independently, i.e. put in place and operate their own recycling and recovery project for packaging waste; in this case, HE.R.R.Co pays them a fee calculated on the basis of the quantities of recovered materials, as certified by relevant documents.

HE.R.R.Co collects data about the target area, mainly regarding the population, produced waste, existing equipment for waste collection and transport, commercial areas or other areas of interest (e.g. industrial areas, etc.); this information is used for planning the collection process (placement of waste bins, collection route and schedule). Based on the agreed plan, HE.R.R.Co provides the appropriate equipment to the local authority, such as waste bins and waste collection vehicles.

Prior to the start of the collection process, a city-wide information campaign addressing all households, takes place. HE.R.R.Co places great emphasis on the information dissemination plan; it runs numerous activities targeting local households, mainly explaining the need to dispose of the packaging materials in the blue recycling bins, separately from organic waste. Examples of these activities include: providing reusable recycling bags to each household, together with a letter from the Mayor; placing advertisements in local buses; using social networks; running TV and radio campaigns; organising school visits, etc.

The collection of materials from the blue bins is done by municipal staff, using the vehicles provided by HE.R.R.Co<sup>16</sup>. The collected waste is transferred to the nearest RSC to be weighed and sorted; the final disposal of RSC residues remains the responsibility of the local authority.

### *Results*

In 2010, HE.R.R.Co's network consisted of approximately 110,000 blue bins, facilitating packaging waste recycling in more than 680 local authorities<sup>17</sup> reaching some 8 million people living in Greece. In total, 28 RSCs were in operation under HE.R.R.Co's responsibility or funding. The performance of the HE.R.R.Co blue bins network initiative during the period 2006-2009 is summarised in Table 3.2.

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<sup>16</sup> Fuel, lubricants and other consumables required for the collection are paid by the local authority.

<sup>17</sup> The number is based on a local authority structure comprising 1,034 municipalities and communes, i.e. prior to the 2010 administrative reform, which reduced the total number of local authorities in Greece to 325.

**Table 3.2 – HE.R.R.Co blue bins network performance indicators<sup>18</sup>**

| <b>Indicator</b>                              | <b>2006</b> | <b>2007</b> | <b>2008</b> | <b>2009</b> |
|-----------------------------------------------|-------------|-------------|-------------|-------------|
| Population covered (million)                  | 4.3         | 6.1         | 6.6         | 7.6         |
| Contracted municipalities (no.) <sup>19</sup> | 337         | 446         | 610         | 648         |
| Sorting centres (no.)                         | 12          | 15          | 18          | 22          |
| Separate collection bins (no.)                | 25.103      | 51.602      | 76.530      | 98.177      |
| Collection vehicles (no.)                     | 95          | 140         | 236         | 327         |
| Separate collection bags (million)            | 0.7         | 1.2         | 1.7         | 2.1         |
| Work places (no of staff)                     | 510         | 680         | 1.052       | 1.578       |
| Operational cost (million EUR)                | 15.6        | 20.1        | 24          | 31.2        |
| Investments (million EUR)                     | 9.1         | 10          | 25.9        | 4.6         |
| Packaging waste recovered (tonnes)            | 26.6623     | 344.362     | 400.033     | 432.013     |

Source: [HE.R.R.Co website](#)

### *Costs*

The development and operation of the blue bins network requires significant funds, the majority of which is provided by HE.R.R.Co. Investments and operational expenses paid by HE.R.R.Co during the period 2006-2009 are detailed in Table 3.2; these costs include the purchase of equipment used in waste collection (bags, bins and vehicles) and the infrastructure required in the RSCs (buildings and sorting facilities).

Local authorities contribute to the expenses of the network both directly (paying for the collection vehicles maintenance and operational costs, as well as for the disposal of RSCs residual waste) and indirectly (through KEDE, as HE.R.R.Co's shareholders).

<sup>18</sup> Data on workplaces, operational cost, investments and recovered waste refer to all H.E.R.R.Co activities (including industrial and commercial packaging waste) and not only to the blue bins network.

<sup>19</sup> Idem.

### 3.2.5 Analysis

#### *Assessment of achievements*

The operation of the HE.R.R.Co blue bin network achieved its objectives in terms of fulfilling packaging operators' and local authorities' legal obligations with regard to waste recycling/recovery. In addition, a significant contribution towards the attainment of national recycling targets has been made, with an annual recovery of more than 430,000 tonnes of packaging waste. The expansion of the network across the country is demonstrated by the relevant annual appropriations, as well as by the increasing numbers of RSCs, collection vehicles and bins.

#### *Success factors and lessons learnt*

As a follow-up of previous recycling efforts dating back to as early as 1994, the HE.R.R.Co blue bins network built on the lessons learnt during a **long-term planning process**, which led to the improvement of the collection and recycling system. In this lasting course of action, adequate attention was given to the **achievement of concrete results**, a fact that inevitably attracted the interest of both the business community and the local authorities and encouraged/secured both involvement and long-term commitment.

The **strong ownership of the collection initiative by local authorities**, with regard to both the HE.R.R.Co organisation and the implementation procedures, increased the commitment level of the local administrations in the scheme. It also maximised the impact on the target population in terms of awareness and willingness to participate in a common effort to recycle. In this respect, the blue bins network benefited from significant visibility. Both HE.R.R.Co and the municipalities involved gave **high importance to awareness-raising and information activities**, promoting the concept of separate disposal of recyclables, explaining the benefits of recycling and giving advice to households on proper waste sorting.

Moreover, attention given to strategic issues in the design of the system such as making best use of **existing capacities and expertise in waste collection of the local authorities involved** further contributed to the successful implementation of the separate collection system.

### 3.2.6 References and further reading

- Jacobsen H. & M. Kristoffersen (2002), Case studies on waste minimisation practices in Europe, European Environment Agency.

- HE.R.R.CO Hellenic Recovery Recycling Corporation (2011), [website](#).

### **3.3 City of Amsterdam trial collection of separated plastics (the Netherlands)**

#### **3.3.1 Background**

In 2007, the Ministry of Housing, Spatial Planning and the Environment (VROM), the commercial packaging sector, and the Association of Dutch Municipalities (VNG) signed a framework agreement<sup>20</sup> regulating in detail the responsibilities of producers with regard to packaging waste separate collection. The agreement addressed, among other issues, the collection of plastic packaging, stating the intention to increase recycling of plastic waste through the separate collection and recycling of household packaging waste and the reuse of plastic packaging by industries. It also set a target for recycling 38% of plastic contained in waste by 2010, to be increased to 42% by the end of 2011.

A national campaign by the producer responsibility company Nedvang, promoted the recycling of plastic waste in the majority of Dutch municipalities, using the logo the ‘Plastic Heroes’. In addition, with a view to implementing the goals of the agreement, the National Waste Management Plan was modified to include provisions for municipalities to take action to ensure the separate collection of plastic from households, along with glass, paper and cardboard.

#### **3.3.2 Synopsis**

- ▶ The separate collection of plastic waste in the city of Amsterdam is a pilot initiative aiming at determining the most suitable collection practice in terms of efficiency, effectiveness and user acceptance.
- ▶ The project is in line with the city’s target to promote prevention of waste and reuse of materials towards waste production minimisation. Initially planned to run for only one year, the pilot was extended by about seven months due to its success.
- ▶ Its main achievements include: successfully dealing with the opposition of those supporting the well-established tradition of waste incineration; achieving high user-acceptance levels already from the first months of operation; and collecting more plastic waste than originally planned.

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<sup>20</sup> ‘Framework agreement between VROM, the commercial sector and the VNG on an approach for the Packaging and Litter dossiers for 2008 to 2012’, dated 27 July 2007.

- ▶ The city of Amsterdam trial collection of plastics is an example of an initiative organised and implemented by a municipal authority using its own resources. Its success is mainly due to political support at the national level to selective waste collection systems, the past experience of the citizens with similar systems for other packaging waste (such as paper and glass), the setting of feasible targets to be achieved within a reasonable timeframe, and the adequate attention given to awareness-raising and information actions.

### 3.3.3 Stakeholders involved

The city of Amsterdam (Centre, West, East, and New-West districts) is the main stakeholder involved in the initiative. It is responsible for the collection, transport, treatment and disposal of household waste. It has put in place a municipal waste management system based on the city's incinerators<sup>21</sup>; with the exception of paper, cardboard and glass, all household waste is transferred to these plants, for energy recovery (co-generation of heat and electricity) and post-incineration extraction of metals. The incinerators are operated by Afval Energie Bedrijf (AEB), a city-owned waste-to-energy enterprise. Prior to the commencement of the trial, common practice was to collect separated plastics and incinerate plastic packaging along with mixed municipal waste.

The Dutch Ministry of Housing, Spatial Planning and the Environment promotes waste separation at household level, by means of regulation, provision of financial support to relevant research and implementation projects, and national level communication campaigns.

### 3.3.4 Description of the initiative

#### *Objectives and implementation procedures*

The city of Amsterdam pilot initiative, aiming at contributing to the attainment of the national recycling targets for packaging waste and plastics, started in May 2010 with a planned duration of one year, but it is still ongoing due to a seven-month extension. The collection trials were designed with a view to identifying the most suitable (in terms of efficiency, cost-effectiveness and acceptance by users) collection system for plastic waste and estimating the total amount of plastic waste that could potentially be recycled. The city has set a target to minimise waste production through prevention and reuse of materials. The plastic collection trials complement the ongoing work on separated collection of glass, paper and textiles.

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<sup>21</sup> Built in 1993 and 2007, they have a combined capacity of more than 1.3 million tonnes of waste.



The pilots run in selected neighbourhoods of four city districts, as follows: in the West city district, underground collection containers able to condense plastic waste were put in two central areas while seven orange coloured large collection bins were placed at street level; in Central, East and New West city districts, street level orange bins were placed in nine, seventeen and four locations, respectively.

Citizens have the option of disposing of their plastic packaging waste in transparent sacks, which they may put next to their mixed garbage at the designated municipal waste collection points. Residents can get transparent sacks at designated locations around the city, or can use any type of transparent carrier bag. Prior to the launch of the pilot project, the city informed residents about the initiative and provided them with instructions by mail; information was also made available at the district websites.

A team of researchers monitors the quantities of plastic waste collected in each district. The evaluation of the trials was due to take place in June 2011 but then delayed following the extension granted to the project until the end of 2011. The evaluation will also include a survey among residents who participated in the trials, to obtain their feedback on the separate collection system for plastic waste.

### *Results*

Even before the launch of the actual implementation of the pilot separate collection schemes, the information campaign of the city triggered a debate on the most appropriate method to treat plastic waste. As a result of the long tradition of waste incineration in the city, the local authority was reluctant to proceed with separate collection. However, following the first year of implementation, according to an internet survey<sup>22</sup>, in a total of some 3,500 respondents, 73% agrees with waste separation.

In several districts the containers were becoming full faster than initially planned. Moreover, researchers recorded cases of residents in the New West district who cycled their way from one neighbourhood to another in order to dispose of their plastic waste in the designated containers. Preliminary data on collected quantities are comparable with other cities in the Netherlands: indicatively, in New West district, where only four orange bins have been places, between 1,200 and 1,400 Kg of plastic waste is collected on a monthly basis.

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<sup>22</sup> At [parool.nl](http://parool.nl) website.



## *Costs*

In line with the framework agreement among Dutch stakeholders on packaging waste, the cost of separate collection and recycling is paid by the business community, through packaging taxes, partly feeding into the Waste Fund; municipalities are then reimbursed by the Fund for local costs related to separate collection and recycling of packaging waste. Payments to the municipalities by the Fund are agreed by all parties involved (under the supervision of the central government) on the basis of the quantities of collected waste.

### **3.3.5 Analysis**

#### *Assessment of achievements*

The pilot separate collection of plastic waste has succeeded in addressing the negative reaction from supporters of waste incineration. Residents in the target and nearby areas were apparently convinced of the benefits of the approach; high user-acceptance levels were achieved from the first months of operation, while plastic waste collection rates were higher than those originally estimated.

Recycling and re-use of plastic waste is in line with the city's target to promote prevention of waste and reuse of materials towards waste production minimisation. The extension of the pilot for an additional period of seven months was justified by the positive results of the preliminary surveys carried out by the city of Amsterdam researchers. The local council will decide about the continuation and expansion of the project to the whole city in early 2012, taking into account, among other indicators, the opinion of local residents.

#### *Success factors and lessons learnt*

The framework agreement between the central government, producer responsibility companies and local authorities, has been a key success factor in the implementation of the city of Amsterdam separate collection trial. Multi-level governance has contributed to developing a balanced approach in addressing local pressure from groups opposing to the system; in particular, national level political support to selective waste collection systems and preference over incineration and energy recovery practices set the right framework for the launch of the project and overcame resistance and past difficulties. In addition, the setting of feasible targets and of a reasonable timeframe for their attainment raised the level of acceptance and support of the new system by the general public.

At the operational level, an important aspect of success has been the past experience of citizens with similar systems for other packaging waste (such as paper and glass). Likewise, the municipality was able to build on its previous experience in waste recycling campaigns when planning the services it provided.

Lastly, the adequate attention paid to awareness-raising and information has played a positive role. The active involvement of the local administration in the organisation of awareness-raising campaigns has led to increased participation of the public in the separate collection scheme. Interactive collaboration with residents through the districts' websites made the provision of personalised services feasible e.g. flagging the need for more containers in selected neighbourhoods.

### **3.3.6 References and further reading**

- Amsterdam City Web-Portal (2011), [Plastic recycling in Amsterdam](#)
- Central District (2011), [website](#), City of Amsterdam
- East District (2011), [website](#), City of Amsterdam
- Nedvang Company (2011), [Plastic Hero Campaign](#)
- New West District (2011), [website](#), City of Amsterdam
- Paroon.nl (2011), [Pilot plastic collection extended](#), article posted on 24/09/2011.
- The Government of Netherlands (2011), [Website - waste management section](#)
- West District (2011), [website](#), City of Amsterdam

## **3.4 Separate waste collection system in Piatra Neamt (Romania)**

### **3.4.1 Background**

From October 1997 to April 1998, a pilot action targeting 2,200 people in Piatra Neamt (2% of the city's population) implemented awareness-raising and information activities on waste prevention (mainly targeting the reuse of packaging), as well as selective waste collection, and recycling. The project was co-financed by the Danish Environmental Protection Agency (DEPA). Since public response to the pilot was positive, all the involved stakeholders made efforts to extend it from one single neighbourhood to the whole city, thereby laying the foundations for the development of an integrated waste management system.

Later, in 2005, legislation<sup>23</sup> regulating the management of packaging and packaging waste came into force. This was the basis for the creation of ECO - ROM AMBALAJE S.A. (ERA), the first producer responsibility company operating in Romania.

Piatra Neamt is located in the North-East Region, where the sorting and plastic waste recycling capacity is 47,000 and 11,653 tonnes, respectively. Packaging waste (including plastic) recycling is carried out by 18 authorised operators. Waste is delivered to the operators by a large number of collection companies, which purchase recyclable waste (including plastics) from households and the business sector.

**Table 3.3 – Packaging waste collectors and recycling/energy recovery operators at the regional level (North-East Region)**

| <b>Material</b>                            | <b>PET</b> | <b>Other Plastics<br/>(HDPE, LDPE, PVC, PP,<br/>PS)</b> |
|--------------------------------------------|------------|---------------------------------------------------------|
| <b>Number of collectors</b>                | 28         | 32                                                      |
| <b>Number of energy recovery operators</b> | 1          | 1                                                       |
| <b>Number of recycling operators</b>       | 3          | 13                                                      |

Source: Balkanwaste project (2010)

### 3.4.2 Synopsis

- ▶ The separate waste collection initiative in Piatra Neamt targets a set of four waste streams: plastic and glass; paper and cardboard; organic waste; and residual waste.
- ▶ The initiative is part of a broader, integrated waste management system comprising a wide range of facilities such as sorting and recycling plants, a composting plant, a C&D waste processing unit, and a sanitary landfill.
- ▶ Among its main achievements are the establishment of a network of 943 collection points serving the needs of some 40 apartments each, and a high user-acceptance, featuring a 90% service fee collection rate for households.
- ▶ The Piatra Neamt separate waste collection system is a good example of a local authority outsourcing all actions across the waste management value chain, from design and construction to operation and supervision of the

<sup>23</sup> Government Decision (GD) No. 621/2005

facilities. Its success is due to the long-term planning of operations; the ability of the local and national authorities to build on the results of relevant past initiatives and to effectively follow up on each activity implemented in the target region; the security and adequacy of funding; and the use of international expertise in the design and implementation stages.

### **3.4.3 Stakeholders involved**

Key stakeholders include the municipality of Piatra Neamt and the private companies contracted to implement the activities related to the separate waste collection system.

The municipality of Piatra Neamt is the legal competent authority for the planning, organisation, management and co-ordination of sanitation services, as well as for arranging the level of sanitation tariffs, in accordance with the guidelines and approved methodology<sup>24</sup> of the National Regulatory Authority for Municipal Services (ANRSC). ANRSC has the power to issue licenses and to develop methodologies and regulations setting the framework for the provision of public municipal services, including waste management and sanitation. In this context, the Ministry of the Environment and Water Management plays a supervising role, through the National Environment Agency.

SC Brantner Servicii Ecologie SA is a sanitation company contracted by the municipality to provide waste management services in the city of Piatra Neamt, and in particular to operate the municipal waste collection, transport and disposal system. The DIG/Heil/DIEKAT consortium constructed the facilities and supplied and installed the equipment used in the separate waste collection system. Finally, the Hill International-Mott MacDonald consortium is responsible for the supervision of works and the provision of technical assistance to the municipality of Piatra Neamt.

### **3.4.4 Description of the initiative**

#### *Objectives and implementation procedures*

The separate waste collection system of the Piatra Neamt municipality targets four waste streams: plastic and glass; paper and cardboard; organic waste; and residual waste. It is part of a broader waste management initiative (EC, 2010) aiming at saving natural resources and protecting human health and the environment by means of a range of facilities such as sorting and recycling

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<sup>24</sup> As per the Order no. 109 of 9 July 2007

plants, a composting plant, a C&D waste processing unit, and a sanitary landfill. With regard to packaging waste and plastic, the system focused on collection at the source, targeting households, small and medium-sized enterprises, and public institutions.

The municipality used international public tenders to contract specialised consultants, construction companies and waste management service providers to undertake the implementation of all stages of the project, including: the supervision of works and the provision of technical assistance; the design and construction of the waste management infrastructure; the supply and installation of equipment; and the operation of the system.

Within the local authority, a Project Implementation Unit (PIU) comprising a local project manager and three technical advisors was established; the PIU's tasks include monitoring and co-operation in the supervision of the works and providing advice on technical matters relating to the contracted services.

At the development phase, the project involved the purchase of waste management equipment, mainly waste collection containers and vehicles, as well as infrastructure works, such as the construction of a sorting plant for plastic and glass (including a mechanical and a manual processing line, in operation since 2007); the setting up of a recycling centre; the building of a composting plant (used to reduce residual waste at landfills); the creation of facilities to crush construction and demolition waste; and the establishment of a car service centre for truck maintenance.

The project also focused on raising public awareness with regard to waste prevention and recycling and the municipality ran public campaigns to educate people about ways to limit their waste production through reuse.

### *Results*

The project resulted in the establishment of a network of 943 collection points with containers of different colours used for each separate waste stream. Each collection point serves the needs of about 40 apartments. A network of 1,102 containers of 660 litres each was set up for the collection of plastic and glass waste. At the regional level (North-East region), the quantities of waste gathered through selective collection are summarised in Table 3.4.

**Table 3.4 – Selective collection results at the regional level**

| <b>The total quantity of collected waste (tonnes)</b> | <b>PET</b>   | <b>Other Plastic</b> | <b>Paper / Cardboard</b> | <b>Glass</b> | <b>Metals</b> | <b>Wood</b> |
|-------------------------------------------------------|--------------|----------------------|--------------------------|--------------|---------------|-------------|
| 2,814.1                                               | <b>512.7</b> | <b>224.8</b>         | 1,660.9                  | 405.5        | 2             | 8.2         |

Source: Balkanwaste project (2010)

### *Costs*

The total cost of the integrated waste management project was 18 million EUR; ERDF (2000-2006) co-financed this amount by 10,380,000 EUR, the rest being covered by national funds.

A sanitation fee is paid by all waste producers, including households, companies and public institutions. The level of the fee is decided by the municipality of Piatra Neamt, following a proposal by the operator of the services on the basis of technical and economic criteria. A variable waste collection service fee applies to households (0.69 EUR per person per month) and companies (7.14 EUR per m<sup>3</sup> of separately collected waste).

## **3.4.5 Analysis**

### *Assessment of achievements*

The development and operation of the Piatra Neamt separate waste collection system has successfully established one of the first recycling systems in Romania. The creation of a wide network of collection points serving the needs of the city has been highly appreciated by residents as demonstrated by a 90% service fee collection rate for households.

The initiative is part of a broader, integrated waste management system comprising a wide range of facilities, which have completely changed the waste management practices in the target area. Its success has facilitated access to further EC and national funding, thus opening the way for a follow-up expansion of the system to address the needs of the whole region: in fact, a 30 million EUR project for the deployment of an integrated solid waste management system in Piatra Neamt county is currently being implemented with co-financing from ERDF for the period 2007-2013 (EC, 2011). The initiative foresees a wide range of measures, including among other things, separate waste collection infrastructure works and equipment, as well as awareness-raising campaigns on waste management.

### *Success factors and lessons learnt*

The success of the separate waste collection system in Piatra Neamt was largely based on the ability of the local and national authorities to **build on the results of relevant past initiatives** and to **effectively follow up on each activity implemented in the target region**. Moreover, **multi-level governance** was crucial in coordinating actions within the national and regional contexts, as well as in prioritising investments in waste management infrastructure.

Given the limited availability of own resources, the **security and adequacy of funding** were equally important to the timely implementation of the initiative; this was mainly achieved through EC support and national contribution.

Lastly, the **use of international expertise** in the design and implementation of the activities made the development of an integrated system that was completely new to local standards possible. In this regard, the involvement of a local Project Implementation Unit in all project stages facilitated the development of local capacities in the sector.

#### **3.4.6 References and further reading**

- ANRSC (2008), ‘Activity report for 2007’.
- EC (2010), ‘[Better waste management comes to Piatra Neamt](#)’, DG Regional Policy – Inforegio.
- EC (2011), ‘[Ultra modern waste management](#)’, DG Regional Policy – Inforegio.
- ECO - ROM AMBALAJE Recovery Recycling Organisation (2011), [website](#)
- Municipality of Piatra Neamt (2011), [General information about the waste management system](#), municipal website.
- Pre Waste Interreg IVC project (2010), [Mapping Report on waste prevention practices in territories within EU27](#), 6 October 2010.
- REPA & EFCon (2010), [Assessment of waste management status in Balkan Countries - Romania](#), 2nd Revision, November 2010.
- REPA, EFCon, Euroconsultants & NTUA (2010), [Evaluation of waste infrastructure in Region 1 North-East - Romania](#), 2nd Revision, December 2010, Bacau, Romania.
- SUROVINA, EFCon, Euroconsultants, REPA & CSDCS (2010), Final Report on Municipal Solid Waste Composition in Romania and Bulgaria, December 2010, Maribor, Slovenia.



## 3.5 Ban on disposable cutlery and crockery in Munich (Germany)

### 3.5.1 Background

The City Council of Munich has been a pioneer in waste management, having already introduced waste hierarchy concepts in 1988, with the adoption of cascading priorities putting waste prevention on top of recycling, recycling before incineration, and incineration ahead of land-filling.

Some of the cities in Germany, which created a trend against the use of disposable food and beverage containers in the beginning of the 1990s are Nurnberg (1989), Freiburg (1990), Munich (1991), and Weimar (1994).

In Munich, the City Council issued a regulation, applicable to all businesses in the city, ruling out the sale of beverages in disposable containers, but because of strong opposition from the business community who feared they would lose their customers, the ban was made ineffective at court<sup>25</sup> in its initial form and its applicability was narrowed to municipally-owned land, facilities or retail space.

### 3.5.2 Synopsis

- ▶ The ban on disposable tableware and food and beverages containers is a long-standing waste prevention initiative by the city of Munich applying to all public events organised in municipally-owned land, facilities or retail space.
- ▶ Since its launch in 1991, the ban has been successfully implemented and monitored by the competent local administrative agencies. The majority of event organisers adhere to the ban and fines are imposed in the few instances of non-conformity.
- ▶ Achievements include: a decrease from 11,000 tonnes (1990) to about 760 tonnes (2006) in the overall quantity of waste produced during events; the development of new business opportunities locally for the provision of dishwashing and other related services to organisers; and a change in the behaviour of locals and visitors in terms of waste generation.
- ▶ The initiative is an example of coherent and systematic efforts towards waste prevention. Its success is mainly due to: the continuity in political support;

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<sup>25</sup> Both the Bavarian Administrative Court and the Federal Administrative Court in Berlin



the facilitation of the implementation of the ban through well co-ordinated efforts to provide reasonably priced alternatives to disposable practices; the use of trained inspectors following well-defined procedures; and also EU and global changes in waste and environmental policy favouring prevention actions and more sustainable lifestyles.

### **3.5.3 Stakeholders involved**

Key stakeholders include the municipality of Munich and municipality-owned companies.

The City Council of Munich is the competent authority granting permits for the organisation of public events. Inspections and enforcement of measures related to waste prevention and management are undertaken by Abfallwirtschaftsbetrieb München (AWM), a company owned by the municipality. AWM is a relatively large organisation, employing about 1,350 staff in 2009, and operating 12 recycling centres, 350 vehicles and 407,000 waste containers.

MobilSpiel e.V. is an official municipal contractor supporting the organisation of public events in an environmentally friendly way. They develop educational processes and activities to promote eco-concepts or try new forms of sustainable living and working styles.

### **3.5.4 Description of the initiative**

#### *Objectives and implementation procedures*

The initiative aims at preventing the generation of waste during public events organised in municipal facilities, land or retail spaces, in particular of plastic and other materials used in disposable drink and food containers, as well as in tableware (including packaging).

Following a municipal regulation issued in 1991, the use of disposable tableware and containers during public events organised on city owned premises is forbidden. More precisely, according to the regulation: *‘At events that are conducted on land or in facilities owned by the city, food and beverages may only be served in reusable packaging and containers that are subjected to a mandatory deposit scheme; this requirement also applies to retail spaces owned by the city. Potential financial support granted of facilities and events is conditional to compliance with this obligation. Exceptions to this*

*requirement may only be allowed in special cases.*<sup>26</sup>

Fines apply to violators of the regulation; rare exceptions may be granted but require a written application and justification. The ban is universal for all city events and facilities: it applies to all major happenings, such as the beer festival (Munich's *Oktoberfest*), the city markets (e.g. the weekly markets in the Olympic Stadium, the Christmas market, etc.), sports events (e.g. Munich City Marathon), and smaller events of 200-300 people.

Participants pay a deposit for the tableware and drink containers they use, and this is reimbursed upon return of the items. Moreover, the city promotes the use of returnable bottles for beverages. For smaller events, organisers have the option to hire table sets and dishwasher services through a municipal official contractor (MobielSpiel e.V.) or any other dish and dishwashing equipment rental services provider. Prices for a mobile dishwasher, a prewash sink, lighting and 120 tableware sets (including transport, installation and soap detergents) range from 170 EUR for a 1-day event to 250 EUR for a long weekend (three day event).

AWM undertakes controls of a random selection of events, in particular major sporting events. Inspections follow a set routine, including on-site advice about the provisions of the regulation on disposable containers and tableware, observation of potential violations, documentation of findings and preparation of reports, and notification to the organisers (warnings). If the organisers violate the regulation, no fine is imposed the first time but a notification letter is issued by AWM informing the organisers about the infringement and the relevant provisions of the by-law, including the potential for future application of a fine; recommendations are also made for future compliance with the rules. If a second violation occurs within a short period of time, the AWM may then impose a fine of up to 2,500 EUR.

### *Results*

The ban on reusable drink containers and tableware is well appreciated by event participants in Germany, as indicated by relevant surveys (Pre Waste, 2011).

Since the launch of the ban, the waste generated during events in Munich was significantly reduced, showing a decrease of 50% in 2004 as compared to 1990. According to AWM data for specific events, waste generated during the

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<sup>26</sup> Pre-waste project (2011); extract from Gewerbe-und Bauabfallentsorgungssatzung LandeshauptstadtMünchen (2003) § 4, Abs. 10.

*Oktoberfest*<sup>27</sup> decreased from 11,000 tonnes in 1990 to 720 tonnes in 2006<sup>28</sup>.

Monitoring of compliance with the provisions of the regulation during sports events in 2010 resulted in complaints/warnings in nine events, of which fines were imposed in only two (in one case the maximum fine of 2,500 EUR was imposed).

### *Costs*

The main expenses for the municipality of Munich relate to staff used for the monitoring and inspection of the events; this cost is partly covered by the revenue from the fines and is mainly compensated for by the reduction in sanitation and street cleaning activities resulting from the application of the ban. Event organisers are obliged to make an initial investment to obtain reusable cutlery, though they make savings in disposable food and beverage containers, which would otherwise be thrown away after the end of the event. Indicatively, the break-even point for drinking cups has a reuse rate of between 7 and 11 times, also taking into account the cost of washing the cups and of avoiding waste disposal; at small events, the additional cost for renting a mobile dishwasher may raise the overall cost by up to 40%; on the other hand, in large events cost savings of up to 50% have been achieved (Pre Waste, 2011).

## **3.5.5 Analysis**

### *Assessment of achievements*

The implementation of the ban on tableware and drink containers has been successful, as proven by the significant reduction in waste generation, by the high conformity levels of the event organisers and the efficiency of the work of the competent local inspection agency.

In addition, the city of Munich policy on disposable cutlery has created new business opportunities locally, related with the provision of dishwashing and other services. Overall, the ban has shaped the behaviour of locals and visitors towards waste prevention and encouraged social change towards more sustainable lifestyles.

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<sup>27</sup> The event was awarded ‘Eco-oscar’ in 1997 by the Federal government of Germany for its environmental performance.

<sup>28</sup> Statistics provided by the [official website of the municipality of Munich](#).

### *Success factors and lessons learnt*

At the governance level, **continuity in political support** was the most important success factor of the ban. The decisiveness and consistency of the City Council as regards the application of the regulation over a period of more than two decades, led to the consolidation of the reusable cutlery and tableware concept.

At an operational level, the **well-coordinated efforts** to provide practical assistance to event organisers to facilitate implementation of the ban reduced opposition to the initiative and encouraged support for it. In this respect, the provision by the city administration of reasonably priced alternatives to disposable practices, such as the use of mobile dishwashing services, was of particular importance.

In addition, through the use of trained inspectors following **well-defined auditing procedures**, the city administration managed to make clear its willingness to support organisers wishing to conform to the regulation, and at the same time showed determination to enforce the ban.

Finally, the ban on disposable drink and food containers benefited from EU and global changes in **waste and environmental policy supporting prevention actions and more sustainable lifestyles**. On the other hand, being among the first cities to introduce such a regulation, Munich strategically decided to **place emphasis on renowned events**, such as the *Oktoberfest*, to develop examples for other organisers to follow; this proved to be a successful approach as a trend towards waste prevention in public events was, indeed, created.

### **3.5.6 References and further reading**

- Pre Waste (2010), [Mapping Report on waste prevention practices in territories within EU27](#), Interreg IVC, 6 October 2010.
- Pre Waste (2011), [Fact sheet on Ban on disposable food and drink containers at events in Munich, Germany](#), Interreg IVC, 23 November 2011.
- City of Munich (2011), [The Munich Oktoberfest in figures](#), official website.

## 4. Recommendations

Recommendations are structured around three main areas<sup>29</sup>: (i) framework conditions potentially able to facilitate effective action by LRAs as determined from the evidence provided by in this study; (ii) actions deserving more attention by LRAs in the fields of plastic waste prevention, life-cycle approach, re-use/recycling, and producer (cost) responsibility; and (iii) aspects to be considered within the future EC Green Paper on plastic waste from a local and/or regional perspective, in particular concerning the promotion of most-advanced LRAs actions.

### 4.1 Framework conditions to enable effective action by LRAs

The diverse experiences outlined across the EU suggest that the establishment of plastic waste separate collection and recycling/recovery systems at the local and regional level is a lengthy process before it reaches maturity. In this context, long-term high-level political commitment to policies promoting solutions at the top of the waste hierarchy plays a crucial role in LRAs' efforts to successfully address the issue of plastic waste. Moreover, continuity in political support promotes an attractive waste management framework for private investments and facilitates the work of local administration in terms of enforcement of relevant policies, as indicated in the Larnaca and the Munich examples, respectively.

At the local and regional level, sufficient political will is fundamental to a long-term implementation process. In fact, decisiveness of local councils and consistency of policies may: (i) convince citizens of the benefits of the proposed waste prevention or separate collection systems, thus encouraging change in social behaviour, and maximising their involvement; (ii) facilitate long-term investments from the private sector, particularly in the form of PPPs; and (iii) make possible the effective enforcement of policies.

EU Directives on waste and on packaging and packaging waste and related binding targets for MS provide a short- and medium-term vision for policy-making and a planning framework for related investments. Both the vision and the planning framework should be clearly developed at the national level to support actions by LRAs. Hence, further to EU efforts:

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<sup>29</sup> As per the technical specifications of this study.

⇒ *MS should clearly provide political support to waste prevention, selective waste collection systems and energy recovery practices over landfilling or incineration, thus setting the right framework for relevant regional strategic planning decisions guiding local implementation.*

A large number of locally/regionally implemented plastic waste management practices have been developed as part of broader agendas and/or long-term strategies securing multi-level commitment. In most cases, such practices are part of separate collection, sorting and recycling/recovery initiatives for packaging waste, focusing on several waste streams (glass, paper, aluminium cans, etc.), and requiring long-term multi-level planning of actions. A commonly followed implementation model, in this respect, seems to be the one successfully practiced in the cases from Cyprus and Romania, where EU funding and policy framing, central government strategic planning, and local authority management and implementation, with the contribution of (international) waste management operators, is performed. It is thus suggested:

⇒ *Consider supporting multi-level governance to co-ordinate actions across different levels, from the EU to local, for example by promoting EU-wide model approaches for the design and implementation of integrated waste management projects able to address the needs of several cities within a region and of focusing on several waste streams, including plastic. Such models for the development of integrated waste management projects could be prioritised within the Structural Funds.*

At the national level this would imply that:

⇒ *MS set clear specifications for large-scale waste management projects, with a view to promoting high environmental standards and protecting long-term investments from potential local pressure groups opposed to the implementation of such projects in specific areas. Likewise, central government administrations could support LRAs in setting standard contracts and/or terms of collaboration with waste management operators, thus facilitating the development of successful PPPs.*

⇒ *Central governments support the development of multi-level and multi-actor framework agreements involving both public authorities at the central and local/regional levels and producer responsibility companies. This would lead to a more balanced approach in terms of (public and private) contribution to the cost of separate collection and recycling/recovery systems, and to the framing and regulation of relevant initiatives within broader waste management strategies.*

Irrespective of the scale and complexity of plastic waste management initiatives involving LRAs, security and adequacy of funding seems to be a common condition for successful results, as the examples presented in this study indicate. Access to sufficient funds becomes even more important when considering the systemic effects of the ongoing Eurozone crisis and the pressures on the banking system (in terms of reduced potential of financing organisations to offer loans), which limits the capacity of both LRAs and producer responsibility organisations to contribute to the schemes. In this context, exploring synergies among available funding mechanisms, notably the Structural Funds and national waste funds (where existing) can potentially overcome financing difficulties. It is thus suggested:

- ⇒ *Consider the facilitation of the creation of national waste funds in all MS through, for example, the provision of loan guarantees or the development of standards for the operation of such funds.*
- ⇒ *Consider using the Structural Funds to leverage capital raised within the national waste funds, with a view to removing existing obstacles in financing and improving LRAs' access to loans and grants for the implementation of separate waste collection and recycling schemes.*

Furthermore, as indicated by the evidence of literally all plastic waste prevention and treatment initiatives, awareness-raising and information actions have been crucial to successful results. LRAs are actively involved in the organisation of local awareness-raising campaigns, targeting relatively small groups of people, often through interactive collaborative approaches with residents. By addressing a broader audience, EU and/or national level campaigns can have a strong impact in this respect, promoting sustainable lifestyles and specifically encouraging waste prevention and/or separate disposal of recyclables, as the example of the HE.R.R.Co blue bins network in Greece shows. It is thus suggested:

- ⇒ *Consider raising visibility of relevant LRA initiatives through national and/or EU-level campaigns, as a means to mainstream successful plastic waste prevention and/or separate collection approaches into locally undertaken initiatives.*

## 4.2 Actions deserving more attention by LRAs

### Waste prevention

Convincing people to change their behaviour in terms of waste generation is the cornerstone of waste prevention. This is evident in the Munich example, which both influenced and benefited from EU and global trends in waste and environmental policy towards more sustainable lifestyles. Indeed, Munich's communication plan managed to set an (at the time) innovative approach for waste prevention during public events, by focusing on renowned city events.

⇒ *LRAs should consider developing and implementing a communication plan based on international experience and adapted to the local context.*

The majority of plastic waste prevention initiatives by LRAs focus on specific types of plastic waste, for example plastic tableware at public events in Vienna and Munich, or plastic containers in the hotel business in Piemonte region. Such well-targeted campaigns reach their intended audiences and achieve tangible results more easily than broader initiatives addressing several waste fractions and waste producers and tend therefore to be more commonly preferred by LRAs. On the other hand, these campaigns are usually relatively small-scale and so lack the critical mass to have a sustainable impact and induce mainstream changes in local behaviour. Examples from this study – such as the Association of ‘Virtuous’ communities in Italy (IT\_2), which participate in the European Week for Waste Reduction (EWWR)<sup>30</sup>, and the Municipality of Alcalà la Real (ES\_1), which is a partner in the Interreg IVC Wasman project – showed that several LRAs have addressed these constraints by joining already existing networks of organisations tackling waste.

⇒ *LRAs planning to organise plastic waste prevention activities should engage in international collaborative initiatives, such as the EWWR, so as to benefit from a pool of good practices, create an opportunity to exchange experiences, and gain from EU-wide visibility, with a view to strengthening the impact and sustainability of their actions.*

Further to awareness-raising and information activities, achieving tangible results visible to citizens may positively impact the level of public acceptance and support for plastic waste prevention initiatives.

⇒ *LRAs should set feasible targets within initiatives focusing on the reduction of plastic waste quantities generated locally, and a reasonable*

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<sup>30</sup> <http://www.ewwr.eu/>



*timeframe for their attainment, so as to increase the level of local appreciation and maximise public involvement.*

### Life-cycle approach

The life-cycle concept complements that of waste hierarchy, aiming at solutions that are most beneficial for the environment; however, selecting the most appropriate practices using the life-cycle approach is often a tedious task, involving a level of technical complexity that requires capacities not always easily available to LRAs. Nevertheless, since advances in the design of waste sorting facilities have made possible the separation of very good quality plastics, as shown by the Larnaca example, the life-cycle approach becomes increasingly a matter of decision-making than of technology application, thus requiring the intervention of LRAs.

⇒ *LRAs should make sure that the private sector is engaged at an early stage of planning and implementation of plastic waste sorting facilities, in order to bring in highly specialised expertise and technology capable of supporting decisions based on life-cycle considerations.*

### Re-use/recycling

The design and construction of re-use/recycling facilities is a long-term process, requiring the use of ample resources to follow licensing procedures and to achieve local consensus on issues such as the location of the project and the technology to be used. As the example in Greece indicates, increased commitment by local administration staff to a common effort to recycle has positive results on raising public awareness and local participation. LRAs implementing initiatives for the re-use/recycling of plastic waste would therefore benefit from:

⇒ *Organising public presentations of plans to implement projects for the re-use/recycling of plastic waste and encouraging local consultations on issues related with the environmental, economic and social impact of the planned investments, including, for example, the location of the facilities, the technologies to be used, the expected benefits, etc.*

⇒ *Developing a strong sense of ownership by local administrations and encouraging local staff involvement in the organisation of separate collection schemes.*

The involvement of the private sector in initiatives aiming at the re-use and recycling of plastic waste is considered common practice and usually takes place

through either direct contracting of one or more waste operators, or in the form of a framework agreement, notably with a producer responsibility company. In order to be successful, such collaboration needs to be based on clear specifications (see also section 4.1) as well as on a solid monitoring mechanism, especially when the initiative is part of a broader waste management project. Further to potential support from central government administration in drafting the specifications of these agreements, LRAs are required to develop and/or acquire capacities that would enable them to effectively monitor the work of private operators, as in the cases of Munich and Larnaca. In this regard, LRAs should consider:

- ⇒ *Collaborating with an intermediary organisation, such as a local development agency, in the monitoring and control of the performance of waste operators; such co-operation would increase transparency (a crucial aspect when recovered plastic is regarded as a market resource to be exploited rather than another waste) and accelerate the decision-making process in all project stages.*
- ⇒ *Providing appropriate training to internal staff of their administration to develop certified capacities in-house, with a view to facilitating direct control over activities and results.*

### Producer (cost) responsibility

There is a wealth of different approaches taken by producer responsibility organisations and LRAs across MS, in terms of plastic waste collection and/or recycling schemes. It is becoming apparent that quite soon the challenge for LRAs will be to share good practices, rather than to develop new solutions. However, data available on the cost and performance of each approach are not clear in all cases and are certainly not consistently enough reported to allow for direct comparisons to be made and good practices to be transferred, as the examples described in this study indicate. It is thus suggested that:

- ⇒ *LRAs through their institutional representatives could promote the development of an inventory of separate waste collection schemes focusing on plastics, with the potential to be expanded in the future to include other materials.*
- ⇒ *LRAs could collaborate with producer responsibility companies for the establishment of an EU-wide benchmarking system, with a view to comparing different approaches and encouraging motivation for improvements in efficiency.*

### 4.3 Aspects promoting relevant LRA actions in the future EC Green Paper

Plastic waste recycling/recovery processes and technologies have progressed enough to support the sorting of plastics to such a quality level that the recovered plastic can be used as raw material for the creation of new products, as the Larnaca example indicates. Good quality plastic waste has increased its chances of being sold in the recyclables market at a high price, which in turn positively affects the viability of hi-tech sorting facilities and motivates both LRAs and waste management operators to adopt such technologies. It is therefore suggested that the EC Green Paper looks at ways to:

- ⇒ *Promote policies that facilitate the further development of commercially viable markets for recycled plastic waste. This could be achieved by means of: (i) removing market obstacles, such as technological externalities reducing the value of recycled plastic, an issue linked to producer responsibility to design packages and products taking into account post-use recyclability (design for recycling); and (ii) addressing market failures, such as the externalisation of the environmental impacts of competitive waste management processes, which are further down the waste hierarchy (incineration for energy recovery, sanitary landfill, etc.), thus rendering plastic recycling/recovery a competitive process in terms of overall costs.*

Moreover, EU waste policies have evolved along with recycling technologies towards stricter standards and higher targets. Inevitably, some LRAs, either as a result of specific restrictions (e.g. geographical isolation, small market size, etc.) or due to lack of adequate resources and capacities, experience difficulties in addressing new policy requirements. In this respect, the EC Green Paper could:

- ⇒ *Ensure that plastic waste management policy remains flexible in terms of treatment processes and technologies, whilst securing the implementation of a common set of high environmental standards, so that it can be applied to the different local contexts, in particular the diverse capacities of implementing authorities at local and regional levels.*

During the last two decades, LRAs (along with producer responsibility organisations) have gained valuable experience with separate waste collection and recycling systems for plastics, developing and implementing a wide range of relevant schemes, as the examples of this study indicate. The EC Green Paper should therefore consider:

- ⇒ *Suggesting the establishment of a mechanism providing LRAs with an action plan and guidance for the transfer of good practices in the separate collection, recycling and recovery of plastic waste.*

In plastic waste separate collection and recycling schemes, framework agreements among producer responsibility companies and LRAs are used to regulate the financial contribution by each party, on the basis of expected costs related to the operation of the schemes. This process often feeds into a dedicated fund, used to finance relevant initiatives by LRAs. On several occasions, though, cost estimations are inaccurate, leading to significant annual fluctuations in the availability of resources within the funds. Thus the EC Green Paper should consider:

- ⇒ *Suggesting the establishment of a mechanism to guarantee the financial transparency of transactions between producer responsibility companies and implementing organisations, notably LRAs.*

# Appendix I – List of References

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