

Local waste prevention programmes

In a nutshell

<u>Summary overview</u>							
<p>It is BEMP to put in place waste prevention measures that target both households and public and private organisations. Some examples are adoption of local plastic bag charges, support for the setup of repair shops, introduction of product/material exchange areas in the territory as well as cooperation with social economy organisations, NGOs and restaurants to encourage the development of agreements for the reduction of food waste, thanks to donations. Waste prevention measures can be identified by:</p> <ul style="list-style-type: none"> • assessing current waste generation patterns in the territory; • prioritising the most relevant waste streams in terms of prevention potential, such as food waste and biowaste, paper/cardboard, plastic (packaging), glass and textiles; • Elaborating a local waste prevention strategy involving the relevant stakeholders (e.g. residents, local businesses, social economy organisations, NGOs); • Monitoring the results of the waste prevention measures adopted and, in light of the results, reviewing the waste prevention strategy. 							
<u>Waste management area</u>							
<u>Cross-cutting</u>	<u>MSW - strategy</u>	<u>MSW - prevention</u>	<u>MSW - collection</u>	<u>MSW - EPR</u>	<u>MSW - treatment</u>	<u>CDW</u>	<u>HCW</u>
<u>Applicability</u>							
<p>Waste prevention measures need to be carefully selected based on local circumstances and well implemented (e.g. some may need support by financial incentives) but there are suitable measures for any context.</p> <p>Although some key waste prevention instruments can only be pursued at the international or national level (e.g. product policy, value-added taxation), there is also scope for action at the regional and local levels.</p>							
<u>Specific environmental performance indicators</u>							

In addition to the common environmental performance indicators presented in the best practice Common Environmental Performance indicators, the most appropriate indicators to assess the successful implementation of this BEMP are:

- establishment of a local waste prevention plan, including long-term and short-term targets and provisions for regular monitoring (y/n);
- budget dedicated to waste prevention programmes per resident per year (EUR/capita/year);
- share of total MSW management budget devoted to waste prevention (%);
- number of stakeholders involved in prevention programmes.

Benchmark of excellence

Waste prevention has strategic relevance in the waste management strategy, which includes a local waste prevention programme underpinning long-term (i.e. 10–20 years) and short-term (i.e. 1–5 years) waste prevention targets and including provisions for regular monitoring.

Description

The term 'waste prevention' is defined in the Waste Framework Directive (WFD, 2008), and, being at the top of the waste hierarchy, prevention measures that lead to a reduction in the amount of waste are of utmost priority. In this respect, various instruments such as strong product policies are discussed in order to reduce the throughput of the economic system, i.e. reduction of raw material inputs and reduction of waste outputs (dematerialisation) (Kranert, 2009; Grooterhorst, 2010a, 2010b; van Ewijk and Stegemann, 2016; Gharfalkar et al., 2015; Defra, 2010). Such instruments can only be established and implemented at the global and/or European level (for some instruments also at national level) with policy approaches like ecodesign of products, extended producer responsibility, change of tax systems, etc. (EC Waste reduction, 2010; European Commission, 2012). In this document, the focus is on waste prevention measures that can be implemented at the regional and local levels.

Following the definition of waste prevention, the measures include those to avoid waste at source and those to reuse products and materials or prepare for reuse waste. For the identification of these measures, the following sources have been considered:

- the waste prevention programmes of the Member States, which have to be established according to Article 29 of the Waste Framework Directive (EIONET, 2015);
- guidance documents (e.g. ACR+, 2010; EC Guidance, 2012; EEB, 2012; INTERREG IVC, 2013; ADEME, 2015, Pre-waste, 2015); and
- waste prevention plans of regions, cities or counties.

In many cases, in these documents the focus is on general strategies and recommendations and only a few concrete measures are mentioned. The proposed approach for the development of a waste prevention programme is shown in Figure 1.

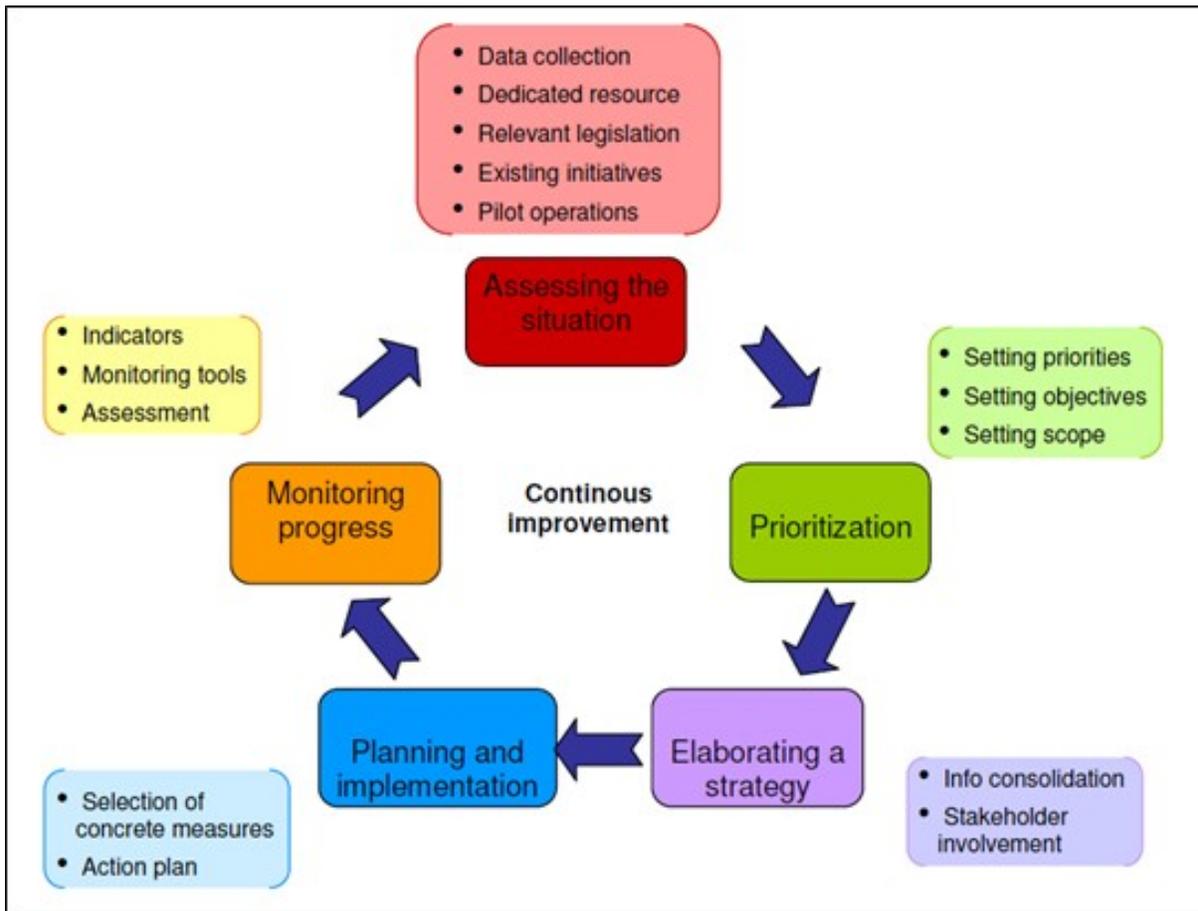


Figure 1. Developing a waste prevention programme (EEB, 2012)

When starting to identify waste prevention measures at the regional and local level, it may be appropriate to focus on the most relevant waste streams, such as food and biowaste, paper/cardboard, plastic (packaging), glass, and textiles (see for instance Welsh Government, 2013; Barcelona City Council, 2013; Phillips et al., 2010). In recent years, the prevention of food waste specifically has been discussed (Sharp et al., 2010a; Cox et al., 2010; European Commission, 2010, 2011a, 2011b). In Table 1, specific prevention measures are presented. They are grouped into measures for individuals and families and for municipalities, cities and counties or private organisations.

Table 1. Examples of waste prevention measures

Measure	Short description	Reference
For individuals and families (consumers)		
Little packaging	To buy things that are produced with as little packaging as possible	Kuriso/Bortelo, 2011
Bags	To use own bags when going shopping, rather than disposable ones provided by the shop	Kuriso/Bortelo, 2011
Reusable packaging	To look for packaging that can be easily reused	Kuriso/Bortelo, 2011
Reusable product	To buy products that can be reused rather than disposable items	Kuriso/Bortelo, 2011
Repair	To try to repair things before buying new items	Kuriso/Bortelo, 2011; City of Graz, 2015

Table 1. Examples of waste prevention measures

Measure	Short description	Reference
Paper use reduction	To reuse paper for writing notes, to avoid printing or print double-sided, to ask for digital billing and invoicing services; in addition, to discourage unwanted mail, especially advertising, for instance by a "no junk mail" sticker on the mailbox	Kuriso/Bortelo, 2011
Container reuse	To reuse containers	Kuriso/Bortelo, 2011
Reusable dishcloth	To use dishcloths rather than paper kitchen towels	Kuriso/Bortelo, 2011
Refillable products	To try to buy refillable products (e.g. printing cartridges, hand soap, powdered cocoa drinks)	Kuriso/Bortelo, 2011
Donation	To donate old items to other possible users	Kuriso/Bortelo, 2011; Sharp et al., 2010a; Cox/Giorgi et al., 2010
Returnable bottles	To buy returnable bottles instead of single-use bottles	Kuriso/Bortelo, 2011
Own cup	To bring own cup, e.g. to school or office	Kuriso/Bortelo, 2011
Needless packaging avoidance	To refuse needless packaging	Kuriso/Bortelo, 2011
Needless product avoidance	To try not to buy needless products	Kuriso/Bortelo, 2011
Reuse shop/centre	To bring reusable products to shops for reselling	Kuriso/Bortelo, 2011; City of Graz, 2015
Bottled water avoidance	To try not to buy bottled drinking water	Kuriso/Bortelo, 2011; Province of Florence, 2014
Reduction of food waste	To try to buy only the quantity of food that one can consume, correctly store purchased food, cook adequate portions and use leftovers	European Commission, 2010, 2011a, 2011b and 2015; Sharp et al., 2010a; Cox/Giorgi et al., 2010
Reusable nappies	To use reusable nappies (supported by the county or city)	Morlok et al., 2017
Mobile dishwasher for festivals	To use a mobile dishwasher (provided by the county or city) for festivals to avoid single-use dishes and cutlery	e.g. Vienna, Rems-Murr County
For municipalities, cities and counties or private organisations		
Mobile dishwasher for festivals	To provide dishes and cutlery along with mobile dishwashers for public festivals for free	e.g. Vienna, Rems-Murr County, City of Graz, 2015
Reduction of canteen waste	To provide reusable dishes, cutleries, napkins and tablecloths as well as tap water and draught beverages in canteens	

Table 1. Examples of waste prevention measures

Measure	Short description	Reference
Reusable nappies	To financially support the use of reusable nappies	e.g. Enfield Council, County of Aschaffenburg, Besançon
Lunchboxes	To provide schoolchildren with reusable lunchboxes	e.g. Rems-Murr County, Barcelona
Repair shops	To support the setup of repair shops	e.g. Vienna, Wales, BMUB, 2013; City of Graz, 2015
Reduction of office paper waste	To promote/adopt reduction of paper consumption in offices (e.g. avoid printing of documents readable on screen, default double-sided printing and copying, use of electronic archives, reuse of envelopes)	City of Graz, 2015
Reduction of food waste	To support activities for the reduction of food waste produced in canteens and restaurants (e.g. staff training, promote customer behaviour change). To promote/support the collection of still edible but no longer sellable food from supermarkets for delivery to social canteens or similar. In addition, to continuously raise awareness so that citizens shall try to buy only the quantity of food they can consume	e.g. LIPOR, Portugal (LIPOR, 2015), Vienna, Wales; BMUB (2013), last minute market, Bologna (last minute market, 2017)
Pay-as-you-throw (PAYT) system	To introduce pay-as-you-throw systems	See the BEMP on PAYT

Source: Own elaboration from different sources

Many of the measures mentioned in Table 1 are for consumers. The change in consumption patterns requires targeted awareness campaigns taking into account psychological mechanisms and the multifaceted nature of waste prevention (Bortoleto et al., 2012; Bortoleto, 2015). Continuous awareness-raising of consumers is required to make them conscious of the waste issue and to keep them motivated (Cecere et al., 2014; Cole et al., 2014). However, economic incentives are much stronger driving forces as the example of charging for plastic bags, e.g. in Ireland, Spain or Japan or anywhere else, demonstrates.

Concerning product reuse (which is a specific aspect within the area of waste prevention measures) such as furniture, electrical and electronic equipment, clothes and home textiles, books, bicycles, etc., there is the BEMP on "Schemes fostering the reuse of products and the preparation for reuse of waste" dealing with the topic.

Environmental benefits

Although waste prevention has high priority, the prevention potential appears to be relatively small in relation to the total municipal waste; only 1–3 % has been reported (Salhofer et al., 2008). For some individual waste streams, the percentage can reach the order of some 10 % (Salhofer et al., 2008). This is confirmed by Figure 2, which shows the development of the total municipal waste amount in Germany, consisting of the fractions: light packaging/plastic, glass, paper/cardboard, biowaste and residual waste. Despite the fact that waste prevention was always a top priority in Germany, the total waste quantity slightly increased. The increase would probably have been even higher without prevention measures but their impact does not seem to be significant. Thereby, quantitative measurement of waste prevention is notoriously difficult as the basic problem is measuring something that is not there (Sharp et al., 2010b; Zorpas and Lasaridi, 2013).

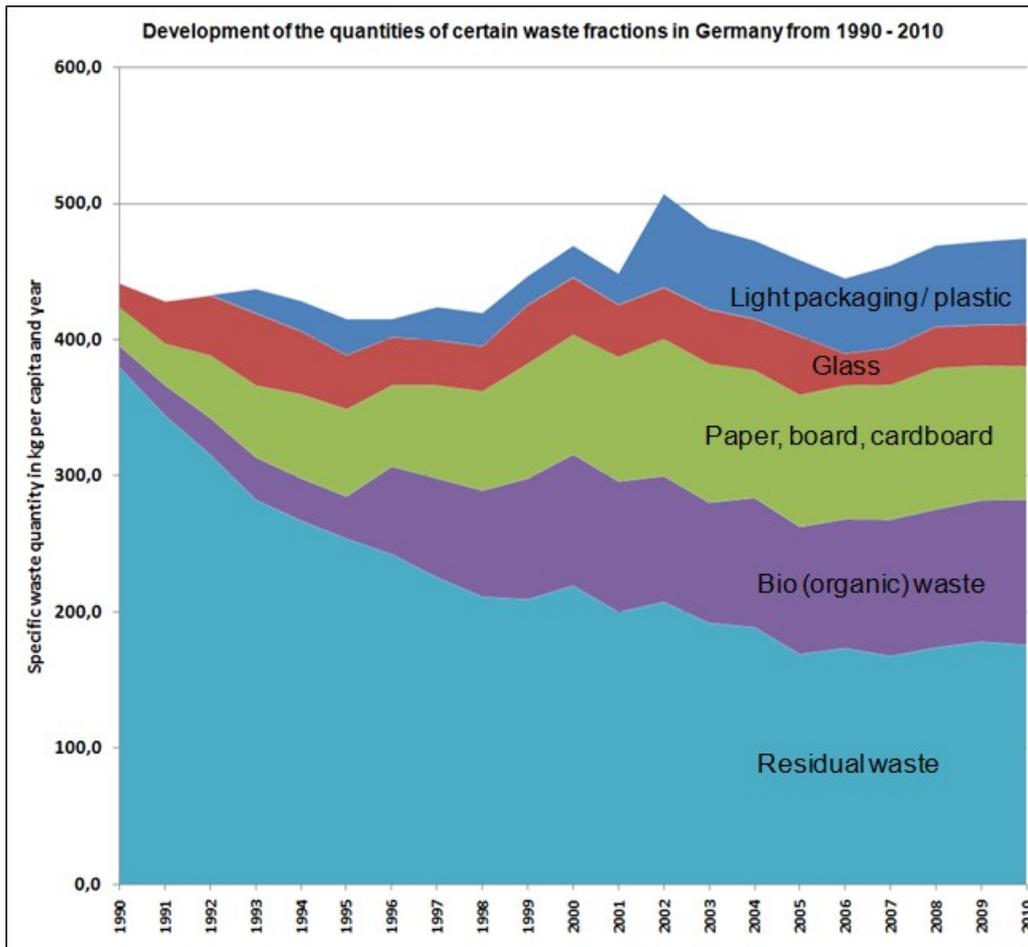
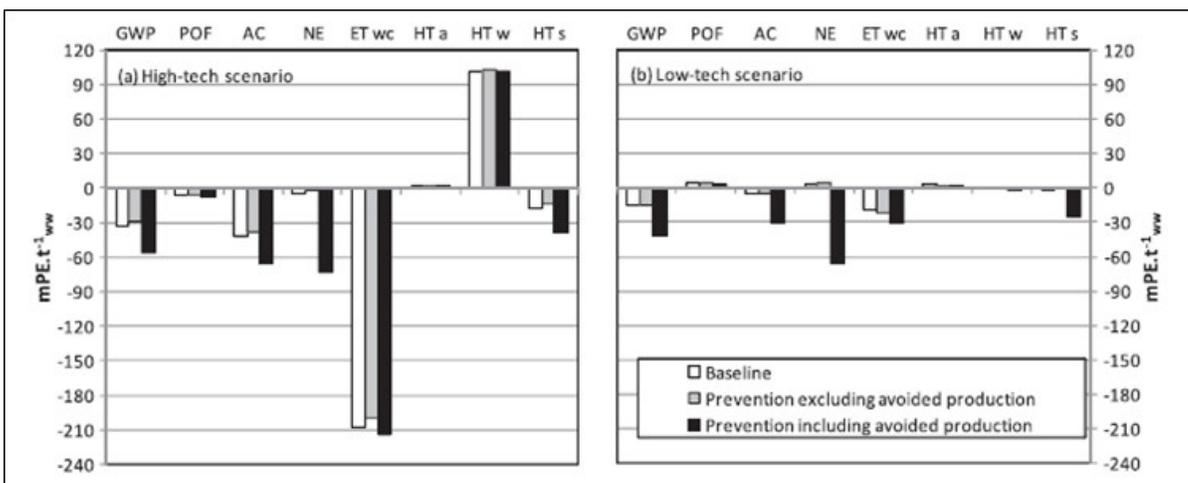


Figure 2. Development of the quantities of certain waste fractions in Germany from 1990 to 2010

The expectation that prevention means reduction of input mass streams and thus reduction of the environmental impact can be confirmed. Figure 3 shows the related environmental impact assessment of integrated waste prevention on two waste management systems. Here, the comparison of the two systems is not important but the illustration that prevention is associated with a significantly lower environmental impact is. However, as indicated, the reduction rates of total municipal waste are low and so the environmental benefit is limited.



Legend:

Impact category	Acronym	Reference	Unit
Acidification	AC	74	kg SO ₂ -eq/person/year
Ecotoxicity water chronic	ET wc	3.52 * 10 ⁵	m ³ water/person/year
Global warming (100 years)	GWP	8.7 * 10 ³	kg CO ₂ -eq/person/year
Human toxicity air	HT a	6.9 * 10 ¹⁰	m ³ air/person/year
Human toxicity soil	HT s	127	m ³ soil/person/year
Human toxicity water	HT w	5 * 10 ⁴	m ³ water/person/year
Nutrient enrichment	NE	119	kg NO ₃ -eq/person/year
Photochemical Ozone formation	POF	25	kg C ₂ H ₂ -eq/person/year

Note: The top of the vertical bars indicates 0 % waste prevention (baseline), the bottom of the vertical bar indicates 100 % waste prevention of the waste streams considered (unsolicited mail, vegetable and meat waste, plastic and glass beverage) (Gentil et al., 2011)

Figure 3. Comparison of integrated waste prevention in two waste management systems.

Side effects

With respect to waste prevention, no significant cross-media effects are known.

Applicability

Waste prevention measures need to be carefully selected based on local circumstances and well implemented (e.g. some may need support by financial incentives) but there are suitable measures for any context.

Although some key waste prevention instruments can only be pursued at the international or national level (e.g. product policy, value-added taxation), there is also scope for action at the regional and local levels.

Economics

There is little information on economic aspects. The investment in awareness campaigns and monitoring of the quantities of the main waste streams will not have a significant impact on waste fees.

Driving forces for implementation

Waste prevention is top of the waste hierarchy of the Waste Framework Directive. According to Article 29 of this Directive, the Member States have to establish waste prevention programmes. This legal background is the main driving force.

Reference organisations

The cities of Barcelona, Vienna, Copenhagen and Besançon and the counties/regions of, Aschaffenburg, Schweinfurt, Flanders and Île-de-France are references with regard to waste prevention (programmes).

Literature

Association of Cities and Regions for Recycling and sustainable Resource management (ACR+) (2010). Quantitative Benchmarks for Waste Prevention, 2010.

- ADEME (2015), National framework for local waste prevention programmes, website: <http://www.optigede.ademe.fr/plan-programme-prevention>, Last access September 2017.
- Barcelona City Council (2013). Waste prevention plan for Barcelona, 2012-2020, https://w110.bcn.cat/MediAmbient/Continguts/Vectors_Ambientals/Neteja_i_Gestio_de_Residus/Documents/Fitxers/wasteprevention, Last access September 2017.
- Bortoleto, A.P. (2015). Waste Prevention Policy and Behaviour – new approaches to reducing waste generation and its environmental impacts. Routledge Taylor & Francis Group, London and New York.
- Bortoleto, A.P., Kurisu, K.H., Hanaki, K. (2012). Model development for household waste prevention behaviour. Waste Management, 32, 2195-2207.
- Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety) (BMUB) (2013). Abfallvermeidungsprogramm des Bundes unter Beteiligung der Länder (Waste prevention programme of the federal government with participation of the federal states) (in German). http://www.bmub.bund.de/fileadmin/Daten_BMU/Pool/Broschueren/abfallvermeidungsprogramm_bf.pdf. Last access September 2017.
- Cecere, G., Mancinelli, S., Mazzanti, M. (2014). Waste prevention and social preferences: the role of intrinsic and extrinsic motivations. Ecological Economics, 107, 163-176.
- City of Graz (2015). Maßnahmenkatalog Abfallvermeidung (Waste Prevention Catalogue), Abfallvermeidungsprogramm der Stadt Graz (Waste Prevention Programme of the City of Graz), http://www.umwelt.graz.at/cms/dokumente/10256661_4851364/a1a8ce3c/Ma%C3%9Fnahmenkatalog_02Oktober_2015.pdf – in German. Last access September 2017.
- Cole, C., Osmani, M., Quddus, M., Wheatley, A., Kay, K. (2014). Toward a Zero waste Strategy for an English Local Authority. Resources, Conservation and Recycling, 89, 64-75.
- Cox, J., Giorgi, S., Sharp, V., Wilson D.C., Blakey, N. (2010). Household waste prevention – a review of evidence. Waste Management & Research, 28, 193-219.
- DEFRA, (2010). “Less is more”: Business Opportunities in Waste & Resource Management, March 2010. Available at: <http://webarchive.nationalarchives.gov.uk/20100415164530/http://www.defra.gov.uk/environment/waste/documents/opportunities-waste-manage.pdf> Last access September 2017.
- European Commission, EC (2010). Analysis of the evolution of waste reduction and the scope of waste prevention – final report (project under the framework contract ENV.G.4/FRA/2008/0112). http://ec.europa.eu/environment/waste/prevention/pdf/report_waste.pdf. Last access September 2017.
- European Commission, EC (2011a). Evolution of (bio-)waste generation/prevention and (bio?)waste prevention indicators – final report (project under the Framework contract ENV.G.4/FRA/2008/0112). http://ec.europa.eu/environment/waste/prevention/pdf/SR1008_FinalReport.pdf. Last access September 2017.
- European Commission, EC (2011b). Guidelines on the prevention of food waste prevention programmes as part of the study on the evolution of (bio-)waste generation/prevention and (bio-)waste prevention indicators (project under the Framework contract ENV.G.4/FRA/2008/0112). http://ec.europa.eu/environment/waste/prevention/pdf/prevention_guidelines.pdf. Last access September 2017.
- European Commission, Directorate-General Environment (2012). Preparing a Waste Prevention Programme – Guidance document. <http://ec.europa.eu/environment/waste/prevention/pdf/Waste%20prevention%20guidelines.pdf>. Last access September 2017.
- European Environmental Bureau, EEB (2012). Tips and advice on how to create an efficient waste prevention programme.
- European Topic Centre on Sustainable Consumption and Production, EIONET (2015). Waste prevention programmes (in the Member States of the European Union). <http://scp.eionet.europa.eu/facts/WPP>. Last access September 2017.
- Gentil, E.C., Gallo, D., Christensen, T.H. (2011). Environmental evaluation of municipal waste prevention. Waste Management, 31, 2371-2379.
- Gharfalkar, M., Court, R., Campbell, C., Ali, Z., Hillier, G. (2015). Analysis of waste hierarchy in the European waste directive 2008/98/EC. Waste Management, 39, 305-313.
- Grooterhorst, A. (2010a). Gefangen in der Kreislaufwirtschaft – oder – Abfallwirtschaft und starke Nachhaltigkeit (Trapped in recycling management – or – Waste management and strong sustainability). Müll und Abfall, 10, 493-500.

Grooterhorst, A. (2010b). Die Nachhaltigkeitslücke – oder – Kann Abfallwirtschaft nachhaltig sein? (The sustainability gap – or – Can waste management be sustainable?. Müll und Abfall, 9, 440-447.

Innovation&Environment – Regions of Europe sharing solutions (INTERREG IVC) (2013). Pre-waste common methodology for regional and local authorities engaging in waste prevention.

Kranert, M. (2009). Abfallvermeidung – Wunsch und Wirklichkeit (Waste prevention – desire and reality). Müll und Abfall, 3, 101.

Last minute market (2017). <https://sites.google.com/lastminutemarket.it/2017/home> Last access July 2017.

LIPOR (2015). Ana Lopes (LIPOR) Personal communication 'Dose certa' project, on 21/10/2015.

Morlok et al., 2017. The Impact of Pay-As-You-Throw Schemes on Municipal Solid Waste Management: The Exemplar Case of the County of Aschaffenburg, Germany. Available at: www.mdpi.com/2079-9276/6/1/8/pdf Last access July 2017.

Phillips P. et al., 2010. A critical review of a key Waste Strategy Initiative in England: Zero Waste Places Projects 2008–2009. Resources, Conservation and Recycling - Volume 55, Issue 3, Pages 335-343.

Pre-waste (2015). Improve the effectiveness of waste prevention policies in EU territories - INTERREG IVC project. Synthesis Report available at: http://www.acrplus.org/images/pdf/Pre-waste_synthesis-report.pdf Last access September 2017.

Province of Florence (2014). Waste-less in Chianti – final report covering the activities of the LIFE project 'LIFE09 ENV/IT/000068.

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=LIFE09_ENV_IT_000068_F

Last access September 2017.

Salhofer, S., Obersteiner, G., Schneider, F., Lebersorger, S. (2008). Potentials for the prevention of municipal solid waste. Waste Management, 28, 245-259.

Sharp, V., Giorgi, S., Wilson D.C. (2010a). Delivery and impact of household waste prevention intervention campaigns (at the local level). Waste Management & Research, 28, 256-268.

Sharp, V., Giorgi, S., Wilson D.C. (2010b). Methods to monitor and evaluate household waste prevention. Waste Management & Research, 28, 269-280.

van Ewijk, S., Stegemann, J. A. (2016). Limitations of the waste hierarchy for achieving absolute reductions in material throughput. Journal of Cleaner Production. Volume 132, Pages 122-128.

Waste Framework Directive (WFD) of the European Union (2008). Directive 2008/98/EC of the European Parliament and of the Council on Waste and Repealing certain directives. Official Journal of the European Union, L 312, 3-30.

Welsh Government (2013). Towards Zero Waste – One Wales: One Planet, The Waste Prevention Programme for Wales, No WG 19974. <http://www.programmeofficers.co.uk/posl/documents/Gloucester/CD13/CD13.80.pdf>. Last access September 2017.

Zorpas, A.A., Lasaridi, K. (2013). Measuring waste prevention. Waste Management, 33, 1047-1056.