

# Managing and minimising waste production

## In a nutshell

SUMMARY
<p>It is best practice to implement advanced waste management in offices owned or managed by public administrations, based on:</p> <ul style="list-style-type: none"><li>• prevention: establish paperless procedures and archives, ensure durability of equipment and consumables (e.g. via green public procurement, see Section 12), enable reuse of office furniture and equipment (e.g. setup of an online inventory of available equipment, furniture and stationery that are no longer needed and ensuring that all services and staff look there before purchasing new items; providing professional cleaning, repair and maintenance to extend lifetime); incentivize staff to use reusable cups instead of single use plastics; provide water fountains (without plastic cups) instead of plastic bottles in meetings or public spaces;</li><li>• segregation: easy access to recycling bins for all the most common waste types and establishment of recycling points for all other waste types, in order to minimise residual waste generation; purchase equipment and consumables made with recyclable materials;</li><li>• monitoring: regular accounting of quantities of waste generated by waste type, covering all types of waste (e.g. separately collected fractions, residual waste, hazardous waste); this can be achieved thanks to appropriate strategies and the involvement of staff from different services.</li></ul>
Target group
Public administrations having office-based operations
Applicability
This best practice is applicable to all public administrations, and specific to office activity. The specific measure implemented (e.g. the different fractions into which waste is segregated) should reflect the specific conditions (e.g. types of waste generated, local availability of recycling services for particular waste types, local legislation and waste management costs).
Environmental performance indicators
<ul style="list-style-type: none"><li>• Total annual office waste generation per full time equivalent (FTE) employee (kg/FTE/year)</li><li>• Total annual amount of furniture, equipment and stationery that is reused (kg/FTE/year, EUR of avoided purchase/FTE/year)</li><li>• Office waste sent for recycling as % of total waste by weight (%)</li><li>• Residual office waste as % of total waste by weight (%)</li></ul>
Bencharks of excellence
<ul style="list-style-type: none"><li>• Zero waste generated in the office buildings is sent to landfill</li><li>• Total waste generation in office buildings is lower than 200 kg/full time equivalent employee/year</li></ul>

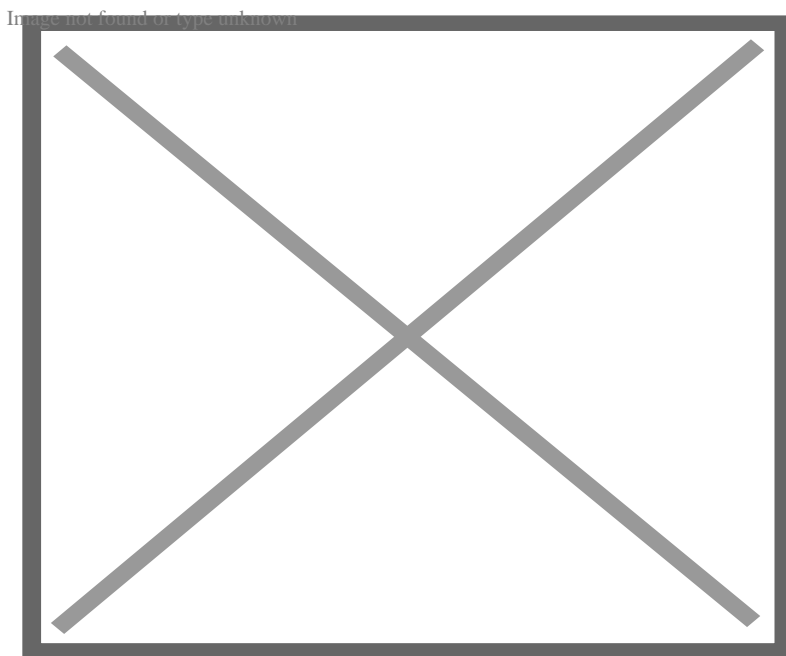
## Description

This best practice covers the managing and minimising of waste production for public administration offices. Waste generated in the offices typically comprises (ADEME, 2012):

- Paper (white paper, printed matter e.g. magazines)
- Packaging including envelopes
- Other non-hazardous waste (e.g. office consumables, office furniture, disposable cups)
- Waste electric and electronic equipment e.g. lighting, computing equipment
- Hazardous waste e.g. printing toners. Computing equipment can contain pollutants such as arsenic in diodes, flame retardants in screens, heavy metals in circuit boards, but also recyclable materials such as metals.

Offices may typically produce less waste than other sectors (e.g. domestic / manufacturing), however a typical worker in the service sector can produce 120 – 140kg waste per year (ADEME, 2012). There is potential for reducing this significantly and achieving recycling rates of over 70%.

Waste management at all levels should follow the so-called waste hierarchy<sup>[1]</sup> where first waste should be prevented, followed by reuse (with no / minimal processing), recycling (reuse of the material after processing), then energy recovery, with disposal to landfill as a last resort – see Figure 1.



**Figure 1: Diagram depicting the waste hierarchy (Defra, 2010). The most preferred option is at the top and the least preferred option is at the bottom of the hierarchy. Disposal refers to landfill.**

A strategy for an office building based on the waste hierarchy would broadly comprise:

- Prevention
- Promoting reuse
- Establishing infrastructure that enables segregation for recycling
- Monitoring and reducing residual waste

The above should be implemented by means of a waste management approach following the principles of PDCA - Plan, Do, Check, Act, as per environmental management systems such as EMAS and ISO 14001. This sequence facilitates continuous improvement and allows those responsible to be proactive (IEMA, n.d.).

For management of waste produced from office canteens and coffee bars see also best practice on minimising the environmental impacts on canteen and bars and organisation of meetings and events.

Effective waste management is a comprehensive approach that requires buy in from management, building managers, contractors and building occupants.

### Waste prevention and reuse

The initial approach should always be to avoid waste. There are some suggestions below for how this can be implemented:

- Paperless procedures/archives
- Employees can have their own cups and pens, which are refilled rather than using disposables.
- Systems can be created to enable reuse such as for office furniture or IT equipment. This will probably involve a well organised physical storage space coupled with an online inventory. Where there is no need for the items, administrations could resell these. They could be offered to staff in the first instance and then offered to third party organisations such as community groups.
- Equipment could be leased rather than purchased (e.g. printers) as then service providers are incentivised to use durable equipment, thus steering away from buying products that are built for obsolescence. When it is preferable to buy equipment, appropriate durability criteria should be included in the technical specifications.
- Green procurement policies should ensure that the whole product lifecycle is being considered rather than just price – this could involve purchasing more durable products, which in some cases may cost more. Minimal packaging should also be considered in any criteria. Detailed criteria for Green Public Procurement (GPP) are available for various products including cleaning products and services, furniture, etc. (European Commission, 2014). See also best practices on green public procurement.
- Reuse should be promoted with employees and awareness raised. There may be added social benefits such as helping charities e.g. donating computers which are no longer needed. Reuse facilities could be extended to items staff can bring from home, including IT equipment, batteries, textiles, etc., and reported separately.

### Increasing recycling rates

Robust infrastructure for segregated waste collection should be made available throughout the offices and this must be integrated with the waste streams that can be recycled by the contracted waste management company. Staff should be trained in the importance of waste segregation. This includes cleaning staff who are often in charge of emptying the different bins into larger containers.

The design and signage of waste bins is important – signs hung above waste bins can flag their location from a distance and bins should be colour-coded and labelled with wording and images to demonstrate types of waste suitable for each bin. For major waste fractions (such as paper), it is best practice to make bins available wherever there is a residual waste bin so that the option to recycle is facilitated.

### Management aspects

As with environmental management more broadly, measurement and monitoring is necessary. This will record the disposal routes (e.g. recycled, composted or landfilled) and progress made towards targets. Regular waste audits are necessary to ensure that there is minimal contamination and to highlight any additional waste streams which do not yet have a reuse or recycling route.

In some cases on-site balers for paper / cardboard may be cost effective. This equipment compress the waste on site reducing storage space required and can enable a return-on-investment, depending on the amount of waste produced, by reducing how often this waste fraction needs to be collected from the office building.

Part of the management role is for all staff to be made aware of the issues. Awareness campaigns could be run, making use of posters, signs and educational guides distributed to staff. There could be a central sustainability hub where information on waste segregation and advice is provided. Alternatively, a nominated waste officer could carry out training in situ, for example around employees desks and ensure that every employee understood the aspirations and nature of each waste stream.

Checks and sanctions could be put in place. This could include regular monitoring of waste with results possibly displayed. There could be inter-departmental competitions set up, departments with the least waste and wrong segregations receiving prizes.

### Setting targets

Targets can be set on the basis of available benchmarks but will depend on size of the office and facilities e.g. whether it has a canteen or not. However, this can be helped by normalising performance figures per employee.

Leeds City Council has a target recycling rate of 50% by 2020. The Council measures total waste (tonnes), recycling rate (%), waste to landfill (%) and hazardous waste. Targets are to increase recycling year on year, reduce waste at source and reduce waste to landfill (Leeds City Council, 2013).

[1] The concept of waste hierarchy is laid out in the European Waste Framework Directive (Directive 2008/98/EC).

## **Environmental benefits**

Minimising the amount of waste generated and maximising re-use and recycling rates have the following environmental benefits:

- Save virgin resources
- Reduce processing energy – recycling materials uses less than extracting and processing virgin materials
- Save on lifecycle energy and carbon involved in producing products and transporting them to the end user.

## **Side effects**

There are no cross media effects with the implementation of this BEMP.

## **Applicability**

This best practice is applicable for all public administrations throughout Europe. However, the different fractions in which waste is segregated should reflect the local availability of recycling services for particular waste types and costs in different countries. Certain practices may be more appropriate for larger offices and some for smaller. For example, a formal on and offline system for furniture reuse would only make sense for larger organisations or for a number of smaller organisations running a common scheme.

## **Economics**

An effective waste management strategy (with a good focus on prevention) can enable significant reductions in purchases. For example spend on disposable cups can be entirely avoided, and refills are generally much cheaper than new disposable items. As for more durable equipment, although the purchasing cost may be higher, significant reductions in life-cycle cost<sup>[1]</sup> can be achieved.

Markets for recycled goods are global and heavily fluctuate hence costs of recycling can vary to a large extent. However as a general rule, recycling can be cost effective and sometimes cost recovery is available e.g. for baled cardboard. Table 3 shows some sample prices for different disposal routes for waste in the UK. Although these prices are for waste management companies, they will be reflected to some extent by end costs paid by the waste producers.

**Table3: UK gate fees report 2014/2015 - costs in £ per tonne (WRAP, 2015)**

Treatment	Material / Type of facility / Grade	Median	Range
MRF <sup>1</sup>	Gate fee for sorting four or more materials (all contract years)	£6	-£43 to £86
	Contracts beginning in 2014 or later sorting four or more materials	£0	-£35 to £34
Organics	Open-air windrow (OAW) <sup>2</sup>	£24	£12 to £53
	In-vessel composting (IVC) <sup>3</sup>	£46	£24 to £75
	Anaerobic Digestion (AD) <sup>4</sup>	£40	£11 to £60
Wood Waste	All grades/types collected from HWRCs <sup>5</sup>	£35	-£4 to £90
MBT	Household waste	£88	£68 to £107
EfW <sup>6</sup>	Pre-2000 facilities	£73	£36 to £110
	Post-2000 facilities	£99	£65 to £132
Landfill	Gate fee only	£20	£9 to £55
	Gate fee plus landfill tax <sup>7</sup>	£100	£89 to £135

1. MRF gate fees reported here exclude haulage costs but include material revenues.

2. This gate fee is for green waste being sent to OAW facilities by local authorities.
  3. This gate fee is for mixed food and green waste being sent to IVC facilities by local authorities under a contract.
  4. This gate fee is for food waste only being sent to AD facilities by local authorities under a contract.
  5. Local authority reported gate fees for the onward management or treatment of waste wood
  6. Incineration with energy recovery. Defra figures on gate fees for PPP/PFI projects have not been included in the summary report this year, as the Defra figures are very similar to those reported here and therefore provide little additional information
  7. At the time of the survey the standard rate of landfill tax was £80 per tonne (i.e. from April 2014)
- Recycling has been incentivised by landfill taxes in Europe. The tax now exists in 20 European countries and rates are on the increase (Fischer et al, 2012).

[1] Lifecycle costing is a technique for estimating the total cost of ownership. It allows costs between different options to be compared over a set timeframe, taking initial capital costs and future operational and asset replacement costs into account (European Commission, 2014).

## **Driving forces for implementation**

Drivers for managing and minimising waste consumption in public sector offices are environmental, financial and social.

Avoiding purchases clearly lower procurement costs for supplies required by offices, and recycling often costs less than landfilling residual waste. It is estimated that local authorities can spend millions unnecessarily on landfill taxes (Shankleman, 2013).

There may be social drivers such as helping charities benefitting from reuse opportunities e.g. reuse of computers.

Implementing the best practice is also likely to reduce risk of non-compliance with legislation, help ensure business continuity (security of supply) and enhance reputation.

When an effective waste management system is implemented specifically for public administration offices, it can play the additional role of demonstrating best practice. For example the landfill diversion figures, recycling rates and actions can be made public.

## **Reference organisations**

### *Barcelona City Council (Spain)*

Barcelona has run a long term and pioneering Green Office Programme incorporating actions on waste reduction and increasing recycling.

### *London School of Economics (UK)*

Recycling activities, waste streams and embedding processes with staff. Success demonstrated by reduction in waste to landfill.

### Tarbes (France)

Recycling offered for various waste streams, internal furniture reuse scheme.

### Sunderland City Council (UK)

A successful furniture reuse scheme.

### Aberdeenshire Council (Scotland, UK)

Increase in recycling and reductions in waste to landfill, employment of a dedicated officer.

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