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Preparing a Waste Management Plan

A methodological guidance note

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Waste legislation)

on the basis of 'Preparing a Waste Management Plan — a
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Abbreviations

BMW	Biodegradable Municipal Waste
C&D	Construction and Demolition waste
EIA	Environmental Impact Assessment
EDM	Electronic Data Management
ELV	End-of-Life Vehicles
EMAS	Eco-Management and Audit Scheme
EU	European Union
EUDIN	European Data Interchange for Waste Notification System
GBI	Green Business Initiative
GPP	Green Public Purchasing, Green Public Procurement
IRP	Integrated Resource Planning
LCA	Life Cycle Analysis
MBT	Mechanical-Biological Treatment
MFA	Material Flow Analysis
MS	Member State
MSW	Municipal Solid Waste
SAP	Structured Analysis Procedure
SME	Small and Medium sized Enterprise
SMT	Scenario Management Table
WEEE	Waste Electrical and Electronic Equipment
WFD	Waste Framework Directive (2008/98/EC)
WMP	Waste Management Plan
WSR	Waste Shipment Regulation

Unless otherwise specified, terms used in this Guidance Note are in line with the definitions given in Directive 2008/98/EC on waste.

1. Introduction

1.1 About this document

Purpose

EU legislation requires the competent authority in each Member State to draw up one or more waste management plans in accordance with the relevant EU directives. It is the responsibility of each individual Member State to apply the principles of these directives when implementing a national waste management system. Waste management planning has thus become a permanent element of public planning efforts in all EU Member States.

This Guidance Note serves to assist waste management planning and promote the development of more coherent and appropriate planning practices across the EU Member States, in compliance with the requirements of the relevant EU legislation.

The Waste Framework Directive 2008/98/EC specifies the current scope and content of waste management planning obligations. Therefore, the Guidance Note issued in May 2003 ([link](#)) needed to be adapted accordingly. Developments in European waste policy and legislation since 2003 had to be considered. Guidance on waste prevention programmes had to be added.

This Guidance Note is aimed mainly at the competent authorities in charge of preparing waste management plans, i.e. national administrations and environmental protection agencies and local and regional authorities. However, it is clear that the focal point in waste management planning differs at national and local/regional levels and this should be taken into account when reading the document.

Furthermore, several parties play a role in the planning process: politicians, administrative staff and planners, contractors, various public organisations, stakeholders in general and the wider public. Each of these groups may find parts of this document of particular interest to them.

The guidance given is generally applicable and can be used in the drafting of both national waste management plans in EU Member States and local management plans for a municipality or region in a given country. Drawing up a Guidance Note with such broad scope is not an easy task. Therefore, many sections include an indication of the administrative level to which the stated conditions apply. National requirements for regional/local waste management plans have been left out of the document, but the need to consider such requirements has been taken into account.

The Guidance Note was originally prepared by the European Topic Centre on Waste and Material Flows, and has subsequently been

revised and updated to bring it into line with the current Waste Framework Directive by Partners of the ETAGIW¹ Consortium (namely Umweltbundesamt GmbH (AEE), BiPRO GmbH Munich, and the Ekotoxikologické Centrum Bratislava (ETC)) on the initiative of the European Commission. As such, this Guidance Note should not be read as representing any official views of the Commission or imposing or suggesting any procedural requirements.

Structure

The Guidance Note contains a review of the overall policies and principles applying to planning in the field of waste management, including waste prevention, in the EU. This includes a review of legislation in force, and in some fields practical methods are indicated for fleshing out the framework put in place by the EU and the various Member States for the contents of management plans. Furthermore, a framework — or 'step-by-step model' — is presented as a source of inspiration for drawing up an individual waste management plan.

Throughout the text there are boxes with examples from waste management plans or from other guidelines, as well as links to relevant information that may be useful when drafting a waste management plan. Furthermore, Chapters 3, 4 and 5 include a checklist with relevant items to consider in the planning process.

This document relates exclusively to drafting of waste management plans. As regards waste prevention programmes, guidance can be found in the 'Waste Prevention Handbook for EU Member States: Guidelines on waste prevention programmes, supporting the revised framework directive' accessible on the European Commission website:

<http://ec.europa.eu/environment/waste/prevention/guidelines.htm>.

At the end of the document a list of key references, including useful websites, is provided for further assistance.

1.2 Why do we need waste management plans?

Waste management plans have a key role to play in achieving sustainable waste management that is in line with EU waste legislation. Their main purpose is to give an overview of all waste generated (including imported, and by specific waste streams) and

¹ Expert team for assessment and guidance for the implementation of Waste legislation.

treatment options for this waste. The plans will provide a framework for the following:

- **Compliance with waste policy and target achievement:**
Waste management plans, national as well as local/regional, are important instruments contributing to implementation and achievement of policies and targets set out in the field of waste management at national and EU level. Waste management plans have to cover the entire geographical territory of the Member States (MS). In the case of several planning levels or parallel planning, waste management plans must be coordinated — this is necessary to ensure that requirements of the waste directives which are addressed to the MS (and not to the regions) are met by each country. It is a good practice to have regional plans approved by the central government.
- **Stocktaking of waste and capacity for managing it:**
Waste management plans give an outline of waste streams from different sources and quantities to be managed. Furthermore, they contribute to ensuring that the capacity and the nature of collection, separation and treatment systems, including recycling, other recovery and disposal methods as well as waste exports and imports, match the type and quantity of the waste to be managed.
A waste management plan should cover all relevant waste streams, their generation, treatment and shipment. [see Chapters 4.1 and 4.3]
The status of the existing waste management system should be described in detail. [see Chapter 4.2]
- **Outline of needs and future developments:**
Waste management plans must contain forecasts of future waste streams and the import and export of waste as well as the associated needs for new collection schemes, recovery and disposal installations. This includes capacity planning for recovery and disposal installations and sufficient information on location criteria for treatment plants. In order to estimate the future relevance of a waste stream, the evolution of its quantity should be assessed. [see Chapter 5.1]
Planning of collection systems and waste treatment capacity should be based on comprehensive estimation of future needs. [see Chapter 5.3] The waste management plan should contain either a concrete list of sites suitable for waste treatment installations or criteria for site identification. [see Chapter 5.4]
- **Outline for management of packaging waste:**
Discuss requirements for the prevention and re-use of packaging and packaging waste (Packaging Directive, Articles 14, 4 and 5) and measures taken/necessary to ensure that the re-use/recycling/recovery targets for packaging and packaging waste will be reached. [see Chapter 3.2]

- **Outline for management of biodegradable waste:**
Discuss strategies and measures taken to achieve reduction of biodegradable waste going to landfills (Landfill Directive, Article 5) and to reach the targets set.
Chapter 3.2 deals with additions to the waste management plan for specific waste streams.
- **Information on general waste management policies and technological measures:**
Plans must describe waste management policies that aim to comply with the waste hierarchy and to achieve continuous improvement in waste management.
This will include any special arrangements for waste oils, hazardous waste or waste streams addressed by specific EU legislation.
A description of general waste management policies and specific waste streams can be found in Chapter 2.2. Additional information on policy instruments is presented in Chapter 5.3.

In addition, WMPs can discuss and arrange the following aspects:

- **Outline of waste management organisation:**
Organisational waste management aspects, including allocation of responsibility between public and private actors. [see Chapter 4.4]
- **Evaluation of waste policies:**
Evaluation of specific waste policy instruments, with a strong focus on economic instruments. [see Chapter 5.6]
- **Awareness campaigns/information provision:**
Use of awareness campaigns and information provision directed at the general public or at a specific group of consumers. [see Chapter 5.7]
- **Contaminated waste disposal sites:**
Inventory of historically contaminated waste disposal sites and measures for their rehabilitation. [see Chapter 5.8]
- **Outline of economic and investment requirements:**
WMPs make provision for a statement of financial requirements for the operation of collection schemes, treatment of waste, etc. On this basis, the needs for future investments in waste treatment plans may be determined.
- **Waste prevention programmes (WPP):**
WPP will be mandatory for EU Member States by the end of 2013. They can be integrated into WMPs or other environmental policy programmes or can be established as standalone programmes.
WPP need to describe as a minimum the waste prevention

objectives and existing prevention measures, indicating to what extent these objectives and measures are aimed at the decoupling of economic growth from the environmental impacts of waste generation, and specifying benchmarks for adopted waste prevention measures; they must evaluate the usefulness of the examples of measures indicated in Annex IV to the WFD or other appropriate measures.

Efficient waste management commonly requires the participation and cooperation of several involved parties/authorities, and coherent planning helps to avoid unnecessary duplication of effort and thus benefits all participants in their work together.

The increasing complexity of waste management issues and the standards set by EU directives entail more stringent requirements in terms of the suitability of treatment plants. In many cases, this means larger and more complex plants for waste treatment, which involves the cooperation of several regional units in the establishment and operation of the plants. In order to enjoy the benefits of large-scale operation covering a wider region, the service is often provided by either intermunicipal units or private enterprises. This makes sense, especially for waste streams or waste treatment methods requiring expensive large-scale equipment, e.g. incineration plants.

1.3 How to respond to the requirements of the new WFD

The WFD does not specify how many plans should be drawn up by a MS, or on which administrative level. However, each MS must ensure that their plans cover the entire geographical territory of the country and that the waste management in the country is in line with the law. In order to comply with these requirements, it is important that competent authorities coordinate all aspects concerning timing, competent regional or local authorities, geographical coverage, scope, review periods and review procedures, coordination with other MS, participation of stakeholders and the general public, as laid down in various articles of the WFD (in particular Article 28).

Such aspects should be reflected in the respective chapters of a national plan or a national guidance document which can be issued to guide regional and local management planning.

Adherence to the structure of Article 28 WFD can facilitate the production of a compliant WMP.

A checklist for compiling a perfect and compliant waste management plan is presented in Chapter 7 of this document (detailed list of questions and provisions). In addition, this Guidance Note contains a

list of minimum to maximum criteria for a WMP compliant and in line with the requirements of EU legislation that can be used as a model for drafting work.

Drawing up or revising a waste management plan on the basis of the requirements of Article 28 WFD is a challenging task. In order to make the WMP practical and easily readable, it is recommended to keep its content as short and precise as possible.

Furthermore, a summary chapter outlining the main content of the status part as well as the planning part should be presented at the beginning of the waste management plan.

Guidance on the different aspects of waste management planning pursuant to the new WFD can be found in the following chapters of this Guidance Note:

1. Relevant waste streams, their generation, treatment and shipment. [Chapters 4.1 and 4.3]
2. Additional chapters for specific waste streams (e.g. packaging, bio-waste) [Chapter 3.2]
3. The status of the existing waste management system [Chapter 4.2]
4. Information about the future relevance of a waste stream and the evolution of its quantity [Chapter 5.1]
5. Planning of collection systems and waste treatment capacity [Chapter 5.3]
6. Information about concrete listing of sites suitable for waste treatment installations or criteria for site identification [Chapter 5.4]
7. Description of general waste management policies and specific waste streams [Chapter 2.2.] Additional information on policy instruments is presented in Chapter 5.3.
8. Information on how to describe organisational aspects of waste management [Chapter 4.4].
9. Economic instruments and their evaluation [Chapter 5.6].
10. Information about public awareness campaigns [Chapter 5.7.]
11. Information about the topic of contaminated waste disposal sites [Chapter 5.8].

1.4 Structure of a typical waste management plan

There is no rigid pattern for how to structure a waste management plan. However, it may be expedient to structure the plan with a *status part* and a *planning part* as the key elements, and to address other aspects like management policies, packaging waste management, and any voluntary elements, according to the legal requirements.

The WFD sets out the main requirements for the content of a waste management plan. In addition, a number of other EU directives stipulate planning elements that must be included in a plan. The European legislative basis is discussed in more detail in Chapter 2.

A national waste management plan will often be of a strategic nature, setting certain objectives, whereas regional or local plans will be more action or implementation-oriented — operational plans with detailed descriptions of current collection systems, treatment plants, etc.

National waste management plans or regional/local ones, however, may contain more extensive measures depending on national legislation and the waste policy applying regionally or locally.

Box 1-1 gives an example of the possible elements of a waste management plan. It should be noted that a waste management plan may be structured in other ways.

Box 1-1: Elements of a waste management plan

Background

- 1 Overall waste problematic in a territory
- 2 EU legislation
- 3 National legislation
- 4 Description of national waste policy and prevailing principles to address Point 1 above, in line with the waste hierarchy
- 5 Description of objectives set in specific areas
- 6 Inputs from the consultation process

Status part

- 1 Waste amounts, e.g.:
 - a) waste streams
 - b) waste sources
 - c) waste management options
- 2 Waste collection and treatment for the above
- 3 Waste shipment
- 4 Organisation and financing
- 5 Assessment of previous objectives

Planning part

- 1 Assumptions for planning
- 2 Forecast in terms of waste generation, total and per waste stream
- 3 Determination of objectives for forecasted:
 - a) waste streams
 - b) waste sources
 - c) waste management options
- 4 Plan of action, including measures for achieving objectives:
 - a) collection systems
 - b) waste management facilities
 - c) responsibilities
 - d) economy and financing

1.5 Planning process and public consultation

The waste management planning process runs in cycles, i.e. in principle it is a continuous process, where the plan or strategy is revised at regular intervals. The process may be broken down into six phases: general considerations, status part, planning part, consultation process, implementation, and plan revision. The planning process is presented in Figure 1-1.

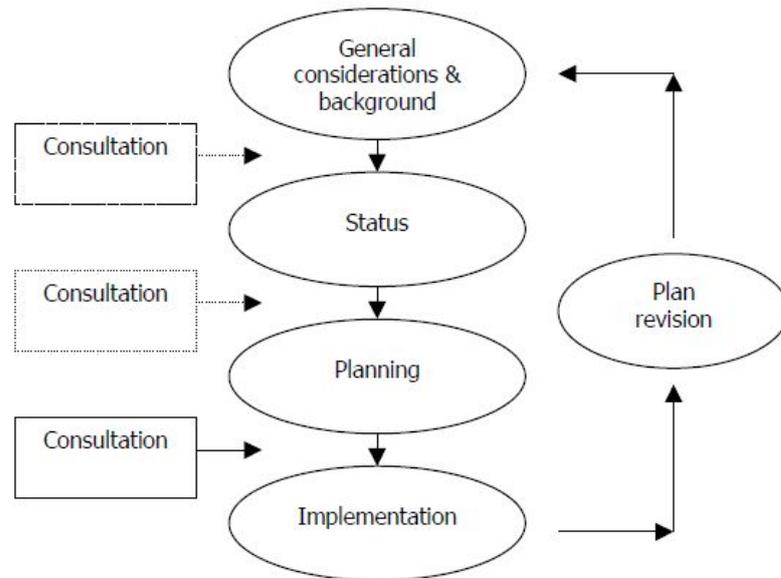


Figure 1-1: Planning process

General considerations and background

As a starting point, the decision is taken to draw up a waste management plan, and all assumptions are gathered. In this phase the planning period is determined, and any other boundaries of the planning scope are clarified. An important issue here is public participation, who should be involved in the planning process and how? Time frames and work plans for preparing the WMP are set out. Moreover, the relationship with other plans, such as spatial and energy planning, is considered. The general considerations are presented in Chapter 3 of this document.

The background part of the waste management plan includes considerations regarding the EU waste management principles as well as current and expected EU directives. The legislative framework of the EU is presented in Chapter 2.

Status

In this phase all data and information on the current situation in the waste management field are gathered and analysed. Then the current waste management system is evaluated, i.e. problems relating to the current system are identified and also the possible solutions to these problems. Questions to be answered in this phase are: does the current system comply with the objectives that are set and may be expected in the future (for example at EU level) and if not, how can the system be improved? The status part is presented in Chapter 4.

Planning

The planning part is prepared on the basis of requirements in EU and national legislation, the status part and relevant assumptions for projecting future developments. Determination of political objectives is a central element, e.g. for priority waste streams or waste treatment, and to develop indicators for checking whether the objectives are met. Another central element is to evaluate how these objectives may be met most effectively.

For this purpose the choice of measures and instruments for the implementation of the plan or strategy is relevant. The planning part is presented in Chapter 5.

Consultation process

The public should have a say in any future waste management system and a consultation phase must be included in the planning process before the final waste management plan and its initiatives are adopted.

Public consultations may take place at various stages in the planning process, for example as a kick-off meeting before the status part, allowing the competent authority to receive ideas and inputs from selected stakeholders or the general public. Alternatively, consultations may be placed just before the planning part when the problems and possible solutions have been identified.

However, in the preparation of a national waste management plan the public in practice is often involved in a consultation round when the first draft of the plan is available. The consultation round may be very limited — the draft plan is sent for written comments to selected stakeholders (political parties, industrial organisations in the waste management sector, consumer and environmental organisations, NGOs, etc.).

The preparation of a regional/local waste management plan often includes a more extensive consultation phase, for example with public meetings, distribution of information pamphlets and information about the plan on the Internet. Public consultation and

the participants in the planning process are presented in Chapter 3.2.

Implementation

Following adoption of the waste management plan, its orientations are put into practice via legislation and regulation, negotiations with the industry, or information to the general public. The implementation of the waste management plan/strategy is not dealt with in further detail in this Guidance Note.

Plan revision

Well ahead of the scheduled end of the planning period, initiatives are taken to revise the plan. At the start of a new planning period the process set out in Figure 1-1 is repeated.

Initially, all assumptions are gathered, and the results of the previous plan are analysed in detail during the preparation of a new status report. Special questions of interest include: which objectives have been met? Which activities were not implemented or did not have the desired effect? Did any of the initiatives have an unexpected impact on other sectors?

Against the background of the new status report and any new political objectives or other requirements, for example at EU level, the next generation waste management plan is prepared.

Revision of the plan is not dealt with in further detail in this Guidance Note.

2. Legislative framework

The European legislative framework with respect to waste management planning is presented in this chapter. This presentation focuses primarily on the directives that stipulate a planning obligation (the Directive on waste and the Directive on packaging and packaging waste). Subsequently, some possible elements that may be included in the waste management plan are presented.

2.1 Legislation on waste

Figure 2-1 below provides a non-exhaustive list of legal documents on waste currently in force at EU level.

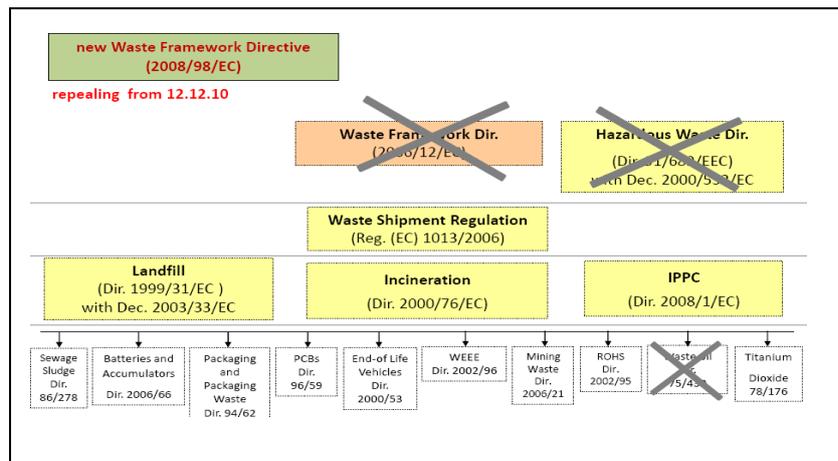


Figure 2-1: Systematic overview of EU waste management legislation

The legal documents may be divided into four groups with the Directive on waste (2008/98/EC) constituting the overall EU regulatory 'framework'.

Directive 2008/98/EC sets out fundamental definitions, basic principles and overall strategic aims and lays down requirements for all types of waste, unless they are specifically regulated by other directives.

A number of other directives regulate specific waste streams, concerning for example titanium dioxide waste, packaging and packaging waste, PCBs and PCTs, waste batteries and accumulators, sewage sludge, end-of life vehicles (ELV), waste electrical and electronic equipment (WEEE), and POPs (persistent organic pollutants).

A final group of directives regulate waste treatment operations: waste incineration and co-incineration, and disposal of waste through landfilling.

A specific type of permit is required for certain waste management operations under Directive 2008/1/EC on integrated pollution prevention and control (IPPC) (note that this will soon be replaced by a new EU Industrial Emissions Directive).

Regulation (EC) No 1013/2006 covers transfrontier shipments of waste.

The Waste Framework Directive

The obligation for Member States to establish a waste management plan is laid down in Directive 2008/98/EC of 19 November 2008 on waste and repealing certain Directives.

The WFD applies to any substance or object which the holder discards or intends to or is required to discard (see definition in Article 3, No 1). However, it does not apply to gaseous effluents or to certain categories of waste (e.g. radioactive waste) and other groups of waste to which specific EU legislation applies, to the extent that they are covered by that legislation (extractive waste, animal carcasses and agricultural waste, waste water) (Article 2).

The subject matter of the WFD is laid down in Article 1, namely measures aimed at protecting the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.

Under Article 13, Member States must take the necessary measures to ensure that waste management is carried out without endangering human health, without harming the environment and, in particular:

- (a) without risk to water, air, soil, plants or animals;
- (b) without causing a nuisance through noise or odours; and
- (c) without adversely affecting the countryside or places of special interest.

Further key objectives of the WFD are set out in Article 4 (waste hierarchy) with subsequent provisions on prevention of waste (Article 9) and on re-use, recovery and recycling (Articles 10 and 11), and requirements for disposal of waste (Article 12).

Additionally, Member States have to apply the principles of self-sufficiency and proximity (Article 16) and ensure that, in accordance with the polluter-pays principle, the costs of waste management are borne by the original waste producer or by the current or previous waste holders (Article 14).

According to Article 28, the competent authorities of the Member States are to establish a waste management plan that relates in particular to the following elements, which are mandatorily to be addressed in each waste management plan:

- (a) the type, quantity and source of waste generated within the territory, the waste likely to be shipped from or to the national territory, and an evaluation of the development of waste streams in the future;
- (b) existing waste collection schemes and major disposal and recovery installations, including any special arrangements for waste oils, hazardous waste or waste streams addressed by specific EU legislation;
- (c) an assessment of the need for new collection schemes, the closure of existing waste installations, additional waste installation infrastructure in accordance with Article 16 and, if necessary, the investments related thereto;
- (d) sufficient information on the location criteria for site identification and on the capacity of future disposal or major recovery installations, if necessary;
- (e) general waste management policies, including planned waste management technologies and methods, or policies for waste posing specific management problems.

Other EU legislation that includes provisions relevant to waste planning

In addition to the general requirement to develop waste management planning, other directives in the waste sector require the establishment of specific plans.

The relevant legislation is presented in Table 2-1.

Table 2-1: Waste management legislation that stipulates a planning obligation

<p>Directive 2008/98/EC of 19 November 2008 on waste</p>	<p>Article 28 <i>Member States shall ensure that their competent authorities establish, in accordance with Articles 1, 4, 13 and 16, one or more waste management plans. Those plans shall, alone or in combination, cover the entire geographical territory of the Member State concerned.</i></p>
<p>Directive 94/62/EC of 15 December 1994 on packaging and packaging waste</p>	<p>Article 14 <i>Management Plans. In pursuance of the objectives and measures referred to in this Directive, Member States shall include in the waste management plans required pursuant to Article 17 of Directive 75/442/EEC, a specific chapter on the management of packaging and packaging waste, including measures taken pursuant to Articles 4 and 5</i></p> <p>Article 4 Prevention. <i>Member States shall ensure that, in addition to the measures to prevent the formation of packaging waste taken in accordance with Article 9, other preventive measures are implemented. Such other measures may consist of national programmes or similar actions adopted, if appropriate in consultation with economic operators, and designed to collect and take advantage of the many initiatives taken within Member States as regards prevention. They shall comply with the objectives of this Directive as defined in Article 1 (1).</i></p> <p>Article 5 <i>Member States may encourage re-use systems of packaging, which can be reused in an environmentally sound manner, in conformity with the Treaty</i></p>

Note: Text in italics is quoted from the Directives. For the exact wording of directives please consult the legislation in force. This is an overview only.

These directives are supplemented by a group of directives aiming at regulating specific waste streams.

The provisions of these directives² that are relevant to waste management planning are summarised in Table 2-2.

² Note that some of the directives contain references to former Waste Framework Directives 75/442/EEC and/or Directive 2006/12/EC. Such references shall be construed as references to Directive 2008/98/EC and shall be read in accordance with the correlation table set out in Annex V to that Directive.

Table 2-2: Other EU legislation that may be taken on board in the waste management planning process

<p>Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)</p>	<p>Article 11 <i>Member States shall ... draw up: Plans for the decontamination and/or disposal of inventoried equipment and the PCBs contained therein;</i> <i>• outlines for the collection and subsequent disposal of equipment ... Member States shall communicate these plans and outlines to the Commission without delay</i></p>
<p>Directive 99/31/EC of 26 April 1999 on the landfill of waste</p>	<p>Article 5 • <i>Member States shall set up a national strategy for the implementation of the reduction of biodegradable waste going to landfills ... and notify the Commission of this strategy. • This strategy should include measures to achieve the targets set out in paragraph 2 [of Article 5 of the Directive] by means of in particular, recycling, composting, biogas production or materials/energy recovery. • The national strategy shall ensure that the targets in the Directive are met.</i></p>

Note: Text in italics is quoted from the Directives.

2.2 EU waste management principles

The European Union’s approach to waste management is based on four principles that are highly relevant in the planning process. They were established by the old Waste Framework Directive 1975/442/EEC and have subsequently been reinforced by the amended Waste Framework Directive 2008/98/EC and the Thematic Strategy on the prevention and recycling of waste.³ The four principles can be summarised as follows:

1. The **waste hierarchy** generally lays down a priority order of what constitutes the best overall environmental opinion in waste legislation and policy. Highest priority is given to waste prevention, followed by preparing for re-use, recycling, or other recovery, e.g. energy recovery. Optimum final disposal is at the bottom of this hierarchy. The aim of implementing the waste

³ Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions — Taking sustainable use of resources forward — A Thematic Strategy on the prevention and recycling of waste {SEC(2005) 1681} {SEC(2005) 1682} /* COM/2005/0666 final *

hierarchy is to decouple economic growth from negative environmental impacts of the use of natural resources and move the EU towards a recycling society.

2. To secure a reduction in the impacts of waste on human health and the environment, especially to reduce the hazardous substances in waste, through the **precautionary principle**.
3. To make sure that those who generate waste or contaminate the environment should pay the full costs of their actions through the **principles of polluter pays and producer responsibility**.
4. To secure an adequate infrastructure by establishing an integrated network of treatment facilities based on the **principles of proximity and self-sufficiency**.

These principles mark the historical evolution of the waste management system, from giving the highest priority to aspects of infrastructure, then adding aspects of human health and the environment, and integrating concerns on conservation of nature and resources, towards a strategic aim of a recycling society, promoting the prevention of waste and, where waste is generated, using it as a resource in a sustainable manner.

The Waste Framework Directive defines different forms of treatment relevant to waste management. It distinguishes between recovery (defined in WFD as 'any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy', such as recycling and incineration with energy recovery) and disposal (forms of waste disposal where resources in waste are not utilised, such as incineration without energy recovery and landfilling).

Waste prevention as a key strategic element of European waste policy is becoming increasingly important. It is clear that the amount of waste generated is growing every year. Since one of the main goals of the EU is to secure economic growth and prosperity, it is imperative that economic growth should not be restricted by the generation of waste. Waste prevention initiatives address not only the industrial sector, by promoting the use of cleaner technology, but also schools and private households through awareness-raising campaigns.

As prevention has the highest priority in the EU waste hierarchy, efforts should aim at reducing the quantity of waste generated. Two terms are commonly used in this respect: 'waste prevention' and 'waste minimisation'.

Preventive Measures			Waste Management Measures			
Prevention	Reduction at source	Re-use of products	Quality improvements	Recycling	Energy recovery	Pre-treatment
Waste Minimisation						

Figure 2-2: OECD definition of waste prevention and waste minimisation

Annex IV to the Waste Framework Directive lists 16 examples of waste prevention measures. These are divided into:

- measures that can affect the framework conditions related to the generation of waste, such as the use of economic instruments, promotion of research and development or the development of indicators;
- measures that can affect the design and production and distribution phase, such as the promotion of ecodesign, the provision of information on waste prevention techniques to businesses or the promotion of environmental management systems (e.g. EMAS);
- measures that can affect the consumption and use phase, such as promotion of ecolabels, the use of awareness campaigns for the general public or the establishment of repair and re-use centres.

Waste recovery contributes both to utilising the resources embedded in waste and to saving virgin raw materials.

The Waste Framework Directive as well as some waste stream specific directives of the European Union include specific targets on recovery, recycling and re-use. An overview of the targets, the objectives and the respective years when the targets have to be achieved is provided below:

TARGETS IN EU WASTE LEGISLATION 				
		min recovery	min recycling	collection rate
Packaging	2008	60%	55%	
Cars	2015	95%	85%	100%
Electronics	2006	70%	50%	min 4 kg per inhabitant per year
Batteries	2011		50% to 75% (efficiency)	
	2012			25%
	2016			45%
Tyres	2006	0 landfill of tyres		
Biowaste diverted from landfills	2006	reduction to 75% of the 1995 level		
	2009	reduction to 50% of the 1995 level		
	2016	reduction to 35% of the 1995 level		
Municipal waste	2015	Separate collection: at least paper/metal/plastic/glass		
	2020	50% recycling of municipal waste		
Construction & Demolition Waste	2020	70% recycling/ material recovery of construction and demolition waste		

Figure 2-3: Targets in EU waste legislation (Source: European Commission, DG Environment)

In the following tables the recovery, recycling and re-use targets mentioned in the directives are listed in detail.

Table 2-3: Targets to be achieved by Member States according to Waste Framework Directive 2008/98/EC

MSW	Preparing for re-use and recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households	increase to a minimum of 50% by weight
C&D waste	Preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute for other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste	increase to a minimum of 70% by weight

Table 2-4: Targets of Packaging and Packaging Waste Directive 94/62/EC: existing targets

By weight	Targets in 94/62/EC
Overall recovery target	min. 60%
Overall recycling target	min. 55%, max.80%
Material specific recycling targets:	
- Glass	60%
- Paper/Board	60%
- Metals	50%
- Plastics	22.5%
- Wood	15%
Year to achieve targets	31 December 2008

Table 2-5: Targets of End-of-life vehicles Directive 2000/53/EC

	Rate of re-use and recovery	Rate of re-use and recycling
By average weight per vehicle and year in 2006	85 %	80 %
By average weight per vehicle and year in 2015	95 %	85 %

Source: Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of-life vehicles

The Directive on waste electrical and electronic equipment (WEEE) included a target that, by the end of 2006 at the latest, a minimum rate of separate collection of four kilograms on average of WEEE per inhabitant per year had to be achieved. The Directive also requires producers to set up systems for the recovery and recycling of WEEE either collectively or individually. It is the responsibility of the producers to ensure that the recovery and recycling targets are met.

Table 2-6: Targets of Directive 2002/96/EC on waste electrical and electronic equipment

	Minimum recovery rate	Minimum rate of component, material and substance re-use and recycling
Large household appliances and automatic dispensers, by an average weight per appliance	80 %	75 %
IT and telecommunications equipment and consumer equipment, by weight of the appliances	75 %	65 %
Small household appliances; lighting equipment; electrical and electronic tools; toys, leisure and sports equipment; monitoring and control instruments, by an average weight per appliance	70 %	50 %
Gas discharge lamps, by weight of the lamps	-	80 %
Year to achieve targets	31 December 2006	

Source: Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) — Joint declaration of the European Parliament, the Council and the Commission relating to Article 9.

Landfilling is ranked lowest in the waste hierarchy due to the lack of utilisation of the resources in the waste. However, landfilling remains the most common waste treatment method in the European Union.

There may be several environmental impacts from landfills. One impact is contribution to the greenhouse effect through the emission of methane gas. Leachate may also damage groundwater if there is no liner system. Other impacts include odours and general inconvenience for people living close to landfill sites.

Hence there are several reasons why the Directive on the landfill of waste (99/31/EC) aims at reducing the amount of biodegradable municipal waste going to landfill. By year 2016, the aim is to have reduced the landfill of biodegradable waste to 35% of the total weight produced in 1995. This corresponds to a diversion away from landfill of some 70 million tonnes of biodegradable municipal waste⁴ in the EU by 2016, assuming that the total quantity will not increase.

⁴ Biodegradable municipal waste management in Europe, EEA Topic report No 15/2001. Table 6, BMW Baseline — 1995. http://reports.eea.eu.int/topic_report_2001_15/en.

Table 2-7 Targets for biodegradable municipal waste diversion away from landfill

Year to achieve target	On the basis of biodegradable municipal waste generated in 1995 ¹ , biodegradable municipal waste going to landfill must be reduced to:
16 July 2006	75 %
16 July 2009	50 %
16 July 2016	35 %

Note 1: Or the latest year before 1995 for which standardised Eurostat data are available. Source: Council Directive 99/31/EC of 26 April on the landfill of waste

Member States which in 1995 (or the latest year before 1995 for which standardised Eurostat data are available) sent more than 80 % of their collected municipal waste to landfill, may postpone the attainment of the targets by a period of four years maximum.

Box 2.2 Example: Diversion of waste away from landfill

In the Netherlands, the Waste Decree (Landfill Ban for biodegradable waste) came into force in 1995. The decree prohibits the landfilling of waste that can be recycled/reused or incinerated with energy recovery. The ban includes household waste, paper and paperboard, organic household waste, packaging, and wood waste. Furthermore, there is a high tax on reusable or combustible waste.

Although the quantity of generated municipal waste increased by about 10 % between 1998 and 2005, the quantities of biodegradable municipal waste being consigned to landfill decreased from 13.1 % to below 2 % in the same period of time.

2.3 Other relevant EU legislation

In addition to legislation directly related to waste management, the waste management planning process should have regard to a number of other relevant Directives which might influence decisions, especially as regards the siting and operation of waste management facilities. In particular:

- The 'Water Framework' Directive 2000/60/EC establishing a framework for Community action in the field of water policy;
- the 'Environmental Impact Assessment' Directive 85/337/EEC as amended by Directive 97/11/EC on the assessment of the effects of certain public and private projects on the

environment;

- the 'Strategic Environmental Assessment' Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (presented in more detail under 3.3 below);
- The 'Habitats' Directive 92/43/EEC on the conservation of wild fauna and flora and of natural habitats.

3. General considerations when drafting a waste management plan

Political support and understanding of the need to draw up a waste management plan is crucial. If a plan already exists, it may have to be revised. If, on the other hand, the first waste management plan has yet to be devised, it is very important that the political level has accepted the need for a plan and allocated sufficient resources to its execution. Hence, it is recommended to create a political starting point in order to carry out the work on a waste management plan.

A political starting point should include a decision on the following questions:

- Why draw up a waste management plan?
- What is the scope of the waste management plan?
- Who will be involved in the preparation of the waste management plan?
- What is the time frame for finalisation of the waste management plan?
- What is the relationship to other plans?

3.1 Definition of the scope of the plan

Before starting the planning, the scope of the plan must be defined.

This includes consideration of the following issues:

- What is the geographical coverage of the plan? National, regional or local?
- Which waste streams will be included in the plan? Total waste, municipal waste, hazardous waste, packaging waste, other?
- Which sectors will be included in the plan?
- What is the time horizon of the plan?

Waste streams and sectors to be included in the plan

The considerations about waste streams to be included should determine the sources, streams and quantities of waste generated, current collection, transportation and treatment, and how these might change in the future. The aim should be to show a complete picture of the waste streams and their management in the country.

Clear definitions of the waste streams are important. Additionally, the waste streams given priority must be clearly defined.

Decisions on waste streams covered by the plan may also affect the economic sectors to be included. In most countries local authorities are responsible for managing municipal waste only. However, in some countries local authorities may either choose to manage industrial waste as well, or they may have been given the authority to manage all waste.

The time horizon for the waste management plan

The time horizon for the plan depends on a number of factors. To reflect this, the plan may consist of two parts: part 1, which will be for immediate action, and part 2, which will have a long-term perspective.

The reason for the long-term perspective part of the plan is that considerable difficulties can be expected in identifying suitable sites for waste treatment facilities or landfills within, or close to, urban areas. Furthermore, it will be necessary to put considerable effort into site selection, environmental impact assessment, and public consultation in order to obtain permission for new sites. Finally, waste treatment facilities represent large investments that need to be recovered over a longer period.

Costs of collection are of a more short-term nature and less capital-intensive. The main items are likely to be contracts with contractors that typically have a lifetime of no more than five years.

From a practical point of view, the time horizon of the plan should also be long enough to make it possible to evaluate whether targets are being reached. Therefore, it will not be practical to re-evaluate the plan before at least three years. The time horizon of the plan may also reflect other considerations of a political nature, e.g. the period between local elections.

Thus, a time horizon of three to five years would be appropriate for revision of the action part of the plan. In any case, the waste management plan has to be evaluated at least every sixth year and revised as appropriate (Article 30 of WFD 2008/98/EC).

3.2 Chapters for specific waste streams in the waste management plan

The Waste Framework Directive stipulates that waste planning requirements laid down in Article 14 of Directive 94/62/EC on packaging and packaging waste as well as the strategy for the implementation of the reduction of biodegradable waste going to

landfills (Article 5 of the Landfill Directive 1999/31/EC) have to be considered in the waste management plan.

Packaging and packaging waste

Article 14 of Directive 94/62/EC on packaging and packaging waste contains the following provisions on waste management plans:

In pursuance of the objectives and measures referred to in this Directive, Member States shall include in the waste management plans a specific chapter on the management of packaging and packaging waste, including measures taken pursuant to Articles 4 and 5.

The chapter on packaging and packaging waste should follow the same structure as the chapters on all other waste streams. It should contain a status part with data about generation, treatment and shipment of packaging waste, data about treatment facilities, and the planning part with waste forecast and policy measures. Specific focus should be put on the prevention and re-use of packaging and packaging waste and on how the detailed recycling targets for packaging waste are to be reached.

Biodegradable Municipal Waste (BMW)

Article 5 of Directive 1999/31/EC on the landfill of waste requires Member States to set up a national strategy for the implementation of the reduction of biodegradable waste going to landfills. This strategy should include measures to achieve the targets set out in paragraph 2 [of Article 5 of the Directive] by means of, in particular, recycling, composting, biogas production or materials/energy recovery.

The chapter on BMW should also contain a status and a planning part. Concerning the status part, it should explain which waste fractions are calculated as BMW and what has been their quantitative development in relation to the base year 1995. Regarding policy development it will be necessary to use a set of different measures in order to reach the targets set out in Article 5 of the Directive on the landfill of waste.

3.3 Participants in the planning process

The involvement of the various stakeholders and the wider public in the planning process should aim at ensuring acceptance of the waste policy in general and contribution to the attainment of its objectives. This is to be done according to the various levels of administration concerned, reflecting cultural traditions and political organisation.

As part of the general considerations when drafting a waste management plan it should be made clear *who* will be the participants in the different stages of the planning process and *how* and *when* the administration/policymakers will bring them in.

Involvement of the public is required by Directive 2001/42/EC on strategic environmental assessment, which covers waste management plans. This is also in line with the UN/ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters ('the Aarhus Convention'). On 18 August 2011, there were 44 Parties to the Convention. The European Union and its then 15 Member States have signed the Convention, which entered into force on 30 October 2001.

Box 3-1: Objective of the Aarhus Convention

In order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and wellbeing, each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention.

Full text available at: <http://www.unece.org/env/pp/treatytext.htm>

Access to environmental information and public participation

Two relevant Directives are currently part of the implementation of the Aarhus Convention in the EU.

The Directive on public access to environmental information establishes a framework for enabling public authorities to deal with requests for access to environmental information. It also allows environmental information to be disseminated to the public and specifies the minimum content of such information.

The Directive on public participation introduces a procedure for consulting the public about plans and programmes relating to the environment, including waste management plans. It specifies the type of information to be provided to the public for the purposes of public consultation and requires setting of reasonable time frames in order to ensure effective involvement of the public in environmental decision-making at an early stage.

Box 3-2:

Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC

http://europa.eu.int/eur-lex/en/dat/2003/l_041/l_04120030214en00260032.pdf

Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC

http://europa.eu.int/eur-lex/en/dat/2003/l_156/l_15620030625en00170024.pdf

Who should be involved in the planning process?

Participants in the waste planning process should include a wide range of stakeholders in order to cover all the important aspects. They may include:

- representatives from the political and the administrative level (government departments, regional authorities, municipalities)
- waste experts
- representatives from the waste management sector (collection, recycling, composting, biogas, incineration and landfill)
- industry, industrial and commercial organisations
- consumer councils/associations
- NGOs.

Other parties may be involved in the planning process as well.

How should participants be involved?

The minimum involvement requirement is to submit the draft waste management plan to a public consultation. The consultation may be carried out as a written procedure where only the most relevant parties (e.g. the participants mentioned above) receive the draft plan and are given a certain period of time for commenting on it.

The draft plan may also be made publicly accessible through the Internet, at town halls and in public libraries. This may include an invitation for all citizens to comment on the draft plan.

A more thorough approach is to set up a high-level advisory committee and a working group.

The purpose of the *advisory committee* is to guide the overall planning process and to give input to the waste management plan on important issues such as identifying priority waste streams, setting realistic objectives and measures to implement the plan. The advisory committee may even be given a more influential role as a steering committee. It should consist of representatives from competent authorities (e.g. Environment, Finance, Energy and Industry), representatives from local/regional authorities, the waste management sector, industry, consumers and NGOs.

The purpose of the *working group* is to be in charge of all the practical work of collecting data, preparing analyses of the existing situation, identifying potential problems, writing proposals for objectives, implications of various measures for implementation, etc., and of course preparing the draft waste management plan. The working group would also act as a secretariat for the advisory committee. The participants of the working group would clearly include staff from the competent authority (e.g. a national Environmental Protection Agency or regional authority) but may also involve a representative from a local/regional authority (if it is a national or regional plan), and a representative from the waste management sector.

Terms of reference should be drawn up for the advisory committee as well as for the working group. Furthermore, the terms of reference should be prepared before the two bodies are set up in order to avoid duplication of work and inconsistencies in organisational structure.

In addition to the advisory committee and the working group, participation may be extended to include a series of *workshops* during the planning process. An initial workshop may be held to foster a mutual understanding of the waste problems encountered and the necessity for action. Such a workshop may include a presentation of the current situation as regards waste quantities generated, environmental impacts from waste treatment and treatment capacity. It would also be an opportunity to collect ideas for future development of the waste sector, establish priority waste streams and receive suggestions for objectives.

Workshops may also be held later in the process when the plan starts taking shape and suggestions for future objectives and targets are ready. The measures required to implement the plan are usually

also of interest to stakeholders. All in all, the main purposes of such workshops are to receive ideas from stakeholders and to exchange information on aspects of waste planning.

Finally, another option is to establish either working groups or workshops dealing with specific waste streams. This may be relevant for priority waste streams, 'new' waste streams that have not been collected and managed before, or situations where radical changes are needed for particular waste streams.

Box 3-3 Example: Participation in development of regional waste management plans

The 'National Waste Strategy: Scotland' was adopted at the end of 1999. In order to implement the strategy, Area Waste Plans for each of eleven areas were to be developed. The Area Waste Plans had gone through an integration process to produce an integrated plan for Scotland.

In the development of the Area Waste Plans, a Waste Area Strategy Group (WASG) had been established, involving partnerships of local authorities, the waste management industry, waste generators and the local enterprise network.

Public awareness

The public consultation on a draft waste management plan may be an integral part of awareness-raising activities. However, public awareness is much more than just commenting on draft plans, and it should be considered important for the acceptance by the general public of waste management issues.

The raising of public awareness is dealt with in more detail in Chapter 5.7 on possible measures for the implementation of a waste management plan.

3.4 Assessment of the effects of certain plans and programmes on the environment

The Directive on the assessment of the effects of certain plans and programmes on the environment applies to plans and programmes likely to have significant effects on the environment and which are prepared and adopted by a competent authority.

Environmental impact assessment is automatically required for plans and programmes which are prepared for town and country planning, land use, transport, energy, waste management, water management, industry, telecommunications, agriculture, forestry, fisheries and tourism. Prior to the adoption of a plan or programme or its submission to the legislative process, the competent authority

of the Member State concerned will be required to carry out an environmental impact assessment and, after consulting the competent environmental authorities, to prepare an environmental report.

The draft plan or programme and the environmental report must be made available to the competent environment authorities and to the public. These authorities and the public will be able to express their views on the draft plan or programme prior to its adoption or submission to the legislative process.

Box 3-4: Further information on assessment of the effects of certain plans and programmes on the environment

Directive 2001/42/EC of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment:

http://europa.eu.int/eurlex/pri/en/oj/dat/2001/l_197/l_19720010721en00300037.pdf

The European Commission's website for environmental impact assessment – EIA:

<http://europa.eu.int/comm/environment/eia/home.htm>

3.5 Time frame for the planning process

A time frame indicating the expected duration of the different stages and the expected date of finalisation of the waste management plan should be created. The time frame should also make provision for the consultation period with the public, which may be time-consuming.

In general, the entire planning process can be expected to take around 18 months, but this may vary according to the circumstances.

The time-planning should also include an indication of the decisions to be taken at each stage and when workshops may take place.

3.6 Relationship with other plans and policies

Waste management planning should be an integral part of the overall national planning system, both as a wider approach to sustainable development and in order to achieve the overall goals set out in the waste management plans. A number of different planning areas relate directly to waste management planning and should be

carefully considered when deciding on the scope and content of a waste management plan.

Spatial planning

Spatial planning regulations, which set out a framework for regulating all development in a given area, may affect local responsibilities for waste management. Such regulations may include specific requirements for permitting or licensing waste treatment or disposal facilities, and focus on ensuring good operational control. National legislation regarding privatisation may also be relevant.

Comprehensive planning, which designates land for specific purposes, creates the basis for carrying out private and public activities and is a means of resolving conflicts between different activities/land uses.

Environmental planning

Waste planning has strong links with environmental planning in general. On the one hand, waste planning is part of overall planning to ensure that certain environmental goals are reached, while on the other hand the goals envisaged in the waste plan can only be achieved if environmental standards are set and controlled for all waste management activities.

Energy planning

Waste treatment facilities can also be power stations, incineration plants and biogas or other industrial plants using waste as a fuel. In order to use the energy produced by certain plants, they have to be incorporated into overall energy planning. Energy production at incineration or biogas plants may even be part of the measures taken with a view to achieving climate policy targets.

Human health

Waste often contains chemical substances liable to affect human health. Examples are hazardous waste, household waste, and waste from energy production and agriculture. Some substances may be hidden or lumped together in products or waste streams. Such issues should be integrated into both health planning and waste management planning.

Occupational health

Waste collection and treatment can heavily influence occupational health, and care should be taken in the initial planning stage to avoid negative impacts on workers. When planning collection systems, special care should be taken to avoid heavy lifting and strain from handling containers. Special attention should also be given to the occupational health conditions at incineration, biological treatment or recycling plants.

Checklist:

It is recommended to set up a task force with clear responsibilities for the work to be carried out.

1. Are political understanding and support for the waste management planning process present?
2. Have sufficient resources been allocated to the process?
3. Scope of the waste management plan:
 - What is the geographical coverage of the plan? National, regional or local?
 - Which waste streams will be included in the plan? Total waste, municipal waste, hazardous waste, packaging waste, other?
 - Which sectors will be included in the plan?
 - What is the time horizon of the plan?
4. Have the participants in the planning process been identified? Do they include government departments, local authorities, waste experts, representatives from the waste management sector and the waste generating industry, and NGOs?
5. Has the time frame for preparation of the waste management plan been set? Time estimates for the work should be realistic.
6. Have any relationships between the waste management plan and other plans (spatial planning, energy planning, etc.) been identified? Do they influence any elements of the waste management plan?

4. Status part

In order to set the objectives for a new waste management plan and to assess the fulfilment of the objectives of the previous plan, if any, the status report should present an overview of the current situation. The status report serves as a point of reference, and it identifies the need for further development of the system. Furthermore, the status report is necessary to measure levels of achievement compared to previously defined objectives.

The current waste collection and treatment system should be described in physical, financial and organisational terms. Hence, analysing the status of the current system allows us to see if it meets the objectives that are already set, such as an overall recycling target, collection of certain waste streams, or achieving certain environmental standards of waste management facilities, etc. The status report is mainly drawn up by the administrative authorities, in cooperation with the various parties within the current waste management system.

For the preparation of a status report, it is necessary to collect data and to provide general knowledge of waste sources, amounts, types, collection, transportation, treatment and disposal of waste, and the structure of the current waste management system.

The outline of the status report will differ from national to regional, and to local levels, since the need for information will differ. At national level aggregated data will be of importance, while the regional/local status report in all respects will have to be more specific. Thus regional/local status reports will contain for example amounts and types of waste generated in the different sectors and treated at different plants, the capacity of the plants in the area and characteristic regional/local conditions due to business structure or natural phenomena.

When a status report is to be drawn up, the first step is to collect data and information. The second step is to describe the current system including identification of areas for improvement in the system. The third step is to evaluate the performance of the current waste management system.

Both the status part and the planning part may be organised according to the 'sources of waste' (different waste-generating activities in the relevant area), waste streams (materials of which the waste is composed), and the waste management options (e.g. collection, sorting, treatment and disposal).

In line with the requirements of the WFD, it is important to incorporate into the status part as well as into the planning part an assessment of the extent to which the waste management planning

(present status or future objectives) will support the implementation of the objectives and provisions of the WFD.

4.1 Waste quantities

To make the status report adequate and as accurate as possible, it is important to use precise and valid data and information. Data can be obtained either by setting up a reporting system with regular data in- and output or by individual data surveys in the preparation phase of the waste management plan. It has to be borne in mind that collection of data often requires extensive work. It is therefore advisable to start the development of data collection systems as soon as possible in the planning process.

At the start of the data collection process, it may be difficult to get reliable figures. In this case, estimates can be made. Estimates often work with waste factors. An example of a waste factor is the waste quantity per inhabitant. If for a given country the waste quantities are known, they can be related to the number of inhabitants. With this factor, waste quantities in another country can be easily calculated.

Basically, information and data are needed on waste amounts for:

- the 'sources of waste';
- the waste streams;
- the waste management processes: generation, collection, transportation, sorting, treatment and disposal.

By identifying the 'sources of waste' it is possible to direct awareness campaigns and waste prevention programmes towards the sources with the highest volumes of waste or towards those with the most hazardous waste generation. At the same time, this will create the platform for any specific regulation directed towards particular waste streams and waste generators. Finally, the effectiveness of inspection and enforcement may be improved.

Box 4-1: Example of relevant waste sources

- Households
- Municipal services
- Industries
- Agriculture/forestry
- Institutions, trade/commerce and offices
- Construction and demolition sites
- Power plants
- Mining
- Wastewater treatment plants

By addressing the waste streams it is possible to obtain information on the quantity and composition of different waste streams. In this way, the authorities will have a background for setting strategic objectives for each waste stream as well as the future treatment methods and facilities needed to attain the objectives. As an example, the Directive on packaging and packaging waste has various targets for a number of packaging materials.

Box 4-2: Example of relevant waste streams

EU Priority waste streams:

- Municipal waste
- Packaging waste
- Tyres
- Waste electrical and electronic equipment
- Construction and demolition waste
- Hazardous waste
- End-of-life vehicles
- Healthcare waste
- Waste oil
- Sewage sludge

Other relevant waste streams:

- Organic residues (garden waste)
- Cardboard
- Plastics
- Iron
- Other metals
- Agricultural waste
- Industrial waste
- Wood waste
- Food and organic waste
- Paper
- Textiles
- Inert residues
- Batteries
- Bulky waste
- Mining waste
- Animal by-products

The status chapter on generation by waste stream should start with a description of the wastes concerned. The composition and the physical and chemical properties of specific types of waste can give information about their hazardousness or about the opportunities to recycle waste fractions. As an example the fractions of residual mixed municipal waste can be mentioned.

Presentation of data and information:

In order to give the reader of the waste management plan a good picture of the waste management situation in a country, the data and information should be presented in an easily digestible way. This

means that in addition to text and tables, data should be visualised with graphs, diagrams and maps.

Additional information can be obtained when data are related to time, area and socio-economic figures, such as

- development over time (time series)
- regional distributions (maps)
- relation to other statistical parameters: inhabitants, GDP.

Examples of key figures are waste generation per capita, waste generation per industrial sector, quantities of hazardous waste per employee in the electroforming industry, rate of glass and paper in municipal solid waste, etc.

The status of the current waste management system and the description of it allow identification of needs in terms of design, capacity and new initiatives.

It is also relevant, and an obligation under the Waste Framework Directive, to present the waste quantities that go through the different processes (generation, collection, transportation, sorting, treatment and disposal). This is mainly in order to be able to assess whether the current capacity of waste management facilities is sufficient.

Box 4-3 Example: Status of waste streams and amounts

Finnish national waste management plan

In the Finnish Waste Management Plan 1998-2005, the status report contains an overview of the waste situation in Finland based on data both collected by the local authorities and calculated on the basis of key figures. For example, specifications have been made of waste recovery by waste source and types of waste, industrial waste generated annually by the industrial sector, and manufacturing waste by sector. The specification of total waste generated annually in Finland is included for the following waste streams:

- Mining waste
- Agricultural waste
- Industrial waste
- Construction waste
- Waste from energy and water supply
- Municipal waste
- Sewage sludge
- Hazardous waste

An overview in English may be found at

<http://www.vyh.fi/eng/orginfo/publica/electro/waste/waste.pdf>

Regional waste management plan of Schleswig-Holstein (Germany)

The regional waste management plan of Schleswig-Holstein covers four waste streams, namely municipal waste, industrial waste, construction & demolition waste and sewage sludge, each in a separate document. Aggregated waste management data (generation, treatment) and data on regional treatment facilities and their permitted throughput capacity are presented in comprehensive and illustrative statistical figures demonstrating the temporal and in some cases the regional variances and tendencies of waste generation (e.g. for different waste streams of municipal waste, for MSW amounts and the different forms of waste treatment). The regional waste management plans are available at http://www.schleswig-holstein.de/UmweltLandwirtschaft/DE/Abfall/04_Abfallwirtschaftsplaene/ein_node.html (in German only).

Methods of collecting data and information

The collection of waste management data is time-consuming and requires a lot of effort because of the high quantity of data and the need to ensure good data quality. It can be done by setting up a regular data collection and management system, preferably managed by an IT system, or by making individual studies on specific waste streams or waste sources.

Additional reasons for setting up a *regular data management system* are found in the obligations for reporting to the European Commission and in the EU waste legislation, requiring Member States to collect certain data about specific waste streams (e.g. register of companies putting WEEE on the market).

Potential sources of waste data are:

- **Producers of waste**
Reporting obligations for waste producers may cover the economic branch of the producer and type and quantity of waste generated. The reporting obligation could be limited to hazardous waste or cover all waste generated. Responsible municipalities or associations thereof should report on household or municipal waste.
- **Waste collection and treatment enterprises**
Enterprises collecting and treating waste can be asked to report regularly on the type, quantity and origin of waste accepted (input), the type of treatment operation and the secondary waste produced (output). Furthermore, economic information can be obtained, such as costs for waste treatment.
- **Waste collection schemes which are responsible for specific waste streams**
The green dot system for packaging and packaging waste or the WEEE clearing house mechanism for waste from electrical and

electronic equipment can provide data about the generation and treatment of the waste streams concerned.

- **Regional and local administrations**
Provinces, municipalities or waste management associations have to set up their own waste management plans in their areas of responsibility (selected waste streams). These plans include data on the selected waste streams as well as on the installations for the treatment of these wastes.

- **Permission authorities**
In combination with the application for a permit (especially IPPC-relevant installations), enterprises usually have to present documentation on waste-relevant aspects. The authorities responsible for these permits are in a position to provide data on expected waste production and on capacity and throughput of waste treatment facilities.

- **Other Ministries**
For a number of cross-cutting waste issues other ministries may issue reports, for example the Ministry of Agriculture on agricultural waste or the Ministry of Health on medical waste, etc.

- **Cooperation with Statistical Bureaus**
For a national waste management plan statistical data may be obtained, for example on demographic developments for the key assumptions in the planning part (see Chapter 5.1). These data are usually collected by a national or regional/local authority and are thus easy to obtain.

Statistical information to be collected can include:

- Population size;
- Geographical size of the area from which waste is collected, divided into residential, industrial, and commercial areas;
- A detailed picture of the size and number of main sectors and activities generating waste (industries, commercial undertakings including agriculture, and tourism);

Box 4-4: EU Waste Statistics Regulation

The problem of incomplete and barely comparable waste data due to different definitions and surveying methods may be overcome to a certain extent in the future thanks to the new EU Regulation on Waste Statistics. Three annexes to the Regulation describe which data should be collected and the methods for doing so.

Key statistics derived from the Waste Statistics Regulation will be presented in two main tables — a waste generation table (according to NACE-classification and the 'EWC-stat V2' classification for waste and hazardous

waste) and a waste management table (recycling, incineration with energy recovery, incineration without energy recovery and landfilling).

EU Member States have employed different surveying methods and statistical waste definitions so far. The new Regulation will lead to more harmonised waste data in the EU.

The Waste Statistics Regulation (No 2150/2002) was adopted on 25 November 2002 and entered into force on 29 December 2002. It is available at:

http://europa.eu.int/eur-lex/en/oj/2002/l_33220021209en.html

Collection of specific data and information for a **local/regional waste management plan** often means taking measurements directly in the waste stream. Such measurements can have varying degrees of sophistication. Where it is possible to weigh the waste, this is of course the most precise way to register the exact amount. If direct measurements are impossible, calculations can be made based on data from equipment currently in use (number of bins emptied, number of trucks arriving at the plant, etc.).

Box 4-5: Local and/or regional waste management system

When a local or regional waste management plan is to be prepared, it is appropriate to include a detailed description of the waste management system in place. A description of the local system for municipal waste may include the following elements, as a minimum:

- Collection equipment (bins, vehicles)
- Transportation schemes (transport logistics, location of treatment plants)
- Transfer/sorting facilities
- Types of treatment plants (e.g. landfills, incineration plants)
- a) Recycling activities — run both by authorities and by private organisations (e.g. the Red Cross)
- Payment schemes
- Regulation (national as well as local)

4.2 Waste shipment

Within the EU, the principles of proximity and of self-sufficiency must be applied for waste disposal and for recovery of mixed municipal waste. This means that waste should be treated as close to the source as possible and that Member States should aim at installing sufficient treatment capacity and should establish an integrated network of disposal and recovery installations, to the extent feasible.

Cooperation with other regions and with other Member States can be used for recovery (except mixed MSW) and for disposal of selected waste streams.

The shipment of hazardous waste is regulated for Member States by the Waste Shipment Regulation and is subject to a complex notification system. The notification documents contain data on waste types, quantities, origin and destination.

In order to fulfil these requirements, to guarantee compliance with the principles at EU level and to be able to develop an appropriate treatment capacity at regional/national level, it is important to compile reliable information on waste imports and exports and to integrate such data into the waste management plan.

Information can be derived from reporting under the Basel Convention for hazardous wastes and other waste subject to notification procedures. In order to get a complete picture, data should also be compiled for waste sent to/received from other Member States or third countries under general information procedures pursuant to Article 18 of the WSR.

For the purpose of waste management planning, the export and import of waste are of importance, while data on transfer are not relevant. For the aggregation of all individual notifications it is advisable to establish an appropriate database.

Box 4-6 Example: Austrian database for waste shipment data and European Data Interchange for Waste Notification

Austria has set up a comprehensive waste data reporting system, called Electronic Data Management (EDM), which includes an application for waste shipment data. Since 2010, the system offers the possibility to handle the notification procedure for the export of waste out of Austria also electronically. EDM is available on the internet on the webpage https://secure.umweltbundesamt.at/edm_portal/home.do.

All shipment data reported electronically or on paper are managed in a comprehensive database. The analysis of the reported data serves as an information source for reporting obligations and the national waste management plan.

Austria participates together with Belgium, the Netherlands and Germany in the EUDIN project — European Data Interchange for Waste Notification System. The aim of the project is to develop a standardised interface for the exchange of data between EU Member States for electronic transposition of the requirements of the Waste Shipment Regulation. Additional information about EUDIN can be found on the webpage <http://www.eudin.org/>

4.3 Waste collection and treatment

First of all, a description of the current waste collection system and treatment facilities is necessary for achieving an overview of collected and treated waste streams. Secondly, the description establishes a basis for identifying where improvements could be made. And thirdly, information about the availability of waste treatment facilities is required for capacity planning.

Systems for collection of all waste streams should be included in the description and, if possible, it should also state which parties are responsible for attending to collection. This is especially relevant for waste streams where collection and/or recycling/recovery targets are set in EU directives. Typical waste streams, where more detailed information about the collection system is required, are packaging waste, WEEE, batteries, waste tyres, ELV, and waste oil.

Information on collection system	Example WEEE
Legal responsibility for collection of waste	Companies putting EEE on the market (producer responsibility)
Practical responsibility for collection	WEEE Clearing House mechanism
Type of collection	Bring back system to collection points, take back obligation of retailers, when new EEE is bought.
Short description of the system	Customers bring back WEEE to the collection points or retailers. Collection points and retailers store the WEEE temporarily. If certain quantities have been reached, the WEEE Clearing House mechanism is informed. Clearing House orders a permitted collection company to transport the WEEE to a permitted treatment facility.
Results of the collection This is the basis for evaluating whether the capacity of the collection system is sufficient.	4 kg WEEE per inhabitant and year

If information about financial aspects of the collection of a specific waste stream is available, it should be presented as well.

Information about waste treatment facilities is valuable for a number of purposes:

- The planning authority needs detailed information about the number and capacity of all types of facilities in order to

undertake capacity planning for the specific waste streams.

- Waste producers are interested in the recovery and disposal of their waste.
- The general public is interested in being informed about existing and planned waste treatment installations in their vicinity.

The registered current usage, the capacity of each plant as well as the financial aspects of the treatment should be included in the description of the system. The description should contain the amount treated annually in respect of each waste stream, the maximum capacity of the plants, the expected lifetime of the plants, the costs of treatment for each waste stream, etc. Plans for extensions or renovations should also be described.

Facilities in which waste is treated may be not only dedicated waste treatment facilities but also production plants. Examples are recycling facilities (e.g. paper production) and co-incineration plants.

Data on waste treatment facilities can be obtained either from operators of the facilities themselves (via visits or questionnaires) or from the responsible permission authorities.

4.4 Organisation and financing of waste management

Organisation of waste management and allocation of responsibilities

The organisation of waste management in a country is in the first instance a question of assigning responsibilities. Responsible bodies can be on the one hand public institutions at different levels and on the other hand the private economy. The distribution of responsibilities depends on the waste stream.

In general it can be said that, for waste generated by the economy, the waste producer itself is responsible for organising collection and treatment.

For waste generated by citizens, the assignment of responsibilities can be diverse. Usually, the municipalities are responsible for residual (mixed municipal solid waste) and bulky waste, but they may delegate their responsibility to private sector companies. An additional option is a Public Private Partnership (PPP), in which a public organisation and a private sector company cooperate in providing public services. For specific waste streams, such as WEEE, batteries, etc., the responsibility is assigned to the private company which puts the product on the market, in terms of extended producer responsibility schemes.

Irrespective of the current system's distribution of responsibility, the responsibility for all waste streams should be described unambiguously in the waste management plan, and the responsible persons, institutions, etc. should be clearly identified.

The documentation of responsibilities and organisation of waste management in the waste management plan will preferably be set out in a generic chapter and, besides a description of bodies involved, might include a schematic overview of the treatment infrastructure in place. Apart from being explained in writing, the situation could be illustrated by flow charts and organigrammes.

In addition to this general chapter it could be a good idea to repeat the key players and responsibilities when discussing individual waste streams.

Box 4.7: Example: Distribution of responsibilities

The waste management plan of the Walloon region includes for each specific waste stream a table showing the organisation and responsible parties. An extract from the section on hazardous waste is shown below. The activities are subdivided into waste inventory, waste prevention, waste collection, disposal, etc. In the case of hazardous waste, the table in the plan contains 36 entries, of which two examples are shown below.

Activity	Promoter	Operator	Expiry
<i>Waste inventory</i> To make it compulsory to establish a standardised register recording quantitative, qualitative and economic information on hazardous waste, its origin, its destination and the treatment residues as well as a standardised semi-annual declaration containing the information of the register, which will be random-checked to ensure the correctness and objectivity of the declarations	Government of Wallonia	<ul style="list-style-type: none">▪ Industry▪ Waste sector▪ Association of municipalities	1999
<i>Waste collection</i> Establish a list of hazardous waste in dispersed amounts subject to separate collection	Government of Wallonia	<ul style="list-style-type: none">▪ Industry▪ Municipalities	1999

Source:

http://environnement.wallonie.be/cgi/dgrne/plateforme_dgrne/visiteur/frame_s.cfm

Financing of waste management

There is a substantial amount of money involved in ensuring continuous development of a waste management system, and throughout Europe there are many methods of financing. Collection and transportation, treatment facilities and landfills are financed and operated by private enterprises, public enterprises, semi-public entities or inter-municipal partnerships.

It is beyond the scope of this Guidance Note to make specific recommendations on this issue. However, in the financial statements of the plans it is important to have certain key figures on the economic consequences of the plan. This information is essential when an attempt is made to anticipate the financial consequences of proposed changes in the current waste management system.

The national plan may contain key figures for waste collection and treatment in the country as a whole, such as total costs of landfilling of waste, average price for landfilling of one tonne of asbestos waste or upper and lower price of separation of waste paper. Usually, it is not possible to present a precise mapping of economic issues in a national plan/strategy.

The regional/local plan, however, should contain actual information on costs of authorities' administrative expenses, collection, transportation, separation, treatment and final disposal of waste. This includes key figures such as:

- Price of treatment of one tonne of waste at the various treatment plants (landfill, incineration, separation, etc.);
- Costs in connection with collection of one tonne of waste, split between collection methods and waste streams;
- Costs in connection with transportation of one tonne of waste distributed on waste streams.

Financing of the waste management system depends on national legislation and the extent to which there is a tradition of making users pay for the service. Charges are quite commonly made for collection and treatment of waste although other financing systems, such as producer responsibility, are used for some waste streams.

Box 4-8: Financing municipal waste management

The Commission has conducted a study on the financing of municipal waste management, aiming to: (1) Complete existing data sets on prices and costs of waste management, which are needed to undertake an economic analysis.

(2) Collate information on the various financing models used by local authorities and nationally by Member States with a view to spreading best practices including an evaluation of the experience with such systems.

The report of the study is posted at:

http://europa.eu.int/comm/environment/waste/studies/eucostwaste_management.htm

4.5 Basis for decision and evaluation of previous objectives

On the basis of the information and analyses of the current situation, it should be possible to evaluate the performance of the current system. Hence, the administrative level and the political decision-makers have a platform for identifying which problems need special attention in the future and which objectives are realistic and achievable within the time frame of the waste management plan.

Moreover, before defining new objectives for the future planning period, it is natural to assess whether the previous waste management plan and its initiatives have had the desired effect. Thus, the plan should also contain a section on whether objectives of the previous plan, if any, have been achieved, and if not, why.

Checklist:

The status of the waste management system will give the parties involved in waste management planning an overview of the current waste management system.

The status report is mainly drawn up by the administrative authorities, in cooperation with the various parties within the current waste management system. Note that the work to be performed is rather extensive, no matter whether it is a revision of existing data or a status survey and data collection being done for the first time.

The status report should give the basis for answering the following questions:

1. Does the current waste management system meet the political objectives for the following:
 - waste prevention/minimisation,
 - recycling/energy recovery,
 - safe disposal facilities?
2. Does the current waste management system address the environmental, health and safety issues in the relevant area of the waste management plan?
3. Does the current waste management system represent an adequate administrative and organisational framework in terms of efficiency in the relevant area?
4. What is the preliminary list of possible changes in order to:
 - meet political objectives,
 - improve the environmental, health and safety performance of the current system,
 - improve the capacity and the physical performance (collection equipment, trucks, access to waste management facilities) of the waste system as a whole and in terms of proximity and self-sufficiency,
 - improve the efficiency and the organisational framework of the system?

5. The planning part

The planning part will be drafted on the basis of: a) EU and national waste legislation and strategies, which may include objectives, set out in specific areas; and b) the information in the status part, i.e. the analysis and evaluation of the current situation.

In the course of planning it is important to take the necessary measures to ensure that the general policy objectives stipulated by EU legislation and corresponding or additional national provisions, as well as any specific targets set, will be achieved or even exceeded.

In the planning part the following aspects should be identified:

- future political objectives, including targets and indicators;
- the changes needed to improve the current system's environmental, health and safety performance;
- the changes needed in relation to the waste system's capacity and physical performance;
- the changes needed to improve the system's efficiency and organisational framework.

Elements that may be included in the planning part are indicated in Table 5-1.

Table 5-1: Possible elements for inclusion in the planning part

<p>1. Identification and analysis of the parameters expected to be significant for waste generation — and identification of waste management options.</p>	<p>Amounts of waste and the composition of waste adjusted in relation to:</p> <ul style="list-style-type: none"> • population growth • changes in economic situation (growth/recession) • changes in demand for, and nature of, consumer goods; changes in manufacturing methods • new waste treatment methods • effects of policy changes.
<p>2. Determination of objectives for:</p>	<ul style="list-style-type: none"> • waste prevention, recycling, recovery and safe disposal of waste • waste streams, e.g. priority waste streams • sources of waste, e.g. industry and households.
<p>3. The future waste management system — action plan</p>	<ul style="list-style-type: none"> • collection (kerbside, bring schemes, recycling sites) • waste management facilities (recycling, incineration with energy recovery, landfilling) • distribution of responsibilities between local authorities and industry (municipal waste/industrial waste, producer responsibility, etc.) • economic consequences and financing: <ul style="list-style-type: none"> ○ total cost of management system ○ use of charges, fees and taxes, producer responsibility • measures to implement the waste management plan.
<p>4. Long-term development</p>	<p>future investments in new waste-management facilities - additional research and studies to be performed.</p>

Waste streams and amounts may be influenced significantly by a number of parameters in the planning period. In order to be able to plan realistically, the dominant parameters should be identified and their expected influence on waste streams should be described and evaluated. Necessary measures to counteract or control undesirable trends should be included in the plan for implementation throughout the planning period.

5.1 Assumptions for planning

There are a number of significant *parameters* which influence the planning:

- waste types and amounts;
- the geographic origin of the waste; and
- the availability of sufficient waste collection and treatment capacity.

For example, the status part may show that in some areas waste amounts have increased. This may mean that preventive measures should be taken or that the treatment capacity for the waste types in question should be enlarged. Similarly, a decrease in amounts of certain waste types may mean that the treatment capacity should be adjusted. In any event, decreases and increases in the course of a year should be analysed in detail to see whether fluctuations are occasional or whether the trend is set to last. These aspects were analysed during the preparation of the status report as described in Chapter 4.

Other parameters may also influence waste generation in the planning period. With a view to estimating the future needs of waste management services etc., it is necessary to estimate the influence of:

- population growth;
- changes in the economic situation (growth/recession);
- changes in the demand for, and nature of, consumer goods;
- changes in manufacturing methods;
- new waste treatment methods;
- the effects of policy changes (prevention, minimisation, re-use, recycling).

Some of these parameters are associated with significant elements of uncertainty. As a result, waste amounts and the need for management facilities etc. can only be based on rough estimates.

Thus, it is not possible to predict future waste generation with absolute certainty and without ambiguity. Nevertheless, there is obviously a need for a reliable basis for securing the necessary capacity for the system in the planning period, especially for future investments, the establishment of collection systems, etc. To overcome this problem, a number of *scenarios* can be envisaged covering variations in waste generation and treatment.

On the basis of the ability and capacity of the country, including the economy, the adopted policies and mandatory targets, such as the targets fixed in EU directives, the most realistic scenario can be selected as a point of departure for the planning.

Given the difficulties of predicting the influence of the abovementioned parameters, a certain degree of flexibility should be integrated into the scenarios to ensure that the plan based on the chosen scenario can be adapted to changes in the assumptions, waste amounts etc.

For example, changes in the population size in a given area may have a significant influence on the collection system, capacity of the waste management system, etc. Therefore, the relation between the population size and the various activities of the plan needs to be transparent, so that necessary adjustments caused by changes in the population size can be made in the appropriate parts of the plan.

Another example is the possible development of a new technology for recycling a waste stream that previously was incinerated or landfilled. The influence of this technology on the waste stream in question should be identifiable, to see whether substantial changes in the current systems would be beneficial.

Transparency is a tool for more flexible planning, in capacity calculations for example, so that the influence of the amounts and origin of different waste streams on the waste management system can be tracked.

Box 5-1: Example of how to calculate the trend in household waste

Data for a given area:

- number of inhabitants registered for year n: A_{inhab}
- waste generation per inhabitant measured or estimated for year n: $Pt/yr \cdot inhab$
- waste in this area for year n: $G_n = A_{inhab} \cdot Pt/yr \cdot inhab$

Hypotheses for development (values given as an example):

- population: low hypothesis +0.4% per year, high hypothesis +0.9% per year
- generation of waste per inhabitant: low hypothesis +0.6% per year, high hypothesis +1% per year.

Estimate of waste to be managed in the year (n+5): Application of low hypothesis for the development of the population and generation per inhabitant: $G_{n+5}: A_{inhab} \cdot (1.004)^5 \cdot Pt/yr \cdot inhab \cdot (1.006)^5 = G_n \cdot 1.051$

Application of high hypothesis for the development of the population and generation per inhabitant: $G_{n+5}: A_{inhab} \cdot (1.009)^5 \cdot Pt/yr \cdot inhab \cdot (1.01)^5 = G_n \cdot 1.099$

5.2 Setting objectives

The results of the status part will provide a significant basis for defining objectives at the national, regional and local levels. Overall, objectives should strike a balance between waste amounts and treatment capacity, for example by implementing initiatives limiting the generation of waste and increasing recycling and recovery or enlarging treatment capacity.

In national waste management plans, objectives may in some cases be determined beforehand, such as EU objectives for recycling. In addition, national objectives may be determined in relation to waste reduction or recycling. The overall strategy for determining new objectives is the waste hierarchy as described in section 2.2. However, for those waste streams or waste sources where objectives have not yet been set, the environmental and economic impacts should be assessed with a view to choosing the optimal waste management option.

Objectives and quantitative targets may be set for priority waste streams, for waste management options (prevention, recycling, etc.) and for economic sectors or households (waste sources).

In the case of policy objectives the general rules for setting objectives should be applied. The definition of objectives should be:

- **Specific:** Objectives should be defined as precisely as possible.
- **Measurable:** Objectives should be formulated in such a way that it is possible to evaluate whether or not they have been reached.
- **Realistic:** It must be possible to reach the objectives.
- **Timely:** Objectives and especially targets should be linked to a deadline by which they must be reached.

In the regional and local waste management plan the strategy for compliance with the principles of the waste hierarchy should be reflected in objectives for the different fields of waste management. Regional or local objectives may be determined to help solve local problems. In any event, objectives must be in line with the overall national strategy on waste.

If previous waste management plans or objectives exist, the setting of objectives should take account of whether or not previous objectives have been achieved, or whether there are any indications that objectives can be achieved in the period in question. Thus, in some cases previous objectives must be adjusted or maintained, or measures must be implemented which make the achievement of the objectives realistic.

Box 5-2 Example: Setting objectives

In 1999 the Norwegian Government published its 'White Paper No 8 - The Government's environmental policy and the state of the environment in Norway'. The paper includes a Chapter on waste with three political objectives:

- growth in the volume of waste should be significantly lower than the rate of economic growth;
- the quantity of waste subject to final disposal (land filling and incineration without energy recovery) by the year 2010 should be 25 per cent of the quantity of waste generated;
- all types of special waste must be dealt with in a safe and acceptable manner.

These objectives must be transformed into measures and quantitative targets. In the Norwegian paper the measures include: greater differentiation in waste charges; increasing the requirements for incineration facilities and increasing the collection of waste oil through measures such as modification of the reimbursement scheme.

Source: <http://odin.dep.no/md/engelsk/publ/rapporter/022051-220006/indexdok000-b-n-a.html> — present methods

Monitoring progress in fulfilling objectives

Qualitative political objectives form part of the point of departure for the planning. They must be transformed into quantitative targets to make them operational and measurable.

A control system can be attached to each political objective to monitor the extent to which it has been achieved. A control system can involve measurable targets, measurable indicators, measures and the identification of preconditions for each objective. The idea is to use the measurable indicator(s) to check if the objective has been met.

If quantitative targets can be applied to the political objective, the indicator is often defined at the same time. If quantitative targets

cannot be defined, or if they need to be made more precise, indicators showing whether the qualitative and quantitative objectives have been met are important for monitoring progress and conformity with the adopted waste plan. In some cases more than one indicator is necessary to monitor an objective. Moreover, measurable targets and indicators are recommended, as they simplify the monitoring.

The measures ensure that the political objectives are achieved. The studies, tests, information, etc. need to be in place before a measure can be introduced.

Each of the political objectives may have several targets and instruments or measures. For example, it is possible to have an overall target for recycling and combine it with recycling targets for specific waste streams or specific sources.

Table 8 illustrates the monitoring system for a single objective. The political objective of reducing landfilling of biodegradable municipal waste is chosen as an example of the use of a control system. The measurable targets are defined in the Landfill Directive, while the required indicators and measures are decided in the Member State, as are the preconditions.

Table 5-2: Illustration of a monitoring system with indicators

Political objective	Measurable targets	Measurable indicators	Measures	Pre-conditions
Reducing the use of landfill	<p>Year 2006: The amount of BMW⁽¹⁾ going to landfill must be reduced to 75 % of the total amount by weight of BMW generated in 1995.</p> <p>Year 2009: must be reduced to 50 %.</p> <p>Year 2016: must be reduced to 35 %.</p>	<p>Every year, the amount of landfilled BMW is monitored and forecasts are prepared in order to evaluate the ability to meet the targets</p> <p>Year 2004 Treatment facilities for BMW to be established in parallel with gradual development of separate collection schemes for paper, cardboard, garden waste, and food waste.</p>	<p>Year 2002:</p> <p>a) Approve the legislative framework in order to secure the individual separation of biodegradable wastes.</p> <p>b) Increase the taxes on waste that goes to landfill by 20 % each year</p>	<p>Year 2001-02: Conduct a baseline study on relevant treatment methods</p>

Note: Targets are from Council Directive 99/31/EC on the landfill of waste.

⁽¹⁾ BMW: Biodegradable Municipal Waste.

5.3 The waste management system in the planning period – action plan

When the current situation and expected future developments in waste quantities have been analysed and the objectives agreed upon, it should be decided how these objectives can be met. This may be considered as the core of the planning process.

The action plan includes:

- selection of collection systems;
- identification of necessary waste management facilities;
- assignment of responsibilities to the various parties;
- considerations of economic consequences and financing;

- considerations on the use of measures to implement the waste management plan (possible measures are presented in Section 5.5).

Collection systems

Decisions have to be taken with respect to collection systems for the identified sources and waste streams. As the collection system may play an important role in the achievement of the targets, the most appropriate type of system should be adopted with a view to achieving them. For example, a kerbside collection system may be more effective than a system where individual waste generators must bring their waste to a central recycling site. A kerbside collection system, however, is often more expensive.

Thus, while economic considerations may play an important role in the decision-making process regarding the choice of collection system, political intentions with respect to service standards and environmental aspects also carry weight.

For each waste stream a statement may be made in the plan with respect to collection method, treatment, etc. Detailed requirements for treatment, transportation etc. for some waste fractions may have been set out in the regional/local waste plan.

Current legislation may determine in detail the structure of a collection system. Similarly, the introduction of collection systems may be boosted by new legislation laying down which type of collection system should be chosen.

Some waste streams have special requirements for recycling. It may be expedient to discuss such waste fractions within one description and one planning section. This applies, for example, to packaging waste for which objectives for recycling rates have been fixed at EU level. Therefore, regardless of source — household or industry and commerce — packaging waste may be gathered under a specific section. The same may be the case for hazardous waste and batteries covered by the Directive on Batteries and Accumulators, as well as for several other waste streams. Moreover, some waste streams are given priority by the EU and should be included in the action plan.

One precondition for a regional or local waste management plan is that the actual management of waste, including its treatment and disposal is planned in detail.

Box 5-3 Example: Garden waste

The Biowaste (food) and Vegetation (garden) Waste Execution Plan of the Flemish Region of Belgium provides for each inhabitant of Flanders to have access to a separate garden waste collection by the end of 1997. This garden waste is either collected at the kerbside (usually presented in bulk) or in a bring scheme. However, some local authorities also offer biodegradable plastic or paper bags with or without any additional charge. In such cases, the collection frequency is generally higher than for collection in bulk.

Source: *Biodegradable municipal waste management in Europe: Strategies and instruments*, European Environment Agency, 2001.

http://reports.eea.eu.int/topic_report_2001_15/en

Waste management facilities

The action plan should include decisions on the type and capacity of waste management facilities. Such decisions should be studied in depth, as establishing these facilities is rather costly.

Regional/local plans should contain a detailed assessment of the need for different types of plants and capacity. The action plan should contain estimates regarding compliance with national waste strategies, such as the proximity and the self-sufficiency principles. Furthermore, the action plan should assess whether the various types of plants have been adapted to the overall objectives of the waste strategy/plan in terms of capacity and treatment method, taking into account the waste hierarchy. Each treatment plant should be described and compared on the basis of the amounts of waste expected to be generated within the planning period.

Moreover, as facilities may have a useful life of several decades, the location must be carefully selected.

The planning horizon for different methods of collection and treatment mainly depends on economies of scale in the equipment involved. This sets minimum capacity sizes for the plant if it is to be operated economically and with minimum planning horizons in order to guarantee the pay-back time. Typical values based on experience are listed in

Table 5-3.

Table 5-3: The minimum planning horizon for various collection and treatment methods

System	Minimum planning horizon
<ul style="list-style-type: none"> • Collection of municipal solid waste • Composting plant (low tech.) • Engineered landfill • Incineration • Composting plant (high tech.) • Hazardous waste treatment plant 	<ul style="list-style-type: none"> • 3 years • 5 years • 10 years • 20 years • 20 years • 20 years

Note: The values are based on experience and depend on the capacity of plants and facilities.

Planning should also include estimates of whether plants comply with present and future requirements, as well as plans for extension, upgrading etc. Finally, the need for new environmental permits should be described.

Box 5-4 Example: Environmental and economic considerations

Staffordshire County Council and Stoke-on-Trent City Council state in the local waste plan that: Proposals for waste incineration will be permitted where the proposed development:

- i) represents the Best Practicable Environmental Option (BPEO);
- ii) includes energy recovery, either by combined heat and power or electricity generation; and
- iii) does not undermine the provision of waste management facilities operating further up the waste hierarchy, including composting and material recycling and waste to energy facilities.

Regarding point iii) it is stated that: Incineration can represent a major investment, require long-term contracts and substantial quantities of waste to guarantee viability. It is therefore important, in the context of the BPEO, the waste hierarchy and the proximity principle, to consider the economic implications of the proposed development, along with the environmental and social implications.

Hence, the overall waste strategy should be borne in mind when deciding on the establishment of waste treatment facilities. The effect on the provision of waste management facilities should be considered to ensure that the proposed development does not undermine more sustainable methods of waste management.

Source:
<http://www.staffordshire.gov.uk/environment/planning/policy/thedevelopmentplan/wastelocalplan/wasteLocalPlan.aspx>

Capacity Planning

In choosing among various collection and treatment options, it is necessary to make sure that in future there is sufficient waste treatment capacity available to achieve the objectives set out in the waste management plan.

In this respect, there are two issues to be taken into consideration. The first relates to financial requirements and who should carry the financial burden if capacity is to be expanded. The second concerns the potential location of future facilities. A common problem is that nobody wants to live next door to a waste management facility (Not-in-my-backyard (NIMBY) effect). Thus the issue often requires planning well ahead.

Box 5-5: Planning — example:

The Danish Environmental Protection Agency made an estimate of the amount of waste suitable for incineration and waste incineration capacity. Information has been gathered from Danish waste incineration plants on current and future incineration capacity, the number of incineration units, the calorific value of waste, annual working time, authorisations and expected changes in capacity or other major changes scheduled before the year 2008. Future amounts of waste suitable for incineration are compared with the expected incineration capacity in the years 2004 and 2008.

The report, 'Affaldsforbrænding i 2004 og 2008, mængder og kapaciteter' (summary in English), is posted at:

<http://www2.mst.dk/common/Udgivramme/Frame.asp?http://www2.mst.dk/Udgiv/publikationer/2001/87-7944-724-4/html/default.htm>

Long-term development

As mentioned in Section 3.1, the plan may only cover three to five years. Given the length of time it takes to plan and build waste treatment installations, considerations on the long-term capacity and costs may be useful.

Furthermore, future initiatives may be necessary to achieve long-term targets. If the targets for biodegradable municipal waste in the Landfill Directive are to be met, for example, new collection systems and recovery facilities may be needed over the next 12 years.

Before deciding on treatment methods and the location of waste management facilities, it may be useful to carry out one or more cost-benefit analyses of scenarios for waste streams and sources. Cost-benefit analysis is a tool for creating an overview of the consequences/impacts of different options and a help to decision-

makers. Cost-benefit analysis may also be a way of examining the impact of the waste management system on other plans, such as health planning, spatial planning, etc.

Economic consequences and financing

The real challenge in waste management planning is how to achieve the preferred mix of treatment methods for each waste stream in the future system. The final result may consist of a number of measures and instruments (legal and economic) to be activated, awareness campaigns, new waste collection schemes and access to new treatment facilities.

In addition to estimating the effectiveness of initiatives in terms of volumes of waste to be directed and redirected in the overall waste stream, future waste management systems will typically imply significant investment and additional operating costs.

An important aspect in making the final decisions and approving a new waste management system will involve analysing the economic consequences of the initial investments and operating costs, and the future level of user fees and charges. Again, each initiative should be evaluated in terms of its economic consequences, and included in a final aggregated overview.

The aim is to estimate total expenditure in terms of capital costs and operating costs. However, as collection equipment, landfills and other facilities needed in the overall waste management system have different lifetimes and depreciation periods, calculations should be made in order to compare and aggregate the costs of numerous operations. One approach is to calculate the total annual costs, i.e. operating costs plus the annual cost of investments.

If possible, costs should be broken down into:

- costs of general administrative initiatives such as waste planning, permitting, legislation, etc.;
- general initiatives for waste prevention;
- costs incurred by the treatment of different waste streams including investment costs.

Thus it should be possible to keep track of the economic costs of achieving the objectives. It should also be possible to compare the costs of the current waste management system with the costs of the new waste management plan.

Calculating costs per tonne of waste may help to give an idea of the average costs, and it may be used to compare the costs with alternatives.

5.4 Criteria for the location of waste treatment facilities

Sites or areas which are suitable for the location of waste treatment facilities can be presented either by geographical map and/or by specifying lists. Pursuant to the ECJ (European Court of Justice) ruling on joined cases C-53/02 and C-217/02, in the absence of a geographical map highlighting permitted areas for the location of future waste disposal sites, precise location criteria must be chosen. These criteria must serve the following purposes:

- allow the competent authority to identify clearly which sites are suitable for waste disposal;
- take into consideration the most recent scientific and technical knowledge;
- take into consideration the specific technical processes chosen for disposal;
- be consistent with the objectives pursued by the WFD (Waste Framework Directive), namely:
 - the protection of public health and the environment
 - the establishment of an adequate network of appropriate disposal installations (taking into account the Best Available Technology (BAT) without involving excessive costs);
 - an adequate transport network so that waste can be disposed in one of the nearest installations.

In practice, the first step is to define siting criteria for areas which are absolutely excluded from construction purposes. This set of criteria may include the following elements:

- areas protected for ecological, landscape or cultural value;
- location susceptible to earthquakes, subsidence, landslides, erosion, flooding, extreme or adverse climatic conditions (e.g. temperature inversions, fogs, severe winds);
- densely populated, built-up area;
- hospitals, schools, places of worship, community facilities;
- residential area, recreation;
- public open space, community facilities, commerce;
- highly visible to many people.

In the second step, the remaining areas should be specified and ranked in a list of potentially suitable areas according to geological and hydro-geological criteria as set out in the Landfill Directive, according to aspects of climatology and according to aspects of infrastructure.

5.5 Possible measures for implementing a waste management plan

A variety of measures are needed for the implementation of a waste management plan. Normally each objective in the plan should be supported by one or more targeted measures.

Regulatory instruments

These are policy instruments where the legislation defines clear obligations: what has to be done or what is forbidden. Examples are bans, standards, compulsory criteria, etc.

Market-based instruments

Market-based instruments try to exert influence by financial pressure, e.g. taxes, charges, product fees, deposit refund schemes and subsidies. As the new Waste Framework Directive asks for information about economic instruments in the optional content, additional information about those instruments is provided in Chapter 5.6.

Information-based instruments

Information can be directed either towards consumers in order to change their purchasing behaviour (e.g. awareness-raising campaigns or product labelling), or towards producers in the form of support to their environmental management (e.g. advisory programmes for businesses). The use of awareness-raising campaigns and information provision directed at the general public or at a specific set of consumers is also part of the optional content of the new Waste Framework Directive and is therefore explained in more detail in Chapter 5.7.

Voluntary agreements

This heading covers instruments where participation is voluntary (EMAS, Eco-Labeling). Agreements between business and government (self-commitment of business) can also be mentioned here.

Box 5.6: Environmental agreements — examples:

Study on environmental agreements

The European Environment Agency (EEA) has carried out a study on Environmental Agreements. The study aims to inform policy makers and the general public on the use of environmental agreements in the European Union by providing a brief review of the current application of such agreements in the Member States. It is available at:

<http://reports.eea.eu.int/92-9167-052-9>

Among the measures available to the relevant authority, the key question is which measure will change people's behaviour in the most efficient way? For each objective the authority should assess not only which measure can best reduce environmental pressure, but also the economic consequences of the measure and its political feasibility.

For some objectives the best option will be regulatory measures, particularly if the aim is to avoid spreading specific dangerous substances. Economic incentives may be more effective for objectives such as reducing waste generation or increasing the recycling rate. However, there may well be other suitable measures.

5.6 Economic instruments and their evaluation

Economic instruments help to achieve environmental, economic and social policy objectives simultaneously by taking account of the hidden costs of production and consumption in a cost-effective way. Thus, economic instruments encourage consumers and producers to change their behaviour to make more eco-efficient use of natural resources, leading in turn to less waste generation and improved waste management.

Experience in the Member States shows that the best way to improve waste management is to combine the following instruments:

- **Landfill and incineration taxes and/or bans** — The results of the study are unequivocal: landfilling and incineration rates have decreased in countries where bans or taxes have driven costs.
- **'Pay-as-you-throw' schemes** have proved to be very efficient in preventing waste generation and encouraging citizens to participate in separate waste collections.

- **Producer responsibility schemes** have enabled several Member States to gather and redistribute the funds necessary for improving separate collection and recycling. However, as cost-efficiency and transparency vary greatly between Member States and between waste streams, these schemes need careful planning and monitoring.

Other **taxes and environmental charges** are often used in waste management. Examples of taxes are the plastic bag tax in Ireland or the Danish waste disposal and batteries tax. Charging for waste collection at household level is sometimes based upon combinations of the bin's size, weight and collection frequencies, which helps to increase awareness about the amount of waste generated, thus reducing it. Environmental subsidies and incentives or tradable permits are also used in waste management, although to a lesser degree.

A general approach towards evaluating the use of economic instruments in waste policies comprises the following steps:

1. analysis of the charge or tax, its objectives and links with the package of relevant government interventions, i.e. what was the intervention and how was it intended to work;
2. PEST analysis, which is an evaluation of the political, economic, social and technological consequences of the instrument, based on the dynamic effects driving the behaviour of the intervention's targets, i.e. what does the system look like prior to the policy intervention — the 'baseline assessment';
3. analysis of the relationship between the baseline assessment and the policy intervention, i.e. how might the intervention have actually affected the system, at what cost and when — the 'impact hypothesis'.

Further information on the use of economic instruments can be found in the following studies:

- European Commission study on the use of economic instruments in waste management (2012):
<http://ec.europa.eu/environment/waste/use.htm>.
- European Topic Centre on waste, study on the 'Effectiveness of environmental taxes and charges for managing sand, gravel and rock extraction in selected EU countries':
http://www.eea.europa.eu/publications/eea_report_2008_2
- The European Environment Agency report on 'Market-based instruments for environmental policy in Europe':

http://www.eea.europa.eu/publications/technical_report_2005_8

- European Commission study on the Economic and Environmental Implications of the Use of Environmental Taxes in the European Union and its Member States (one of the taxes studied is the landfill tax):

http://europa.eu.int/comm/environment/enveco/taxation/ch10_landfill.pdf

- The OECD Environmentally Related Taxes Database with predefined queries on national taxes, including waste taxes:

<http://www.oecd.org/EN/document/0,,EN-document-8-nodirectorate-no-1-30168.00.html#title1>

5.7 Public awareness

If a waste management system is to be efficient and function properly, it is important for the public to understand the system and to support it. The success of some recycling schemes relies almost entirely on support from its users, e.g. households. How does a local authority persuade a citizen to carry empty glass bottles to the local bring bank or recycling centre, if he or she can just dump them in the waste bin?

While legal and economic incentives may change people's behaviour, creating public awareness and willingness to manage waste properly is equally important.

Box 5-7: Public information — examples

Austria, the Federal Ministry of Agriculture and Forestry, Environment and Water Management — a guideline on waste separation, 'Abfall-Trenn-ABC':

- http://www.land-oberoesterreich.gv.at/cps/rde/xchg/ooe/hs.xsl/20842_DEU_HTML.htm

Belgium, Brussels, guide on how to manage household waste:

- <http://www.bruxelles-proprete.be/Content/html/dechets/index.asp>

Czech Republic, Ministry of Environment, guide on waste management:

- <http://www.ekoporadny.cz/faq/jak-tridit-odpady.htm>

France, Agency for Environment and Energy Management, ADEME, practical guidelines on how to deal with household waste, home composting, waste electrical and electronic equipment and hazardous waste:

- <http://www.ecocitoyens.ademe.fr/mes-dechets>

Poland, Ministry of Environment, anti-littering information campaign 'Don't litter your conscience':

- http://www.mos.gov.pl/artykul/7_aktualnosci/11193_nie_zasmiej_swojego_sumienia_nowa_kampania_spoeczna_ms.html

Poland, Warsaw, series of guidelines on how to deal with municipal waste:

- <http://www.stolicaczystosci.pl/index.php?p=page&id=29>

United Kingdom, WRAP's campaigns 'Recycle now' and 'Love Food Hate Waste':

- <http://www.recyclenow.com/>
- <http://england.lovefoodhatewaste.com/>

There are several ways of raising public awareness of waste issues and providing information on how to deal with waste. In setting up a public awareness campaign, the following steps should be considered:

- choice of target groups (age, gender, demographic data, etc.);
- choice of objectives to be achieved (public awareness, motivation, regional expansion, reducing environmental impact, etc.);
- choice of communication content (emotional, rational, ethical, fear-inducing, appealing, etc.);
- choice of media (TV, radio, internet, newspapers, magazines, leaflets, brochures, personal communication, outdoor communication, etc.);
- choice of communication schedule (timing, duration, constant vs bursts);
- defining the communication budget (who pays, how much, allocated where ?);
- monitoring and feedback;
- evaluation and adjustments.

The internet is a natural medium for information. It is fairly easy, and inexpensive, to design an internet site where the public can find answers to their questions regarding waste management and can

download the waste management plan and information leaflets. There is a wide selection of good websites (examples of websites set up by public authorities can be found in Box 5-7). Internet sites often contain graphic, multi-media material which appeals to different social groups and is easy to understand. They often contain answers to frequently asked questions (FAQs) and links to other websites where the user may find further information.

Box 5-8: Low-cost tools for public awareness

1. Mass-education activities such as:
 - articles in newspapers
 - news releases
 - speeches
 - guest appearances by municipal staff in radio and TV programmes
 - public service announcements.
2. Guest lectures at:
 - schools
 - universities
 - clubs
 - interest groups / NGOs
 - public events.
3. Internet site.
4. Posters and exhibitions.
5. Workforce courtesy training.
6. House-to-house visits by (voluntary) awareness workers.
7. Neighbourhood committees for information and awareness raising regarding public health, environment and waste.

Source: World Bank Group: Strategic planning guide for municipal solid waste management.

At local or regional level, the competent authority or waste management enterprise may establish a telephone hotline or email service where citizens can ask questions regarding the waste management system.

Another possibility is learning-by-doing, for example by having trained staff at the recycling centre to help people separate their waste correctly.

School education is crucial. Children often bring good habits home and educate their parents.

5.8 Contaminated waste disposal sites

Most waste streams contain substances which are a danger to human health and the environment, and waste treatment facilities are a potential source of emissions of these substances. Since some decades ago the legislation for waste treatment facilities was not as strict as it is now, a number of these facilities have polluted the surrounding soil and groundwater. In particular, landfills without proper sealing have become historical contaminated sites.

A chapter in the waste management plan on the situation of historical contaminated waste disposal sites may contain the following information:

- **Legal situation**
Contaminated sites may be regulated in waste-management legislation, but also in soil or water legislation. Usually, the rules for contaminated sites do not apply only to historical waste treatment sites, but also to industrial sites which have polluted their vicinity.
- **Description of the situation**
A description of the situation of contaminated sites should contain information about the number of potential and confirmed sites, as well as remediated sites and their location. The competent authorities should integrate into the plan the results of comprehensive inventories on closed low-standard landfills or unmanaged and/or illegal dumpsites. In the case of remediated sites, the technical measures for securing and remediating the site should be explained.
- **Remediation plan**
The planning should contain a categorisation (low to high risk) and prioritisation of sites and a detailed time schedule for their final remediation. This should include a definition of the necessary measures for the different risk categories.
- **Financing**
Historical and chemical analysis of potentially contaminated sites, remediation and aftercare are time-consuming and expensive tasks. Therefore, it will be necessary to determine how much money will be necessary to manage the sites, and where the funds will come from.

Preparing a waste management plan — Final Checklist:

Content and structure:

- Have at least all compulsory elements (Article 28.3 WFD) been included in the plan?
- Does the plan ensure full geographical coverage of the area concerned (Article 28.1, first paragraph) ?

Setting of objectives:

- Are the objectives in line with EU waste management principles?
- Have objectives been set for EU priority waste streams?
- Has there been any environmental or economic assessment of objectives?

Monitoring and evaluation of objectives for revision of the strategy/plan:

- Have measurable targets been set for all objectives, either in EU or national legislation or as a result of the planning process?
- Have indicators been identified with a view to monitoring developments? Are they measurable?
- A timetable should be made for revising the strategy/plan: how and when is it going to be revised? Has it been revised within the past 6 years?

Strategy formulation and action plan:

- Have future waste amounts been estimated? Are the assumptions reasonable and do they cover all the factors that may influence waste generation in the future?
- Which types of waste management facilities are in place? Do they have sufficient capacity for future requirements (based on estimated future waste amounts) and new objectives?
- Have responsibilities been distributed among government, local authorities, industry, etc.?
- Have the costs of implementing the plan been estimated? Is the plan to be financed via waste charges/fees, income taxes or other means?
- Has a timetable been fixed for implementing new activities in the action plan?

Implementation measures:

- Does the plan include measures to support: its implementation, awareness raising, economic incentives, and other administrative or regulatory measures?

6. Detailed list of questions to be addressed and answered in waste management plans

WASTE MANAGEMENT PLAN

Availability of required information [Article 28(1) WFD]:

1. Name of the waste management plan or prevention programme.
2. Website at which the plan is available (Article 31 WFD).
3. Date of adoption (month and year).
4. Date of revision (month and year).
5. Responsible administrative body (name, address, e-mail, other contact details).
6. Type of document: new waste management plan, substantial revision.
7. Content of the plan: waste sources, prevention programme included or not.
8. Geographical level of the plan / full coverage of the geographical area concerned.
9. Information on number and level of related plans to cover national territory.
10. Information on harmonisation with other plans.
11. Proof that either alone or in combination, all plans cover the entire geographical territory of the Member State.

Material scope of the waste management plan:

1. State which type of waste is covered (total waste management, Municipal Solid Waste (MSW), hazardous waste, specific waste streams, other).
2. Where there are several separate plans, information on harmonisation.
3. Information on whether or not the plan contains a separate chapter on the management of packaging waste.
4. Information on targets and measures for reducing biodegradable waste going to landfills as referred to in Article 5 of Directive 1999/31/EC.

General preparatory requirements [Articles 28(1), 30, 31, 32, and 33]:

1. Information on whether or not the plan is already based on the 2008 Waste Framework Directive's requirements.
2. Is the plan in accordance with the 2008 Waste Framework Directive's waste hierarchy **[Article 28(1)]** ?
3. Deviation from the 2008 Waste Framework Directive's waste hierarchy (Article 4(2)) as regards specific waste streams, and information on the life-cycle thinking behind it.
4. Cooperation with other Member States or with the EU in drawing up the waste management plan (list names and details of the topics and form of any such cooperation **[Article 32]**), including details on type and scope of cooperation.
5. Participation of relevant authorities, stakeholders, and the general public **[Article 31]**.
6. Information on environmental assessment pursuant to the Strategic Environmental Assessment (SEA) Directive 2001/42/EC, if carried out.
7. Procedures to ensure that the plan is evaluated at least every six years and revised as appropriate and, where relevant, in accordance with new Commission requirements for prevention (Article 9), re-use and recycling (Article 11) **[Article 30(1)]**.
8. Electronic link to a publicly available website for the plan **[Article 31]**.

Mandatory content [Articles 28(2), 28(3) and 28(5)]:

1. Analysis of current waste management situation in the geographical entity concerned **[Article 28(2)]**.
2. Measures suggested to improve environmentally sound management at all levels of the waste hierarchy **[Article 28(2)]**.
3. Assessment of possible contribution to the implementation of the 2008 Waste Framework Directive objectives, including assessment criteria. **[Article 28(2)]**
4. Quantity of waste generated by different sources **[Article 28(3)(a)]**.
5. Quantity of waste generated (according to waste types), and evaluation of the future development of these waste streams **[Article 28(3)(a)]**.

6. Quantity and destination of waste, according to waste types, shipped from and to the territory covered **[Article 28(3)(a)]**.
7. Description of all existing waste collection schemes, specification of major schemes by waste types **[Article 28(3)(b)]**.
8. Assessment of the need for new collection schemes; **[Article 28(3)(c)]**; specification of major schemes required, where necessary including related investments.
9. Number and capacity of major waste disposal and recovery installations already in place **[Article 28(3)(b)]**.
10. Assessment of the need to close existing waste installations, and type of installations that need to be closed, where necessary including the related investments.
11. Assessment of the need for additional waste installation infrastructure, and major types of installation infrastructure needed, where necessary including the related investments.
12. Special arrangements for certain waste streams, e.g. waste oils, hazardous waste or other waste streams addressed by specific EU legislation **[Article 28(3)(b)]**.
13. Assessment in accordance with the principles of self-sufficiency and proximity (Article 16) **[Article 28(3)(c)]**.
14. Statement on whether self-sufficiency for waste disposal and recovery of mixed MSW is already reached or will be reached within the plan. List of major waste streams or sources, and indication whether self-sufficiency is reached at national level or list countries involved in cooperation (list by waste type and treatment method).
15. Measures established to assure compliance with the proximity principle.
16. Information and criteria for location of all listed future disposal or major recovery installations **[Article 28(3)(d)]**.
17. General waste management policies, including planned waste management technologies and methods or specific policies for problematic waste. **[Article 28(3)(e)]**. List of major policy priorities by waste types and by technologies.
18. Requirements for prevention and re-use of packaging and packaging waste (Packaging Directive, Articles 14, 4, and 5) **[Article 28(5)]**. Indication whether or not the re-

use/recycling/recovery targets for packaging and packaging waste have been reached or will be reached within the plan — indicate the year, and major strategies applied.

19. Strategies for the reduction of biodegradable waste going to landfills (Landfill Directive, Article 5). **[Article 28(5)]**; Indication whether or not the recycling/recovery targets for biodegradable waste have been reached or will be reached within the plan — indicate the year, and major strategies applied.

Non-mandatory content [Article 28(4)]:

1. Describe the organisation of waste management in the territory covered **[Article 28(4)(a)]**.
2. Describe the allocation of responsibilities between public and private actors **[Article 28(4)(a)]**.
3. Evaluate the usefulness and suitability of economic and other instruments; describe instruments used **[Article 28(4)(b)]**.
4. Include information on awareness-raising campaigns and information provision; describe which audiences these measures address and whether you intend to carry out an evaluation of the effectiveness of the measures taken **[Article 28(4)(c)]**.
5. Specify historical contaminated waste disposal sites and measures for their rehabilitation **[Article 28(4)(d)]**.

7. Minimum to maximum criteria for a good waste-management plan

This Chapter comprises an illustration of criteria used in determining the quality of a waste-management plan in the light of the requirements of the EU Waste Framework Directive (2008/98/EC). The criteria are classified from the minimum requirements to be accepted as compliant, to the maximum criteria for establishing an ideal waste management plan from the point of view of EU policy objectives and legislation. The criteria can be used by competent authorities as a model and guidelines for the development and/or revision of waste-management plans.

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
1	1. Name of the waste-management plan or prevention programme 2. Responsible administrative body 3. Type of document: New waste management plan, substantial revision	1. General explanation in writing 2. Year of adoption 3. Revision interval	1. Date of adoption 2. Revision interval 3. Name, address, of responsible administrative body 4. Information on geographical level and scope 5. Information on harmonisation with other	1. Date of adoption (month and year) 2. Date for revision 3. Name, address, e-mail, other contact details 4. Information on number and level of related plans to cover national territory 5. Information on harmonisation

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
	4. Geographical level 5. Scope (waste sources, or waste types covered)	4. Geographical level and scope in the title	plans 6. Information on whether the entire geographical territory of the Member State is covered, either by an individual plan or by a combination of all plans 7. Prevention programme listed as chapter in content, if included	with other plans 6. Information on whether the entire geographical territory of the Member State is covered, either by an individual plan or by a combination of all plans 7. Information on whether prevention programme included or not; and, if separate, where to find it 8. Link to website for electronic version
2	1. Deviation from waste hierarchy (Article 4(2)) and justification if relevant 2. Information on	General statements	1. Information on whether or not the plan is based on Directive 2008/98/EC 2. Statement establishing that the WMP is in accordance with	In introductory chapter: 1. Information on whether or not the plan is based on Directive 2008/98/EC 2. Statement illustrating how the

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
	<p>cooperation or not with other Member States or with the EU in drawing up the WMP</p> <p>3. Involvement and participation of relevant authorities, stakeholders, as well as the general public</p>		<p>the new waste hierarchy</p> <p>3. Information on cooperation (which waste streams, which treatments)</p> <p>4. Separate Chapter on the management of packaging waste indicated in content list</p> <p>5. Chapter on biodegradable waste strategy indicated in content</p>	<p>WMP is in accordance with the new waste hierarchy</p> <p>3. Information on cooperation specifying type and scope of cooperation (which waste streams, which amounts, which treatments)</p> <p>4. Information on environmental assessment pursuant to the SEA Directive 2001/42/EC</p> <p>5. Statements relating to review procedures and indicators for policy effectiveness (link to corresponding Chapters)</p> <p>6. Information as to whether or not the plan contains a separate Chapter on the management of packaging</p>

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
				waste 7. Indication of where information on biodegradable waste (as referred to in Article 5 of Directive 1999/31/EC) can be found in the plan
3	Measures intended to improve environmentally sound management at all levels of the waste hierarchy	General statement	Structured description of policy measures taken/envisaged to improve ESM	Specific Chapter describing policy measures taken/envisaged to improve ESM with links to more detailed Chapters where appropriate
4	Plan's contribution to the implementation of the 2008 Waste Framework Directive objectives, including assessment criteria	General statement	Specific Chapter describing the plan's contribution to the implementation of the 2008 Waste Framework Directive objectives; links to progress data in corresponding Chapters	Specific Chapter describing the plan's contribution to the implementation of the 2008 Waste Framework Directive objectives; conclusions documented by overview of

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
				developments in waste generation, and waste treatment including quantified waste prevention
5	Waste generation by source	Data for starting year for MSW; if relevant for industrial production	<ol style="list-style-type: none"> 1. Data for MSW and/or industrial production further broken down into household, commerce, institutions, different industrial sectors, etc. 2. Overview tables and/or figures for generation (annual or several years) including different sources and totals 	<ol style="list-style-type: none"> 1. Data for MSW and/or industrial production further broken down into household, commerce, institutions, different industrial sectors, etc. 2. Overview tables and/or figures for generation: trend from the past to the end of the WMP, or even beyond, including different sources and annual total 3. Illustration of developments in

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
				shares from different sources
6	Waste generation by waste stream	Textual information and data for starting year for packaging waste, biowaste, ELV, WEEE, batteries, waste oil, hazardous waste	<ol style="list-style-type: none"> 1. Packaging waste fractions, biowaste, ELV, WEEE, batteries, waste oil, hazardous waste, bulky waste, sewage sludge, waste tyres, waste wood 2. Overview tables for generation trends (several years: at least two from the past and one at the end of the WMP) 	<ol style="list-style-type: none"> 1. Differentiated data for packaging waste fractions, biowaste fractions, ELV, WEEE, batteries, waste oil, hazardous waste fractions, and various other waste streams 2. Overview tables and/or figures for generation trends (from the past to the end of the WMP or even beyond) 3. Illustration of developments in shares of different waste types to annual total

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
7	Assessment of development in waste generation	Textual information and data for final year covered by the plan for packaging waste, biowaste, ELV, WEEE, batteries, waste oil, hazardous waste	<ol style="list-style-type: none"> 1. See above for illustration 2. Short justification for estimate 	<ol style="list-style-type: none"> 1. See above for illustration 2. Detailed justification for estimation
8	Import/export	Textual information and data by waste types including destination for starting year and last year of the plan	Overview tables on current status and trends by waste types including destinations for hazardous and non hazardous waste	<ol style="list-style-type: none"> 1. Overview tables/figures on current status and trends by waste types including destinations (e.g. pie charts) for hazardous and non hazardous waste 2. Indication of treatment type (D/R-Code) and major treatment operations by major waste stream and destination

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
9	Description of existing waste collection schemes	For starting year (what is in place, at least for waste oils, hazardous waste or waste streams covered by specific EU legislation)	<ol style="list-style-type: none"> 1. Description of type of collection system (kerbside, collection points, civic amenity sites, extended producer responsibility schemes) for major waste streams covered 2. Indication of trend of annual collection quantities for major waste types 	<ol style="list-style-type: none"> 1. Detailed description of kerbside, collection points, civic amenity sites, extended producer responsibility schemes for all waste streams covered 2. Illustration of trend of annual collection quantities by waste types
10	Major existing waste disposal and recovery installations	Textual information (what is in place; at least for waste oils, hazardous waste or waste streams addressed by specific EU legislation)	<ol style="list-style-type: none"> 1. Listing of installations by type and class, including remaining capacity or annual throughput 2. Description of special arrangements for certain waste streams as required and additional national priority 	<ol style="list-style-type: none"> 1. Listing of installations including background information on age, standard, contact, remaining or annual capacity, annual throughput, type of waste received, and region/district served

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
			waste streams (illustrative maps, if relevant)	2. illustrative maps of existing infrastructure 3. Description of special arrangements for certain waste streams as required and additional national priority waste streams (illustrative maps if relevant)
11	Conclusion on whether or not there is a need for new collection schemes, waste management infrastructure and/or closure of existing waste installations in order to assure/achieve self-sufficiency and proximity principles (Article 16)	General statement	1. Quantification by major schemes/installations required; 2. Related investments addressed 3. Short statement whether or not self-sufficiency and	1. Quantification by major schemes/installations required; background on geographical priorities and/or location/distribution of the new facilities, if relevant; 2. Maps illustrating needs in relation to existing

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
			<p>proximity principles for waste disposal and for recovery of mixed MSW have already been reached or will be reached within the plan.</p>	<p>infrastructure</p> <ol style="list-style-type: none"> 3. Related investments addressed 4. Conclusions on whether or not self-sufficiency and proximity principles for waste disposal and for recovery of mixed MSW have already been reached or will be reached within the plan. 5. Waste streams or sources listed for which self-sufficiency has not yet been reached. 6. Information on whether self-sufficiency and proximity have

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
				<p>been/will be reached at national level; or whether there is cooperation with other countries.</p> <p>7. (listed by waste type and treatment method)</p>
12	Criteria for location of all listed installations (future disposal or major recovery)	General statement and textual information on criteria	Textual description and justification for selected sites (schematic maps)	In addition to textual description and justification, illustration of planned sites (maps, technical drawings used in EIA or SEA)
13	General waste management policies, including planned waste management technologies and methods or specific policies for problematic waste	General statement and textual information	<p>1. (For stakeholders involved, allocation of responsibilities - see point 17)</p> <p>2. Background information on legal priorities and provisions</p>	<p>1. (For stakeholders involved, allocation of responsibilities - see point 17)</p> <p>2. Background information on legal priorities and provisions</p>

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
			<p>(bans), taxes, awareness raising, training, guidance, etc.</p> <p>3. Description of requirements as regards treatment standards and treatment options</p> <p>4. Strategies to tackle problematic waste streams</p>	<p>(bans), fee system; taxes, environmental funds, awareness raising, training, guidance, etc.</p> <p>3. Description of requirements as regards treatment standards and treatment options</p> <p>4. Strategies to tackle problematic waste streams</p> <p>5. Overview table on major policy priorities listed by waste and by treatment technologies</p>
14	Prevention and re-use of packaging and packaging waste	Text including information on whether or not the re-use/recycling/recovery	Statement on whether or not the re-use/recycling/recovery targets for packaging and packaging	1. Statement on whether or not the re-use/recycling/recovery targets for packaging and

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
		targets for packaging and packaging waste have been reached or will be reached within the plan	waste have been reached or will be reached within the plan; indicate the year, and major strategies applied.	<p>packaging waste have been reached or will be reached within the plan; indicate the year, and major strategies applied.</p> <p>2. Illustration by means of tables and/or figures of trends</p> <p>3. Information on more ambitious national targets if relevant</p>
15	Strategies for reducing biodegradable waste going to landfills (Landfill Directive, Article 5)	Text including information on whether or not the recycling/recovery targets for biodegradable waste have been reached or will be reached within the plan	Same as above	Same as above

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
16	Description of the organisation of waste management in the territory covered [Art.28(4)(a)]	Not mandatory	<ol style="list-style-type: none"> 1. Specific Chapter with structured description of waste management system. 2. Information on supervision and control of waste chain and cooperation with neighbouring regions in other Member States 	<ol style="list-style-type: none"> 1. Specific Chapter with well structured description of waste management system. 2. Detailed information on organisation of supervision and control of waste chain and cooperation with neighbouring regions in other MS 3. Illustration by means of waste flow/organisation chart
17	Description of the allocation of responsibilities between public and private stakeholders [Article 28(4)(a)]	Not mandatory	<ol style="list-style-type: none"> 1. Specific Chapter with structured description of the competences of national, regional and local authorities and the private sector 	<ol style="list-style-type: none"> 1. Specific Chapter with well structured description of the competences of national, regional and local authorities and the private sector

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
			<p>concerning collection, transport, recovery</p> <p>2. Information on extended producer responsibility programmes</p> <p>3. Description of rules for service contracts with citizens</p>	<p>concerning collection, transport, recovery</p> <p>2. Information on extended producer responsibility programmes</p> <p>3. Illustration by an organisation chart</p> <p>4. Description of rules for service contracts with citizens and quantification of annual fees for citizens</p>
18	Evaluation of the usefulness and suitability of economic and other instruments; description of instruments	Not mandatory	1. Specific Chapter with detailed description of steering instruments/tools applied in the past and for the planning	1. Specific Chapter with detailed description of steering instruments/tools applied in the past and for the planning

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
	used [Article 28(4)(b)]		<p>period.</p> <p>2. Indication of the impacts and implications of the instruments used in the past (how did the measure affect waste generation and/or collection/treatment shares?)</p>	<p>period.</p> <p>2. Listing of indicators for evaluation</p> <p>3. Quantitative evaluation of the impacts and implications of the instruments used in the past; (how did the measure affect waste generation and/or collection/treatment shares?)</p>
19	Additional information on awareness campaigns and information provision; description of which audience these measures address and whether an	Not mandatory	1. Specific Chapter with detailed description of awareness-raising and information exchange measures in the past and for the planning	1. Specific Chapter with detailed description of awareness-raising and information exchange measures in the past and for the planning

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
	evaluation of the effectiveness of the measures taken is foreseen [Article 28(4)(c)]		period. 2. Indication of the impacts and implications of the instruments used in the past; (how did the measure affect waste generation and/or collection/treatment shares?)	period. 2. Listing of indicators for evaluation 3. Quantitative evaluation of the impacts and implications of the instruments used in the past; (how did the measure affect waste generation and/or collection/treatment shares?)
20	Specification of historical contaminated waste disposal sites and measures for their rehabilitation [Article 28(4)(d)]	Not mandatory	1. Listing/mapping of former waste disposal sites, including information on kind of waste deposited, operational period of site.	1. Listing/mapping of former waste disposal sites, including information on kind of waste deposited, operational period of site, specific risks to the environment and/or human

	WFD requirement	<i>Minimum Criteria for a WMP compliant with EU legislation and policy objectives</i>	<i>Criteria for a WMP to be a good plan in the light of EU legislation and policy objectives</i>	<i>Maximum Criteria for an ideal WMP suitable to serve as an example of good practice for compliance with EU legislation and policy objectives</i>
			2. Action plan for rehabilitation, including detailed information on technical measures.	health. 2. Action plan for rehabilitation, including detailed information on technical measures and related investments.

8. Useful websites and publications

A non-exhaustive list of references available on the Web is given below. It includes sources of further information on waste-management planning, various guidelines, as well as national or regional plans and equivalent strategic documents.

An overview of relevant publications is also provided.

8.1 Further information on WMP

The European Commission, General website: DG Environment, Nuclear	http://europa.eu.int/comm/environment/index_en.htm
Safety and Civil Protection	EU focus on waste management: http://europa.eu.int/comm/environment/waste/facts_en.htm Integrated Product Policy: http://europa.eu.int/comm/environment/ipp/home.htm
EU Legislation, EUR-Lex Section 15.10.30.30 — Waste management and clean technology	http://europa.eu.int/eur-lex/en/lif/reg/en_register_15103030.html
The European Statistical Office — Eurostat	http://www.europa.eu.int/eurostat.html
The European Environment Agency	General website: http://www.eea.eu.int/ On waste: http://themes.eea.eu.int/Environmental_issues/waste
European Topic Centre on Waste and Material Flows	http://waste.eionet.eu.int/ Wastebase, an electronic database with information on waste, waste policies, planning, management and treatment in Europe: http://wastebase.eionet.eu.int/
The Secretariat of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, The Aarhus Convention	http://www.unep.ch/basel/ http://www.unece.org/env/pp/ Implementation of the Aarhus Convention into European legislation: http://europa.eu.int/comm/environment/aarhus/index.htm
OECD Environment Directorate	http://www.oecd.org/oecd/pages/home/displaygeneraI/03380,EN-home-8-nodirectorate-no-no--8,FF.html

	The Environmentally Related Taxes Database http://www1.oecd.org/scripts/env/ecoInst/index.htm
ACRR (Association of Cities and Regions for Recycling)	http://www.acrr.org/german/about-us/ubers.htm
The Association for the Sustainable Use and Recovery of Resources in Europe	http://www.assurre.org
The Resource Recovery Forum	http://www.residua.com/rrf/index.htm

8.2 Guidelines

Strategic Planning for Sustainable Waste Management: Guidance on Option Development and Appraisal	The UK Government's Office of the Deputy Prime Minister (ODPM) has published a good practice guidance on strategic planning for sustainable waste management. http://www.planning.odpm.gov.uk/spswmgo d/index.htm
Méthode de révision des plans and Gestion des déchets: état des connaissances	Published by the French Agency for Environment and Energy Management, ADEME. The French version is published at: http://www.ademe.fr/collectivites/Dechetsnew/Politique-planif/plans/guide.htm . An English summary, Management of household waste: Departmental Plans, is also available.
Strategic Planning Guide for Municipal Solid Waste Management	Published by the World Bank. The Guide aims to provide information, supporting methodologies and tools to assist in the development of Strategic MSWM Plans at the local and regional level. It is targeted mainly at local and regional authorities in developing countries and economies in transition, but much of the material in the Planning Guide will be relevant and useful to all countries. http://wbln0018.worldbank.org/External/Urban/UrbanDev.nsf/Urban+Waste+Management/349F2CDAE6E96C6285256B3A007DB3D1?OpenDocument
National Waste Strategy: Supporting Guidance	Guidance document by the Scottish EPA in preparing Area Waste Plans as a key means of implementing the national waste strategy.

	http://www.sepa.org.uk/nws/guidance/nws/nws_supporting_guidance.htm
Waste Guide. Framework and Strategies for Waste Management in European Cities	Published by the Environmental Protection Agency of the City of Copenhagen, with the support of the European Commission's Environment Directorate-General, 1999. http://euronet.uwe.ac.uk/waste/
Waste Minimisation Good Practice Guide	Published by the UK Environment Agency. The Guide is useful for small and medium-sized enterprises setting up a waste minimisation programme in the workplace. http://www.environmentagency.gov.uk/commdata/105385/good_practice.pdf
Les guides pratiques	The French Agency for Environment and Energy Management, ADEME, has published four practical guidelines: les déchets des ménages; le compostage individuel; les appareils électroménagers and Les déchets dangereux. http://www.ademe.fr/particuliers/

8.3 National waste-management plans and strategies

Austria	Federal Waste Management Plan 2001, Austrian Federal Ministry of Agriculture, and Forestry Environment and Water Management 1998/2002 http://gpool.lfrz.at/gpoollexport/media/file/federalwaste.pdf
Belgium	Wallon: Horizon 2010, Plan Wallon des déchets, Wallon Ministry of the Environment http://environnement.wallonie.be/cgi/dgrne/plateforme_dgrne/visiteur/frames.cfm Brussels: Plan de prévention et de gestion des déchets. Flanders: Strategic Waste Plan (2002-2006) and other waste management plans: http://www.ovam.be/
Denmark	Waste 21, Waste Management Plan 1998-2004, Danish Environmental Protection Agency: http://www.mst.dk/udgiv/Publications/1999/87-7909-571-2/pdf/87-7909-570-4.PDF
Finland	The National Waste Plan, 1998-2005, Ministry of the Environment: http://www.vyh.fi/eng/environ/policy/waste/planning.htm A booklet, Finland's National Waste Management Plan in brief: http://www.vyh.fi/eng/orginfo/publica/electro/waste/waste.pdf
France	Examples of Plans départementaux: Adopted or published: Pas-de-Calais: Plan départemental 13 September 2002 révisé d'élimination de déchets menagers et assimilés Alpes de Haute-Provence: Plan 15 February 2002 départemental d'élimination de déchets menagers et

	assimiles
Germany	Examples of Abfallwirtschaftsplanen: Adopted or published: Bavaria: Abfallwirtschaftsplan Bayern, December 2001 Verordnung und Begründung Freie Hansestadt Bremen: February 2002 Abfallwirtschaftsplan und Abfallbilanz
Greece	A summary of the plan is available in English at WasteBase (not an official summary): http://waste.eionet.eu.int/wastebase/plans/details_html?pk=PGR01-0
Ireland	'A policy statement, waste management — changing our ways', The Department of the Environment and Local Government, September 1998: http://www.environ.ie/enviro/invindex.html Example, regional plan: Waste Management Plan for the Dublin Region 1999-2003.
Italy	A summary of the plan is available in English at WasteBase (not an official summary): http://waste.eionet.eu.int/wastebase/plans/details_html?pk=PIT1 Examples of regional plans: Adopted or published: Lazio: Piano di gestione dei rifiuti September 2002 Puglia: Piano di gestione dei rifiuti e September 2002 delle bonifiche in Puglia — Completamento, integrazione e modificazione
Luxembourg	Plan national de gestion des déchets (2001-2006). http://www.mev.etat.lu/home.html
Netherlands	The Minister of Housing, Spatial Planning and the Environment together with the Waste Management Council formulated The National Waste Management Plan 2002-2012. http://www.aoo.nl/default.htm?http%3A//www.aoo.nl/page.asp%3Fmenu_id%3D76
Norway	The Government's Waste Policy, Ministry of the Environment http://odin.dep.no/md/engelsk/publ/rapporter/022051-220006/index-dok000-b-n-a.html
Portugal	Projecto Para o Plano Nacional de Resíduos, Ministry for Towns, Territorial Planning and Environment: http://www.ambiente.gov.pt/
Spain	Plan Nacional de Residuos Urbanos (2000-2006). [In English: National Plan for Municipal Waste in Spain]. http://www.mma.es/calid_amb/residuos/plan/index.htm
Sweden	Regeringens skrivelse, 1998/99:63, En nationell strategi för avfallshanteringen http://miljo.regeringen.se/propositionermm/skrivelser/pdf/skr9899_63.pdf Examples of local plans: Adopted or published: Malmö stad: Avfallsplan 1993 Nybro: Avfallsplan for Nybro 1989-2000 April 1991

United Kingdom	<p>England and Wales: Waste Strategy 2000 (Part 1 and 2), Department of the Environment, Transport and the Regions http://www.defra.gov.uk/environment/waste/strategy/cm4693/pdf/wastvol1.pdf http://www.defra.gov.uk/environment/waste/strategy/cm4693/pdf/wastv2_1.pdf</p> <p>Scotland: The National Waste Strategy 1999, Scottish Environment Protection Agency: http://www.sepa.org.uk/nws/guidance/nws/nws_1999.htm</p> <p>Draft Area Waste Plans are available at: http://www.sepa.org.uk/nws/guidance/dawp.htm</p>
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8.4 Publications

EU Focus on Waste Management

The European Union has defined and is pursuing a waste strategy which is addressed in this publication. It is intended to inform local and regional players, NGOs, policy-makers at all levels, social partners and consumers, as well as citizens. It includes links to related Commission studies on waste. The strategy is published at:
<http://europa.eu.int/comm/environment/waste/publications/eufocus.htm>

EU Study on Waste Prevention and Minimisation

This study examines some of the best waste minimisation practices for both industrial and municipal waste flows. The objectives of the study are to:

- a. identify and analyse the measures taken by the various national players to minimise the quantity and hazardousness of industrial waste;
- b. identify and analyse, in the municipal waste sector, best practices in waste prevention;
- c. identify horizontal measures taken with the aim of eliminating hazardous substances from the waste stream;
- d. measure and analyse, with several concrete examples, the environmental and economic gains associated with the prevention of waste.

The study is published at:

<http://europa.eu.int/comm/environment/waste/studies/prevention&minimisation.htm>

Financing and Incentive Schemes for Municipal Waste Management

The specific objective is to carry out 20 case studies on innovative financing systems at local and national levels, to be chosen in agreement with the European Commission. These case studies focus on systems that were able to provide incentives to reduce waste quantities and increase recycling and composting. The experience and results of such systems are described. The study is published at:

<http://europa.eu.int/comm/environment/waste/studies/financingmun>

[icipalwaste_management.htm](#)

Costs of Municipal Waste Management in the EU

The European Commission has published a substantial report on municipal solid waste (MSW) management costs. The report gives an overview of the costs of different waste management options at local and national levels for all 15 EU Member States. The study constitutes an attempt on the part of the Commission to generate baseline data for the costs of future policy changes. The report and the appendices are available from:

http://europa.eu.int/comm/environment/waste/studies/eucostwaste_management.htm

Municipal Waste Management in Accession Countries

Eurostat has collected information on the ten Central and Eastern European countries and the two Mediterranean countries.

<http://europa.eu.int/comm/eurostat/Public/datashop/print-catalogue/EN?catalogue=Eurostat&product=KS-47-02-301--N-EN>

Success stories on composting and separate collection

This project has involved identifying a number of successful centralised and home composting schemes in six Member States: Spain, France, Ireland, Italy, Portugal and the United Kingdom. For each scheme a case study has been completed, highlighting the reasons for the scheme's success.

<http://europa.eu.int/comm/environment/waste/compost/index.htm>

Economic analysis of options for managing biodegradable municipal waste

The main objective of the study was to conduct an economic evaluation that considers both private and social welfare costs and benefits of existing options for managing the biodegradable fraction of municipal waste. The main emphasis is on separate collection and composting / anaerobic digestion. The study focuses on the Member States of the European Union and on the first wave of accession countries.

<http://europa.eu.int/comm/environment/waste/compost/>

Biodegradable municipal waste management in Europe

This report from the EEA is intended as a guide to help decision-makers in their efforts to comply with the EU Landfill Directive targets for reducing the landfilling of biodegradable municipal waste.

http://reports.eea.eu.int/topic_report_2001_15/en

Environmental instruments

The EEA carries out a number of studies on policy measures and instruments. One example is Environmental taxes — Recent developments in tools for integration, where the EEA reports on developments in the use and impact of environmental taxes and on progress made with ecological tax reforms. Published at:

http://themes.eea.eu.int/Actions_for_improvement/policy/reports.

Methods and tools for assessing information related to waste and material flows

The study includes an overview of various tools such as lifecycle assessment (LCA), environmental impact assessment, cost-benefit analysis, geographical information systems (GIS), indicators, and gives a description of applications. To be published by the European Environment Agency: <http://www.eea.eu.int/>

Environment and health

The Danish Environmental Protection Agency published a report in 2001 describing its work in protecting human health with the aid of legislation on chemicals and the environment. The report focuses on human exposure to health risks from air, soil, drinking water, bathing water, swimming pools, waste, wastewater, noise and chemical substances. The report was prepared for use mainly in Central and Eastern European countries. More information: Environmental Factors and Health -The Danish Experience, published at: http://www.mst.dk/udgiv/Publications/2001/87-7944-519-5/html/default_eng.htm

9. Further information about waste prevention programmes

9.1 Principles to be observed by waste prevention programmes

The people responsible for deciding which waste prevention measures should be implemented have to strike a balance between:

- the rights and freedoms of individuals, enterprises and interest groups;
- the need to keep products and service systems functioning;
- the need to protect health and the environment while preserving resources.

In doing so, the following principles should be observed:

Minimum macro economic costs	<p>The objective is to create a system (a macro economy) which meets the needs of our generation, at least with respect to macro economic costs, without jeopardising the needs of future generations. Macro economic costs include costs generated by environmental impacts, social costs and financial costs.</p> <p>They also include the costs for future generations which we generate today by consuming natural resources (such as concentrated materials and energy carriers).</p>
Life-cycle thinking	<p>All the processes and substance flows (in both directions) covering the needs of our society should be non-polluting and environmentally safe.</p> <p>The macro economic costs to be considered include: the environmental, economic and social impacts of mining the materials we use until their final deposition in a safe sink.</p> <p>The impacts to be considered include human health, emission/immission to air, water and soil, effects on land, protected areas and biodiversity.</p>
Decoupling	<p>The carrying capacity of planet earth is limited. Hence, it is necessary, at least in the long</p>

	term, to reduce radically the environmental impacts and consumption of natural resources while ensuring that the economy continues to grow.
Protection of natural resources, environmental and human health	Reducing environmental impacts means protecting natural resources and environmental and human health.
Prevention of negative economic and social impacts; promotion of economic and social development	The waste prevention programme, while aiming to lower environmental impacts, should not cause negative economic and social impacts but rather take up opportunities for increasing competitiveness, creating jobs and shifting from a material/energy-based economy to a service-based economy.
Waste hierarchy	<p>The following waste hierarchy should apply as a priority in legislation and policy relating to waste prevention and management:</p> <ul style="list-style-type: none"> (a) prevention; (b) preparing for re-use; (c) recycling; (d) other recovery, e.g. energy recovery; (e) disposal. <p>When applying this waste hierarchy Member States should take measures to encourage the options that deliver the best overall environmental outcome (the lowest macro economic system costs). This may mean that specific waste streams depart from the hierarchy, where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste.</p>
Waste as a resource	'Waste' by definition means any substance or object which the holder discards, or intends or is required to discard. Hence, waste is material which no longer has any real value for the holder. Waste prevention, however, can amount to re-establishing value for the holder or any other potential user.
Safe sinks	The maximum recycling rate is achieved when a further increase of recycling would increase the macro economic system costs (and would increase the environmental impact). Any material which would increase the total

	<p>environmental impact of a macro economy when recycled is to be separated from the material flows, treated so that it cannot cause any further harm and stored in a safe sink.</p>
Sustainability	<p>Sustainability means that the macro economic system which we establish to meet our needs should be able to develop into a system which can meet the needs of future generations efficiently. In the long term these macro economic systems must have the capacity to operate without any degradation of natural resources.</p>
Sustainable consumption and production	<p>One way of preventing waste is to promote sustainable consumption and production. This encompasses low-impact mining and material processing, cleaner production, eco-design and long-lasting repairable, efficient low-material, low-pollutant products, and consumption which meets needs with a minimum of materials, energy and products.</p> <p>Many waste prevention measures focus on the early stages of the life cycle, where the material and waste flows, as well as the environmental impacts, are the greatest. However, it should not be forgotten that changes in the consumption phase do not only affect environmental impacts in this phase but also affect the environmental impacts of all preceding and subsequent phases. Therefore, it is important to start by considering all phases of the life cycle before selecting a priority target area for the waste prevention programme.</p> <p>A crucial lever for waste prevention is the promotion of lifestyles which focus on creating 'happiness' instead of focusing on owning as much as possible.</p> <p>Sustainable consumption is the use of goods and services which cover basic needs, and improve the quality of life, while simultaneously minimising the degradation of natural resources, the utilisation of toxic materials and emissions of waste and pollutants throughout the lifecycle so that the needs of future generations are not jeopardised (NORWEGIAN MINISTRY OF THE ENVIRONMENT 1994).</p>
Eco-efficiency and	<p>Eco-efficiency means meeting given needs with</p>

eco-sufficiency	<p>minimal depletion of natural resources and minimal environmental impacts.</p> <p>One drawback of the eco-efficiency concept is that, frequently, past efficiency improvements have not led to less input (that is less consumption of natural resources) but rather to increased output (that is more final consumption). In order to tackle this rebound effect, the concept of eco-sufficiency also addresses the level of needs that final consumers wish to cover. By influencing consumption patterns and lifestyles, a high quality of life is achieved with minimal depletion of natural resources and minimal environmental impacts.</p>
Efficiency and effectiveness	Each measure in the waste prevention programme must have greater benefits than costs. It also must contribute to achieving the objectives of the programme at lower costs than the alternatives at hand.
Technical feasibility and economic viability.	The only viable measures are those which can be implemented under real life conditions and which society can afford.
Transparency and participation	Member States should ensure that the development of waste legislation and policy is a fully transparent process which complies with existing national rules governing the consultation and involvement of citizens and stakeholders.
Precautionary principle	Waste-prevention programmes should anticipate problems which may develop in the future and provide appropriate solutions. It is always cheaper to prevent damage in an efficient way than it is to repair it.
Proximity principle	Normally, the point where the environmental impact can be reduced most efficiently and most effectively is at the source of the pollution.
Polluter-pays principle and extended producer responsibility	<p>The person or body causing an impact is responsible for abating that impact as well as for carrying the costs.</p> <p>At any rate, the party which pays for improving the system should be the party which benefits from the improvement.</p> <p>Tenant-landlord situations can frequently be</p>

	<p>found in our system. For instance, if a landlord invests in better building insulation, it is he who carries the costs, while the tenant benefits from a lower fuel bill.</p> <p>One of the core tasks of waste-prevention programmes is to surmount these situations of multi-person-irresponsibility and create conditions where the polluter pays and the investor reaps the benefit.</p> <p>Examples of concrete ways of applying the polluter-pays principle with extended producer responsibility schemes are levies on polluting products or 'take-back' obligations with an additional obligation to cover the costs for the treatment of the respective spent products (EcoLogic 2005).</p>
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10. Glossary of technical terms

Bio-waste

Bio-waste means biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants.

Biodegradable Waste

Biodegradable waste means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.

Bulky waste

Large wastes, such as appliances, furniture and trees and branches, which cannot be handled by normal municipal waste-processing methods.

Co-incineration

Co-incineration means incineration whose main purpose is the generation of energy or production of material products and:

- which uses wastes as a regular or additional fuel or
- in which waste is thermally treated for the purpose of disposal.

Collection

Collection means the gathering of waste, including the preliminary sorting and storage of waste for the purposes of transport to a waste-treatment facility.

Separate collection means collection where a waste stream is kept separately by type and nature so as to facilitate a specific treatment.

Construction and Demolition Waste (C&D Waste)

Construction and demolition waste means waste corresponding to the waste codes in Chapter 17 of the Annex to Commission Decision 2000/532/EC3, excluding hazardous waste and naturally occurring material as defined in category 17 05 04.

Commercial Waste

Commercial waste, also known as retail waste, is a waste material that originates in wholesale business establishments, office buildings, stores, schools, hospitals and government agencies.

Disposal

Disposal means any operation which is not recovery, even where the operation has as a secondary consequence the reclamation of substances or energy.

Dump

An open, unmanaged, illegal disposal site used instead of a permitted landfill.

Energy recovery

The energy which is produced by the incineration of waste is utilised.

Green Waste

see Biowaste

Hazardous waste

Hazardous waste means waste which displays one or more hazardous properties, for example explosive, toxic or infectious.

Health-care waste — HCW (Medical, Clinical, Hospital Waste)

Any solid waste that is generated in the diagnosis, treatment, or immunisation of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals.

Hazardous household waste

Hazardous household waste means those fractions of household waste which fall under the definition of hazardous waste.

Household Waste

Household waste means waste generated by households.

Incineration

Incineration is the thermal treatment of wastes with or without recovery of the combustion heat generated. This includes the incineration by oxidation of waste as well as other thermal treatment processes such as pyrolysis, gasification or plasma processes, in so far as the substances resulting from the treatment are subsequently incinerated. The process of burning solid waste under controlled conditions to reduce its weight and volume and often to produce energy.

Industrial waste

Waste which results from industrial processes, including factories and treatment plants.

Inert Waste

Inert waste means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the eco-toxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.

Landfill / Sanitary landfill

A landfill means a waste disposal site for the deposit of the waste onto or into land (i.e. underground).

A sanitary landfill is a landfill that meets the standard specifications, including sound siting, extensive site preparation, proper leachate and gas management and monitoring, compaction, daily and final cover, complete access control and record-keeping.

Material recovery

Material recovery means any recovery operation, excluding energy recovery and reprocessing into materials which are to be used as fuel.

Municipal Waste

Municipal waste means waste from households and similar waste. Similar waste is defined as waste which is in nature and composition comparable to household waste, excluding production waste and waste from agriculture and forestry.

Organic waste

Material that is derived from plant or animal sources, and which can generally be decomposed by microorganisms.

Packaging

Packaging means all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer.

Packaging waste

Packaging waste means any packaging or packaging material which falls under the definition of waste, excluding production residues.

Paperboard

Heavyweight grades of paper, commonly used for packaging products such as cereal boxes.

Recovery

Recovery means any operation whose principal result is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

Recycling

Recycling is the third level of the waste hierarchy. It means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Residual Waste

The elements of the household waste stream that remain after recycling or compostable materials have been separated or removed.

Re-use

Re-use is the second stage in the waste hierarchy. Re-use means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for re-use means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment

Treatment means recovery or disposal operations, including preparation prior to recovery or disposal. This includes the physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volumes or hazardous nature, facilitate its handling or enhance recovery.

Waste management

Waste management means the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, as well as measures taken as a dealer or broker.

Waste Minimisation

Action to prevent waste being produced in order to minimise or reduce the amount of waste requiring final disposal. Minimising waste saves collection and disposal costs and helps to reduce the demand for raw materials.

11. Literature

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