RAMBOLL

COLLECTORS
WASTE COLLECTION SYSTEMS ASSESSED AND GOOD PRACTICES IDENTIFIED

Deliverable D1.1

KEY PARAMETERS FOR WASTE COLLECTION SYSTEMS DEFINED AND VALIDATED

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Credits

Disclaimer

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Contents

Introduction

Five tonnes of waste per capita are generated every year in the EU. These annual 2.5 billion tonnes of waste contain large volumes of valuable materials for Europe's industrial base. Proper collection of waste is a pre-condition for their optimal recovery. The current trend of increasing higher collection rates is promising, but progress is uneven between Members States and between regions.

Good regional practices have the potential to serve as good practice examples for other regions. So far, however, results of existing studies and good practices have not been effective enough in supporting the implementation of better-performing systems elsewhere. The main objective of the COLLECTORS project is to overcome this situation and to support decision-makers in shifting to better-performing collection system.

COLLECTORS will therefore:

1. Increase awareness of the collection potential by compiling, harmonising and presenting information on systems for Packaging and Paper Waste (PPW), Waste Electrical and Electronic Equipment (WEEE) and Construction & Demolition Waste (CDW) via an online information platform.
2. Improve decision-making on waste collection by the assessment of twelve good practices on their performance on:

   (1) quality of collected waste;

   (2) economics;

   (3) environment;

   (4) societal acceptance.
3. Stimulate successful implementation by capacity-building and policy support methods that will increase the technical and operational expertise of decision-makers on waste collection.
4. Engage citizens, decision-makers and other stakeholders throughout the project for validation of project results and to ensure the usability of COLLECTORS-output.

The COLLECTORS project covers the following waste groups/streams:

- **Packaging and Paper waste from private households and similar sources:**
  - Paper & cardboard - packaging and non-packaging;
  - Plastic packaging;
  - Metal packaging;
  - Glass packaging;
  - Beverage composites;
- **Waste Electrical and Electronic Equipment from private households and similar sources;**
- **Construction and demolition waste with a focus on wastes that are managed by public authorities.**

In general, the waste management chain from waste generation to waste collection and the first treatment step is investigated per waste stream.

Methodology for selection of parameters

The first task **"Specification – and validation – of key parameters for collection systems"** was related to the **identification and selection of parameters** that are suitable for describing and assessing key elements of waste collection systems. Based on the **final list of key parameters**, an inventory on waste collection systems was prepared.

Identification of preliminary list of parameters in literature

The first objective of task 1.1 was to **identify as many parameters as possible**, to ensure that no relevant parameters are missed. In addition, the focus was to identify parameters that either:

a) describe the context a waste collection system is embedded in (e.g. population, climate, geography etc.);

b) are not waste stream specific but potentially interesting for developing "parameter groups" (e.g. waste generation, waste collection etc); or

c) describe characteristics of waste collection systems for specific waste streams (PPW, WEEE, and CDW).

Literature database

In a first step, a list of all material and literature to be screened for parameters has been elaborated; an initial list of literature as included in the project proposal was used as a starting point. In addition, a desk research has been conducted to identify literature related to parameters for waste collection. Project partners have also been asked to share relevant information sources.

Overall, this resulted in a list of approximately 300 information sources for the parameter identification.

These sources were systematically screened for parameters. Therefore, an Excel database summarising all literature was created sorting all single sources according to the type of information it contained. The following information was assessed per information source:

- Short ref.
- Title
- Date (year)

- Author/publisher
- Doc. Type
- Original file name
- Link
- Country covered
- Language of the document
- Screening status (y/n)
- Covers additional stream (y/n)
- Comment
- Information on PPW, CDW or WEEE
- Original source

Short ref.	Title	Date	Author/publisher	Doc.	Link	Countr	Language
2014, Case study on WEEE in FI, bio	Case study on WEEE in Finland	2014	bio Intelligence Service	PDF	Link	FI	English
2014, Case study on WEEE in DK, bio	Case study on WEEE in Denmark	2014	bio Intelligence Service	PDF	Link	DK	English
2014, ACR+, The EU Capital Cities Wa	The EU Capital Cities Waste Managn	2014	ACR+	PDF	Link	IE, UK, Dk	English
2013, The Croatian Parliament, HR Na	Act On Sustainable Waste Managem	2013	The Croatian Parliament	PDF	Link	HR	English
2013, R4R, Municipal Solid Waste Dat	Municipal Solid Waste Data - R4R Pr	2013	R4R	PDF	Link	DK, IE, AT	English
2013, Ministerium für Wi, DE Rhinelan	Abfallwirtschaftslan Rheinland-Pfalz	2013	Ministerium fürWirtschaft	PDF	Link	DE	German
2013, CWIT, WP2 D2-1 Mapping of W	Work Package 2: WEEE Actors and	2013	CWIT	PDF	Link	European	English

Figure 1: Excerpt of the literature database

The database summarises relevant literature sources for each of the three waste streams on a separate sheet, providing a comprehensive overview. In addition, a fourth sheet collates all sources. Thus, this database was furtherused as a starting point for the systematic identification of collection systems per waste stream.

Screening of literature

Based on the literature database the project team started systematically screening each source identified per waste stream for parameters. To compile the parameters a dedicated database was designed based on several aspects that are relevant for parameters to assess waste collection system. These aspects are well known to the project team in the light of previous studies with similar focus. They are summarised hereafter.

Firstly, parameters can be grouped in **three main categories**:

- **Quantity-based parameters** reflect an amount of waste divided by a normalising factor, such as population and year, population equivalent (eqpop) and year, area and year, etc. They provide a good overview of overall waste management performance in absolute terms as well as insights on how the waste management develops over time. However, this type of parameters has limitations because it is highly dependent on external factors.
- **Performance ratios** are defined as percentages and are especially useful for specific waste fractions. These indicators are more complex because they put absolute terms in relation to each other, e.g. capture rates. This provides a good overview of the actual waste management performance for a waste management phase (collection, treatment, etc.) or a specific waste

fraction (glass, paper, etc.). The performance ratio parameters can have limitations, such as data availability issues or their dependence on external factors such as the presence of Extended Producer Responsibility (EPR) systems, weather, tourism etc.

- **Qualitative parameters** are a good parameter for features of a collection systems that cannot be assessed with quantitative data but can be described only. This includes two main categories of features: a) waste strategy and instruments and b) external factors whose influence is difficult to quantify. Some examples of waste strategies and instruments are: equipment used, legal framework, economic instruments, costs and incomes, communication activities; examples for external factors are: consumption patterns, geography, type of housing, weather, tourism etc.

Secondly, as aforementioned there is a difference between parameters describing the context the waste collection system is embedded in and parameters that describe the actual collection of the three waste streams. Thus, the following main assumptions should be considered:

- There are **general parameters** relevant for describing a waste collection system, that are waste independent, e.g. population size.
- There are **overarching parameters** for waste collection and can be applicable to the assessment of any waste collection system independently of the waste stream, e.g. generation per capita.
- There are waste stream **specific parameters** that are very specific to the collection of a certain waste stream and are not directly transposable to another waste stream.

Note: the distinction between general parameters, overarching parameters, and specific parameters as described above has been an **intermediate working step**, in particular to get a better overview of the hierarchy of different parameters and potential parameter groups; at a later stage, the groups “overarching parameters” and “waste stream specific parameters” have been merged (see description in section “pre-assessment of identified parameters” below).

Thirdly, to make the screening process as efficient as possible and to use synergies with the following task under this WP 1 (task 1.2 selection of parameters), it is important to assess important features per parameter identified already during the screening. This includes inter alia features related to the points outlined above. It is important to assess whether a parameter is operational, meaning that it can be calculated based on data usually available and if the parameter has already been in use to support this assessment. It is also important to categorise parameters directly based on the broader topic they assess such as waste generation, collection, economic features of the collection system, social aspects etc. Further, it must be assessed if a parameter is general, overarching, or specific (see above).

All these aspects are reflected in the design of the database for the parameter identification, which summarises information on the following:

- **Parameter group:** group the parameters depending on either the waste management phase they are applicable to, the external factor it addresses.
- **Single parameter name:** Definition of a short name for the parameter.

- **Description:** brief description of what the parameter intends to measure.
- **Sub-stream:** is the parameter also applicable to sub-streams of an overarching waste stream. The overarching waste streams are PPW, CDW, and WEEE, sub streams are e.g. paper in PPW; bricks in CDW, or batteries in WEEE.
- **Unit**: the unit in which the parameter can be assessed, this refers to the grouping of parameters as described above under quantity-based parameters, performance ratios and qualitative parameters.
- **Country, Region, City**: was the parameter identified within a specific geographical context.
- **operational (y/n):** assessment whether data/information for the parameter assessment is available and if it has already been used as a parameter to support this evaluation.
- **Source (short ref):** Data source where the parameter was identified.
- **Applicable for other stream**: Is the parameter also applicable for another waste stream, an if yes for which one.
- **Comment**: Additional relevant information on the parameter

Parameter group	Single parameter name	Description	Sub-stream	Unit	Country, Region, City	Source (short ref)	Also appli le fo othe
Challenges	Past challenges with waste prevention, collection	Such as declining waste prevention	y	Qualitative	--	Requested	y
Challenges	Current challenges with prevention, collection an	Such as declining waste prevention	y	Qualitative	--	Requested	y
Challenges	Past challenges with collection	Such as impurities, vandalism, ina	y	Qualitative	--	(no date),	y
Challenges	Current challenges with collection	Such as impurities, vandalism, ina	y	Qualitative	--	(no date),	y
Challenges	Past challenges with treatment	Such as impurities, inconvenient di	y	Qualitative	--	Requested	y
Challenges	Current challenges with treatment	Such as impurities, inconvenient di	y	Qualitative	--	Requested	y
Challenges	Price relation of primary and secondary resources	A low price of primary resources re	y	€/t	--	--	y
Challenges	Disadvantages of the collection system		y	qualitative		WEEE case	y
Challenges	Level/power of jurisdiction as regards waste management		y	qualitative		local legisl	y
Challenges	Do other challenges exist	e.g. primary raw materials are stil	yes		Austria	RE4 Proje	y
Drivers	Advantages of the system		y	qualitative		WEEE case	y
Drivers	Golden rules and best practices of the collection system		y	qualitative		WEEE case	y
Drivers	Budget spent on information campaigns		y	€		partly WEI	y
Drivers	Existence of a stakeholder platform to exchange	on the collection system	y	yes/no	EU-28	WEEE perf	y
Economic features	Set-up costs	Set-up costs to implement a specifi	y	€	EU-28	2015, BiPF	y
Economic features	Running costs	Running costs for the operation of	y	€/year; €/cap	EU-28	2015, BiPF	y
Economic features	Source of funding/funding mechanism	Regional tax; regional budget; spe	y	Qualitative	EU-28	2015, BiPF	y
Economic features	Revenue/Amount of funding per funding mechani	Regional tax; regional budget; spe	y	€	EU-28	2015, BiPF	y
Economic features	Cost for households		y	€/collection; €	EU-28	2015, BiPF	y
Economic features	Market value of recyclates		y	€/t	EU-28	2015, (no	y
Economic features	Market size for recyclates		y	t/y	--	2012, Wel	y
Economic features	Revenue from sale of recyclates		y	€	--	--	y
Economic features	Economic local instruments involved	Deposit scheme; fine for illegal dur	y	Qualitative	EU-28	2014, R4R	y
Economic features	cost for housholds	type of costs e.g. fees, tax, per ba	n	qualitative	EU-28	SR5, WMP	y
Economic features	construction cost		y	€	EU-28	SR5, WMP	y
Economic features	transportation cost		y	€	EU-28	SR5, WMP	y
Economic features	equipment cost		y	€	EU-28	SR5, WMP	y
Economic features	land cost		y	€	EU-28	SR5, WMP	y
Economic features	power		y	€	EU-28	SR5, WMP	y
Economic features	labour		y	€	EU-28	SR5, WMP	y
Economic features	avoided costs		y	€	EU-28	SR5, WMP	y
Economic features	additional income		y	€	EU-28	SR5, WMP	y
Economic features	Modulation of fees based on true cost of waste management		n	yes/no	EU-28	WEEE Perf	y
Economic features	cost efficiency	??	#	qualitative			#
Economic features	Level of landfill charges		n	€/t	EU-28	JASPERS F	y
Economic features	Taxes on virgin materials		yes	€	Italy	EU CDW P	y
Economic features	Remaining revenues from landfill taxes	e.g. for promotion and support of v	n	qualitative		EU CDW P	y
Economic features	Creating stimulating environments - "Separation gets cheaper than not separating"	Cost reduction is an important driv	yes	qualitative / €	Netherlands	NL bio	y
Economic features	Innovative business models	do innovative business models exis	yes	yes/no	Netherlands	NL bio	y
Economic features	Landfil tax		n	yes/n	EU-28	Waste dat	y

Figure 2: Excerpt of the parameter database

Pre-selection of parameters based on the "five basic principles"

This step was related to the selection of parameters that were assessed and included in the inventory analysis of waste collection systems (Task 1.2.). The eventual set of parameters upon which waste collection systems can be evaluated have been validated regarding their usefulness for decision-makers via a participatory approach. Therefore, during the first regional working group in March 2018, regional and local authorities have been consulted regarding their considerations to further specify and validate the parameter. This step was highly important also to allow for the effective multi-attribute comparison of the waste collection systems throughout the project.

Five basic principles

The overarching methodology that has been applied for the selection of parameters is based on the five basic principles as defined by Keeney and Raiffa[1]. All parameters used for the inventory need to meet certain criteria to present a neutral comparison of information on different waste collection systems. For this purpose, the five basic principles of criteria selection have been applied by the project team and when liaising with the Regional Working Group (RWG) for the selection:

- **Completeness**: The chosen set of parameters shall allow achieving the project´s goal. Therefore, it must cover all relevant aspects of the research subject. For the context of COLLECTORS, the parameters must comprise all aspects relevant to compare different waste collection systems. Therefore, it is necessary that parameters of different categories are included, e.g. parameters regarding the actual waste management stage (generation, collection, transport, treatment) but also ecologic, economic, social, political, etc. aspects.

- **Operational ability:** The chosen set of parameters needs to be operational, i.e. need to be useful and meaningful to allow a comparison of different alternatives (in this case collection systems) against the project's goal. To be operational, the parameters need to help understanding the differences between the compared alternatives and should be usable for explaining such differences. Any chosen parameter for this research needs to be useful for regional decision makers who want to compare different collection systems. Also, data for existing waste collection systems per chosen parameter needs to be already available.

1 Raiffa, H. and Keeney, R.L. (1975): Decision Analysis with Multiple Conflicting Objectives, Preferences and Value Tradeoffs, IIASA Working Paper, WP-75-053.

- **Decomposability:** The chosen set of parameters needs to be decomposable. In a complex decision-making process where many alternatives are compared against each other, the chosen set of parameters needs to show a certain level of detail. The aim should be to enable a split of the overall decision into many small decisions according to the chosen parameters. For this research this means that e.g. several parameters for the waste management stage need to be chosen. A general comparison of waste collection systems (i.e. one big decision) cannot be decisive as the decision-maker may not oversee all aspects. By contrast, a 'decomposed' decision (i.e. several small decisions) based on different parameters reflecting the waste management stage (e.g. parameters about waste generation, waste collection points, quality of the collected waste, etc.) allows the decision maker to choose an alternative (i.e. collection system) by comparing the alternatives alongside the different parameters.

- **Non-redundancy:** The chosen set of parameters should not include redundant parameters. Hence, parameters should not query the same information or information which will overlap to avoid double counting. Hence, there should not be a) parameters for the collected amount of waste and the population and b) a parameter for collected waste per capita.

- **Minimalism:** The chosen number of parameters should be kept to the minimum (without harming the aspect of completeness as described above) as each chosen parameter complicates the decision-making process.

Initial internal consultation on parameters

In addition to the parameters identified via the screening of literature, partners of the project, i.e. the ones responsible for Task 1.3, WP 2 and WP 3, were asked to share relevant parameters with Ramboll to be included in the parameter database. Ramboll obtained the following input by partners:

Table 1: Overview of parameters requested by partners

Parameters requested by partners	*Parameter(s) attributed by Ramboll matching requirement*
Requested by VITO	
Quality	• Covered by parameter group "waste treatment": first sorting step, recycling rejects, misthrows
Price	• Covered by parameter group "economic features"
Commercialisation	• Responsibilities for collection, policy
The final destination and application of the recycled waste to differentiate between high value and low value recycling	• Information going beyond the first treatment (input and output, where possible) is difficult to obtain. Additional information can be covered by parameter "sorting / treatment steps" (all streams), where available
Requested by VTT	
Collection rate	• Covered by parameter group "waste collection": capture rate (collection rate)
Share of separately collected waste	• Covered by parameter group "waste collection"
Removal of harmful substances	• Covered by parameter group "waste treatment": to be defined per waste stream, what information is available (first treatment)
Benefits, data availability	• Financing mechanisms are covered by parameter group "economic features"; sufficient data availability is evaluated by applying five basic principles
Running costs (OPEX)	• Covered by parameter group "economic features"
Set-up costs (CAPEX)	• Covered by parameter group "economic features"

Parameters requested by partners	*Parameter(s) attributed by Ramboll matching requirement*
Acceptability, job creation	• Covered by parameter groups “social aspects” (acceptance) and “economic features” (job creation)
Necessary framework conditions	• Covered by parameter group “influencing policy”
Financial	• Covered by parameter group “economic features”
Knowledge and time capacities for implementation of a collection system and the acceptance of a scheme	• Covered by parameter group “performance over time”
Past and current challenges/problems	• Covered by parameter group “challenges and drivers”
Requested by PNO	
CAPEX	• Covered by parameter group “economic features”
OPEX	• Covered by parameter group “economic features”
Lifetime of investment/machine	• Not included yet, to be discussed
% recycled material	• Information going beyond the first treatment (input and output, where possible) is difficult to obtain. Additional information can be covered by parameter “sorting / treatment steps” (all streams), where available
Quality recycled material	• Information going beyond the first treatment (input and output, where possible) is difficult to obtain. Additional information can be covered by parameter “sorting / treatment steps” (all streams), where available
Employment (FTE’s)	• Covered by parameter group “economic features”
Barriers for acceptance /challenges	• Covered by parameter group “challenges & drivers”
Involved finance schemes (private/ public/ subsidies)	• Covered by parameter group “economic features”
Consumer fees	• Covered by parameter group “economic features”

Parameters requested by partners	*Parameter(s) attributed by Ramboll matching requirement*
Requested by Leiden University	
Total amount of waste treated (mass)	• Covered by parameter group “waste treatment”
Total amount of waste (mass) untreated	• Covered by parameter group “waste treatment”
Container size	• Covered by parameter group “waste collection”
Container material	• Covered by parameter group “waste collection”
Pre-collection separation?	• Not clear; source separation of single fractions covered by parameter group “waste collection”
Transportation: • **Mode: truck, train, ship** • **Distance(s)** • **Capacity/size of trucks, trains or ships**	• Covered by parameter group “waste collection”
Separation process	• Source separation covered by parameter group “waste collection”; first treatment (sorting) covered by parameter group “waste treatment”
Landfill	• Covered by parameter group “waste treatment”
Incineration	• Covered by parameter group “waste treatment”
Sorting including output materials (amount)	• Covered by parameter group “waste treatment”
Area of treatment plant m2	• (initially covered by parameter group “environmental criteria”, parameter not selected)
Description of machinery	Not included.
Resource use (energy, water)	• (initially covered by parameter group “environmental criteria”, parameter not selected)
Amounts of materials recovered	• Information going beyond the first treatment (input and output, where possible) is difficult to obtain. Additional information can be covered by parameter

Parameters requested by partners	Parameter(s) attributed by Ramboll matching requirement
	"sorting / treatment steps" (all streams), where available

The project team assessed whether there are overlaps with already identified parameters. Where not, requested parameters have been added to the database as new parameter.

Pre-assessment of identified parameters

As the project team selected an inclusive approach for the parameter identification, meaning a screening that included all parameters identified in the literature per waste stream, many parameters were compiled within the previous step. With the objective of obtaining an operational number of parameters to be discussed at the meeting in Treviso the project team conducted a pre-assessment and selection in line with the five basic principles, i.e. operational ability and non-redundancy. The principles completeness, decomposability, and minimalism have been applied for the final selection of parameters during the meeting in Treviso with the external experts.

The following steps have been applied by the project team to pre-select parameters:

1. As all parameters identified were listed per waste stream (PPW, CDW, WEEE) numerous parameters of the category overarching were **duplicates** to each other. The project team started by assessing each parameter to identify duplicates. Duplicates are parameters that are identical to each other, e.g. same unit. Each parameter that was a duplicate was marked as such and then excluded from the list of overarching parameters. Note that no parameter was deleted from the database to ensure traceability along the entire selection process. Instead, a filter was inserted for duplicates.

2. Although duplicates had been eliminated there remained parameters that were not the same but still referred to the same information of a collection system and thus did not fulfil the principle of **non-redundancy**. As an example, amount of miss throws targets the same information as the impurity rate of a waste stream collected. Analogous to the above step these parameters were filtered out.

3. The third step was dedicated to the assessment whether a parameter is really **operationa**l in the light of what is necessary for the assessment of waste collection systems. To allow a comparison of different alternatives in waste collection it is primordial that information and data on the parameter is available. Hence, the project team assessed whether a parameter is already in use (usually a good indication that data is available across systems) and if it is realistic that data can be gathered for a certain parameter in the later task 1.2. Note that this step was partly a subjective decision by the project team, that was however based on the longstanding expertise of the project team from working with parameters in waste management.

Taking into consideration the feedback of selected partners on the first draft report, a list of key parameters to be discussed with all project partners and the RWG per waste stream has been prepared and included in the second draft report:

- **general parameters** including **6 parameter groups**:
  external factors, population, weather, housing, economy, tourism;
- **waste stream specific parameters** including **10 parameter groups** (note: as described in section "screening of literature above", groups "overarching parameters" and "waste stream specific parameters" have been merged at this stage):
  waste generation, waste collection, waste treatment, waste prevention, economic features, environmental criteria, social aspects (acceptance, awareness, communication), influencing policy, performance over time, challenges & drivers.

Discussion and validation of pre-selected parameters

To make sure that selected key parameters

a) match with specific information needs of decision-makers in practice and

b) fulfil requirements for subsequent work packages,

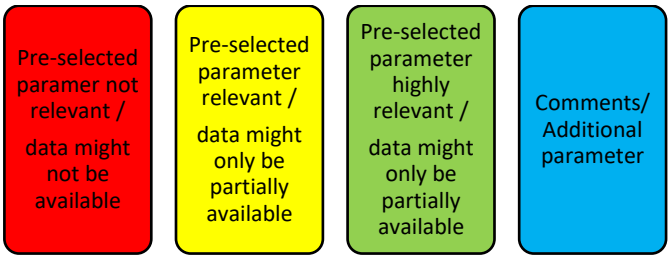
pre-selected parameters per waste stream have been discussed during the first project meeting in Treviso (20 – 22 March 2018):

- 20 March 2018 with General Assembly (interactive poster session)
- 21 March 2018 with Regional Working Group (interactive poster session)
- 22 March 2018 with Expert Group (presentation of results & discussion)

For the interactive sessions, pre-selected parameters as presented in the second draft report were processed and posters have been prepared. The main objective of the interactive sessions has been to discuss the following points:

- Which parameters are useful (relevant) / not useful (not relevant)?
- Which parameters (per parameter group) are most important in practice for decision-making?
- Is data on parameters available at local / regional level available (yes/no/partly)?
- Is the overall set per stream ok?
- Clarification of parameter specific questions

The following colour codes have been used:



Below, pictures from the interactive poster sessions are presented.

Figure 3: Colour code system for assessment of pre-selected parameters

Figure 4: Interactive poster session – assessment of pre-selected parameters

Figure 5: Interactive poster session - wrap-up

More detailed information on feedback obtained during the different interactive poster sessions is provided in the **Appendix to this report** (i.e. presentation of all posters by GA and RWG).

In a next step, feedback obtained from different interactive poster sessions has been compiled in an Excel file to

- **Reduce** the number of pre-selected parameters, i.e. remove parameters that were not considered useful or where data at local / regional level is expected to be not available – consensus by GA, RWG and the expert group
- **Specify** / **improve** pre-selected parameters that were considered useful and where data at local / regional level is expected to be (yes/partly) available – feedback either by GA or RWG and taking in consideration feedback from the expert group and the expertise of the project team
- **Add** additional parameters that were considered useful and where data at local / regional level is expected to be (yes/partly) available - by GA and RWG

In addition, feedback provided by the expert group has been taken into consideration to get a reasonable set of parameters per waste stream.

The figure below illustrates how information has been processed in the Excel file. The following colour codes have been used in the Excel file:

- red colour: parameter rejected
- green colour: parameter kept
- yellow colour: parameter re-phrased
- blue colour: new parameter added

Note: the decision on parameters that finally have been selected was not based on a strict systematic approach / algorithm but rather on expertise of the project team and in line with the five basic principles (example: if there have been different opinions if a parameter is useful or not or if data is expected to be available or not, the project team made a decision based on experience and objectives of the project).

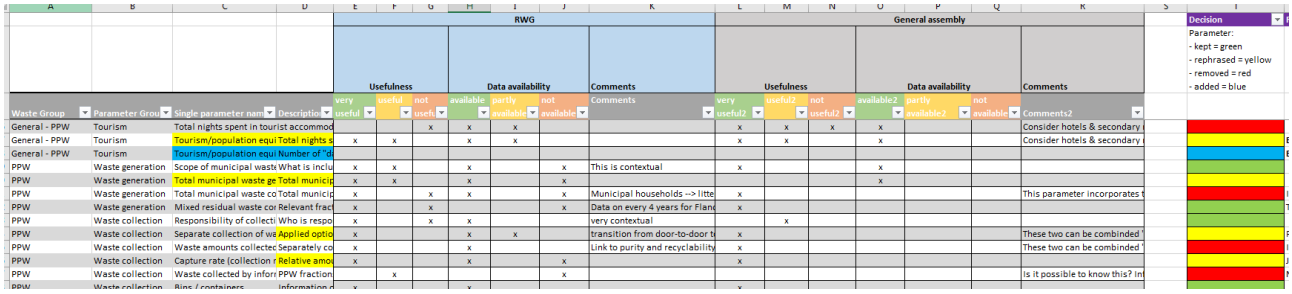


Figure 6: Excerpt of the Excel file for processing of Treviso feedback

Based on this Excel file, a final set of key parameters per waste stream has been prepared **(see next chapter**):

- **general parameters** with **five parameter groups**:
  external factors, population, housing, economy, tourism (note: parameter group "weather" removed)
- **waste stream specific parameters** with **nine parameter groups**:
  waste generation, waste collection, waste treatment, waste prevention, economic features, social aspects (acceptance, awareness, communication), influencing policy, performance over time, challenges & drivers (note: parameter group "environmental criteria" removed because such environmental criteria are already included in other parameter groups and might also be calculated, e.g. emissions resulting from waste transportation).

It is important to note that the **overall set of key parameters** that finally have been selected **are used in four Work Packages.** However, since not all parameters and parameter groups are equally relevant for all Work Packages and the required level of detail for investigating certain parameters and parameter groups varies, all selected key parameters have been **allocated to different Work Packages**.

For **Work Package 1**, parameters have been selected

- that are needed to prepare an inventory on waste collection systems under task 1.2 (i.e. interesting parameters that allow stakeholders identifying waste collection systems from the inventory / database, based on specific characteristics, e.g. remoteness, to learn more about such waste collection systems), and
- that are needed to select twelve case studies for in-depth analyses in WP2 and WP3 in dialogue with involved stakeholders under task 1.3, using a multiple-criteria decision-making approach.

All other selected key parameters are covered by **Work Package 2** "Boundary conditions and solutions for implementation of waste collection systems", **Work Package 3** "Quantification of costs and benefits", and **Work Package 4** "Guidelines for implementation and policy development".

The allocation of key parameters to different Work Packages has been performed internally, in close cooperation with all Work Package leaders. In the final set of key parameters per waste stream as presented in the next chapter, information on the allocation of parameters to different Work Packages is included.

Selected key parameters

General parameters

External factors

Single parameter name	Description	Unit	WP allocation
Area type	Type of area in scope: municipality, group of municipalities, city, agglomeration, other	qualitative	WP 1
Area size	Size of area in scope.	km²	WP 1
Remoteness	Area in scope in regard to its remoteness / connection to the surrounding area: mountain area, island, coastal area, inland – unspecific.	qualitative	WP 1

Population

Single parameter name	Description	Unit	WP allocation
Population	Number of inhabitants living in the area in scope.	number	WP 1
Population density	Number of inhabitants living in the area in scope in relation to the area size.	inhabitants/km²	WP 1

Economy

Single parameter name	Description	Unit	WP allocation
GDP per inhabitant	GDP per inhabitant in the area in scope.	€	WP 1

Housing

Single parameter name	Description	Unit	WP allocation
Type of housing	The prevalent type of housing in the area in scope: detached and semi-detached houses (houses where waste collection is expected to be rather non-anonymous, individual bins), multi-family houses: terraced houses, apartment buildings, housing blocks (houses where waste collection is expected to be rather anonymous, shared bins).	share in %	WP 1
Total number of households	The number of households in the area in scope.	number	WP 1
Average size of households	The average size of households in the area in scope.	number/ household	WP 1

Tourism

Single parameter name	Description	Unit	WP allocation
Tourist overnight stays	Total number of tourist overnight stays in the area in scope and number of tourist overnight stays per inhabitant. ***Exceptional case: "general parameter" that is relevant for PPW only!***	number, number / inhabitant	WP 1
One-day visitors	Total number of one-day visitors (overnight stays excluded) in the area in scope and number of one-day visitors per inhabitant. ***Exceptional case: "general parameter" that is relevant for PPW only!***	Number / pop eq	WP 1

Waste stream specific parameters

Packaging and Paper Waste

Waste generation

Single parameter name	Description	Unit	WP allocation
Scope of municipal waste generated / collected	What is included: household waste, household waste and similar commercial waste, not clear, other / additional	qualitative	WP 1
Total municipal waste generation / collection	Total municipal waste amounts generated/collected and its composition most recent reference year. Main fractions as presented in waste statistics.	t and kg/capita	WP 1
Mixed residual waste composition	Mixed residual waste composition, based on sorting analysis. Share of PPW fractions in %.	%	WP 1

Waste collection

Single parameter name	Description	Unit	WP allocation
Responsibility of collection	Responsibility for collection of different PPW fractions. Specification who is leading operations: public authority or private scheme. Per PPW fraction.	qualitative	WP 1
Separate collection of waste fractions	Applied options for separate collection of different PPW fractions and collected amounts in t and kg/capita	tonnes; kg/capita; qualitative	WP 1
Capture rate (collection rate)	Relative amount of separately collected quantity of a material, for	%	WP 1

	different PPW fractions (calculation based on residual waste composition / sorting analysis)		
Bins / containers	Number and size of bins / containers for door-to-door collection of PPW fractions from households	number, qualitative	WP 1
Frequency of door-to-door collection	Collection frequency for door-to-door collection of mixed residual waste and relevant PPW fractions.	number, qualitative	WP 1
Number of bring points per inhabitant	Total number + density of bring points network	total number; number of inhabitants per bring point.	WP 1
Distance to containers	Average (walking) distance for citizen to the next bring point	metres	WP 2, 3, 4
Number of civic amenity sites per inhabitant	Total number + density of civic amenity sites network	total number; number of inhabitants per CAS.	WP 1
Level of sorting in civic amenity sites	Sorting of PPW fractions in civic amenity sites	qualitative	WP 2, 3, 4
Implementation of collection system	Implementation of the current PPW collection system, per fraction: pilot phase, transition phase, fully implemented	qualitative	WP 1
Collection coverage	Percentage of households / area covered by door-to-door separate collection, per relevant fraction.	%	WP 1
Type of transportation and fuel	How are different PPW types transported from point of collection to first treatment plant? Truck, train, ship? What kind of fuel is used?	qualitative	WP 2, 3, 4
Transport distances	Transport distance for different PPW fractions from point of collection to first treatment plant	km	WP 2, 3, 4

Waste treatment

Single parameter name	Description	Unit	WP allocation
Impurities / misthrows	Impurity rate in % (calculation: weight of non-target material in collected waste / weight of total collected waste) * 100; or results of sorting analysis); impurities refer to the amount of non-target materials in the separately collected waste stream, i.e. misthrows by residents	%	WP 1
First sorting / treatment: destination	Destination of different PPW fractions after collection	qualitative	WP 1
Output from first sorting / treatment	Output fractions from first sorting / treatment and destination	%, qualitative	WP 1
Subsequent sorting / treatment steps and expected uses	If applicable, subsequent sorting / treatment steps and final recycling rate; expected uses of material fractions	qualitative	WP 1

Economic features

Single parameter name	Description	Unit	WP allocation
Costs / organisation	Description of - (shared) responsibilities and benefits - funding mechanisms (e.g. fee charged to producers per tonne of household packaging put on the market; level of cost coverage by producers;	qualitative	WP 2, 3, 4

	- funding sources (regional tax; regional budget; special waste budget; waste fee, including shares;		
Setup costs	Setup costs to establish current collection system for different PPW fractions. If possible, breakdown of costs in: waste collection, waste transportation, waste treatment, staff, infrastructure. Elements financed by public authority vs. private schemes / producers. Explanation of all indicated costs	€ per y/t/cap; qualitative	WP 1
Annual running costs	Annual running costs to operate current collection system for different PPW fractions. If possible, breakdown of costs in: waste collection, waste transportation, waste treatment, staff, infrastructure. Elements financed by public authority vs. private schemes / producers. Explanation of all indicated costs	€ per y/t/cap; qualitative	WP 1
Fee system	Municipal waste fees to consumer based on: fixed fee, no PAYT elements (flat rate); pay-as-you-throw elements; no clear information; other	qualitative	WP 1
Annual municipal waste fee per household	Annual waste fee to be paid by private households for municipal waste management, breakdown (estimate) of share of PPW stream and per relevant PPW fraction, where possible	€ per capita/ household	WP 1
Financial incentive for consumer to separate waste	Financial incentive for source separation of PPW in place and communicated to consumer (deposit-refund system excluded) y/n; if yes, qualitative description	qualitative	WP 2, 3, 4

Social aspects

Single parameter name	Description	Unit	WP allocation
Feedback gathering mechanisms	Existence of citizen feedback gathering mechanisms (surveys, questionnaires) and information on behavioural insights y/n; If yes, qualitative description of citizen feedback and / or insights (where available the relation to the level of annual waste fee the private households need to pay – cost to consumer)	qualitative	WP 1
Socio-cultural background of citizens influencing PPW collection	Information on source separation ability, cultural and educational background, age of citizens - influence on waste management practices? If yes, description	qualitative	WP 2, 3, 4
Awareness raising and communication addressing citizens	Existence of awareness raising measures (y/n) - information campaigns for consumers, including number of campaigns - support services (interactive help line by internet or phone) providing guidance or help to citizens regarding waste sorting and collection; If yes, qualitative description	qualitative	WP 2, 3, 4
Stakeholder engagement	Existence of platforms (developed by local/regional authorities): - bringing together different public and private stakeholders on regular or non-regular basis - contributing to improving/ facilitating cooperation along the value chain; If yes, qualitative description	qualitative	WP 2, 3, 4

Capacity building and training addressing authorities	Existence of capacity building activities and training programmes addressing authorities; If yes, qualitative description	qualitative	WP 2, 3, 4
Employment	People employed in the municipal waste management sector (direct jobs), specified for PPW stream if data available; short description, what kind of jobs are included in statistic / estimate	number; qualitative	WP 1

Influencing policy

Single parameter name	Description	Unit	WP allocation
Extended producer responsibility	Existence of an EPR scheme on PPW fractions	qualitative	WP 2, 3, 4
Relevant additional national/regional/local legislation on waste prevention	Waste prevention targets / legal provisions on prevention of PPW influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4
Relevant additional national/regional/local legislation on waste collection	Waste collection targets / legal provisions on collection of PPW influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4
Relevant additional national/regional/local legislation on waste treatment	Waste treatment targets / legal provisions on treatment of PPW influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4

Guidelines	PPW management system implemented in line with specific planning guidelines that are available at national/regional/local level y/n (note: documents providing guidance on planning & implementation of waste collection systems in practice, not legal provisions); if yes, qualitative description	qualitative	WP 2, 3, 4
Procurement	Existence of specific procurement requirements, enhancing sustainable waste treatment and / or data collection (e.g. tracking of waste until final destination / final recycling step)	qualitative	WP 2, 3, 4
Control	Control mechanisms in place to ensure there is compliant PPW management y/n; if yes, qualitative description	qualitative	WP 2, 3, 4
Penalties, sanctions, fines	Are penalties, sanctions, fines for non-compliant management of PPW fractions in place y/n; if yes, qualitative description	qualitative	WP 2, 3, 4

Performance over time

Single parameter name	Description	Unit	WP allocation
Development of separately collected amounts in the last five years	Development of separately collected PPW in the last five years in tonnes, per PPW fraction.	tonnes	WP 1

Development of capture rate in the last five years	Reference to parameter "Capture rate (collection rate)"; development of capture rate in the last five years before most recent reference year	%/year	WP 2, 3, 4
Development of quality of collected material in the last five years	Reference to parameter "Relative amount of waste stream rejected for recycling after first treatment"; development of quality of collected material in the last five years measured as amount of impurities in separately collected fractions (= misthrows), sorted out during first sorting step, per PPW fraction; misthrows / impurities refer to the amount of non-target materials in the separately collected waste stream;	%/year	WP 2, 3, 4
Evolution of collection system	Evolution of collection system per fraction / waste type / category over time (e.g. capture rates, amounts collected, collection coverage)	qualitative	WP 2, 3, 4
Gradual improvement or sudden changes	Conclusion on improvement, per fraction / collection type where applicable: - Cat.1: Gradual improvements - Cat 2: Sudden changes - explanation	category 1 / 2; qualitative	WP 2, 3, 4

Challenges & drivers

Single parameter name	Description	Unit	WP allocation
PPW escaping from formal collection route/system	Is information available on: a) PPW littering b) informal PPW collection c) informal PPW treatment? If yes, short description of problem and potential measures	qualitative	WP 2, 3, 4
Main challenges in the past	Which decisions / actions taken / circumstances hampered positive	qualitative	WP 2, 3, 4

	development of waste collection system, per fraction where available / applicable; lessons learned --> what should not be done / cannot be recommended		
Future challenges	Main challenges expected in future	qualitative	WP 2, 3, 4
Main success factors / drivers in the past	Which decisions / actions taken / circumstances supported positive development of waste collection system, per fraction where available / applicable; lessons learned --> what should be done / can be recommended	qualitative	WP 2, 3, 4
Influencing factors - conclusion	Main drivers for having the current waste collection system as it is, in a positive and negative way (example: because of available infrastructure, because of economic limitations / options, because of good / poor citizen participation…)	qualitative	WP 2, 3, 4

Waste Electrical and Electronic Equipment

Waste generation

Single parameter name	Description	Unit	WP allocation
Estimated WEEE generation	Estimated WEEE generation in the area in scope (municipality, city...) based on estimate of WEEE generation per capita available at national level; Additional information on local / regional data to be included in remarks section if available (e.g. number and types of products in household stocks)	tonnes	WP 1
Mixed residual waste composition	Share of small WEEE included in mixed residual municipal waste.	%	WP 1

Waste collection

Single parameter name	Description	Unit	WP allocation
Scope of WEEE collected	What is included: WEEE from households only, WEEE from households and WEEE from similar sources, no clear distinction	qualitative	WP 1
Responsibility of collection	Responsibility for collection of WEEE fractions. Specification who is leading operations: public authority or private scheme.	qualitative	WP 1
Separate collection of waste fractions	Applied options for separate collection of different WEEE and collected amounts in t and kg/capita	tonnes; kg / capita; qualitative	WP 1

Applied collection streams in civic amenity sites	Sorting of WEEE categories / types in civic amenity sites	qualitative	WP 1
Non-retail bring points (e.g. civic amenity sites)	Total number of non-retail bring points and number of inhabitants per 1 non-retail bring point/container	total number; number of inhabitants per non-retail bring point.	WP 1
Retailer bring points	Total number of retailer bring points and number of inhabitants per 1 retailer bring point/container	total number; number of inhabitants per retailer bring point.	WP 1
Mobile collection	Mobile collection points (e.g. waste collection trucks, collection events) available for the end-user; collection frequency; WEEE accepted	number; qualitative	WP 1
Implementation of collection system	Implementation of the current WEEE collection system, per fraction: pilot phase, transition phase, fully implemented	qualitative	WP 1
Collection-synergies with other waste streams	Synergies between, e.g. WEEE and batteries collection systems	qualitative	WP 1

Waste treatment

Single parameter name	Description	Unit	WP allocation
Quality of collected WEEE	Amount of WEEE rejected/complaint by treatment operators per container (%-estimation for categories Large Appliances, IT monitors and screens, Cooling Appliances)	%	WP 1

First sorting / treatment: destination	Destination of different WEEE categories / types after collection	qualitative	WP 1
Output from first sorting / treatment	Output fractions from first sorting / treatment of WEEE categories /types and destination	%, qualitative	WP 1
Subsequent sorting / treatment steps and expected uses	If applicable, subsequent sorting / treatment steps and final recycling rate; expected uses of material fractions	qualitative	WP 1

Waste prevention

Single parameter name	Description	Unit	WP allocation
Waste prevention measures	Specific waste prevention measures on WEEE taken at local level? If yes, qualitative description of measures	qualitative	WP 2, 3, 4
Key measures to promote re-use/reparation	Specific measures to promote re-use/reparation of WEEE taken at local level	qualitative	WP 1

Economic features

Single parameter name	Description	Unit	WP allocation
Costs / organisation	Description of - (shared) responsibilities and benefits - funding mechanisms (fee charged to producers per tonne of WEEE category put on the market; level of cost coverage by producers) - funding sources (regional tax; regional budget; special waste budget; waste fee, including shares)	qualitative	WP 1

Setup costs	Setup costs to establish current WEEE collection system. If possible, breakdown of costs in: waste collection, waste transportation, waste treatment, staff, infrastructure. Elements financed by public authority vs. private schemes / producers. Explanation of all indicated costs	€ per y/t/cap; qualitative	WP 1
Annual running costs	Annual running costs to operate current WEEE collection. If possible, breakdown of costs in: waste collection, waste transportation, waste treatment, staff, infrastructure. Elements financed by public authority vs. private schemes / producers. Explanation of all indicated costs	€ per y/t/cap; qualitative	WP 1
Fee system	Municipal waste fees to consumer based on: fixed fee, no PAYT elements (flat rate); pay-as-you-throw elements; no clear information; other	qualitative	WP 1
Annual municipal waste fee per household	Annual waste fee to be paid by private households for municipal waste management, breakdown (estimate) of share of WEEE stream and per relevant category / type, where possible	€ per capita/ household	WP 1

Social aspects

Single parameter name	Description	Unit	WP allocation
Feedback gathering mechanisms	Existence of citizen feedback gathering mechanisms (surveys, questionnaires) and information on behavioural insights y/n; If yes, qualitative description of citizen feedback and / or insights (where available the relation to the level of annual waste fee the private	qualitative	WP 1

	households need to pay – cost to consumer)		
Socio-cultural background of citizens influencing WEEE collection	Information on source separation ability, cultural and educational background, age of citizens - influence on waste management practices? If yes, description	qualitative	WP 2, 3, 4
Awareness raising and communication addressing citizens	Existence of awareness raising measures (y/n): - information campaigns for consumers, including number of campaigns - support services (interactive help line by internet or phone) providing guidance or help to citizens regarding waste sorting and collection; If yes, qualitative description	qualitative	WP 2, 3, 4
Stakeholder engagement	Existence of platforms (developed by local/regional authorities): - bringing together different public and private stakeholders on regular or non-regular basis - contributing to improving/ facilitating cooperation along the value chain; If yes, qualitative description	qualitative	WP 2, 3, 4
Capacity building and training addressing authorities	Existence of capacity building activities and training programmes addressing authorities y/n; if yes, qualitative description	qualitative	WP 2, 3, 4
Employment	People employed in the municipal waste management sector, specified for WEEE stream if data available: direct jobs; short description, what kind of jobs are included in statistic / estimate.	number, qualitative	WP 1

Influencing policy

Single parameter name	Description	Unit	WP allocation
Relevant additional national/regional/local legislation on waste prevention	Targets / legal provisions on prevention / preparation for re-use of WEEE influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4
Relevant additional national/regional/local legislation on waste collection	Targets / legal provisions on collection of WEEE influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description; E.g. thresholds on max. amounts that can be delivered to bring points, etc.	qualitative	WP 2, 3, 4
Relevant additional national/regional/local legislation on waste treatment	Targets / legal provisions on treatment of WEEE influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4
Guidelines	WEEE management system implemented in line with specific planning guidelines that are available at national/regional/local level y/n (note: documents providing guidance on planning & implementation of waste collection systems in practice, not legal provisions); If yes, qualitative description	qualitative	WP 2, 3, 4
Standards	Does the majority of the management operators (collection,	qualitative	WP 2, 3, 4

	transport and treatment operators) apply WEEELABEX/CENELEC standards? If yes, qualitative description		
Penalties, sanctions, fines	Are penalties, sanctions, fines for non-compliant management of WEEE types / categories in place y/n; if yes, qualitative description	qualitative	WP 2, 3, 4

Performance over time

Single parameter name	Description	Unit	WP allocation
Development of WEEE collection per capita in the last five years	Reference to parameter "total WEEE collected"; development of separately collected WEEE amounts in total and per category / type in the last five years before most recent reference year (in kg/capita)	kg/capita/year	WP 1
Development of quality of collected material in the last five years	Reference to parameter "Quality of collected WEEE"; development of amount of WEEE rejected/complaint by treatment operators per container (%-estimation for categories Large Appliances, IT monitors and screens, Cooling Appliances)	%/year	WP 2, 3, 4
Evolution of collection system	Evolution of collection system per fraction / waste type / category over time (e.g. capture rates, amounts collected, collection coverage)	qualitative	WP 2, 3, 4
Gradual improvement or sudden changes	Conclusion on improvement, per fraction / collection type where applicable: - Cat.1: Gradual improvements - Cat 2: Sudden changes; explanation	category 1 / 2: qualitative	WP 2, 3, 4

Challenges & drivers

Single parameter name	Description	Unit	WP allocation
WEEE escaping from formal collection route/system	Is information available on: a) WEEE littering or vandalism b) informal PPW collection (theft, scavenging) c) informal WEEE treatment? If yes, short description of problem and potential measures	qualitative	WP 2, 3, 4
Main challenges in the past	Which decisions / actions taken / circumstances hampered positive development of waste collection system, per fraction where available / applicable; lessons learned --> what should not be done / cannot be recommended	qualitative	WP 2, 3, 4
Future challenges	Main challenges expected in future?	qualitative	WP 2, 3, 4
Main success factors / drivers in the past	Which decisions / actions taken / circumstances supported positive development of waste collection system, per fraction where available / applicable; lessons learned --> what should be done / can be recommended	qualitative	WP 2, 3, 4
Influencing factors - conclusion	Main drivers for having the current waste collection system as it is, in a positive and negative way (example: because of available infrastructure, because of economic limitations /	qualitative	WP 2, 3, 4

	options, because of good / poor citizen participation…)		

Construction and demolition waste

Waste generation

Single parameter name	Description	Unit	WP allocation
Scope of municipal CDW generated / collected	What is included: household waste, household waste and similar commercial waste, not clear, other / additional	qualitative	WP 1
Mixed waste composition	Based on mixed waste / waste composition analysis: % of CDW (or relevant fractions e.g. such as asbestos cement) in mixed waste	%	WP 1

Waste collection

Single parameter name	Description	Unit	WP allocation
Responsibility of collection	Responsibility for collection of different CDW fractions. Specification who is leading operations: public authority or private scheme. Per CDW fraction.	qualitative	WP 1
Separate collection of waste fractions	Applied options for separate collection of different CDW fractions and	tonnes; kg/capita; qualitative	WP 1

	collected amounts in t and kg/capita		
Civic amenity sites	Total number + density of civic amenity sites network	total number; number of inhabitants per CAS.	WP 1
Level of sorting in civic amenity sites	Sorting of CDW fractions in civic amenity sites, description	qualitative	WP 1
Mobile collection	Mobile collection points (e.g. waste collection trucks) available for the end-user; collection frequency; CDW fractions accepted	number; qualitative	WP 1

Waste treatment

Single parameter name	Description	Unit	WP allocation
Type of first treatment	First sorting / treatment: destination of different CDW fractions after collection	qualitative	WP 1
Hazardous substances removed before treatment	Especially asbestos	t, %	WP 1
Output from first sorting / treatment	Output fractions from first sorting / treatment and destination	%, qualitative	WP 1

Subsequent sorting / treatment steps and expected uses	If applicable, subsequent sorting / treatment steps and final recycling rate; expected uses of material fractions	qualitative	WP 1

Waste prevention

Single parameter name	Description	Unit	WP allocation
Measures taken concerning sustainability of the construction sector	Measures taken by authorities to improve/facilitate/ promote: - use of environmentally friendly construction materials, - enhancement of construction sector, - extending life cycle of buildings y/n; description	qualitative	WP 2, 3, 4

Economic features

Single parameter name	Description	Unit	WP allocation
Costs - organisation	**Description of** - (shared) responsibilities and benefits - funding mechanisms (e.g. fee charged to producers per tonne of household packaging put on the market; level of cost coverage by producers)	qualitative	WP 2, 3, 4

	- funding sources (regional tax; regional budget; special waste budget; waste fee, including shares)		
Setup costs	Setup costs to establish current collection system for different CDW fractions. If possible, breakdown of costs in: waste collection, waste transportation, waste treatment, staff, infrastructure. Elements financed by public authority vs. private schemes / producers. Explanation of all indicated costs	€ per y/t/cap; qualitative	WP 1
Annual running costs	Annual running costs to operate current collection system for different CDW fractions. If possible, breakdown of costs in: waste collection, waste transportation, waste treatment, staff, infrastructure. Elements financed by public authority vs. private schemes / producers. Explanation of all indicated costs	€ per y/t/cap; qualitative	WP 1
Fee system	Municipal waste fees to consumer based on: fixed fee, no PAYT elements (flat rate); pay-as-you-throw elements; no clear information; other	qualitative	WP 1
Annual municipal waste fee per household	Annual waste fee to be paid by private households for municipal waste management, breakdown (estimate) of share of CDW stream and per relevant CDW fraction, where possible	€ per capita/ household	WP 1

Social aspects

Single parameter name	Description	Unit	WP allocation
Awareness raising and communication addressing citizens	Existence of awareness raising measures (y/n): - information campaigns for consumers, including number of campaigns - support services (interactive help line by internet or phone) providing guidance or help to citizens regarding waste sorting and collection; If yes, qualitative description	qualitative	WP 2, 3, 4
Stakeholder engagement	Existence of platforms (developed by local/regional authorities) y/n: - bringing together different public and private stakeholders on regular or non-regular basis, - contributing to improving/ facilitating cooperation along the value chain; If yes, qualitative description	qualitative	WP 2, 3, 4
Capacity building and training addressing authorities	Existence of capacity building activities and training programmes addressing authorities y/n; if yes, qualitative description	qualitative	WP 2, 3, 4
Employment	People employed in the municipal waste management sector (direct jobs), specified for PPW stream if data available; short description, what kind of jobs are included in statistic / estimate	number; qualitative	WP 1

Influencing policy

Single parameter name	Description	Unit	WP allocation
Relevant additional national/regional/local legislation on waste prevention	Targets / legal provisions on prevention of CDW influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4
Relevant additional national/regional/local legislation on waste collection	Targets / legal provisions on collection of CDW influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description; Example: threshold on max. CDW amount that can be delivered to civic amenity site (fixed or mobile) y/n; if yes, threshold	qualitative	WP 1
Relevant additional national/regional/local legislation on waste treatment	Targets / legal provisions on treatment of CDW influencing local / regional waste management in place (additional to standard EU legal requirements) y/n; If yes, qualitative description	qualitative	WP 2, 3, 4
Guidelines	CDW management system implemented in line with specific planning guidelines that are available at national/regional/local level y/n (note: documents providing guidance on planning & implementation of waste collection systems in practice, not legal provisions); If yes, qualitative description	qualitative	WP 2, 3, 4
Control	Control mechanisms in place to ensure there is compliant CDW	qualitative	WP 2, 3, 4

	management y/n; if yes, qualitative description		
Penalties, sanctions, fines	Are penalties, sanctions, fines for non-compliant management of CDW fractions in place y/n; if yes, qualitative description	qualitative	WP 2, 3, 4

Performance over time

Single parameter name	Description	Unit	WP allocation
Evolution of collection system	Evolution of collection system per fraction / waste type / category over time (e.g. capture rates, amounts collected, collection coverage)	qualitative	WP 2, 3, 4
Gradual improvement or sudden changes	Conclusion on improvement, per fraction / collection type where applicable: - Cat.1: Gradual improvements - Cat 2: Sudden changes; explanation	category 1 / 2	WP 2, 3, 4

Challenges & drivers

Single parameter name	Description	Unit	WP allocation
CDW escaping from formal collection route/system	Is information available on: a) CDW littering b) informal CDW collection c) informal CDW treatment, in particular hazardous fractions? If yes, short description of problem and potential measures	qualitative	WP 2, 3, 4
Main challenges in the past	'Which decisions / actions taken / circumstances hampered positive development of waste collection system, per fraction where available / applicable; lessons learned -> what	qualitative	WP 2, 3, 4

	should not be done / cannot be recommended		
Future challenges	Main challenges expected in future?	qualitative	WP 2, 3, 4
Main success factors / drivers in the past	Which decisions / actions taken / circumstances supported positive development of waste collection system, per fraction where available / applicable; lessons learned --> what should be done / can be recommended	qualitative	WP 2, 3, 4
Influencing factors - conclusion	Main drivers for having the current waste collection system as it is, in a positive and negative way (example: because of available infrastructure, because of economic limitations / options, because of good / poor citizen participation…)	qualitative	WP 2, 3, 4

Glossary

CAPEX

Capital expenditure

CDW

Construction and Demolition Waste

CO

Confidential; only for partners of the Consortium – regarding the *Dissemination Level*

EPR

Extended Producer Responsibility

eqpop

Population equivalent

FTE

Full-time equivalent

GA

General assembly

GDP

Gross Domestic Product

OPEX

Operational expenditure

PAYT

Pay-as-you-throw

PP

Restricted to other programme participants – regarding the *Dissemination Level*

PPW

Packaging and Paper Waste

PU

Public – regarding the *Dissemination Level*

RE

Restricted to a group specified by the Consortium – regarding the *Dissemination Level*

RWG

Regional Working Group

WEEE

Waste Electrical and Electronic Equipment

WP

Work Package