



IMPACTPapeRec: IMPACT - Introduction and Improvement of Separate Paper Collection to avoid landfilling and incineration

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Methodology for IMPACTPapeRec best practice and working instructions

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IMPACTPAPE REC

Boosting separate paper collection



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Abbreviations

BE	Belgium
BG	Bulgaria
BP	Best Practice
BPWG	Best Practice Working Group
DE	Germany
EPR	Extended Producer Responsibility
ESC	External Support Committee
ES	Spain
EU	European Union
FR	France
GP	Good Practice
KPI	Key Performance Indicator
PfR	Paper and cardboard for recycling (= Paper for Recycling)
PL	Poland
RO	Romania
SI	Slovenia
UK	United Kingdom of Great Britain and Northern Ireland
WP	Work Package



1. Introduction

1.1. Background

- Paper for recycling as raw material for the industry

The paper and board industry is a strategic sector in the EU economy, actively contributing to the re-industrialisation of Europe. It uses wood, a renewable material, and Paper for Recycling (PfR) as its main raw materials for producing paper products. In addition to these paper products, the industry is increasingly producing high value-added products and sophisticated materials for the textile, food and pharmaceutical industries, as well as bio-based fuels and chemicals.

Currently, the production of paper and board in the EU stands at 91 million tonnes per year, while PfR represents almost 44 million tonnes, or 46%. The absolute contribution of PfR has increased over the last few years (25 million tonnes in 1991; 30 million tonnes in 1995; 40 million tonnes in 2000) (CEPI, 2015). Moreover, this sector boosts the creation of value 'made in Europe'. At least 82% of all raw materials consumed come from Europe¹; most of the suppliers are European companies and 77% of the paper products are used in the European market.

The availability of European PfR as a raw material has forced the industry and the authorities to boost actions to ensure constant and sustainable procurement of PfR. All the PfR collected is currently recycled with the PfR collection rate generally equal to the PfR recycling rate. However, the increase in the availability of PfR has not taken place in all EU states, and this is especially true in Eastern European countries. Moreover, the quality of this material does not always meet the requirements of paper recycling (i.e. high moisture, presence of contaminants). Both facts make it difficult to continue the increases in PfR collection observed over the last few years if specific actions are not taken. Especially in terms of municipal PfR, there is still a broad margin to improve collection and recycling rates. For total PfR, in theory a recovery rate of 80% could be achieved (the remaining 20% not being recoverable due to its characteristics; i.e. toilet and other hygiene paper, wallpaper, long-term storage²).

- EU waste management policy and vision for a circular economy

The EU's approach to waste management is based on the "waste hierarchy" which sets a priority order when shaping waste policy and managing waste at the operational level. Prevention is the best option, followed by (preparing for) reuse, recycling and other forms of recovery. Disposal such as landfilling and incineration without energy recovery are to be considered as a last resort.

EU waste legislation aims to move waste management up the waste hierarchy, turning waste into a resource, and thus achieving the EU vision for a circular economy.

¹ For PfR only, the figure would be close to 100% (CEPI, 2016)

² If the non-collectable and non-recyclable materials from the definition are excluded, then the theoretical maximum is 100% recycling of what is collected. However, under this approach, the rates would be different from the rates applied by most experts in this field and there is the risk of confusion with the statistics.



1.2. The project IMPACTPapeRec

The project IMPACTPapeRec has as an objective to further increase the separate collection of PfR – through the improvement of both quantity and quality of PfR – and to promote appropriate schemes to avoid landfilling and incineration. It focuses on countries with below European average paper recycling rates such as Bulgaria, Poland and Romania as well as countries where paper from households, small shops and offices is often collected in a commingled stream with other recyclables, as it is currently the case in France and the UK.

IMPACTPapeRec wants to act as the common European information point for PfR collection for the European industry, by pooling and disseminating information and bringing together stakeholders from the value chain to exchange results, findings and experiences.

The main outcome of the work carried out by the IMPACTPapeRec project is a Best Practice Handbook in which best practices and collection systems are analysed. The aim of the Handbook will be to support the different EU regions in the implementation of best collection procedures.

1.3. Best Practice Handbook

In order to improve the development and promotion of best practices in paper collection there is a need for common evaluation and benchmarking methodologies. The Handbook will therefore also include a common evaluation methodology for PfR collection, which will be validated in the five countries that are the focus of the project (Bulgaria, France, Poland, Romania and the UK).

The methodology developed will be an important element of the Best Practice Handbook. It will thus serve as guidance for policy-makers to develop and implement innovative solutions for the PfR collection stage.

The current report presents the methodology as it is seen at this stage of the project, but it is very likely to evolve until a finalised version is included in the Handbook.

1.3.1. Best practices - why

■ Theory and practice

The goal of using BP is the following: instead of aiming to reach an abstract ideal state, one could get inspired by existing practices that are already implemented and are already working somewhere else.

There is not a common definition for a “best practice” – neither in the academic literature, nor among practitioners. The understanding that is probably the most widespread and most commonly used in practice focuses on the “functional” orientation of a best practice. This means that something that has proven to be good and to achieve good results somewhere, and that can potentially be transferred elsewhere, can be considered as a “best practice” (Veselý, 2011).

■ EU approach on BP

The recent legislative proposals on waste by the European Commission include long-term targets to reduce landfilling and to increase preparation for reuse and recycling of key waste streams notably of municipal waste and packaging waste. For instance, as of 2015, EU Member States are obliged to separately collect paper, glass, metal and plastic with a view to foster high quality recycling of these materials. These targets should gradually lead Member States to “converge on best-practice levels”



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(European Commission, 2015a). In order to support EU Member States in this process, a specific action is the “Identification and dissemination of good practices in waste collection systems” (European Commission, 2015b). The Commission has performed several studies in order to facilitate this process.

- Literature/ Available documents on paper collection

The document “Best available techniques (BAT) for production of pulp, paper and board” includes only a very general chapter about “Sorting, handling and storage of paper for recycling”. It does not give further details about how to collect PfR (European Commission, 2015c).

A recent report has assessed the state of separate collection of waste in 28 EU capital cities (BIPRO, 2015). The report provides an overview of the different performances and identifies cities with the best overall performance, based on a headline scoreboard of key indicators on separate collection and applied collection schemes. Based on an examination of the five best performing capital cities, some common traits have been found and conclusions and recommendations have been drawn. The report further provides a comprehensive overview of literature focusing on different aspects of separate collection in Europe, including a short description and indicating the geographical focus of the publication. This literature overview can be used as a reference database.

The EcoPaperLoop project run from 2012 until 2014 and received funding from the EU Regional Development Fund. The main objective was to improve the quality of PfR in Central Europe and several reports have been produced in the course of the project. One of these reports is a final guidance document with recommendation guidelines on sustainable collection strategies in the region. The document addresses different aspects of paper collection including legislation, economic incentives, waste logistics, communication and education (EcoPaperLoop, 2014).

1.3.2. Best practices – how

- Methodology for identifying BP

The primary aim of the BP approach is to improve certain organisation/ system by adopting practices applied in another organisation/ system that seem more successful. In simplified terms, the process consists of two elements: organisations/ systems whose working needs to be improved (Group 1) and those which serve to provide inspiration for the needed improvement (Group 2) (Veselý, 2011).

In the project, the territories from the first group (those that need improvements) are already identified. The current report aims to assist in the identification of the territories from the second group – namely the best practices. Using the developed methodological framework should help to evaluate the performance of a system (considering a range of key elements and aspects) and to determine the elements that could be transferred/ adopted thus allowing the achievement of a similar level of performance.

- Organisational structure of the project

To achieve the objectives in the IMPACTPapeRec project, different working groups – so-called “working packages” have been formed. One of these – work package 2 (WP2) – has among its tasks the development of a common approach to evaluate and assess the impact of best practices. This report has been produced within the framework of WP2. In a different working group – work



package 3 (WP3) – the evaluation methodology as well as the transferability of best practices will be validated through the analysis of several case studies.

Further working teams within the project have contributed to this report (such as an External Support Committee and Best Practice Working Groups), they are described in more details below (see Section 2.1).

2. Methodology for IMPACTPapeRec best practice

This section gives an overview of the different steps taken in the framework of/within the IMPACTPapeRec project with the objective of identifying, analysing and evaluating good practices of PfR collection that will feed in the contents of the Best Practice Handbook.

This has been a gradual process. After the establishment of the first design of the methodology, it has been applied and tested in preparation of the first deliverable of the project, D2.1 "Completed questionnaires and benchmarking report". Results of the data collection and analysis and their implications for the methodology haven been discussed with all partners and the External Support Committee. This helped to review and improve the methodology and different steps, and to provide a guidance/ set of working instructions (see Section 3).

2.1. Selection of territories

■ Project focus territories

In this project, the main problems of paper and board collection were identified in the following way:

- I. Not existing or properly working separate collection of recyclables → paper & board ends up in residual waste or is used for house firing
- II. Mixed collection of recyclables → paper & board is collected together with other recyclables ('commingled')

According to these two categories, the project focuses on selected countries: Bulgaria, Poland and Romania from the first category and France and the UK from the second. Each territory³ from these five focus countries has been defined as a separate "cluster" and included in the analysis. The clusters include both project partners and not project partners. The latter have been selected based on personal contacts.

Table 1: List of project focus territories

Project focus territories					
Clusters	Project partners	Country	Clusters	Not project partners	Country
Dupnitsa	Municipality of Dupnitsa	BG	Lelis ⁴	Municipality of Lelis Stora Enso Poland	PL

³ The territories include municipalities as well as association of several municipalities

⁴ Data availability for Lelis has been very limited and further investigation of the territory will be rather restricted



Mezdra	Municipality of Mezdra	BG	Szczecin	The City of Szczecin	PL
Mihai Viteazu	Municipality of Mihai Viteazu TEGA waste management company	RO	Merthyr Tydfil County	Merthyr Tydfil County Borough Council	UK (South Wales)
Sfantu Gheorghe	Municipality of Sfantu Gheorge	RO			
Vendée	Trivalis association	FR			

Good practice territories

In addition, a number of territories which are considered as good practices have been included in the analysis. The selection criteria included performance, type of separate collection system and personal contacts that helped to ensure an efficient collaboration. The focus was on countries identified as high performers (Germany, Spain, Belgium), but also based on their geographical location in order to allow for some diversity and coverage (Slovenia).

Table 2: List of project good practice territories

Good practice territories	
Not project partners	
Liège	BE
Kempton/Oberallgäu/Lindau	DE
Ljubljana	SI
Cádiz	ES
Logroño	ES

The selection process was based on both internal (from project partners) and external input (not part of the project consortium).

- The internal input was supported by the extensive knowledge and network of ACR+ and other project partners.
- The external input relied on the creation of specific advisory structures – the External support Committee (ESC) and Best Practice Working Groups (BPWGs). The ESC is composed of European experts in the field of municipal waste and paper recovery and recycling. The BPWGs are composed of project partners and ESC members.

The involvement of these different actors ensured wide expertise and knowledge.

2.2. Initial data collection

BPWG

In addition to identifying best practice territories, the initial role of the BPWGs was to also give input for the development of the methodology for data collection (excel template and questionnaires described below) and evaluation (defining Key Performance Indicators (KPIs)). For this purpose, initially five BPWGs have been formed to discuss the following topics in particular:



Table 3: Initial Best Practice Working Groups and discussion points

	BPWG	Topics
1)	Paper collection systems and equipment	Collection rate, impurities of collected material
2)	New policies and standards	How to evaluate the formal transposition of EU legislation and the achievement of targets, possible classifications for evaluating the quality of collected fractions after they have been sorted
3)	Other collection systems	How to measure the quality of collected material and the recycling rate
4)	Paper quality and processes incorporating paper recycling	Measurement of the quality of fibres, recycling rate
5)	Citizen involvement/ social acceptance	Possible indicators for evaluating social acceptance, motivation and satisfaction

Study visits

Study visits to all clusters⁵ of the project have been conducted in the first several months. This has allowed project partners to get a very good comprehension of the existing collection systems and to be able to structure and critically assess the gathered information about the different territories.

Initially, two main tools were developed to gather relevant data from the selected territories:

Excel for mainly quantitative data

A template in the form of an Excel document has been prepared with the aim to gather the following information:

- General background information on the territory
- Legal framework (national, regional, and local)
- Existing EPR systems and their involvement in the local collection scheme
- Economic incentives for citizens
- Waste fees
- Collection service
- Collection system for PfR and for residual waste
- Municipal waste generation and collection
- Municipal waste treatment
- Evolution paper and cardboard waste separately collected & evolution collection of residual waste and separate collection of other recyclables
- Evolution paper and cardboard waste recycled

⁵ All project clusters excluding Lelis. The following territories have been visited: Dupnitsa (BG), Mezdra (BG), Mihai Viteazu (RO), Sfantu Gheorghe (RO), Trivalis/ SCOM (FR), Szczecin (PL), Merthyr Tydfil (UK). Additionally, the ACR+ team also visited Liège (BE) and PROPAKMA visited Kempten/Oberallgäu/Lindau (DE).



- Cost and revenues for the municipality, cost coverage
- Costs for citizens and shops (example calculation)
- PfR quality (impurities, moisture)

These templates were filled in by the respective local authority and/or the local waste management company. Information exchange was conducted mainly via email and phone.

Collecting complete and reliable data and information from the selected territories has proven to be a difficult task. Even by the time of finalisation of this report some key information was still missing. This is due to different and complex reasons, for instance in cases when:

- no systematic and uniform data collection has been established at local level
- relevant information is fragmented and in the hands of various stakeholders who do not share or exchange between them (especially when private interests or competition issues are involved)
- relevant information is aggregated by public authorities at national level.

In the process of filling it in, the excel template has also been modified and improved. This has led to drafting of a final excel template which is described further in this report (see Section 3.2).

■ **Questionnaires for qualitative data** (multiple-choice questions but also open questions)

In order to get a more complete understanding of the performance of a system and in line with the multi-stakeholder approach of the IMPACTPapeRec project, a number of additional stakeholders have been asked to give their opinion. A set of questionnaires have been designed targeted at the following six stakeholder groups:

- Citizens
- Shops & small businesses
- Collectors & sorters
- Paper mills
- Employees of the waste management (WM) department of the municipality
- NGOs & associations & researchers

The questionnaires serve the purpose of giving an indication of the level of information of the different stakeholder groups, the problems they see as well as their general satisfaction with the waste management system. They also serve to verify to what extent the various opinions are in line with the information provided by the municipality and/ or the local waste management company. The questionnaires have been designed in an anonymous way and do not contain any personal or quantitative data.

For all territories the objective was to gather 15-20 answers from the citizens and 5-10 from shops and small businesses. Considering their nature, the objective has been to receive at least one answer from each of the other stakeholder groups. For most of the territories these objectives have not been fully achieved, for diverse reasons. Given the limited number of responses received, the study does not have the primary aim of being representative. It rather serves the purpose of giving an indication of the level of information of the different stakeholder groups, the problems they see as well as their general satisfaction with the waste management system; and to verify to what extent the various opinions are in line with the information provided by the municipality and/ or the local waste



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management company. Filling in the questionnaires further served the purpose to test and validate the methodology.

After the questionnaires have been used to get feedback from the different territories, they have been reviewed in order to improve them – according to the lessons learnt and comments received. This has led to the drafting of final questionnaires (described further below in Section 2.4).

2.3. Synthesis and first analysis of gathered data

■ Factsheets

The data gathered through the Excel template and the questionnaires described above have been systematised in a more descriptive format as a separate factsheet for each territory. Each factsheet contains the following information:

- General data: including specificities of the territory such as population, density and urbanisation class
- National and regional system: with a focus on relevant legislation and targets, as well as description of any existing Extended Producer Responsibility (EPR) system(s)
- Waste collection scheme: including description and pictures
- Information and communication
- Evolution of collected paper and cardboard
- Paper and cardboard waste treatment
- Costs and revenues, resources
- Stakeholder satisfaction
- Main problems/ challenges⁶

■ Synthesis report

The collected data for all territories has been compiled in a synthesis report⁷ which includes the 13 factsheets on each of the territories. The main purpose of the report is to present the data collected since the start of the project, to analyse the situation on each of the territories and to draw some key conclusions. This is useful as it also gives an indication of the issues that need to be kept in mind during the rest of the project duration, for instance:

The synthesis document and the first analysis of the gathered data identify the data collection stage as one of the most difficult ones – mainly because of lack of reliable data on different levels → and therefore highlights the need for improving data collection in many of the cluster territories;

⁶ In the IMPACTPapeRec project, the main problems/ challenges in the factsheet only included the issues that were raised by the territories themselves (through the Excel template and the stakeholder questionnaires).

⁷ The synthesis report has been an internal deliverable of the project, accessible only to members of the consortium including the Commission Services. However, part of the data has been published in a subsequent deliverable report – D3.1 – which is public.



It identifies main common problems in the case study territories (as indicated by the local stakeholders) → these problems should be receive a special focus and be looked into more details during the project duration.

2.4. In-depth analysis and evaluation

2.4.1. Participatory data analysis

Data analysis is a lengthy process consisting of several phases. Therefore, throughout the whole duration of the project, several rounds of workshops will be carried out to cover these different phases. These workshops will be conducted with active participation and input from all project partners, following the methodology described below.

Different types of workshops are used in the framework of the project:

- a) cluster workshops that focus on the analysis of the cluster specific questions/aspects
- b) BPWG that focus on everything related to best practices: collection of BPs, analysis of BP, evaluation of BP
- c) innovation working groups – create innovation, later in the project⁸

The workshops have the task to gather complete information and different points of view from the partners of the project. Due to the highly diverse stakeholder interests as well as cultural backgrounds of the different partners, it is important that the methodology chosen would grant the possibility to every participant to share her/ his view on the different matters regardless of their English communication capabilities. Stimulating participation creates a common understanding of the problem, avoids confusion and generates a higher degree of involvement in the whole process. The methodology would not only need to stimulate participation, but encourage partners to reach certain agreements, moving the project forward. This methodology is based on Design Thinking procedures to develop innovation that follow steps of divergence and convergence to be able to reach the best solutions (see Figure 1).

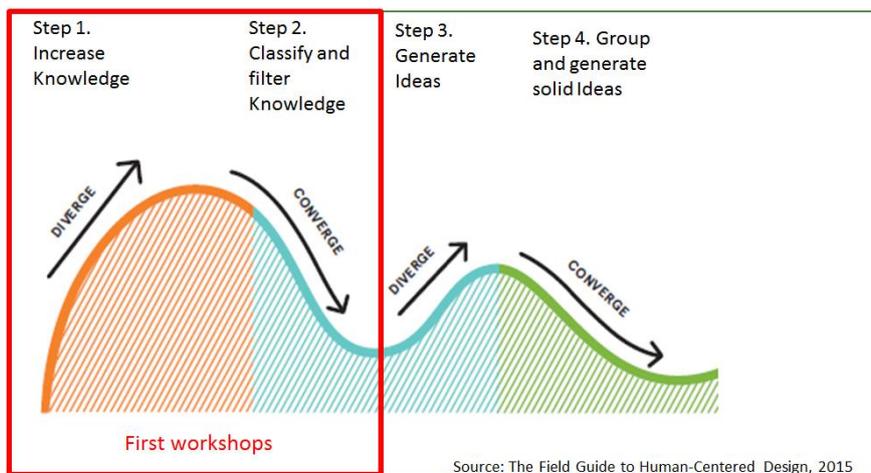


Figure 1: Workshop methodology

⁸ The workshop methodology is developed in WP4 (which addresses innovation aspects) as a tool to create innovation, but it is also a great tool to tackle other questions in the working groups



After the collection of data, a first round of workshops was conducted. It was aimed at increasing, classifying and filtering the information collected in the first months of the project. The first round of workshops was conducted as two separate sessions:

- discussion of data collection outcomes: organised in the cluster working groups as part of data analysis;
- discussion of best practices: organised in the BPWGs as a first evaluation of best practices. This discussion will continue in the upcoming months following a similar methodology but in a different format (online communication instead of physical meetings).

The methodology for the two workshop sessions shared some common features:

- Working in groups of 8-12 people. Bigger groups would make participation from all members impossible.
- Individual work and collective discussion. It was important to give time for everybody to think individually as well as to be able to share their thoughts
- A common moderator for all the groups that had the responsibility to lead the way through the different phases of the dynamics, making sure everybody understood the goal of each phase and one of the most important, stay on schedule.
- Post-its were used to share opinions and placed on the wall to share with everybody.
- All groups shared their conclusions at the end of the workshop.

The outcome of these first workshops was a very clearly defined problem giving the basis to generate well-oriented ideas in the following phase.

■ Cluster workshop

For this session the participants have been divided into “clusters”. Each cluster corresponded to a territory(ies) in the project with similar characteristics (in terms of legislative context, constraints, operational environment). The participants in each cluster included a mix of stakeholders with the idea to bring in both internal and external perspectives on the respective territories.

The goal of this workshop was to define the major problems that the different territories face when trying to improve their paper collection. A well-defined problem is the best way to generate great ideas.

The workshop was divided into different phases:

Phase 1. Problems in Paper Collection (free thinking). All members of the group had to think about the main problematics that their cluster faces, each of them with their own perspective (i.e. business, city hall, recycler...). At the end of this phase a list of problems was drawn from which they needed to compromise and choose only one for the following phase.

Phase 2. Problem Definition and Analysis. In this phase it was very important to have a common message in what the problem is, so everybody had to give their view through post-its and share with the rest of the group. When sharing, a person of the group had to organize the information in groups in order to have a structured analysis of the problems.



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Phase 3. Key Issues. Once the analysis of the information is done, it is important to give insight statements about the problem. These are key issues to be dealt with or to solve when generating ideas around the subject.

2.4.2. Data evaluation

■ Best Practice Workshop

For the second session of the first workshop the groups have been reshuffled and new “Best Practice Working Groups” (BPWGs) have been formed. The groups have been divided by four best practice categories:

- Operational aspects
- Legal and economic instruments
- Monitoring and control
- Information and communication

The goal was to gather the best practices used by the different countries and stakeholders in order to have a clear definition of the best practice and understand the benefits and requirements to implement them. Finally, the impact of this best practice was estimated by the participants.

The workshop was divided into different phases:

Phase 1. Best Practice (free thinking). In this case all members had to generate and propose best practices around a certain subject (i.e. Operational Aspects). As with the previous workshop, the outcome was a list of best practices to further work on, but only one was chosen for the following steps.

Phase 2. Problem Definition and Analysis. In this case the goal was to understand the main barriers faced when implementing this best practice as well as understand the main benefits of its implementation.

Phase 3. Evaluation. The goal of this phase was a quantitative estimation of the impact of each best practice on 3 different KPIs⁹ (environmental, social and economical). Members of the group were asked to estimate numerically the impact of the best practice, with the following scale:

- 2 Strong reduction of the KPI
- 1 Small reduction of the KPI
- 0 Neutral
- +1 Small Increment of the KPI value
- +2 Strong Increment of the KPI value

⁹ This was the methodology used for the first workshop but that it will be reviewed since it does not consider all performance indicators. Furthermore, it has not been decided yet which performance indicators are indeed “key” performance indicators.



■ BPWGs

Further on in the project, the newly defined BPWGs will incorporate also members of the ESC. Regular meetings will be organised (on a virtual basis) with the purpose to discuss and analyse in more details relevant BPs. If necessary, additional face-to-face workshop will be organised.

The four BPWGs have been defined with the following main discussion topics:

Table 4: Updated Best Practice Working Groups and discussion points

	BPWG	Topics
1)	Operational aspects	Collection system and infrastructure, type of containers, trucks, etc.
2)	Policy, legislation and economic aspects	Legislation, economic instruments, costs & revenues, strategies, etc.
3)	Monitoring and control	Data collection, monitoring of performance, quality control, enforcement, control (checks, fines), etc.
4)	Information and communication	Approaches to communicate and educate the users/ citizens

■ Initial list of indicators : both quantitative and qualitative

Five broad categories of indicators have been initially identified, open for further discussion on their applicability and relevance.

Table 5: Initial list of indicators

	Indicator group	Indicators
1)	Operational indicators (all quantitative)	<ul style="list-style-type: none"> - PfR collection rate - Impurities (non-paper components) - Moisture content - Quality of the PfR, measured as average price that the collection company can achieve for the material - Service to citizens (collection service, litres/inhabitant/year) - Service to shops (collection service, litres/shop/year)
2)	Economic indicators (all quantitative)	<ul style="list-style-type: none"> - Costs for the municipality, split into total cost of the system, cost of PfR collection and sorting, cost of collection and sorting of other fractions - Revenues for the municipality, split into revenues from EPR schemes, revenues from waste fees, revenues from material - Cost coverage for the municipality - Direct cost for citizens - Direct cost for small shops -
3)	Social indicators (all qualitative)	<ul style="list-style-type: none"> - Stakeholder satisfaction (small shops participating in the system, collector/sorter, recycler/paper mill, waste management department of the municipality, NGOs/researchers/associations - Satisfaction of citizens



		-
4)	Environmental indicators (all quantitative)	- Paper and cardboard recycling rate - Fuel of paper and board collection - Carbon footprint of waste treatment options
5)	Political/legislative indicators (all qualitative)	- Extent of implementation of EU and national legislation - Extent of achievement of EU and national legislative targets -

Several steps have been taken to further develop this initial list of indicators. In the first months of the project, the proposed indicators have been extensively discussed and reviewed in the initially defined five BPWGs (see section 2.2 for a presentation of these BPWGs). The discussions mainly focused on debatable indicators and specific critical issues.

■ Updated short list of indicators for further discussion

After data collection and analysis of the data received from the territories, it was possible to better estimate the relevance and feasibility of certain indicators. The outcomes were further discussed among the members of the Executive Board and were further examined in more details during a dedicated additional meeting. This has led to adjustments to the initial list of indicators and to drawing up of an updated list of indicators, as indicated in **Error! Reference source not found..**

Table 6: List of updated indicators

Indicator	Explanation
Operational indicators	
Paper & cardboard collection rate	The paper and cardboard collection rate describes the amount of paper and cardboard separately collected (= Paper for Recycling) compared to the total amount of paper & cardboard waste on the territory, in %. The total amount includes paper for recycling separately collected, paper & cardboard in residual waste, paper & cardboard in other separately collected waste fractions, paper & cardboard leaving the municipal waste system (house firing, burning, littering)
Impurities: non-paper components	Describes the amount of non-paper components in the paper for recycling. Can be measured at two different points of the process: 1.2.1 When entering the sorting plant 1.2.2 When entering the paper mill
Moisture content	According to EN 643: 10 % maximum Paper mills usually have individual requirements depending on PfR grade. Most paper mills set a maximum allowed level of moisture and do not accept PfR that exceeds this level. Moisture is economically important: moisture will be deducted if exceeding agreed level



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	<p>High moisture contents (>15 %) indicate lower quality of PfR</p> <p>High moisture can furthermore complicate the sorting process</p> <p>Moisture content can give some indications on the quality of the collection method.</p>
Service to the citizen	<p>Collection service offered to the citizen: paper and cardboard collection capacity that is offered to each citizen for each of the different collection schemes (DtD, BB, RY, other forms).</p> <p>This Indicator should in a second step be compared to the potential of consumption (total paper & cardboard waste, taken from indicator 1.1, paper & cardboard collection rate) to get the % of total potential in collection scheme covered.</p>
Economic indicators	
Cost coverage	<p>This indicator shows in how far the costs of the collection system are covered by the revenues. This can be calculated for</p> <p>2.1.1 For the whole collection system or</p> <p>2.1.2 Just the paper & cardboard fraction</p>
Structure of the cost coverage	<p>This indicator shows the revenues per type and indicates is the share that is covered by waste fees, EPR fees, material revenues or other sources.</p>
Direct cost for the citizen (in % of minimum wage)	<p>The cost of the system for the individual citizen can have a crucial impact on his/ her satisfaction with the system and thus an indirect impact on his/her participation.</p>
Costs for the municipality	<p>This indicator provides information about the total cost of the waste collection system and is provided as total in both the local currency and in €. It can be calculated</p> <p>2.4.1 for the whole system</p> <p>2.4.2 only for the Paper for recycling (PfR) fraction</p>
Revenues for the municipality	<p>This indicator provides information about the total revenues to the waste collection system and is provided as total in both the local currency and in €. It includes the revenues from material selling, revenues from PROs and revenues from waste fees, and can be calculated</p> <p>2.5.1 for the whole system</p> <p>2.5.2 only for the Paper for recycling fraction</p>
Social indicators	
Budget spent on waste & resources	<p>This indicator measures the budget spent on education and information activities on waste and resources issues. It therefore gives indication about</p>



education/information	<p>the importance that is given to education and information by the main actors. This includes the budget spent by</p> <p>3.1.1 the municipality</p> <p>3.1.2 the waste management company</p> <p>3.1.3 the Producer Responsibility Organisation (PRO) active on the territory</p>
Service to citizens	<p>This indicator describes the service to the citizen from the perspective of the citizen:</p> <p>Door-to-door collection: Collection frequency</p> <p>Bring Banks: Average distance</p> <p>Recycling Yard: Average distance</p>
Citizens and stakeholder satisfaction	<p>This indicator describes the satisfaction of citizens and other relevant stakeholders with the current waste management system. Stakeholders considered are:</p> <p>Citizens</p> <p>Small shops and businesses</p> <p>Collector/sorter</p> <p>Recycler/Paper mill</p> <p>Employees of WM department at the municipality</p> <p>NGOs/researchers/associations</p>
Environmental indicators	
Paper & cardboard recycling rate	<p>This indicator shows the amount of paper & cardboard waste actually recycled compared to all paper & cardboard waste collected on a territory.</p>
Rates of other treatment for paper and board	<p>This indicator shows the amount of paper & cardboard waste that is not recycled but goes into composting, incineration, and landfill. It is split in three parts:</p> <p>4.2.1 Composting rate</p> <p>4.2.2 Incineration rate</p> <p>4.2.3 Landfill rate</p> <p>One also needs to know the recycling rate, 4.1.</p>
Carbon footprint of p&b treatment	<p>Calculation based on average values in Europe for treatment options</p> <p>Calculation requires availability of indicators 4.1 and 4.2</p>
Carbon footprint of p&b	<p>Calculation is conducted according to the Scope 1 of the GHG protocol –</p>



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collection (fuel)	<p>direct emissions.</p> <p>Needed information: liters of fuel consumed per year in paper collection (data should be available to the waste management company).</p> <p>Based on the fuel consumption the CO₂emissions can be calculated via a direct formula. This formula can be included in the excel tool to directly convert liters of fuel in CO₂ emitted (http://www.ghgprotocol.org/calculation-tools/faq)</p>
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The next steps towards the definition of a final list of KPIs will include a review and feedback by all project partners. If proved necessary, additional meetings of key experts amongst partners and ESC will be organised in order to discuss critical indicators. Finally, a common decision will be reached on which indicators are indeed “key” and should be marked as “KPIs”.

3. Working instructions

This section gives working instructions for assessing the performance of one or several territories in terms of PfR management.

The working instructions are the first results of the project and are following the methodology developed in the scope of the project. They build on the work done so far in the project, on the lessons learnt, and on improvements made as a result of the first application of the methodology.

The final methodology will be presented in the main outcome of the project – the Handbook on Best Practices in PfR collection. The work and the learning process are still ongoing and this report only presents the current status.



3.1. Selection of territories

As a first step, territories for analysis and evaluation should be chosen. Based on the experience in the IMPACTPaperRec project, for this purpose it is important to involve a range of different



stakeholders with a diverse background and expertise in order to get a broad overview and coverage of territories.

3.2. Data collection

In order to analyse and evaluate the performance of a territory it is necessary to have comprehensive and reliable information about it. Therefore the first step after a territory is selected is to collect extensive relevant data.

From the experience in WP2, the following methodological tools are useful to gather such data:

- *Excel template*: quantitative data covering a range of aspects (contextual, legislative, economic, operational). The Excel template can be found in Annex I¹⁰

The excel document is intended to collect an extensive array of information. Territories with established data collection practices should have no major difficulties in filling it in. For territories where this is not the case, the excel template can fulfil the additional purpose of giving guidance as to what data they should aim at collecting.

- *Questionnaires*: qualitative data gathered through the consultation of a whole range of relevant stakeholders. Questionnaire templates for suggested six different stakeholder groups can be found in Annex II.¹¹

When used on a larger scale and based on a representative sample, it is believed that the developed questionnaires can indeed provide very good information about stakeholder satisfaction, especially if used in combination with other surveys that are carried out by municipalities. A representative sample for citizens and shops/ small businesses should be defined according to the characteristics of each territory. For the other questionnaires it is quite possible that there is only one organisation/body active in the territory studied. In that case it is important to get responses from several people inside the organisation in order to make sure that the answers match up.

- *Factsheet*: summarised data, easy to read. The factsheet template can be found in Annex III.

The main data from the two documents above can be combined and presented in a more synthetic and easy-to-read format. The synthetic factsheet can include graphs and charts in order to visualise relevant data, trends and evolutions. Whereas the Excel and the Questionnaires contain facts and raw data, the factsheet can already include some elements of analysis.

- *Site visits*

It is seen as very important if the “evaluator” can seize the possibility to personally visit the territory and to see the practical functioning of the collection system.

¹⁰ The excel template is constantly improved and updated over the course of the project, in line with the development of the list of performance indicators. The version here attached is the version that has been used for data collection from the case study territories.

¹¹ The questionnaires here in attachment are the revised and improved versions after feedback from partners and participants and including lessons learnt through the process of data collection.



3.3. Data analysis

Once the data is gathered, it is useful to involve a number of different stakeholders at the analysis stage. Ideally, (part of) the exchange and discussions would be conducted in personal meetings but also virtual exchange following the methodology described in Section 2.4.1 is possible. For the analysis, the suggested factsheet and indicators can provide guidance for the main aspects to be looked at.

3.4. Data evaluation

For evaluation, it is useful to use performance indicators. Measurement through KPIs helps to monitor performance of BP application and can also serve to benchmark with other territories or across time.

Work in the project is ongoing in order to deliver a list of KPIs in the coming months. At this point, the project consortium is considering a total of 16 performance indicators, amongst them, however, there are some that are still very much under discussion. This discussion will continue and will lead to a final list of performance indicators, amongst which a set of Key Performance Indicators will be selected. These KPIs will be applied in the Handbook, and the Handbook will include a final list of validated KPIs.

4. Next steps for the development of the BP Handbook

The main outcome of the IMPACTPapeRec project will be the Best Practice Handbook. The Handbook will contain an analysis of best practices and collection systems and will also include the common evaluation methodology for PfR collection presented in this report. It aims to provide:

- A knowledge database on current strategies, concepts and activities in best performing municipalities and regions in Europe
- A synthesis of best practices in the collection of PfR
- Conclusions and recommendations relating to the creation and implementation of best practices
- Contacts for further information

These elements are an initial list for the contents of the Handbook, as defined in the preliminary working plan of the project. However, it is evolving according to the opinions expressed by the project partners and to the needs of the targeted audience. The development of the Handbook is a lengthy process that is based on the input from partners, different working teams and the ESC. Some of the further steps towards the handbook include:

- First list of good practices

An initial list of good practices will be developed based on the different information gathered so far: through the site visits of the clusters, the synthesis report, the first round of workshops and a general review of the relevant literature.

The initial list will represent a rather complete index/inventory of good practices, classified under several categories. It will not contain, however, any detailed description or in-depth characterisation of each practice as this will be done at the second stage (as presented below).



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Several rounds of feedback from project partners and external experts (from the ESC) are foreseen in order to further refine and possibly scope down the initial list.

- Discussion of draft good practices within specific working groups

Each good practice from the revised list will be subject to discussions within the four BPWGs (“Operational aspects”, “Policy, legislation and economic aspects”, “Monitoring and control”, “Information and communication”). With the input from all project consortium and the ESC a complete coverage/ representativeness of the value chain is sought as this is seen to play a key role in the definition of final best practices.

The aim is to provide a rather detailed analysis including:

- A description of the GP: including some background, details on how it is implemented, methods/ techniques applied, people/ actors involved and related responsibilities, main implementation steps, timing, etc.
- Applicability: including advantages (achieved environmental benefits), limitations (limiting factors to applying the GP), economic implications (cost and benefits of implementing the BP, including estimations of required budget, possible cost savings and revenues), driving factors for implementation (internal and external factors that influence the implementation)

Amongst these good practices, partners will define the criteria how to choose best practices (also considering the KPIs) and will then come up with a list of Best Practices that will be included in the Handbook.

BPs proposed in the first version of the Handbook will be evaluated by Clusters in WP3, by analysing their applicability in their own territory, their own needs for the implementation and the expected impact in the territory. This information will be a valuable feedback for the final version of the handbook

Finalisation of the Handbook including a full list of best practices is planned to be issued in month 18 of the project.



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