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IMPACTPapeRec: IMPACT - Introduction and Improvement of Separate Paper Collection to Avoid Landfilling and Incineration

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[1] Hamburger Recycling Ens
[2] Hamburger Recycling Group
[3] PTS, Papiertechnische Stiftung
[4] Tehnopapir

IMPACTPAPEREC
Boosting separate paper collection

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D3.2 Innovative models and best practices to be implemented in cities under study

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Abbreviations

ACR+	Association of Cities and Regions for sustainable Resource management
BG	Bulgaria
BP	Best Practice
BPWG	Best Practice Working Group
CEPI	Confederation of European Paper Industries
EEB	European Environmental Bureau
ESC	External Support Committee
FR	France
GP	GOOD PRACTICE
INWG	Innovation Node Working Group
ITENE	Instituto Tecnológico del Embalaje, Transporte y Logística
Jan	January
PfR	Paper for Recycling
p&b	Paper and board
PL	Poland
Prio	Priority
PTS	Papiertechnische Stiftung
RO	Romania
Sep	September
SPP	Association of Polish Papermakers
TBD	To be determined
UK	United Kingdom of Great Britain and Northern Ireland
WP	Work package
WS	Workshop

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1 Introduction

IMPACTPapeRec is a European project designed to boost the Circular Economy by further increasing the separate collection of paper for recycling (PfR) and promote appropriate schemes to avoid landfilling and incineration.

The main outcome of the work carried out by the IMPACTPapeRec project will be BEST PRACTICE HANDBOOK, containing the analyses of BEST PRACTICES for the collection of paper and board. The aim of the handbook is to support the different European regions in the implementation of the best collection procedures. The content given in the BEST PRACTICE HANDBOOK will be applied in seven cluster territories from five different countries. This validation will provide valuable feedback to enhance the BEST PRACTICE HANDBOOK.

The focus of the project are countries where paper and board still largely ends up in residual waste or where the predominant collection scheme is comingled (i.e. paper is separated from residual waste but is collected mixed with other recyclables such as metals and plastics). These focus countries are Bulgaria, Poland and Romania from the first category and France and the UK from the second. Each municipality from these five focus countries has been defined as a separate "cluster" and included in the analysis. The clusters include both project partners and non- project partners. The latter have been selected based on personal contacts.

This report is the second out of three, which are reporting cluster analyses results.[5] The main objective of this report is a detailed description of the problem analysis and its application to the cluster territories. Based on the first selection of suitable GOOD PRACTICES, first results of the initial discussion regarding the implementation of GOOD PRACTICES are also included. The term GOOD PRACTICE was introduced to express the fact that not every practice is equally applicable to all territories. Hence, in the cluster analysis the term GOOD PRACTICE will be used.

The Chapter 2 gives an introduction to the general approach taken in the work presented in this report. The methodology and results of the general problem analysis are described in Chapter 3. The results of the cluster analysis are presented separately for each cluster in Chapter 4. Conclusions and outlook in Chapter 5 give a summary of the main results and next steps ahead.

[5] The first report provided an overview of the current situation of the paper and board collection systems in the cluster territories. [1]

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2 General approach

Figure 1 illustrates the general approach of the work documented in this report. According to the creative problem solving process used in IMPACTPapeRec project, there are four main parts of work needed to solve a problem [1].

1. Defining the problem
2. Generating ideas
3. Evaluating ideas
4. Deciding to implement ideas.

The work of WP3 focuses on parts 1 and 4.

The core problem addressed by IMPACTPapeRec is the separate collection of paper and board. Not surprisingly, this is a rather complex issue involving lots of different aspects. Thus, it is very important to carry out a profound problem analysis which corresponds to part 1 of the problem solving process.

The results from the *survey* among the stakeholder groups in the cluster territories[6] and the outcomes of the first *cluster workshop*[7] were summarized in the *first list of problems* for each cluster territory. Based on this information the *general problem analysis* for separate collection of paper and board was carried out and it resulted in the identification of NEGATIVE EFFECTS, CAUSES and CHALLENGES. In order to link the problem analysis to the subsequent parts of the problem solving process, those GOOD PRACTICES[8] which matched the identified CHALLENGE were allocated (*GOOD PRACTICES allocation*). The results of the *general problem analysis* are described in Chapter 3.

Building on the outcome of the *general problem analysis,* each cluster group was asked to proceed with the analysis for its territory (*cluster analysis*). During another cluster workshop[9], the cluster groups first selected those CAUSES and CHALLENGES that seemed the most relevant for their territory. According to the *GOOD PRACTICES allocation* some relevant GOOD PRACTICES were chosen to discuss their implementation in another cluster workshop9. This analysis corresponds to part 4 of the problem solving process and cluster groups will continue working on it during the upcoming months. The results of the *cluster analysis* so far are described in Chapter 4.

The results of the cluster workshops were used to update the list of GOOD PRACTICES. In particular, an additional best practice and innovation workshop[9] was held to gather more ideas about how to address CHALLENGES that were rated as highly important.

[6] This survey was carried out by the project partner ACR+. The designed questionnaires focused on different stakeholder groups, asking about the level of information, problems they see and general satisfaction with the waste management system.
[7] This cluster workshop took place in Budapest, September 2016. It is described in [3].
[8] Refers to the 'List of GOOD PRACTICES' from 3rd November 2016, see Appendix 8.3.
[9] These cluster workshops took place in Barcelona, January 2017. It is described in [3].

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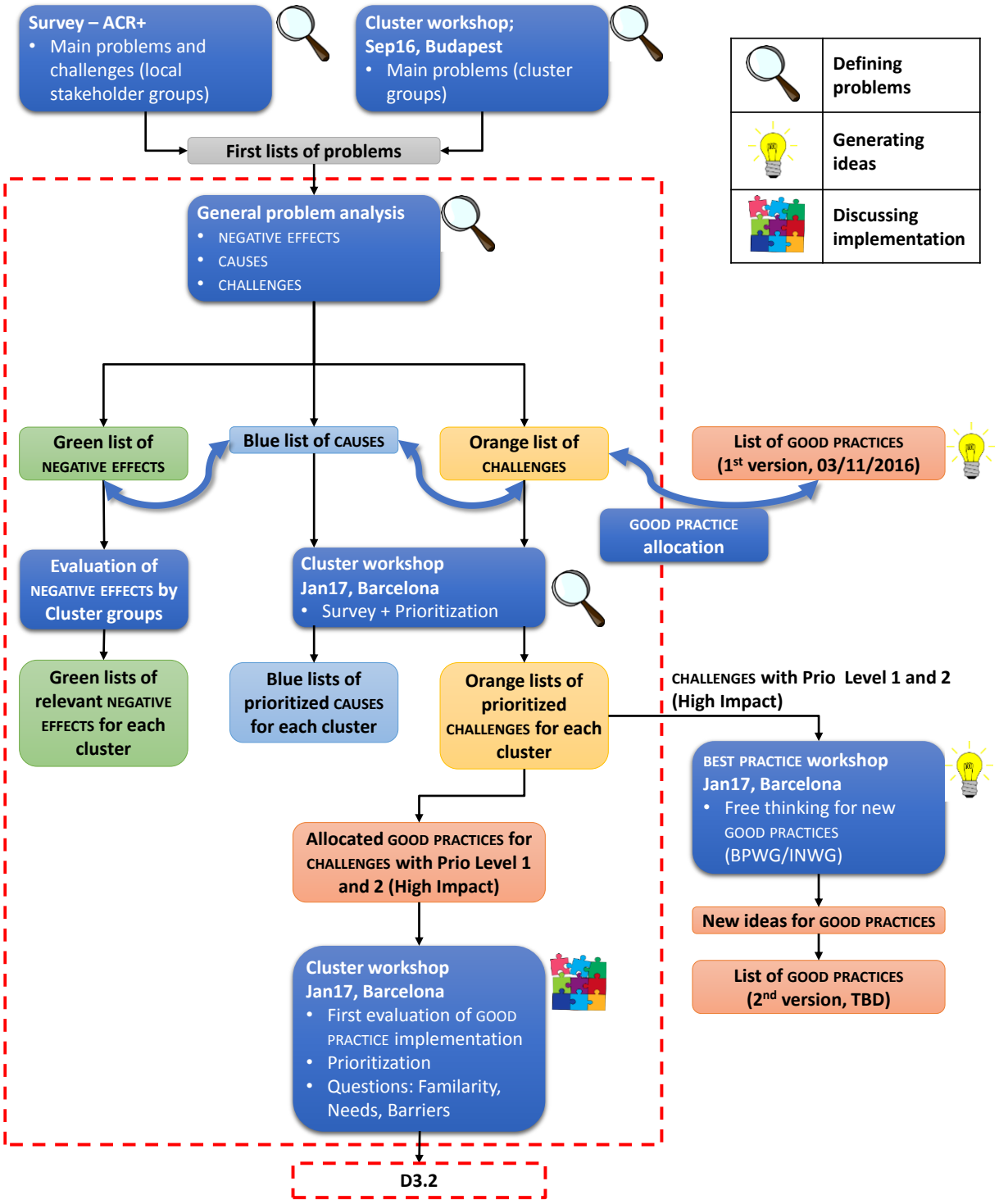

Figure 1: Schematic description of the general approach

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3 General problem analysis

To ensure a common and comparable approach for the cluster analysis it was decided to first conduct a general problem analysis. The analysis was based on the information about the problems of paper and board collection gatheredfrom the cluster groups. The aim was to have a characterisation of NEGATIVE EFFECTS, CAUSES and CHALLENGES available that could be used for the detailed cluster analysis.

3.1 Methodology

Complex problems need a proper analysis of the situation, identifying all related causes. Problems are a combination of cause(s) and effect(s). For example, a lacking environmental awareness among citizens (=cause) might result in low motivation for separate collection (=effect). In some cases a clear distinction between cause and effect is difficult as some aspects could work both as a cause and as an effect. For example, low motivation for separate collection could, at the one hand, be the effect of a lacking environmental awareness. On the other hand, it could also be the cause for the mixed collection of different materials. When analysing a problem each effect results from one or more causes. Each cause could itself be the effect of another cause and so on. The whole system of causes and effects could be visualised with a so called fishbone diagram. However, this kind of presentation is not suitable for this report which is why the results will be presented in tables.

Starting with the available information from the stakeholder survey and the first cluster workshop the main NEGATIVE EFFECTS of problems in paper and board collection were defined. In the next step, the primary, secondary and tertiary CAUSES for these NEGATIVE EFFECTS were identified and described. the following step was was to analyse which CHALLENGES and needs can be deducted from each CAUSE. These CHALLENGES were then categorized and allocated to the GOOD PRACTICES already identified by the BPWGs.[10]

3.2 NEGATIVE EFFECTS

Originating from the first list of problems stated by the stakeholder and cluster groups, the following key problems have a direct negative effect on the performance of paper and board collection in terms of quantity, quality, cost coverage and citizen's satisfaction:

- **Low quantity of collected paper and board** — A low quantity of collected paper and board results in low collection rate and hence low recycling rate. In case when paper and board are sorted from other waste or recyclables streams to increase the quantity, the PfR quality is suffering. The cost coverage of the system is at risk as profits from PfR sales are low.
- **Mixed material** — A mixed collection of materials decreases the collection quantity. The quality of commingled collected material is

[10] The list of GOOD PRACTICES is a working document which is continuously updated and managed by the project coordinator ITENE.

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	suffering. The cost coverage is at risk (more effort for sorting, less profit because of poor quality material).
• **Low quality of paper and board – impurities and moisture**	The decrease in quality results in smaller profits from PfR sales. No impact on quantity and citizens satisfaction.
• **Low motivation of citizens**	This results in a decrease of the collection quantity and quality. The cost coverage is at risk. No impact on satisfaction of citizens.
• **Vandalism**	This results in a decrease of the collection quantity. Replacement needs high investment costs. As citizens might feel endangered and annoyed, their satisfaction suffers.
• **Littering around collection sites**	This results in a decrease of the collection quantity and citizens' satisfaction. Additional costs for cleaning are necessary.

Based on the available information the relevance of each key issue for each cluster was assessed (see Table 1).

Table 1: Relevance of the identified key problems of paper and board collection for each cluster territory

#	Negative effects	Cluster 1 Dupnitsa	Cluster 2 Mezdra	Cluster 3 Sfantu Gheorghe	Cluster 4 Mihai Viteazu	Cluster 5 Vendée	Cluster 6 Merthyr Tydfil	Cluster 7 Szczecin
1	Low quantity of paper and board	✓	✓	✓	✓	-	-	✓
2	Mixed material	✓	✓	✓	✓	✓	✓	✓
3	Low quality of paper and board - impurities	✓	✓	✓	✓	✓	✓	✓
4	Low quality of paper and board - moisture	✓	✓	-	✓	-	-	✓
5	Low motivation of citizens	✓	✓	✓	✓	✓	✓	✓
6	Vandalism	✓	✓	✓	-	-	-	✓
7	Littering around collection sites	✓	✓	✓	✓	✓	(✓)	✓

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3.3 CAUSES

The problem analysis resulted in a list of sixteen CAUSES, which are described in Table 2. The table also liststhe associated NEGATIVE EFFECTS and a classification per type. The latter is relevant in terms of the linkage to the Best Practice Working Groups (BPWG)[11]:

- operational: BPWG 1
- economic, political and legal: BPWG 2
- technical: BPWG 1 and 3
- social: BPWG 4

Table 2: Characterisation of CAUSES for negative performance in paper and board collection

#	CAUSE	Type	Description	Effects[12]
1	**Lack of citizens' motivation**	Social	Citizens are not motivated enough to separate recyclables and waste in different streams. The reasons could be: general indifference, lack of information and education, dissatisfaction with the system or lack of direct benefit from separate collection.	Low quantity; Mixed material; Littering
2	**Waste pickers / scavengers**	Social	People who collect paper from containers in order to sell it in collection shops; Either as additional or main income	Low motivation; Littering
3	**Lack of information, communication and education[13] about resource management and recycling**	Social	Citizens do not have enough information about the waste management system, they lack knowledge about the advantages of recycling, they have no or badly performing communication system.	Mixed material; Low motivation; Vandalism
4	**Lack of environmental awareness**	Social	This corresponds to lack of education about resource management and recycling.	Low motivation; Littering
5	**Vandalism**	Social	Wilful damage and destruction of containers by burning them and its content. Mainly caused by social problems and boredom.	Low motivation;

[11] Referring to D2.2 [2], see appendix 8.1
[12] See also appendix 8.2, "allocation between CAUSES and NEGATIVE EFFECTS on paper and board collection"
[13] Information – giving facts to citizen (one-way); Communication – two-way information process between municipalities/responsible companies and citizens (feedback); Education – offers knowledge about recycling to understand why separate collection is useful.

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#	CAUSE	Type	Description	Effects[12]
				Littering
6	**Contamination**	Social	Contamination in terms of unwanted materials, consisting of non-paper components as well as paper and board detrimental to standard production of paper and board.[14] Reasons could be: ignorance or indifference of the citizens when it comes to separate collection. In some cases, the collection system is designed to collect unsuitable materials such as beverage carton.	Low quality (impurities); Mixed material
7	**Insufficient compression of material, e.g. cardboard**	Social, technical	Insufficient compression of (packaging) material could cause overfilling of the collection bins or containers. In that case citizens might put the material into another container or aside. The material might also be put next to the container if the object is bigger than the container opening.	Mixed material; Littering
8	**Use of paper and board (p&b) for heating**	Social, economic	Usage and disposal of paper and board for heating.	Low quantity
9	**Inappropriate design of containers and collection sites**	Technical	- Material and construction of containers: easy damage and destruction, especially turning over for theft of material; -Container opening: either too small for large volume objects or too big, thus attracting theft of material; - Volume of bins/containers: small volume might cause overfilling, thus littering and mixed materials. - Type of receptacle: plastic bag might not be suitable for stiff objects, such as corrugated board - Access to containers: easy access could cause theft and contamination of material or vandalism of containers	Low quantity; Vandalism; Littering

[14] According to the European List of Standard Grades of Paper and Board for Recycling EN 643 [4]

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#	CAUSE	Type	Description	Effects[12]
10	**Storage of paper and board without roof/coverage**	Technical	Inappropriate storage of paper and board exposes the material to weather conditions which may cause and might cause wetness	Low quality (moisture)
11	**Mixed collection of material into container**	Operational, technical	Paper and board is collected together with other recyclables and/or residual waste. Either caused by the established collection system (one bin or commingled) or by citizens (lack of motivation, full containers etc.).	Low quantity; Mixed material
12	**Mixed collection of material into vehicle**	Operational, technical	Separately collected streams are mixed together inside one vehicle. Either because material inside the different containers is already mixed anyway. Or because there is no treatment available for separate streams.	Low quantity; Mixed material; Low motivation
13	**Jointly collected material into one vehicle**	Operational, technical	Separately collected streams are collected together into the same vehicle. The vehicle has compartments inside, which are invisible from the outside or the collection receptacles are bags which are collected togethe, but treated separately later.	Low motivation
14	**Inconvenient availability**	Operational	Limited availability of bring collection sites for recyclables might cause lack of motivation of citizens for separate collection. Limitation might be caused by opening hours, too long distances and inconvenient location.	Mixed material, Low quality (impurities); Low motivation
15	**Lack of standardisation and guidelines**	Political	Standards and guidelines for operational, technical, control and social aspects could help to improve separate collection of paper and board[15]	Low quality (both)
16	**Regulations are missing or not clear**	Legal	Distinct regulations for operational, technical, control and social aspects could help improve separate collection of paper and board [15]	Low quantity; Low motivation

[15] Aspects related to policy and standardisation will be addressed by separate reports, to be issued later.

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3.4 CHALLENGES

Once the list of CAUSES was available, each CAUSE was analysed for the CHALLENGES that need to be addressed to eliminate the CAUSES for negative performance of paper and board collection. These CHALLENGES are classified into three areas – social, operational and strategy/monitoring /control.

On the basis of the list of GOOD PRACTICES on paper and board collection[16], relevant GOOD PRACTICES were allocated to the CHALLENGES. At the moment of conducting the analysis, there was no corresponding GOOD PRACTICE available for some of the identified CHALLENGES. In the meanwhile, the list of GOOD PRACTICES has been updated (2nd version). The *GOOD PRACTICE allocation* will be updated accordingly.

[16] Referring to 'List of GOOD PRACTICES' from 3rd November 2016, see appendix 8.3

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Table 3: CHALLENGES (Social – communication and education)

#	CHALLENGES	Addressed CAUSES	BPWG	GP#[17]
1	**Provide** information about the environmental and economic advantages **of separate collection**	Lack of motivation of citizens; Lack of information, communication and education; Lack of environmental awareness	4	4.1 4.2 4.3 4.8
2	**Provide** information about collection system and instructions how to separate **(including which material belongs where)** waste	Lack of information, communication and education; Contamination; Mixed collection into container	4	(2.5) 4.1 4.4 4.5 4.6
3	Targeted information campaigns for individual population groups **(children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel**	Lack of motivation of citizens; Lack of information, communication and education	4	4.13
4	Long-term education strategy **which enables all population groups to gain knowledge about recycling**	Lack of motivation of citizens; Lack of information, communication and education; Lack of environmental awareness	4	4.10 4.11 4.13
5	**Ensure** transparency of the system (with reliable data)	Lack of motivation of citizens; Jointly collected material	4 3	-
6	**Create** trust in the system	Lack of motivation of citizens; Jointly collected material	4 3	-
7	**Establish** communication system **between municipality/responsible companies and citizens, this should be convenient and efficient**	Lack of information, communication and education; Inconvenient availability	4	4.2
8	**Provide social activities, e.g. social institutions, youth centres**	Vandalism	2 4	-
9	**Provide assistance in social problem cases (e.g. social worker)**	Vandalism	2 4	-

[17] GOOD PRACTICES from 1st version of GOOD PRACTICES List (03/11/2016) not allocated to CHALLENGES yet: 1.2, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4, 2.7, 2.10, 4.7, 4.9, 4.12

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Table 4: CHALLENGES (Operational – system and logistics)

#	CHALLENGES	Addressed CAUSES	BPWG	GP#[18]
10	Select convenient system, type of container,-collection frequency, **depending on local characteristics (population density, demographics, type of building)**	Lack of motivation of citizens; Inconvenient availability; Use of p&b for heating	1	1.1 (2.5)
11	Select convenient opening hours, distances and location, **depending on local characteristics (demographics, infrastructure)**	Lack of motivation of citizens; Inconvenient availability; Use of p&b for heating	1	1.1 (1.10)
12	Restrict access **to collection sites and collected material**	Waste pickers/ scavenger; Vandalism; Inappropriate design	1 3	1.7 1.9 3.5
13	Avoid disposal of mixed waste by passersbys	Contamination	1	-
14	Improve design of containers/bins **according to the local conditions – material, construction, opening**	Inappropriate design; vandalism	1	(1.6) 1.7 1.9 1.10 (2.5)
15	Make sufficient volume **for the accruing quantity of recyclables and waste** available	Inappropriate design; Insufficient compression	1 3	- 3.6
16	Avoid exposing paper and board to weather conditions **– container, vehicle, storage**	Storage without roof/ coverage	1 3	- -
17	Using "polluter pays"-principle **to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)**	Contamination; Mixed collection into container	1 2 3	1.3 1.5 (2.8) 2.9 3.5

[18] GOOD PRACTICES from 1st version of GOOD PRACTICES List (03/11/2016) not allocated to CHALLENGES yet: 1.2, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4, 2.7, 2.10, 4.7, 4.9, 4.12

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Table 5: CHALLENGES (Strategy, monitoring and control)

#	CHALLENGES	Addressed CAUSES	BPWG	GP#[19]
18	Restrict trade of paper & board	Waste pickers/ scavengers	2	-
19	Establish laws and surveillance **activities against theft and vandalism**	Waste pickers/ scavengers	2 3	- 3.4
20	Collect data about potential quantity of paper and board	Inappropriate design	3	3.2
21	Availability of data/information **about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns**	Contamination	(2) 3	(2.6) 3.1 3.3
22	Integration of the informal sector **into waste management system**	Waste pickers/ scavengers	5	-

[19] GOOD PRACTICES from 1st version of GOOD PRACTICES List (03/11/2016) not allocated to CHALLENGES yet: 1.2, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4, 2.7, 2.10, 4.7, 4.9, 4.12

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4 Cluster analysis

The cluster analysis provides detailed information for each cluster territory. According to the cluster territories defined at the beginning of IMPACTPapeRec project, a cluster analysis was carried out for each cluster separately [2]. Figure 2 shows the target countries: Bulgaria, Romania, Poland, UK and France.

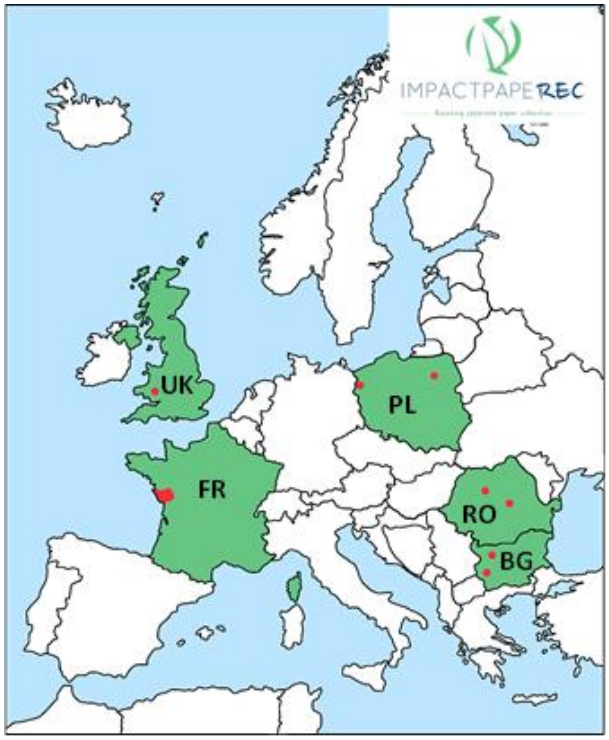

Figure 2: European map showing studied clusters (in red)

Each municipality from these five target countries has been defined as a separate "cluster", and included in the analysis (see Table 6). A detailed description of the current situation in each cluster territory is included in the previous report [2]. The territories have been chosen based on performance, separate collection system and personal contacts that helped ensure efficient collaboration. Bulgarian, Romanian and French territories are represented by partners of the project consortium. The clusters from the United Kingdom and Poland were incorporated as external partners. For both countries, there was no municipality included directly in the project as a project partner. Therefore, the cluster leaders for both clusters evaluated existing contacts and interesting territories together with the work package leaders, and Szczecin in Poland and Merthyr Tydfil in United Kingdom were chosen. However, as there are Polish partners included in the project, it was also decided to include a cluster analysis for the country Poland in general.

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Table 6: Cluster name, local partners and cluster leaders

Cluster	Target country	Local partners	Cluster leader
1. Dupnitsa	BG	Dupnitsa, Hamburger Recycling Bulgaria, Fenix Dupnitsa Ltd.	Hamburger Recycling
2. Mezdra	BG	Mezdra, Hamburger Recycling Bulgaria	Hamburger Recycling
3. Sfantu Gheorghe	RO	Sfantu Gheorghe, TEGA, Hamburger Recycling Romania	PTS
4. Mihai Viteazu	RO	Mihai Viteazu, Hamburger Recycling Romania	PTS
5. Vendée	FR	Trivalis, Ecofolio	Ecofolio
6. Merthyr Tydfil	UK	Merthyr Tydfil	CEPI
7. Szczecin	PL	Szczecin	Stora Enso
8. POLAND	PL	Stora Enso, EEB, SPP	

The clusters are usually represented by local partners. However, during the cluster workshops[20] other project members also participated in the cluster group discussions. The cluster analysis benefits from an external perspective, where external refers both to stakeholder and country. The workshops took a very participatory approach where all partners were engaged and encouraged to contribute by sharing their knowledge and ideas. It should be noted that the cluster workshops could not always be held for all seven cluster territories. Especially for those countries with no municipal partner in the project the information was otherwise collected.

Since all the members of the ESC were invited to join the workshops, held as part of the project meeting in January 2017 in Barcelona, there were some representatives from other countries participating as well. This opportunity was used to collect valuable information from experts from other European countries, such as Belgium, Switzerland, Czech Republic, Germany, Spain and Italy. Detailed results from this 'mixed cluster' group are presented in appendix 8.12.

4.1 Methodology

Based on the outcome of the general problem analysis (chapter 3), the cluster groups were asked to evaluate the relevance of the identified CAUSES and CHALLENGES for their territory. According to the prioritization of the CHALLENGES, the relevant GOOD PRACTICE were selected and discussed.

[20] These cluster workshops took place in Budapest, September 2016 and Barcelona, January 2017. They are described in [3].

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4.1.1 CAUSES for negative performance in paper and board collection

A questionnaire was developed to evaluate the relevance of the identified CAUSES for negative performance in paper and board collection (Figure 3). Each cluster group member was asked to evaluate each CAUSE in terms of importance and complexity.

❶ Individual rating – 10 min

- Is the cause ***not*** relevant for your cluster?
  → **Please tick '0 (Not relevant)'!**
- How important is the cause for your cluster?
  → **Please rate 'Importance'!**
- How difficult will it be to find a solution?
  → **Please rate 'Complexity'!**

#	Cause	0 Not relevant		1 Very low	2 Low	3 Medium	4 High	5 Very high
i	...		Importance	x				
			Complexity				x	

Figure 3: Questionnaire for classification of CAUSES

Those cluster groups present at the cluster workshop were asked to discuss their rating within the group afterwards. [1] The results given for Mezdra, Dupnitsa, Sfantu Gheorghe, Mihai Viteazu and Poland show the agreed evaluation. For the remaining cluster groups Vendée, Merthyr Tydfil and Szczecin the partners were asked to send the questionnaire by email. In case of more than one answer, the results given show the average values.

The matrix system in Table 7 shows four areas of prioritization:

- Prio 1: CAUSES of (very) high importance and (very) low complexity
- Prio 2: CAUSES of (very) high importance but medium to (very) high complexity
- Prio 3: CAUSES of medium to (very) low importance but (very) low complexity
- Prio 4: CAUSES of medium to (very) low importance and medium to (very) high complexity

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Table 7: Criteria matrix used for the prioritization of the CAUSES

CAUSES		Importance ➲				
		1 Very Low	2 Low	3 Medium	4 High	5 Very High
➲ Complexity	1 Very Low	Prio 3			Prio 1	
	2 Low					
	3 Medium	Prio 4			Prio 2	
	4 High					
	5 Very High					

4.1.2 CHALLENGES addressing the identified CAUSES for negative performance on paper and board collection

A questionnaire was developed to evaluate the relevance of the identified CHALLENGES for negative performance in paper and board collection (Figure 4). Every cluster group member was asked to evaluate each CHALLENGE in terms of importance and complexity.

❶ Individual rating – 10 min

- Is the challenge ***not*** relevant for your cluster?
  → **Please tick '0 (Not relevant)'!**
- How do you see the impact of the challenge for your cluster?
  → **Please rate 'Impact'!**
- How difficult will it be to find a solution?
  → **Please rate 'Complexity'!**

Challenges & Needs	Addressed causes	BP WG	0 Not relevant		1 Very low	2 Low	3 Medium	4 High	5 Very high
…	…	i		Impact				x	
				Complexity					x

Figure 4: Questionnaire for classification of CHALLENGES

Those cluster groups present at the cluster workshop were asked to discuss their rating within the group afterwards. [1] The results given for Mezdra, Dupnitsa, Sfantu Gheorghe, Mihai Viteazu and

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Poland show the agreed evaluation. For the remaining cluster groups Vendée, Merthyr Tydfil and Szczecin the partners were asked to send the questionnaire by email. In case of more than one answer, the results given show the average values.

The matrix system in Table 8 shows four areas of prioritization:

- Prio 1: CHALLENGES of (very) high importance and medium to (very) low complexity
- Prio 2: CHALLENGES of (very) high importance but (very) high complexity
- Prio 3: CHALLENGES of medium to (very) low importance but (very) low complexity
- Prio 4: CHALLENGES of medium to (very) low importance and medium to (very) high complexity

Table 8: Criteria matrix used for the prioritization of the CHALLENGES

CHALLENGES		Impact ➲				
		1 Very Low	2 Low	3 Medium	4 High	5 Very High
⬇ Complexity	1 Very Low	Prio 3			Prio 1	
	2 Low					
	3 Medium	Prio 4			Prio 2	
	4 High					
	5 Very High					

4.1.3 Selection of relevant GOOD PRACTICES (according to the prioritized CHALLENGES)

According to the prioritization of CHALLENGES by each cluster, the relevant GOOD PRACTICES have been selected for further analysis.[21] Obviously, the implementation of a GOOD PRACTICE is more likely the more important and less complex a challenge is. Therefore, the ranking of the selected GOOD PRACTICES for the implementation analysis corresponds with the level of prioritization by each cluster group. GOOD PRACTICES classified as Prio 1 and Prio 2 were chosen for the implementation analysis (see Table 8).

4.1.4 Implementation of the relevant GOOD PRACTICES in the clusters

4.1.4.1 Prioritization of GOOD PRACTICES for further analysis

The cluster groups were asked to evaluate the selected GOOD PRACTICES in terms of their impact and feasibility. Similar to the matrix for CAUSES and CHALLENGES, the GOOD PRACTICES were then classified into four groups (Table 9):

[21] Based on the *GOOD PRACTICE allocation* described in chapter 8.3

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- Prio 1: GOOD PRACTICES of (very) high impact and (very) high feasibility
- Prio 2: GOOD PRACTICES of (very) high impact but medium to (very) low feasibility
- Prio 3: GOOD PRACTICES of medium to (very) low importance but (very) high feasibility
- Prio 4: GOOD PRACTICES of medium to (very) low importance and medium to (very) low feasibility

Table 9: Criteria matrix used for the prioritization of the GOOD PRACTICES

GOOD PRACTICE Implementation		Impact ➲				
		1 Very Low	2 Low	3 Medium	4 High	5 Very High
➲ Feasibility	1 Very Low	Prio 4			Prio 2	
	2 Low					
	3 Medium					
	4 High	Prio 3			Prio 1	
	5 Very High					

4.1.4.2 First analysis results of the GOOD PRACTICE implementation

Those GOOD PRACTICES evaluated as Prio 1 and Prio 2 were analysed with regard to implementation in respective cluster territories. The local partners of each cluster were asked if they already use a GOOD PRACTICE and encouraged to share their opinion concerning needs and barriers in the case of implementation.

a. Do you already use this GOOD PRACTICE? → Current level of implementation
b. What do you need for implementation? → Needs in case of implementation
c. What are the barriers for implementation? → Barriers in case of implementation

Information given in this report regarding possible implementation of GOOD PRACTICES in the cluster territories are temporary answers given by the local partners ad-hoc. So far, the motives for the given answers were not discussed in detail. After the first version of the best practice handbook has been made available to them, the cluster groups will proceed with its validation and the implementation analysis during the upcoming months. Final results will be published in the upcoming report 'Results on the validation of the handbook and the evaluation methodology'.

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4.2 Results for Cluster Dupnitsa (BG)

4.2.1 Evaluation of CAUSES by cluster – Dupnitsa (BG)

Table 10 shows that the Dupnitsa cluster group agreed that two CAUSES are (very) important and easy to address (Prio Level 1, in green):

- *Mixed collection of material into vehicle*
- *Regulations are missing or not clear*

In addition to this, seven CAUSES were rated as being of high or very high importance, but the cluster group thinks it would be more difficult to find a solution for these CAUSES (Prio Level 2, in yellow):

- *Lack of motivation of citizens*
- *Waste pickers / scavengers*
- *Contamination*
- Use of p&b for heating
- *Inappropriate design of containers and collection sites*
- *Mixed collection of material into container*
- *Inconvenient availability*

Table 10: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Dupnitsa (BG)[22]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	4	3	2
2	Waste pickers / scavengers	5	5	2
3	Lack of information, communication and education about resource management and recycling	3,5	1	3
4	Lack of environmental awareness	3	3	4
5	Vandalism	3	2	3
6	Contamination	4	4	2
7	Insufficient compression of material e.g. cardboard	2	4	4
8	Use of p&b for heating	4	4	2
9	Inappropriate design of containers and collection sites	4	3	2
10	Storage of paper and board without a roof/coverage	3	3	4
11	Mixed collection of material into containers	5	4	2
12	Mixed collection of material into vehicle	4	2	1
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	5	3	2
15	Lack of standardisation and guidelines	2	2	3
16	Regulations are missing or not clear	4	2	1

[22] Appendix 8.5 includes detailed results for each CAUSE and each participant of the cluster workshop.

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4.2.2 Evaluation of CHALLENGES by cluster – Dupnitsa (BG)

The cluster group agreed on one of the most important CHALLENGES with low complexity:

- *Targeted Information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language and channel.*

Eleven other CHALLENGES were also rated as being of high or very high impact, however, it would be difficult to find solutions for them. These CHALLENGES are classified as Prio Level 2 (in yellow) in Table 11, Table 12 and

Table 13.

*Table 11: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Dupnitsa (BG)*[22]

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide information about the environmental and economic advantages of separate collection	3	2	3
2	Provide information about collection system and instructions how to separate (including which material belongs where)	4	3	2
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	4	2	1
4	Long-term education strategy which enables all population groups to gain knowledge about recycling	5	3	2
5	Ensure transparency of the system (with reliable data)	4	4	2
6	Create trust in system	5	5	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	4	4	2
8	Provide social activities, e.g. social institutions, youth centres	2	2	3
9	Provide assistance in social problem cases (e.g. social workers)	2	2	3

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*Table 12: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Dupnitsa (BG)* [22]

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	5	4	2
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	4	3	2
12	Restrict access to collection sites and collected material	3	3	4
13	Avoid disposal of mixed waste by passersbys	3	3	4
14	Improve design of containers/bins according to the local conditions – material, construction, opening	4	3	2
15	Make sufficient volume for the accruing quantity of recyclables and waste available	4	4	2
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	4	3	2
17	Using "polluter pays" principle to ensure direct benefit for separate collection and lower contamination (e.g. PAYT)	4	4	2

*Table 13: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Dupnitsa (BG)* [22]

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	3	3	4
19	Establish laws and surveillance activities against theft and vandalism	3	5	4
20	Collect data about potential quantity of paper and board	4	3	2
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	4	4	2
22	Integration of the informal sector into waste management system	5	5	2

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4.2.3 Relevant GOOD PRACTICES for cluster – Dupnitsa (BG)

ForCHALLENGES assessed as being of high and very high impact, twenty-three relevant GOOD PRACTICES were identified[23]. Out of those twenty three, a first set of ten GOOD PRACTICES was analysed. Seven out of ten chosen GOOD PRACTICES are related to *information and communication activities*, the rest are connected with *operational aspects*.

Table 14: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Dupnitsa (BG)

GP #	*GOOD PRACTICE name*	CHALLENGE *Prio 1*	CHALLENGE *Prio 2*
1.7	Implement measuresagainst theft of paper & board	-	14 Improve design
1.9	Automatic underground collection systems	-	14 Improve design
1.10	Adapted container opening	-	11 Convenient access 14 Improve design
4.1	Information on containers and bags	-	2 Provide instructions
4.4	Waste ambassadors	-	2 Provide instructions
4.5	Website on paper & board recycling	-	2 Provide instructions
4.6	Roadshows, events and workshops	-	2 Provide instructions
4.11	Environmental and economic benefits of recycling	-	4 Education strategy
4.10	Educational areas on paper & board collection and recycling	-	4 Education strategy
4.13	Targeted communication campaigns	3 Targeted campaigns	4 Education strategy
1.1	Collection system adapted to the real needs	-	10 Convenient system 11 Convenient access
1.3	Volunteer collection of paper & board	-	17 Polluter pays
1.5	Collection shops	-	17 Polluter pays
1.6	Underground containers	-	14 Improve design
2.5	Harmonisation of key parameters of bins	-	2 Provide instructions 10 Convenient system 14 Improve design
2.8	Separation into municipal, commercial and industrial paper and board stream	-	17 Polluter pays
2.9	Pay-as-you-throw	-	17 Polluter pays
3.1	Data collection of paper & board	-	21 Collect quality data
3.2	Data collection of residual and other waste		20 Collect quantity data
3.3	Measurement of quality of paper & board	-	21 Collect quality data
3.5	Use smart card system or barcode stickers	-	17 Polluter pays
3.6	Software on optimization of collection routes	-	15 Sufficient volume
4.2	Comprehensive communication package	-	7 Communication system
No GOOD PRACTICE available		-	5 Ensure transparency 6 Create trust 16 Avoid weather exposure 22 Integrate informal sector

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4.2.4 Evaluation of GOOD PRACTICE implementation by cluster – Dupnitsa (BG)

4.2.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding impact and feasibility criteria (Table 15).
The cluster group agreed that there are four GOOD PRACTICES of high impact and feasibility, which present Prio Level 1:

- *Information on containers and bags*
- *Website on paper & board recycling*
- *Roadshows, events and workshops*
- *Environmental and economic benefits of recycling*

There are four other GOOD PRACTICES classified as Prio Level 2, which were rated as being of high or very high impact as well. But in this case feasibility is estimated as medium, low or very low:

- *Implement measures against theft of paper and board*
- *Automatic underground collection systems*
- *Adapted container opening*
- *Targeted communication campaigns*

Table 15: Prioritization of relevant GOOD PRACTICES (allocated to the CHALLENGES with Prio 1 and Prio 2), Cluster – Dupnitsa (BG)

GP #	GOOD PRACTICE name	Impact	Feasibility[24]	Prio Level	WS analysis
1.7	Implement measures against theft of paper & board	5 - very high	1 - very low	2	☑
1.9	Automatic underground collection systems	4 - high	1 - very low	2	☑
1.10	Adapted container opening	4 - high	2 - low	2	☑
4.1	Information on containers and bags	5 - very high	5 - very high	1	☑
4.4	Waste ambassadors	1 - very low	5 - very high	3	-
4.5	Website on paper & board recycling	4 - high	5 - very high	1	☑
4.6	Roadshows, events and workshops	4 - high	4 - high	1	☑
4.11	Environmental and economic benefits of recycling	4 - high	4 - high	1	☑
4.10	Educational areas on paper & board collection and recycling	3 - medium	3 - medium	4	-
4.13	Targeted communication campaigns	4 - high	3 - medium	2	☑

[23] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

[24] Note: This cluster group did the prioritization according to complexity instead of feasibility; the results have been adjusted afterwards.

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4.2.4.2 First analysis results of the GOOD PRACTICE implementation

GOOD PRACTICES marked as Prio Level 1 and 2 (Table 15, in green and yellow) generally have not been applied in Dupnitsa yet.

In case of implementation, needs are mostly referring to additional knowledge and barriers are mainly related to the financial issues. For some of the GOOD PRACTICES there is no clear idea about possible barriers so perhaps those practices could be more easily implemented.

It is important to mention that Bulgarian municipalities are not the owner of the collection containers. The system for the recovery and recycling of paper & board and other fractions of packaging waste in Bulgaria is currently managed by recovery organizations (EKOPAK, EKOBULPAK, BULEKOPAK and EKOCOLLECT). Municipalities only have the obligation to make a contract with a recovery organization in order to enable primary selection of packaging waste. They have no influence on the collection system (selection of bins, bring banks, etc.), on the selection of companies that will collect recyclables nor on how material will be processed and sold.

Table 16: Analysis results of the GOOD PRACTICE implementation, GP 4.1, Cluster – Dupnitsa (BG)

GP 4.1 – Information on containers and bags
a) Current level of implementation
This GP is applied in Dupnitsa but only by labelling the container with a small sticker. The municipality would like to have big stickers with photos or pictures (like the ones for children).
b) Needs in case of implementation
Negotiation with owner of containers to implement different stickers
c) Barriers in case of implementation
The owner of the container is not willing to negotiate

Table 17: Analysis results of the GOOD PRACTICE implementation, GP 4.5, Cluster – Dupnitsa (BG)

GP 4.5 – Website on paper & board recycling
a) Current level of implementation
Specific web page does not yet exist
b) Needs in case of implementation
IT investment, popularize the use of web information for similar topics
c) Barriers in case of implementation
Web pages are not really a popular way of getting information in this municipality

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Table 18: Analysis results of the GOOD PRACTICE implementation, GP 4.6, Cluster – Dupnitsa (BG)

GP 4.6 – Roadshows, events and workshops
a) Current level of implementation
Yes, but only in the scope of recovery organisations
b) Needs in case of implementation
Additional investments and planning
c) Barriers in case of implementation
No clear ideas about possible barriers

Table 19: Analysis results of the GOOD PRACTICE implementation, GP 4.11, Cluster – Dupnitsa (BG)

GP 4.11 – Environmental and economic benefits of recycling
a) Current level of implementation
No, this GP is not applied in this region
b) Needs in case of implementation
People who would work on this, prepare it, organize distribution etc.
c) Barriers in case of implementation
Lack of volunteers and not enough money to finance all activities

Table 20: Analysis results of the GOOD PRACTICE implementation, GP 1.7, Cluster – Dupnitsa (BG)

GP 1.7 – Implement measures against theft of paper & board
a) Current level of implementation
No measures currently applied
b) Needs in case of implementation
More knowledge about available solutions (e.g. container design, legal issues, methods of collection)
c) Barriers in case of implementation
Lack of knowledge about solutions

Table 21: Analysis results of the GOOD PRACTICE implementation, GP 1.9, Cluster – Dupnitsa (BG)

GP 1.9 – Automatic underground collection systems
a) Current level of implementation
It has never been applied there, but they heard about this idea from IMPACTPapeRec Project
b) Needs in case of implementation
Big investments
c) Barriers in case of implementation
Money for investment and training for the citizens

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Table 22: Analysis results of the GOOD PRACTICE implementation, GP 1.10, Cluster – Dupnitsa (BG)

GP 1.10 – Container opening system adapted to paper & board
a) Current level of implementation
Not adapted yet, but it seems as a good option to do it
b) Needs in case of implementation
Knowledge – to know exactly what the best option would be
c) Barriers in case of implementation
Huge differences in packaging waste types - not easy to satisfy all conditions

Table 23: Analysis results of the GOOD PRACTICE implementation, GP 4.13, Cluster – Dupnitsa (BG)

GP 4.13 – Targeted communication campaigns
a) Current level of implementation
Yes, this practice is applied in the form of public discussions
b) Needs in case of implementation
Financial support from the Government
c) Barriers in case of implementation
No clear ideas about possible barriers

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4.3 Results for Cluster Mezdra (BG)

4.3.1 Evaluation of CAUSES by cluster – Mezdra (BG)

In case of the Mezdra cluster, Table 24 shows that none of the CAUSES is rated as Prio Level 1, so the cluster group decided that the most important CAUSES are not easy to solve. There were thirteen CAUSES rated as of high or very high importance, but also of high or very high complexity. These CAUSES are marked as Prio Level 2 in the table below (in yellow).

Table 24: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Mezdra (BG)[25]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	5	5	2
2	Waste pickers / scavengers	3,5	3	4
3	Lack of information, communication and education about resource management and recycling	5	3.5	2
4	Lack of environmental awareness	5	3.5	2
5	Vandalism	5	3	2
6	Contamination	4,5	4.5	2
7	Insufficient compression of material, e.g. cardboard	5	3	2
8	Use of p&b for heating	5	4.5	2
9	Inappropriate design of containers and collection sites	5	4	2
10	Storage of paper and board without roof/coverage	0	0	0
11	Mixed collection of material into container	4	3.5	2
12	Mixed collection of material into vehicle	4	3.5	2
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	5	3.5	2
15	Lack of standardisation and guidelines	5	4	2
16	Regulations are missing or not clear	5	4	2

4.3.2 Evaluation of CHALLENGES by cluster – Mezdra (BG)

Similar as in the case of CAUSES, the cluster group agreed that the most important CHALLENGES are not easy to solve. Thus none of the CHALLENGES is rated as a Prio Level 1. Twenty out of the 22 offered CHALLENGES were rated as being of high or very high impact, but the cluster group thinks that it would be more difficult to find solutions for these CHALLENGES. These CHALLENGES are marked as Prio Level 2 in the three tables below.

[25] Appendix 8.6 includes detailed results for each CAUSE and CHALLENGE each participant of the cluster workshop.

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*Table 25: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Mezdra (BG)*[25]

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide information about environmental and economic advantages of separate collection	5	3.5	2
2	Provide information about collection system and instructions how to separate (including which material belongs where)	5	3.5	2
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	5	4	2
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	5	3.5	2
5	Ensure system transparency (with reliable data)	5	4	2
6	Create trust in the system	5	4	2
7	Establish communication system between municipality/responsible companies and citizens; this should be convenient and efficient	5	4	2
8	Provide social activities e.g. social institutions, youth centres	4	3	2
9	Provide assistance in social problem cases (e.g. social workers)	4	3	2

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*Table 26: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Mezdra (BG)* [25]

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	5	4	2
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	5	3.5	2
12	Restrict access to collection sites and collected material	5	3.5	2
13	Avoid disposal of mixed waste by passersby	5	3.5	2
14	Improve design of containers/bins according to the local conditions – material, construction, opening	5	4	2
15	Make sufficient volume for the accruing quantity of recyclables and waste available	5	3.5	2
16	Avoid exposing paper and board toweather conditions – container, vehicle, storage	0	0	0
17	Using "polluter pays"- principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	4	4	2

*Table 27: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Mezdra (BG)* [25]

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	3	3	4
19	Establish laws and surveillance activities against theft and vandalism	5	3	2
20	Collect data about potential quantity of paper and board	5	4	2
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	5	4	2
22	Integration of the informal sector into waste management system	5	4	2

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4.3.3 Relevant GOOD PRACTICES for cluster – Mezdra (BG)

For CHALLENGESassessed as Prio Level 2 twenty-six relevant GOOD PRACTICES were identified[26]. Out of those twenty-six, a first set of six GOOD PRACTICES was analysed.

In case of Mezdra there are no CHALLENGES marked asPrio Level 1, which impliesthere is no GOOD PRACTICE with such priority as well. Same number (three in each group) of GOOD PRACTICES is related to *operational aspects* and *monitoring and control*. There areno GOOD PRACTICES chosen in relation to*policy, legislation and economic aspect* or *information and communication activities.*

[26] Based on the *GOOD PRACTICE allocation* described in chapter 3.4[27] Appendix 8.7 includes detailed results for each CAUSE and each participant of the cluster workshop

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Table 28: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Mezdra (BG)

GP #	GOOD PRACTICE name	CHALLENGE Prio 2 (no Prio 1 chosen)	
1.1	Collection system adapted to the real needs	10 Convenient system	11 Convenient acess
1.7	Implement measures against theft of paper & board	12 Restrict access	14 Improve design
1.9	Automatic underground collection systems	12 Restrict access	14 Improve design
3.4	Control measures against theft of paper & board	19 Establish surveillance	
3.5	Use smart card system or barcode stickers	12 Restrict access 14 Improve design	17 Polluter pays
3.6	Software on optimization of collection routes	15 Sufficient volume	
1.3	Volunteer collection of paper & board	17 Polluter pays	
1.5	Collection shops	17 Polluter pays	
1.6	Underground containers	14 Improve design	
1.10	Adapted container opening	11 Convenient access	14 Improve design
2.5	Harmonisation of key parameters of bins	2 Provide instructions 10 Convenient system	14 Improve design
2.8	Separation into municipal, commercial and industrial paper and board stream	17 Polluter pays	
2.9	Pay-as-you-throw	17 Polluter pays	
3.1	Data collection for paper & board	21 Collect quality data	
3.2	Data collection for residual and other waste	20 Collect quantity data	
3.3	Measurement of quality of paper & board	21 Collect quality data	
4.1	Information on containers and bags	1 Provide advantages	2 Provide instructions
4.2	Comprehensive communication package	1 Provide advantages	7 Communication system
4.3	Include citizens actively in the information loop	1 Provide advantages	
4.4	Waste ambassadors	2 Provide instructions	
4.5	Website on paper & board recycling	2 Provide instructions	
4.6	Roadshows, events and workshops	2 Provide instructions	
4.8	Publication of news on paper & board recycling	1 Provide advantages	
4.10	Educational areas on paper & board collection and recycling	4 Education strategy	
4.11	Environmental and economic benefits of recycling	4 Education strategy	
4.13	Targeted communication campaigns	3 Targeted campaigns	4 Education strategy
No GOOD PRACTICE available		5 Ensure transparency 6 Create trust 8 Provide social activities	9 Provide social assistance 13 Avoid disposal 22 Integrate informal sector

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4.3.4 Evaluation of GOOD PRACTICE Implementation by cluster – Mezdra (BG)

4.3.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding impact and feasibility criteria. Table 29 shows that the Mezdra cluster agreed there is no option of both high impact and feasibility. Thus, there is no GOOD PRACTICE presented as Prio Level 1.

Three GOOD PRACTICES are marked as Prio Level 2*:*

- *Collection system adapted to the real needs*
- *Automatic underground collection systems*
- *Software on optimization of collection routes*

These GOOD PRACTICES were rated as being of high or very high impact, but in this case feasibility is estimated as medium or even very low.

Table 29: Prioritization of relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Mezdra (BG)

GP #	GOOD PRACTICE name	Impact	Feasibility	Prio Level	WS analysis
1.1	Collection system adapted to the real needs	5 - very high	3 - medium	2	☑
1.7	Implement measures against theft of paper & board	2 - low	5 - very high	3	-
1.9	Automatic underground collection systems	4 - high	1 - very low	2	☑
3.4	Control measures against theft of paper & board	2 - low	5 - very high	3	-
3.5	Use smart card system or barcode stickers	3 - medium	2 - low	4	-
3.6	Software on optimization of collection routes	4 - high	3 - medium	2	☑

4.3.4.2 First analysis results of the GOOD PRACTICE implementation

There is no GOOD PRACTICE classified as Prio Level 1. GOOD PRACTICES classified as Prio Level 2 have not been applied in Mezdra yet. In case of implementation, needs and barriers are mainly related to financial issues and problematic national legislation. Allocation of responsibilities between municipalities and recovery organisations is seen as the ultimate problem.

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Table 30: Analysis results of the GOOD PRACTICE implementation, GP 1.1, Cluster – Mezdra (BG)

GP 1.1 – Collection system adapted to the real needs
a) Current level of implementation
This GOOD PRACTICE is known, but currently not applied (only bring banks)
b) Needs in case of implementation
Legislative change on national level is needed to change the allocation of responsibilities (municipalities/ PROs)
c) Barriers in case of implementation
Political process

Table 31: Analysis results of the GOOD PRACTICE implementation, GP 1.9, Cluster – Mezdra (BG)

GP 1.9 – Automatic underground collection systems
a) Current level of implementation
They have heard about it, but have no findings regarding the implementation in Bulgaria
b) Needs in case of implementation
Financing and implementation of convenient collection system (municipalities should have responsibility for recyclables)
c) Barriers in case of implementation
Financing and national legislation

Table 32: Analysis results of the GOOD PRACTICE implementation, GP 3.6, Cluster – Mezdra (BG)

GP 3.6 – Software on optimization of collection routes
a) Current level of implementation
They have heard about it, but have no findings regarding the implementation in Bulgaria
b) Needs in case of implementation
Financing and implementation of convenient collection system (municipalities should have responsibility for recyclables)
c) Barriers in case of implementation
Financing and national legislation

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Date: 28 April 2017

4.4 Results for Cluster Sfantu Gheorghe (RO)

4.4.1 Evaluation of CAUSES by cluster – Sfantu Gheorghe (RO)

Table 33 shows that the cluster group agreed that the most important CAUSE and also easy to address is:

- *Lack of information, communication and education about resource management and recycling*

The following three CAUSES were rated as being of high or very high importance, but it would be more difficult to find a solution for these CAUSES (Prio Level 2, in yellow):

- *Lack of motivation of citizens*
- *Lack of environmental awareness*
- *Insufficient compression of material e.g. cardboard*

Table 33: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Sfantu Gheorghe (RO)[27]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	4	3	2
2	Waste pickers / scavengers	1	2	3
3	Lack of information, communication and education about resource management and recycling	5	2	1
4	Lack of environmental awareness	4	4	2
5	Vandalism	3	3	4
6	Contamination	1	4	4
7	Insufficient compression of material e.g. cardboard	4.5	5	2
8	Use of p&b for heating	1	4	4
9	Inappropriate design of containers and collection sites	3	4	4
10	Storage of paper and board without roof/coverage	2	2	3
11	Mixed collection of material into container	2	2	3
12	Mixed collection of material into vehicle	1	1	3
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	2.5	2	3
15	Lack of standardisation and guidelines	1	2	3
16	Regulations are missing or not clear	1	2	3

4.4.2 Evaluation of CHALLENGES by cluster – Sfantu Gheorghe (RO)

The cluster group agreed on one most important CHALLENGE that is regared as being oflow complexity:

- *Establish laws and surveillance activities against theft and vandalism.*

[27] Appendix 8.7 includes detailed results for each CAUSE and each participant of the cluster workshop

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Six other CHALLENGES were rated as being ofhigh or very high impact, but it would be difficult to find a solution for these CHALLENGES. These CHALLENGES are:

- *Provide information about environmental and economic advantages of separate collection*
- *Provide information about collection system and instructions how to separate waste*
- *Long-term education strategy which enables all population groups to gain knowledge about recycling*
- *Create trust in the system*
- *Select convenient system, type of container,–collection frequency, depending on local characteristics (population density, demographics, type of building)*
- *Restrict access to collection sites and collected material.*

*Table 34: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Sfantu Gheorghe (RO)[27]*

CHAL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide Information about the environmental and economic advantages of separate collection	4	4	2
2	Provide Information about collection system and instructions how to separate (including which material belongs where)	4	3	2
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	3	5	4
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	5	4	2
5	Ensure transparency of the system (with reliable data)	0	0	0
6	Create trust in the system	4	4	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	3	3	4
8	Provide social activities, e.g. social institutions, youth centres	0	0	0
9	Provide assistance in social problem cases (e.g. social workers)	0	0	0

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*Table 35: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Sfantu Gheorghe (RO)* [27]

CHAL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	5	4	2
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	0	0	0
12	Restrict access to collection sites and collected material	5	3	2
13	Avoid disposal of mixed waste by passersby	2	2	3
14	Improve design of containers/bins according to the local conditions – material, construction, opening	2	2	3
15	Make sufficient volume for the accruing quantity of recyclables and waste available	3	2	3
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	0	0	0
17	Using "polluter pays"-principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	2	3	4

*Table 36: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Sfantu Gheorghe (RO)* [27]

CHAL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	0	0	0
19	Establish laws and surveillance activities against theft and vandalism	5	2	1
20	Collect data about potential quantity of paper and board	2	5	4
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	0	0	0
22	Integration of the informal sector into waste management system	2	5	4

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4.4.3 Relevant GOOD PRACTICES for cluster – Sfantu Gheorghe (RO)

For those CHALLENGES that were assessed as being of high and very high impact, sixteen relevant GOOD PRACTICES were identified[28]. Out ofthose sixteen, a first set of eight GOOD PRACTICES was analysed.

Four out of the eight chosen GOOD PRACTICES are related to *information and communication activities*, the rest is connected with *operational aspects, monitoring and control*. There was no GOOD PRACTICE chosen in relation with *policy, legislation and economic aspect*.

Table 37: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Sfantu Gheorghe (RO)

GP #	GOOD PRACTICE name	CHALLENGE Prio 1	CHALLENGE Prio 2
1.7.	Implement measures against theft of paper & board	-	12 Restrict access
1.9.	Automatic underground collection systems	-	12 Restrict access
3.4.	Control measures against theft of paper & board	19 Establish surveillance	-
3.5.	Use smart card system or barcode sticker	-	12 Restrict access
4.1.	Information on containers and bags	-	1 Provide advantages 2 Provide instructions
4.4.	Waste ambassadors	-	2 Provide instructions
4.5.	Website on paper & board recycling	-	2 Provide instructions
4.6.	Roadshows, events and workshops	-	2 Provide instructions
1.1	Collection system adapted to the real needs	-	10 Convenient system
2.5	Harmonisation of key parameters of bins	-	2 Provide instructions 10 Convenient system
4.2	Comprehensive communication package	-	1 Provide advantages
4.3	Actively include citizens in the information loop	-	1 Provide advantages
4.8	Publication of news on paper & board recycling	-	1 Provide advantages
4.10	Educational areas on paper & board collection and recycling	-	4 Education strategy
4.11	Environmental and economic benefits of recycling	-	4 Education strategy
4.13	Targeted communication campaigns	-	4 Education strategy
No GOOD PRACTICE available			6 Create trust

[28] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

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4.4.4 Evaluation of GOOD PRACTICE Implementation by cluster – Sfantu Gheorghe (RO)

4.4.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding impact and feasibility criteria (Table 38). The cluster group agreed that the GOOD PRACTICES ofthe highest impact and feasibility are:

- *Implement measures against theft of paper & board*
- *Information on containers* and *bags*
- *Website on paper & board recycling*

These GOOD PRACTICES present Prio Level 1.

Within the Prio Level 2, there are two GOOD PRACTICES marked*:*

- *Control measures against theft of paper and board*
- *Roadshows, events and workshops.*

These GOOD PRACTICES were rated as being ofhigh or very high impact as well, but in this case feasibility would be medium or low.

Table 38: Prioritization of relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Sfantu Gheorghe (RO)

GP #	GOOD PRACTICE name	Impact	Feasibility	Prio Level	WS analysis
1.7.	Implement measures against theft of paper & board	5 - very high	5 - very high	1	☑
1.9.	Automatic underground collection systems	1 - very low	1 - very low	4	-
3.4.	Control measures against theft of paper & board	4 - high	2 - low	2	☑
3.5.	Use smart card system or barcode stickers	2 - low	1 - very low	4	-
4.1.	Information on containers and bags	4 - high	5 - very high	1	☑
4.4.	Waste ambassadors	3 - medium	4 - high	3	☑
4.5.	Website on paper & board recycling	4 - high	4 - high	1	☑
4.6.	Roadshows, events and workshops	4 - high	3 - medium	2	☑

4.4.4.2 First analysis results of the GOOD PRACTICE implementation

Some of the GOOD PRACTICES marked as Prio Level 1 and 2 have already been applied in this cluster. However, according to the provided information about the current situation, there is still some potential for improvement.

In case of implementation, needs are mostly referring to adequate personnel and equipment while barriers are mainly related to the financial issues and lack of time to organise new activities.

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Additional explanation is needed to check why there were two GOOD PRACTICES selected in relation with the measures against theft of paper and board, even though the informal sector in Romania is usually not collection this material, picking up only metals and plastics (higher value goods).

Table 39: Analysis results of the GOOD PRACTICE implementation, GP 1.7, Cluster – Sfantu Gheorghe (RO)

GP 1.7 – Implement measures against theft of paper and board
a) Current level of implementation
Yes, in some areas there is a video system
b) Needs in case of implementation
Containers that could be locked
c) Barriers in case of implementation
Money, local policies against theft of paper and board are not available

Table 40: Analysis results of the GOOD PRACTICE implementation, GP 4.1, Cluster – Sfantu Gheorghe (RO)

GP 4.1 – Information on containers and bags
a) Current level of implementation
Yes, this practice is applied, there isgraphic information on containers
b) Needs in case of implementation
No additional needs, they are satisfied with existing solutions
c) Barriers in case of implementation
No barriers at the moment

Table 41: Analysis results of the GOOD PRACTICE implementation, GP 4.5, Cluster – Sfantu Gheorghe (RO)

GP 4.5 – Website on paper and board recycling
a) Current level of implementation
Yes, it exists. But there is potential for improvement, also additional proposals were provided: Smart phones application
b) Needs in case of implementation
IT specialist, idea on how to present it in a simple yet interesting way
c) Barriers in case of implementation
Money and organisation

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Table 42: Analysis results of the GOOD PRACTICE implementation, GP 3.4, Cluster – Sfantu Gheorghe (RO)

GP 3.4 – Control measures against theft of paper and board
a) Current level of implementation
Not implemented
b) Needs in case of implementation
- Political will to survey citizens - Money - Commitment to use police against theft - local police is the only institution that can do something regarding this issue, they should be more active
c) Barriers in case of implementation
Money; lack of political will to put it into practice

Table 43: Analysis results of the GOOD PRACTICE implementation, GP 4.6, Cluster – Sfantu Gheorghe (RO)

GP 4.6 – Roadshows, events and workshops
a) Current level of implementation
Yes, there are some activities for schools and kindergartens but theyshould be organised more often
b) Needs in case of implementation
- Set of materials explainingpaper recycling - Videos explainingwhy all kinds of waste are collected with one single truck - Equipment: for example, there is a need for some equipment in case some field work is organised (for picking waste in nature (so called "cleaning day"). Also, there should be more people who wouldbe responsible to organize suchevents.
c) Barriers in case of implementation
Money

Table 44: Analysis results of the GOOD PRACTICE implementation, GP 4.4, Cluster – Sfantu Gheorghe (RO)

GP 4.4 – Waste ambassadors
a) Current level of implementation
No, this GP does not exist. They heard of it for the first time during ImpactPapeRec project. There are agents who collect payments (invoices are distributed door to door) Additional idea: children as ambassadors
b) Needs in case of implementation
Experienced persons to do this (with communication skills and wide knowledge in the field of waste, especially regarding PfR)
c) Barriers in case of implementation
Money; finding adequate ambassadors with all necessary skills; time to organize this

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4.5 Results for Cluster Mihai Viteazu (RO)

4.5.1 Evaluation of CAUSES by cluster – Mihai Viteazu (RO)

Table 45 shows that the cluster group agreed that three CAUSES are (very) important and easy to address (Prio Level 1, marked in green):

- *Insufficient compression of material e.g. cardboard*
- *Mixed collection of material into containers*
- *Mixed collection of material into vehicle.*

Seven CAUSES were rated as being of high or very high importance as well, but it would be more difficult to find a solution for these CAUSES. These CAUSES are*:*

- *Lack of motivation of citizens*
- *Lack of information, communication and education about resource management and recycling*
- *Lack of environmental awareness*
- *Contamination*
- *Use of p&b for heatingInconvenient availability*
- *Regulations are missing or not clear.*

Table 45: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Mihai Viteazu (RO)[29]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	5	5	2
2	Waste pickers / scavengers	0	0	0
3	Lack of information, communication and education about resource management and recycling	5	4	2
4	Lack of environmental awareness	5	5	2
5	Vandalism	1	5	4
6	Contamination	5	5	2
7	Insufficient compression of material e.g. cardboard	4	2	1
8	Use of p&b for heating	4	3	2
9	Inappropriate design of containers and collection sites	3	3	4
10	Storage of paper and board without roof/coverage	0	0	0
11	Mixed collection of material into container	5	2	1
12	Mixed collection of material into vehicle	5	2	1
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	4	3	2
15	Lack of standardisation and guidelines	3	4	4
16	Regulations are missing or not clear	4	4	2

[29] Appendix 8.8 includes detailed results for each CAUSE and CHALLENGE each participant of the cluster workshop.

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4.5.2 Evaluation of CHALLENGES by cluster – Mihai Viteazu (RO)

The cluster group agreed on the two most important CHALLENGES oflow complexity:

- *Provide information about collection system and instructions how to separate (including which material belongs where).*
- *Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel.*

Ten other CHALLENGES were rated as being of high or very high impact as well, but the cluster group considered it would be difficult to find a solution for these CHALLENGES . These CHALLENGES are marked as Prio Level 2 in the next three tables below.

*Table 46: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Mihai Viteazu (RO)*[29]

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide Information about the environmental and economic advantages of separate collection	4	3	2
2	Provide Information about collection system and instructions how to separate (including which material belongs where)	5	2	1
3	Targeted Information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	5	2	1
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	3	5	4
5	Ensure transparency of the system (with reliable data)	3	2	3
6	Create trust in thesystem	5	4	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	4	3	2
8	Provide social activities, e.g. social institutions, youth centres	-	-	-
9	Provide assistance in social problem cases (e.g. socialworkers)	-	-	-

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*Table 47: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Mihai Viteazu (RO)* [29]

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	5	4	2
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	0	0	0
12	Restrict access to collection sites and collected material	3	3	4
13	Avoid disposal of mixed waste from people passing by	2	4	4
14	Improve design of containers/bins according to the local conditions – material, construction, opening	4	3	2
15	Make sufficient volume for the accruing quantity of recyclables and waste available	5	5	2
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	0	0	0
17	Using "polluter pays"- principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	4	5	2

*Table 48: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Mihai Viteazu (RO)* [29]

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	4	4	2
19	Establish laws and surveillance activities against theft and vandalism	4	4	2
20	Collect data about potential quantity of paper and board	2	4	4
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	4	3	2
22	Integration of the informal sector into waste management system	0	0	0

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4.5.3 Relevant GOOD PRACTICES for cluster – Mihai Viteazu (RO)

For those CHALLENGES assessed as being ofhigh and very high impact, 24 GOOD PRACTICES were identified[30]. All of them are related to *information and communication activities*. Out of those practices, a first set of five GOOD PRACTICES was analysed.

Table 49: Relevant GPs (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Mihai Viteazu (RO)

GP #	GOOD PRACTICE name	CHALLENGE Prio 1	CHALLENGE Prio 2
4.1	Information on containers and bags	2 Provide instructions	1 Provide advantages
4.4	Waste ambassadors	2 Provide instructions	-
4.5	Website on paper & board recycling	2 Provide instructions	-
4.6	Roadshows, events and workshops	2 Provide instructions	-
4.13	Targeted communication campaigns	3 Targeted campaigns	-
1.1	Collection system adapted to the real needs	-	10 Convenient system
1.3	Volunteer collection of paper & board	-	17 Polluter pays
1.5	Collection shops	-	17 Polluter pays
1.6	Underground containers	-	14 Improve design
1.7	Implement measures against theft of paper & board	-	14 Improve design
1.9	Automatic underground collection systems	-	14 Improve design
1.10	Adapted container opening	-	14 Improve design
2.5	Harmonisation of key parameters of bins	-	10 Convenient system 14 Improve design
2.6	Clear allocation of rights	-	21 Collect quality data
2.8	Separation into municipal, commercial and industrial paper and board stream	-	17 Polluter pays
2.9	Pay-as-you-throw	-	17 Polluter pays
3.1	Data collection of paper & board	-	21 Collect quality data
3.3	Measurement of quality of paper & board	-	21 Collect quality data
3.4	Control measures against theft of paper & board	-	19 Establish surveillance
3.5	Use smart card system or barcode stickers	-	17 Polluter pays
3.6	Software on optimization of collection routes	-	15 Sufficient volume
4.2	Comprehensive communication package	-	1 Provide advantages 7 Communication system
4.3	Include citizens actively in the information loop	-	1 Provide advantages
4.8	Publication of news on paper & board recycling	-	1 Provide advantages
No GOOD PRACTICE available		-	6 Create trust 18 Restrict trade

[30] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

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4.5.4 Evaluation of GOOD PRACTICE Implementation by cluster – Mihai Viteazu (RO)

4.5.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding impact and feasibility criteria (Table 50). The cluster group agreed that a GOOD PRACTICE with the highest impact and feasibility, which presents Prio level 1 (in green), is

- *Information on containers and bags*

Within Prio Level 2, there are two GOOD PRACTICES marked*:*

- *Waste ambassadors*
- *Targeted communication campaigns.*

These GOOD PRACTICES were rated as being ofhigh or very high impact as well, but the results of the cluster group discussion showed that feasibility would be medium or low in this case.

Table 50: Prioritization of relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Mihai Viteazu (RO)

GP #	GOOD PRACTICE name	Impact	Feasibility	Prio Level	WS analysis
4.1	Information on containers and bags	5 - very high	5 - very high	1	☑
4.4	Waste ambassadors	4 - high	3 - medium	2	☑
4.5.	Website on paper & board recycling	1 - very low	3 - medium	4	-
4.6	Roadshows, events and workshops	3 - medium	2 - low	4	☑
4.13	Targeted communication campaigns	4 - high	2 - low	2	☑

4.5.4.2 First analysis results of the GOOD PRACTICE implementation

Some of the GOOD PRACTICES marked as Prio Level 1 and 2 were applied in this cluster, but they are currently not implemented. All activities stopped as soon as the previous European funding was officially finished. There is a similar situation regarding equipment, in case of containers with graphic stickers. Once they were destroyed, there was no replacement available.

In case of implementation of new GOOD PRACTICES, the cluster group concluded that their needs mostly consist of having adequate personnel and equipment, while barriers mainly related to financial issues, lack of time to organise new activities and difficulties in procurement procedure due to fact that municipality is not direct owner of the containers.

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Table 51: Analysis results of the GOOD PRACTICE implementation, GP 4.1, Cluster – Mihai Viteazu (RO)

GP 4.1 – Information on containers and bags
a) Current level of implementation
This GOOD PRACTICE seems to be the most interesting for Mihai Viteazu. It used to be implemented in their municipality, but containers were destroyed (info not visible anymore) and now they need replacement.
b) Needs in case of implementation
New containers and additional stickers
c) Barriers in case of implementation
High costs are the biggest problem. Also, procurement procedure is very complicated because they are not direct owners of containers; decision rights and responsibilities are not totally clear.

Table 52: Analysis results of the GOOD PRACTICE implementation, GP 4.4, Cluster – Mihai Viteazu (RO)

GP 4.4 – Waste ambassadors
a) Current level of implementation
This GOOD PRACTICE was seen as second most interesting one for Mihai Viteazu. It has never been applied there, but they heard about this idea from the ImpactPapeRec Project
b) Needs in case of implementation
The assumption is that people will not want to volunteer, so it's necessary to prepare strategy for employment and education.
c) Barriers in case of implementation
Organization of work and duties between municipality and operator-company, because operator-company is the one that has to pay waste ambassadors.

Table 53: Analysis results of the GOOD PRACTICE implementation, GP 4.13, Cluster – Mihai Viteazu (RO)

GP 4.13 – Targeted communication campaigns
a) Current level of implementation
This GOOD PRACTICE was applied there in the period 2008-2010, as one activity of a European funded program. In partnership with other municipalities involved in this project they organized campaigns in schools and conferences for citizens. They also bought new trucks and bins from this funding. However,all activities stopped as soon as the project was officially finished.
b) Needs in case of implementation
Money and people who will organize all these activities. They do not need outsourced associates, just the commitment from those who are already employed.
c) Barriers in case of implementation
Currently, not enough time

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Table 54: Analysis results of the GOOD PRACTICE implementation, GP 4.6, Cluster – Mihai Viteazu (RO)

GP 4.6 – Roadshows, events and workshops
a) Current level of implementation
This GOOD PRACTICE was applied there in the period 2008-2010, as one of the activities of aEU funded program. In partnership with other municipalities involved in this project, they organized campaigns in schools and conferences for citizens. They also bought new trucks and bins from this funding. However,all activities stopped as soon as the project was officially finished.
b) Needs in case of implementation
First of all, it is important to motivate citizens. Then, to find educated personnel who should organize all these activities.
c) Barriers in case of implementation
Costs and low education level regarding environment in general.

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Date: 28 April 2017

4.6 Results for Cluster Vendée (FR)

As no one from cluster Vendée was present during the workshops in Barcelona, the evaluation was done afterwards individually via email and phone calls. In the end, local partners provided all necessary information and all analyses were done in the same way as for those clusters that attended the workshops in Barcelona. Average results are presented in the following tables.

4.6.1 Evaluation of CAUSES by cluster – Vendée (FR)

Table 55 shows that none of the CAUSES were rated as Prio Level 1, so it can be concluded that the cluster group from France believes the most important CAUSES are not easy to solve.

The following CAUSES were rated as being of high or very high importance, but the cluster group thinks it would be more difficult to find a solution for these CAUSES:

- *Lack of motivation of citizens*
- *Inappropriate design of containers and collection sites*
- *Inconvenient availability*

Table 55: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Vendée (FR)[31]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	5	4.5	2
2	Waste pickers / scavengers	3.5	3	4
3	Lack of information, communication and education about resource management and recycling	3.5	2.5	4
4	Lack of environmental awareness	2.5	3	4
5	Vandalism	3	2.5	4
6	Contamination	3.5	3.5	4
7	Insufficient compression of material e.g. cardboard	3.5	1.5	3
8	Use of p&b for heating	1	1.5	3
9	Inappropriate design of containers and collection sites	4	2.5	2
10	Storage of paper and board without roof/coverage	3.5	1.5	3
11	Mixed collection of material into container	3	2.5	4
12	Mixed collection of material into vehicle	2	1.5	3
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	4.5	4	2
15	Lack of standardisation and guidelines	3	2	3
16	Regulations are missing or not clear	3.5	4	4

4.6.2 Evaluation of CHALLENGES by cluster – Vendée (FR)

The cluster group agreed on four most important CHALLENGES with low complexity:

[31] Appendix 8.9 includes detailed results for each CAUSE and each participant of the cluster workshop.

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- *Provide Information about collection system and instructions how to separate*
- *Select convenient system, type of container,–collection frequency, depending on local characteristics*
- *Select convenient opening hours, distances and location, depending on local characteristics*
- *Avoid that paper and board is exposed to weather conditions – container, vehicle, storage.*

These CHALLENGES are marked in green as Prio level 1, and can be found in the three tables below. Seven other CHALLENGES were rated as being of high or very high impact, but it would be difficult to find a solution for these CHALLENGES. These CHALLENGES are marked as Prio Level 2 in the three tables below.

*Table 56: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Vendée (FR)*[31]

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide information about environmental and economic advantages of separate collection	4.5	3	2
2	Provide information about collection system and instructions how to separate (including which material belongs where)	5	1.5	1
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	3.5	4	4
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	5	3.5	2
5	Ensure transparency of the system (with reliable data)	3	2.5	4
6	Create trust in the system	5	4.5	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	3.5	2.5	4
8	Provide social activities, e.g. social institutions, youth centres	3	4	4
9	Provide assistance in social problem cases (e.g. social workers)	1.5	2.5	4

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*Table 57: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Vendée (FR)* [31]

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	4	2	1
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	4	1.5	1
12	Restrict access to collection sites and collected material	2.5	4	4
13	Avoid disposal of mixed waste by passersby	4.5	4	2
14	Improve design of containers/bins according to the local conditions – material, construction, opening	3.5	3.5	4
15	Make sufficient volume for the accruing quantity of recyclables and waste available	5	3.5	2
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	4	2	1
17	Using "polluter pays"- principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	4.5	5	2

*Table 58: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Vendée (FR)* [31]

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	2.5	4	4
19	Establish laws and surveillance activities against theft and vandalism	2.5	4	4
20	Collect data about potential quantity of paper and board	3.5	2.5	4
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	4.5	2.5	2
22	Integration of the informal sector into waste management system	3	3	4

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4.6.3 Relevant GOOD PRACTICES for cluster – Vendée (FR)

For those CHALLENGES that were assessed as ofhigh and very high impact, 22 relevant GOOD PRACTICES were identified[32] and analysed.

As shown in Table 59, ten relevant GOOD PRACTICES are related to *information and communication activities*, the rest is equally divided between *operational aspects, monitoring and control* and *policy, legislation and economic aspect*.

Table 59: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Vendée (FR)

GP #	GOOD PRACTICE name	CHALLENGE Prio 1	CHALLENGE Prio 2
1.1	Collection system adapted to the real needs	10 Convenient system 11 Convenient access	-
1.3	Volunteer collection of paper & board	-	17 Polluter pays
1.5	Collection shops	-	17 Polluter pays
1.10	Adapted container opening	11 Convenient access	-
2.5	Harmonisation of key parameters of bins	2 Provide instructions 10 Convenient system	-
2.8	Separation into municipal, commercial and industrial paper and board stream	-	17 Polluter pays
2.9	Pay-as-you-throw	-	17 Polluter pays
3.1	Data collection of paper & board	-	21 Collect quality data
3.3	Measurement of quality of paper & board	-	21 Collect quality data
3.4	Control measures against theft of paper & board	-	-
3.5	Use smart card system or barcode stickers	-	17 Polluter pays
3.6	Software on optimization of collection routes	-	15 Sufficient volume
4.1	Information on containers and bags	2 Provide instructions	1 Provide advantages
4.2	Comprehensive communication package	-	1 Provide advantages
4.3	Include citizens actively in the information loop	-	1 Provide advantages
4.4	Waste ambassadors	2 Provide instructions	-
4.5	Website on paper & board recycling	2 Provide instructions	-
4.6	Roadshows, events and workshops	2 Provide instructions	-
4.8	Publication of news on paper & board recycling	-	1 Provide advantages
4.10	Educational areas on paper & board collection and recycling	-	4 Education strategy
4.11	Environmental and economic benefits of recycling	-	4 Education strategy
4.13	Targeted communication campaigns	-	4 Education strategy
No GOOD PRACTICE available		16 Avoid weather exposure	6 Create trust 13 Avoid disposal

[32] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

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4.6.4 Evaluation of GOOD PRACTICE Implementation by cluster – Vendée (FR)

4.6.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding the impact and feasibility criteria (Table 60). Local partner Trivalis selected seven options of GOOD PRACTICES with both the highest impact and feasibility. Those GOOD PRACTICES present Prio level 1 and most of them are related to *information and communication activities*. There are six GOOD PRACTICES marked as Prio Level 2. These GOOD PRACTICES were rated as being ofhigh or very high impact, but in this case feasibility would be medium, low or even very low.

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Table 60: Prioritization of relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Vendée (FR)

GP #	GOOD PRACTICE name	Impact	Feasibility[33]	Prio Level	WS analysis
1.1	Collection system adapted to the real needs	4 - high	4 - high	1	☑
1.3	Volunteer collection of paper & board	3 - medium	2 - low	4	
1.5	Collection shops	1 - very low	4 - High	3	
1.10	Adapted container opening	3 - medium	3 - medium	4	
2.5	Harmonisation of key parameters of bins	5 - very high	5 - very high	1	☑
2.8	Separation into municipal, commercial and industrial paper and board stream	5 - very high	2 - low	2	☑
2.9	Pay-as-you-throw	4 - high	2 - low	2	☑
3.1	Data collection of paper & board	4 - high	3 - medium	2	☑
3.3	Measurement of quality of paper & board	4 - high	3 - medium	2	☑
3.4	Control measures against theft of paper & board	2 - low	2 - low	4	
3.5	Use smart card system or barcode stickers	4 - high	2 - low	2	☑
3.6	Software on optimization of collection routes	3 - medium	3 - medium	4	
4.1	Information on containers and bags	4 - high	5 - very high	1	☑
4.2	Comprehensive communication package	5 - very high	4 - high	1	☑
4.3	Include citizens actively in the information loop	3 - medium	3 - medium	4	
4.4	Waste ambassadors	5 - very high	5 - very high	1	☑
4.5	Website on paper & board recycling	2 - low	5 - very high	3	
4.6	Roadshows, events and workshops	1 - very low	3 - medium	4	
4.8	Publication of news on paper & board recycling	3 - medium	3 - medium	4	
4.10	Educational areas on paper & board collection and recycling	5 - very high	4 - high	1	☑
4.11	Environmental and economic benefits of recycling	5 - very high	5 - very high	1	☑
4.13	Targeted communication campaigns	4 - high	3 - medium	2	☑

4.6.4.2 First analysis results of the GOOD PRACTICE implementation

More than the half of the GOOD PRACTICES marked with Prio Level 1 and 2 are applied in this cluster. In case of implementation of new GOOD PRACTICES or in case theexisting ones could be improved, mentioned needs mostly refer to the adequate personnel, new political decisions (e.g. rules, legislation

[33] Note: This cluster group did the prioritization according to complexity instead of feasibility; the results have been changed afterwards.

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policies), targeted planning and good communication. As this cluster is a renowned tourist centre, barriers are mainly related to the lack of GOOD PRACTICES that could offer comprehensive solution for tourists during their stay. According to the results, it is evident that tourists generate large amounts of waste and it is very important to solve this issue efficiently.

Table 61: Analysis results of the GOOD PRACTICE implementation, GP 1.1, Cluster – Vendée (FR)

GP 1.1 – Collection system adapted to the real needs
a) Current level of implementation
Yes, in order to meet the tourism needs
b) Needs in case of implementation
Tourists must have both possibility and information where to dispose paper or board in separate bins; communication with tourists
c) Barriers in case of implementation
Communication channels to tourists

Table 62: Analysis results of the GOOD PRACTICE implementation, GP 2.5, Cluster – Vendée (FR)

GP 2.5 – Harmonisation of key parameters of bins
a) Current level of implementation
No
b) Needs in case of implementation
New political decisions
c) Barriers in case of implementation
No political decisions right now

Table 63: Analysis results of the GOOD PRACTICE implementation, GP 4.1, Cluster – Vendée (FR)

GP 4.1 – Information on containers and bags
a) Current level of implementation
Yes, it has started in Trivalis on January 1st 2017
b) Needs in case of implementation
Team of experts/board was needed, it was established to work on supporting the communication (10 representatives from the 22 communities of Trivalis are working on this, it's possible to find data on the website)
c) Barriers in case of implementation
-

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Table 64: Analysis results of the GOOD PRACTICE implementation, GP 4.2, Cluster – Vendée (FR)

GP 4.2 – Selection of a comprehensive and functional communication package
a) Current level of implementation
Working on it
b) Needs in case of implementation
Team of experts/ board was needed, it was established to work on supporting the communication (10 representatives from the 22 communities of Trivalis are working on this, it's possible to find data on the website)
c) Barriers in case of implementation
Professional language vs. everyday language - technical concepts hard to explain

Table 65: Analysis results of the GOOD PRACTICE implementation, GP 4.4, Cluster – Vendée (FR)

GP 4.4 – Waste ambassadors
a) Current level of implementation
Yes
b) Needs in case of implementation
Adequate personnel (good communication skills and knowledge) Political decisions
c) Barriers in case of implementation
-

Table 66: Analysis results of the GOOD PRACTICE implementation, GP 4.10, Cluster – Vendée (FR)

GP 4.10 – Educational areas on paper and board collection and recycling
a) Current level of implementation
Yes
b) Needs in case of implementation
Political decision It is necessary to envisage possibilities for visiting in the design phase of the the yards (regulations and standards must be met)
c) Barriers in case of implementation
The size of the area (sometimes too small, not enough (secure) space for visitors necessity to make some things new (it should be "attractive" for visitors, especially adapted for children)

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Table 67: Analysis results of the GOOD PRACTICE implementation, GP 4.11, Cluster – Vendée (FR)

GP 4.11 – Environmental and economic benefits of recycling
a) Current level of implementation
Working on it
b) Needs in case of implementation
Supporting materials and equipment, communication channels (visual, radio etc.)
c) Barriers in case of implementation
Find the best examples that everybody could remember (easy to remember, raise awareness)

Table 68: Analysis results of the GOOD PRACTICE implementation, GP 2.8, Cluster – Vendée (FR)

GP 2.8 – Separation into municipal, commercial and industrial stream of paper and board
a) Current level of implementation
Not everywhere: in case of small commercials rule is that, it is collected with the municipal collection. the collection from big commercials to be separately
b) Needs in case of implementation
Rules, legislation policies
c) Barriers in case of implementation
Changing habits

Table 69: Analysis results of the GOOD PRACTICE implementation, GP 2.9, Cluster – Vendée (FR)

GP 2.9 – Pay-as-you-throw
a) Current level of implementation
In French: "la redevance incitative" - # 50% of the collection of Trivalis has this rule
b) Needs in case of implementation
Material, whichmeans (equipment) and adequate personnel, list of the households, with info about capacity of the bins, logistical follow-up, trained people to explain the pricing and analyse collected data
c) Barriers in case of implementation
The most important is to analyse tariffs (fixed and variable part) No good solution in case of tourists (how to pay, how much?)

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Table 70: Analysis results of the GOOD PRACTICE implementation, GP 3.1, Cluster – Vendée (FR)

GP 3.1 – Data collection of paper and board
a) Current level of implementation
Yes
b) Needs in case of implementation
Control of the collection and treatment; Analysis of the collected paper and feedback about the quality from plants/depots
c) Barriers in case of implementation
Everyone should be informed about rules and characteristics

Table 71: Analysis results of the GOOD PRACTICE implementation, GP 3.3, Cluster – Vendée (FR)

GP 3.3 – Measurement of quality of paper & board
a) Current level of implementation
Yes
b) Needs in case of implementation
Planning of the procedure and definition of what we want to analyse (in France: MODECOM)
c) Barriers in case of implementation
It is time consuming and difficult.

Table 72: Analysis results of the GOOD PRACTICE implementation, GP 3.5, Cluster – Vendée (FR)

GP 3.5 – Use smart card system or barcode sticker
a) Current level of implementation
Not everywhere in Vendée
b) Needs in case of implementation
Materials, which means (equipment) and adequate personnel (for data tracking and processing (location, logistic, invoicing system etc.))
c) Barriers in case of implementation
No good solution in case of tourists (how to pay, how much?)

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Table 73: Analysis results of the GOOD PRACTICE implementation, GP 4.13, Cluster – Vendée (FR)

GP 4.13 – Targeted communication campaigns
a) Current level of implementation
Not really – but they are aware this is a good idea and at the beginning of this year (2017) cooperation with all recycles was initiated regarding this issue
b) Needs in case of implementation
Good communication between people responsible for public relations and technical tasks
c) Barriers in case of implementation
Not clear who will support these campaigns; how often they should be organized and how long they should last

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4.7 Results for Cluster Merthyr Tydfil (UK)

As no one from cluster Merthyr Tydfil was present during the workshops in Barcelona the evaluation was done afterwards individually via email. Despite not being a partner of the project consortium, they have provided necessary information.

4.7.1 Evaluation of CAUSES by cluster – Merthyr Tydfil (UK)

Table 74 shows that the local partner seestwo CAUSES as important and easy to adress (Prio Level 1, in green):

- *Mixed collection of material into container*
- *Mixed collection of material into vehicle*

Five CAUSES were rated as being of high or very high importance, but the local partner thinks that it would be more difficult to find a solution for these CAUSES:

- *Lack of motivation of citizens*
- *Lack of information, communication and education about resource management and recycling*
- *Lack of environmental awareness*
- *Contamination*
- *Regulations are missing or not clear*

Table 74: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Merthyr Tydfil (UK)

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	4	4	2
2	Waste pickers / scavengers	0	0	0
3	Lack of information, communication and education about resource management and recycling	5	3	2
4	Lack of environmental awareness	5	3	2
5	Vandalism	1	1	3
6	Contamination	4	3	2
7	Insufficient compression of material e.g. cardboard	3	2	3
8	Use of p&b for heating	3	1	3
9	Inappropriate design of containers and collection sites	2	2	3
10	Storage of paper and board without roof/coverage	3	2	3
11	Mixed collection of material into container	4	2	1
12	Mixed collection of material into vehicle	4	2	1
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	2	2	3
15	Lack of standardisation and guidelines	3	3	4
16	Regulations are missing or not clear	3	2	2

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4.7.2 Evaluation of CHALLENGES by cluster – Merthyr Tydfil (UK)

The local partner feels that the most important CHALLENGES are not easy to solve. None of the CHALLENGES is rated as Prio Level 1. Six out of 22 offered CHALLENGES were rated as being of high or very high impact, but it would be difficult to find solutions for them. These CHALLENGES are:

- *Provide information about the environmental and economic advantages of separate collection*
- *Provide information about collection system and instructions how to separate*
- *Long-term education strategy which enables all groups of the population to gain knowledge about recycling*
- *Create trust in the system*
- *Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient*
- *Using "polluter pays"-principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)*

Listed CHALLENGES are shown in yellow as Prio Level 2 in the three tables below.

*Table 75: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Merthyr Tydfil (UK)*

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide information about the environmental and economic advantages of separate collection	4	3	2
2	Provide information about collection system and instructions how to separate (including which material belongs where)	4	3	2
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	3	4	4
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	5	4	2
5	Ensure transparency of system (with reliable data)	2	2	3
6	Create trust in system	4	5	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	4	4	2
8	Provide social activities, e.g. social institutions, youth centres	3	3	4
9	Provide assistance in social problem cases (e.g. social workers)	3	4	4

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*Table 76: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Merthyr Tydfil (UK)*

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	3	3	4
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	0	0	0
12	Restrict access to collection sites and collected material	1	1	3
13	Avoid disposal of mixed waste by passersby	2	4	4
14	Improve design of containers/bins according to the local conditions – material, construction, opening	1	1	3
15	Make sufficient volume for the accruing quantity of recyclables and waste available	1	2	3
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	2	3	4
17	Using "polluter pays"- principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	4	4	2

*Table 77: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Merthyr Tydfil (UK)*

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	0	0	0
19	Establish laws and surveillance activities against theft and vandalism	1	3	4
20	Collect data about potential quantity of paper and board	3	1	3
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	3	2	3
22	Integration of the informal sector into waste management system	1	3	4

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4.7.3 Relevant GOOD PRACTICES for cluster – Merthyr Tydfil (UK)

For those CHALLENGES that were assessed as being of high and very high impact sixteen relevant GOOD PRACTICES were identified[34] and analysed. Ten out of 16 GOOD PRACTICES are related to *information and communication activities.*

Table 78: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Merthyr Tydfil (UK)

GP #	*GOOD PRACTICE name*	CHALLENGE *Prio 1*	CHALLENGE *Prio 2*
1.3	Volunteer collection of paper & board	-	17 Polluter pays
1.5	Collection shops	-	17 Polluter pays
2.5	Harmonisation of key parameters of bins	-	2 Provide instructions
2.8	Separation into municipal, commercial and industrial paper and board stream	-	17 Polluter pays
2.9	Pay-as-you-throw	-	17 Polluter pays
3.5	Use smart card system or barcode stickers	-	17 Polluter pays
4.1	Information on containers and bags	-	1 Provide advantages 2 Provide instructions
4.2	Comprehensive communication package	-	1 Provide advantages 7 Communication system
4.3	Include citizens actively in the information loop	-	1 Provide advantages
4.4	Waste ambassadors	-	2 Provide instructions
4.5	Website on paper & board recycling	-	2 Provide instructions
4.6	Roadshows, events and workshops	-	2 Provide instructions
4.8	Publication of news on paper & board recycling	-	1 Provide advantages
4.10	Educational areas on paper & board collection and recycling	-	4 Education strategy
4.11	Environmental and economic benefits of recycling	-	4 Education strategy
4.13	Targeted communication campaigns	-	4 Education strategy
No GOOD PRACTICE available		-	6 Create trust

4.7.4 Evaluation of GOOD PRACTICE Implementation by cluster – Merthyr Tydfil (UK)

4.7.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding impact and feasibility criteria (Table 79). Results show that the GOOD PRACTICE of the highest impact and feasibility is:

- *Targeted communication campaigns*

This GOOD PRACTICE presents Prio Level 1.

Within Prio Level 2 there are two GOOD PRACTICES marked, and they were rated as being of very high impact, but for themfeasibility would be low:

[34] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

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- *Pay-as-you-throw*
- *Use smart card system or barcode stickers*

Table 79: Prioritization of relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Merthyr Tydfil (UK)

GP #	GOOD PRACTICE name	Impact	Feasibility	Prio Level	WS analysis
1.3	Volunteer collection of paper & board	1	3	4	
1.5	Collection shops	1	1	4	
2.5	Harmonisation of key parameters of bins	N/A	N/A	0	
2.8	Separation into municipal, commercial and industrial paper and board stream	N/A	N/A	0	
2.9	Pay-as-you-throw	4	2	2	☑
3.5	Use smart card system or barcode stickers	4	2	2	☑
4.1	Information on containers and bags	3	5	3	
4.2	Comprehensive communication package	3	2	4	
4.3	Include citizens actively in the information loop	3	3	4	
4.4	Waste ambassadors	3	4	3	
4.5	Website on paper & board recycling	2	3	4	
4.6	Roadshows, events and workshops	3	5	3	
4.8	Publication of news on paper & board recycling	3	5	3	
4.10	Educational areas on paper & board collection and recycling	3	2	4	
4.11	Environmental and economic benefits of recycling	3	4	3	
4.13	Targeted communication campaigns	4	4	1	☑

4.7.4.2 First analysis results of the GOOD PRACTICE implementation

GOOD PRACTICE marked as Prio Level 1 (*Targeted communication campaigns*) is not currently implemented, but promotional campaigns are generic in relation to service areas. Those GOOD PRACTICES marked as Prio Level 2 are not currently applied.

In case of implementation, needs are mostly related to financial issues and new investments, while barriers are connected to low public concern in case of campaigns and dependence on the will of authority as they are responsible for decisions about implementing new systems, such as Pay-as-you-throw, smart cards and barcode sticker.

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Table 80: Analysis results of the GOOD PRACTICE implementation, GP 4.13, Cluster – Merthyr Tydfil (UK)

GP 4.13 – Targeted communication campaigns
a) Current level of implementation
Promotional campaigns are generic in relation to service areas. We do not currently have bespoke material campaigns for paper recycling.
b) Needs in case of implementation
Resources in the form of bespoke publicity materials or financial assistance in order to provide our own promotions and campaigns
c) Barriers in case of implementation
Public participation in paper/card recycling schemes

Table 81: Analysis results of the GOOD PRACTICE implementation, GP 2.9, Cluster – Merthyr Tydfil (UK)

GP 2.9 – Pay-as-you-throw
a) Current level of implementation
Pay as you throw is not currently in operation in our area.
b) Needs in case of implementation
Investment to provide weighing systems on vehicles/containers and to provide resources to implement.
c) Barriers in case of implementation
Whether it is the will of the authority to implement this sort of system. Public buy-in.

Table 82: Analysis results of the GOOD PRACTICE implementation, GP 3.5, Cluster – Merthyr Tydfil (UK)

GP 3.5 – Use smart card system or barcode sticker
a) Current level of implementation
This system is not currently in operation in the area.
b) Needs in case of implementation
Investment to provide system and infrastructure.
c) Barriers in case of implementation
Whether it is the will of the authority to implement this sort of system. Public buy-in.

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4.8 Results for Cluster Szczecin (PL)

As no one from the cluster Szczecin was present during the workshops in Barcelona the evaluation was done afterwards individually via email. Despite not being a partner of the project consortium, cluster provided allnecessary information. Presented tables show the average results.

4.8.1 Evaluation of CAUSES by Cluster – Szczecin (PL)

Table 83 shows that the cluster group did not define any CAUSES as being of high importance and complexity. Such result appeared only in case of Szczecin so it would be advisable to consider the additional potential CAUSES.

Table 83: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – Szczecin (PL)[35]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	2.5	2.5	4
2	Waste pickers / scavengers	0.5	0.5	3
3	Lack of information, communication and education about resource management and recycling	2	2	3
4	Lack of environmental awareness	3	3	4
5	Vandalism	3	3	4
6	Contamination	2.5	2.5	4
7	Insufficient compression of material e.g. cardboard	2	2	3
8	Use of p&b for heating	2	2	3
9	Inappropriate design of containers and collection sites	0.5	0.5	3
10	Storage of paper and board without roof/coverage	2	2	3
11	Mixed collection of material into container	2.5	2.5	4
12	Mixed collection of material into vehicle	1.5	1.5	3
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	0.5	0.5	3
15	Lack of standardisation and guidelines	1	1	3
16	Regulations are missing or not clear	1	1	3

4.8.2 Evaluation of CHALLENGES by Cluster – Szczecin (PL)

The cluster group agreed that the most important CHALLENGES are not easy to solve. None of the CHALLENGES is rated as Prio Level 1.

Three CHALLENGES were rated as being of high or very high impact, but the cluster group thinks that for them it would be difficult to find solutions. These CHALLENGES are marked in yellow as Prio Level 2 in the three tables below, and all of them are related to social – communication and educational issues.

[35] Appendix 8.10 includes detailed results for each CAUSE and each participant of the cluster workshop.

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*Table 84: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – Szczecin (PL)*[35]

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide information about the environmental and economic advantages of separate collection	2	2	3
2	Provide information about collection system and instructions how to separate (including which material belongs where)	1	1	3
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	2	2	3
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	2	2	3
5	Ensure transparency of the system (with reliable data)	1	1	3
6	Create trust in the system	5	5	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	1	1	3
8	Provide social activities, e.g. social institutions, youth centres	5	5	2
9	Provide assistance in social problem cases (e.g. social workers)	4	4	2

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*Table 85: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – Szczecin (PL)* [35]

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	3	3	4
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	3	3	4
12	Restrict access to collection sites and collected material	0	0	0
13	Avoid disposal of mixed waste by passersby	0	0	0
14	Improve design of containers/bins according to the local conditions – material, construction, opening	0	0	0
15	Make sufficient volume for the accruing quantity of recyclables and waste available	0	0	0
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	0	0	0
17	Using "polluter pays"-principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	1	1	3

*Table 86: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – Szczecin (PL)* [35]

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	0	0	0
19	Establish laws and surveillance activities against theft and vandalism	0	0	0
20	Collect data about potential quantity of paper and board	2	2	3
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	0	0	0
22	Integration of the informal sector into waste management system	0	0	0

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4.8.3 Relevant GOOD PRACTICES for Cluster – Szczecin (PL)

There have been no relevant GOOD PRACTICES for the mentioned CHALLENGES ofPrio Level 1 and 2 yet[36].

Table 87: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – Szczecin (PL)

GP #	*GOOD PRACTICE name*	CHALLENGE *Prio 1*	CHALLENGE *Prio 2*
-	-	-	-
No GOOD PRACTICE available		-	6 Create trust 8 Provide social activities 9 Provide social assistance

4.8.4 Evaluation of GOOD PRACTICE Implementation by Cluster – Szczecin (PL)

The first evaluation has not been done yet, because there are no relevant GOOD PRACTICES for the mentioned CHALLENGES ofPrio Level 1 and 2.

[36] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

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Date: 28 April 2017

4.9 Results for Cluster POLAND

The target country Poland is represented by the consortium partner Stora Enso. Hence, it was decided to have a Polish cluster group during the workshops in Barcelona. This chapter shows cluster analysis for the country Poland in general.

4.9.1 Evaluation of CAUSES by cluster – POLAND

Table 88 shows that cluster group agreed two CAUSES are important and easy to address (Prio Level 1, in green):

- *Contamination*
- *Mixed collection of material into container*

Four CAUSES were rated as being ofhigh or very high importance, but it would be more difficult to find a solution for these CAUSES. These CAUSES are*:*

- *Lack of motivation of citizens*
- *Lack of information, communication and education about resource management and recycling*
- *Use of p&b for heating*
- *Inconvenient availability*

Table 88: Prioritization of CAUSES – discussed und agreed by cluster group, Cluster – POLAND[37]

CAUSE #	CAUSES	Importance	Complexity	Prio Level
1	Lack of motivation of citizens	4	4	2
2	Waste pickers / scavengers	1	1	3
3	Lack of information, communication and education about resource management and recycling	4	3	2
4	Lack of environmental awareness	3	4.5	4
5	Vandalism	1	1	3
6	Contamination	4.5	2	1
7	Insufficient compression of material e.g. cardboard	0	0	0
8	Use of p&b for heating	4.5	4	2
9	Inappropriate design of containers and collection sites	1.5	2.5	4
10	Storage of paper and board without roof/coverage	2	2	3
11	Mixed collection of material into container	4.5	1.5	1
12	Mixed collection of material into vehicle	2.5	2	3
13	Jointly collected material into one vehicle	-	-	-
14	Inconvenient availability	4	4	2
15	Lack of standardisation and guidelines	2.5	3	4
16	Regulations are missing or not clear	3	3	4

[37] Appendix 8.11 includes detailed results for each CAUSE and each participant of the cluster workshop.

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4.9.2 Evaluation of CHALLENGES by cluster – POLAND

The cluster group agreed on four most important CHALLENGES with low complexity:

- *Provide information about collection system and instructions how to separate*
- *Targeted information campaigns for individual population groups in terms of content, language, channel*
- *Select convenient system, type of container,–collection frequency, depending on local characteristics*
- *Make sufficient volume for the accruing quantity of recyclables and waste available.*

Three other CHALLENGES were rated as being of high or very high impact, but it would be difficult to find a solution for these CHALLENGES. These CHALLENGES are marked as Prio Level 2 in the three tables below and are:

- *Provide information about the environmental and economic advantages of separate collection*
- *Long-term education strategy which enables all groups of the population to gain knowledge about recycling*
- *Create trust in system*

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*Table 89: Prioritization of **social** CHALLENGES – discussed und agreed by cluster group, Cluster – POLAND*[37]

CHALL #	CHALLENGES Social – communication and education	Impact	Complexity	Prio Level
1	Provide information about the environmental and economic advantages of separate collection	4.5	4	2
2	Provide information about collection system and instructions how to separate (including which material belongs where)	4	2	1
3	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel	4	2	1
4	Long-term education strategy which enables all groups of the population to gain knowledge about recycling	4.5	3	2
5	Ensure transparency of system (with reliable data)	3	5	4
6	Create trust in system	4	5	2
7	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient	3	4	4
8	Provide social activities, e.g. social institutions, youth centres	1	1	3
9	Provide assistance in social problem cases (e.g. social workers)	1	1	3

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*Table 90: Prioritization of **operational** CHALLENGES – discussed und agreed by cluster group, Cluster – POLAND[37]*

CHALL #	CHALLENGES Operational – system and logistic	Impact	Complexity	Prio Level
10	Select convenient system, type of container, collection frequency, depending on local characteristics (population density, demographics, type of building)	4	2	1
11	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)	3	2	3
12	Restrict access to collection sites and collected material	1.5	1.5	3
13	Avoid disposal of mixed waste by passersby	1.5	1	3
14	Improve design of containers/bins according to the local conditions – material, construction, opening	2.5	2	3
15	Make sufficient volume for the accruing quantity of recyclables and waste available	4.5	1	1
16	Avoid exposing paper and board to weather conditions – container, vehicle, storage	3	2	3
17	Using "polluter pays"- principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)	3.5	5	4

*Table 91: Prioritization of **strategic** CHALLENGES – discussed und agreed by cluster group, Cluster – POLAND[37]*

CHALL #	CHALLENGES Strategy, monitoring and control	Impact	Complexity	Prio Level
18	Restrict trade of paper & board	1.5	4.5	4
19	Establish laws and surveillance activities against theft and vandalism	1.5	4	4
20	Collect data about potential quantity of paper and board	3	2	3
21	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns	3.5	3	4
22	Integration of the informal sector into waste management system	1	5	4

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4.9.3 Relevant GOOD PRACTICES for Cluster – POLAND

For those CHALLENGES assessed as being ofhigh and very high impact, thirteen relevant GOOD PRACTICES were identified.[38] Out of thirteen, a first set of six GOOD PRACTICES was analysed.

Four out of six GOOD PRACTICES are related to i*nformation and communication activities.*

Table 92: Relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – POLAND

GP #	*GOOD PRACTICE name*	CHALLENGE *Prio 1*	CHALLENGE *Prio 2*
1.1	Collection system adapted to the real needs	10 Convenient system	-
3.6	Software on optimization of collection routes	15 Sufficient volume	-
4.1	Information on containers and bags	2 Provide instructions	1 Provide advantages
4.4	Waste ambassadors	2 Provide instructions	-
4.5	Website on paper & board recycling	2 Provide instructions	-
4.13	Targeted communication campaigns	3 Targeted campaigns	4 Education strategy
2.5	Harmonisation of key parameters of bins	2 Provide instructions 10 Convenient system	-
4.2	Comprehensive communication package	-	1 Provide advantages
4.3	Include citizens actively in the information loop	-	1 Provide advantages
4.6	Roadshows, events and workshops	2 Provide instructions	-
4.8	Publication of news on paper & board recycling	-	1 Provide advantages
4.10	Educational areas on paper & board collection and recycling	-	4 Education strategy
4.11	Environmental and economic benefits of recycling	-	4 Education strategy
No GOOD PRACTICE available		-	6 Create trust

4.9.4 Evaluation of GOOD PRACTICE Implementation by Cluster – POLAND

4.9.4.1 Prioritization of GOOD PRACTICES for further analysis

Every GOOD PRACTICE was evaluated regarding impact and feasibility criteria. The conclusion of the cluster group was that the GOOD PRACTICES with the highest impact and feasibility are:

- *Information on containers and bags*
- *Waste ambassadors*
- *Targeted communication campaigns*

These GOOD PRACTICES present Prio Level 1 (Table 93, in green).

Within Prio Level 2 there is one GOOD PRACTICE marked and was rated as being of very high impact, but in this case feasibility would be low:

- *Collection system adapted to the real needs*

[38] Based on the *GOOD PRACTICE allocation* described in chapter 3.4

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Table 93: Prioritization of relevant GOOD PRACTICES (according to the CHALLENGES with Prio 1 and Prio 2), Cluster – POLAND

GP #	GOOD PRACTICE name	Impact	Feasibility	Prio Level	WS analysis
1.1	Collection system adapted to the real needs	5 - very high	2 - low	2	☑
3.6	Software on optimization of collection routes	3 - medium	4 - high	3	☑
4.1	Information on containers and bags	5 - very high	5 - very high	1	☑
4.4	Waste ambassadors	4 - high	4 - high	1	☑
4.5	Website on paper & board recycling	2 - low	4 - high	3	-
4.13	Targeted communication campaigns	4 - high	5 - very high	1	☑

4.9.4.2 First analysis results of the GOOD PRACTICE implementation

Some of the GOOD PRACTICES marked as Prio Level 1 and 2 have already been applied in Poland, but there is still need for improvement.

In case of implementation, needs are mostly related to additional knowledge and clear regulations (e.g. public procurement, tenders), and barriers are mainly related to the lack of finance and expertize. General problems are environmental awareness and insufficient space in houses for separate waste collection.

Table 94: Analysis results of the GOOD PRACTICE implementation, GP 4.1, Cluster – POLAND

GP 4.1 – Information on containers and bags
a) Current level of implementation
already exists in Poland cluster
b) Needs in case of implementation
-
c) Barriers in case of implementation
clear regulation is still missing

Table 95: Analysis results of the GOOD PRACTICE implementation, GP 4.4, Cluster – POLAND

GP 4.4 – Waste ambassadors
a) Current level of implementation
This GOOD PRACTICE does not exist in Poland
b) Needs in case of implementation
Skilled and trustworthy people with communication skills and corresponding training. . Part of the tender with WM (service plus appropriate tender). Material with contacts
c) Barriers in case of implementation
Money, appropriate tender, convince responsible ones that this GP is value for money, cultural issue (letting someone to enter on your private property)

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Table 96: Analysis results of the GOOD PRACTICE implementation, GP 4.13, Cluster – POLAND

GP 4.13 – Targeted communication campaigns
a) Current level of implementation
Different campaigns of this type are existing in Poland
b) Needs in case of implementation
Good, standardized source of knowledge/GOOD PRACTICES (like „Handbook"). Source of financing
c) Barriers in case of implementation
Lack of finance and know-how

Table 97: Analysis results of the GOOD PRACTICE implementation, GP 1.1, Cluster – POLAND

GP 1.1 – Collection system adapted to the real needs
a) Current level of implementation
This GP partly exists in Poland but some of methods for PfR collection - which are generally available - might not be available for some kinds of households
b) Needs in case of implementation
Space outside (and inside) the houses, environmental awareness (citizens' acceptance); public procurement of containers for citizens
c) Barriers in case of implementation
Enough space (inside and outside the houses)

Table 98: Analysis results of the GOOD PRACTICE implementation, GP 3.6, Cluster – POLAND

GP 3.6 – Software on optimization of collection routes
a) Current level of implementation
This GP exists in Poland, but the cluster is not familiar with it
b) Needs in case of implementation
Important to connect routes with compositions, weight, citizens, addresses (enhancing the data). Personal data are needed
c) Barriers in case of implementation
Personal data are needed

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5 Conclusions and Outlook

The general problem analysis shows that the interactions between CAUSES and the NEGATIVE EFFECTS on the performance of paper and board collection are quite complex. Fifteen main CAUSES were identified, the majority being related to either social or operational aspects. The analysis of these CAUSES identified 22 CHALLENGES that need to be addressed. The comparison between CHALLENGES and the already identified GOOD PRACTICES showed that eight CHALLENGES could not be connected to any of the GOOD PRACTICES available at the time.

The cluster analyses give an initial picture about if and how the identified CAUSES and CHALLENGES are relevant in each cluster territory. The aim of this report is not to compare the results in the clusters to one another. The conditions in each territory are very different and perceptions depend on specific experiences with the topic. However, it is very important to further analyse results given by the local partners. This follow up should start with an examination of rather unexpected and inconsistent answers. A detailed enquiry might reveal the motives behind some of the ratings and answers given. Some of the given prioritizations for CAUSES and CHALLENGES might not be consistent with the data and information collected from the clusters so far.

The discussion about implementation of the proposed GOOD PRACTICES has only started and will be continued.

According to the collected information so far, a list of GOOD PRACTICES prioritized for further analysis is available for each cluster except Szczecin (PL) as follows:

Cluster Dupnitsa (BG):

- *Information on containers and bags*
- *Website on paper & board recycling*
- *Roadshows, events and workshops*
- *Environmental and economic benefits of recycling*
- *Implement measures against theft of paper and board*
- *Automatic underground collection systems*
- *Adapted container opening*
- *Targeted communication campaigns*

Cluster Mezdra (BG)

- *Collection system adapted to the real needs*
- *Automatic underground collection systems*
- *Software on optimization of collection routes*

Cluster Sfantu Gheorghe (RO)

- *Implement measures against theft of paper & board*
- *Information on containers* and *bags*
- *Website on paper & board recycling*
- *Control measures against theft of paper and board*
- *Roadshows, events and workshops.*

Cluster Mihai Viteazu (RO)

- *Information on containers and bags*

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- *Waste ambassadors*
- *Targeted communication campaigns.*

Cluster Vendée (FR)

- *Collection system adapted to the real needs*
- *Harmonisation of key parameters of bins*
- *Information on containers and bags*
- *Comprehensive communication package*
- *Waste ambassadors*
- *Educational areas on paper & board collection and recycling*
- *Environmental and economic benefits of recycling*
- *Separation into municipal, commercial and industrial paper and board stream*
- *Pay-as-you-throw*
- *Data collection of paper & board*
- *Measurement of quality of paper & board*
- *Use smart card system or barcode stickers*
- *Targeted communication campaigns*

Cluster Merthyr Tydfil (UK)

- *Targeted communication campaigns*
- *Pay-as-you-throw*
- *Use smart card system or barcode stickers*

Cluster Poland (PL)

- *Collection system adapted to the real needs*
- *Information on containers and bags*
- *Waste ambassadors*
- *Targeted communication campaigns*

Those GOOD PRACTICES not analysed yet will be evaluated in the same way. In case clusters already implemented GOOD PRACTICES, they will be asked for more details about their experiences, problems and possible improvements. For those GOOD PRACTICES which the clusters see as very complex, some additional information will be provided as soon as the factsheets for the GOOD PRACTICES are available. Also, it will be assessed how incentives, standardisation and policy measures might help overcome mentioned needs and barriers.

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7 List of Tables

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8 Appendix

8.1 BPWG/INWG [3]

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

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8.2 Allocation between CAUSES and NEGATIVE EFFECTS on paper and board collection

	CAUSES	Low quantity of paper and board	Mixed material	Low quality of paper and board - impurities	Low quality of paper and board - moisture	Low motivation of citizens	Vandalism	Littering around collection sites
1	**Lack of motivation of citizens**	✓	✓	-	-	-	-	✓
2	**Waste pickers / scavengers**	-	-	-	-	✓	-	✓
3	**Lack of information, communication and education about resource management and recycling**	-	✓	-	-	✓	✓	-
4	**Lack of environmental awareness**	-	-	-	-	✓	-	✓
5	**Vandalism**	-	-	-	-	✓	-	✓
6	**Contamination**	-	(✓)	✓	-	-	-	-
7	**Insufficient compression of material e.g. cardboard**	-	✓	-	-	-	-	✓
8	**Use of p&b for heating**	✓	-	-	-	-	-	-
9	**Inappropriate design of containers and collection sites**	✓	-	-	-	✓	✓	✓
10	**Storage of paper and board without roof/coverage**	-	-	-	✓	-	-	-
11	**Mixed collection of material into container**	✓	✓	-	-	-	-	-
121	**Mixed collection of material into vehicle**	✓	✓	-	-	✓	-	-
13	**Jointly collected material into one vehicle**	-	-	-	-	✓	-	-
14	**Inconvenient availability**	-	✓	✓	-	✓	-	✓
15	**Lack of standardisation and guidelines**	-	-	✓	✓	-	-	-
16	**Regulations are missing or not clear**	✓	-	-	-	✓	-	-

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8.3 Description of relevant GOOD PRACTICES (from 1st version of GOOD PRACTICE List)

This 1st version of good practice list has been completely reworked, including a clearer description of each good practice, some good practices were removed, whilst some were added. This new list will be published on the project website.

1.1. SPECIFIC COLLECTION SYSTEM ADAPTED TO THE REAL NEEDS

Selection of the best collection system (e.g. bring banks, door-to-door, recycling yard, mobile collection points) for each zone of the municipality by taking into account its specific characteristics and needs: type of building, density of population, and demographics. The decision of the most suitable system in each neighbourhood should be based on a "step by step" list of requirements. All stakeholders should be engaged in this process.

1.3. VOLUNTEER COLLECTION OF PAPER AND BOARD

Specific campaigns for the collection of paper and board by public and private municipal centres (e.g. schools, sports clubs), which may provide an extra help for funding their activities and needs.

1.5. COLLECTION SHOPS

Shops where citizens can bring their used paper and cardboard, and receive a small financial or in-kind compensation for it.

1.6. UNDERGROUND CONTAINERS IN HIGHER POPULATION DENSITY AREAS

Replace common recyclables bins by underground containers with a high capacity, allowing reducing surface space used by bring banks.

1.7. IMPLEMENT MEASURES AGAINST THEFT OF PAPER BASED ON CONTAINER DESIGN

Measures established could be based on container design which makes theft difficult.

1.9. AUTOMATIC UNDERGROUND COLLECTION SYSTEMS

Fully automatic underground collection systems with a collection point and with pipes that suck in recyclables and bring it to the sorting centre.

1.10. CONTAINER OPENING SYSTEM ADAPTED TO PAPER AND BOARD

Use of containers with openings adapted to the size and shape of the material deposited (i.e. graphic paper, paper and board packaging). Wide and flat openings are preferred.

2.5. HARMONISATION OF THE KEY PARAMETERS OF BINS

Define legislation or standards on national level that regulate key parameters which allow the system to become unified all over the country, particularly regarding bin colour and shape, for a clear identification of the bin where citizens should put the recyclables away. It will ensure consistency of the message and facilitate the act of separation for the users.

The standardisation of systems also presents an opportunity to standardise lorries for collection of containers and other equipment. It can help compare results among towns which enables us to see discrepancies and act accordingly to implement improvements.

2.6. CLEAR ALLOCATION OF RIGHTS AND RESPONSIBILITIES Legislative clarification of stakeholders' allocated rights and responsibilities in paper and board collection (i.e. producers, citizens, municipalities, waste managers, paper mills and legal bodies).

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2.8. SEPARATION OF PAPER AND BOARD DIFFERENT STREAMS: MUNICIPAL, COMMERCIAL AND INDUSTRIAL Municipalities should guarantee separate collection of different paper and board streams. Municipalities should directly carry out collection of: (1) municipal paper and board and (2) paper and board generated in small commerces. Moreover, municipalities should enact bylaws (eg. ordinances) defining that paper and board generated by big commerces and industries should be managed by private waste managers and not through municipal collection.

2.9. PAY-AS-YOU-THROW

Fee calculation based on the principle that the less waste you produce (or more and better you sort), the less you pay. Different options for different collection systems should be considered (e.g. smart card or barcode stickers for bring banks). Trade-off between costs and benefits should be considered.

3.1. DATA COLLECTION AND MONITORING OF PfR QUALITY PARAMETERS

Implementation of sampling procedures to control the quality of Paper for Recycling. Main parameters to be measured are: material composition, impurities, ashes, moisture and sticky contaminants.

3.2. DATA COLLECTION AND CONTROLLING OF THE COMPOSITION OF RESIDUAL WASTE AND OTHER RECYCLABLES STREAMS

Implementation of a methodology to monitor and analyse the composition of residual waste. Based on that, specific actions will be taken in order to get more material out of the residual stream (i.e. separate collection).

3.3. MEASUREMENT OF QUALITY OF PAPER

Collection of various KPIs differing per material composition (impurities, moisture content, unusable non-paper composition, unusable paper material, total weight of the consignment).

3.4. CONTROL MEASURES AGAINST THEFT OF PAPER BASED ON CONTROL UNITS

Control and enforcement of measures to avoid theft of paper for recycling. Measures established could be based on control units (camera surveillance, municipal police who surveil entities which receive PfRillegally).

3.5. USE A SMART CARD SYSTEM OR BARCODE STICKERS

Use a smart card or barcode stickers which allows identifying users and monitoring/control of their waste. This makes more sense when it is combined with a PAYT system to control their performance.

3.6. SOFTWARE ON OPTIMIZATION OF COLLECTION ROUTES

Implementation of optimization software which will plan routes of collecting trucks in advance, trying to be as effective as possible and taking into account some aspects such us: collection calendar for households, filling level of the containers or energy savings.

4.1. INFORMATION ON CONTAINERS AND BAGS

Include illustrative and brief information about paper collection with the recycling instructions (collection schedules and allowed materials) in order to clarify doubts of the citizens, recycling processes and targets appointed by the municipality, both in containers and bags.

4.2. SELECTION OF A COMPREHENSIVE AND FUNCTIONAL COMMUNICATION PACKAGE

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Considering local conditions, demographic characteristics, cultural aspects and options available for selecting the most suitable communication strategy to develop.

4.3. INCLUDE CITIZENS ACTIVELY IN THE INFORMATION LOOP (MAKING CITIZENS ACTORS)

Establishment of a bi-directional communication among municipalities, waste and resource managers, experts and citizens, in order to get inputs from all stakeholders involved. It could be deployed by establishing periodical survey such as campaigns, assemblies, apps, web platforms and face-to-face meetings. Citizens can use these interactive platforms to cooperate with new ideas, opinions or to participate in voting processes.

4.4. WASTE AMBASSADORS

Appointing people to inform citizens about the collection system established in the municipality in order to boost their participation. Information will be given by door-to-door visits and information points in the neighbourhoods.

4.5. WEBSITE ON PAPER AND BOARD RECYCLING

Website explaining municipal paper and board collection system in an easy way. It will also show the benefits of paper and board recycling. This website will be promoted through all channels used by the municipality (e.g. local newspaper, information on bins, leaflets, social networks, radio, waste ambassadors).

4.6. ROADSHOWS, EVENTS, WORKSHOPS

Organization of outdoor visual activities to engage local residents and small businesses to join paper and board recycling.

4.8. PUBLICATION OF MOTIVATING NEWS ON PAPER AND BOARD RECYCLING

Dissemination of successful stories regarding paper and board recycling to draw attention, inspire and motivate citizens (e.g. use of recycled paper by public bodies, increasing collection rate of newspaper in a neighbourhood). The good stories should be concrete and based on reliable data.

4.10. EDUCATIONAL AREAS ABOUT PAPER AND BOARD COLLECTION AND RECYCLING

Integration of a reserved area in recycling yards and/or sorting plants in order to teach visitors (e.g. kids, students, retired people) about paper and board collection and recycling.

4.11. DISSEMINATION OF ENVIRONMENTAL AND ECONOMIC BENEFITS OF RECYCLING

Development and launch of awareness campaigns based on illustrative and clear examples of the recycling benefits (e.g. CO2 reduction or saved trees because of the paper recycled last year in amunicipality).

4.13. TARGETED COMMUNICATION CAMPAIGNS

Identification ofsocial groups in which paper and board collection should be improved and develop targeted communication campaigns for them (e.g. schools, kindergartens, new homeowners, tourists in holiday flats).

GOOD PRACTICES from 1st version of GOOD PRACTICE List (03/11/2016) not allocated to CHALLENGES yet:

1.2, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4, 2.7, 2.10, 4.7, 4.9, 4.12

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8.4 Summary of CHALLENGES (incl. short term)

CHALLENGES	
1 Provide advantages	Provide information about environmental and economic advantages of separate collection
2 Provide instructions	Provide information about collection system and instructions how to separate (including which material belongs where)
3 Targeted campaigns	Targeted information campaigns for individual population groups (children, elderly, tourists, employees, newbies, minorities etc.) in terms of content, language, channel
4 Education strategy	Long-term education strategy which enables all groups of the population to gain knowledge about recycling
5 Ensure transparency	Ensure transparency of system (with reliable data)
6 Create trust	Create trust in system
7 Communication system	Establish communication system between municipality/responsible companies and citizens, this should be convenient and efficient
8 Provide social activities	Provide social activities, e.g. social institutions, youth centres
9 Provide social assistance	Provide assistance in social problem cases (e.g. social workers)
10 Convenient system	Select convenient system, type of container,-collection frequency, depending on local characteristics (population density, demographics, type of building)
11 Convenient access	Select convenient opening hours, distances and location, depending on local characteristics (demographics, infrastructure)
12 Restrict access	Restrict access to collection sites and collected material
13 Avoid disposal	Avoid disposal of mixed waste from people passing by
14 Improve design	Improve design of containers/bins according to the local conditions – material, construction, opening
15 Sufficient volume	Make sufficient volume for the accruing quantity of recyclables and waste available
16 Avoid weather exposure	Avoid exposing paper and board to weather conditions – container, vehicle, storage
17 Polluter pays	Using "polluter pays"-principle to ensures direct benefit for separate collection and lower contamination (e.g. PAYT)
18 Restrict trade	Restrict trade of paper & board
19 Establish surveillance	Establish laws and surveillance activities against theft and vandalism
20 Collect quantity data	Collect data about potential quantity of paper and board
21 Collect quality data	Availability of data/information about the type of contamination and hot spots is necessary to introduce specific measures/information campaigns
22 Integrate informal sector	Integration of the informal sector into waste management system

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Date: 28 April 2017

8.5 Cluster – Dupnitsa (BG)

Country cluster			Dupnitsa	Dupnitsa	Dupnitsa	Dupnitsa	Dupnitsa	Dupnitsa	Dupnitsa
#	Cause		Local	Local	Local	Local	Non local	Non local	All
1	Lack of motivation of citizens	Importance	2	4	3	4	3	4	4
		Complexity	5	3	4	5	5	4	3
2	Waste pickers / scavengers	Importance	2	4	4	5	5	5	5
		Complexity	3	4	5	5	5	5	5
3	Lack of information, communication and education	Importance	3	5	3	3	1	5	3,5
		Complexity	4	4	3	2	3	2	1
4	Lack of environmental awareness	Importance	1	4	3	3	1	3	3
		Complexity	3	3	3	1	1	3	3
5	Vandalism	Importance	2	3	4	4	5	2	3
		Complexity	2	2	3	4	5	4	2
6	Contamination	Importance	2	3	5	4	3	5	4
		Complexity	2	3	5	4	3	4	4
7	Insufficient compression of material e.g. cardboard	Importance	1	3	3	2	0	2	2
		Complexity	2	2	4	4	0	2	4
8	House firing	Importance	5	4	4	3	5	5	4
		Complexity	3	5	5	4	3	4	4
9	Inappropriate design of containers and collection sites	Importance	2	3	1	4	5	5	4
		Complexity	2	2	1	3	1	4	3
10	Storage of paper and board without roof/ coverage	Importance	2	5	4	4	3	2	3
		Complexity	3	4	2	1	5	3	3
11	Mixed collection of material into container	Importance	3	5	4	5	5	4	5
		Complexity	3	5	2	5	3	5	4
12	Mixed collection of material into vehicle	Importance	2	3	2	4	4	3	4
		Complexity	4	4	1	1	4	3	2
14	Inconvenient availability	Importance	3	5	3	3	5	4	5
		Complexity	4	5	2	2	5	4	3
15	Lack of standardisation and guidelines	Importance	2	2	2	3	3	2	2
		Complexity	3	2	1	1	3	1	2
16	Regulations are missing or inconclusive	Importance	3	5	4	?	0	4	4
		Complexity	2	2	2	?	0	3	2

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Date: 28 April 2017

Country cluster			Dupnitsa	Duonitsa	Dupnitsa	Dupnitsa	Dupnitsa	Dupnitsa	Dupnitsa
#	Challenges - short		Local	Local	Local	Local	Non local	Non local	All
1	Provide advantages	Impact	2	4	3	4	1	3	3
		Complexity	3	3	3	2	3	5	2
2	Provide instructions	Impact	3	4	4	3	5	4	4
		Complexity	3	3	3	1	1	3	3
3	Targeted campaigns	Impact	3	5	4	4	4	5	4
		Complexity	2	3	3	2	3	2	2
4	Education strategy	Impact	5	4	5	5	2	5	5
		Complexity	4	4	3	2	1	4	3
5	Ensure transperency	Impact	3	5	4	3	5	4	4
		Complexity	3	5	2	2	5	5	4
6	Create trust	Impact	5	4	4	5	5	4	5
		Complexity	3	4	2	5	5	5	5
7	Communication system	Impact	5	4	4	4	5	5	4
		Complexity	3	3	4	2	2	5	4
8	Provide social activities	Impact	4	1	2	2	0	4	2
		Complexity	3	1	2	1	0	1	2
9	Provide social assistance	Impact	2	1	2	2	0	2	2
		Complexity	2	1	2	1	0	2	2
10	Convenient system	Impact	3	5	4	5	5	5	5
		Complexity	4	4	3	3	3	5	4
11	Convenient access	Impact	3	4	3	4	5	3	4
		Complexity	3	2	3	3	5	2	3
12	Restrict access	Impact	3	3	3	4	2	4	3
		Complexity	4	3	4	3	4	5	3
13	Avoid disposal	Impact	3	3	3	?	0	3	3
		Complexity	3	2	3	?	0	5	3
14	Improve design	Impact	3	4	4	4	5	5	4
		Complexity	4	4	3	2	3	3	3
15	Sufficient volume	Impact	3	3	4	?	5	5	4
		Complexity	4	3	3	?	5	4	4
16	Avoid weather exposure	Impact	4	4	4	4	3	4	4
		Complexity	4	3	4	3	3	3	3
17	Polluter pays	Impact	5	5	4	3	3	4	4
		Complexity	4	4	4	3	3	4	4
18	Restrict trade	Impact	3	4	4	2	1	4	3
		Complexity	3	4	3	3	5	5	3
19	Establish surveillance	Impact	2	4	4	2	1	4	3
		Complexity	4	5	5	5	5	5	5
20	Collect quantity data	Impact	4	5	3	3	5	3	4
		Complexity	1	3	3	2	3	5	3
21	Collect quality data	Impact	5	4	3	?	4	5	4
		Complexity	3	4	3	?	4	5	4
22	Integration informal	Impact	4	5	5	5	5	5	5
		Complexity	4	5	5	5	5	5	5

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Date: 28 April 2017

8.6 Cluster – Mezdra (BG)

Country cluster			Mezdra	Mezdra	Mezdra	Mezdra	Mezdra	Mezdra
#	Cause		Local	Local	Non local	Non local	Non local	All
1	Lack of motivation of citizens	Importance	5	4	5	3	5	5
		Complexity	4	5	4	2	5	5
2	Waste pickers / scavengers	Importance	3	3	4	0	4	3,5
		Complexity	4	4	3	0	5	3
3	Lack of information, communication and education	Importance	4	5	3	3	5	5
		Complexity	5	4	2	2	3	3,5
4	Lack of environmental awareness	Importance	5	5	3	3	5	5
		Complexity	5	4	2	3	3	3,5
5	Vandalism	Importance	5	4	4	1	4	5
		Complexity	3	5	3	2	3	3
6	Contamination	Importance	4	5	4	4	5	4,5
		Complexity	4	4	3	4	4	4,5
7	Insufficient compression of material e.g. cardboard	Importance	5	5	2	?	3	5
		Complexity	3	5	2	?	3	3
8	House firing	Importance	5	5	3	1	4	5
		Complexity	3	4	3	2	4	4,5
9	Inappropriate design of containers and collection sites	Importance	5	5	4	4	4	5
		Complexity	4	5	2	4	3	4
10	Storage of paper and board without roof/ coverage	Importance	0	0	3	2	0	0
		Complexity	0	0	1	1	0	0
11	Mixed collection of material into container	Importance	5	5	4	4	5	4
		Complexity	4	5	2	4	5	3,5
12	Mixed collection of material into vehicle	Importance	5	5	4	1	3	4
		Complexity	4	5	2	1	3	3,5
14	Inconvenient availability	Importance	4	4	4	1	5	5
		Complexity	4	3	2	1	3	3,5
15	Lack of standardisation and guidelines	Importance	5	5	4	4	5	5
		Complexity	4	5	2	3	4	4
16	Regulations are missing or inconclusive	Importance	5	4	4	?	5	5
		Complexity	4	5	3	?	4	4

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Date: 28 April 2017

Country cluster			Mezdra	Mezdra	Mezdra	Mezdra	Mezdra	Mezdra
#	Challenges - short		Local	Local	Non local	Non local	Non local	All
1	Provide advantages	Impact	5	5	5	4	5	5
		Complexity	3	3	2	4	3	3,5
2	Provide instructions	Impact	5	5	5	4	5	5
		Complexity	3	3	2	3	3	3,5
3	Targeted campaigns	Impact	5	5	4	4	5	5
		Complexity	3	4	2	3	3	4
4	Education strategy	Impact	5	5	4	4	5	5
		Complexity	4	3	3	3	3	3,5
5	Ensure transperency	Impact	5	5	4	3	5	5
		Complexity	4	4	4	4	4	4
6	Create trust	Impact	5	5	5	4	5	5
		Complexity	4	4	4	5	5	4
7	Communication system	Impact	5	5	3	5	5	5
		Complexity	3	4	2	3	4	4
8	Provide social activities	Impact	3	4	4	3	3	4
		Complexity	4	3	4	3	4	3
9	Provide social assistance	Impact	4	4	4	3	3	4
		Complexity	3	3	4	3	3	3
10	Convenient system	Impact	5	5	5	5	5	5
		Complexity	4	4	2	3	3	4
11	Convenient access	Impact	5	5	5	3	5	5
		Complexity	3	4	2	3	3	3,5
12	Restrict access	Impact	5	5	4	5	4	5
		Complexity	4	4	2	5	3	3,5
13	Avoid disposal	Impact	5	5	4	3	5	5
		Complexity	4	4	2	3	3	3,5
14	Improve design	Impact	5	5	5	5	5	5
		Complexity	4	4	2	4	3	4
15	Sufficient volume	Impact	5	5	4	4	5	5
		Complexity	4	4	2	4	3	3,5
16	Avoid weather exposure	Impact	0	0	3	5	0	0
		Complexity	0	0	2	3	0	0
17	Polluter pays	Impact	5	5	3	3	4	4
		Complexity	4	4	2	3	4	4
18	Restrict trade	Impact	4	4	4	4	4	3
		Complexity	4	4	2	4	4	3
19	Establish surveillance	Impact	4	5	4	4	4	5
		Complexity	4	3	1	4	4	3
20	Collect quantity data	Impact	5	5	3	4	4	5
		Complexity	4	4	2	3	3	4
21	Collect quality data	Impact	5	5	3	4	5	5
		Complexity	4	4	2	3	4	4
22	Integration informal	Impact	5	5	5	4	5	5
		Complexity	4	4	5	3	4	4

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8.7 Cluster – Sfantu Gheorghe (RO)

Country cluster			St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe
#	Cause		Local	Local	Local	Local	Local	Non local	All
1	Lack of motivation of citizens	Importance	5	5	3	4	5	5	4
		Complexity	5	3	5	3	3	3	3
2	Waste pickers / scavengers	Importance	3	4	2	3	4	4	1
		Complexity	4	4	2	?	5	5	2
3	Lack of information, communication and education	Importance	2	5	5	5	5	3	5
		Complexity	2	3	3	4	3	1	2
4	Lack of environmental awareness	Importance	3	5	3	5	4	4	4
		Complexity	3	4	4	3	3	4	4
5	Vandalism	Importance	4	3	3	3	3	?	3
		Complexity	5	2	3	4	3	?	3
6	Contamination	Importance	2	4	4	3	4	3	1
		Complexity	4	4	3	5	3	4	4
7	Insufficient compression of material e.g. cardboard	Importance	4	4	3	4	4	4	4,5
		Complexity	4	3	3	2	3	4	5
8	House firing	Importance	2	3	3	3	3	4	1
		Complexity	5	3	5	2	4	4	4
9	Inappropriate design of containers and collection sites	Importance	2	3	3	5	3	2	3
		Complexity	2	5	3	3	3	3	4
10	Storage of paper and board without roof/ coverage	Importance	2	5	2	5	2	3	2
		Complexity	4	2	2	3	2	3	2
11	Mixed collection of material into container	Importance	2	3	3	3	3	1	2
		Complexity	2	3	3	3	3	2	2
12	Mixed collection of material into vehicle	Importance	1	4	2	3	2	1	1
		Complexity	1	3	2	3	2	1	1
14	Inconvenient availability	Importance	2	2	2	2	2	1	2,5
		Complexity	3	2	2	2	2	2	2
15	Lack of standardisation and guidelines	Importance	0	0	2	2	2	2	1
		Complexity	0	0	2	2	2	2	2
16	Regulations are missing or inconclusive	Importance	0	0	2	2	2	2	1
		Complexity	0	0	2	2	2	2	2

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Date: 28 April 2017

Country cluster			St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe	St. Gheorghe
#	Challenges - short		Local	Local	Local	Local	Local	Non local	All
1	Provide advantages	Impact	3	4	4	4	4	5	4
		Complexity	3	4	5	3	4	4	4
2	Provide instructions	Impact	2	5	5	4	4	0	4
		Complexity	?	4	2	3	2	0	3
3	Targeted campaigns	Impact	4	4	3	3	3	5	3
		Complexity	2	3	3	3	3	5	5
4	Education strategy	Impact	3	4	5	4	5	5	5
		Complexity	2	4	4	3	4	5	4
5	Ensure transperency	Impact	3	0	0	3	0	0	0
		Complexity	2	0	0	3	0	0	0
6	Create trust	Impact	3	4	5	5	4	4	4
		Complexity	4	3	5	3	4	5	4
7	Communication system	Impact	4	4	3	3	3	4	3
		Complexity	2	2	2	3	4	5	3
8	Provide social activities	Impact	2	0	0	3	0	1	0
		Complexity	2	0	0	3	0	5	0
9	Provide social assistance	Impact	0	0	1	0	0	1	0
		Complexity	0	0	3	0	0	5	0
10	Convenient system	Impact	2	0	4	0	0	0	5
		Complexity	4	0	3	3	3	0	4
11	Convenient access	Impact	1	4	4	4	0	0	0
		Complexity	1	3	3	3	0	0	0
12	Restrict access	Impact	5	4	4	3	4	0	5
		Complexity	5	4	4	3	4	0	3
13	Avoid disposal	Impact	?	4	4	4	4	?	2
		Complexity	?	4	3	3	3	?	2
14	Improve design	Impact	1	3	2	3	2	0	2
		Complexity	4	3	2	3	2	0	2
15	Sufficient volume	Impact	1	4	4	4	4	?	3
		Complexity	3	3	5	3	5	?	2
16	Avoid weather exposure	Impact	4	3	0	4	0	0	0
		Complexity	1	3	0	3	0	0	0
17	Polluter pays	Impact	4	3	3	3	1 und 3	4	2
		Complexity	4	3	4	0	4	4	3
18	Restrict trade	Impact	4	4	0	4	5	?	0
		Complexity	5	3	0	3	4	?	0
19	Establish surveillance	Impact	4	2	0	3	4	0	5
		Complexity	3	2	0	3	2	0	2
20	Collect quantity data	Impact	4	3	4	4	4	3	2
		Complexity	3	2	4	3	4	5	5
21	Collect quality data	Impact	2	4	3	?	0	3	0
		Complexity	4	4	3	?	0	3	0
22	Integration informal	Impact	5	3	3	?	3	?	2
		Complexity	5	3	4	?	4	?	5

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8.8 Cluster – Mihai Viteazu (RO)

Country cluster			Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu
#	Cause		Local	Local	Local	Non local	Non local	Non local	All
1	Lack of motivation of citizens	Importance	5	5	5	5	5	5	5
		Complexity	3	3	5	5	4	3	5
2	Waste pickers / scavengers	Importance	0	0	2	2	0	5	0
		Complexity	0	0	4	4	0	4	0
3	Lack of information, communication and education	Importance	5	5	4	4	4	5	5
		Complexity	4	4	3	3	3	1	4
4	Lack of environmental awareness	Importance	5	4	5	5	4	5	5
		Complexity	4	3	5	5	2	1	5
5	Vandalism	Importance	4	4	3	3	4	4	1
		Complexity	3	1	3	3	2	4	5
6	Contamination	Importance	2	3	4	4	3	5	5
		Complexity	2	2	2	2	2	2	5
7	Insufficient compression of material e.g. cardboard	Importance	4	4	4	4	4	4	4
		Complexity	3	2	1	4	?	1	2
8	House firing	Importance	5	5	5	4	5	5	4
		Complexity	5	5	5	4	3	3	3
9	Inappropriate design of containers and collection sites	Importance	3	4	4	4	4	5	3
		Complexity	2	3	2	3	3	1	3
10	Storage of paper and board without roof/ coverage	Importance	2	0	2	1	0	4	0
		Complexity	1	0	2	2	0	3	0
11	Mixed collection of material into container	Importance	5	5	5	4	5	5	5
		Complexity	4	4	2	4	3	1	2
12	Mixed collection of material into vehicle	Importance	5	5	3	5	5	3	5
		Complexity	5	5	2	?	4	2	2
14	Inconvenient availability	Importance	5	4	3	4	5	3	4
		Complexity	4	3	2	3	3	2	3
15	Lack of standardisation and guidelines	Importance	4	4	1	1	5	4	3
		Complexity	4	4	1	1	5	5	4
16	Regulations are missing or inconclusive	Importance	5	4	5	5	5	5	4
		Complexity	4	4	5	4	4	5	4

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Country cluster			Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu	Mihai Viteazu
#	Challenges - short		Local	Local	Local	Non local	Non local	Non local	All
1	Provide advantages	Impact	5	5	5	4	5	5	4
		Complexity	4	3	3	3	2	4	3
2	Provide instructions	Impact	5	5	3	4	5	5	5
		Complexity	3	3	1	3	2	3	2
3	Targeted campaigns	Impact	4	4	3	4	5	4	5
		Complexity	4	3	3	3	3	3	2
4	Education strategy	Impact	5	4	3	4	5	5	3
		Complexity	4	4	4	4	3	3	5
5	Ensure transperency	Impact	5	5	2	4	5	5	3
		Complexity	4	3	2	4	4	5	2
6	Create trust	Impact	5	5	3	5	5	5	5
		Complexity	5	4	5	5	4	5	4
7	Communication system	Impact	5	5	2	4	4	4	4
		Complexity	3	3	3	2	3	3	3
8	Provide social activities	Impact	2	0	2	4	3	2	?
		Complexity	3	0	2	2	2	5	?
9	Provide social assistance	Impact	2	0	2	3	4	2	?
		Complexity	3	0	2	4	3	2	?
10	Convenient system	Impact	5	5	3	3	5	5	5
		Complexity	4	3	3	3	3	3	4
11	Convenient access	Impact	4	4	3	2	4	3	0
		Complexity	4	4	1	4	3	3	0
12	Restrict access	Impact	5	4	2	2	0	5	3
		Complexity	4	3	4	3	0	1	3
13	Avoid disposal	Impact	4	4	1	3	2	2	2
		Complexity	3	3	4	4	2	1	4
14	Improve design	Impact	5	2	2	4	5	5	4
		Complexity	4	2	2	3	3	4	3
15	Sufficient volume	Impact	5	3	3	4	4	5	5
		Complexity	5	2	1	4	3	3	5
16	Avoid weather exposure	Impact	5	0	4	4	0	4	0
		Complexity	5	0	2	2	0	1	0
17	Polluter pays	Impact	5	4	4	5	4	5	4
		Complexity	5	3	5	5	4	4	5
18	Restrict trade	Impact	4	4	5	5	3	3	4
		Complexity	4	4	2	4	3	3	4
19	Establish surveillance	Impact	5	3	4	2	1	5	4
		Complexity	4	4	5	3	2	4	4
20	Collect quantity data	Impact	5	4	2	2	4	5	2
		Complexity	5	2	2	4	4	4	4
21	Collect quality data	Impact	5	5	2	4	4	5	4
		Complexity	4	4	4	4	3	4	3
22	Integration informal	Impact	5	4	2	4	1	5	0
		Complexity	4	4	4	4	5	4	0

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Date: 28 April 2017

8.9 Cluster – Vendée (FR)

Country cluster			Vendée	Vendée	Vendée
#	Cause		Local	Local	All
1	Lack of motivation of citizens	Importance	5	5	5
		Complexity	5	4	4,5
2	Waste pickers / scavengers	Importance	5	2	3,5
		Complexity	3	3	3
3	Lack of information, communication and education	Importance	4	3	3,5
		Complexity	1	4	2,5
4	Lack of environmental awareness	Importance	1	4	2,5
		Complexity	3	3	3
5	Vandalism	Importance	4	2	3
		Complexity	3	2	2,5
6	Contamination	Importance	3	4	3,5
		Complexity	3	4	3,5
7	Insufficient compression of material e.g. cardboard	Importance	4	3	3,5
		Complexity	1	2	1,5
8	House firing	Importance	1	1	1
		Complexity	1	2	1,5
9	Inappropriate design of containers and collection sites	Importance	5	3	4
		Complexity	1	4	2,5
10	Storage of paper and board without roof/ coverage	Importance	4	3	3,5
		Complexity	1	2	1,5
11	Mixed collection of material into container	Importance	1	5	3
		Complexity	1	4	2,5
12	Mixed collection of material into vehicle	Importance	1	3	2
		Complexity	1	2	1,5
14	Inconvenient availability	Importance	5	4	4,5
		Complexity	5	3	4
15	Lack of standardisation and guidelines	Importance	2	4	3
		Complexity	2	2	2
16	Regulations are missing or inconclusive	Importance	5	2	3,5
		Complexity	5	3	4

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Date: 28 April 2017

Country cluster			Vendée	Vendée	Vendée
#	Challenges - short		Local	Local	All
1	Provide advantages	Impact	5	4	4,5
		Complexity	3	3	3
2	Provide instructions	Impact	5	5	5
		Complexity	1	2	1,5
3	Targeted campaigns	Impact	5	2	3,5
		Complexity	4	4	4
4	Education strategy	Impact	5	5	5
		Complexity	3	4	3,5
5	Ensure transperency	Impact	4	2	3
		Complexity	2	3	2,5
6	Create trust	Impact	5	5	5
		Complexity	5	4	4,5
7	Communication system	Impact	3	4	3,5
		Complexity	1	4	2,5
8	Provide social activities	Impact	3	3	3
		Complexity	4	4	4
9	Provide social assistance	Impact	3	0	1,5
		Complexity	5	0	2,5
10	Convenient system	Impact	5	3	4
		Complexity	2	2	2
11	Convenient access	Impact	5	3	4
		Complexity	1	2	1,5
12	Restrict access	Impact	3	2	2,5
		Complexity	3	5	4
13	Avoid disposal	Impact	5	4	4,5
		Complexity	4	4	4
14	Improve design	Impact	4	3	3,5
		Complexity	2	5	3,5
15	Sufficient volume	Impact	5	5	5
		Complexity	4	3	3,5
16	Avoid weather exposure	Impact	5	3	4
		Complexity	2	2	2
17	Polluter pays	Impact	5	4	4,5
		Complexity	5	5	5
18	Restrict trade	Impact	3	2	2,5
		Complexity	5	3	4
19	Establish surveillance	Impact	3	2	2,5
		Complexity	5	3	4
20	Collect quantity data	Impact	3	4	3,5
		Complexity	2	3	2,5
21	Collect quality data	Impact	5	4	4,5
		Complexity	1	4	2,5
22	Integration informal	Impact	3	3	3
		Complexity	3	3	3

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8.10 Cluster – Szczecin (PL)

Country cluster			Szczecin	Szczecin	Szczecin
#	Cause		Local	Local	All
1	Lack of motivation of citizens	Importance	3	2	2,5
		Complexity	3	2	2,5
2	Waste pickers / scavengers	Importance	0	1	0,5
		Complexity	0	1	0,5
3	Lack of information, communication and education	Importance	1	3	2
		Complexity	1	3	2
4	Lack of environmental awareness	Importance	3	3	3
		Complexity	3	3	3
5	Vandalism	Importance	1	5	3
		Complexity	1	5	3
6	Contamination	Importance	1	4	2,5
		Complexity	1	4	2,5
7	Insufficient compression of material e.g. cardboard	Importance	0	4	2
		Complexity	0	4	2
8	House firing	Importance	0	4	2
		Complexity	0	4	2
9	Inappropriate design of containers and collection sites	Importance	0	1	0,5
		Complexity	0	1	0,5
10	Storage of paper and board without roof/ coverage	Importance	1	3	2
		Complexity	1	3	2
11	Mixed collection of material into container	Importance	2	3	2,5
		Complexity	2	3	2,5
12	Mixed collection of material into vehicle	Importance	2	1	1,5
		Complexity	2	1	1,5
14	Inconvenient availability	Importance	0	1	0,5
		Complexity	0	1	0,5
15	Lack of standardisation and guidelines	Importance	1	1	1
		Complexity	1	1	1
16	Regulations are missing or inconclusive	Importance	1	1	1
		Complexity	1	1	1

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Date: 28 April 2017

Country cluster			Szczecin	Szczecin	Szczecin
#	Challenges - short		Local	Local	All
1	Provide advantages	Impact	2	2	2
		Complexity	2	2	2
2	Provide instructions	Impact	1	1	1
		Complexity	1	1	1
3	Targeted campaigns	Impact	2	2	2
		Complexity	2	2	2
4	Education strategy	Impact	2	2	2
		Complexity	2	2	2
5	Ensure transperency	Impact	1	1	1
		Complexity	1	1	1
6	Create trust	Impact	5	5	5
		Complexity	5	5	5
7	Communication system	Impact	1	1	1
		Complexity	1	1	1
8	Provide social activities	Impact	5	5	5
		Complexity	5	5	5
9	Provide social assistance	Impact	4	4	4
		Complexity	4	4	4
10	Convenient system	Impact	3	3	3
		Complexity	3	3	3
11	Convenient access	Impact	3	3	3
		Complexity	3	3	3
12	Restrict access	Impact	0	0	0
		Complexity	0	0	0
13	Avoid disposal	Impact	0	0	0
		Complexity	0	0	0
14	Improve design	Impact	0	0	0
		Complexity	0	0	0
15	Sufficient volume	Impact	0	0	0
		Complexity	0	0	0
16	Avoid weather exposure	Impact	0	0	0
		Complexity	0	0	0
17	Polluter pays	Impact	1	1	1
		Complexity	1	1	1
18	Restrict trade	Impact	0	0	0
		Complexity	0	0	0
19	Establish surveillance	Impact	0	0	0
		Complexity	0	0	0
20	Collect quantity data	Impact	2	2	2
		Complexity	2	2	2
21	Collect quality data	Impact	0	0	0
		Complexity	0	0	0
22	Integration informal	Impact	0	0	0
		Complexity	0	0	0

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Date: 28 April 2017

8.11 Cluster – POLAND

Country cluster			Poland	Poland	Poland	Poland	Poland	Poland	Poland
#	Cause		Local	Local	Non local	Non local	Non local	All	Local
1	Lack of motivation of citizens	Importance	5	4	4	2	5	4	4
		Complexity	4	4	2	4	4	4	5
2	Waste pickers / scavengers	Importance	3	2	2	1	2	1	4
		Complexity	3	1	3	4	3	1	4
3	Lack of information, communication and education	Importance	4	4	3	4	5	4	3
		Complexity	2	1	1	4	3	3	3
4	Lack of environmental awareness	Importance	4	5	5	4	5	3	3
		Complexity	3	3	2	4	2	4,5	3
5	Vandalism	Importance	2	4	2	2	2	1	3
		Complexity	2	1	4	4	3	1	3
6	Contamination	Importance	3	4	3	4	5	4,5	5
		Complexity	3	3	3	4	4	2	5
7	Insufficient compression of material e.g. cardboard	Importance	2	?	2	0	0	0	3
		Complexity	3	1	2	0	0	0	3
8	House firing	Importance	4	4	4	4	3	4,5	3
		Complexity	4	2	3	4	3	4	3
9	Inappropriate design of containers and collection sites	Importance	4	3	2	2	0	1,5	4
		Complexity	3	1	?	1	0	2,5	4
10	Storage of paper and board without roof/ coverage	Importance	3	3	3	1	4	2	5
		Complexity	3	1	4	1	1	2	5
11	Mixed collection of material into container	Importance	5	4	4	4	3	4,5	5
		Complexity	3	2	3	2	1	1,5	5
12	Mixed collection of material into vehicle	Importance	5	3	2	4	0	2,5	4
		Complexity	3	1	1	2	0	2	4
14	Inconvenient availability	Importance	4	4	4	2	1	4	3
		Complexity	3	2	4	2	1	4	3
15	Lack of standardisation and guidelines	Importance	4	3	2	4	3	2,5	2
		Complexity	3	2	3	2	1	3	2
16	Regulations are missing or inconclusive	Importance	3	4	3	4	3	3	4
		Complexity	3	1	4	1	2	3	4

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Date: 28 April 2017

Country cluster			Poland	Poland	Poland	Poland	Poland	Poland	Poland
#	Challenges - short		Local	Local	Non local	Non local	Non local	All	Local
1	Provide advantages	Impact	4	4	4	4	5	4,5	4
		Complexity	4	3	2	2	3	4	4
2	Provide instructions	Impact	5	3	5	5	5	4	5
		Complexity	2	2	1	2	4	2	4
3	Targeted campaigns	Impact	5	4	4	4	4	4	4
		Complexity	3	1	3	3	3	2	4
4	Education strategy	Impact	4	5	4	4	5	4,5	4
		Complexity	3	4	4	3	3	3	4
5	Ensure transperency	Impact	5	4	4	3	4	3	5
		Complexity	4	4	5	5	2	5	5
6	Create trust	Impact	5	4	5	5	4	4	5
		Complexity	4	5	5	4	4	5	5
7	Communication system	Impact	3	4	3	4	3	3	4
		Complexity	5	3	4	4	2	4	4
8	Provide social activities	Impact	2	2	2	1	0	1	3
		Complexity	2	2	3	5	0	1	3
9	Provide social assistance	Impact	1	2	1	2	0	1	3
		Complexity	3	1	1	5	0	1	3
10	Convenient system	Impact	4	5	5	5	4	4	5
		Complexity	2	3	4	1	2	2	5
11	Convenient access	Impact	4	4	4	4	1	3	5
		Complexity	3	3	4	2	1	2	3
12	Restrict access	Impact	2	2	2	2	1	1,5	4
		Complexity	2	2	3	1	1	1,5	4
13	Avoid disposal	Impact	2	1	2	2	3	1,5	5
		Complexity	3	1	2	2	3	1	3
14	Improve design	Impact	3	2	4	1	0	2,5	4
		Complexity	1	1	2	4	0	2	4
15	Sufficient volume	Impact	5	3	3	4	4	4,5	5
		Complexity	3	2	?	4	1	1	4
16	Avoid weather exposure	Impact	3	3	3	4	3	3	5
		Complexity	3	1	1	1	1	2	4
17	Polluter pays	Impact	4	4	3	3	3	3,5	4
		Complexity	4	4	5	3	5	5	4
18	Restrict trade	Impact	3	1	1	1	0	1,5	4
		Complexity	4	2	5	5	0	4,5	4
19	Establish surveillance	Impact	2	1	?	3	0	1,5	3
		Complexity	3	2	?	1	0	4	4
20	Collect quantity data	Impact	2 und 4	3	3	5	3	3	5
		Complexity	1	2	4	2	4	2	4
21	Collect quality data	Impact	2	4	4	2	3	3,5	5
		Complexity	2	3	3	2	3	3	5
22	Integration informal	Impact	1	2	?	5	2	1	4
		Complexity	4	3	?	5	4	5	4

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8.12 Cluster – Mixed

Country cluster			Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
#	Cause		BE	CH	CZ	DE	ES	ES	IT	All
1	Lack of motivation of citizens	Importance	0	5	4	2	3	0	3	3
		Complexity	0	5	2	2	2	0	2	5
2	Waste pickers / scavengers	Importance	1	2	5	0	4	5	4	4
		Complexity	3	2	5	0	4	5	4	4
3	Lack of information, communication and education	Importance	0	3	5	3	4	2	3	3
		Complexity	0	3	4	2	3	2	2	2
4	Lack of environmental awareness	Importance	2	3	3	3	4	0	4	3
		Complexity	5	5	3	2	3	0	3	2
5	Vandalism	Importance	0	3	2	0	4	4	3	3,5
		Complexity	0	4	2	0	4	5	3	4
6	Contamination	Importance	0	4	5	3	4	5	4	4
		Complexity	0	4	5	3	3	4	2	3
7	Insufficient compression of material e.g. cardboard	Importance	3	4	4	4	3	0	4	3
		Complexity	3	4	4	3	2	0	2	3
8	House firing	Importance	0	2	1	0	1	0	2	0
		Complexity	0	1	1	0	1	0	2	0
9	Inappropriate design of containers and collection sites	Importance	2	4	4	2	2	0	3	2
		Complexity	1	2	2	2	1	0	2	2
10	Storage of paper and board without roof/ coverage	Importance	?	3	2	2	0	0	4	2
		Complexity	?	1	2	2	0	0	2	1
11	Mixed collection of material into container	Importance	0	5	2	0	0	0	3	0
		Complexity	0	1	1	0	0	0	2	0
12	Mixed collection of material into vehicle	Importance	0	5	3	0	0	0	3	0
		Complexity	0	1	2	0	0	0	2	0
14	Inconvenient availability	Importance	4	5	3	0	0	0	5	4
		Complexity	3	2	2	0	0	0	3	1
15	Lack of standardisation and guidelines	Importance	0	3	2	0	2	0	4	1,5
		Complexity	0	4	3	0	2	0	3	2
16	Regulations are missing or inconclusive	Importance	0	3	4	0	4	0	4	0
		Complexity	0	4	4	0	4	0	4	0

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Country cluster			Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
#	Challenges - short		BE	CH	CZ	DE	ES	ES	IT	All
1	Provide advantages	Impact	3	3	3	4	3	5	5	3
		Complexity	2	4	3	4	2	3	3	3
2	Provide instructions	Impact	5	4	2	4	3	5	5	5
		Complexity	2	3	2	2	2	3	2	3
3	Targeted campaigns	Impact	4	4	2	3	4	3	5	4
		Complexity	5	4	2	4	3	1	5	3
4	Education strategy	Impact	2	4	4	5	3	3	5	3
		Complexity	2	2	3	5	2	1	3	2
5	Ensure transperency	Impact	1	4	3	2	3	4	5	4
		Complexity	1	2	2	3	2	1	2	1
6	Create trust	Impact	5	4	3	4	3	4	4	4
		Complexity	5	1	2	5	3	1	1	2
7	Communication system	Impact	3	4	2	3	4	5	4	5
		Complexity	5	1	2	4	4	2	4	4
8	Provide social activities	Impact	4	1	0/1	0	4	3	3	3
		Complexity	3	1	0/1	0	4	1	4	1
9	Provide social assistance	Impact	4	1	0/1	0	4	5	4	4
		Complexity	3	1	0/1	0	4	1	3	4
10	Convenient system	Impact	5	4	3	0	4	5	4	4
		Complexity	2	1	3	0	2	4	1	5
11	Convenient access	Impact	5	4	2	0	0	5	4	5
		Complexity	3	1	2	0	0	1	2	2
12	Restrict access	Impact	0	4	0/1	0	4	5	2	5
		Complexity	0	1	0/1	0	3	5	2	4
13	Avoid disposal	Impact	0	4	0/1	0	4	0	3	0
		Complexity	0	1	0/1	0	3	0	3	0
14	Improve design	Impact	5	4	0/2	0	4	5	2	5
		Complexity	4	1	0/1	0	3	5	2	4
15	Sufficient volume	Impact	0	4	2	4	0	0	2	4
		Complexity	0	1	2	4	0	0	1	3,5
16	Avoid weather exposure	Impact	0	4	0/1	5	0	2	4	2
		Complexity	0	1	0/1	1	0	3	2	1
17	Polluter pays	Impact	3	?	3	5	4	5	4	3
		Complexity	5	5	3	5	3	1	3	5
18	Restrict trade	Impact	0	0	0	0	4	5	2	0
		Complexity	0	0	0	0	3	5	4	0
19	Establish surveillance	Impact	0	0	0	0	4	5	3	4
		Complexity	0	0	0	0	3	5	4	5
20	Collect quantity data	Impact	0	0	0	0	0	0	4	0
		Complexity	0	0	0	0	0	0	2	0
21	Collect quality data	Impact	3	4	3	3	4	5	5	4,5
		Complexity	3	2	3	5	2	1	2	3
22	Integration informal	Impact	0	0	0/2	0	5	5	5	5
		Complexity	0	0	0/2	0	5	5	4	5