



WP 4 – Improve Collection Strategies



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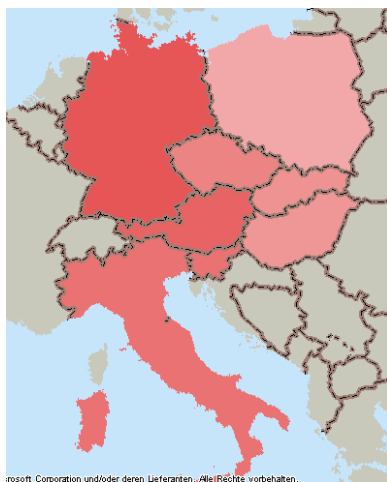


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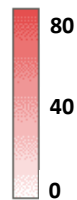
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Current paper & board recycling rates in CE



recycling rate in %



$$\text{recycling rate \%} = \frac{\text{pfr}^* \text{ collection}}{\text{p\&b}^{**} \text{ consumption}} \times 100 \%$$

*p&b = paper & board

**pfr = paper for recycling



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Objective

- ⇒ To develop **recommendations for improving existing or initially installing collections systems** taking into account all major local and regional principal variables crucial for the success of the effort.
- ⇒ Focus on collection of paper for recycling from households

Content

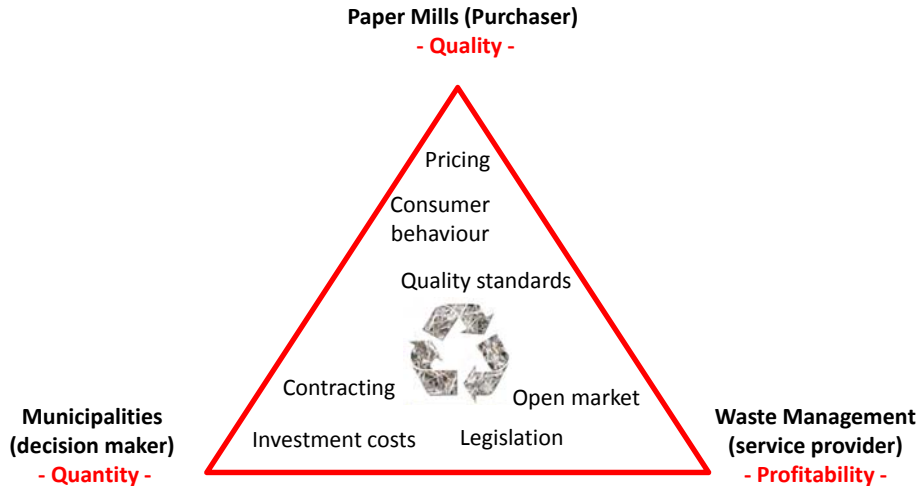
1. Stakeholders' areas of conflict
2. Recommendations
3. Tool for decision finding



1. Stakeholders' areas of conflict



Areas of conflicts



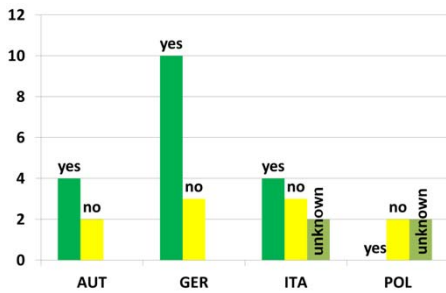
Areas of conflicts



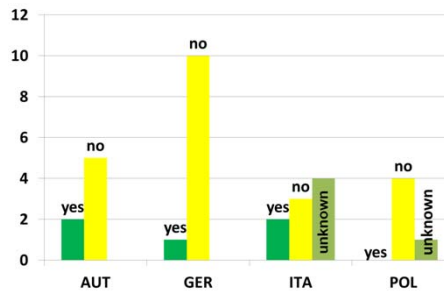
Survey on Collection Strategies: Changes observed in recent years

n = number of answers from local authorities

n increasing collection rates

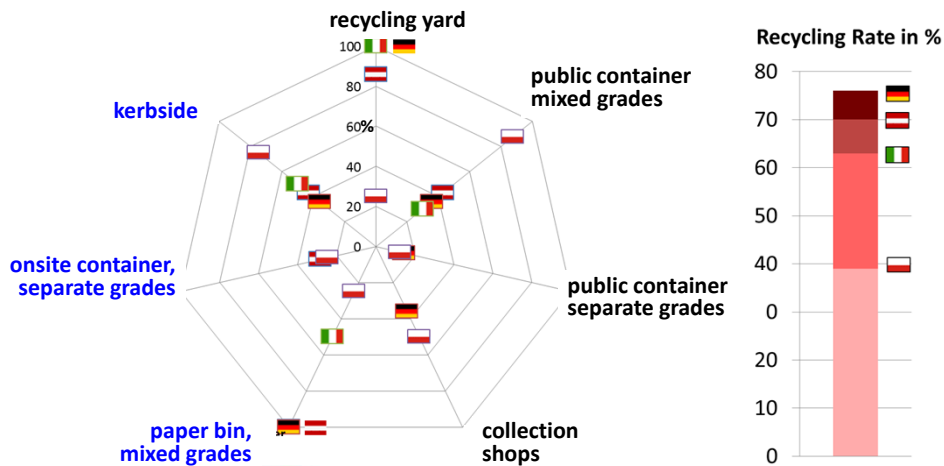


n improving quality



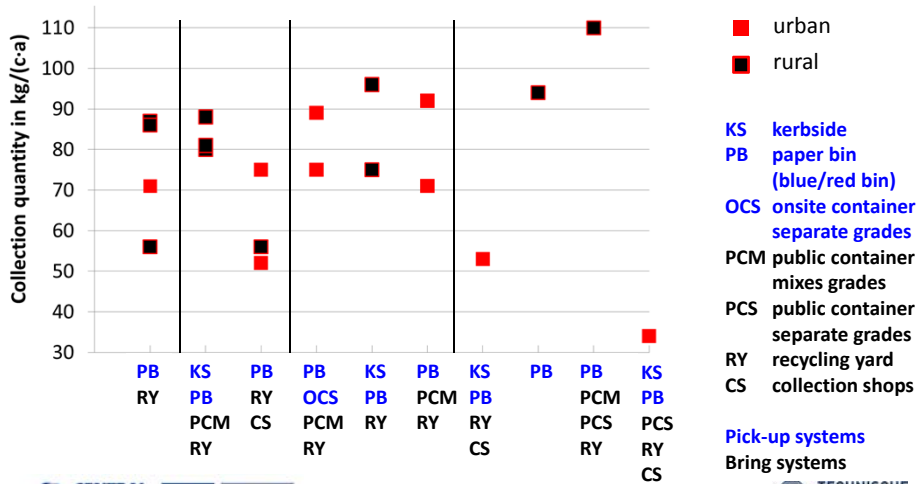
Correlation between collection system and recycling rate

39 responding authorities



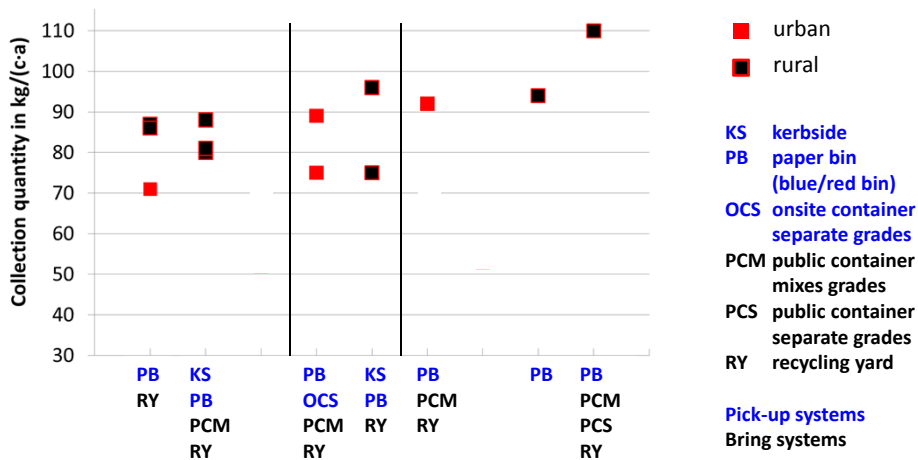
Correlation betw. combination of collection systems and quantity

20 responding authorities, data from AUT + GER



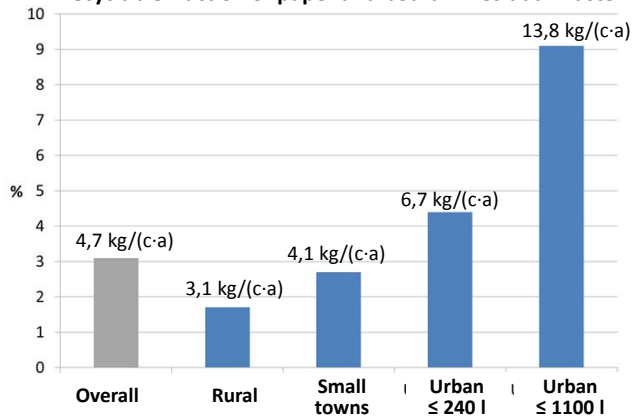
Correlation between type of collection systems versus quantity

elimination of collection shops and low GDP, data from AUT + GER



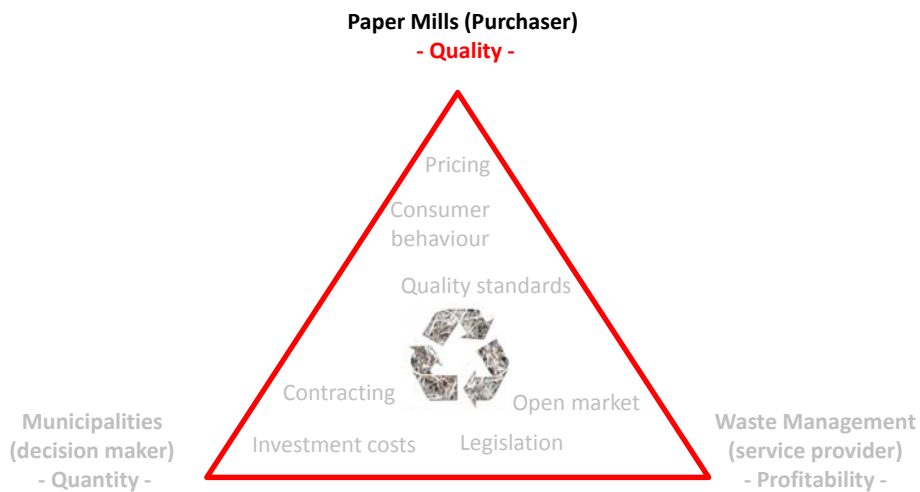
E. g. potential of paper for recycling from households depending on urbanisation/housing conditions, example from Germany

Study from Southern Lower Saxony, 2012:
Recyclable fraction of paper and board in residual waste¹⁾



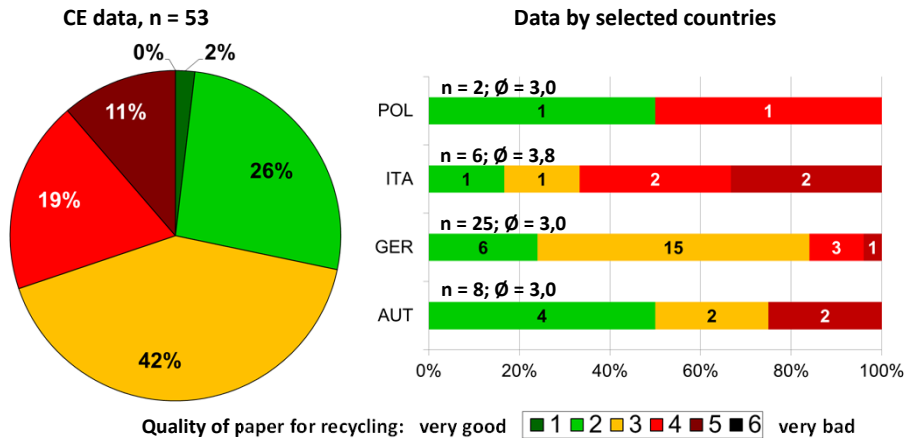
=> Comprehensive approach including all waste streams needed

Areas of conflicts



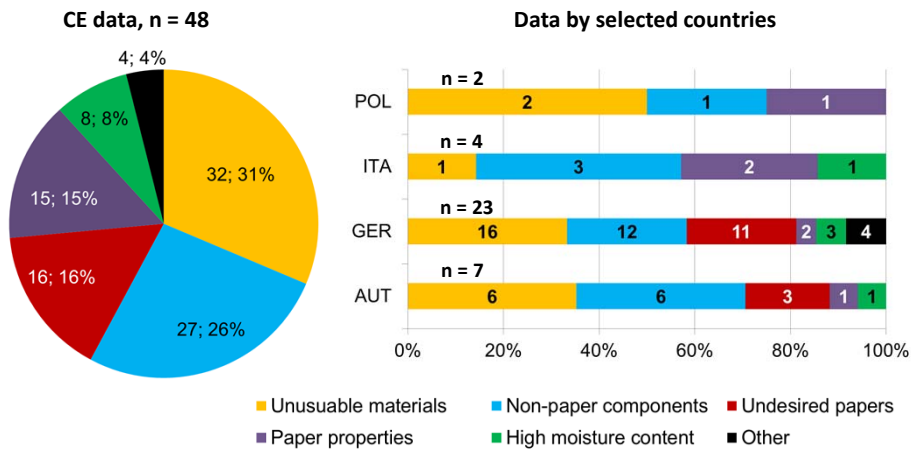
Satisfaction with the quality of paper for recycling

n = number of responding paper mills

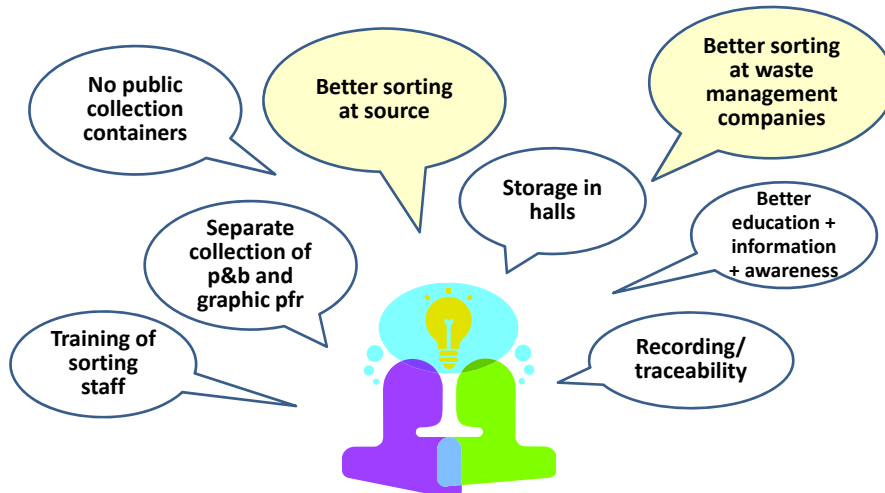


Type of problems with paper for recycling

n = number of responding paper mills, multiple answers possible







Ideas from paper mills to improve the collection of paper for recycling



Areas of conflicts

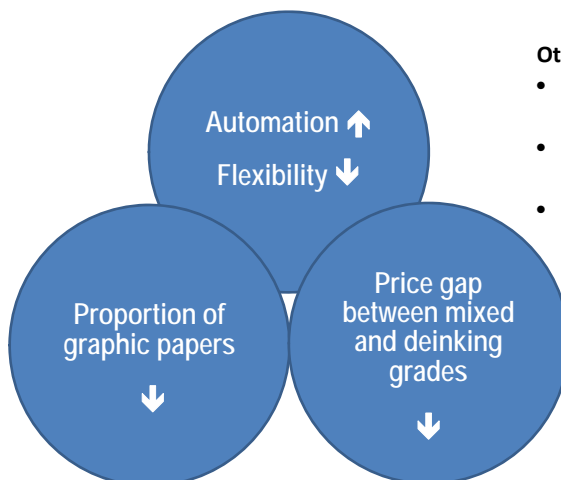


Statements concerning economic aspects of collection & sorting, Germany

	 +  <small>Source: WU</small>	  <small>Source: Intecus</small>
Examples from:	Berlin, automatic sorting plant (state of the art)	Dresden, manual sorting of paper for recycling from graphic paper containers
Collection	area determined by costs for logistics	two collection tours needed for separate containers => paper bin more economical
Profitability	largely depending on external factors	profitable only for already separately collected graphic paper
Quality	little undesired material sorted paper for recycling: visual good quality for paper mills	in graphic containers: 90 % graphic, 10 % miss-sorting paper bin: 2-5 % undesired mat.

*Source: <http://www.mario-czaja.de/2014/03/gemeinsam-am-blaue-tonnen-problem-arbeiten/>

Challenges for waste management industry in Germany



Other facts:

- Short contract durations with municipalities
- Strong competition results in small margins
- Additional competition by paper mills (contracts between paper mills – local authorities)
 - (Increasing thefts and frauds)

=> **Poor to non existing planning security**

Challenges for waste management industry in Poland

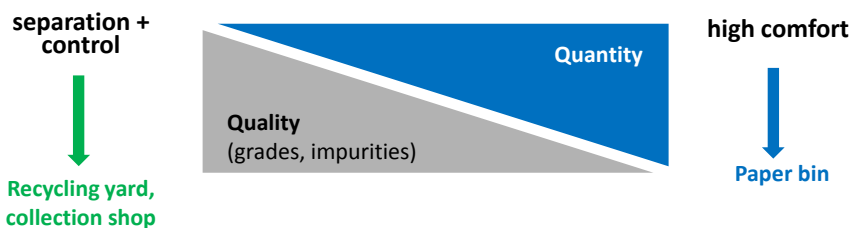


Source: Rethink, Stora Enso 3/2012

Focus on organisational challenges/problems:

- Municipalities are free to decide about level of waste separation
- Often no sorting at point of collection
=> low quality of paper for recycling
=> unconscious ignorance of requirements by municipalities?
- No effective control of waste management streams by authorities
- Often low technical standard of sorting plants
- Relatively low environmental awareness & too little incentives for citizens to separate recyclable fractions

Differences and competing objectives make the identification of ideal solutions difficult



- No clear indication from data and other sources that certain collection systems offer overwhelming effects.
- Assessment depends upon particular stakeholder group.

2. Recommendations

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Reduction of areas of conflicts

+

Improvement of waste management

Reducing the areas of conflict (1)

Contracting and concepts:

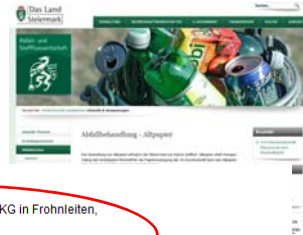
- **Long-term contracts** between stakeholders to support willingness to invest
 - => min. 5 years
 - => room for adapting prices and fees
 - => transparent contract design (e. g. separation of collection and sales)
 - => CEPI guidelines on tendering collection
- **Rethink public private partnerships** for sorting plants especially for urban/metropolitan areas
- **Inclusion of regional industries** in concepts
 - => requirements of local paper industry
 - => sorting plants available



Reducing the areas of conflict (2)

Communication and education:

- **PR activities for local use of paper for recycling** by municipalities
=> rise awareness of importance of regional recycling loops, e. g. publication of recycling ways on municipalities websites
- **Enhance the dialogue** between major stakeholders
- **Education** for stakeholders by stakeholders
=> e. g. use of same quality standards



In der Steiermark werden von der

- Fa. Mayr-Melnhof Karton GmbH & Co KG in Frohnleiten,
- der Fa. Norske Skog in Bruck/Mur,
- der Fa. Rosegg & Rothwangl in Koglhof und der
- Fa. Bauernfeind Roman Papierfabrik AG in Frohnleiten

Papier und Kartonagen zur Ver

Source: www.abfallwirtschaft.steiermark.at

Reducing the areas of conflict (3)

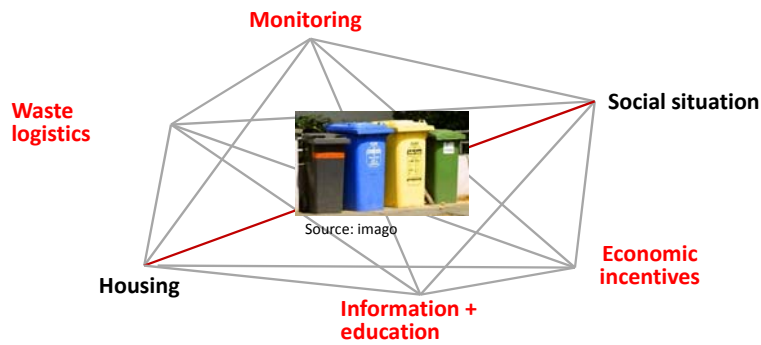
Legislation and other aspects:

- **Implementation of recycling target rates (national)** adjusted to waste streams
- **Clear rules concerning responsibility** for collection from households
=> organization by municipalities
=> no private pick up systems (e. g. blue bin)
=> allowance of private collection shops
=> support of collection by kindergartens, charities,...
- Evaluate **take-back systems for packaging** (dual systems)
- Countrywide/Europe-wide **standardised minimum waste separation**
- **Stricter control** of waste/recyclable fraction flows
- **Support** of development of **useful waste management technologies** helping to meet recycling rates



Socio-economic factors influence success of collection systems on a very local level

Relevant factors for waste separation apart from legal framework:



red: influencable by municipalities

Improvement of waste management (1)

Waste logistics:

- **No commingled collection** for paper for recycling with other recyclable fractions
- **Separate collection of graphic paper** if applicable
- Most **user-friendly collection system** for available space
=> short (or convenient) ways
=> mixture of pick up and bring systems
- **Appropriate design/service of collection points**
=> adjustment of container size/collection intervals
=> locked or fenced containers



Source: private photography, Wrocław

Improvement of waste management (3)

Economic incentives:

- **Reward citizens** for paper for recycling in good quality
=> credits for mixed grades from paper bins by weight and property
=> incentives for pre-collected paper for recycling (graphic, board) at municipal recycling yards



Source: private photography, Heidenau

- Separate paper for recycling collection should be offered **free of charge**
- **Fair waste charging system/personalization of disposal fees**
=> Pay-as-you-throw for residual waste (paying per bag, by weight, by volume)
- Adjustment of **fees for residual waste**

Improvement of waste management (4)

Information and education:

- **Multichannel marketing** by authorities
=> information phone, posters, written information, social media ...
- Municipal **waste management consultants**
- Waste separation campaigns and **communication of benefits and results**
- **Environmental education** in kindergartens and schools
- **Countrywide consistent layout** of collection systems

uniform label scheme in Czech Republic

source: presentation by Mr. Grolmus (EKO-KOM) at workshop on collection strategies in Sopron, 9.7.14

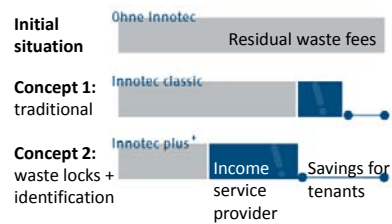


Improvement of waste management (7)

Special solutions for large housing estates:

- **Personalized costs** especially important for motivation (high anonymity)
=> lock and identification systems (fair waste management)
- Example from Germany: use of **specialized** private or public **service partners** with closed concepts and performance contracting
=> services: analysis, consultancy, layout, information of tenants, management of collection points, clearing
=> financed by saving waste fees
- **Educational offerings** by local authorities for housing associations

Source: Image brochure of innotec abfall-management GmbH,
example of reduction for waste fees and performance contracting



3. Tool for decision finding on www.ecopaperloop.eu/outcome



Online based tool

1. Request of local conditions and specification of area
2. Decision tree:
 - decision if change of collection systems is useful
 - including recommendations
3. Suggestions for adequate collection systems on basis of local conditions (descending priority):
 - Building structure
 - Infrastructure
 - Mobility
 - Income
 - Average age of population
 - Education

Please choose the country where you want to collect paper for recycling.*

[Please choose] ▾

Name of the region*: _____

How is the average income in your region compared to your country?

● much lower ● lower ● average ● higher ● much higher

How is the transport (roads) infrastructure in your area compared to the average infrastructure in your country?

● worse ● average ● better

How is the education level in your region compared to your country? The education level can be measured by percentage of tertiary education.

Example: Request for local conditions



Example for results

Dresden Neustadt:

- **Building structure:** detached, semi-detached, **rented flats in apartment buildings**, owned flats in apartment buildings, high-risers
- **Transport infrastructure:** much worse, **average**, better
- **Mobility per 1000 inh.:** < 300 cars, **300-500 cars**, > 500 cars
- **Income:** much lower, lower, **average**, higher, much higher
- **Age:** < 38, 38–46, > 46
- **Education:** lower, average, **higher**

Results: Public containers – Onsite bin/containers – Collection shop



Suitable collection systems for your situation

Based on your given answers these are recommended collection systems for your region/area. They are listed in descending order, beginning with the most suitable.

The evaluation of the different collection systems reflects the project team's opinion and means the following: ++ = very good, + = good, = = pending, - = bad, -- = very bad.

Public conventional containers and underground containers (bring system)

Conventional containers and underground containers are placed on public ground at places where they are reachable for citizens. Conventional containers are suitable for urban areas, but also for rural areas with a relatively high population density. For areas with low population density installation close to highly frequented locations is a good option. Underground containers, in contrast to conventional containers, have the container body placed underground and offer higher collection capacities. Underground containers are particularly recommended where smart appearance is an important point for decision finding. They are very well suited for urban and densely built-up areas. For collection a special garbage truck is needed that can lift the containers up. In the case of separate collection of graphic paper for recycling and board/cardboard special trucks with 2 compact-mats or an extra collection bin is necessary. Public containers are probably the best system if a municipality decides for separate collection of graphic paper for recycling and board/cardboard, because manual re-sorting of separately collected graphic paper for recycling seems to be economical (experience: 10 % miss-sorting in public containers) (2).

	Conventional container	
User-friendliness	Depends strongly on the distance between the residents' home and the collection points. Beneficial if containers are situated on main paths or closed to highly frequented locations.	++
Quality of paper for recycling	Varying a lot depending from the area. Example for good result: 2-3 % non-paper components (2). Too small slots for paper packaging may cause disposal of paper for recycling outside containers.	++
Costs	Expensive for mixed paper for recycling: specific collection cost in €/t relatively high and in the same range of onsite bin (6). Higher collection costs for separate containers for graphic paper for recycling and board/cardboard if two collection bins needed (2). May be compensated by higher returns.	+
Other aspects	Experience with feasible distance: max. 100 m (6). If adequate collection intervals and container sizes/numbers avoiding disposal of paper for recycling outside containers. Easier to expand compared to underground containers.	+
	Underground container	
User-friendliness	Depends strongly from the distance between the residents' home and the collection points. Beneficial if containers are situated on main paths or closed to highly frequented locations. More convenient to fill compared to conventional containers (6, 9) for people with disabilities.	++
Quality of paper for recycling	See conventional containers	++



Ecodesign for the Enhancement of Central Europe
Paper Based Products Recycling Loop



Grant No: 4CE555P3

**Thank you for your
attention.**



11.02.2015

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