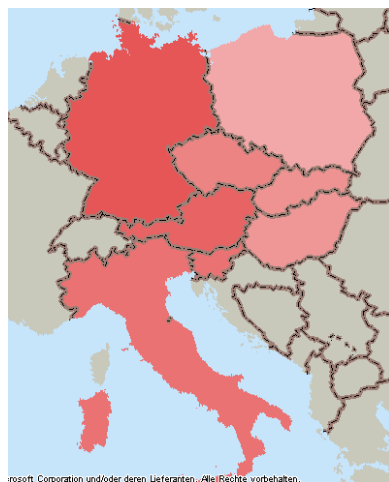


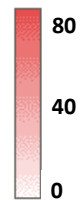
WP 4 – Criteria for improved strategies for p&b collection in CE



Current p&b 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



Criteria for improved strategies for p&b collection in CE

Agenda

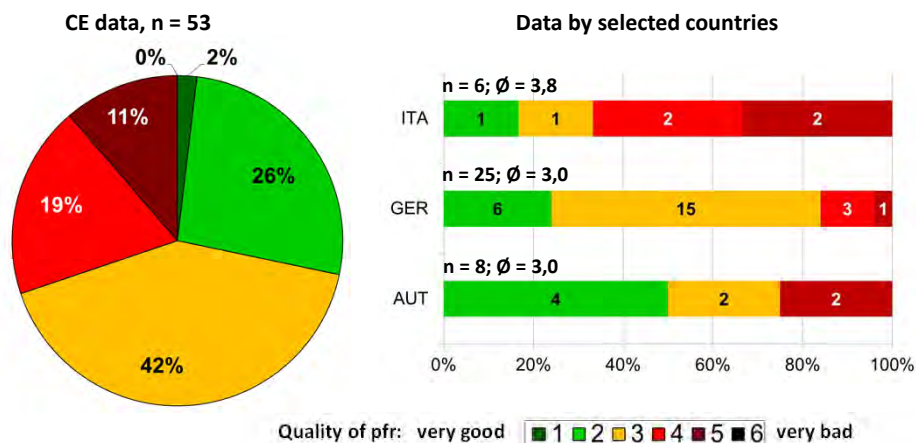
- ➔ The paper mills' view
- ➔ The authorities' view
- ➔ The waste management companies' view
- ➔ Pros and Cons
- ➔ Authorities as decision maker
 - Social and technical mixture of influences
 - Decision tree



The paper mills' view

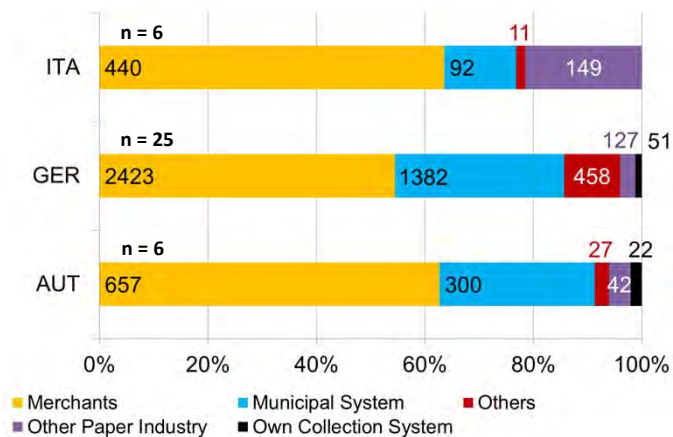
Paper mills' survey: Satisfaction with quality of pfr

n = number of responding paper mills



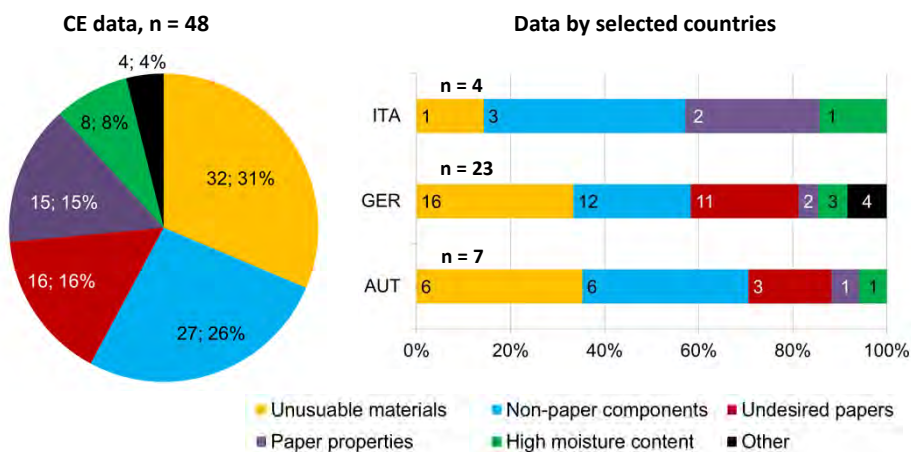
Paper mills' survey: Sources of pfr

n = number of responding paper mills, multiple answers possible, data in kt/a



Paper mills' survey: Problems with pfr

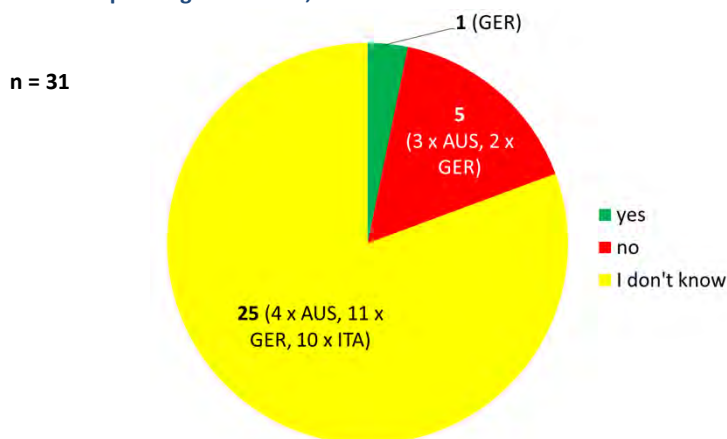
n = number of responding paper mills, multiple answers possible



The local authorities' view

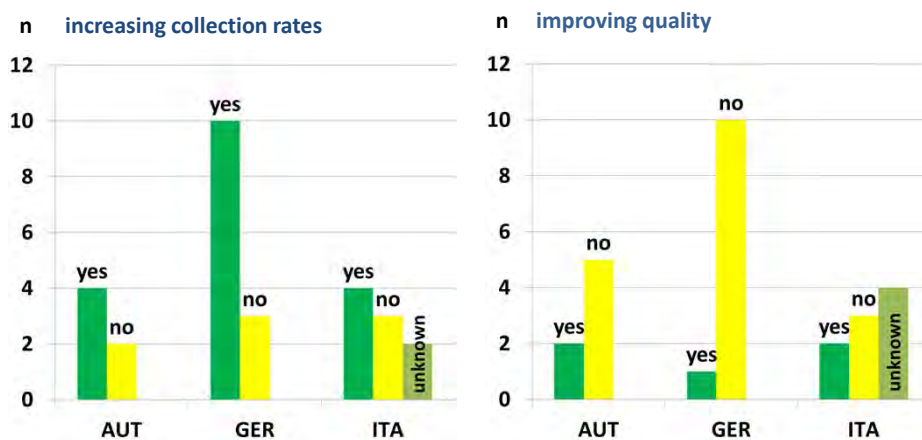
Survey Collection Strategies: Implementation of standard EN 643 for classification after sorting

n = number of responding authorities, data from AUT + GER + ITA



Survey Collection Strategies: Changes observed in recent years

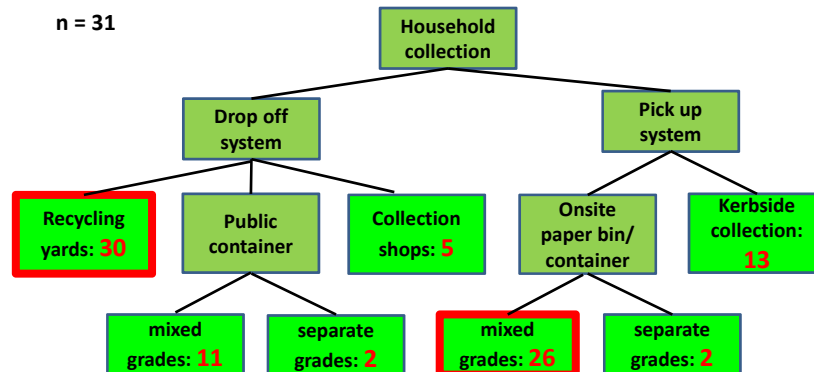
n = number of answers



Survey Collection Strategies: Existing collection systems

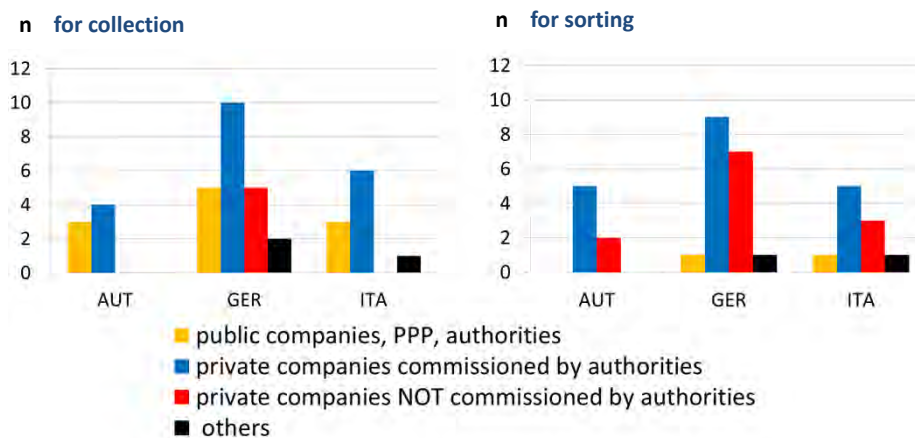
n = number of responding authorities

data from AUT + GER + ITA, multiple answers possible



Survey Collection Strategies: Type of organisations responsible for collection and sorting

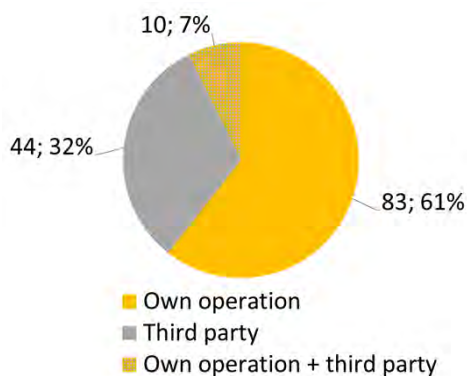
n = number of responding authorities, multiple answers possible



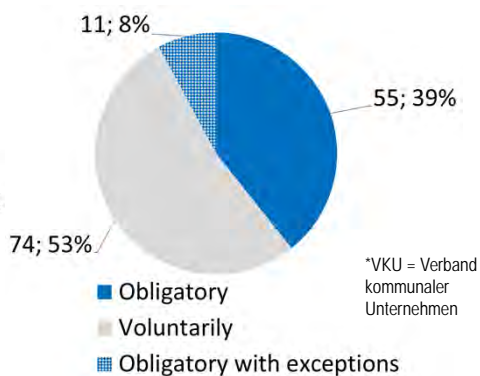
German data from the VKU* report 2012: Handling and regulations

n = number of answers

Handling of municipal collection,
n = 137



Regulations governing the use of
municipal systems,
n = 140

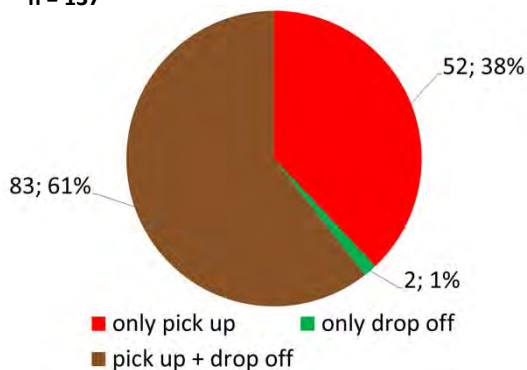


*VKU = Verband kommunaler Unternehmen

German data from the VKU report 2012: Usage of pick up and drop off systems

n = number of answers

n = 137



Trend towards pick up systems

Drop off system:

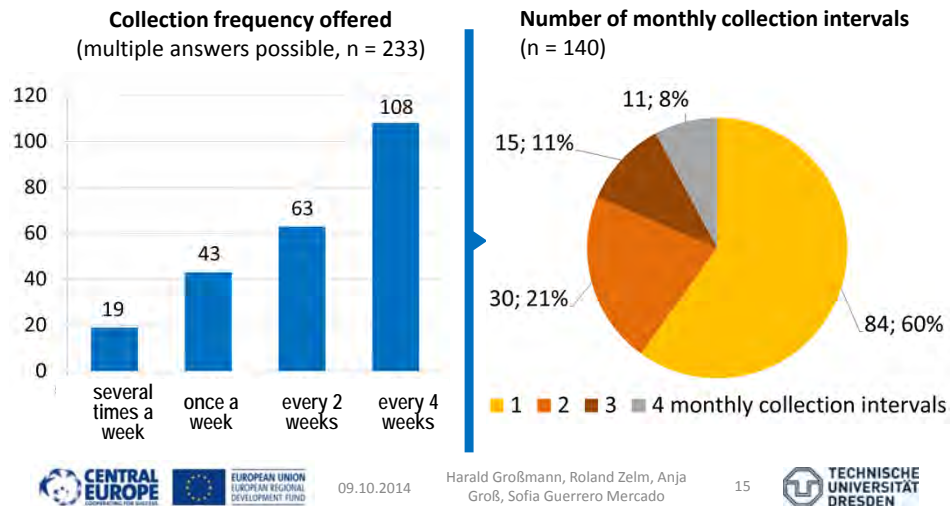
inhabitants/public container $\leq 7 \text{ m}^3$:

- min. 151, max. 5,393
 - average 1,246
- (n = 40)

Distance to sorting plant/merchant:

- min. 1 km, max. 45 km
 - average 13 km
- (n = 102)



German data from the VKU report 2012: Collection frequency (pick up), n = number of answers



The waste management companies' view

Statements from Waste Management Companies, Dresden



Economic aspects of manual sorting :

		Graphic paper 	Board
Collection	more economical because of vehicle technology => collection in one tour	=> two collection tours	
Profit-ability	not profitable because of low price difference between deinking and mixed grades	profitable only for already separately collected newspapers/magazines	
Through-put	20 t mixed paper: 6 employees · 8 working hours	40 t newspaper/magazines: 2 employees · 8 working hours	

Are automatic sorting plants a possible solution to at least partly solve the pfr quality problems reported by paper mills?

Statements from Waste Management Companies, Wertstoff-Union Berlin

Economic aspects of automatic sorting:

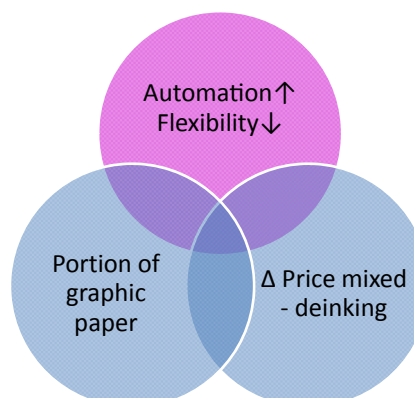
	 + 
Collection	Collection area determined by costs for logistics
Profitability	largely depending on external factors
Throughput	120,000 t/year (3/4 blue bin, 1/4 packaging + mixed paper from commercial sources; 2 work shifts á 3 employees for re-sorting)
	Only little undesired material in blue bin (charging and collection frequency are crucial for acceptance and quality)

No prediction concerning market opportunities for automatic sorting plants possible

Sorting plants act in a volatile market with changing consumer behaviour:

- Portion of deinking paper is continuously shrinking
- Paper thievery
- Interplay of supply and demand

Efficiency of sorting plants for lightweight packaging¹⁾:
100,000 t/year throughput
5 Mio. inhabitants collection area





Pros and Cons

Conclusions of the World Café at the Paper Collection Strategies Seminar in Sopron (HUN, July 9, 2014)

Participants of the paper chain



09.10.2014

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Pros and Cons



Commingle collection needs to be banned

- **YES:** penalties, recommendation to refrain, social pressure
- **NO:** no bans
- Do not leave decision regarding certain collection system to municipalities!

Collection should be as easy as possible for consumers

- **YES:** kerbside (pick up) tops bring banks, improved information, frequency, costs

New and efficient sorting technologies will have the main impact to solve quality problems of pfr

- **NO:** quality of pfr is made at home, promotion of sorting



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Pros and Cons

Collection strategies have to be supported by PR and public education for best results concerning quantity and quality

- **YES, YES, YES** and as early as possible

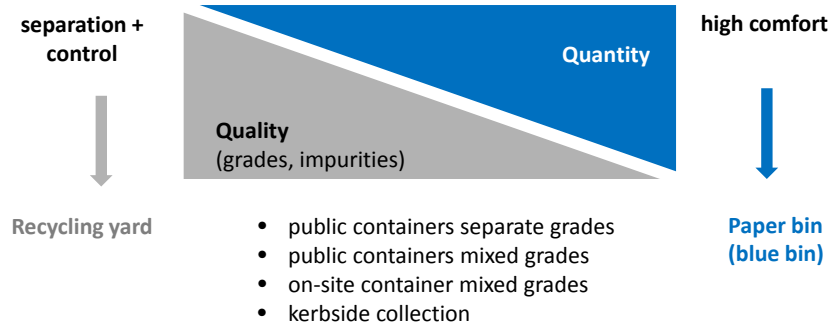
Local authorities should be fully responsible for installing and organising collection from households (independent from market price)

- **YES:** no open competition
- **NO:** no assignment of all responsibilities to local authorities

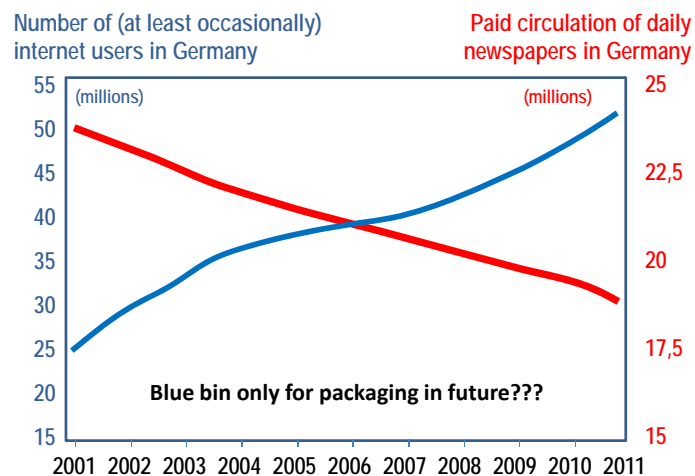


Authorities as decision maker

Discrepancies prevent ideal solutions

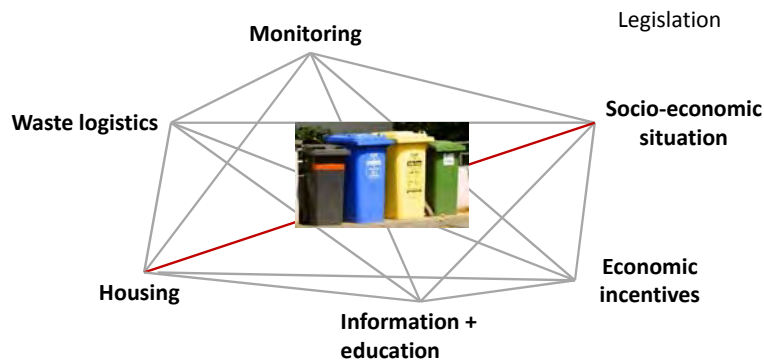


What the statistics say

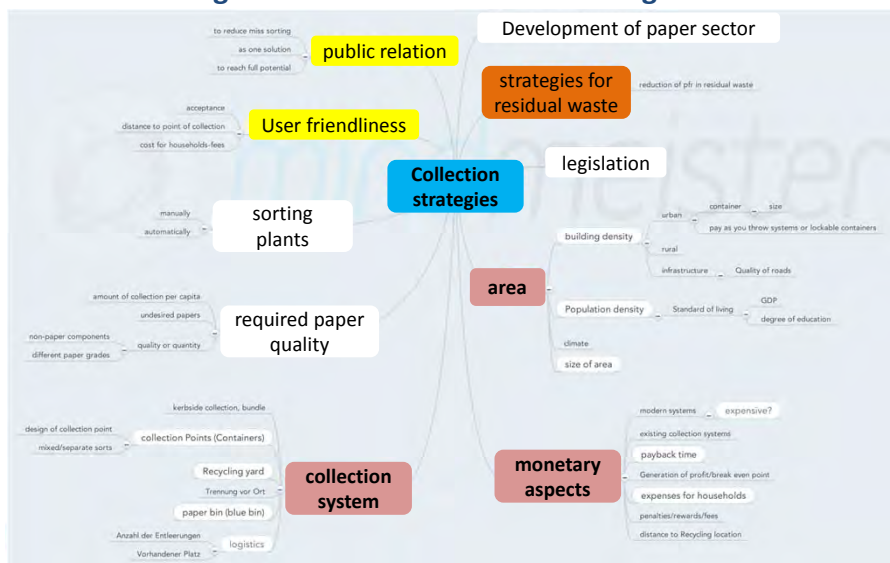


Is there any potential to increase quantities of pfr from households in countries with high recycling rates?

Relevant factors for waste separation: social technical mixture



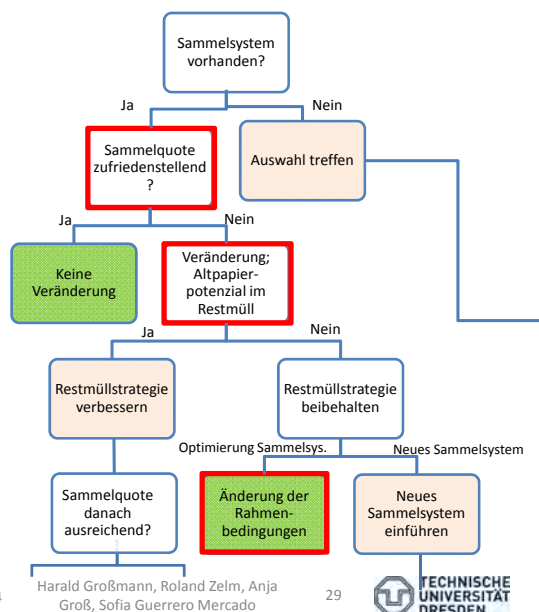
Brainstorming: Influences on collection strategies



Decision tree (excerpt)

Prioritisation for introduction of new collection system:

1. Building structure
2. Focus on quality or quantity of pfr
3. Space for collection system
4. User friendliness
5. Level of investment



Targets for collection rates: LCA-IWM project

Prosperity level	Average potential in kg/(c·a)	Paper & board	
		Rate of separate* collection	
		Average in %	Max. in %
Very high	119.7	45.5	74.2
High	123.8	12.8	33.2
Medium	83.2	4.4	48.9
Low	46.5	0.8	7.5

← medium and optimum target rate

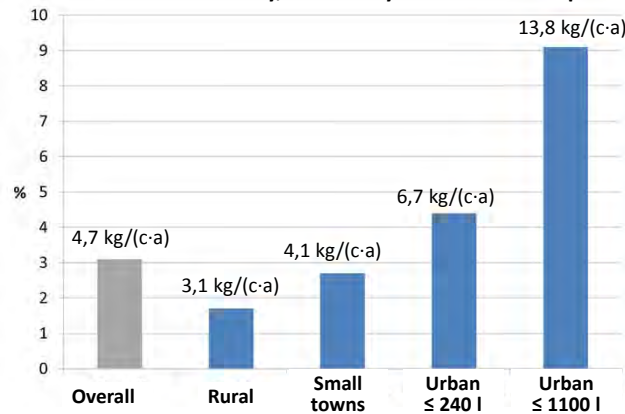
Prosperity level defined by state of economic development (GDP, infant mortality rate, employment structure)
26 datasets 45 datasets

* Separate collection means separation of recyclable fractions (not paper grades)

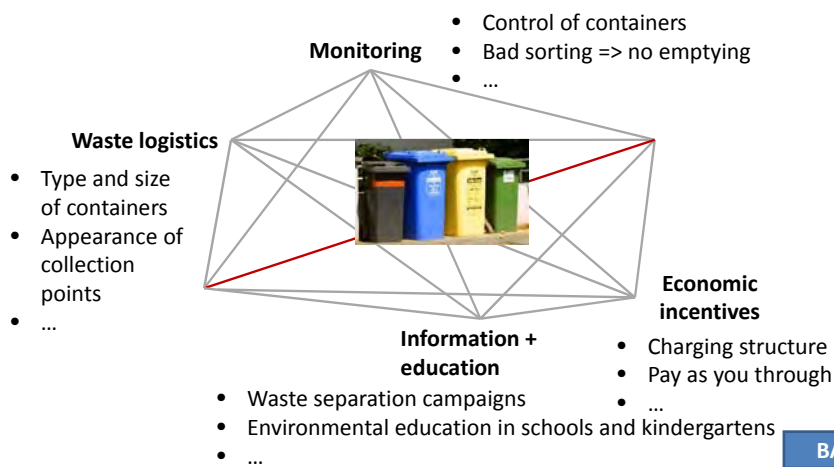


Is there any potential to increase quantities of pfr from households in countries like Austria and Germany?

Study from Southern Lower Saxony, 2012: Recyclable fraction of p&b in residual waste¹⁾



Prevailing conditions





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



**Thank you for your
Attention.**



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Harald Großmann, Roland Zelm, Anja
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