



Paper and Board Collection Strategies for Central Europe

A report from the
ECOPAPERLOOP Project

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The ECOPAPERLOOP Project

In Central Europe regions paper for recycling is a major resource, the paper recycling rates within this region, however, are anything but homogeneous.

Since paper for recycling is not only recycled in the country where it is produced, some essential features such as eco-design and ecollection concepts must be developed at transnational level to increase the sustainability of the whole paper loop.

The ECOPAPERLOOP project, co-funded by the European Union/European Regional Development Fund (ERDF) and the local project partners, aims at improving the quality of paper for recycling.



... but what is CENTRAL EUROPE?



**ECOPAPERLOOP'S Objective:
Enhancing the Quality of Paper for Recycling**

The background:

- Recycling allows used materials to be converted into new products without using any or at least much less of precious resources, many of which we are greatly overusing.
- Recycling helps to reduce the rapidly increasing amounts of waste which otherwise have to be disposed – not always in an environmentally compatible way.
- Recycling saves substantial amounts of energy thus reducing the CO₂ footprint

The European Commission strives for a bio-based society in Europe by the year 2050.

The European paper industry strives for reducing their CO₂ emissions by 80 % by 2050.

In this context paper recycling will play an even more important role than ever.

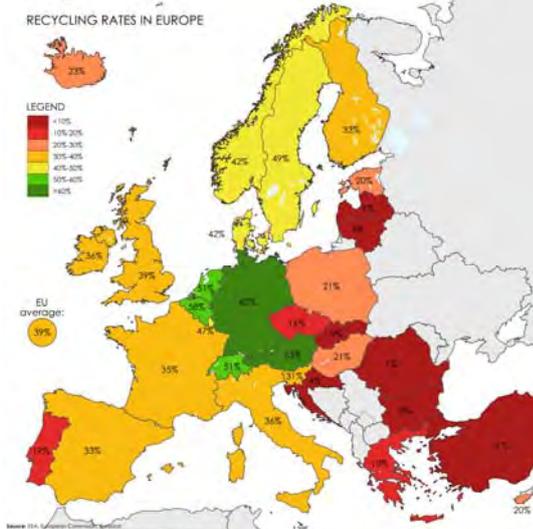
The Importance of Waste Management

Although ECOPAERLOOP focusses on further developing P&B recycling in CENTRAL EUROPE – only a comparably small part of the continent – corresponding strategies must not be discussed disregarding the overall context of waste management and recycling and – even more – the asymmetries of the various national situations.

As there is a strong correlation between the total amount of municipal waste and the total amount of paper & board recycled in a given region, the current statistics unambiguously state that there is something to be done in parts of Central Europe.

The path to more recycling and less waste, though, is not a simple one. It requires a different way of thinking and it sometimes requires new legislation (for example on recovery strategies, product design or the like). What might help in order to become better is to share and discuss experiences made elsewhere under similar conditions. This is one of the main objectives of ECOPAPERLOOP.

Recycling of Municipal Waste in Europe in 2010



Countries < 50 %

- Sweden 49 %
- Luxembourg 47 %
- Denmark 42 %
- Norway 42 %
- United Kingdom 39 %
- Ireland 36 %
- Italy 36 %
- France 35 %
- Spain 33 %
- Finland 33 %
- Slovenia 31 %
- Iceland 23 %
- Hungary 21 %
- Poland 21 %
- Estonia 20 %
- Cyprus 20 %
- Portugal 19 %
- Greece 18 %
- Czech Republic 16 %
- Malta 13 %
- Latvia 9 %
- Slovakia 9 %
- Lithuania 5 %
- Croatia 4 %
- Romania 1 %
- Turkey 1 %
- Bulgaria 0 %



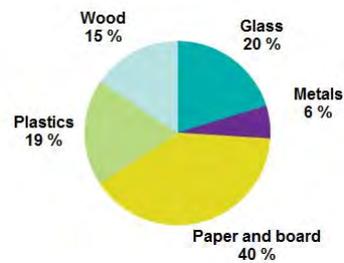
The Importance of Waste Management

P&B is by far the most intensively recycled material in Europe.

But it has become a much sought-after resource in many parts of the world. And in contrast to many other recyclables P&B is probably the most vulnerable one. If not treated appropriately it quickly loses important quality characteristics and thus its value for the paper industry and what comes on top: paper fibres cannot be recycled forever.

So there are good reasons to collect, sort and recycle P&B in the best possible way.

In Europe and in particular in CENTRAL EUROPE there is no longer what is considered a developing country in the narrow sense in which recycling is frequently of marginal importance, but there are large differences when it comes to waste management in general and P&B recycling in particular.



Recycling rates EU-27 (2011)



The basics of recycling in general

Paper recycling, though, must not be regarded as a unique approach completely unrelated to any other strategy to tackle the problem of overutilising scarce resources or to solve disposal problems. It is usually part of far more comprehensive strategies, the rules and constraints of which have to be respected and accepted to some extent.

Recycling of no matter which material is – as the term claims – a cycle .
A cycle which basically consists of 3 phases.

- I. Collection and sorting waste (discharged material)
- II. Processing sorted waste into a usable secondary raw material
- III. Producing new products based entirely or partially on this very secondary raw material



The basics of recycling in general

All of these 3 phases are equally important for meeting the objectives mentioned and in particular in terms of procuring products which are sufficiently well accepted by the consumer.

But in all 3 phases faults can be made or to some extent inevitably occur which are prone to make the whole approach fail or render it unsatisfactorily.

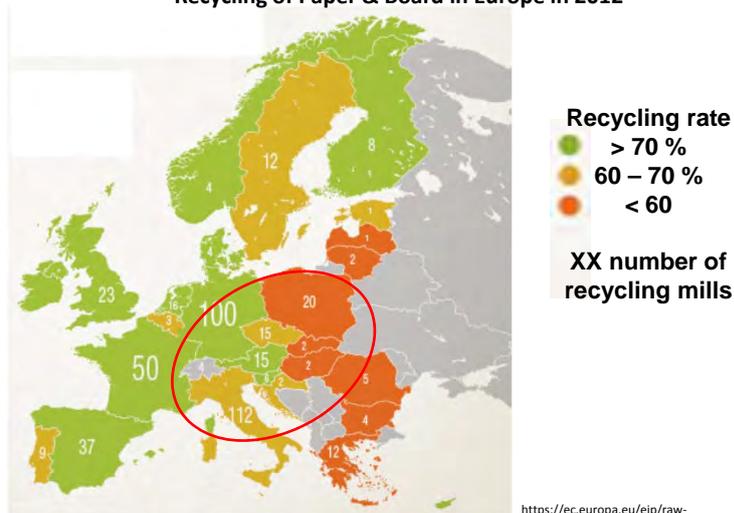
Most of those faults, however, which are most difficult or not at all to remedy are made in the 1st phase, i. e. in collecting and sorting.

Against this background, the identification of the best collection and sorting system for a prevailing configuration is crucial in achieving ECOPAPERLOOP's objective to

Enhance the Quality of Paper for Recycling in Central Europe



Recycling of Paper & Board in Europe in 2012



<https://ec.europa.eu/eip/raw-materials/sites/rawmaterials/files/RAW-081-13.pdf>



The specific features of paper recycling

There is a general consensus within all stakeholders that paper & board waste is a valuable commodity. But as stated earlier, this value is far more vulnerable and volatile than that of many other materials.

P&B can be contaminated or polluted with other matter while being converted or used to an extent which hinders any recycling or even makes it impossible. In some cases this is unavoidable – but it can safely be assumed that this applies to less than 20 % of all P&B.

P&B, in particular graphic P&B, can also gradually forfeit its recyclability because of ageing.

And eventually, P&B can also lose its value due to inappropriate collection and sorting strategies .

And this is something which can be avoided.



The current options for collecting P&B

Collection strategies can be characterized according to

- what kind of recyclables are collected and
- how the collection of recyclables is organized

Collection strategy according to the kind of recyclables

Commingled /Single stream collection

There are many options for collecting recyclable materials, but **commingling** and **single stream** collection strategies are rather wide-spread amongst municipal recycling programs.

Both terms are frequently considered synonyms to refer to systems in which all recyclables are collected in the same bin or container.

«Commingling», however, may also refer to materials grouped together by category (e. g. graphic and packaging paper), but still separated from other types of materials.





The current options for collecting P&B

Source separation

On the opposite end of the spectrum of collection options is source separation in which materials are separated by type and grade (i.e. quality) prior to collection.

Commingling can be considered something in between specific source separation and single stream collection.

There are benefits and drawbacks to each system depending on the composition of the waste stream, previous success with collection techniques, amount of community support and participation, and available work force and technological options.



One size does not fit all when it comes to recycling collection systems, so all of the pros and cons of the entire lifecycle of the system should be evaluated before making a decision.

http://pages.uoregon.edu/recycle/Book/HTML/chapter_9.htm



The current options for collecting P&B The pros and cons of commingling and source separation

A major benefit of single stream collection is that higher volumes are collected which, however, may be highly contaminated and often unfit for use in manufacturing.

Due to its pronounced sensitivity to virtually all kind of contaminations special care must be taken when collecting P&B in order to preserve and safeguard its properties.

Including paper in single stream collection can greatly inhibit a recycling program's ability to procure a valuable raw material.

It is always easier to switch from no matter which system to commingling/single stream if there is a need than to switch to source separation later because participants will not be accustomed to separate materials and contamination will occur.

Paper& board therefore should – wherever possible – be collected separately from any other recyclables. Source separation even between paper and board is the best option if justified by the local demand.



**The basic collection strategies:
Organisation of collection**

If we leave visionary solutions like underground pneumatic or vacuum systems or the like out for the moment there are basically only 3 alternatives how recyclables (and waste) from household can be collected :

- **Curbside collection**
- **Bring-bank systems (Drop-off centres)**
- **Buy-back centres**



**The basic collection strategies:
Drop-off Centres**

These civic amenities require their clients to bring the recyclables to a central location, either an installed or mobile collection station or the reprocessing plant itself.

This form of recycling waste collection is easy to establish. However, since the use of such centres is on a voluntary basis, it often suffers from low and unpredictable supply of recyclables.





The basic collection strategies:
Curbside Collection

Curbside collection is a strategy frequently installed by local authorities or waste haulers to collect recyclable items from the consumer. Instead of sending their recyclables to a centralized location, in “Curbside Collection”, the recyclables are picked up from the recyclers using a waste collection vehicle.

It is considered a low-risk strategy to reduce waste volumes and increase recycling rates. Materials are typically collected in large coloured bins, coloured bags, or small open plastic tubs, specifically designated for content.



The basic collection strategies:
Buy-back Centres

In a Buy-back Centre system the participants are similarly to a drop-off system required to bring the recyclables to a central location. The only difference is the fact that, the (rather) clean recyclates are purchased from the recyclers.

This method of recycling waste collection provides an incentive for recyclers to send their used items for recycling, hence ensuring a stable supply of recyclables.

In cases where the resale value of the material is lower than the processing cost, government subsidies may be required to make the system viable.



In Central Europe Buy-back centres for paper and board are rarely found. It might be considered an initial step to develop source separated collection.



Criteria relevant for the identification of the most appropriate P&B collection system for a given situation

The most appropriate or most effective P&B collection system for a given situation is the one which procures best quality and highest yield in the most economic way.

Experience has taught that the efficiency of a collection system in terms of quantity and quality is a complex function of a.o.



Identification of the state-of-the-art of p&b collection systems in CE

Characterising typical regions in CE

Characterising recycling mills in CE

Mainly desk-top research and questionnaires aiming at identifying pros and cons of existing strategies for used p&b collection with respect to

- quality
- yield
- logistic requirements
- acceptance
- costs

Definition of a limited number of archetypical regions within CE with respect to a.o.

- population density
- local infrastructure
- structure of the regional p&b industry
- level of prosperity
- per capita p&b consumption

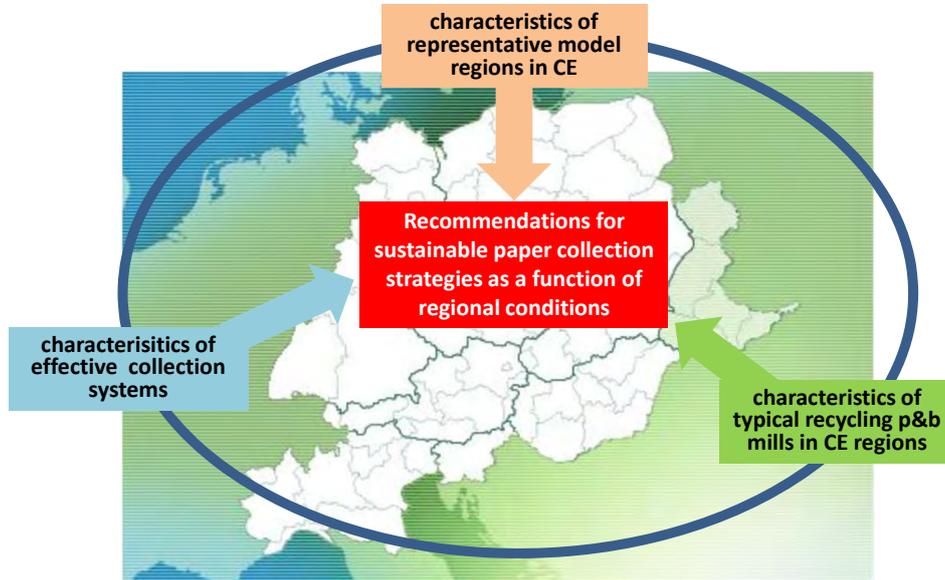
Description of the local recycling p&b industry within CE with respect to a. o.

- raw material basis
- products
- recovered paper procurement
- production capacity
- rp collection strategy

characteristics of effective collection systems

characteristics of representative model regions in CE

characteristics of typical recycling p&b mills in CE



The status of the project

The very comprehensive collection of data necessary to develop a sufficiently accurate idea of the diversity of constellations relevant for paper recycling in Central Europe is not yet finished.

It turned out that the culture of establishing meaningful statistics is anything but equally practised in this part of Europe – which makes data collection a challenge.

Once completed this data will be condensed into a limited number of model scenarios representing situations relevant for paper recycling in this part of Europe.

Eventually – based on the data mentioned, on experiences and on additional facts – recommendation will be made for these scenarios aiming at improving paper recycling through appropriate and more tailor-made collection systems.