

**Energy savings in paper production by opening up the value chains of recovered paper from lightweight packaging, residual waste and commercial waste**

**European Paper Recycling Council (EPRC) Awards 2021/2022**  
(29. Juni 2022, Brussels)

©Christian Maurer / Fotolia.de

© EnEWA



Gefördert durch:





### Background/ Problem Definition

- Traditional collection systems
  - Paper and board: Paper for recycling bins, recycling centers, commercial purchase
  - LWP: yellow bags & waste bins, recycling islands & recycling centers
- Due to declaration as laminates, misdirected waste and collection systems, a high percentage of the available fiber is withdrawn from the material cycle (in Germany by the XXXVI. Recommendation of the German Federal Institute for Risk Assessment (BfR)) and ends up in the mixed waste streams lightweight packaging (LWP), residual waste and commercial waste during collection.
- The increasing cost pressure in the packaging sector due to higher license fees and the large cost difference between paper and board & LWP leads to a trend and pull towards the blue garbage can.

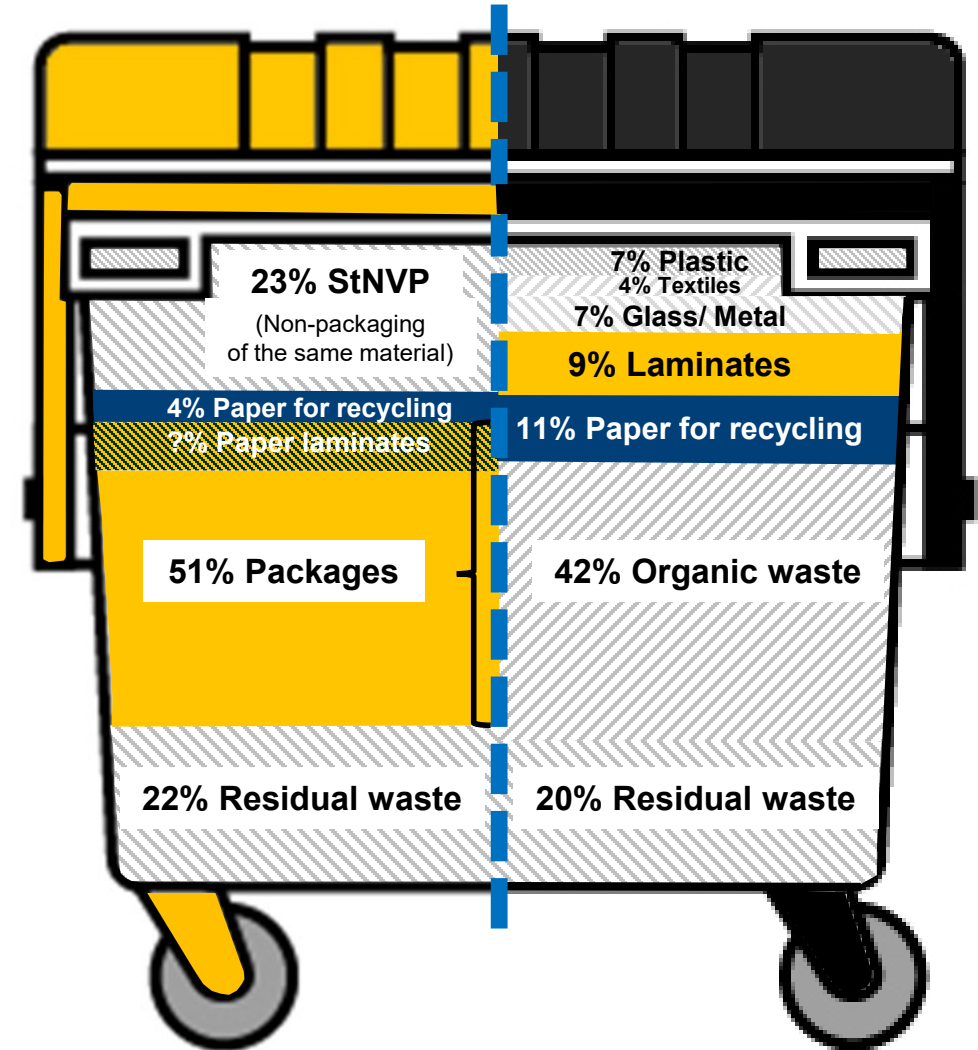
**To ensure the sensible use of fibers from mixed waste streams, to increase recycling rates and to make recycling more economically interesting, the overall process must be improved!**



# EnEWA.

## Objective.

- Development of paper for recycling processes from lightweight packaging, residual waste and commercial waste on a pilot plant scale.
- The project results shall lead to a further development of the XXXVI. recommendation of the BfR
  - Modification of the existing prescription ban
  - Introduction of technical limits
- By using the produced fiber material, the following objectives will be achieved
  - Definition of marketable fractions from the waste streams investigated.
  - Achievement of the targeted recycling rate of 90%.
  - Savings in CO<sub>2</sub>-emissions
    - Approx. 266,702 t/a CO<sub>2</sub>



Source: Thomä/ Widder Berliner Verpackungskonferenz 2014 [www.trennstadt-berlin.de](http://www.trennstadt-berlin.de)

© EnEWA





# EnEWA.

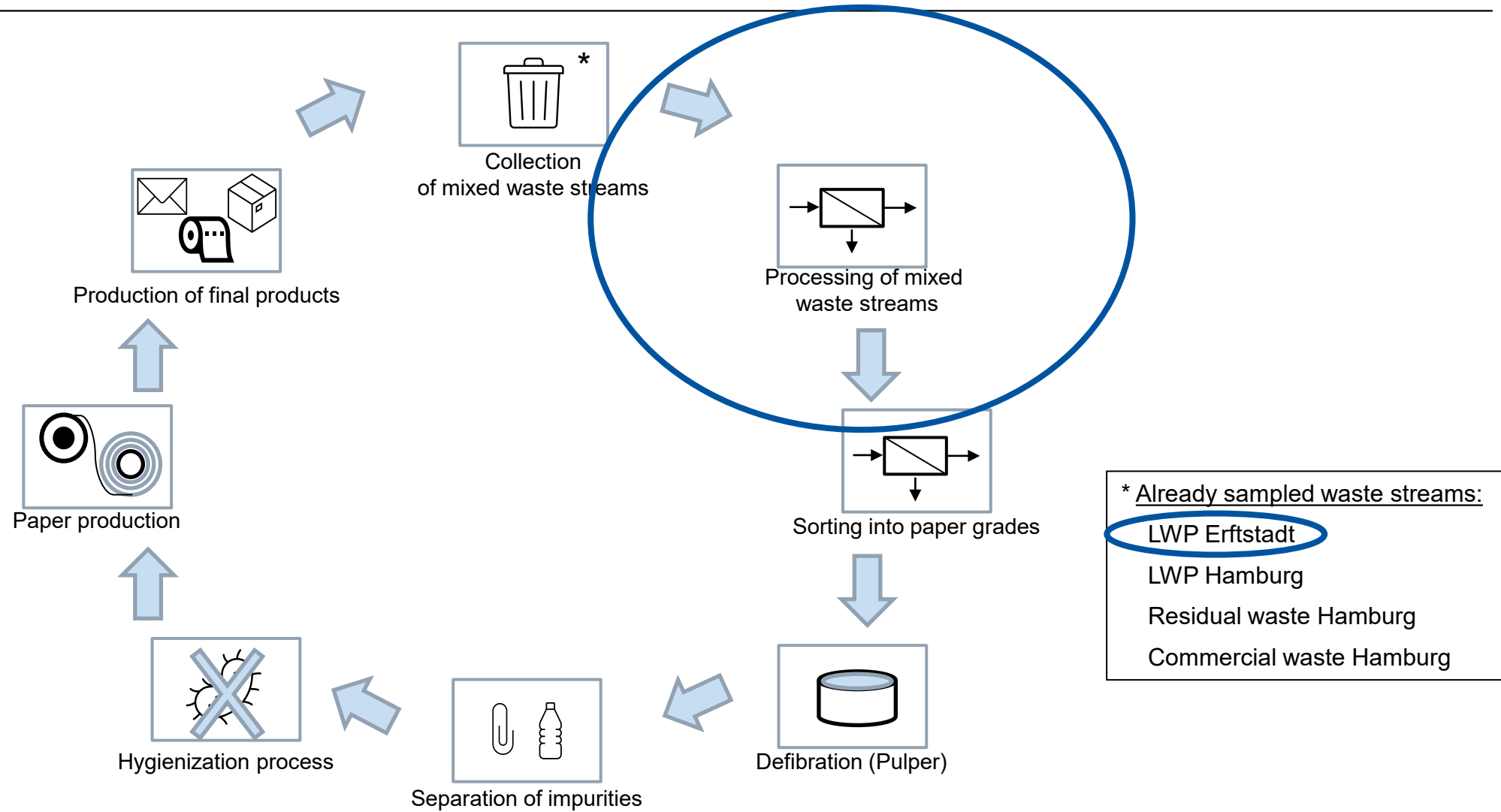
## Approach.



- Use of fiber material from mixed waste streams
- Development of a hygienization process
- Increase of recycling rates in paper production
- Submission of a recommendation for action to the BfR





# Paper Recycling Process.

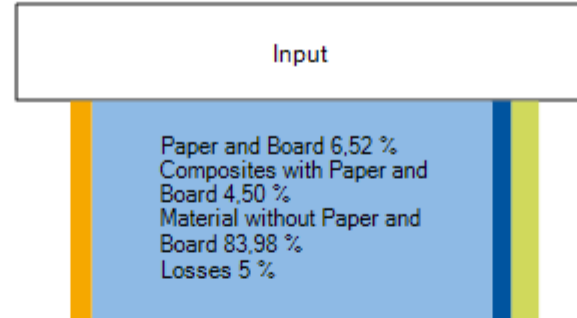
## EnEWA.



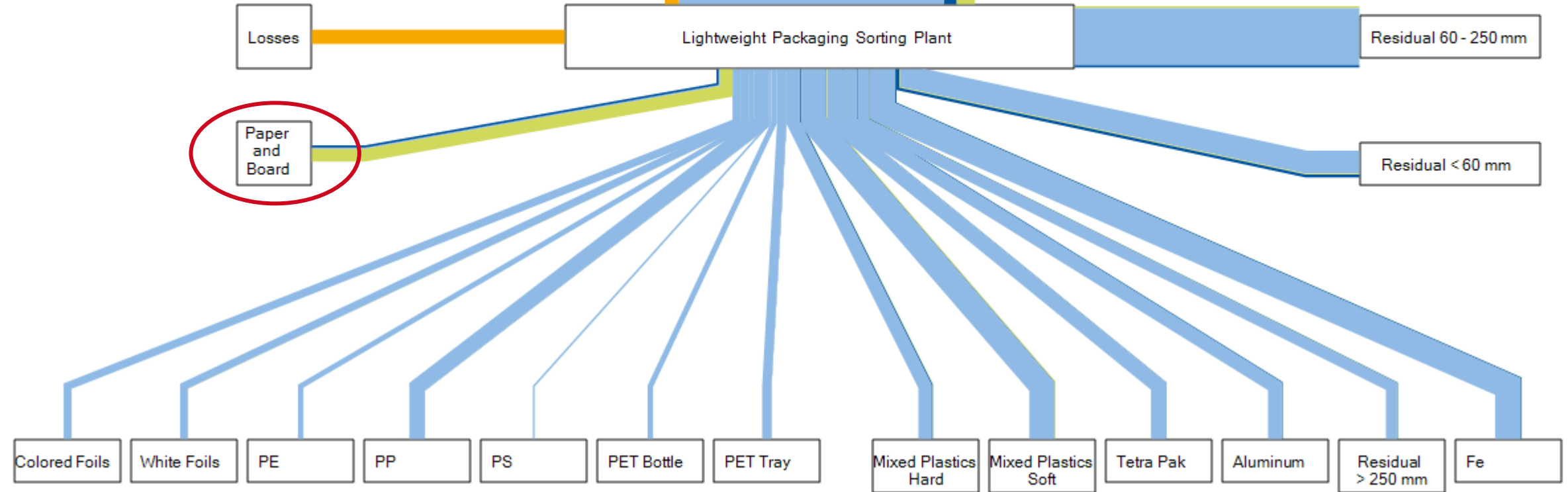
# Mass Balance

## LWP Sorting Plant Erfstadt

	Paper and Board [%]
	Paper and Board Composite [%]
	No Paper and Board [%]
	Losses [%]



• Sampling based on LAGA PN 98 and „Sachsenrichtlinie“ (number of samples and mass per sample)  
 → Two samples with 90 liters per hour.  
 24 samples in total per output stream.





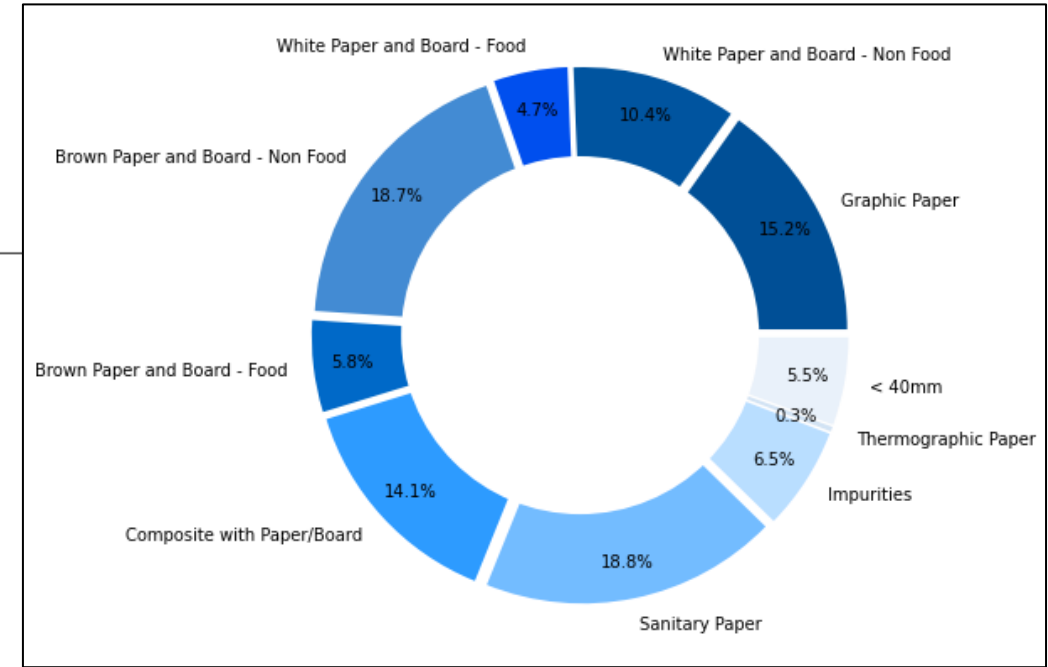
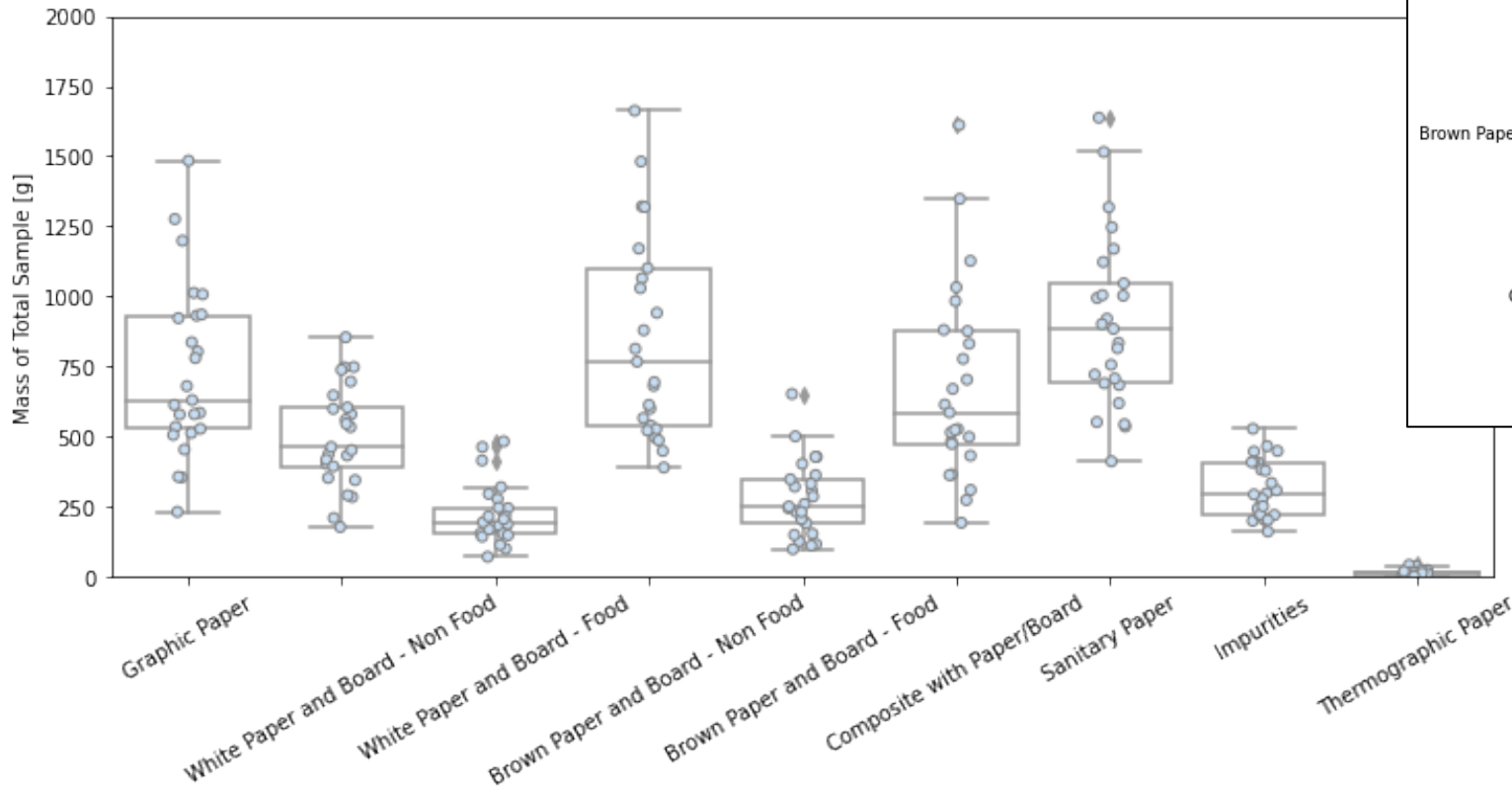
# Paper and Board from Lightweight Packaging

## Sorted Paper Grades



# Paper and Board from Lightweight Packaging Composition

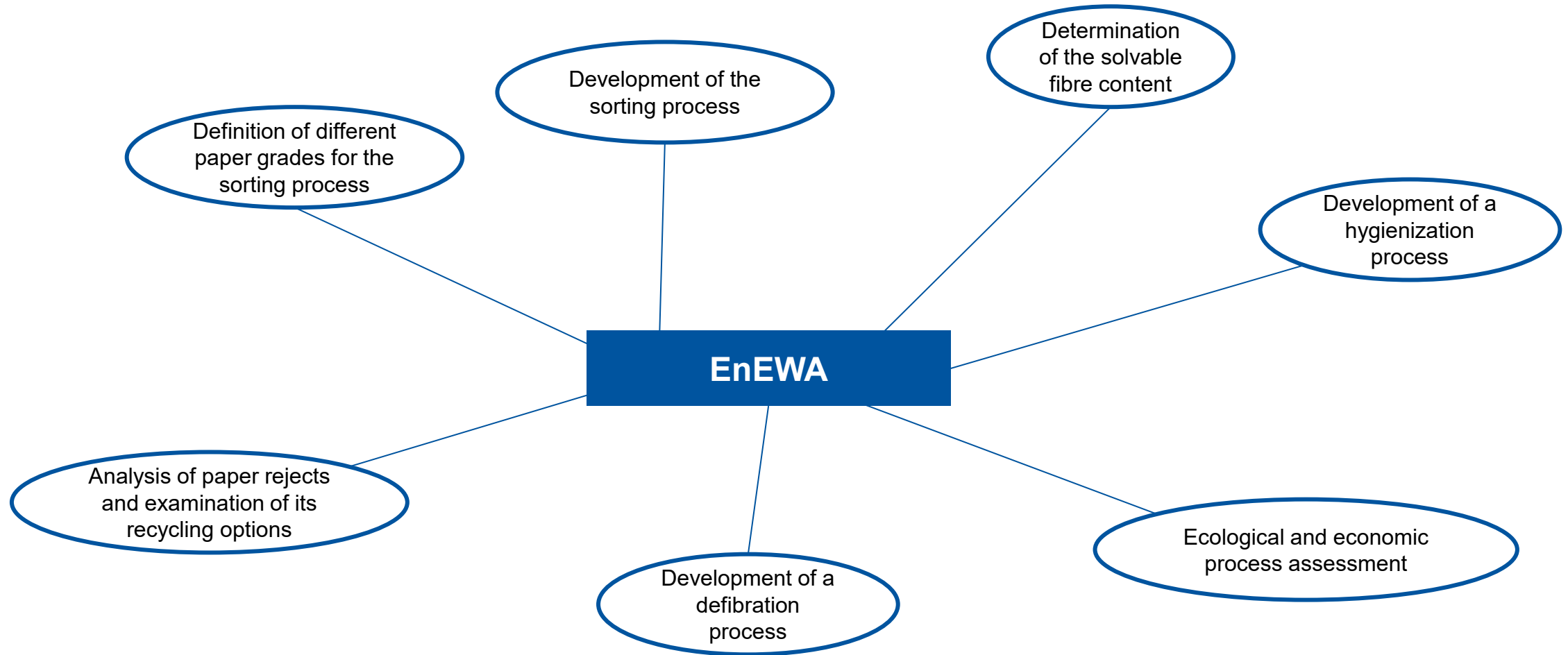
46,4 % of the paper from lightweight packaging could have been disposed within the separated paper collection!





# EnEWA - What's next?

## Outlook: Our Research Questions.





Alena Spies, M. Sc.

Research Assistant

Chair of Anthropogenic Material Cycles (ANTS)

RWTH Aachen University

Wüllnerstr. 2, D-52062 Aachen

Tel.: +49 241 80-95713

Mail: [alena.spies@ants.rwth-aachen.de](mailto:alena.spies@ants.rwth-aachen.de)

Web: [www.ants.rwth-aachen.de](http://www.ants.rwth-aachen.de)

René Sauer, M. Sc. M. Sc.

Research Assistant

Chair of International Production Engineering and Management (IPEM)

University of Siegen

Siegener Str. 152, 2, D-57223 Kreuztal

Mobil: +49 170 873 4099

Mail: [rene.sauer@uni-siegen.de](mailto:rene.sauer@uni-siegen.de)

Web: <https://protech.mb.uni-siegen.de/ipem/>