

Result of SPaRE and Extruder Equipment

A novel approach of cost reduction for reject treatment

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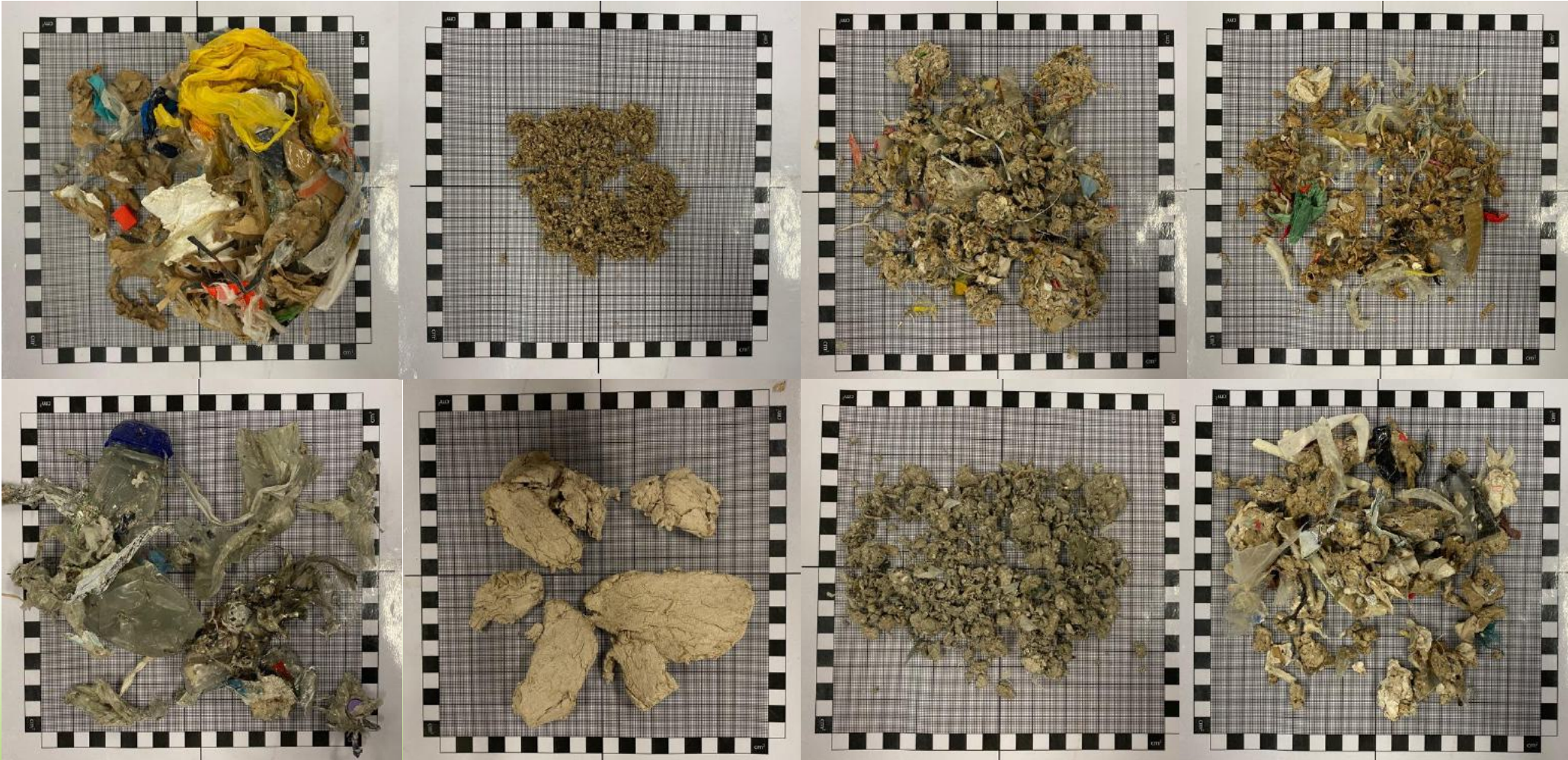
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Rejects – a huge and costly problem

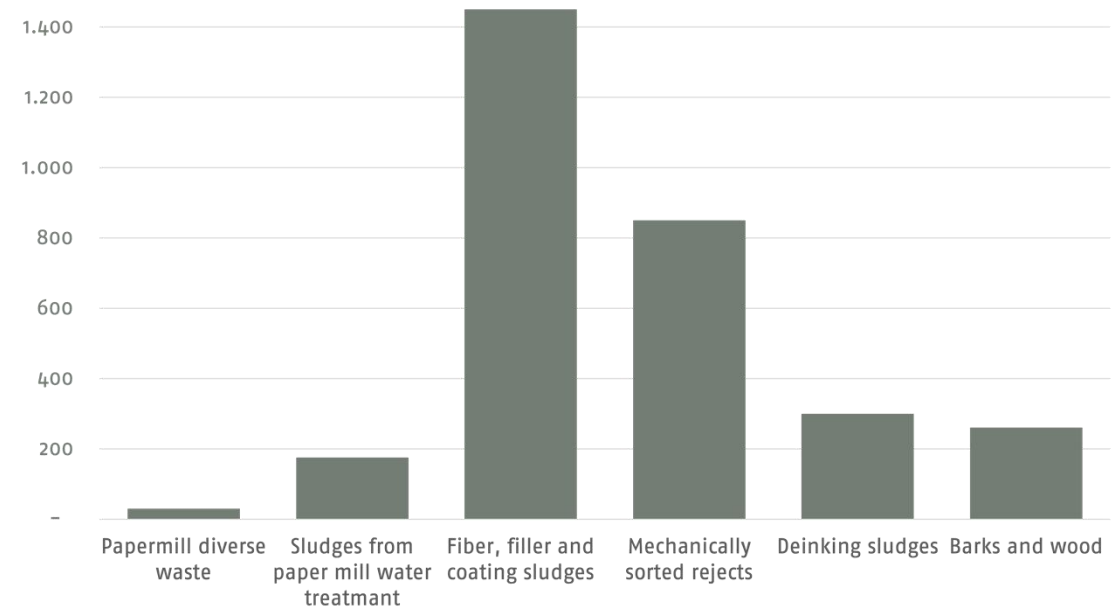


Rejects – a huge and costly problem



Rejects – a huge and costly problem

- 2021 alone in Germany we had roughly 3 Mio t of rejects in paper industry, in EU roughly 20 Mio t.
- 80% are going in thermal recycling.
- The average moisture content is 50%, big loss in caloric value.
- Requires big amount of fossil fuels.



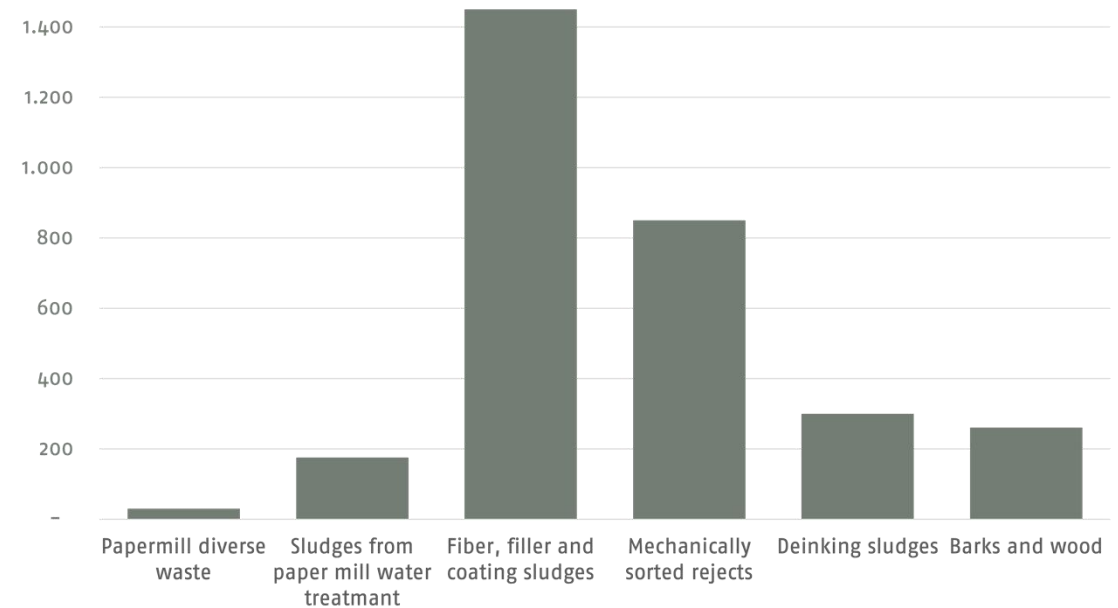
SPaRE – searching solutions



SPaRE – searching solutions

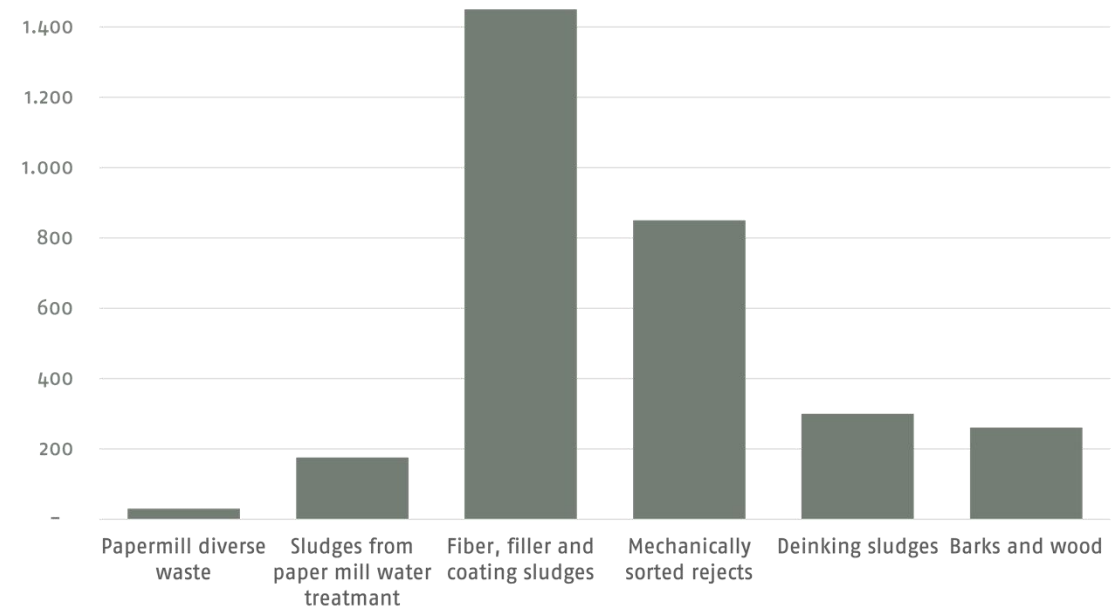
SPaRE Research Targets:

- Define recycling paths for rejects
- Develop rating measurement
- Increase reuse in circular economy
- Rate economic modelling of different path
- Optimize processes



SPaRE – searching solutions

- Optimization of pulping process
- Separation of fibres
- Optimize caloric value
- Turn waste in valuable side stream
 - Ideally with the Ogumazer



Ogumazer – the reject pelletizer



Ogumazer – the reject pelletizer



- The device is a special screw press.
- Rejects with solids between 20% and 50% are fed into the Ogumazer.
- Through extruder nozzles pellets with solids above 70% exit.
- Temperature of pellets ranges between 70°C and 95°C.
- Latent heat delivers continuing evaporation increasing solids up to 97% within 24 hours when slightly ventilated

Ogumazer – the reject pelletizer



Significant moisture reduction due to:

- Compression
- Dewatering
- Internal friction
- expansion

Ogumazer – the reject pelletizer



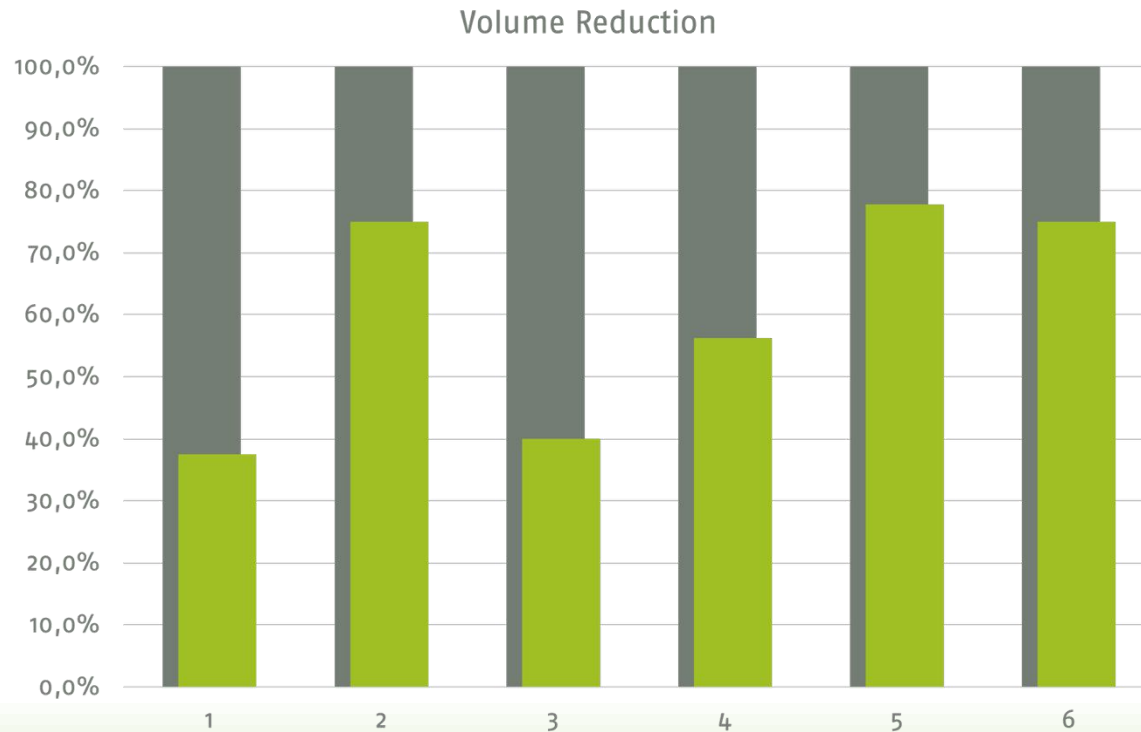
Significant moisture reduction on:

 Fibre sludge

 Reject

 Significant reduction on transportation cost as less water is transported

Ogumazer – the reject pelletizer



Significant volume reduction of 20% to 65% on:

- Fibre sludge
 - Reduction largely depends upon ash content
- Reject
- Significant reduction on transportation cost

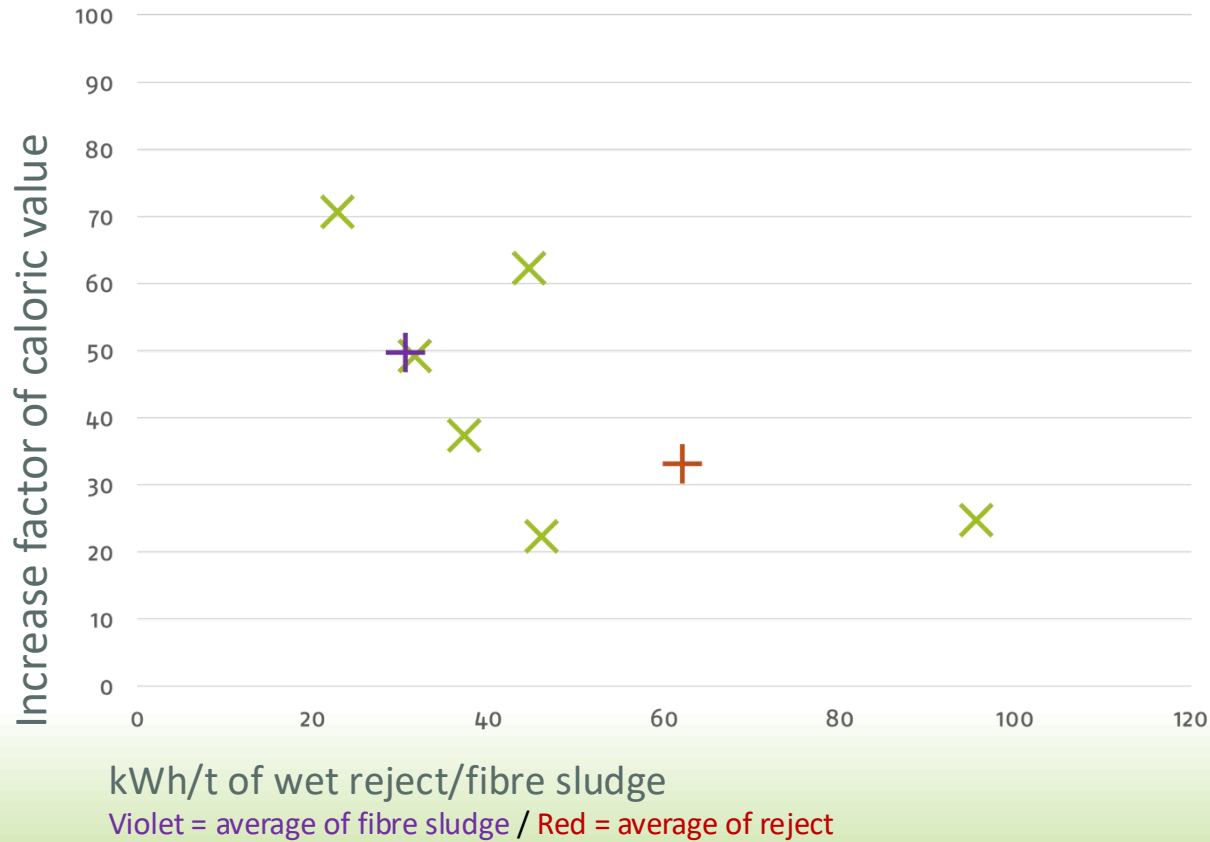
Ogumazer – the reject pelletizer



Significant increase of caloric value by 40% to 120%:

-  Fibre sludge like lignite
-  Reject like carbon

Ogumazer – the reject pelletizer



The increase in caloric value is a multiple of the required electric energy of the Ogumazer

Each kWh electric input into Ogumazer delivers 22 to 70 kWh caloric value.

The payback period ranges typically between 3 and 12 months

Ogumazer – the solution for reject?



Ogumazer – the solution for reject!

- Strong increase of the solids of the reject
 - Less water to transport
- High increase of caloric value
 - Due to lower water content
- Strong reduction of the specific volume
 - Less transport volume
- Thus use without fossil fuel possible
- pays back the sorting process

Ogumazer – the solution for reject!

- Increase of temperature during process is like pasteurization
- Increase of temperature is due to
 - internal friction
 - Internal compression
- Temperature increase is sufficient to kill
 - All bacteria
 - Most fungi
- Thus elimination of odour
- Low moisture prevents biological recontamination

Ogumazer – the solution for reject!



Fibre recovery?

Fibre recovery?

- We are presently working with a machine builder to wash rejects before pelletizing to recover valuable fibres
- PROPAKMA is working in SPaRE and other research projects for evaluation of feasibility and economy
- The Jet Wing Liquid from Klass Filter GmbH helps recover the valuable fibres from the water circuits

Summary

Summary

- Reject treatment is very costly today – 80€/t up to 160€/t
- Energy is very costly today
- The Ogumazer is one solution to this cost
 - Increasing reject solids eliminates needs for fossil fuels
 - Increasing reject temperature eliminates bacteria and most fungi
 - Increasing reject solids eliminates odour
 - Reducing specific value reduces transportation cost
 - Reducing total weight reduces transportation cost

Thanks a lot



 Questions?