

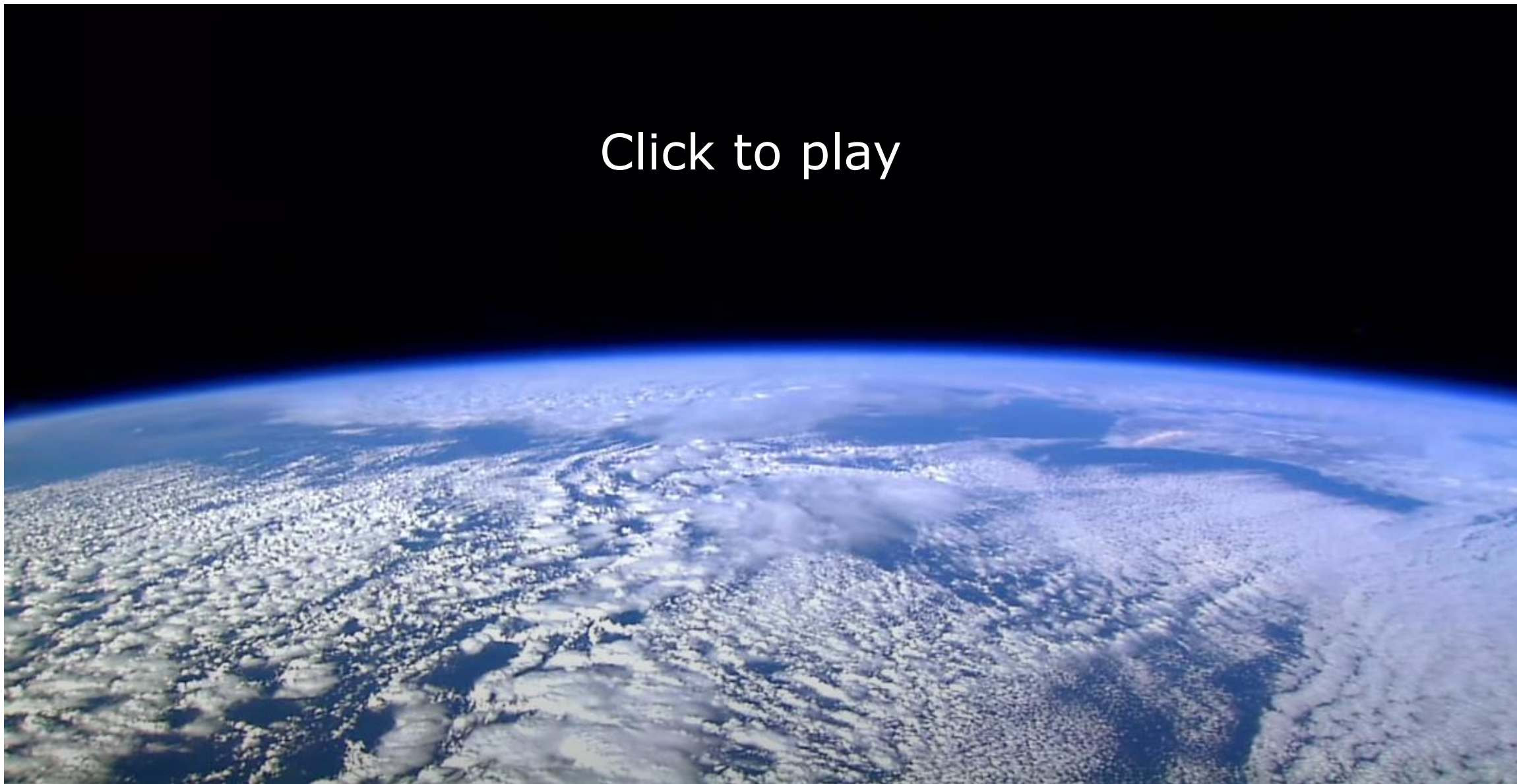
Unfit Banknote Recycling Study & New Recycling Solutions

2022

Jeroen Kusters, Director of sales
16th November 2022

RECONNAISSANCE **CASH&PAYMENTS**
SUSTAINABILITY FORUM™

Click to play



Introduction

Royal Dutch Kusters Engineering

- Founded in 1911
- A family-owned company with a proven history of innovation and entrepreneurship
- Leading manufacturer of high security off-line destruction and shred handling equipment – for both banknotes and coins
- Installed base of more than 700 systems in various applications in over 80 countries



About us

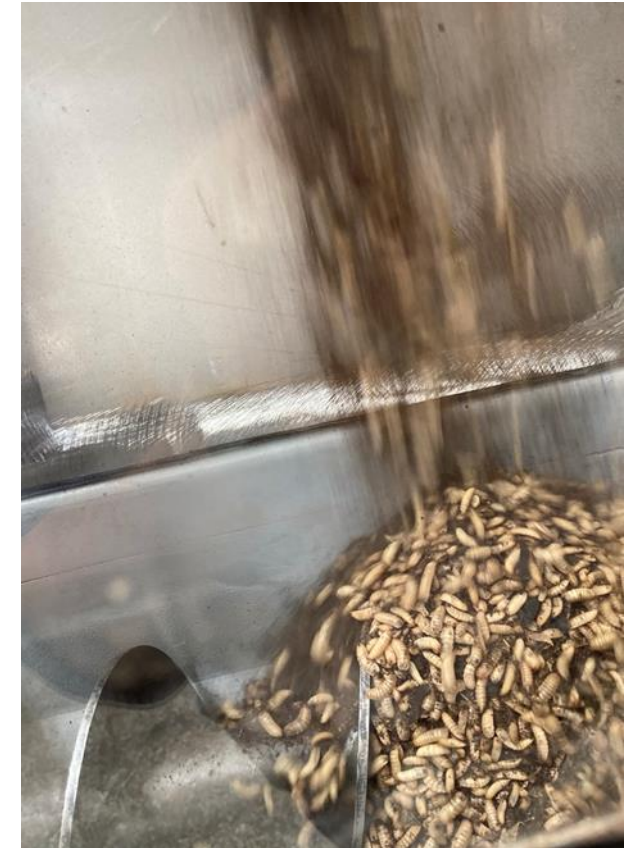
Separation technologies
for MSW and compost



Dewatering technologies
for paper mills



Insect breeding



Banknote shred waste pyramid

Banknote shred waste pyramid



Source: Royal Dutch Kusters Engineering

Various blogs on recycling banknotes



16-05-2019

Turning cash into a natural resource; Recycling banknotes

The disposal of unfit banknotes doesn't stop with the destruction and briquetting of the banknotes alone. There is still the remaining waste paper in.



21-07-2022

Environmental re-use of shredded banknotes

The shredded banknote recycling process is often arranged depending on the volume of the banknotes, if these are shredded centrally or decentrally,.

Recycling shredded banknotes

Our mutual challenges

- Relatively low volumes
- Decentralised
- Maturity level of local recycling markets
- Waste follows the money
- Wide variety of notes
 - Inks
 - Security features
 - Substrates

Separation is crucial

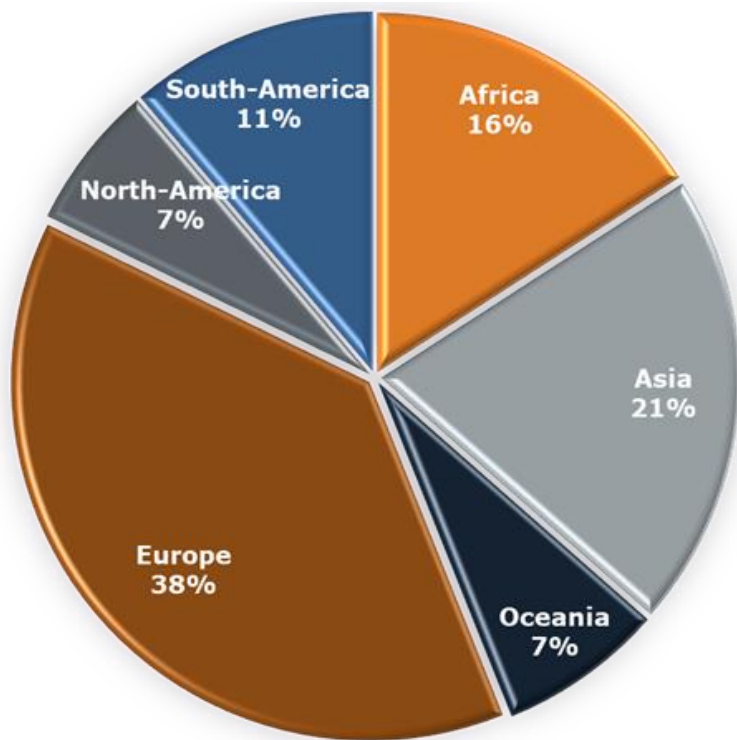
Source separate various substrates

- Separate shred collection increases recyclability
- Separate plastics from cotton for
 - On-line destruction
 - Off-line bulk destruction
- Easy to incorporate in existing or new configurations of on-line and off-line destruction



Banknote Recycling Study

About the participants



- In total 82 countries took part
- Divided amongst 6 continents
- 97,2% were Central Banks

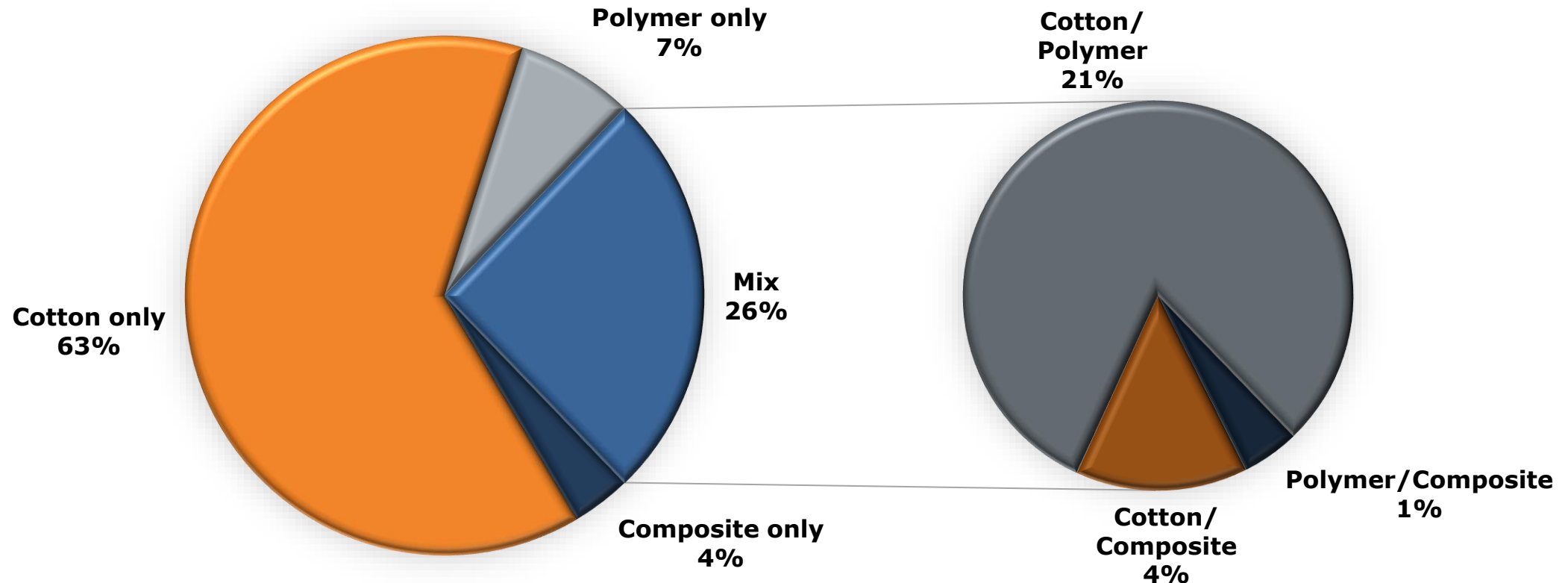


Substrates and way of disposal

Overview of what kind of substrates are in circulation and how these are disposed

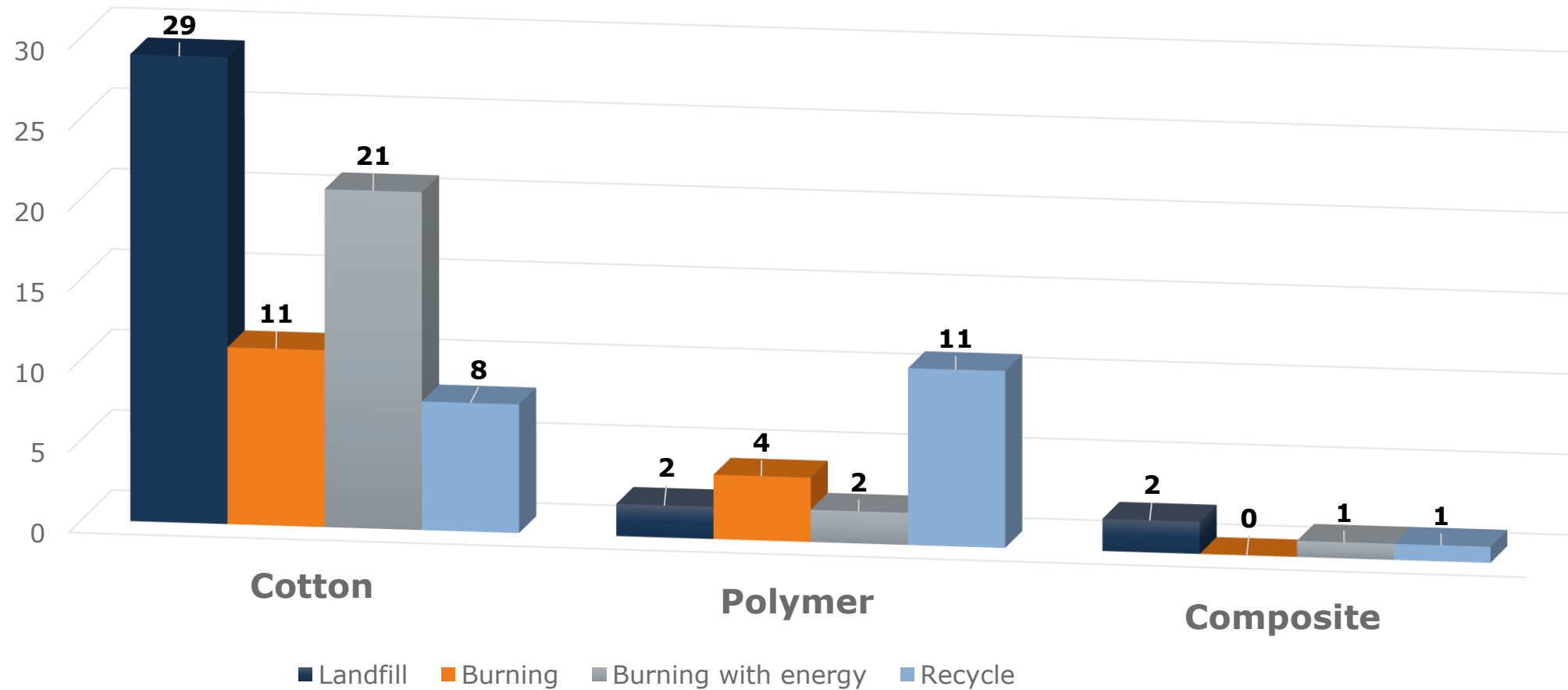
Kind of substrates in circulation

How many countries (in percentage) have which kind of substrate

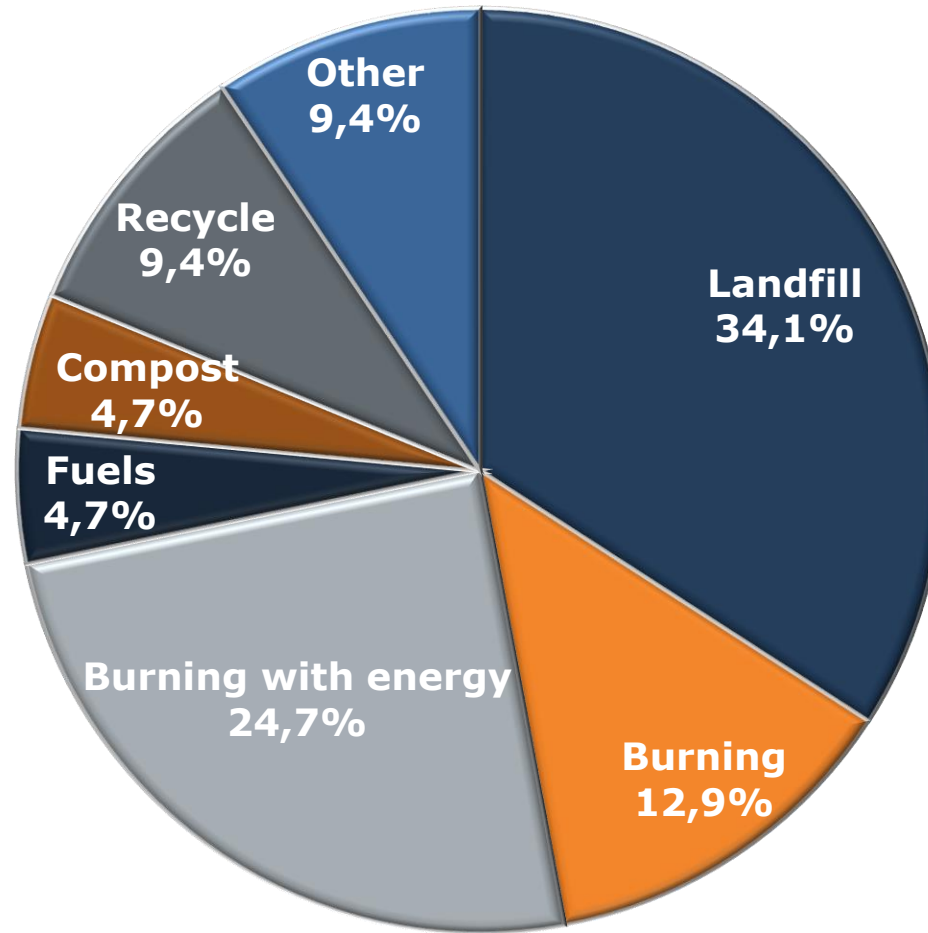


Top 4 method of disposal per substrate

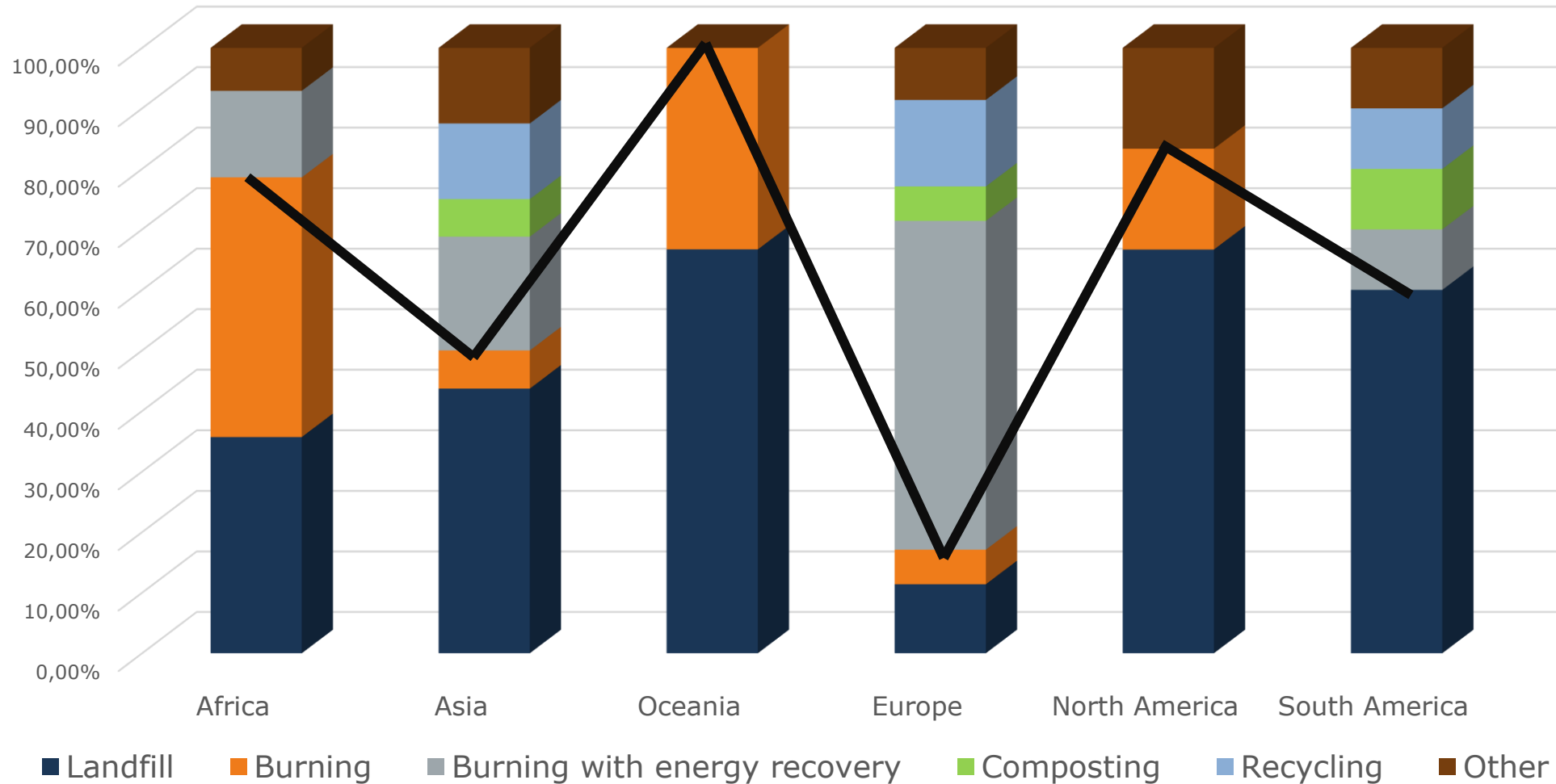
In absolute numbers



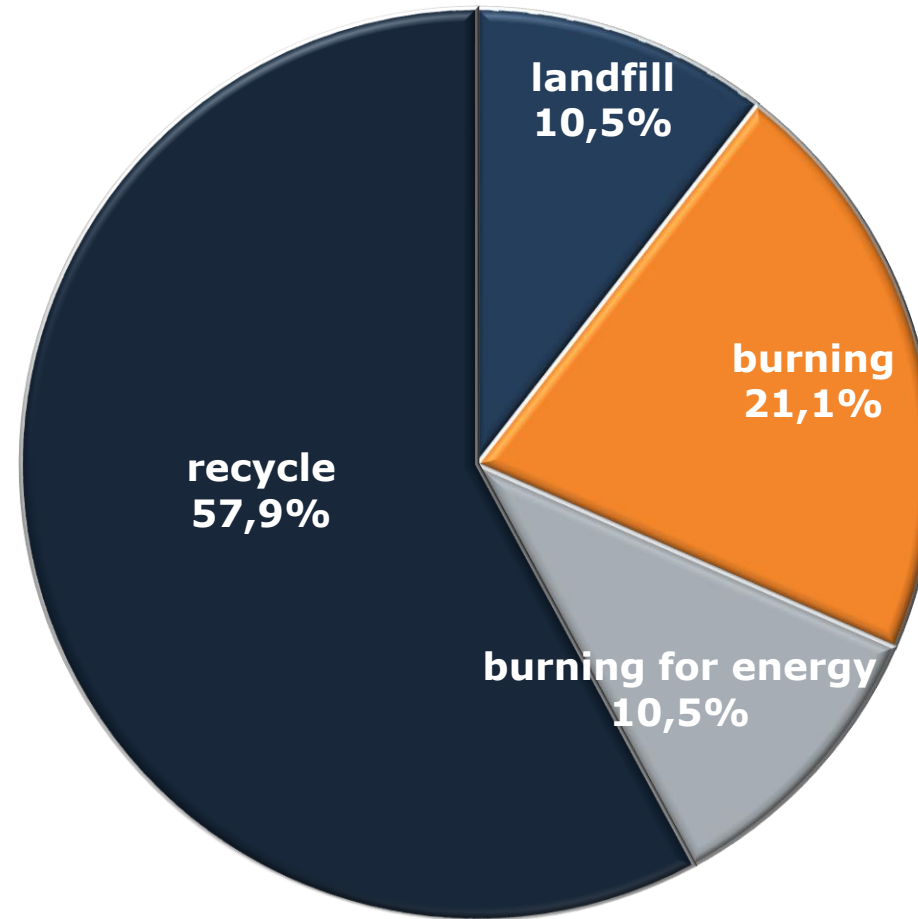
How are cotton banknotes disposed?



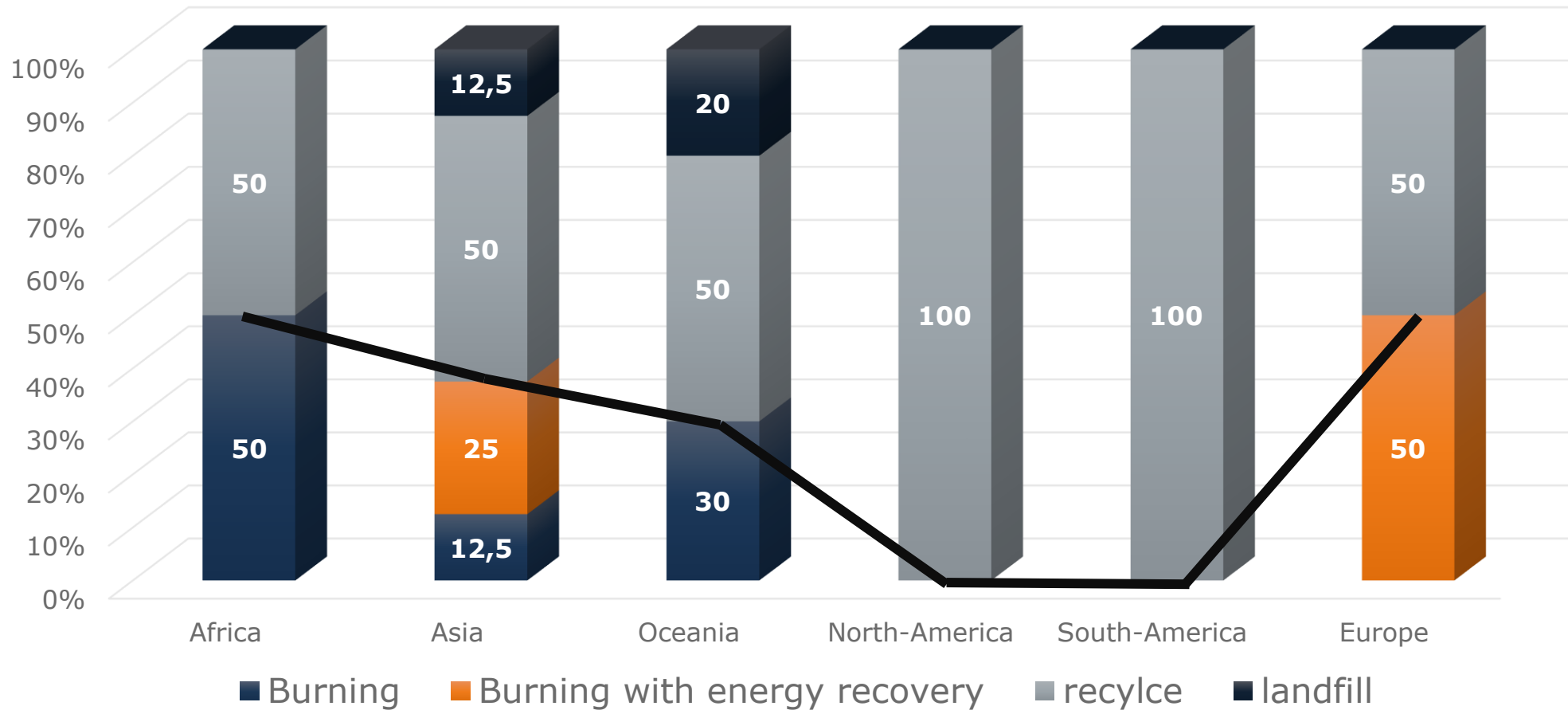
How is this divided per continent for cotton



How are polymer banknotes disposed?



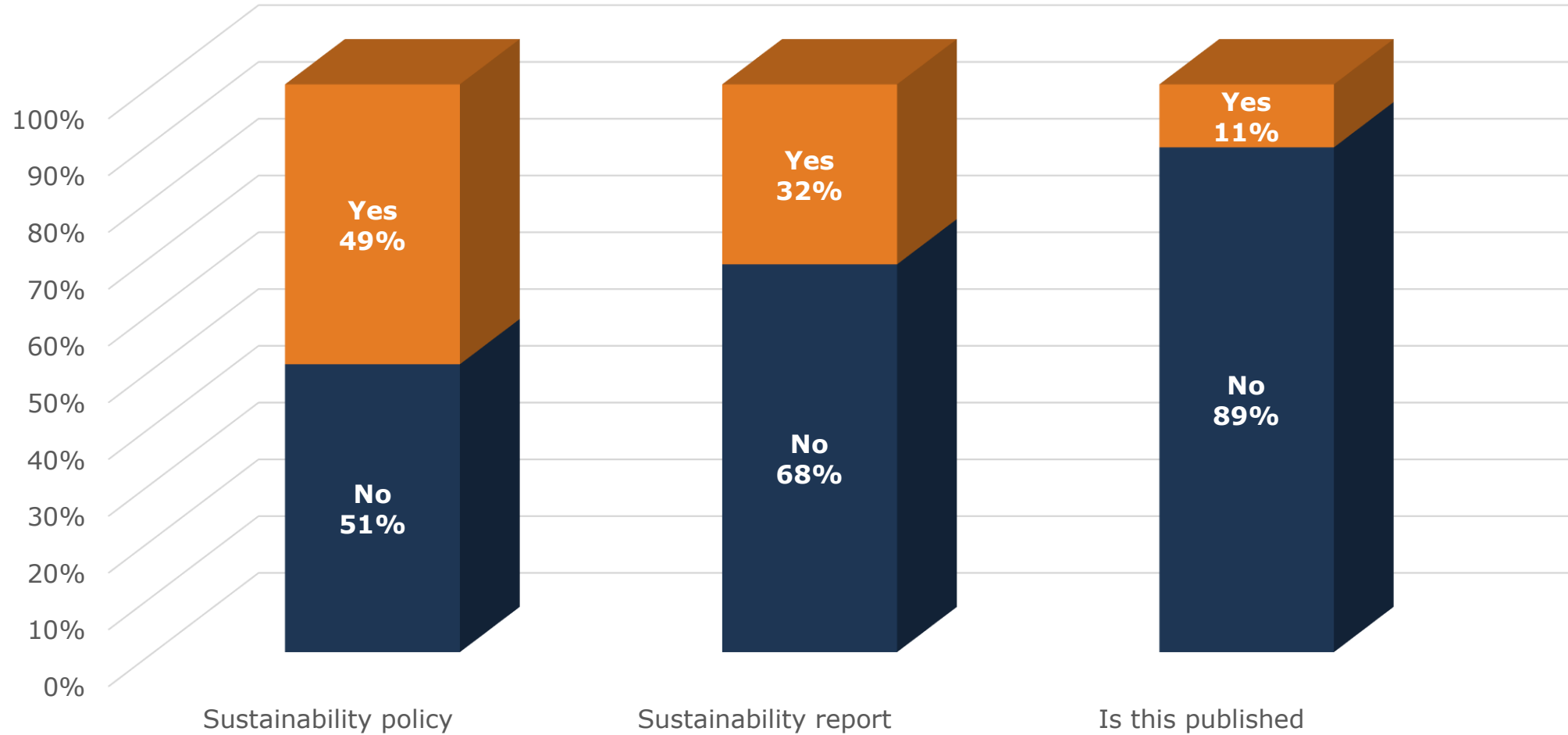
How is this divided per continent for polymer



Sustainability

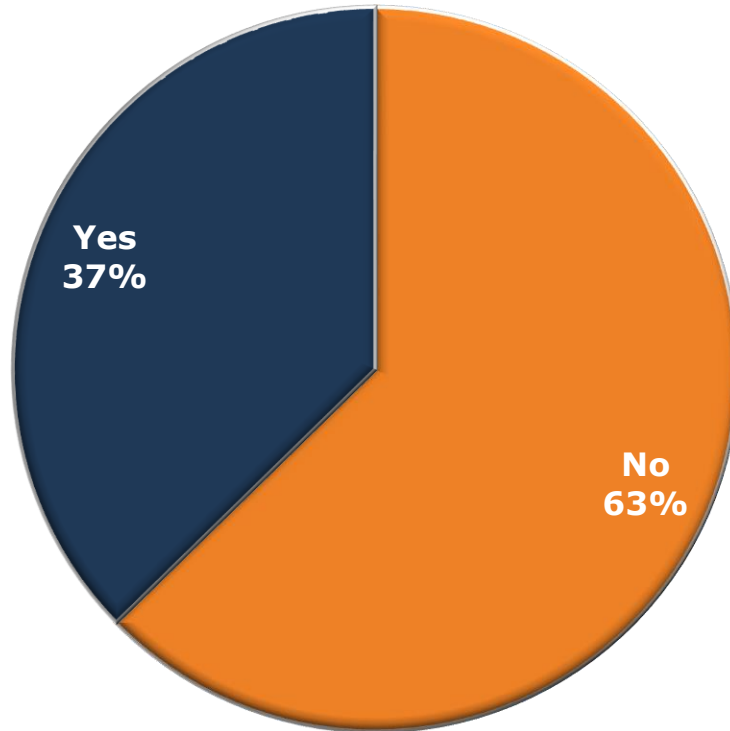
Is sustainability part of the organisation or processes

Is there a sustainability policy and report

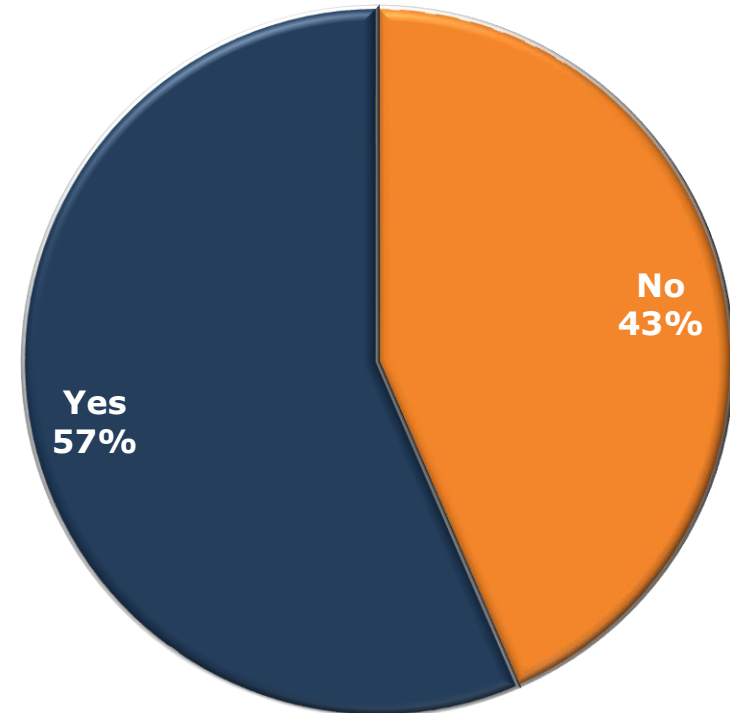


Are you considering to change the way of disposal?

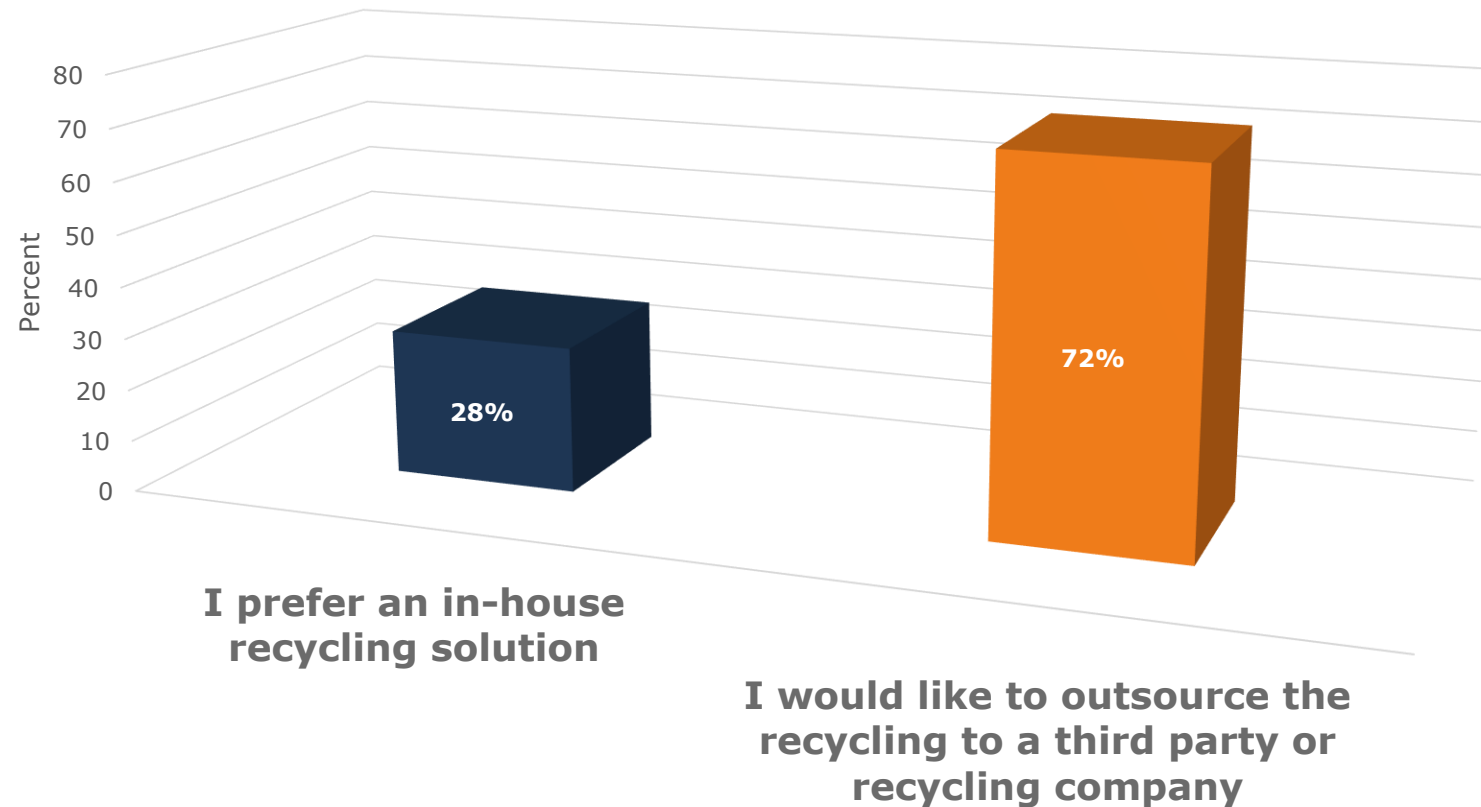
Consider to change method of disposal?



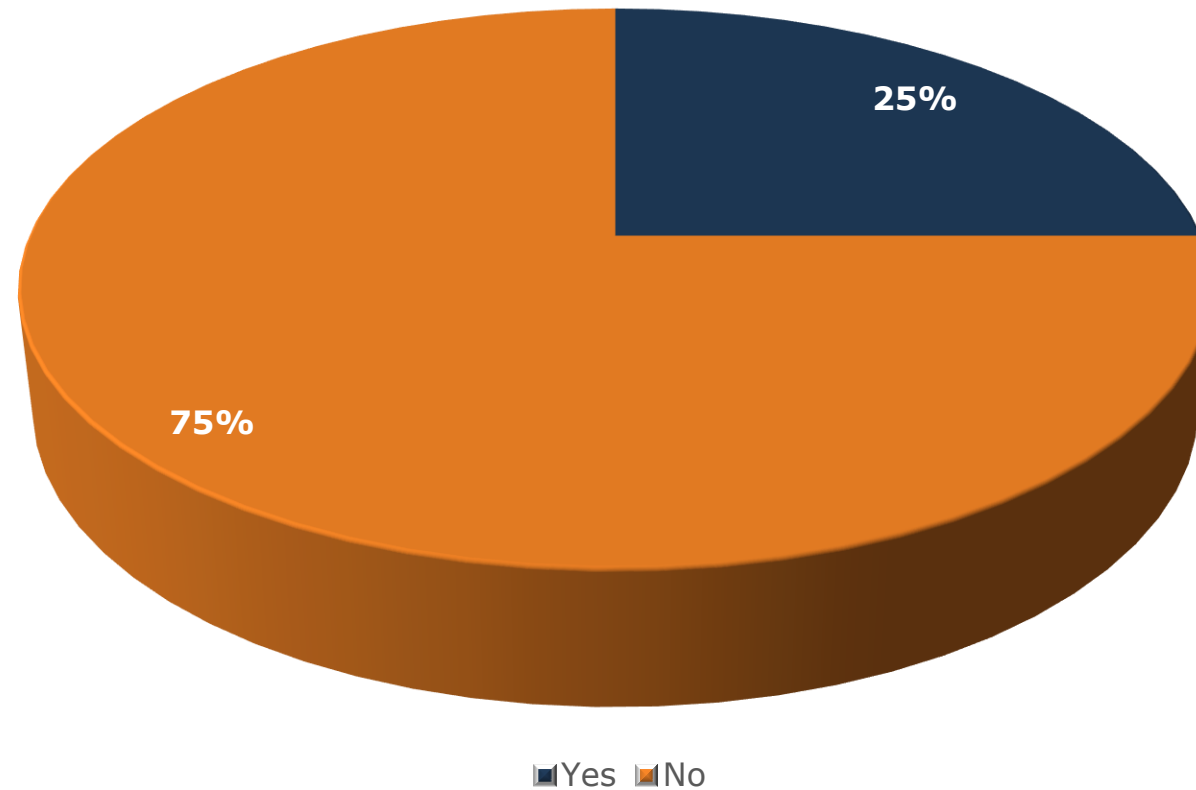
Willing to pay more if that would be better for the environment?



How would you like to organize it



Have you conducted an environmental Life Cycle Analysis?



Life cycle assessment study

Swiss National Bank

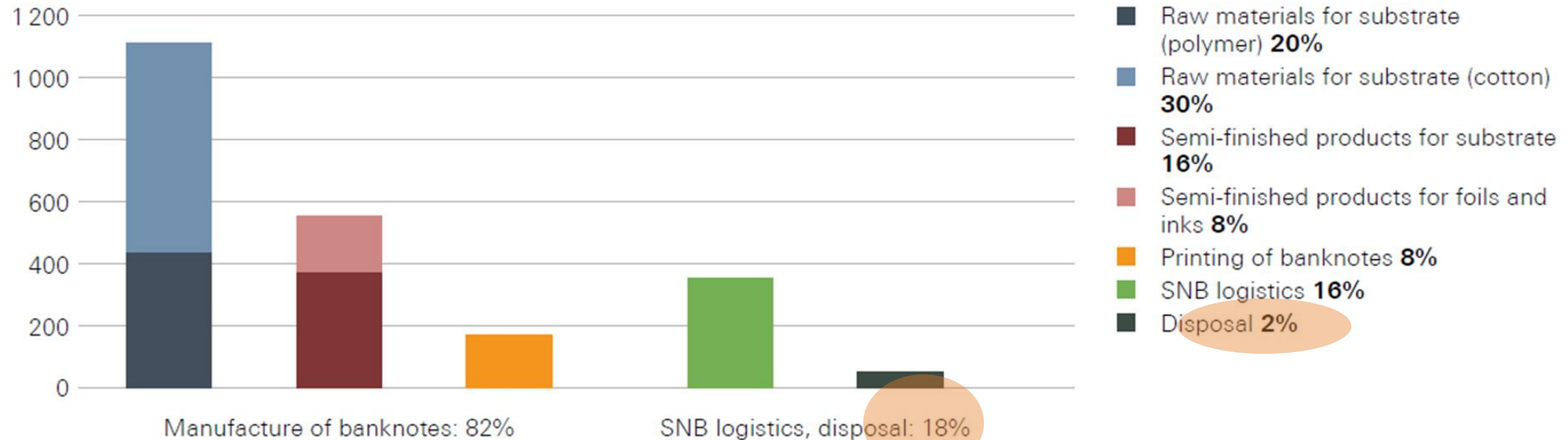
Life cycle assessment study – 9th series

Swiss National Bank (2022)

OVERALL ENVIRONMENTAL IMPACT OF ANNUAL BANKNOTE PRODUCTION

Total 2.2 billion environmental impact points (EIP)

In millions of EIP



Source(s): SNB

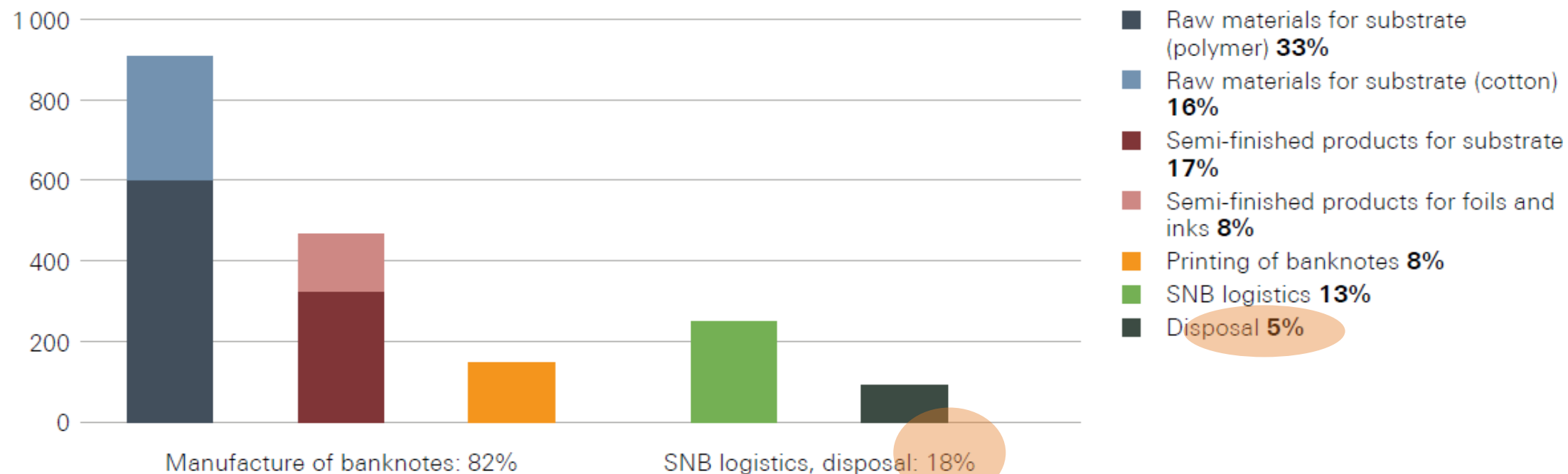
Life cycle assessment study – 9th series

Swiss National Bank (2022)

GREENHOUSE GAS EMISSIONS OF ANNUAL BANKNOTE PRODUCTION

Total: 1,900 tonnes of CO₂ equivalents

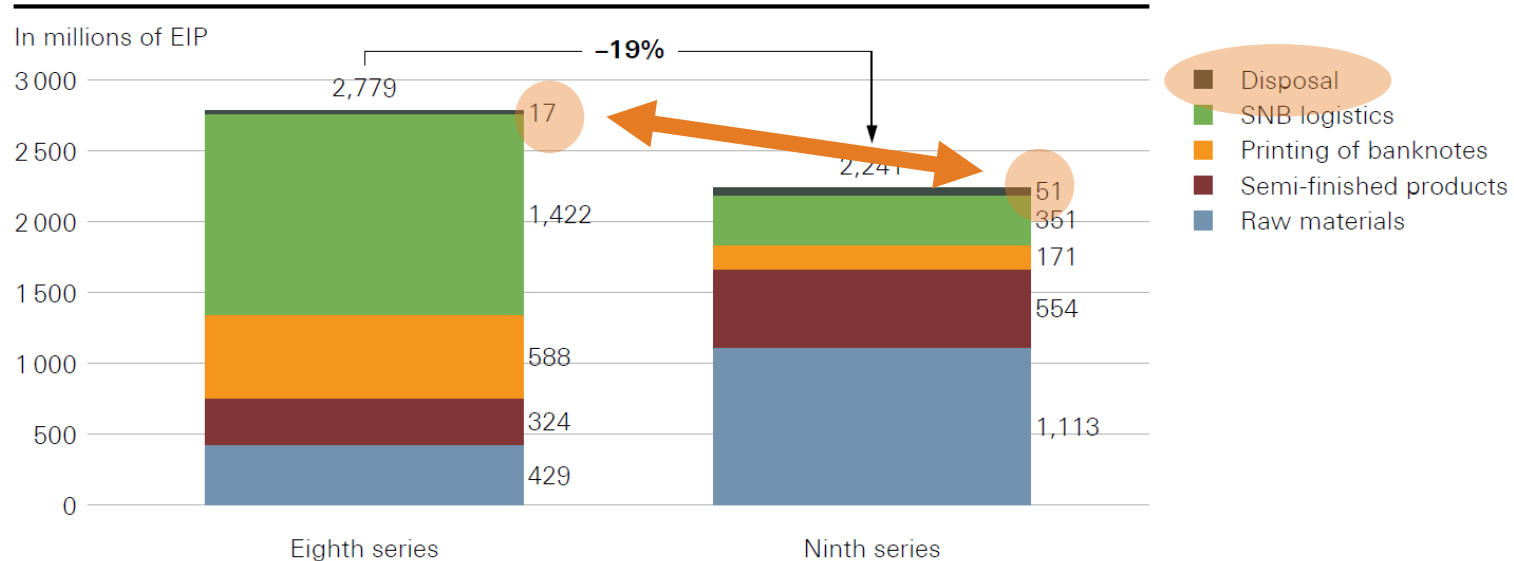
CO₂ equivalents, tonnes



Life cycle assessment study – 9th series

Swiss National Bank (2022)

OVERALL ENVIRONMENTAL IMPACT OF EIGHTH AND NINTH-SERIES BANKNOTES PRODUCED ANNUALLY



Source(s): SNB

- Overall impact lowered by 19%
- Disposal impact increased by 300% in Environmental Impact Points (EIP) from 8th – 9th series

New recycling solutions

Hybrids

Hybrid

Autoclave technology

(source: Hughes Energy)





Cotton

Board panel

Patented Process

Patented technology and processes require only water, heat and pressure to convert fiber waste into high-performance material solutions

Non-Toxic

Converts cellulosic wastes to a panel product without toxic or hazardous additives



100% Recycled

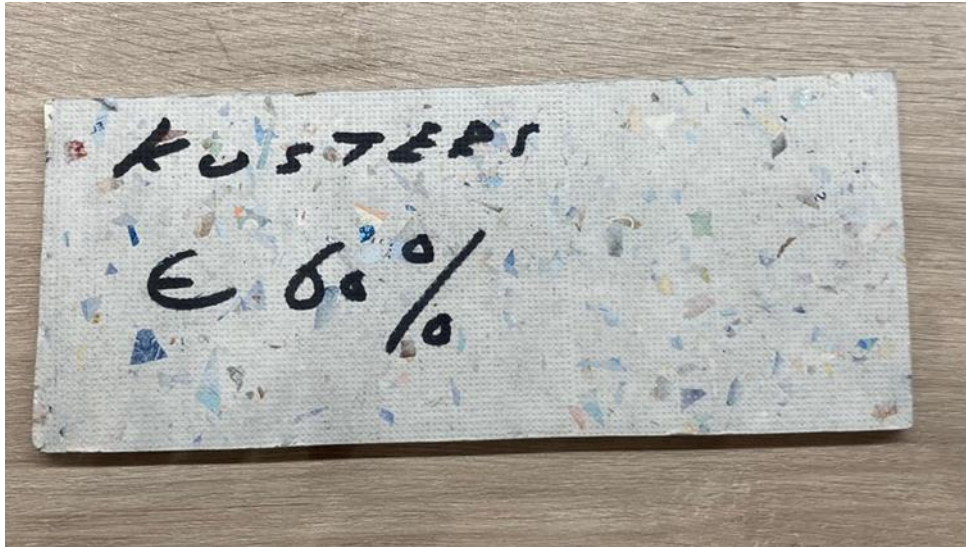
100% recycled-content / recyclable manufacturing solution which competes with a variety materials both physically and mechanically

Waste Resources

Utilizes endless raw cellulose waste streams including paper based fibers, cardboard, agricultural waste (rice straw, tomato stamps, cocoa husk etc.).

Board panel

Board Panel example



Our proposition

- Mix of 100% recycled/upcycled material
- Diverting waste streams by forging locally available fiber alloys

Board panel

Signage



Interior design

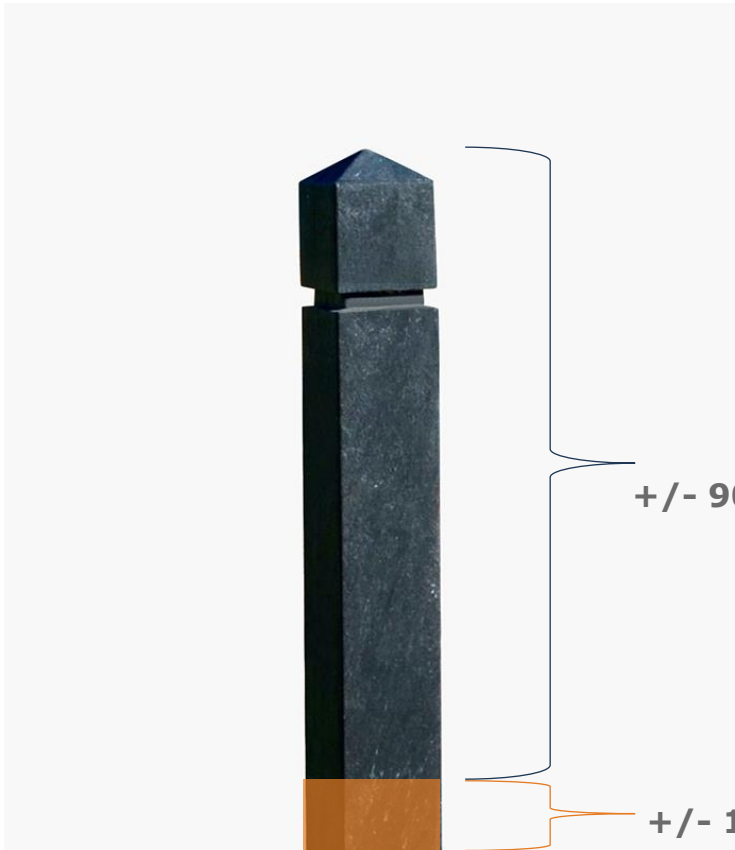


Polymer

Current solutions

Polymer recycling

Current recycling solutions for polymer



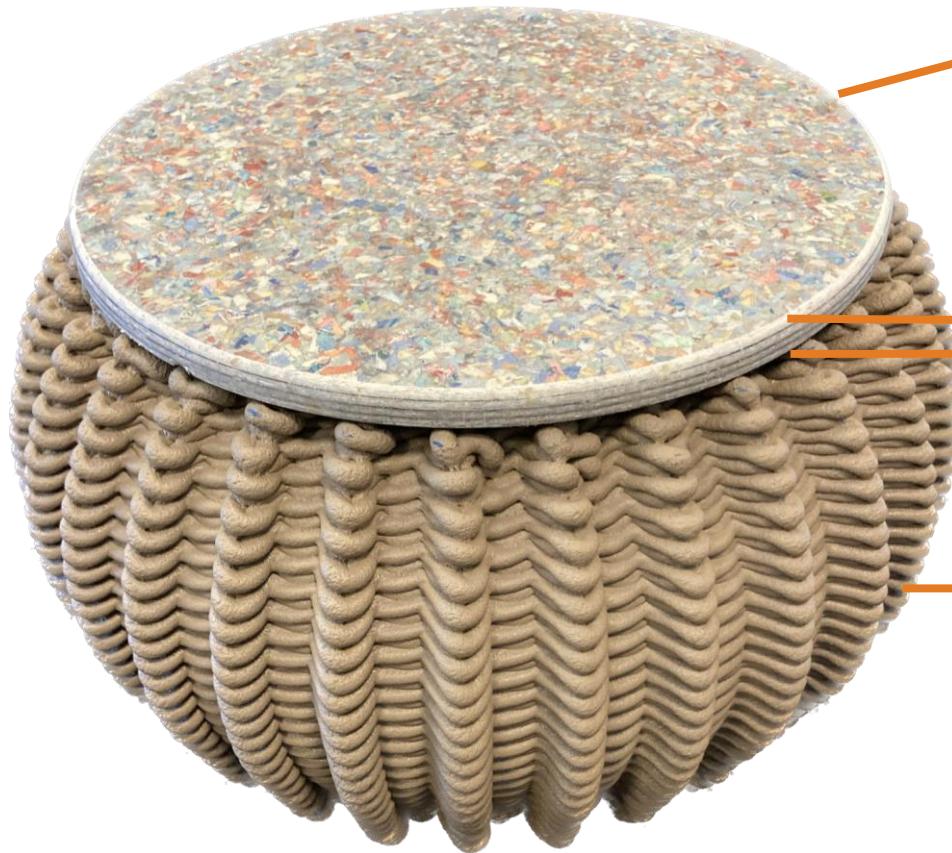
Source: Note Printing Australia \ Replas

- High quality polymer shreds are often transformed into low level recycled products
- Therefore most recyclers mix the shreds with other plastics and downgrading the quality

Latest developments

Polymer recycling

Latest developments



Top

- 60% Euro cotton shreds
- 40% Recycled paper fibres

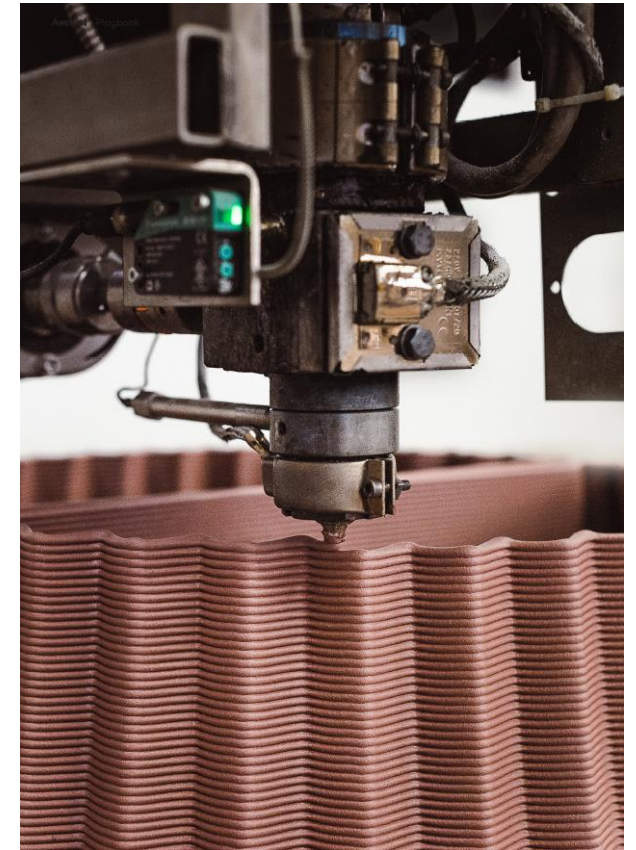
Pouf

- 100% UK polymer shreds

Recycled banknote solutions

By Royal Dutch Kusters Engineering

- Fully made of banknotes
- Circular
- Open for large scale trials now



Thank you



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VALUE ADDING TECHNOLOGY