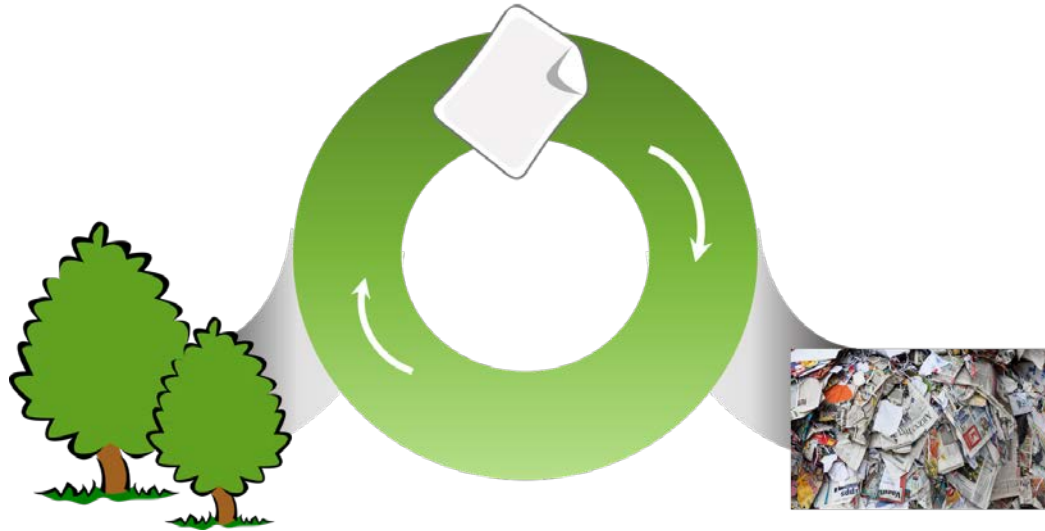


CIRCULAR ECONOMY

IN PERSPECTIVE OF FIBER FLOW BETWEEN US AND CHINA

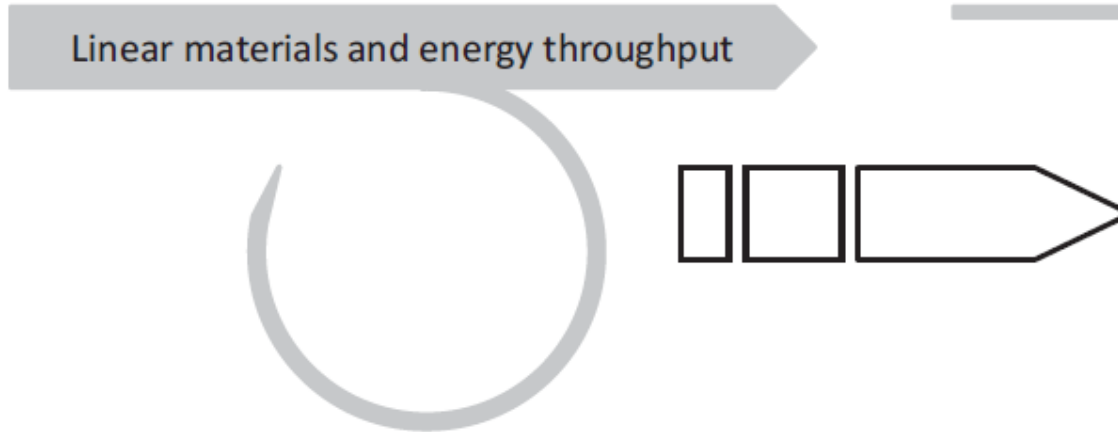


JIYOUN CHRISTINA CHANG
YOUNG PROFESSIONAL, WORLD BANK

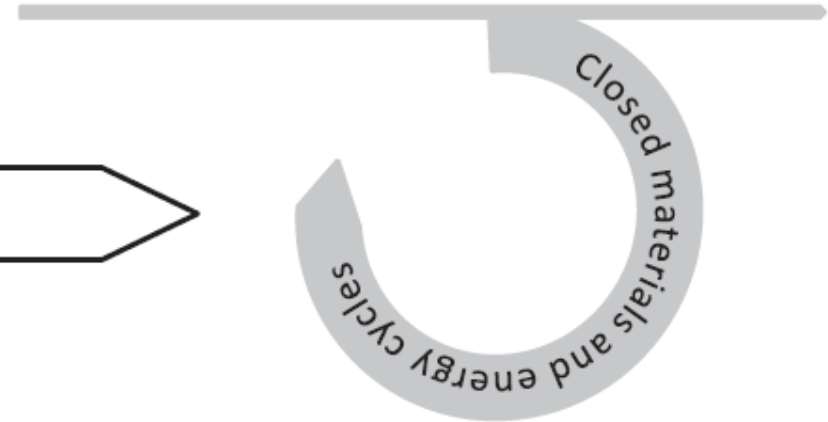
NOVEMBER 5, 2019
FORET 2019 – WORLD BANK SIDE EVENT

CONCEPT OF CIRCULAR ECONOMY

a) Current flows in the linear economy



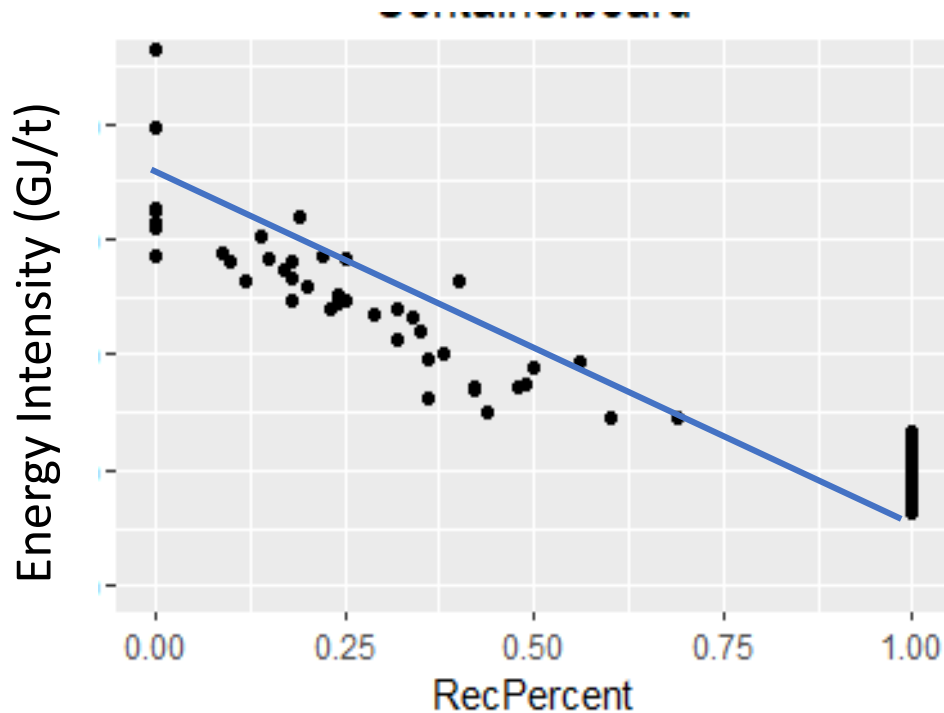
b) Future flows in the circular economy



Moreau et al., JIE (2017) 21, 497

- A regenerative system by design in which **innovative business model, social participation**, and activities promoting ***reuse, reduce, recycling and recovery*** all contribute to **close *system-wide* resource loops**
- **Decouple** economic activities from excessive levels of **resource consumption and environmental damage**

WHY PAPER RECYCLING?



**More Recycled Content in Product
Less Production Energy**

Common policy towards a circular economy

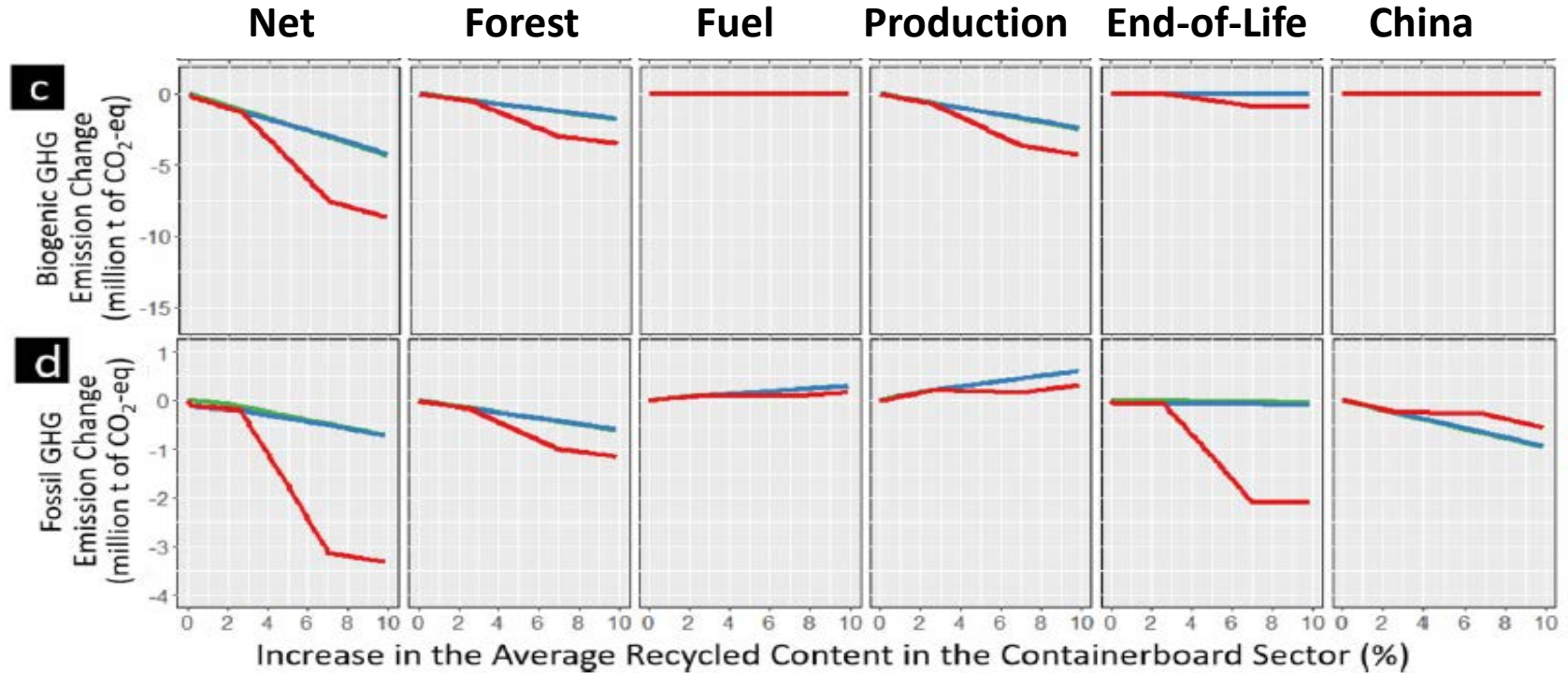
- Increase recycled content in a product
- Increase recovery of waste paper

Expected Impact in paper recycling

- More carbon sequestration in forest
- Less GHG emission from the production
- Less GHG emission from waste paper in landfills

THE IMPACT OF INCREASED RECYCLED CONTENT IN US CONTAINERBOARD – SCENARIO ANALYSIS

J.C. Chang et al. *J. Cleaner Production* 241 (2019) 118133

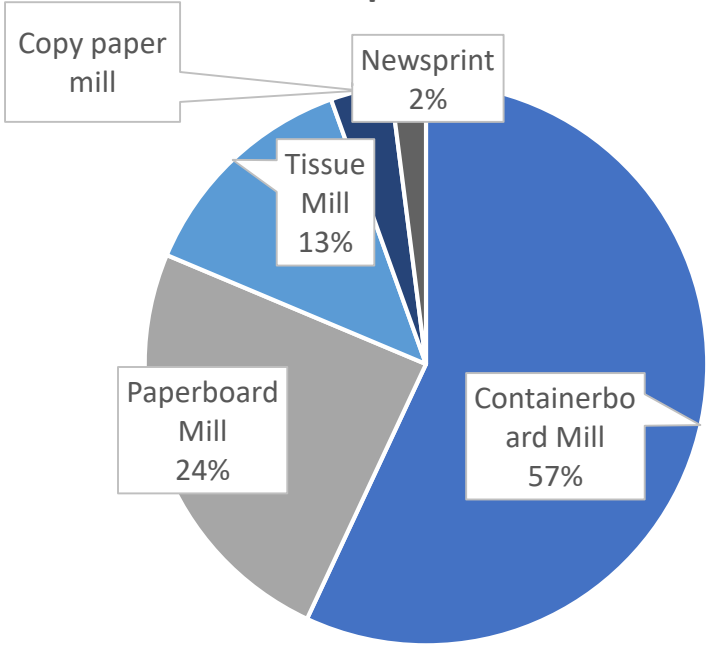


Based on 2015 US fiber flow data.

Red color - Additional recovery is cheaper than Blue and green

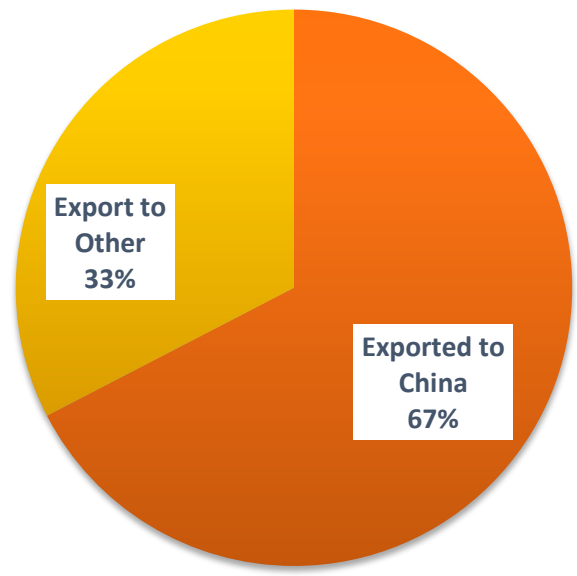
US RECOVERED PAPER IN 2015

Domestic Consumption of Recovered Paper in US



Total 27 million t consumed

Recovered Paper Export



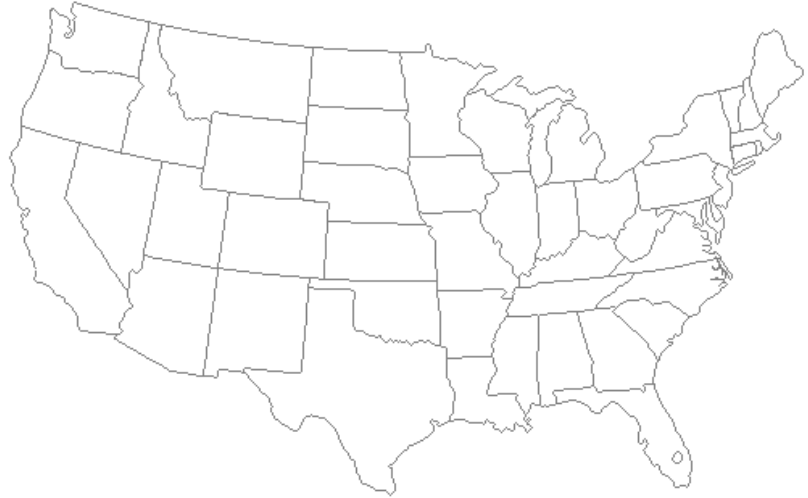
Total 19 million t exported
Total 13 million t exported to China

13 million t of exported recovered paper to China is mostly old corrugated cardboard and mixed paper (poorly sorted)

PAPER RECYCLING IN US VS CHINA



US



- Both virgin and recycled paper
- High domestic collection
- High cost of sorting for high quality grade

China



- High recycled content paper made of imported waste paper
- No virgin pulping capacity
- Low domestic collection (poor infrastructure)

- Both US and China do not have a full circle of resource flow.
- A policy promoting a circular economy in one country influence another country depends on its resources.
- GHG emission reduction benefits from a circular economy policy may not be as much as expected due to unintentional consequences in other countries.
- To achieve benefits of a circular economy, making an investment decision should be based on a comprehensive approach with consideration of the impact on the relevant system.