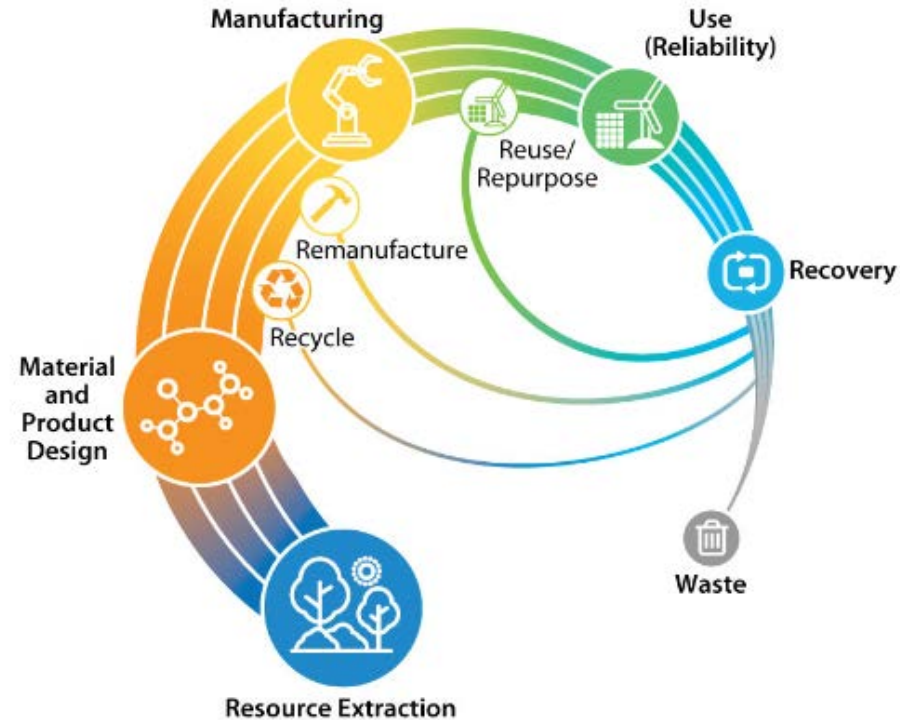


Paper and Plastics in Landfills: The Missed Opportunity

Anelia Milbrandt
Paper & Plastics Recycling Conference
October 24, 2024

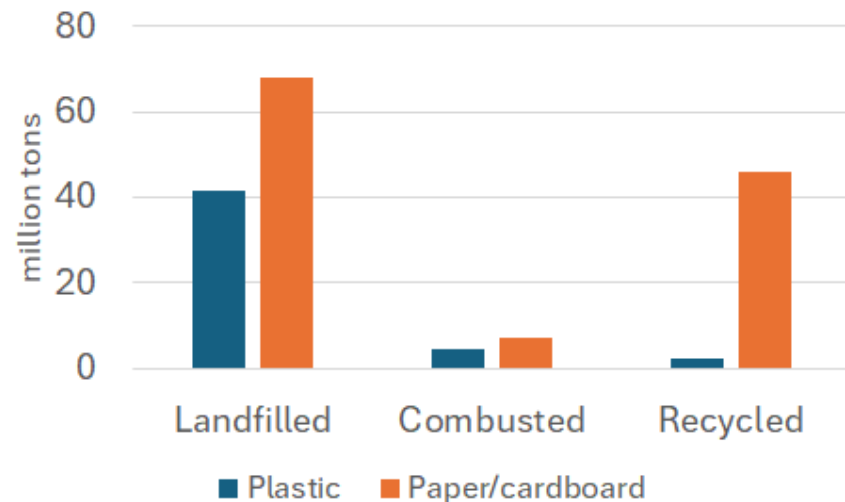
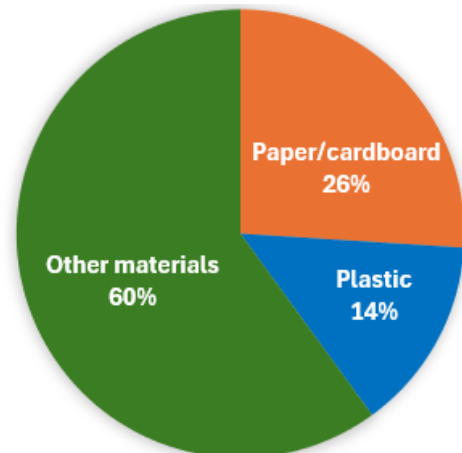
NREL and Waste Resources Research

- U.S. Department of Energy Laboratory
- Leadership in clean energy research, development, and deployment
- Waste resources research:
 - Focus on landfilled waste
 - Generating subnational level data
 - Approach:
 - Bottom-up (on-site data for 1,776 landfills and 85 combustion facilities)
 - Waste composition studies (>50)

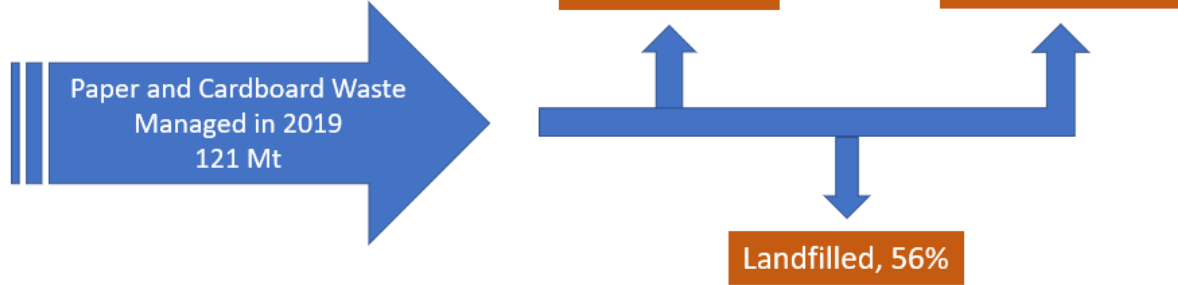


Plastic and Paper/Cardboard Waste Management in the U.S.

- Paper/cardboard is typically the largest MSW category generated
- Together, paper and plastic materials constitute about 40% of MSW managed in the U.S.
- A significant amount is landfilled



Paper and Cardboard Waste Management in the U.S.

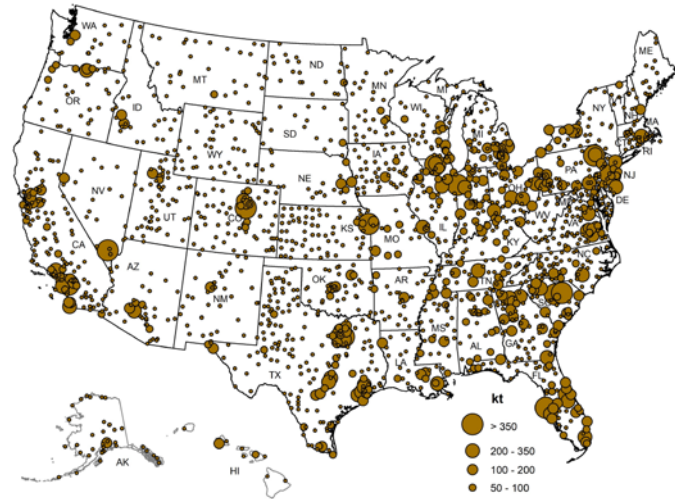
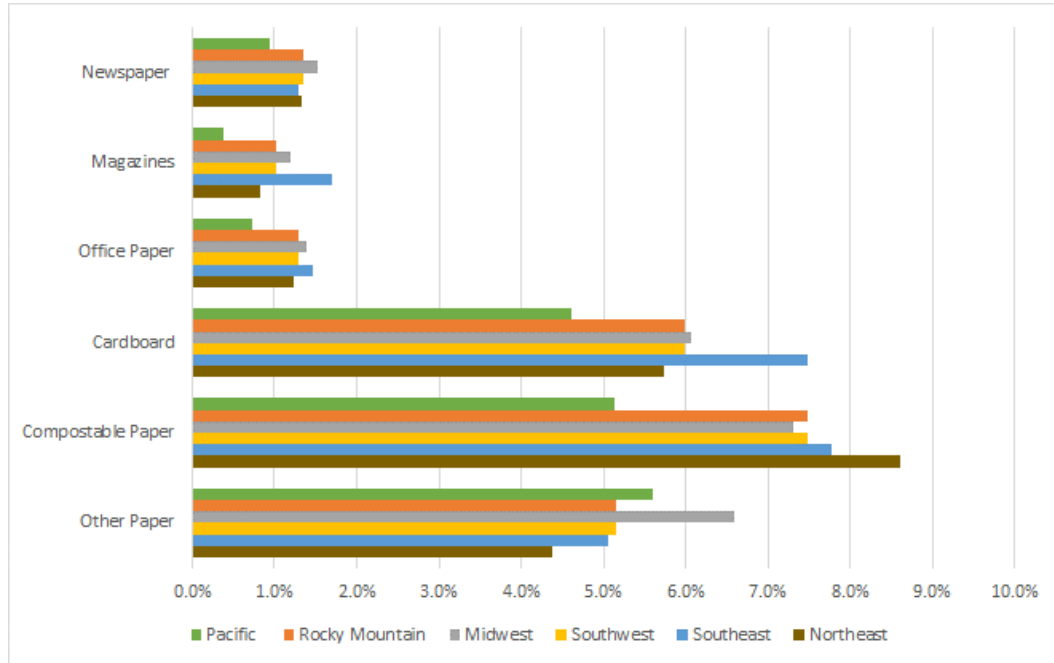


Material	Landfilled ('000 tons)	%	Combusted ('000 tons)	%	Recycled ('000 tons)	%	Total Paper and Cardboard Waste Managed ('000 tons)
Newspaper	3,830	51%	353	5%	3,270	44%	7,453
Magazines	3,479	55%	316	5%	2,500	40%	6,295
High Grade/Office	3,903	54%	447	6%	2,900	40%	7,250
OCC/Kraft	19,500	36%	1,864	3%	32,090	60%	53,454
Compostable Paper	22,423	90%	2,503	10%	Neg.	Neg.	24,926
Other	14,962	69%	1,580	7%	5,210	24%	21,752
Total	68,097	56%	7,063	6%	45,970	38%	121,130

Losses to the U.S. Economy

	Paper/Cardboard	Plastics
Market Value	\$4 B	\$7.2 B
Disposal costs	\$4 B	\$2.3 B
Embodied energy	2.2 EJ (9% of industrial energy consumption)	3.4 EJ (12% of industrial energy consumption)
Energy source	1 EJ (4% of industrial energy consumption)	1.5 EJ (5.5% of industrial energy consumption)

Geographic Distribution of Landfilled Paper and Cardboard Waste



Key Takeaways

No surprise on plastics: Recovery rates remain low

Major insights on waste patterns:

- More paper is landfilled than previously thought
- Paper recycling rates are lower than previously thought
- Paper and plastic together make up 40% of total MSW managed

Missed opportunity for resource and energy recovery: Landfilling wastes the potential to recover valuable materials and the energy used in their production

Financial impact of landfilled paper and plastics:

- Over **\$11 Billion** in lost market value
- Plus **\$6 Billion** in disposal costs



Thank you!

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