Abstract:

Waste Doesn't Care About Design Intent

Every material eventually becomes waste. Waste is also generated within recycling processes themselves – yet rarely accounted for in circular economy thinking. True zero waste remains theoretical.

The hierarchy of end-of-use responses is well known: reuse, recycling, recovery, disposal. What is less understood is where it breaks down – and why.

The critical interface is not logistics. It is human behaviour. Separate collection systems e.g. for packaging depend on one simple cognitive rule: if it looks like plastic, it is plastic. This binary switch governs how people sort – regardless of what a material actually is.

This has direct consequences for bio-based and biodegradable plastics. Both will follow the plastic stream in practice. Allowing biodegradable plastics into bio-waste collection does not solve a disposal problem. It creates a contamination problem, destroying composting and soil improvement pathways for genuinely organic material, due to misbehavior of consumers, being unable to distinguish different types of plastics.

The answer is pragmatic: collection and sorting infrastructure must be adapted to distinguish bio-based and conventional plastics from biodegradable materials. Dedicated processing streams for biodegradable materials will become viable as volumes grow – and volumes will grow.

No packaging in the bio-bin. That's the simplest message.