

CLOSING THE LOOP

TOWARD CIRCULARITY IN THE SUPPLY CHAIN

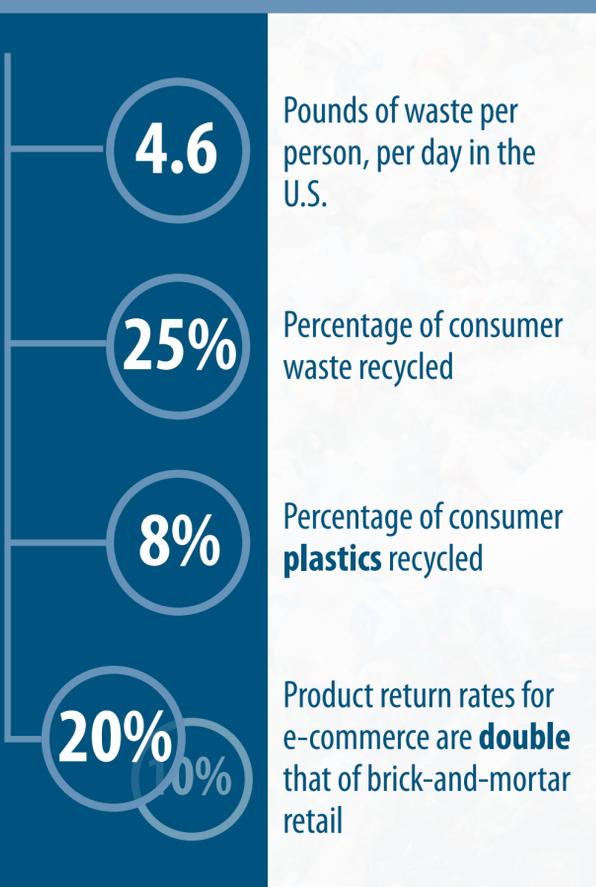
MIT Center for Transportation & Logistics
Roundtable Report - HIGHLIGHTS
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MIT Sustainable Supply Chains
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Why Circular Supply Chains?



U.S. HOUSEHOLDS

Recycling access 50% No Recycling access 50%

BARRIERS

- Companies are currently wired for linear supply chains.
- Fragmented or missing standards work against circular supply chains.
- Consumers need recycling education to improve the recyclability of the stream.

Motivators to Solving the Challenges

REGULATION
CONSUMER PRESSURE
NGO PRESSURE

Bottom Up
Employees who see a way work better or managers looking to see waste as a value stream

Top Down
CEO passionate about the environment, or corporate directive to improve

Images of a brand's iconic products or packaging washing up on beaches or appearing in horrific images of e-waste processing situations creates a pressure to take control of end-of-life items.

“ If the conversation is only about cost, you're dead in the water **”**
- Apparel Manufacturer

“ We announced goals on plastics because people expect it now. **”**
- Computer Manufacturer

“ We have an outcry from consumer youth—Gen Z wants this. **”**
- Apparel Manufacturer

Mechanisms for Circular Supply Chains

Ecosystems of partners
-Public-private ecosystems
-Supply chain ecosystems
-Pre-competitive collaboration

During the roundtable, groups considered 18 circularity mechanisms (shown randomly at right)

Groups converged on:

- Industrial symbiosis
- Product design
- Reverse logistics

as primary mechanisms to drive circular supply chains

In every ecosystem, all partners must be viable and motivated in order to play their role.

“ The future is a circular economy, and the heart of that is collaboration on future technology and additional research. **”**
- FMCG Retailer

Activity adapted from materials from the Ellen McArthur Foundation, ellenmacarthurfoundation.org

Examples of Circular Supply Chains

- Servitization** Consumers get a lifetime membership and their first organic cotton shirt by paying a deposit. They get a new shirt any time for any reason when they return the old one in any condition for small fee. The company recycles returned shirts and encourages customers to include other end-of-life apparel in the return envelope. More than 20,000 people were on the waiting list to join the service.
- Reverse Logistics** Two companies said they have recycling initiatives that generate more revenue than they cost. Interestingly, although recycling is profitable at both companies, they don't book these profits. Instead, they prefer to reinvest the gains in further circularity efforts such as training, investment in recycling equipment, and other opportunities.
- Industrial Symbiosis** "Industrial symbiosis" eliminates waste by finding a partner who would use the "waste" as input for their own product. Byproducts become products. Materials suppliers, competitors, and companies in other industries can help close the loop. For example, using carbon fiber scrap from the aerospace industry to make high-performance laptop parts.
- Product Design** Better designs might also steer products away from "monstrous hybrids" that are hard to disassemble and recycle. Designing multi-use, concentrated products helps enclose more product in less packaging and reduce the total number of different products consumers must buy.

“ Only go after partnerships that will move significant volumes of waste. **”**
- Apparel Manufacturer