

Pouch Packaging: Popular, Profitable and Problematic

A Presentation of the Closed Loop Foundation Research Initiative
**Investigating Emerging Recycling Solutions for Post-consumer
Film and Flexible Packaging**

2016 Global Pouch Forum – Miami, FL
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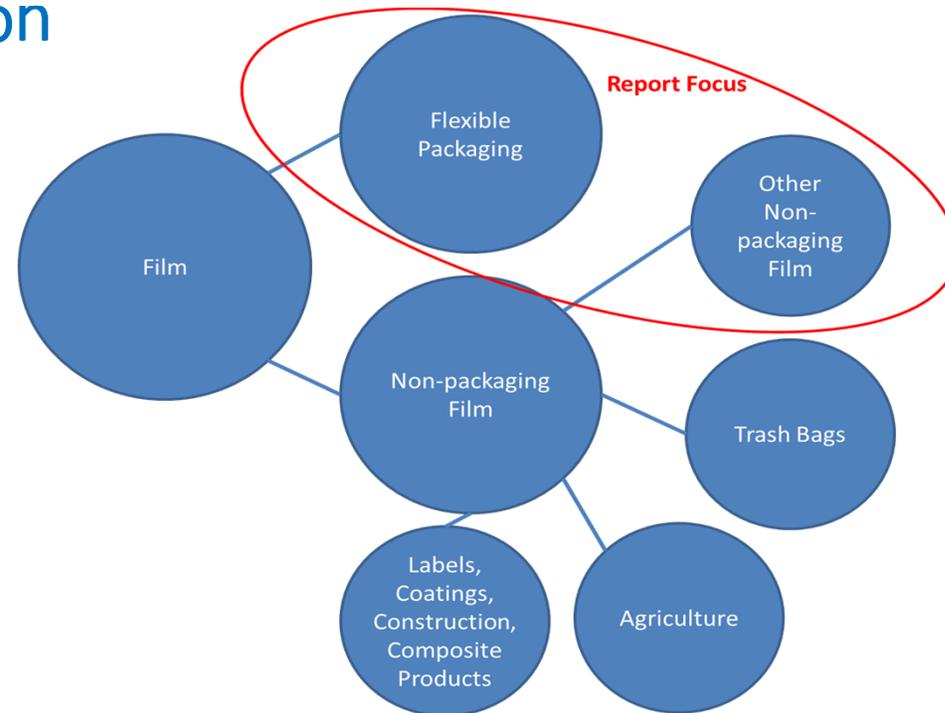
Closed Loop Foundation Research Initiative

- The Closed Loop Fund seeks to provide leadership in identifying investment opportunities to build comprehensive recycling programs.
- One area of investment need is to leverage improved film recycling opportunities and significant increases in film recycling rates, especially for residential film and flexible plastic packaging.
- CLF identified RSE USA as a firm with film recycling expertise to evaluate emerging solutions for recycling post-consumer film and flexible packaging, and make recommendations on how sources of capital can best be targeted and deployed to help build innovative recycling models for these materials.



Areas of Investigation

Plastic film is defined by the plastics industry as having a thickness of less than 10 mils (i.e., 0.010" or 0.25 mm). Most mono-layer film bags and wraps range in thickness from 0.5 to 2.0 mil thick, and at such low thickness are highly flexible and generally not able to support their own weight. Multi-layer flexible packaging (e.g., stand-up pouches) more commonly range from 2-5 mils in thickness, and while flexible, have a degree of stiffness.



Presentation Outline

- What is happening with respect to flexible plastic packaging recovery and what recycling options exist?
- Why is pouch packaging problematic, given its clear environmental benefits?
- What are the current barriers to recycling and recyclability?
- Is progress occurring to overcome these barriers?
- How can innovation be encouraged and targeted?



Current Status of Flexible Film Recycling

- Today's flexible plastic packaging recycling infrastructure has been built for polyethylene film - LDPE, LLDPE, HDPE
- Amount of polyethylene recovered for recycling:
 - Commercial 859 MM lbs
 - Marketplace characterized by captive supply, clean predictable stream, highest value
 - Residential Store Drop-off 136 MM lbs
 - Marketplace characterized by many access points - 18,000 retail locations, capacity to manage wraps/film as well as bags, but only 7% recycling rate
 - MRF 9.7 MM lbs
 - Marketplace characterized by severe operational and market challenges



Flexible Packaging Performs Well in LCAs

Replace all recyclable packaging with flexible packaging?

- Reduce volume of packaging discards by 77%
- Reduce carbon impacts by 40%

Go back and replace all flexible packaging with recyclable rigid packaging?

- Increase global climate impacts of food packaging by 6%



What's the Problem Then?

- **Sustainable Packaging Coalition:**
Sustainable packaging must be “Effectively recovered and utilized in biological and/or industrial closed-loop cycles”
- **Circular Economy 100:** “A circular economy...aims to keep products, components and materials at their highest utility and value at all times”

There is no plastic packaging so “good” that it can simply be thrown away.



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Consumer Expectation:
Packages are **Recyclable**



Challenges with Recyclability of Flexible Packaging

- **Consumer Return to Retail**

- Discerning multi-layer from pure PE pouches is impossible
- Risk of contamination from content residue may be real
- Traditional PE markets may reject mixed film materials
- In localities that have banned plastic shopping bags, stores have removed bag and film recycling bins
- Retail recycling centers are inconsistent among different stores with regard to bin placement, signage, and materials accepted
- Consumers don't know what is acceptable film for recycling
- Recycling behavior is disconnected from shopping behavior



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Challenges with Recyclability of Flexible Packaging

- **Materials Recovery Facilities (MRFs)**

- Plastic bags and other films compromise MRF operations and contaminate other materials
- Film that travels through a MRF degrades in quality as it goes
- Technology to identify then separate multi-layer pouches from pure PE pouches and other materials is not proven in MRF environment



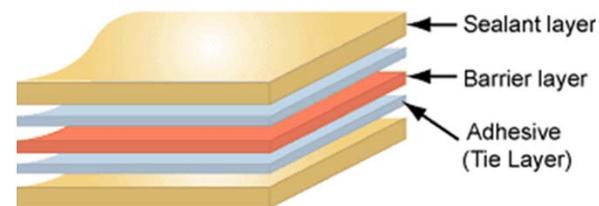
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Challenges with Recyclability of Flexible Packaging

• Reclaimers

- Very difficult to evaluate contents of a bale of PE film by looking at it, so creating and implementing bale specifications to incorporate pouches and multi-layer materials has not been done
- Sorting technology cannot identify materials under top layer
- Layers do not readily separate in recycling process
- Materials are incompatible with each other and do not now result in a usable manufacturing feedstock



What is Needed to Accelerate Pouch Recycling?

- **Innovation:**

- Sortation technology (robotics, new uses of current technology)
- Material compatibility technology
- New end markets

- **Design:**

- Demand for recyclable designs
- R&D in design for recyclability

- **Investment:**

- Companies need to invest capital into circular solutions for their packaging

- **End-use Markets:**

- Companies need to become the end market



Sample Innovations



	<ul style="list-style-type: none"> • Robotic technology that better sorts flexible material at the MRF
	<ul style="list-style-type: none"> • Plastics company creating new polymers out of multi-material plastics
	<ul style="list-style-type: none"> • RETAIN™ polymers allow converters to recycle barrier film trim back into film production without compromising performance or aesthetics.
	<ul style="list-style-type: none"> • Multilayer PE structure that provides functional and aesthetic advantages comparable to a mixed-material structure, but solves the recycling challenge.

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How will Innovation Happen?

- **Established Companies**
 - Brand demand will drive innovation
 - Engagement with supply chain on design will optimize package performance throughout lifecycle
- **Entrepreneurs**
 - Directed capital through grants and loans will inspire solutions
 - Demand for material will drive commercialization
- **Education**
 - Post-consumer PE resin is valuable, despite short term market challenges



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The Closed Loop Fund is a social impact fund investing \$100M to increase the recycling of products and packaging.

Investors
include:

3M

Goldman
Sachs

U
Unilever

P&G
Procter & Gamble

Walmart

Coca-Cola

Johnson
A FAMILY COMPANY

Johnson & Johnson
FAMILY OF CONSUMER COMPANIES

COLGATE-PALMOLIVE

KEURIG
GREEN MOUNTAIN

PEPSICO

■ The Closed Loop Fund unlocks recycling value by providing **0% and low interest loans** to cities and companies to build recycling infrastructure.

WE INVEST IN:



COLLECTION



SORTATION



END MARKET
DEVELOPMENT

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CRITERIA:



FINANCIALS



REPORTING



SCALABILITY



TONNAGE



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Closed Loop Fund Investment



The Closed Loop Fund has allocated \$10m in capital to drive pouch recycling



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