CoPPAC Presentation

October 13th, 2015

PACKAGING CONSORTIUM

MICHIGAN STATE UNIVERSITY

SCHOOL OF PACKAGING

Formally Launched April 2014

PACKAGING CONSORTIUM™

The vital partner and catalyst for
the packaging value chain

In 2014, PAC connected >3000 people

PAC 48 Tours, Seminars, Social & Education

13 Facility tours, 300+ attendees.

3 Seminars, 200+ attendees.

6 Social activities, 500+ attendees.

2 Summit/Symposium, 700+ attendees.

10 Webinars, 1000+ attendees.

14 In-class courses, 180+ attendees.

PAC educates industry

8 in-class courses

In April 2014, PAC NEXT launched

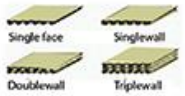
The Ultimate Packaging Optimization Course

"Got me excited to really dive into our company's plan and develop a strong strategy" – Joanna Caners, Home Depot

15 on-line courses

PAC can customize courses & present in-house

On-Line Courses

 Primary Types of Packaging (Overview)	COMING SOON  Packaging Optimization	 Graphic and Structural Design and Branding	 Package Printing Processes & Supplementary Decorating
 Corrugated Fibreboard: Properties and Regulations	 Corrugated Fibreboard: Printing & Box Design	 Fiber, Paper & Paperboard	 Folding Cartons
 Glass Packaging	 Steel & Aluminum Metal Containers	 Labels & Applications	 Bottle Design Basics
 Injection Moulding Plastics	 Blow Moulding Plastics	 Flexible Packaging Laminates	 GFSI Approved Food Safety Standard

PACKAGING CONSORTIUM™

PAC NEXT

A WORLD WITHOUT PACKAGING WASTE

Launched August 3, 2011

VISION

A World Without Packaging Waste

PURPOSE

To facilitate the convergence of ideas and identify sustainable solutions that lead to zero packaging waste

GOAL

To minimize recovery system cost while maximizing recycling rates and the value of recovered materials

PACKAGING CONSORTIUM™

FOOD WASTE

FOOD WASTE PACKAGING SOLUTIONS

Launched December 5, 2013

VISION

A Catalyst for Food Waste Packaging Solutions

GOAL

To maximize the reduction of food waste through prevention and extension of shelf life utilizing sustainable packaging solutions

INDUSTRY TRENDS & DRIVERS

Circular Economy

A $2billion(1) - 20billion(2) opportunity?

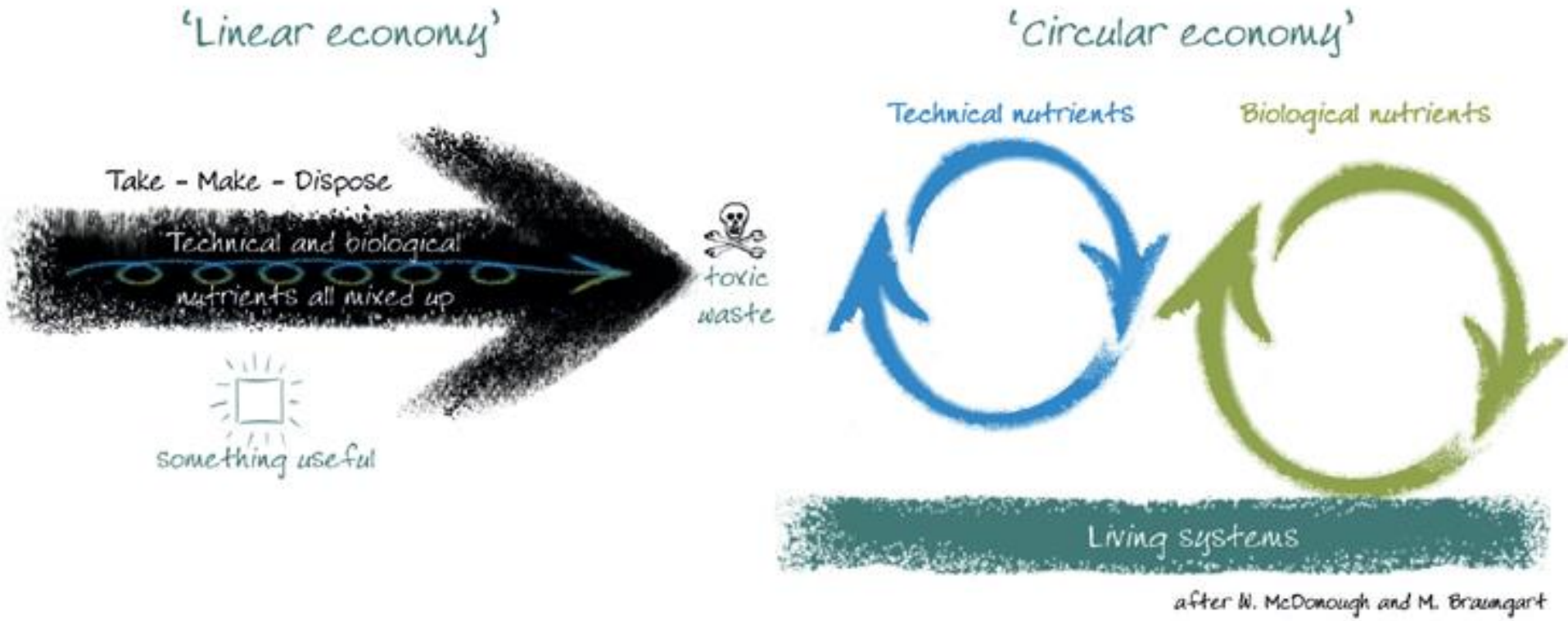
Curbside collection & recovery costs ca. $1billion / yr

Value of pkg materials that go to landfill > $1.1 billion / yr

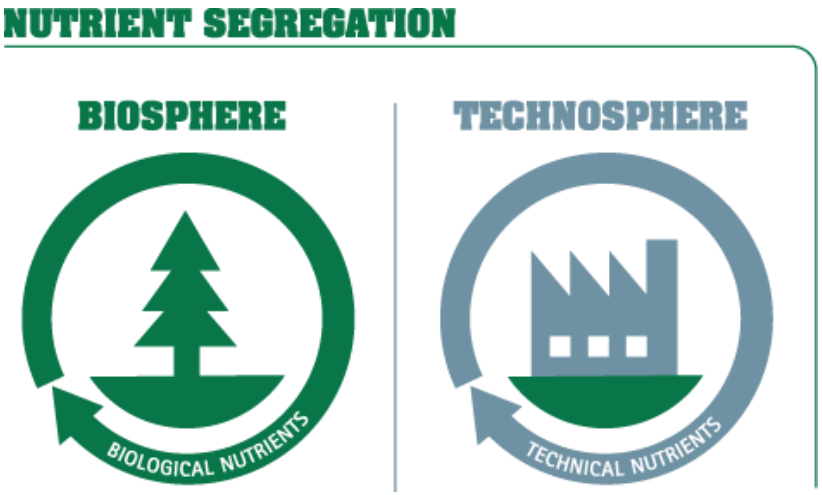
(1) Canada Wide Action Plan for EPR 2009

(2) Estimate – US GDP 10x Canada GDP

Circular Economy & Life Cycle Thinking



Circular Economy & Life Cycle Thinking



Packaging that can be readily dis-assembled into biological and technical nutrients

Packaging that can be easily separated into Re-usable or Recyclable or Renewable materials

Optimizing for the Packaging Value Chain

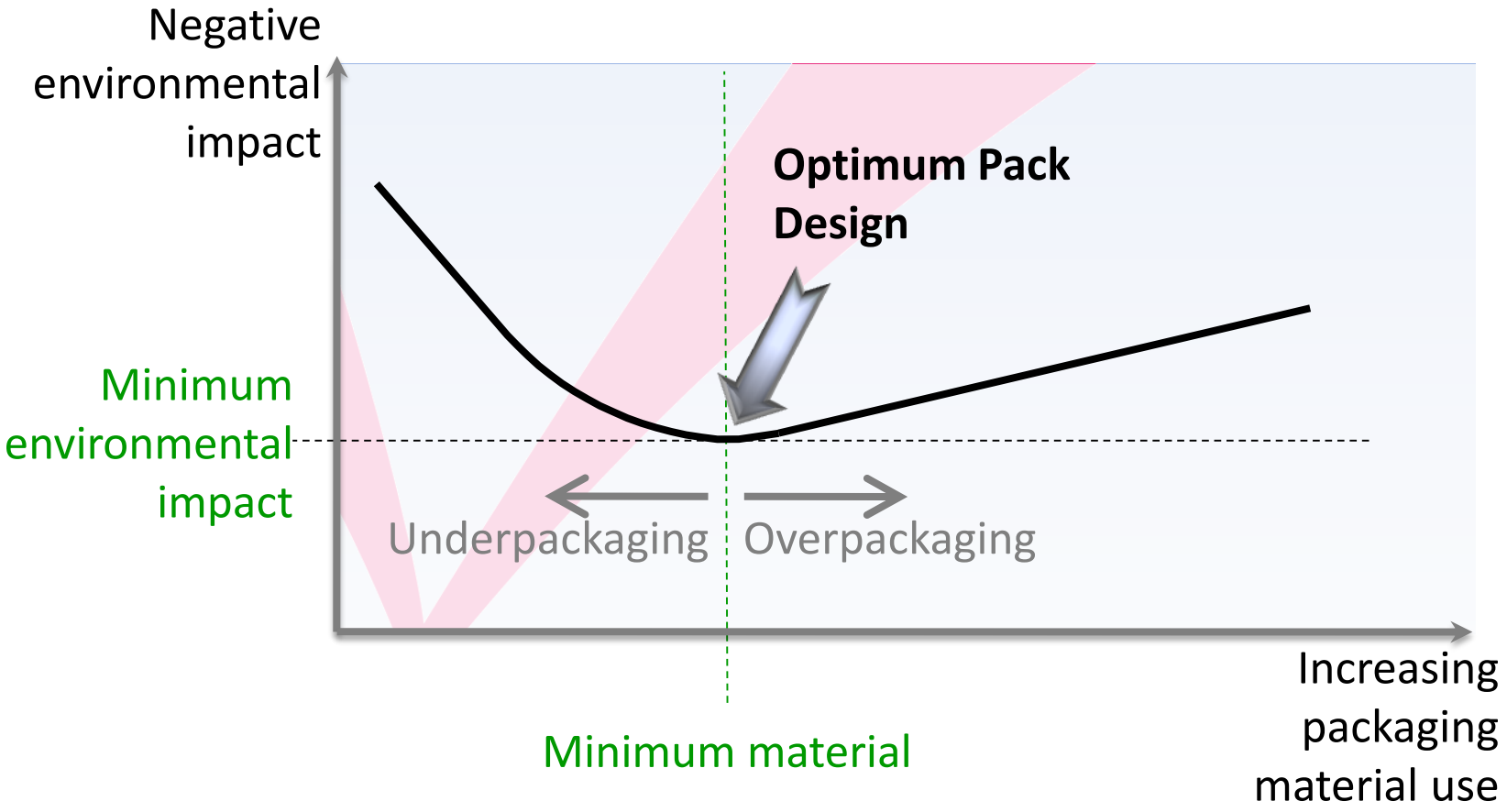


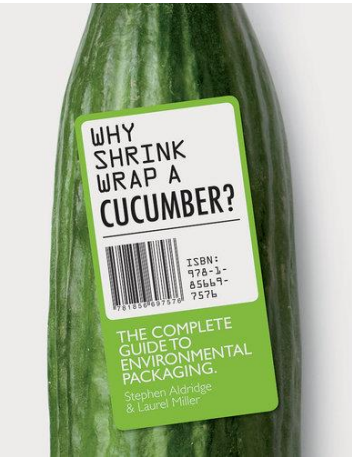
Diagram courtesy of Innventia AB

The PAC NEXT Way

A WORLD WITHOUT PACKAGING WASTE

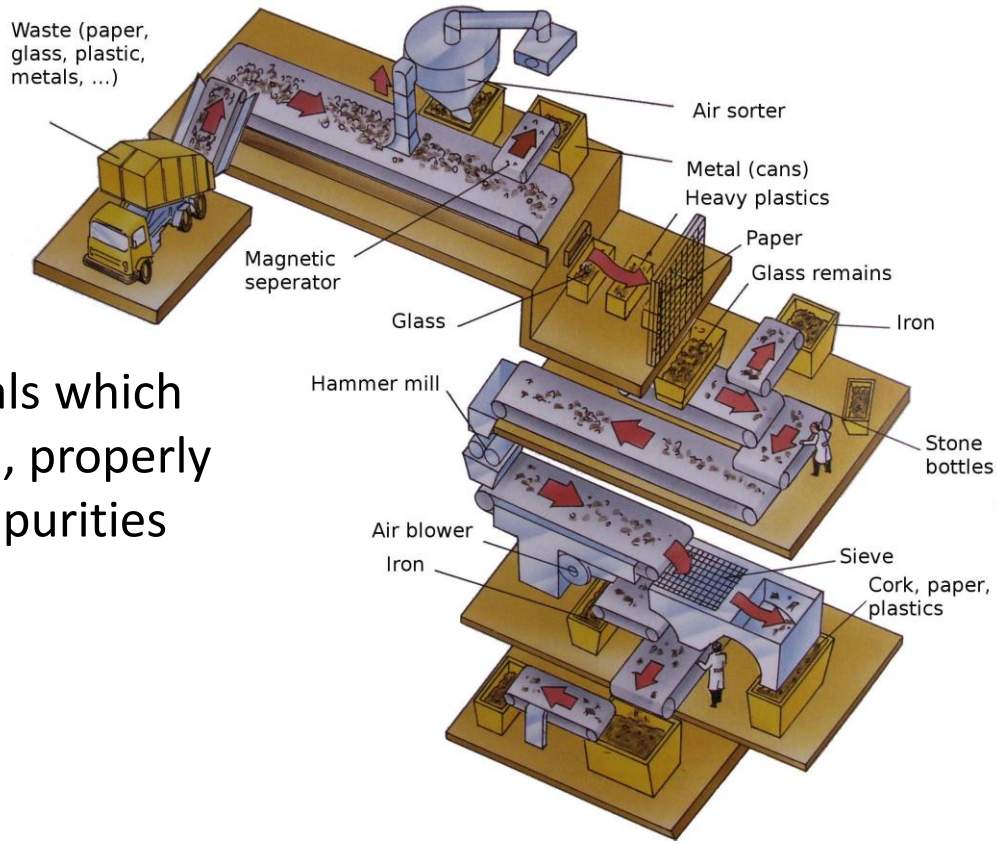
Product Design & the Value of Packaging

- Consumer preferences / attitudes
  - Want value, performance AND sustainability with no compromises
- Role of packaging
  - Win at shelf, communicate equity & info, convenient & safe to use, protect & preserve, efficient logistics, reduce food waste, sustainable, circular



Designs That Work in MRFs

- What is a MRF?
  - MRF stands for Material Recovery Facility
  - MRFs receive collected materials for recycling where it is sorted and baled for processing based on available end markets



  - It is important that the materials which come out of the MRF are clean, properly sorted and relatively free of impurities

Top 10 Packaging Challenges in a MRF

1. Multi-Layer Laminates
(mixed plastics resins and foil)

- Not recyclable but consumers put in bin
- Manual sorting - goes to residuals for landfill or EfW
- Volume impact – 10 pouches = 1 bottle
- Flexible laminated packaging demand growing
- Need viable recycling end market

2. Compostable Plastic
(mainly PLA)

- Not accepted curbside but similar to clear PET / PS
- Optical sorters divert to mixed plastics
- Manual sorting – similar to PET
- PLA no longer sold into beverage bottle market
- Focus on recycling NOT on composting

3. Black Plastic Containers

- Variable acceptance curbside
- Manual sorting to mixed plastics
  (Optical sorters not effective)
- Other colors preferred or additives – easier to sort

4. Full Shrink Wrap Label

- Accepted curbside
- Full labels can confuse optical sorters
- APR Design for Recyclability guidelines
  - Label floats in water
  - Ink does not stain rPET
  - Partial label preferred

5. Hot Beverage Polycoated Cups

- Variable acceptance curbside
- Keep lid separate from cup – rinsed / clean
- Manually sorting to polycoated containers (high value) or mixed paper stream (lower value)
- Optical sorters for fibers – then manual sort

6. Metallized Tubes

- Not accepted curbside but consumers put in bins
- Ends up in residuals going to landfill or efw
- Enval developing technology to separate foil / plastic

7. Single-Serve Hot Beverage Pods

- Not accepted curbside but consumers put in bin
- Small – contaminates glass stream
- Design for dis-assembly, recyclable plastics and compostable plastics

8. Colored Opaque PET

- Accepted curbside but contaminates clear PET
- Requires manual sorting to mixed plastics
- Clear PET preferred

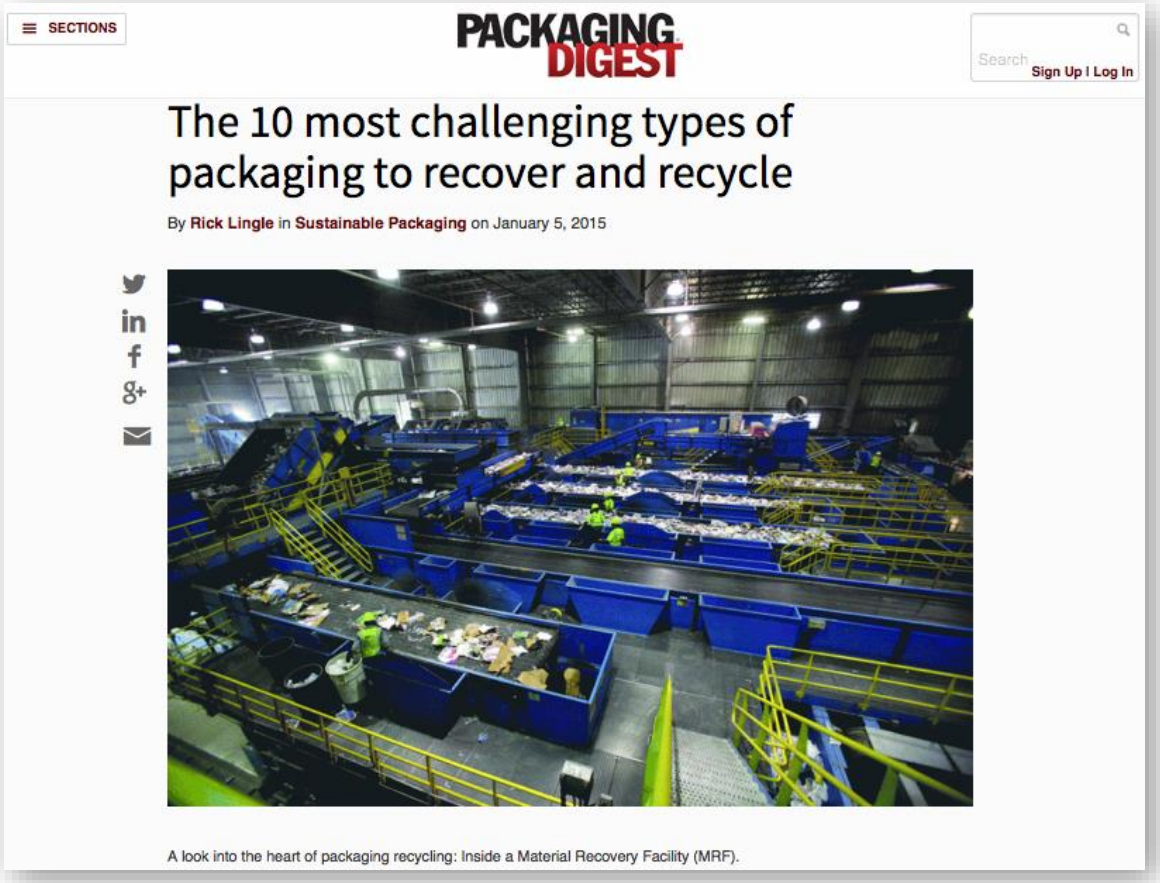
9. Non-PET Clamshells

- Similar to clear PET
- Optical sorters send to mixed plastics
- APR guidelines – use labels, inks & adhesives that can be easily removed

10. Cardboard Tray with Plastic Film

- Requires manual separation of materials otherwise plastic & board goes to landfill
- Municipality P&E programs – separate materials or avoid mixed materials

- One of most popular articles of past months
- More than 2,000 Page Views
- Keep building this momentum



Case Studies From Members

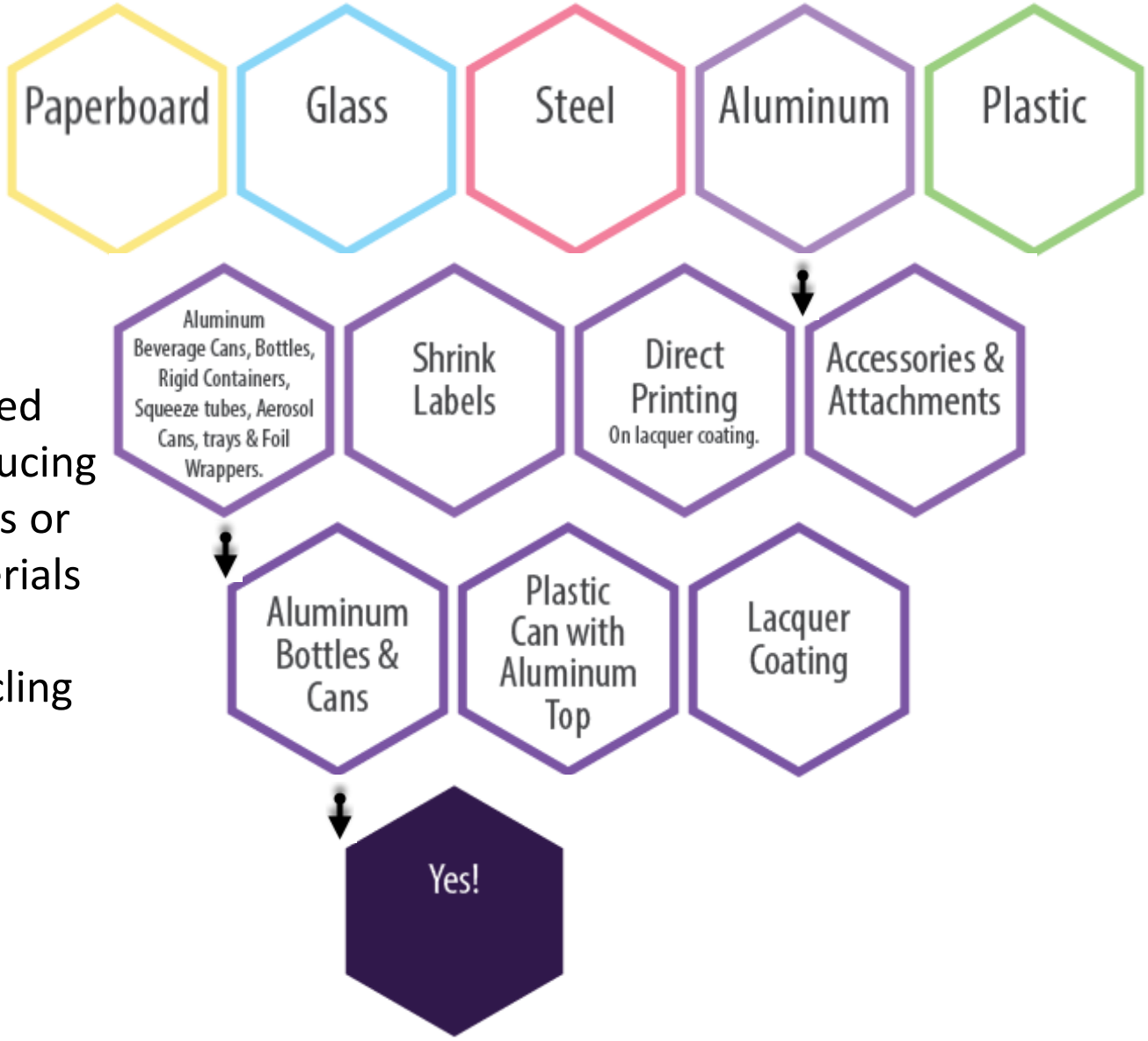
- What would be recycling impact of switching from PET to Talc filled Polypropylene tray and OPS lid for Home Meal Replacement products?

- Recycling comparison of poly-coated paper tubs for ice cream versus Polypropylene tubs

- Recycling comparison of metal vs. plastic aerosol containers

Decision Trees for Current Recycling Stream

Developed to help packaging designers, manufacturers identify and avoid any unintended consequences of introducing new packaging materials or existing packaging materials with a new application, within the current recycling infrastructure.



Food Security

Global Food Production

33% of all food produced globally is wasted

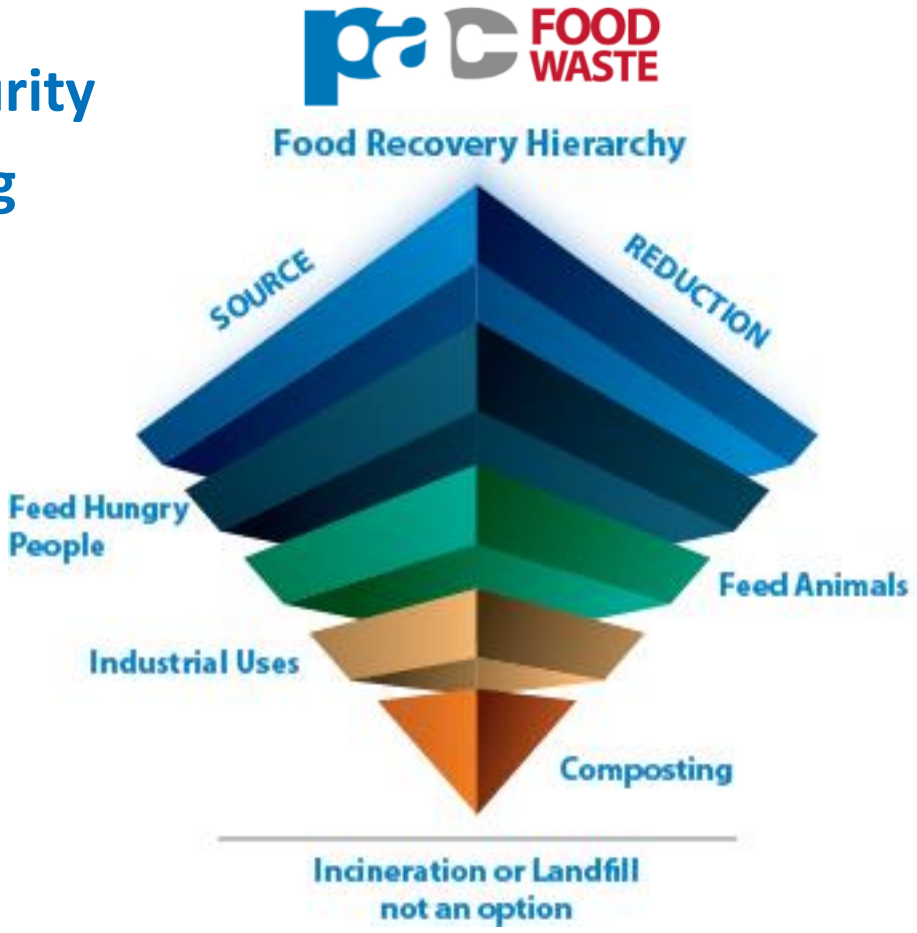
Canadian food waste estimated at $31 Billion CAD
US food waste estimated at $165 Billion USD

~50% food waste relates to consumer behaviour

Food waste is avoidable

Driving Factors to Reduce Food Waste

- Greater demand for food security
- More organizations recovering food for redistribution
- Proactive efforts of retailers, manufacturers and foodservice providers to divert waste
- Government policies and rising costs of landfill
- Investments in composting/ organic waste facilities



Role of Packaging in Reducing Food Waste

Consumer Beliefs vs. Behaviours

Harris Poll 2014 commissioned by Sealed Air

Consumer Beliefs vs. Behaviours

Harris Poll 2014 commissioned by Sealed Air

Communicating the Value of Packaging

	No Wrapping	Shrink Wrap
Shelf-life Claim NOT Shown	 73%	 27%
Shelf-life Claim Shown	 Shelf life of 3 days if stored properly 40%	 Shelf life of 14 days if stored properly 60%

Harris Poll 2014 commissioned by Sealed Air

Food Waste Along the Value Chain

Product source – Farm
9%

Raw material transportation
1-2%

Manufacturing/ processing
18%

Warehousing/ storage
1-2%

Post-consumer

Consumer
51%

Point of purchase – Retail or Food Service
17%

Finished goods transportation

1-2%

Food Waste Along the Value Chain

Key functions of packaging to tackle food waste

PROTECT PRODUCT

EXTEND SHELF LIFE

PROMOTE BEHAVIOUR CHANGE

Finding the Right Balance

✓Protect product
✓Reduce damage
✓Prevent food waste

✓Reduce amount of material and types used
✓Source the right materials
✓View product-package system
✓Optimize end-of-life options

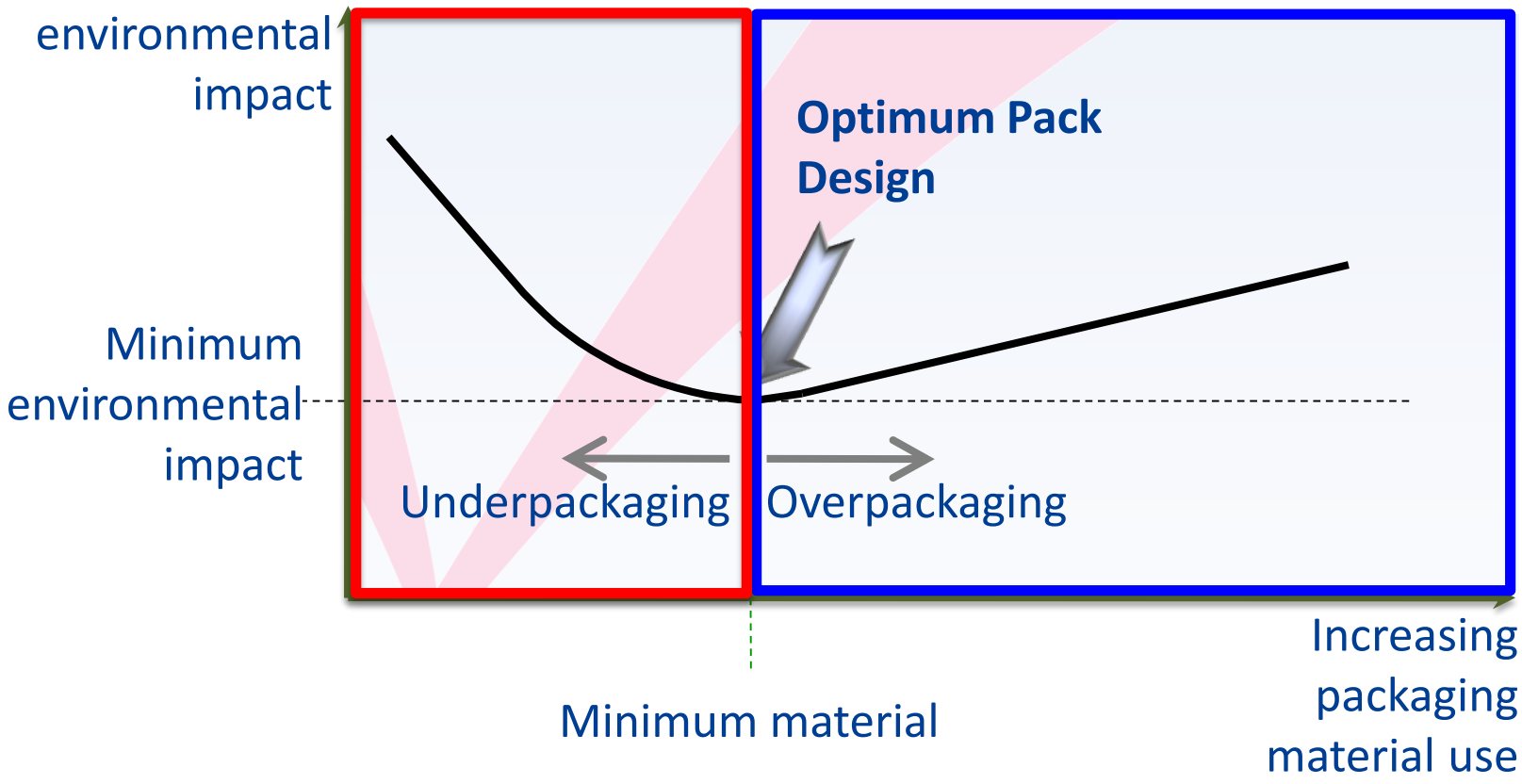


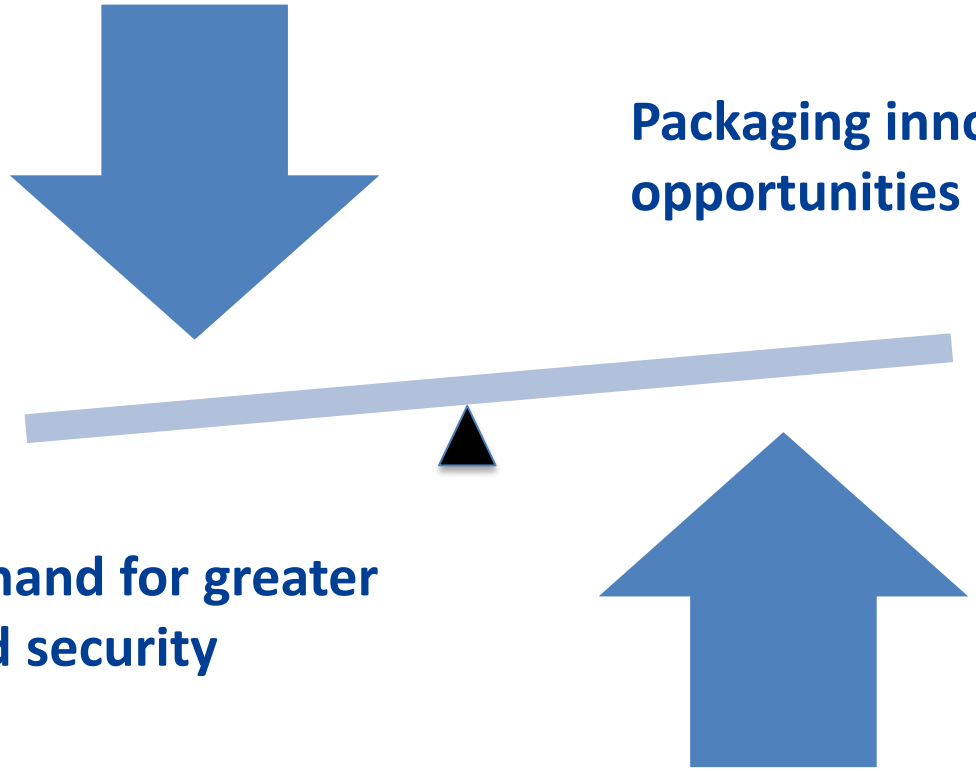
Diagram courtesy of Innventia AB

Finding the Right Balance

Packaging considerations for fresh and processed foods			
Material selection	Material weights	Package design, dimension and shape (ergonomics)	Interaction between packaging levels
Mechanical and chemical characteristics	Packing line efficiency	Filling / packing line speed	Handling efficiencies
Cube utilisation	Stackability	Easy to open, dispense and close	Stability and robustness through supply chain
Warehousing, stocking and stacking	Inventory control	Filling , order picking, sorting and packing	End of life waste management options
Transport mode and lengths	Infrastructure conditions	Loading / unloading operations	Change of transport modalities
Product containment	Product protection and preservation	Product convenience	Temperature and humidity control
Product quality	Product shelf life	Product safety and hygiene	Product communication
Packaging material costs	Equipment costs	Waste management costs	Marketing costs

Source: RMIT, 2013

Dynamic interplay



Food Waste Packaging Solutions

Solutions include **smart food packaging technologies** & food science that extend shelf life and freshness

Examples:

- Modified Atmosphere Packaging (MAP)
- Scavenger technologies
- Vacuum packaging
- Anti-microbial packaging
- Aseptic packaging

Solutions that provide **consumer convenience** and allow for improved food storage practices

Examples:

- Portion packaging
- Resealable packaging
- Designs for easy product removal
- Product information on preparation, dosing, storage
- Best Before, Use By, Sell By dates
- More robust packaging materials

Project Highlights

- PAC FOOD WASTE's three inaugural projects explore the relationships between smart, innovative packaging and causes of food waste along the food value chain.
  - **Food Waste Reduction Case Studies**
  - **Who's Who of Packaging and Food Waste Initiatives**
  - **Single-Serve Coffee Life Cycle Assessment**

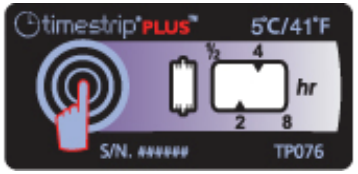
Food Waste Packaging Case Studies

Manufacturing/ processing

Raw material transportation

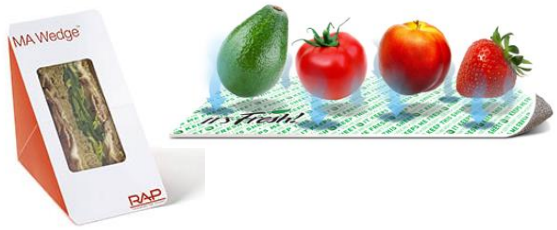
Finished goods transportation

Warehousing/ storage



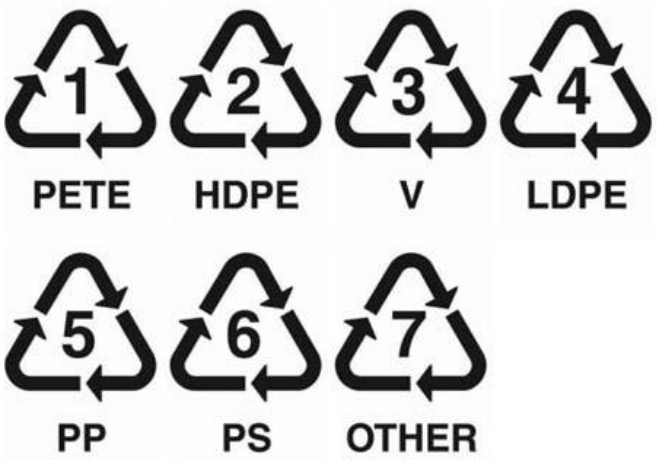
Consumer

Point of purchase – Retail or Food Service



Innovation Areas

Curbside Access & Infrastructure – Recycling & Composting

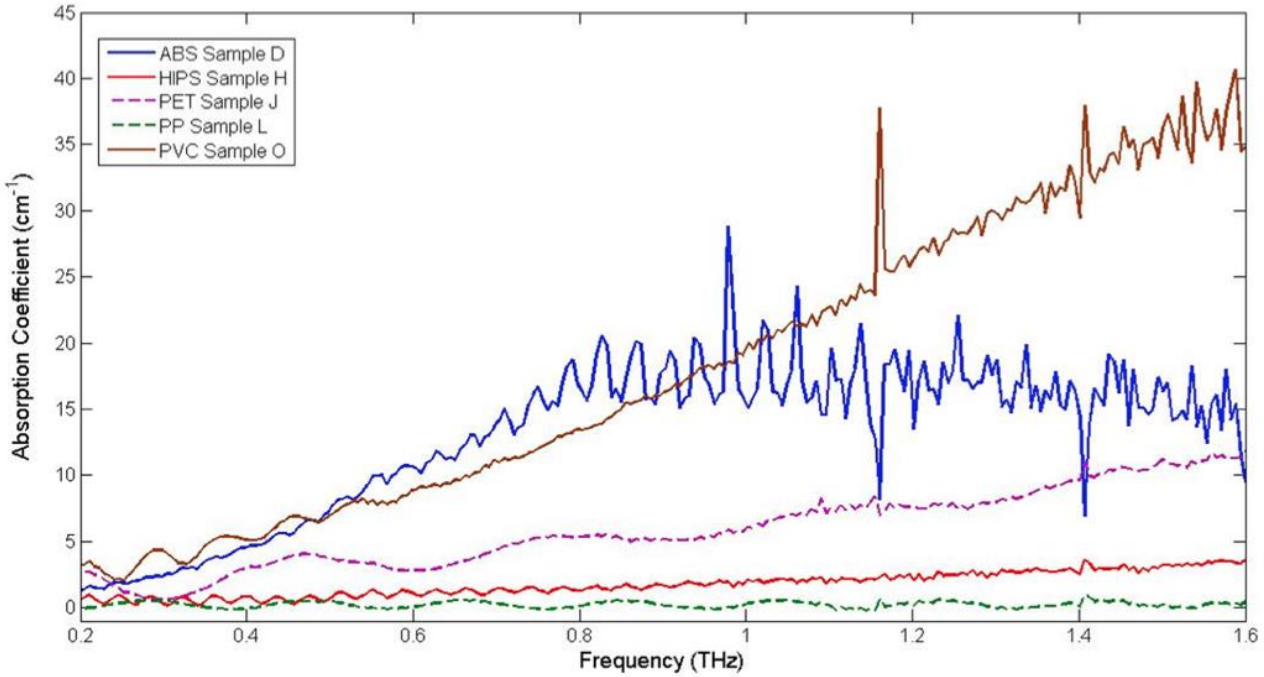


CLOSED LOOP fund

COMPOSTABLE
Biodegradable Products Institute | US COMPOSTING COUNCIL
TM

MRF Sorting Technologies

Terahertz Sensing of Black Plastics from Electronic Waste



Material characterization example

Graph courtesy of TeTechS Inc.

Reprocessing & Developing End Markets

Trial with PCR Laminated Film

15 lbs of typical PCR Film sent to Zzyzx

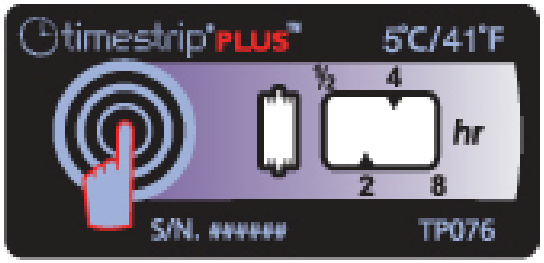
Zzyzx processed as-received film into
natural gray and green pellets
(smell greatly reduced due to low temperature
SSSP and limited heat exposure during extrusion)

Pellets can be injection and compression
molded as well as made into film

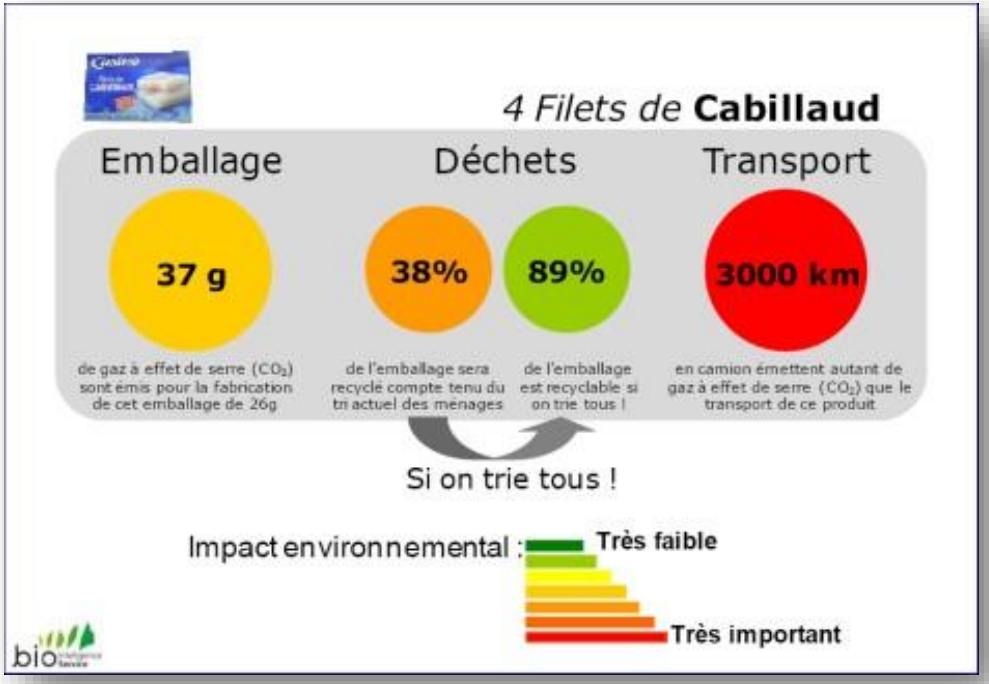
Zzyzx Polymers

Food Waste Monitoring – Supply chain, tampering, temperature

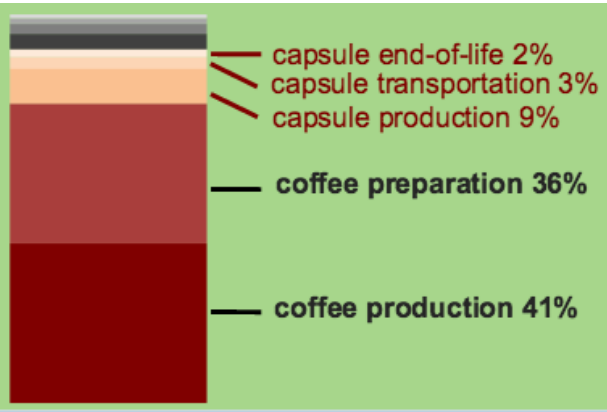
- Provide real time expiration data, product tracing and correct storage temperature indicators



Food Waste Education – Storage & other information



The study found that the **capsule** footprint is a **small contributor** to the overall footprint of the single serve system!



Capsule life cycle impacts are **less than 15%** of the total carbon footprint

Packaging waste is a small factor

Food waste savings are HUGE!

39,000 - 116,900 tonnes of potential waste avoided per year![4]

When it comes to **potential avoided coffee waste**, there are significant environmental benefits!

67,552-202,658 cars off the road from **CO_2 savings**

14,791-44,375 Olympic pools from **water savings**

21,821-65,463 football stadiums from **land savings**

Innovation & Design

PAC Global Leadership Awards

Awards Gala – April 22, 2015

Packaging Competitions

First North American Sustainable Packaging Awards launched in 2008.

First North American Food Waste Packaging Awards launched in 2015.

Brand Marketing fastest growing category.

Competition open to all!

Sustainable Packaging Award Winners 2015

PAC GLOBAL LEADERSHIP AWARDS

Food Waste Awards 2015

PAC GLOBAL LEADERSHIP AWARDS

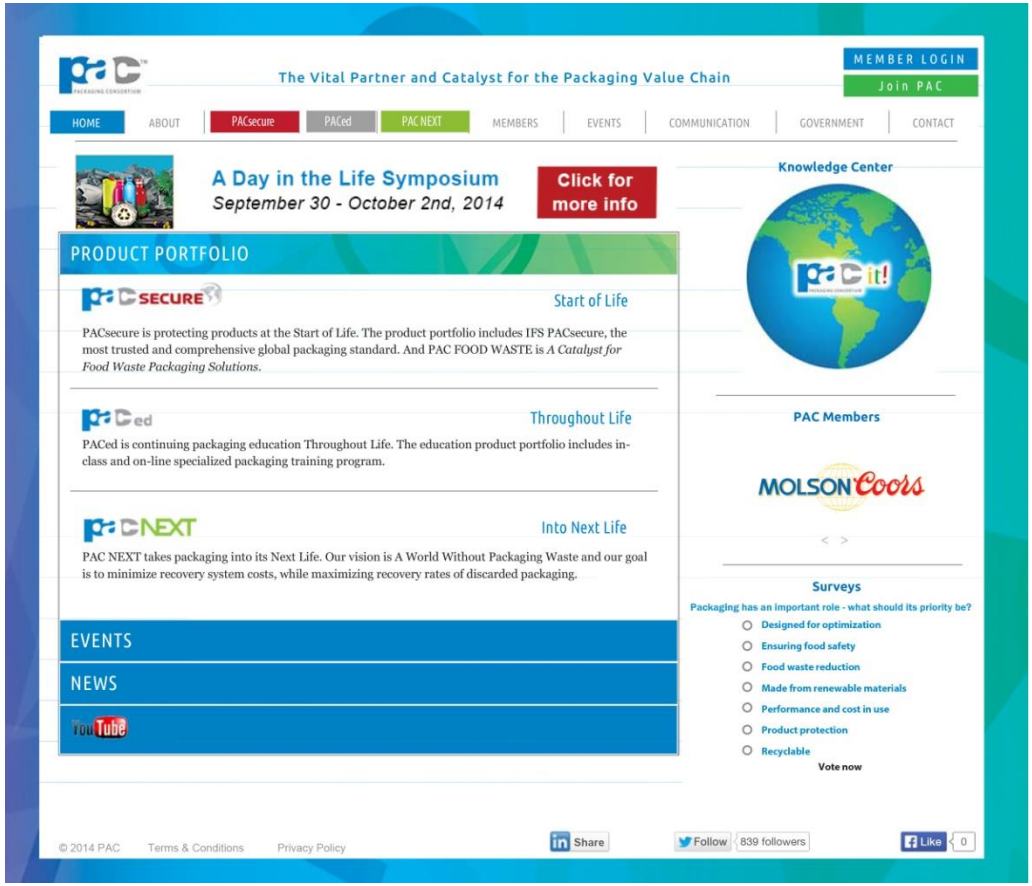
Best of Show 2015

Best of Show 2015

2016 Awards - Packaging Innovation

PAC Website

PAC has a new interactive website, featuring surveys, YouTube videos, the PACit Knowledge Center and PAC NEXT Decision Trees.



Membership is free for students!

Thank you!

Contact:
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Learn more at pac.ca!