

# PACKAGING TECHNOLOGY & RESEARCH

**MORE SUSTAINABLE  
PACKAGING FOR NOVELTY  
DAIRY DESSERTS**



# ABOUT PTR

## Dr. Claire Sand thinks “all food packaging all the time”



Claire’s mission is to enable a more sustainable food system with science and value chain innovations that more sustainably increases food shelf life and prevents food waste

- 35+ years of food packaging experience
- Ranks innovative packaging science and value chain solutions to extend shelf life
- Generates implementation roadmaps and aligns business cases
- IFT Fellow, Riester-Davis-Brody life-time achievement in food packaging award recipient
- Doctorate in Food Science and Nutrition at University of Minnesota
- MS and BS in Packaging at Michigan State University

### Owner



### Adjunct Professor



### Monthly Columnist



### Current Leadership & Editorial Boards



### Recent Awards



# ABOUT PTR

## What we do

Provide tailored packaging  
**science & value chain**  
solutions to the  
**food & packaging industry**



# ABOUT PACKAGING TECHNOLOGY & RESEARCH

## Recent projects on achieving a More Sustainable Food System

### Less Food Waste

- Conducted **value chain analysis** that identified 287 product, process, and package solutions with 1.1 billion pounds in reduced food waste for 6 Minnesota crops - **AURI**
- Sourced, screened, and ranked intelligent packaging options to **reduce food waste by 10%** and 15% and improve food safety and reduce labor associated with the product use for a QSR suppliers
- Defined QSR value chain drivers to **build the business case** for packaging that decreases food waste
- Ranked packaging solutions to reduce food waste by category impact and feasibility to channel research and development for multi-industry stakeholder groups for food and packaging companies - **ReFED**

### More Sustainable Packaging



- **Guided Package Material Switching** -----
- Discerned 5 different **package sourcing implications** by varying scopes on LCAs in the fresh produce industry
  - Pinpointed package material sustainability differences using **Forensic LCA and analysis**
  - Identified, sourced, and developed 50+ more sustainable material options for 3 structures **with the same product shelf life and operational performance solutions** that provided a 10-46% reduction in climate change
  - Identified, sourced, and developed 156 solutions that provided a 10-212% **reduction in climate change**

- **Refined Package Design** -----
- Package design for 15+ entrepreneurs seeking to **connect brand and product characteristics to more sustainable packaging**
  - Employed advanced **material science** to construct 4 more sustainable packaging systems
  - Achieved 5 more **sustainable packaging designs** by linking value chain needs with internal constraints
  - Redesigned packaging systems to meet QSR needs and **lower the total environmental footprint**
  - Conducted directional **Consumer Research** to guide decision making on 6 more sustainable packaging options in the meat industry

### More Sustainable Food System

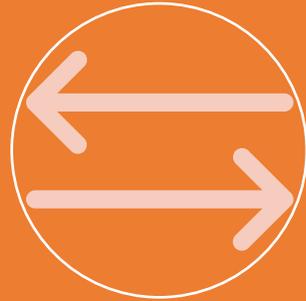


- **Employed UNSDG Target 12** to link more sustainable packaging and food waste for 3 major brands
- **Defined sustainability strategy** for a company with 12 packaged food brands
- Built the **Business Case** for more sustainable packaging using **value chain drivers** of retailer, consumers, and post-consumer handlers for 15+ products

# Take-Aways



Packaging's role in moving the dial on a more sustainable food (novelty ice cream) system is more appropriately focused on preventing food waste and UNSDG Target 12



Tailwind and Headwinds define where we are now



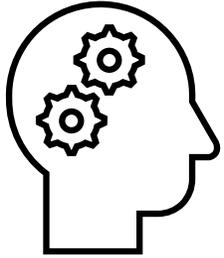
Sourcing - Biomass-derived PE and PET are drop-in solutions



Disposal - Value chain, design and systems thinking is needed

**MORE SUSTAINABLE PACKAGING FOR NOVELTY DAIRY DESSERTS**

# More Sustainable Packaging



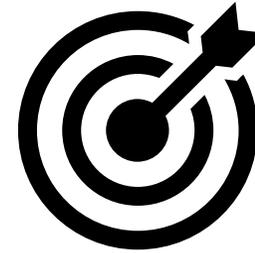
## **RATIONALE**

Actually be more sustainable and not reduce product shelf life



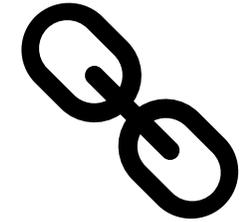
## **DEFENSIBLE**

Be communicated to retailer, consumers, and post-consumer handlers in a meaningful manner



## **ACHIEVABLE**

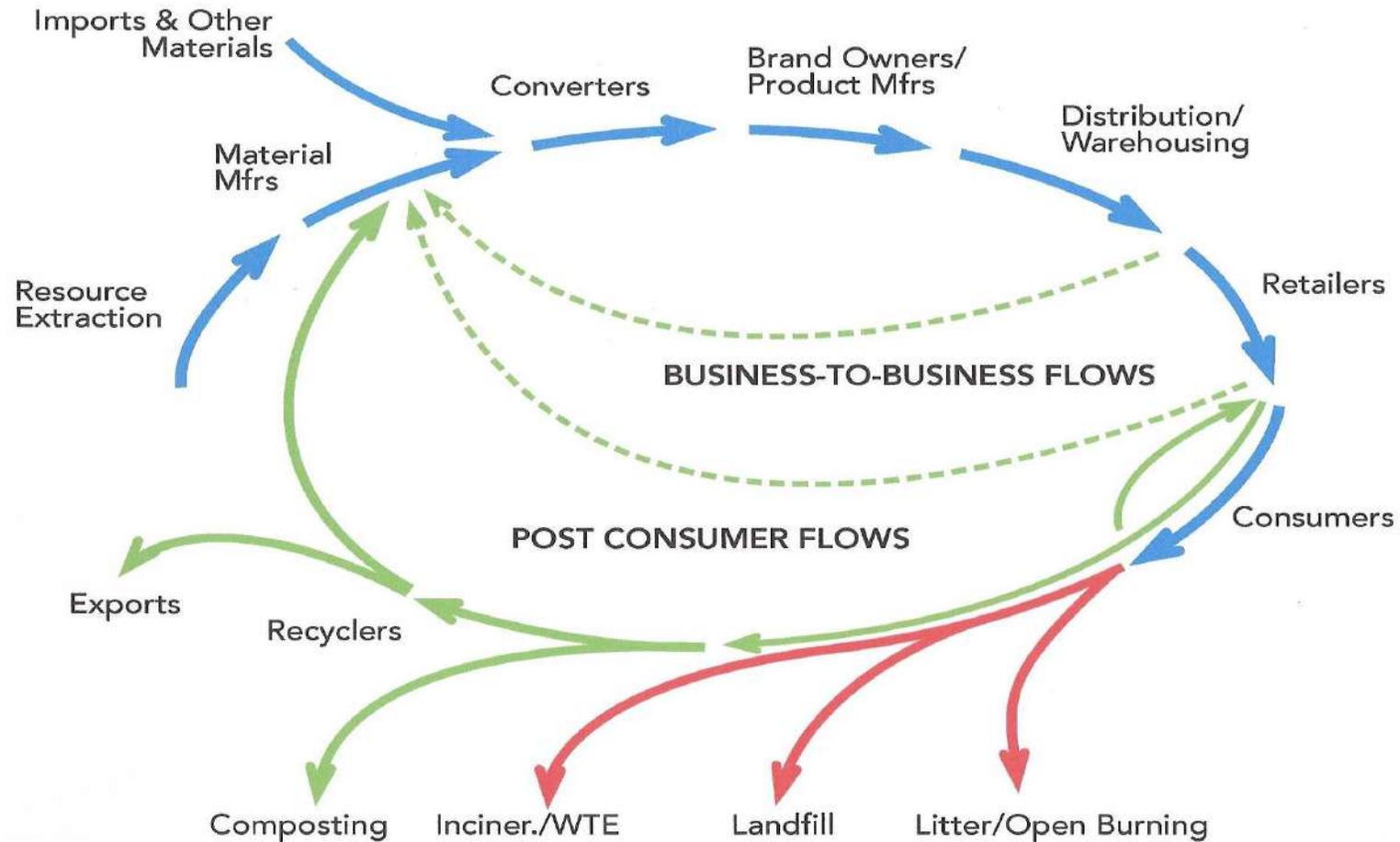
Uses what is viable in 1,3,5 years within defined constraints



## **LINKED**

Aligns with retailer, consumers, and post-consumer handler needs and targets

# Packaging Life Cycle



# The Waves of Sustainability

## 2<sup>nd</sup> Wave

1969 and the Cuyahoga River was burning

Silent Spring

Weather inversions in London and NYC

Earth Day and EPA 1970

Ended in USA in 1990s

## 3<sup>rd</sup> Wave

Global supply

Triple Bottom Line - TBL

People, Profit, Planet - PPP

Corporate Social Responsibility - CSR

## 4<sup>th</sup> Wave

### 4<sup>th</sup> Wave – Sustainability Age of Reason

**Motivated by negatives**

- Greenwashing
- Eroded consumer trust

**Motivated by positives**

- Food waste awareness
- Global brands & packaging suppliers

## WHERE WE ARE NOW I

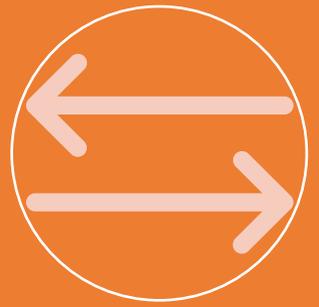
# More Sustainable Packaging Prevents Food Waste

- If food waste was a country, it would rank 3rd in CO<sub>2eq</sub> behind China and the United States
- Science-based and value-chain based packaging solutions to prevent food waste are abundant
- Different foods demand different packaging requirements
- A pragmatic- and science-based approach ranks packaging solutions by their ability to halt major degradative reactions
- More sustainable packaging does not increase and instead prevents food waste

# Take-Aways



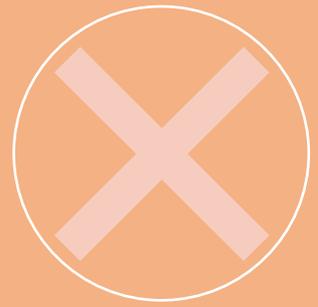
Packaging's role in moving the dial on a more sustainable food (novelty ice cream) system is more appropriately focused on preventing food waste and UNSDG Target 12



Tailwind and Headwinds define where we are now



Sourcing - Biomass-derived PE and PET are drop-in solutions

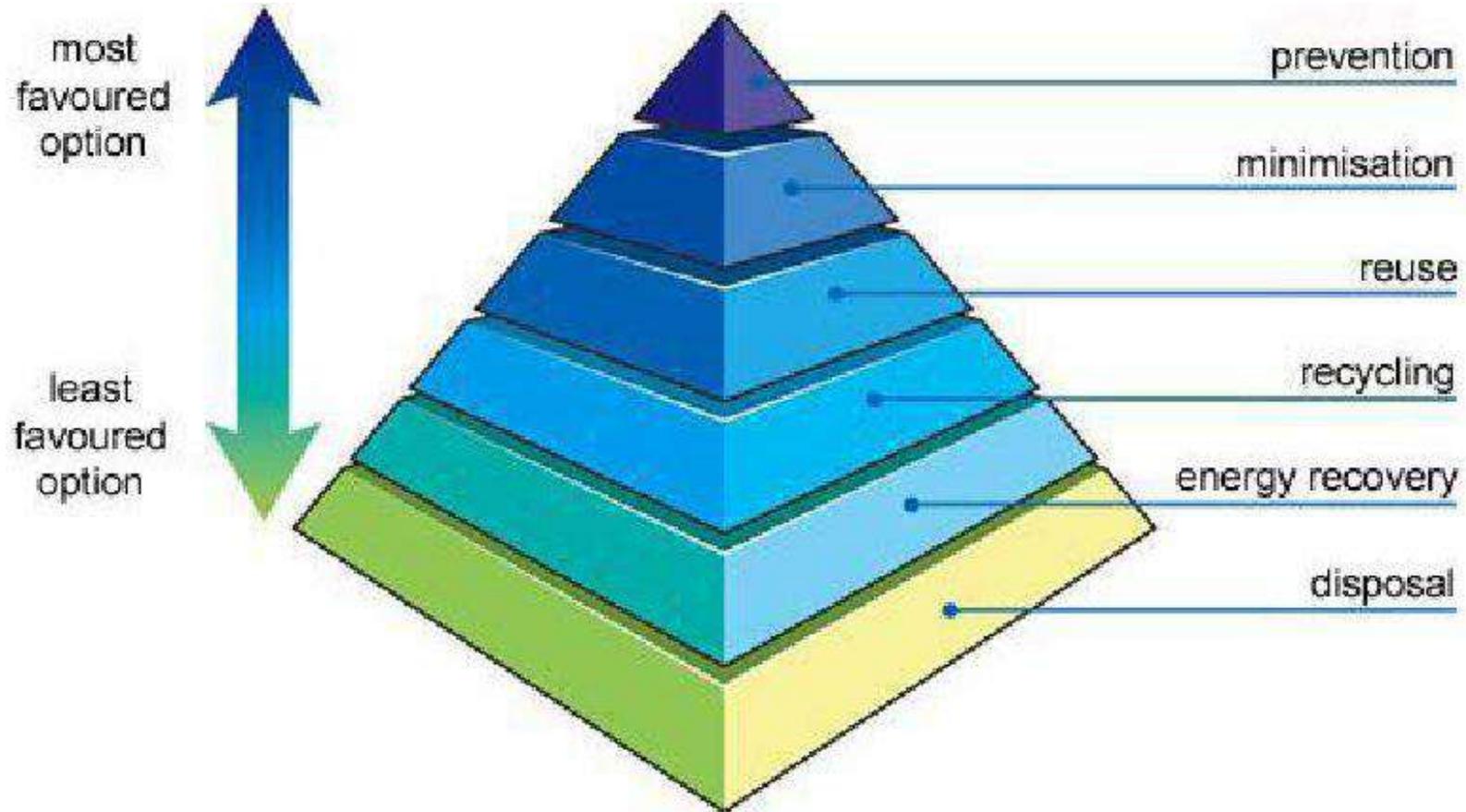


Disposal - Value chain, design and systems thinking is needed

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# WHERE WE ARE NOW I

## Options



# WHERE WE ARE NOW

## Packaging Solutions that Prevent Food Waste as a Function of Feasibility and Impact

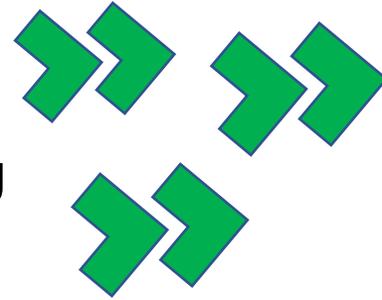


# WHERE WE ARE NOW I

## Tailwinds

### Focus on the End Game

- + More sustainable food system is advancing
- + UNSDG Target 12 links food waste and packaging
- + Business cases can align



### Packaging has power

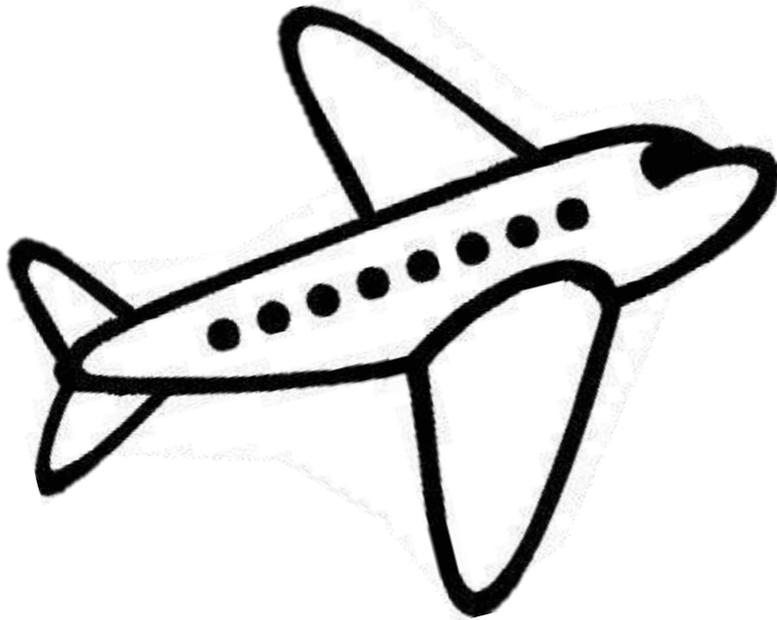
- + 5<sup>th</sup> Industrial Revolution linking information with emotions
- + Unique position/power of Retailers
- + Shared Value
- + Design Innovation

### Material science delivers

- + 100% Bioderived Polymers advance
- + Compostable un-reality is eminent
- + Chemical and mechanical recycling finesse

# WHERE WE ARE NOW I

## Headwinds



### **Packaging Industry not leading in a concerted manner**

- Reactionary Industry Leadership remains after trust has eroded
- “we have been here before” feeling from established leaders

### **Social pressure not Science dominate discussion**

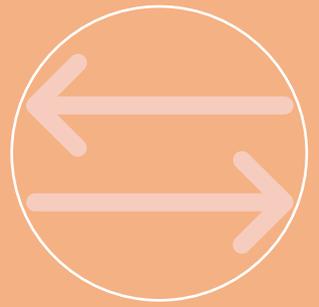
- Consumer opinions are not fact-based
- Legislation lack scientific understanding
- Brands are being bullied into bad decisions

### **Lack of Responsibility**

- Lack of focus on common need for collection and sorting
- Brands and packaging industry continue to erode trust
- Investment disconnected to End Game



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# SOURCING I

## Reduce



- Design-Add carton coating and finesse with 5 integrated compartments
- Eliminate individual inner packaging



- Optimize cube efficiency

# SOURCING I MOST SUSTAINABLE SOURCE

Biomass-derived (tree and crop) from Earth surface  
Paperboard  
Some plastics

OR

Fossil-derived (oil) from inside Earth  
Some plastic  
Some coatings

OR

Earth derived (extraction) from inside Earth  
Glass (sand, etc)  
Metal (bauxite, iron) derived

&

Virgin content

OR

Recycled content

OR

Reused package

# SOURCING I

## Considerations

### Environmental

- LCA Considerations - Primary Energy
- Greenhouse Gas Emissions
- Eutrophication
- Stratospheric Ozone Depletion
- Loss of Biodiversity
- Soil Carbon Depletion
- Soil Erosion
- Deforestation

### Social

- Food Security
- Land Use Change Impacts
- Local and/or Indigenous Communities
- Occupational Health & Safety
- Water Management
- Chemical Use: Nutrients and Pest Management
- Co-Product and Waste Management
- Labor Rights

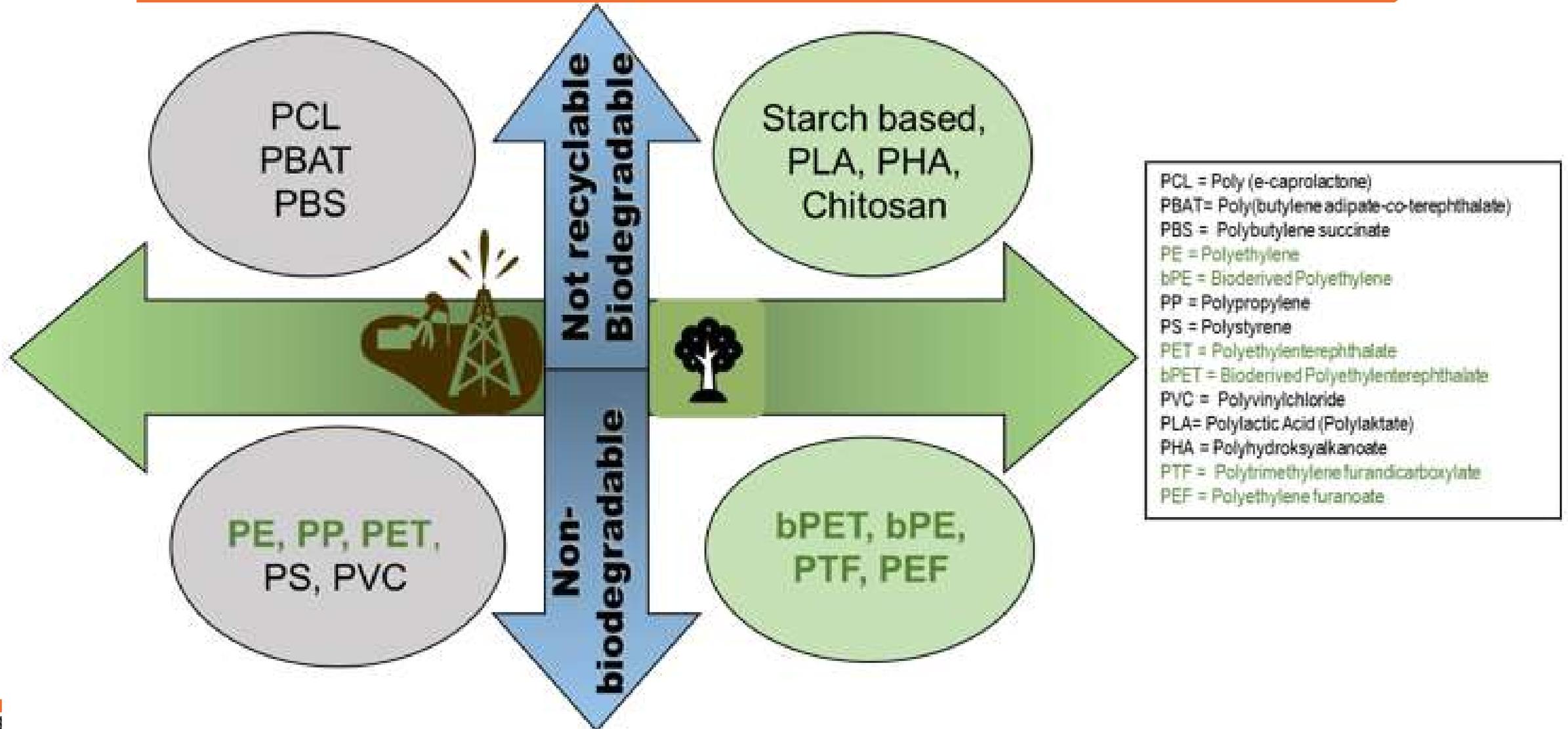
# SOURCING I

## Considerations

\* We have partnered with Canopy's Pack4Good Initiative to ensure our sourcing of product packaging does not come from wood pulp from Ancient and Endangered Forests across our supply chain. We've already begun this responsible journey as we've been using FSC-certified fiber in our pints since 2009, but we want to further improve in this space. We've initiated work with Canopy and their Pack4Good initiative as they recognize the critical value of forests to biodiversity, climate, and traditional communities. [Learn more here.](#)

# SOURCING I

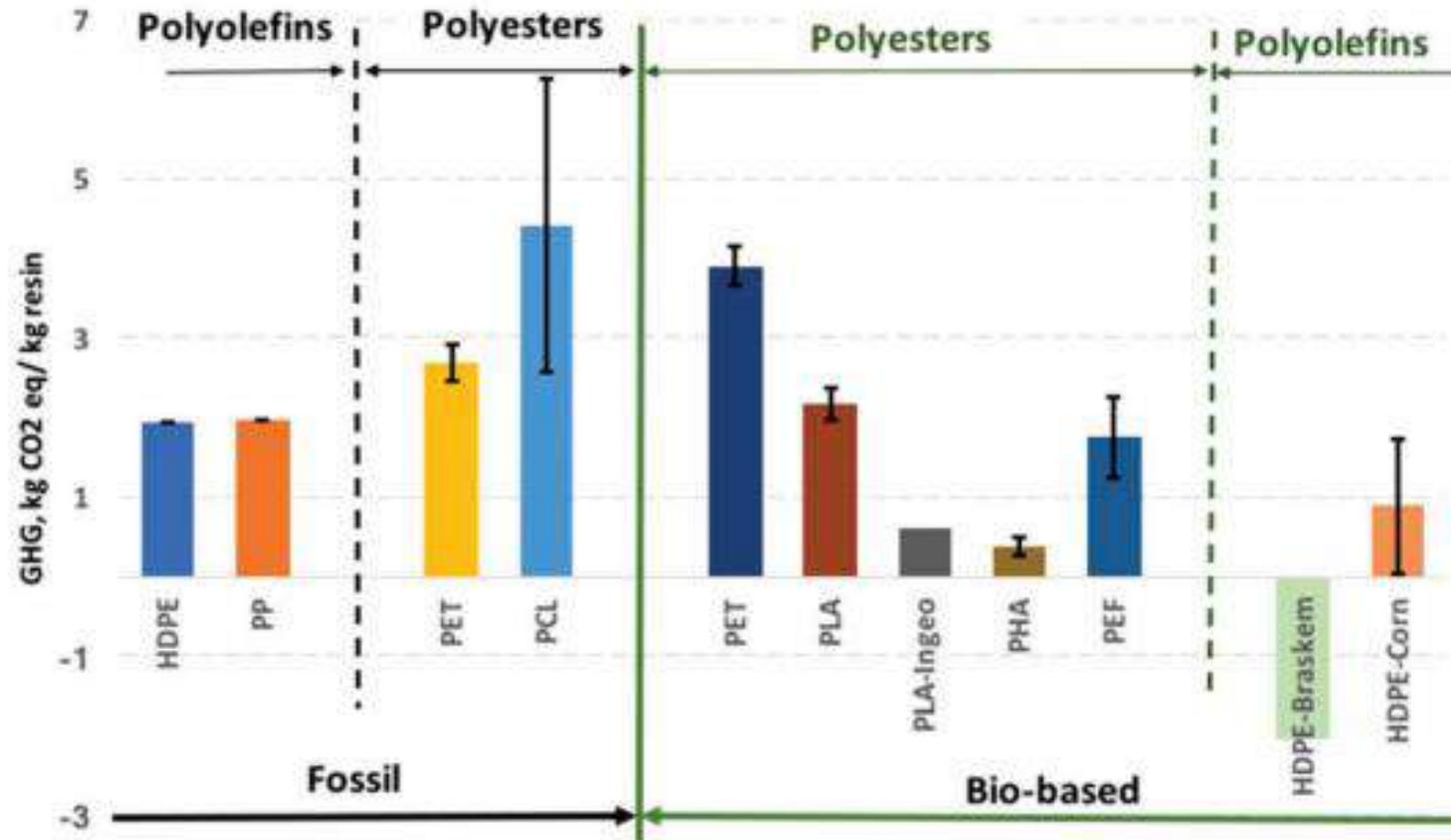
## The Alphabet



# SOURCING I

## Biomass derived polymers

Some bioderived polymers generate more GHG than oil derived polymers



# SOURCING I

## Selected Biomass derived polymers in use today



**Coke PlantBottle**  
CSD Drink/Water  
Global  
30%



**Volvic**  
Bottled Water  
UK, 6x50cl  
20%



**Sokenbicha**  
RTD Tea  
USA, 15.2-fl oz  
up to 30%



**VitaminWater**  
Flavoured Water  
USA, 20-fl oz  
up to 30%



**Heinz PlantBottle**  
Ketchup  
30%

# SOURCING I

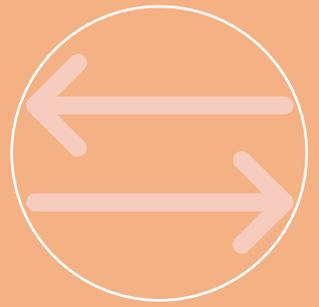
## Clean Packaging

- Frozen Packaging is approved based on its defined use
- Over [10,000 chemicals](#) are approved for direct food contact
- Many are linked to cancer, endocrine disruption, health and environment
- Alternatives to Tier 1, 2 and 3 chemicals are being implemented
- Clean packaging allows for a safe circular economy





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# DISPOSAL I

## Most Sustainable Disposal

Landfill

OR

Waste to Energy

OR

Incinerate it

OR

Reuse it

OR

Litter

OR

Biodegrade it

OR

Recycle it



# DISPOSAL I Recyclable

Many ways to achieve recyclable packaging  
Verified as recyclable



Package coating and forming innovation



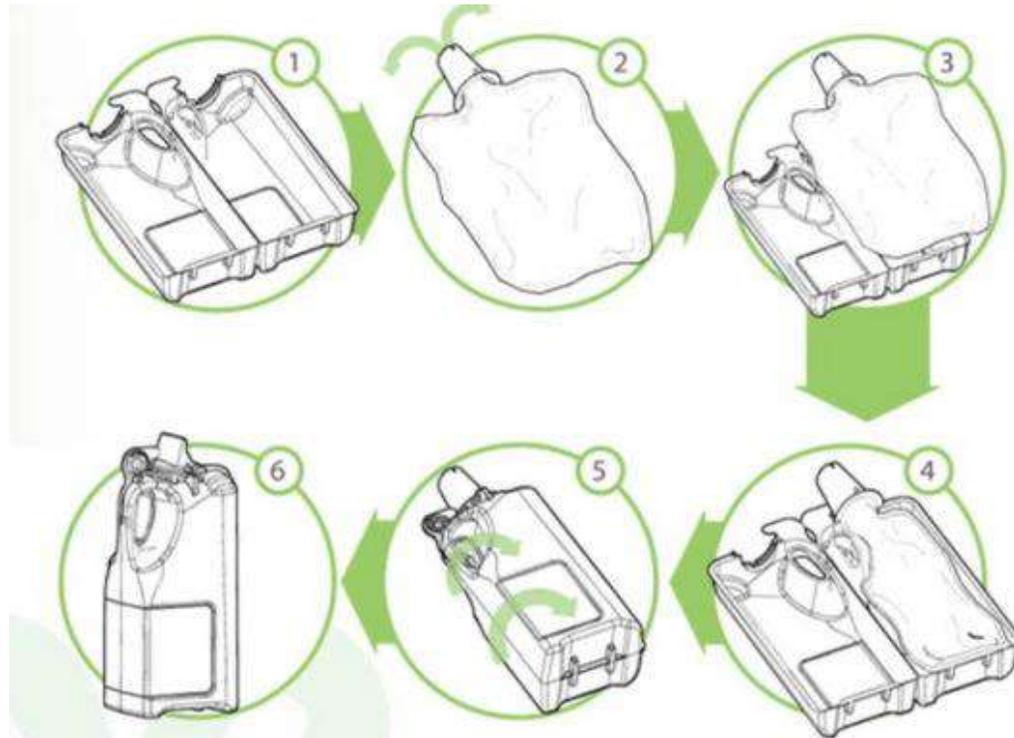
Design innovation-  
Integrated lidding



Product coating and wrapper coating  
innovation-  
NESTLÉ aiming at 100% recyclable or  
reusable packaging by 2025.

# DISPOSAL I

## Recycle ready and SDO Recyclable film have untapped potential in novelties



# DISPOSAL I

## Reusable Packaging

Sustainability is dependent on transport from use to reuse

- Just Salad is more sustainable
- OZZI is more sustainable
- TerraCycle or Loop system is not more sustainable than current packaging unless within 100 miles



# SOURCING AND DISPOSAL I

## Value Chain & Systems Thinking

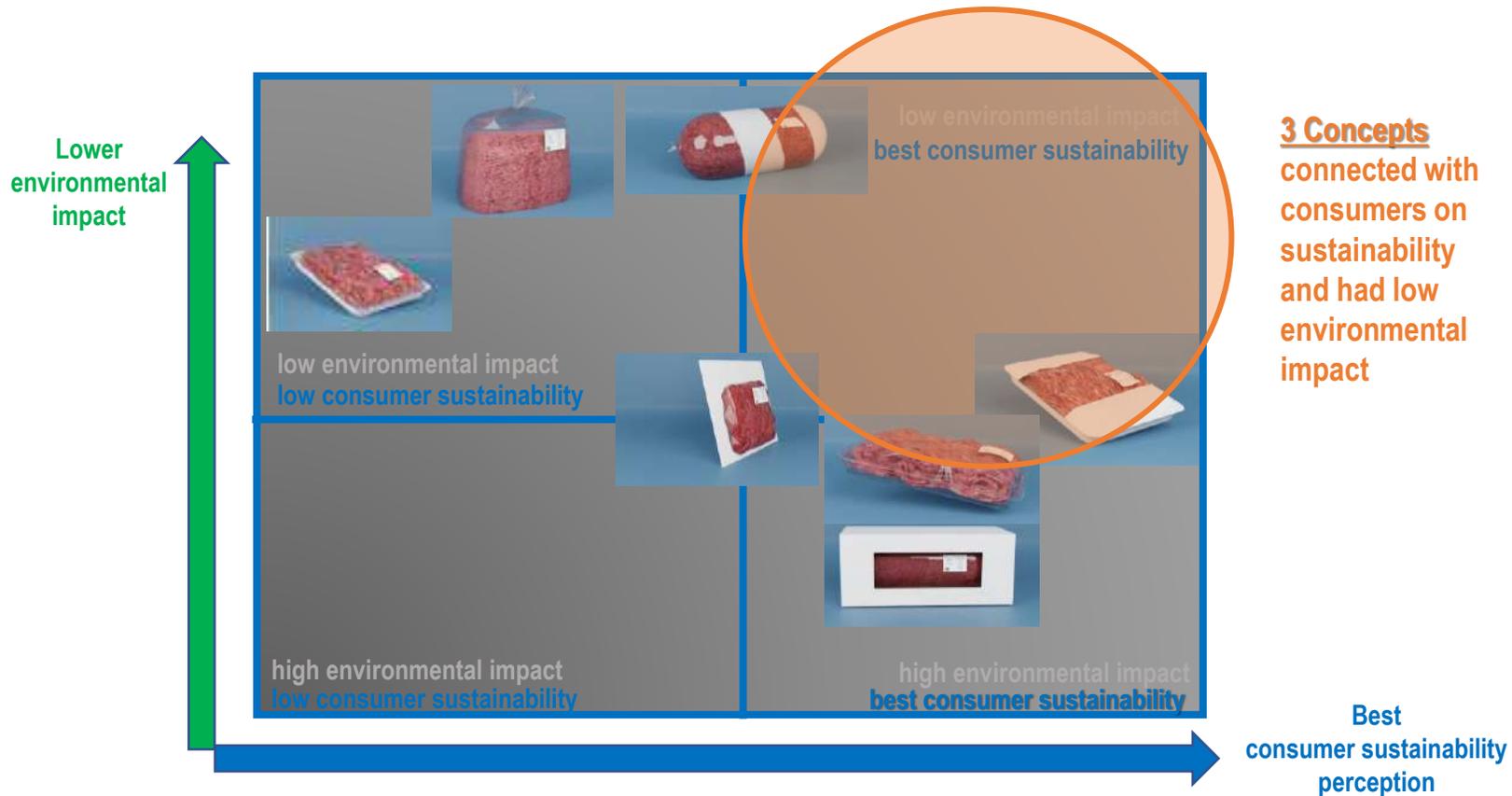
- Value Chain modifications
  - Master-pack rethink
  - Connect with packaging that can extend shelf life
- Systems thinking
  - Add value by addressing what foods need
    - Decrease barrier and reduce headspace with edible polymers
- New means to get food to people



# WHERE WE ARE NOW I

## MORE Sustainable Packaging needs to be Science-driven

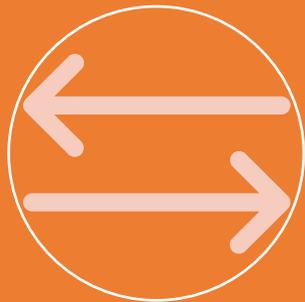
- Consumers do not intuitively select more sustainable packaging



# Take-Aways



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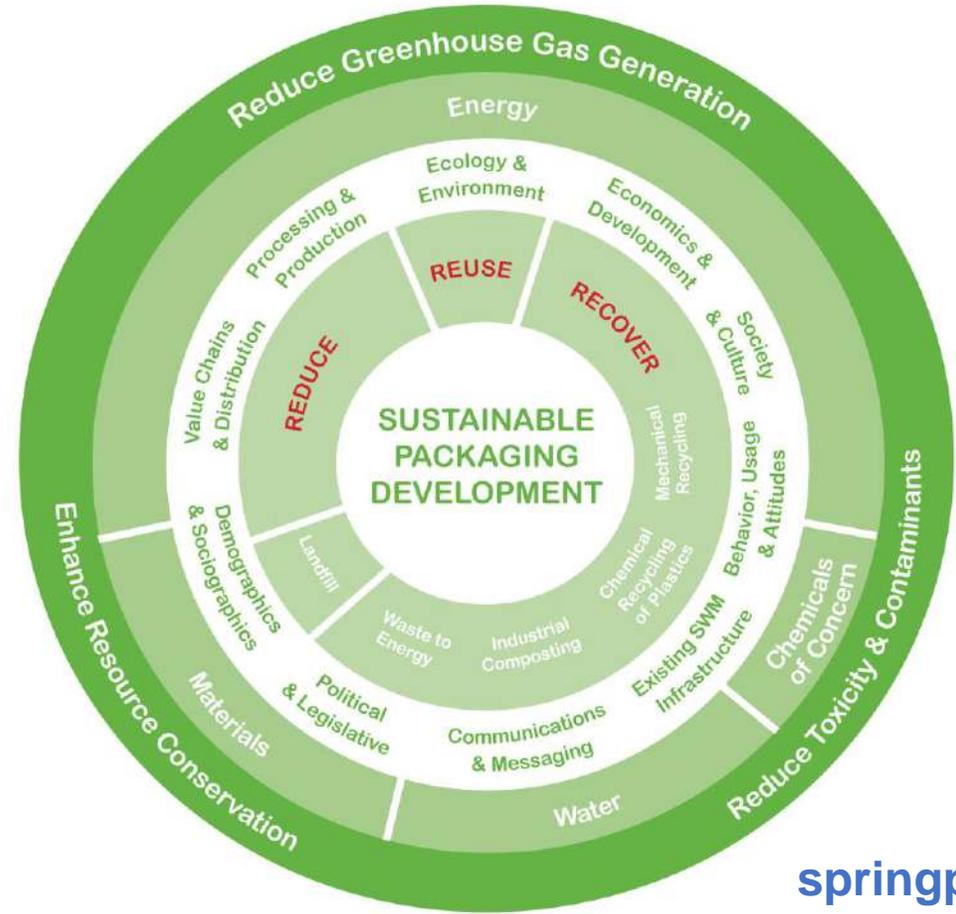


Disposal - Value chain, design and systems thinking is needed

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Need more ?

Science-based advice from cross-functional experts



# Thank you & Next Steps



Set up a virtual coffee with Claire

SCAN ME

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[PackagingTechnologyAndResearch.com](http://PackagingTechnologyAndResearch.com)**