





## SUSTAINABILITY AS AN INNOVATION OPPORTUNITY

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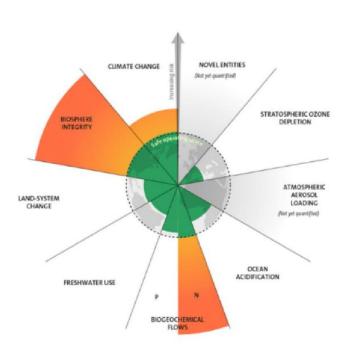






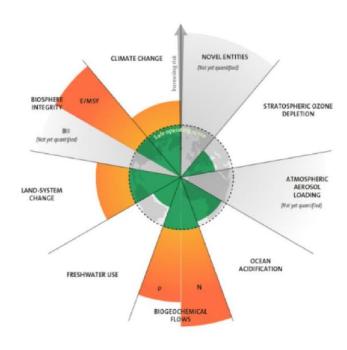
#### **EXCEEDING PLANETARY BOUNDARIES**

2009



7 boundaries assessed, 3 crossed

2015



7 boundaries assessed, 4 crossed

2023

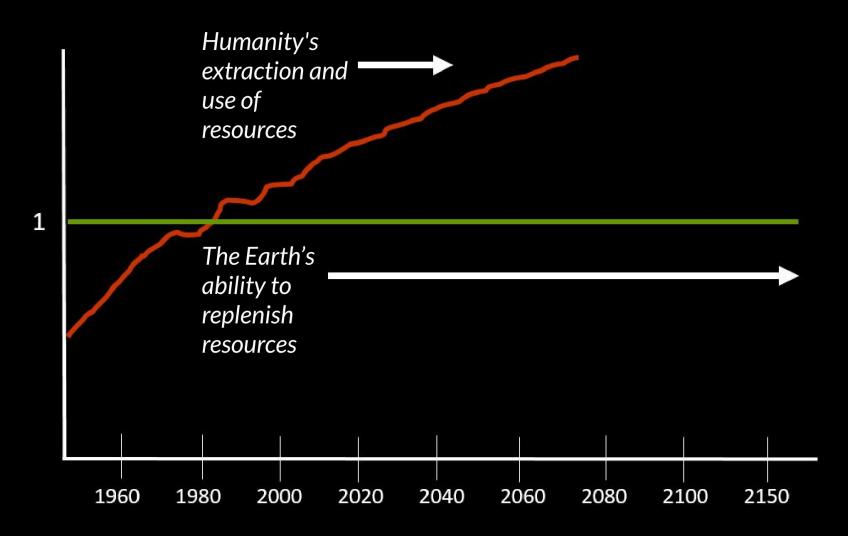


9 boundaries assessed, 6 crossed





#### ECOLOGICAL FOOTPRINT







#### LINEAR ECONOMY

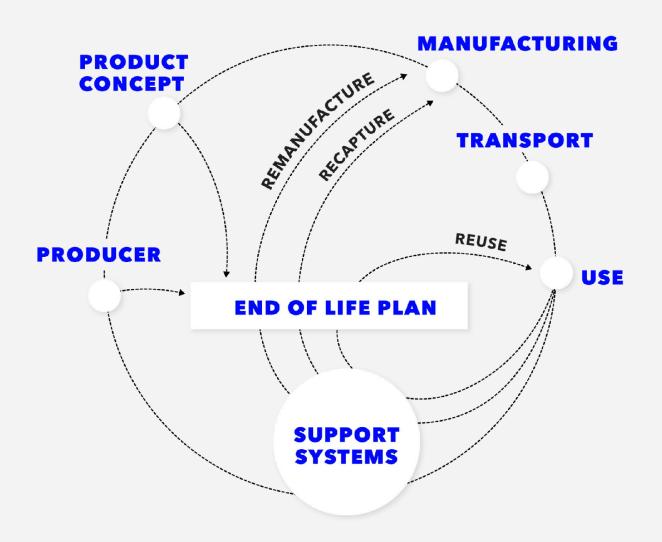


#### **EXTRACTIVE AND EXPLOITATIVE**





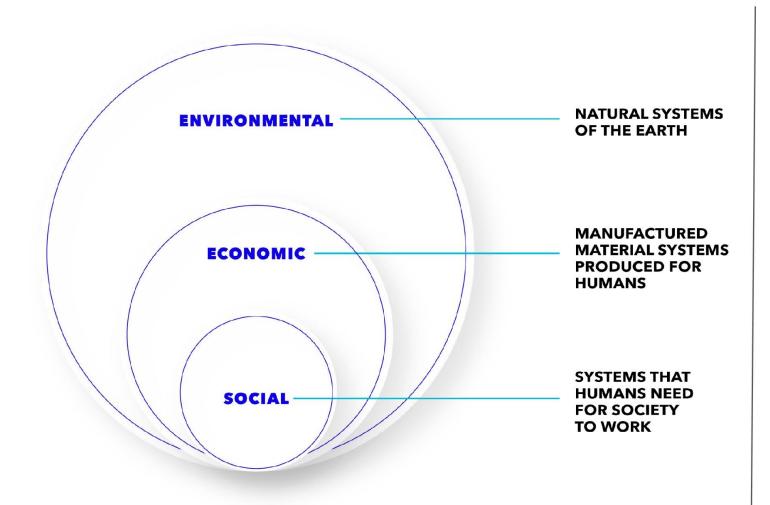
#### **CIRCULAR ECONOMY**



#### REGENERATIVE BY DESIGN



#### **SOME COMMON MYTHS**



It's just about recycling

About resource efficiency

Only for the sustainability team

**Costs more** 



# THREE GOALS OF THE CIRCULAR ECONOMY

#### **ELIMINATE**

Eliminate
waste and
pollution
from the system

#### **EXTEND**

Extend the useful life of products and materials

#### REGENERATE

Regenerate and restore natural systems



#### **Circular Economy Core Priorities**

#### Seeing Waste as a Resource

- Find ways to reuse byproducts and waste products
- Take back products at the end of life
- Close the loop on production to eliminate waste
- Offer services that enable repurposing and reuse before recycling or waste

#### **Extending Product Lifetime**

- Design and produce products that are intentionally created to last longer and be reused
- Create support systems that enable products to be taken back and cycled through the system
- Offer repair and refurbishment

#### Swapping to Renewable Resources

- Prioritize the use and production of renewable resources
- Restore and regenerate land-based crops
- Create circular flows to reduce the need for natural resources to be extracted



# CIRCULAR DESIGN MOVES FROM DESIGNING PRODUCTS IN ISOLATION FROM THE SYSTEM TO CREATING ONES THAT MAXIMIZE VALUE CREATION WITHIN IT.







#### **NEW ECODESIGN REGULATION**

Replaces the existing ecodesign directive enlarging its scope, beyond energy-using products, to include ALL product categories sold into the EU market.

The new "Digital Product Passport" will provide information about products' environmental sustainability.

Setting of a wide range of requirements, including on:

- Product durability
- Reusability
- Upgradability
- Reparability
- Rules on the presence of substances that inhibit circularity
- Energy and resource efficiency
- Recycled content, remanufacturing and recycling;
- Carbon and environmental footprints
- The use of Digital Product Passport.



#### FRENCH REPAIR LAWS

iPhone 12 809,00 €



- · Coverage of the iPhone, including its battery
- Protection against accidental damage

Includes tax on insurance premiums at the applicable rate

Find out more

€809.00

VAT and costs included: approx. 147.00 € \*.

Financing available. >

Colour corresponds to level of reparability in 2 point intervals

















Free, fast and contactless Free personalized session delivery.

Easy and free returns

Withdrawal: Check availability



Questions about buying an iPhone?

Chat with our iPhone Specialists

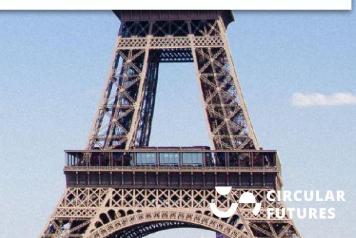


The new repairability score on Apple's French website

Screenshot / Apple

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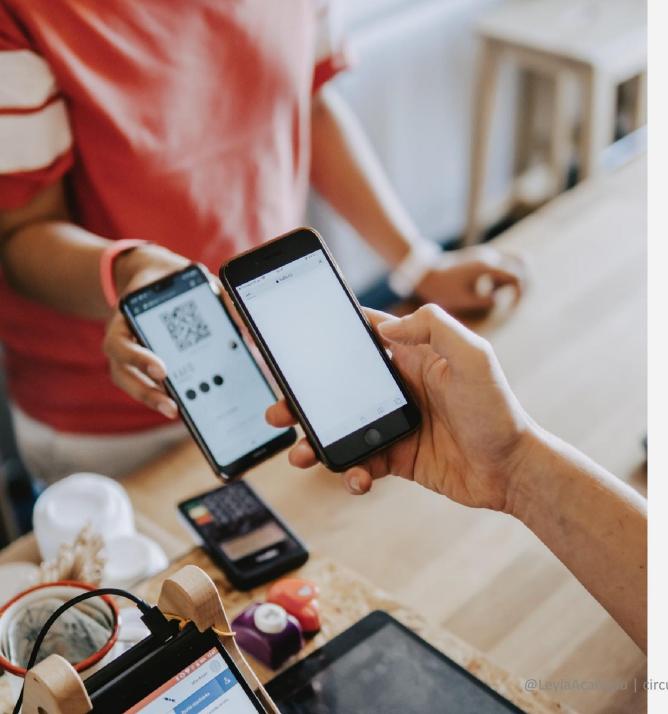
SOURCE: https://www.insidehook.com/culture/france-repair-law-tech



#### SELF ASSESSMENT SCORE CARDS

Criteria	Sub-criteria	Score of subcriterion /10	Weighting factor of subcriterion	Score of criterion /20	Total criteria scores /100
		710	Subcriterion	720	7100
CRITERION 1 : DOCUMENTATION	1.1 Availability of the technical documentation and other documentation related to user and maintenance instructions	6.2	2	12.3	
CRITERION 2 : DISASSEMBLY, ACCESSIBILITY, TOOLS, FASTENERS	2.1 Ease of disassembly parts from List 2*	2.5	1	5.9	59.6
	2.2 Necessary tools (List 2)	1.9	0.5		
	2.3 Fasteners characteristics parts from List 1** and List 2	5.0	0.5		
CRITERION 3 : AVAILABILITY OF SPARE PARTS	3.1 Availability over time parts from List 2	6.5	1	9.3	
	3.2 Availability over time parts from List 1	1.3	0.5		
	3.3 Delivery time parts from List 2	6.5	0.3		
	3.4 Delivery time parts from List 1	1.3	0.2		
CRITERION 4 : PRICE OF SPARE PARTS	4. Ratio between price of parts from list 2 to the price of the product	6.0	2	12.0	
CRITERION 5 : SPECIFIC CRITERION	5.1 Accessibility of usage-counter to consumers	10.0	1,	20.0	
	5.2 Free remote assistance	10.0	0.5		
	5.3 Possibility to reset softwares	10.0	0.5		
Reparability index on 10					6





# DIGITAL PRODUCT PASSPORTS

A physical product's digital twin that securely records and shares all the sustainability-related data from across the product's full lifecycle using blockchain technology to ensure data integrity.

A tool adopted by the EU for collecting and sharing lifecycle product data on a product's sustainability, environmental and recyclability attributes.

Product categories targeted for DPP by the EU are batteries & vehicles, textiles, electronics & ICT, furniture, plastics, construction and chemicals.



circularfutures.co

Digital Product Passport (DPP):

Complete Guide

le to DPPs

vnload the complete

#### **Digital Product Passport**

Protokol NFT Platform

#### **Industry Talk**

**Avery Dennison launches Digital Product Passport solution** 

The EU Digital Product Passport (DPP) is coming. need to start preparing for it now.

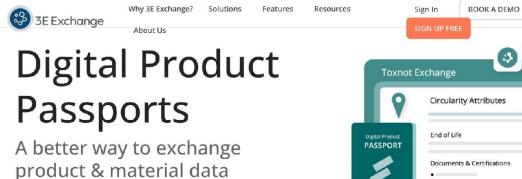


Avery Dennison is paving the way for largescale adoption of digital product passports, working with the European Commission and enabling global businesses in textiles, electronics, EV batteries, and more to prepare for the upcoming regulation.

© Avery Dennison

#### Digital Product Passport

The Protokol Digital Product Passport is a tool for collecting and sharing product data throughout its entire lifecycle used to illustrate a product's sustainability, environmental and recyclability attributes with an ecosystem of stakeholders.



Create, find, & share your material data across your entire supply chain with help of the Toxnot Exchange. We're transforming the way you communicate with all your suppliers.





Circular economy: New law on more sustainable, circular and safe

batteries enters into force





Council of the EU Press release 10 July 2023 10:30

#### Council adopts new regulation on batteries and waste batteries

The Council today adopted a new regulation that strengthens sustainability rules for batteries and waste batteries. The regulation will regulate the entire life cycle of batteries – from production to reuse and recycling – and ensure that they are safe, sustainable and competitive.

About the institutions ~



Council of the European Union

Batteries are key to the decarbonisation process and the EU's shift towards zero-emission modes of transport. At the same time end-of-life batteries contain many valuable resources and we must be able to reuse those critical raw materials instead of relying on third countries for supplies. The new rules will promote the competitiveness of European industry and ensure new batteries are sustainable and contribute to the green transition.

— Teresa Ribera, Spanish minister for the ecological transition

Infographic - Towards a sustainable, circular, European battery supply chain

See full infographic



#### **DIGITAL PRODUCT PASSPORTS (DPPS)**

- Only some product groups will need to have a DPP
- Possibly, certain components of a product will need to have a DPP (i.e. batteries) without the main product itself having one (such as a car)
- There will be minimum requirements on the content of DPPs for specific product groups
- The EU Commission may exempt products from having a DPP where other EU laws include a system for the digital provision of information

- EU will not manage the technical infrastructure but give guidance
- Where relevant, third-party conformity assessment might be required for part of the information.
- In the coming years, based on the ESPR working plan, the Commission will propose specific requirements for product groups or horizontal measures via delegated acts
- All substances of concern present in a product will have to be tracked by default and information on those substances will be included in the DPP



#### **EU's NEW PACKAGING & PACKAGING WASTE**

The new EU regulation introduces binding measures on waste prevention reuse and recycled content targets in packaging while making full recyclability and recycling at scale the minimum requirement.



# PPWR Recyclability

All packaging must be designed for recycling by 2030 (reaching grades A-C)

All packaging must be recycled at scale by 2035



# PACKAGING & PACKAGING WASTE REGULATION (PPWR) RESTRICTIONS

- Bans on PFAS in food contact packaging
- No multipacks and an outright ban on packaging for unprocessed fresh fruit and vegetables
- Mandated recycling applies to all packaging except for packaging made from lightweight wood, cork, textile, rubber, ceramic, porcelain and wax.
- sticky labels used in fruit and vegetables along with Tea and coffee bags will have to be compostable

- No over packaging: will need to be designed to have only the minimum material needed to achieve the packaging protection function. Things like false bottoms, double walls, and additional layers will be banned.
- Recyclability: All packaging must be designed for recycling in processes proven in an operational environment.
- Recycled content: Post consumer waste from within the EU must be used





#### PPWR REQUIREMENTS

- Fruit stickers and tea bags must be biodegradable.
- Sorting and reusability labels will be mandatory.
- 40% of most packaging types used to transport goods in the EU will have to be reusable
- Where there is plastic greater than 5% of the weight of the packaging it will have to have a minimum amount of recycled content from post consumer waste from within the EU.
- There will be a scorecard used to indicate how recyclable the packaging is. There is a minimum score and those with higher scores will get reduced Extended Producer Responsibility (EPR) fees.





#### **SCORECARD**

There will be a scorecard used to indicate how recyclable the packaging is.

Scores are A through to D.

There is a minimum score and those with higher scores will get reduced Extended Producer Responsibility (EPR) fees.

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# IMPACT

### LIFE CYCLE THINKING

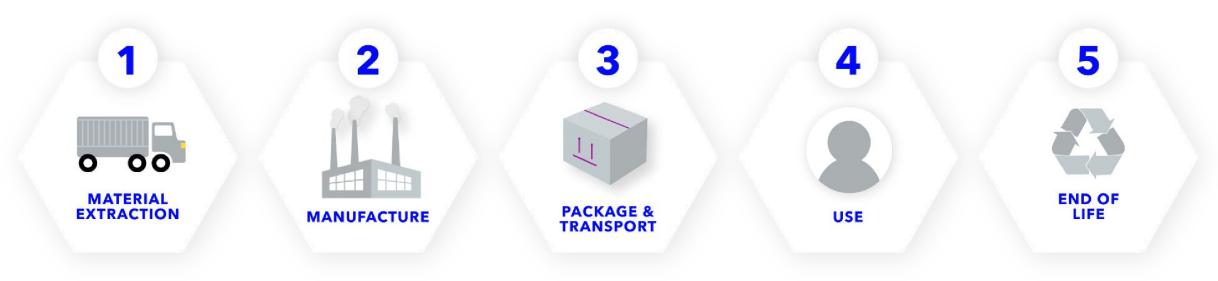
Is a way of thinking that includes the economic, environmental and social consequences of a product or process over its entire life

- UNEP Life Cycle Initiative



#### **ASSESS ACROSS ALL LIFE CYCLE STAGES**

Everything that is produced goes through these five main life cycle stages: Material Extraction, Manufacturing. Packaging and Transportation, Use and End of Life (EOL).





#### **VALUE LOSSES** MATERIAL EXTRACTION MANUFACTURING PRODUCT MATERIAL USE REMANUFACTURE USE **END OF LIFE VALUE REGAINS** LANDFILL LITTER LIFE CYCLE STAGES SYSTEM LOSSES END OF LIFE OPTIONS

# LIFE CYCLE ASSESSMENT

A framework that takes into consideration the whole of life environmental impacts of a product or service by looking at the impacts that actions in the economy have on natural systems by looking from the cradle to grave. ISO 14001







#### SUSTAINABLE DESIGN STRATEGIES













REPAIRABILITY













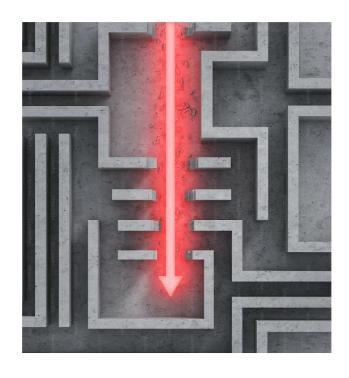




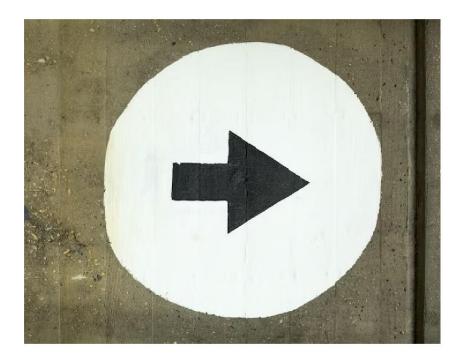


#### **CHANGE**

# INBOUND From the world



#### OUTBOUND From your Business







#### Journal of Food Protection

Volume 87, Issue 9, September 2024, 100329



Research Paper

### CO<sub>2</sub> Laser-labeling on Fresh Produce: Evaluating Postharvest Quality, Microbial Safety, and Economic Analysis

Durga Khadka <sup>1</sup>, Eleni D. Pliakoni <sup>1</sup>, Patrick Abeli <sup>1</sup>, Olivia C. Haley <sup>1</sup>, Tricia Jenkins <sup>1</sup>, Xuan Xu <sup>2 3</sup>, Majid Jaberi-Douraki <sup>3 4</sup>, Logan L. Britton <sup>5</sup>, Manreet S. Bhullar <sup>1 6</sup> ○ ⊠

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https://doi.org/10.1016/j.jfp.2024.100329 7

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### Highlights

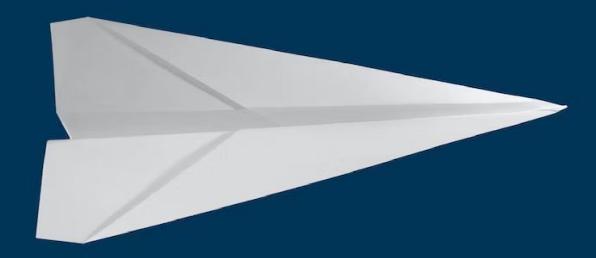
- CO<sub>2</sub> laser-labeling technology minimally reduced the postharvest quality.
- Laser engraving and wax application did not facilitate microbial attachment.
- CO<sub>2</sub> laser-labeling technology has potential in commercial applications.

### Laser labels replaces stickers



# BREAKTHROUGH INNOVATION





INNOVATION THAT LEAPS FORWARD AND DISRUPTS.

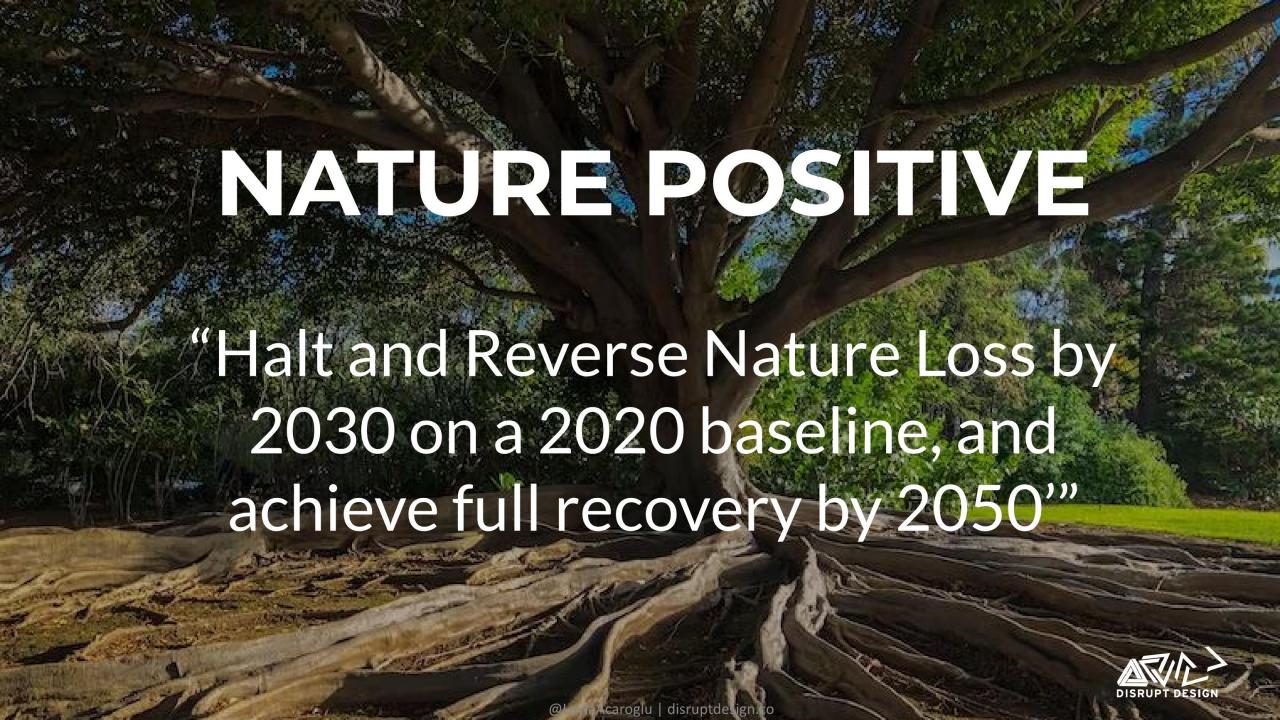
HAS RADICAL AND DRAMATIC IMPACTS.



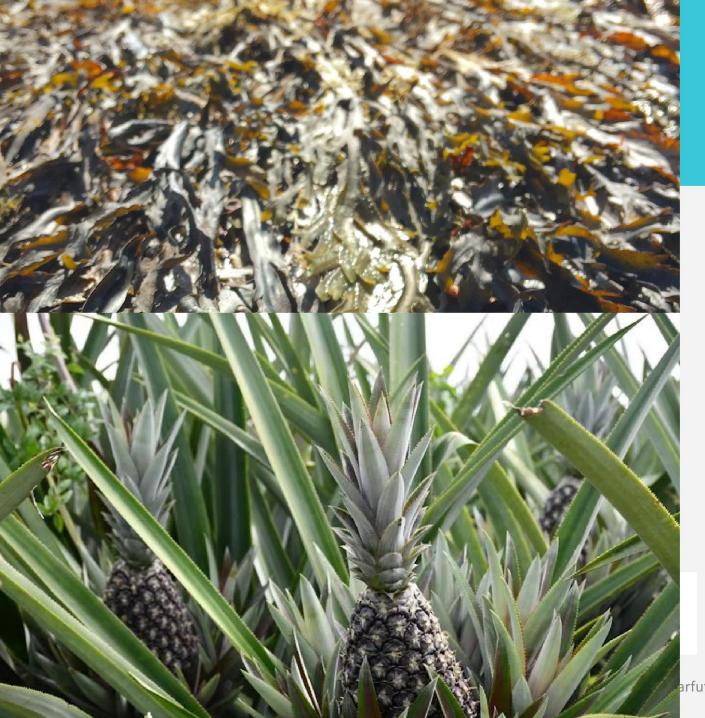












## BIO BASED MATERIALS

FROM SEAWEED TO APPLE SKINS, PINEAPPLE WASTE AND BANANA PEELS THERE ARE A LOT OF NEW **BIO BASED MATERIALS VYING TO COMPLETE** WITH PLASTIC AND OFFER **BIODEGRADABLE END OF** LIFE OPTIONS



arfutures.co

## **TYPES OF BIO-BASED PRODUCTS**

### COMPOSTABLE

Within a few months, these can return to a natural state with no toxic residue in a standard compost environment.

INDUSTRIAL COMPOSTING

**HOME COMPOSTING** 

### **BIODEGRADABLE**

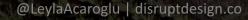
Over a period of time, microorganisms (fungi, bacteria, etc.) can break them down, but may leave toxic residue.

INDUSTRIAL BIODEGRADATION

### **DEGRADABLE**

Under specific environments, the materials can undergo chemical changes that alter the state of the material.

NO OPTION FOR OPTIMAL RECOVERY







# NUIFLA

# NOPLA, bioplastic made from seaweed

# We make packaging disappear





# Made from Notpla

Ooho and our other packaging solutions are made from Notpla, a material made from seaweed and plants that disappears naturally.

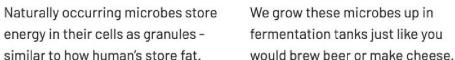
Our products (>)

Our shop (>



#### From, and back to, nature.



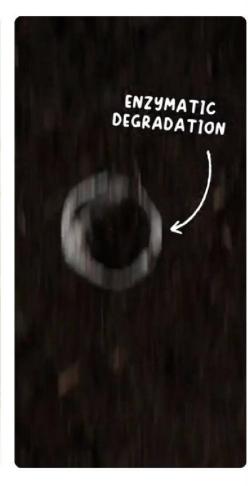




We then extract the granules from those cells and formulate them so that they're manufacturable in traditional plastic equipment.



The result is packaging that is completely stable in use just like plastic.



Once you're done with your packaging, you can throw it away and microbes in the soil will consume and break it down, leaving nothing behind.



## A NEW GENERATION

### **OF MATERIALS**

We use plant leftovers of the agricultural industry, and turn them into the innovative material traceless®. As part of a new generation of natural biomaterials, traceless® is fully plant-based, naturally degradable and plastic-free - a material that truly leaves no trace.



# Traceless: materials made from organic food waste that can be used like plastics

### FOR A FUTURE

# FREE OF POLLUTION AND WASTE

We produce traceless materials in the form of pellets, which can be further processed into a wide range of end products - from paper coatings to rigid, flexible or adhesive applications.

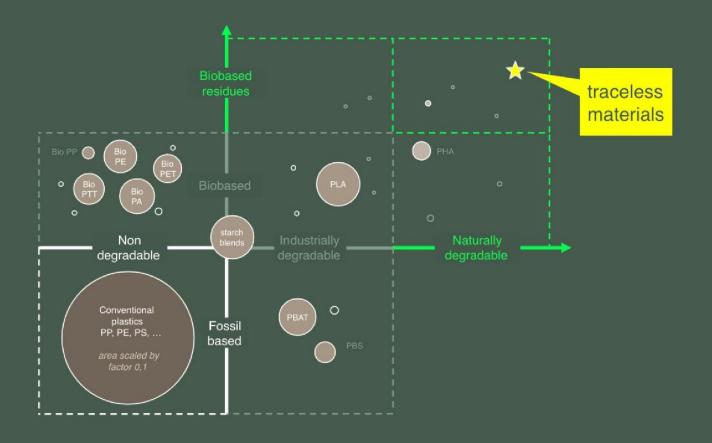
Ready to be used in single-use, packaging or adhesive products, they enable manufacturers to avoid problematic plastics and develop fully regenerative, nature-based product choices for everyone.



# BASED ON NATURAL POLYMERS

traceless® materials leave behind the familiar categories of the (bio)plastic age – and open up a new generation of plastic-free materials: natural biomaterials!

They are not only bio-based, but even biobased on leftovers, namely plant residues of agricultural industry. For biodegradation, they don't need industrial composting conditions, but are certified home compostable.



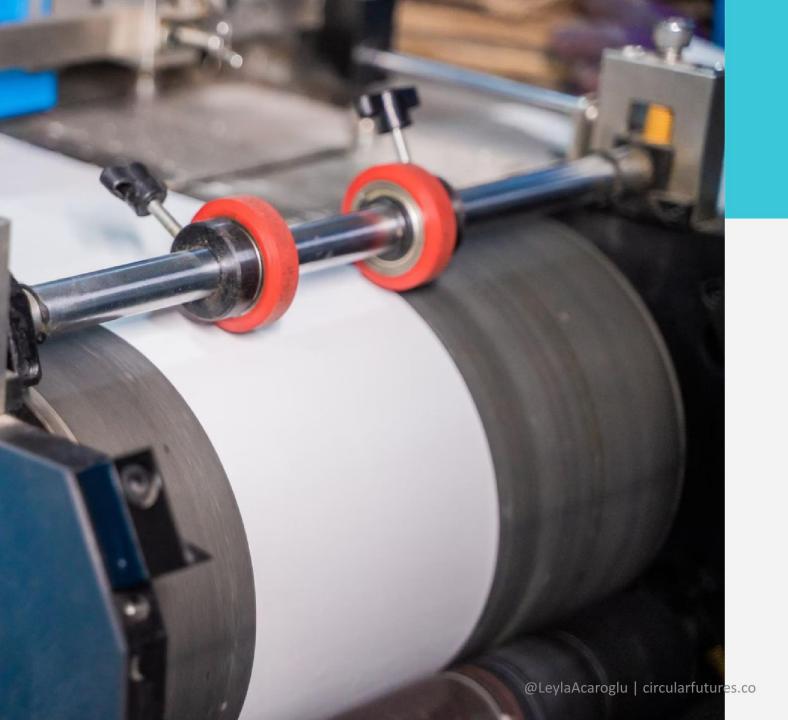




# WATER BASED ADHESIVE

NEW TYPES OF ADHESIVES
THAT REPLACE
SOLVENT-BASED GLUES SO
THAT LABELS ARE EASIER
TO REMOVE AND RECYCLE.





# LINERLESS LABELS

REDUCTION OF LINERS IN LABELS TO REDUCE UNRECYCLABLE MATERIALS.

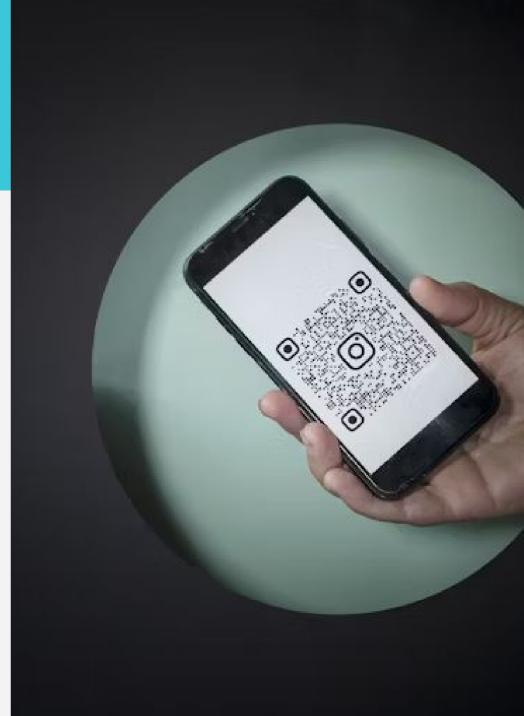


# ON PACK DIGITAL INFORMATION

DIGITAL WATERMARKS FOR RECYCLING CALCIFICATION.

TO SHARE BETTER RECYCLING, REUSE AND CARE INSTRUCTIONS ON THE PRODUCT VIA QR CODES.

WILL BE REQUIRED VIA DIGITAL PRODUCT PASSPORTS TO DO THUS





## REUSE SYSTEMS

FROM FAST FOOD TO SHAMPOO, COMPANIES ARE EXPERIMENTING WITH SOPHISTICATED REUSE PACKAGING SYSTEMS THAT REDUCES WASTE/COSTS AND CREATES CUSTOMER LOYALTY.



refund.



Burger King's new reusable packaging Burger King

The reusable containers and cups will be introduced at select restaurants in New Portland and Tokyo. The fast food giant says it plans to add more cities following i three locations afterward.

"During Covid, we have seen the environmental impact of increased takeaway orderin which makes this initiative by Burger King all the more important." Tom Szaky, the four



NEWSROOM SERVICES CONTACT US

### Fast-Food Reusable Packaging Market is Estimated to Evaluate to US\$33.96 Billion in 2030, By Persistence Market Research

The fast-food reusable packaging market is witnessing substantial growth driven by increasing consumer eco-consciousness and the industry's shift towards sustainable practices

January 24, 2024 13:15 ET| Source: Persistence Market Research

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New York, Jan. 24, 2024 (GLOBE NEWSWIRE) -- Market Size & Overview:

The Fast-Food Reusable Packaging Market is witnessing a notable surge as environments concerns drive the food industry towards sustainable practices. With an increasing focus on reducing single-use plastic and minimizing waste, fast-food chains are embracing reusable packaging solutions. This market evolution is fueled by a growing consumer preference for eco-friendly alternatives and a recognition of the ecological impact associated with traditional disposable packaging.



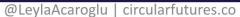
## Give reusable packaging a spin

Dizzie addresses the problem of packaging waste in groceries. We are here to help any retailer or brand transition from single-use packaging to reusable packaging.



# Abel & Cole partners with Again to expand its range of refillable packaging.







# COLLABORATIVE RECYCLING/REUSE

GROUPS WORKING TOGETHER TO GET MANDATORY SYSTEMS IN PLACE TO ENABLE AT SCALE SOLUTIONS.

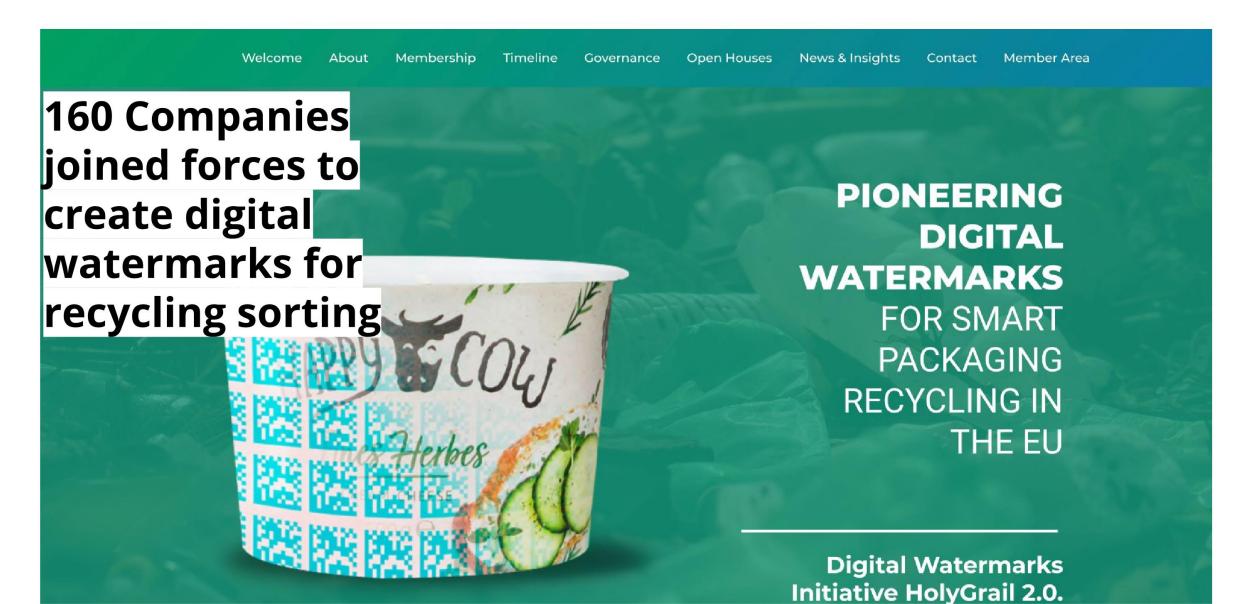
ENTIRE CITIES SWITCHING TO REUSE SYSTEMS AND OFFERING THE ASSOCIATED SERVICES.











About us Recyclability Recycled Plastic Get certified Use of Claims Join us







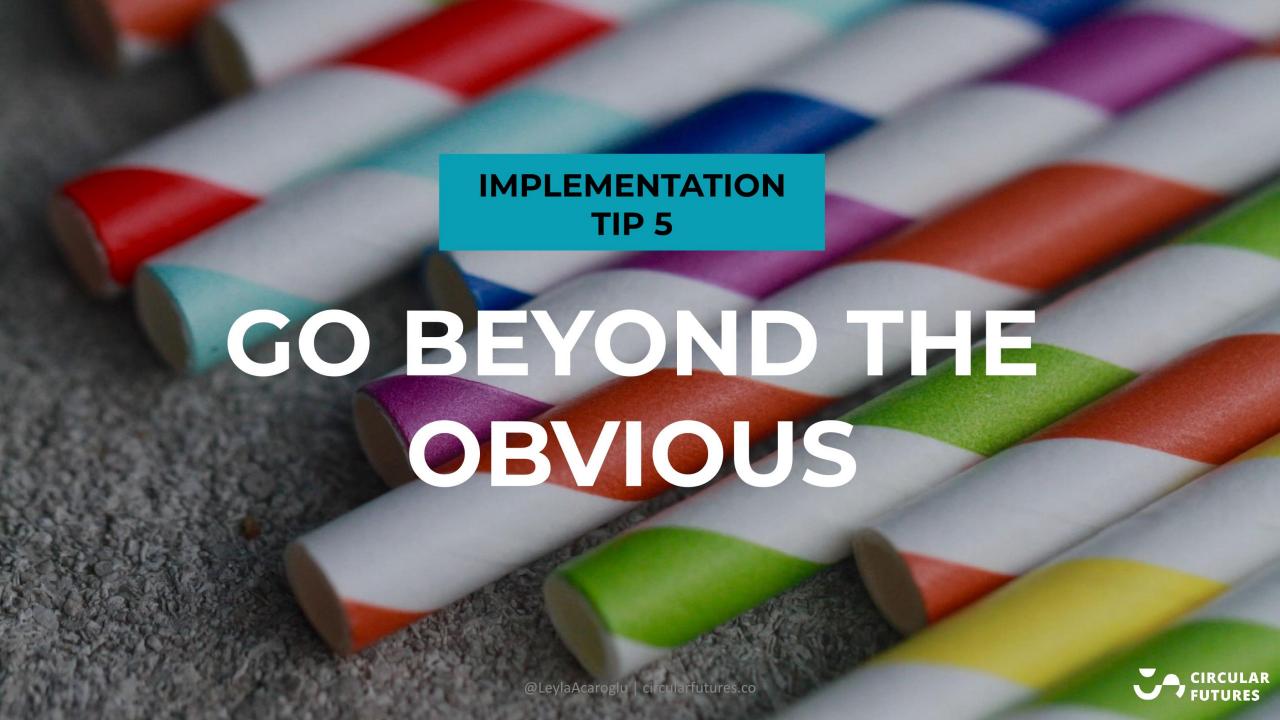




IMPLEMENTATION TIP 4

# WORK WITH YOUR DESIGN TEAM







### Let's connect

# LEYLA ACAROGLU

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disruptdesign.co unschools.co circularfutures.co leylaacaroglu.com

