

# DIGITALIZATION AND THE ENVIRONMENTAL BENEFITS OF THINWALLED PLASTIC PACKAGING

TALKING WASTE™ WILL HELP TO SAVE THE PLANET





# THE WORLD TODAY

NOTHING NEW BUT NOW RECOGNIZED BY ALL PEOPLE ON THIS PLANET



[https://commons.wikimedia.org/wiki/File:Trashed\\_vegetables\\_in\\_Luxembourg.jpeg](https://commons.wikimedia.org/wiki/File:Trashed_vegetables_in_Luxembourg.jpeg)



# PACKAGING DESIGN

## WHAT HAS TO BE CONSIDERED - SIMPLIFIED

### 1. PRODUCT (FOOD)

... must be packed in a way that it is protected and has longest possible shelf-life.

### 2. PACKAGING PROCESS

... performance driven, high speed and efficient, lowest waste rate.

### 3. SUPPLY CHAIN

... easy to pack, easy to palettize, low weight to keep transport cost controlled.

### 4. MARKETING

... secures consumer recognition and allows consumer engagement, colorful branding.



CDI - Center for innovation and development, Zell (Germany)

# PACKAGING DESIGN

## AFTER USAGE – WHO CARES

- The importance is always with the product itself and never with the packaging. Only costs – that was the recognition.
- Here is the real opportunity  
– make an old packaging product a valuable new product.

### THE BENEFITS ARE SO OBVIOUS

- **Recycling** avoids waste.
- **Recycling** creates value.
- **Circularity** protects the planet without creating new risks by keeping the standards of living.



MINIMISE PACKAGING  
WASTE



CONSERVING  
RESOURCES



SAVE ENERGY



# PROTECTION!

PLANET, PEOPLE, FOOD

- Plastic packaging ensures that food can be transported long distances, stays on the shelves longer, and prevents large amounts of food from going to waste
- For **PACCOR**, educating consumers about the value of plastic and making recycling easier is a top priority



**PLASTIC PACKAGING SOLUTIONS WITH DIGITAL WATERMARKING CREATE SOCIETAL VALUE**

PACCOR has calculated it in a study ...



# INVESTORS REALLOCATE CAPITAL TO SUSTAINABLE PORTFOLIOS



**Larry Fink,**  
Chairman and CEO BlackRock

**// With the impact of sustainability on investment returns increasing, we believe that sustainable investing is the strongest foundation for client portfolios going forward. //**

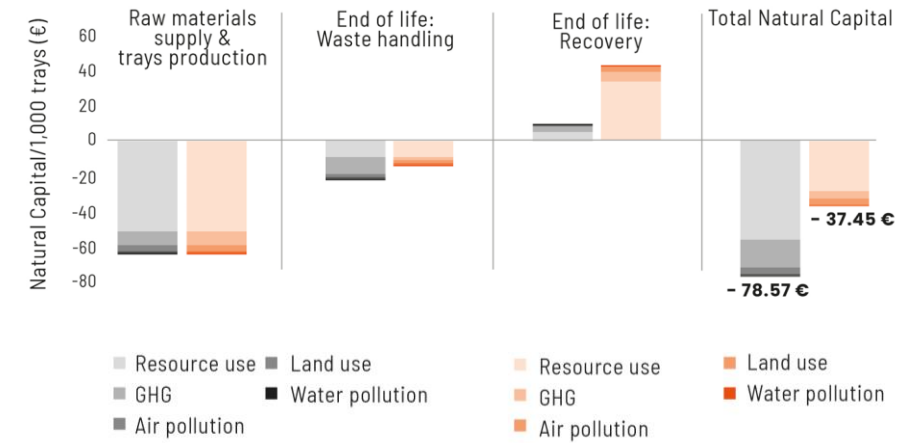
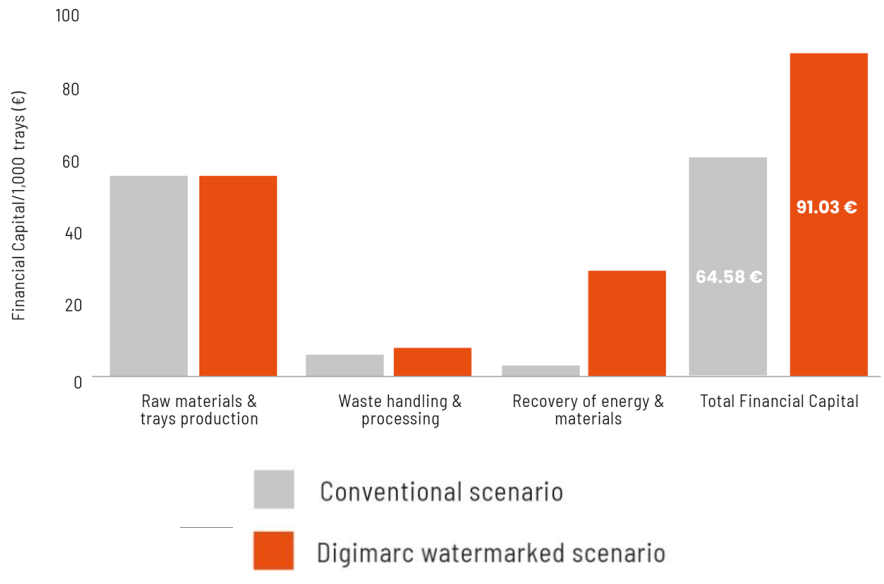
Sources: <https://corpgov.law.harvard.edu/2018/01/17/a-sense-of-purpose/>; <https://www.schurflexibles.com/de/news/schur-flexibles-erreicht-top-platzierung-im-esg-risk-rating>

Picture: <https://www.blackrock.com/corporate/about-us/leadership/larry-fink>

# DIGIMARC DIGITAL WATERMARKING ON PLASTIC PACKAGING SOLUTION CREATES SOCIETAL VALUE (I/II)

3D PROFIT AND LOSS STUDY PROVES THAT

- The *3D Profit and loss study*\* focus on assessing and comparing the positive and negative impacts of plastic value chains based on Environmental, Financial and Social capitals

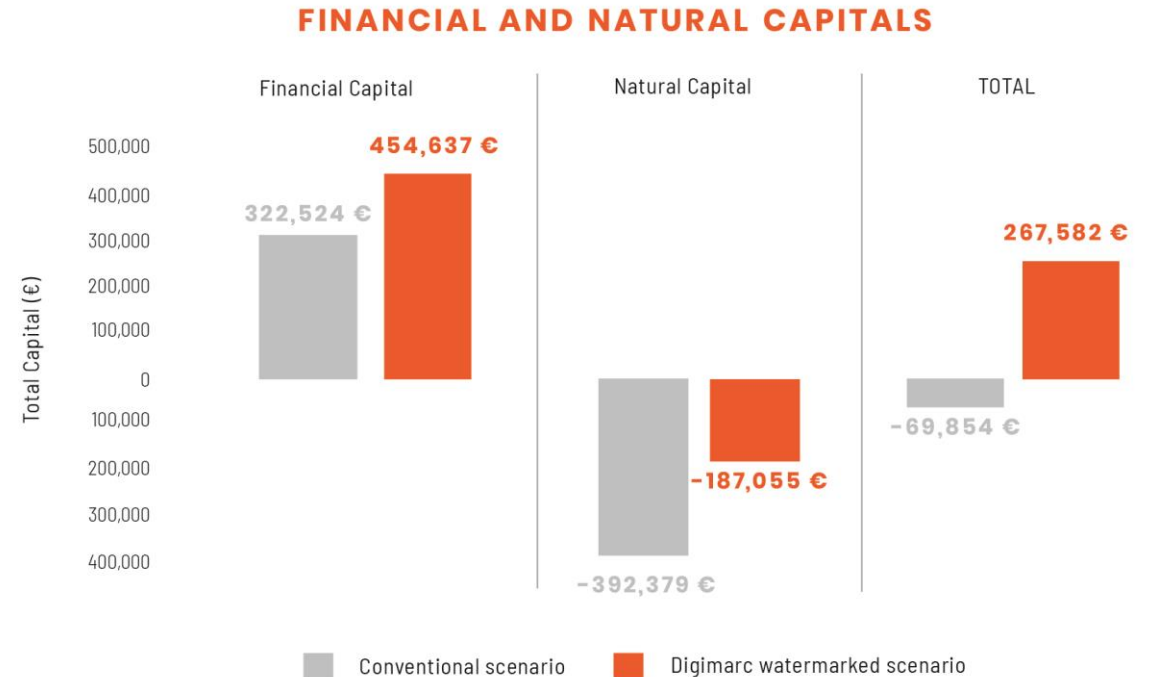


\*1000 black tray value chains introduced to the German market over the period of one year

# DIGIMARC DIGITAL WATERMARKING ON PLASTIC PACKAGING SOLUTION CREATES SOCIETAL VALUE (II/II)

3D PROFIT AND LOSS STUDY PROVES THAT

- The value of recovering polymer feedstocks preventing additional extraction of plastics is approximately four times that of doing business as usual
- Digimarc watermarks on PACCOR plastic trays create 41% more Financial Capital and a 52% reduction in Natural Capital loss compared to conventional end-of-life









**PIONEERING  
DIGITAL  
WATERMARKS  
FOR SMART  
PACKAGING  
RECYCLING IN  
THE EU**

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**Digital Watermarks  
Initiative HolyGrail 2.0.**



# HOLY GRAIL 2.0

LATEST NEWS MARCH 2022

## SIGNIFICANT MILESTONE ACHIEVED WITH THE SEMI-INDUSTRIAL VALIDATION OF DETECTION SORTING UNIT

**Press release for immediate release – Brussels, 30 March 2022** – The Digital Watermarks Initiative [HolyGrail 2.0](#), driven by [AIM](#)- European Brands Association and powered by the [Alliance to End Plastic Waste](#), has achieved a significant milestone with the successful validation, after semi-industrial testing mimicking real-life conditions, of the prototype detection unit for digital watermarks. The results show that the digital watermark technology can achieve more granular sorting of packaging waste at scale, such as developing separate food and other new PCR streams that currently do not exist (e.g. for cosmetic or detergent applications). This would open up new recycling streams, effectively overcoming limitations of current near-infrared (NIR) sorting technologies and drive a true circular economy for packaging. Consistent high results across all tested categories of plastic packaging material of 99% detection, 95% ejection and 95% purity rates, on average, demonstrate an impressive performance of the first prototype. Developed by the machine vendor [Pellenc ST](#) and the digital watermarks technology supplier [Digimarc](#), the detection unit is now ready for industrial-scale pilots, which are planned to start later this year. Details on industrial partners and packaging scope will be released soon.

Category	Detection Rate[1] (Estimate)	Ejection Rate[2] (By weight)	Purity[3] (By weight)
Rigid PP	99%	95%	96%
Rigid PE	98%	96%	99%
Rigid PET	99%	98%	95%
Flexibles	99%	91%	90%
<b>Average across packaging materials</b>	<b>99%</b>	<b>95%</b>	<b>95%</b>

*Table 1: Average single sort results from mixed packaging waste streams (watermarked samples + contamination (non-watermarked samples + other pack material classes)). Typical industrial process conditions have been used in these trials (belt speed of 3m/s; Loading: Rigids running at ~2.5 tonnes/hr; Flexibles at ~0.5 tonnes/hr). Success criteria (after 1st sort) for detection efficiency/ejection efficiency/purity are 95%/95%/92% for rigid packaging, 95%/87%/90% respectively for film packaging (in line with industrial specifications).*



THESE PRODUCTS CARRY THE CODE  
ALL PACCOR PRODUCTS HAVE SUCCESSFULLY  
UNDERGONE THE HOLYGRAIL 2.0 TESTING  
DIRECTLY ON THE SURFACE OF THE PLASTIC



# HOLY GRAIL 2.0 - MULTI-COMPONENT PRODUCTS POSSIBLE

PACCOR DUOSMART® YOGHURT CUP

**DETECTION** - 100% ✓  
**EJECTION** - 97% ✓

The product validation was conducted by the digital watermarks initiative holygrail 2.0, driven by AIM - european brands association and the alliance to end plastic waste.



Plastic cup with paper banderole  
(DuoSmart®)

# DIGITALIZATION FOR THE BENEFIT OF THE ENVIRONMENT

## TOWARDS A CIRCULAR ECONOMY

- **PACCOR is the first packaging manufacturer** who is able to apply the digital watermark technology to ALL commercially available rigid plastic packaging surfaces, in **2D** and **3D**
- **PACCOR** successfully participated in the recent **HolyGrail 2.0** testing at the ARC in Copenhagen in October 2021
- **PACCOR** sent 8 products into the test – all of them are classified as non-recyclable for new food packaging either because of colour, packaging design or due to the lack of identification





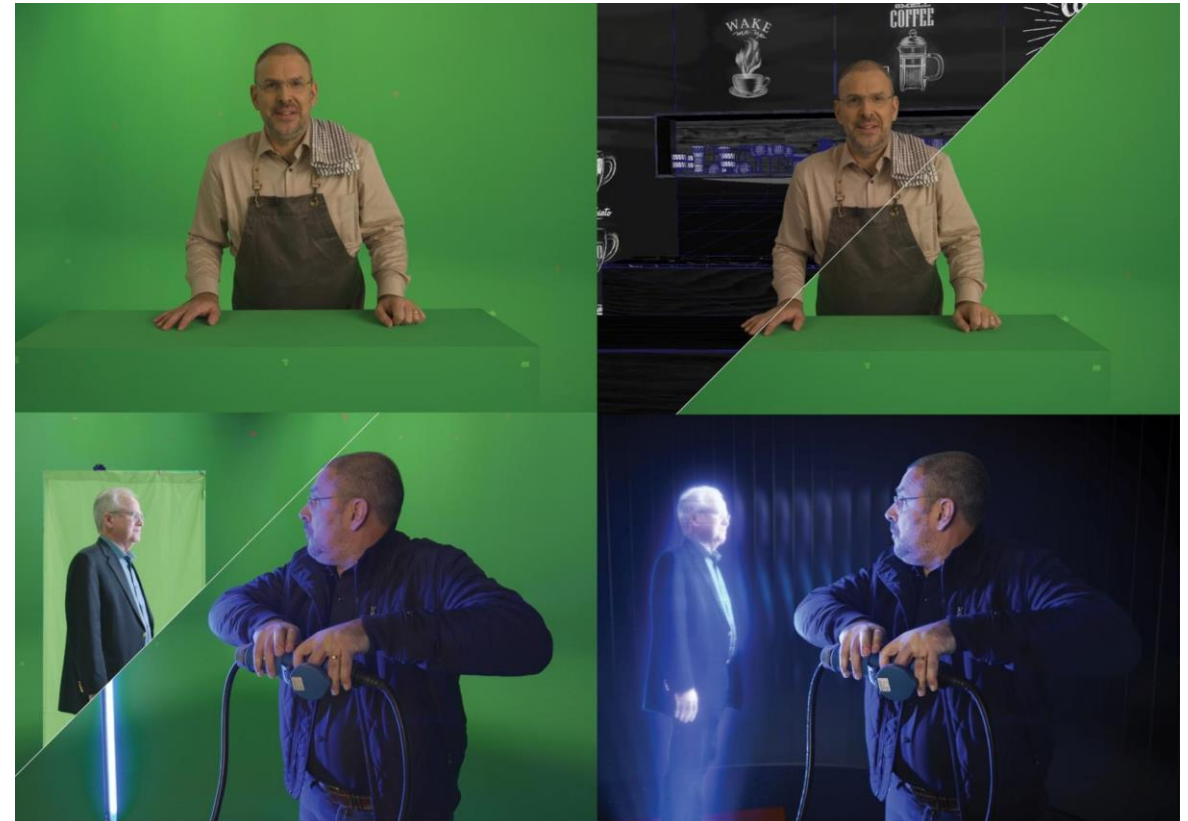


# GERMAN BRAND AWARD '22 DIGITAL BRAND OF THE YEAR

INTERACTIVE DIGITAL PACCOR BOTH



german  
brand  
award  
'22  
digital  
brand  
of the year

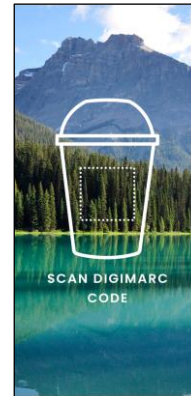


# PACCOR IS ALREADY THINKING ONE STEP AHEAD ...WITH PCS

## DIGITAL ECOSYSTEM TO ENSURE CIRCULAR ECONOMY

- PACCOR's patented cloud solution (PCS), together with digital watermarks, improve efficiency and transparency along the entire value chain

- This technical solution will enable all participants in the value chain to access PACCOR's product data worldwide
- The prerequisite for this is the digital watermark on the packaging in combination with PACCOR's cloud solution, PCS



Scan code page



Material



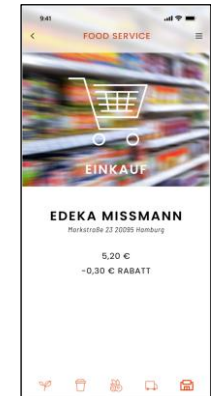
Environment



Product/content



Logistics

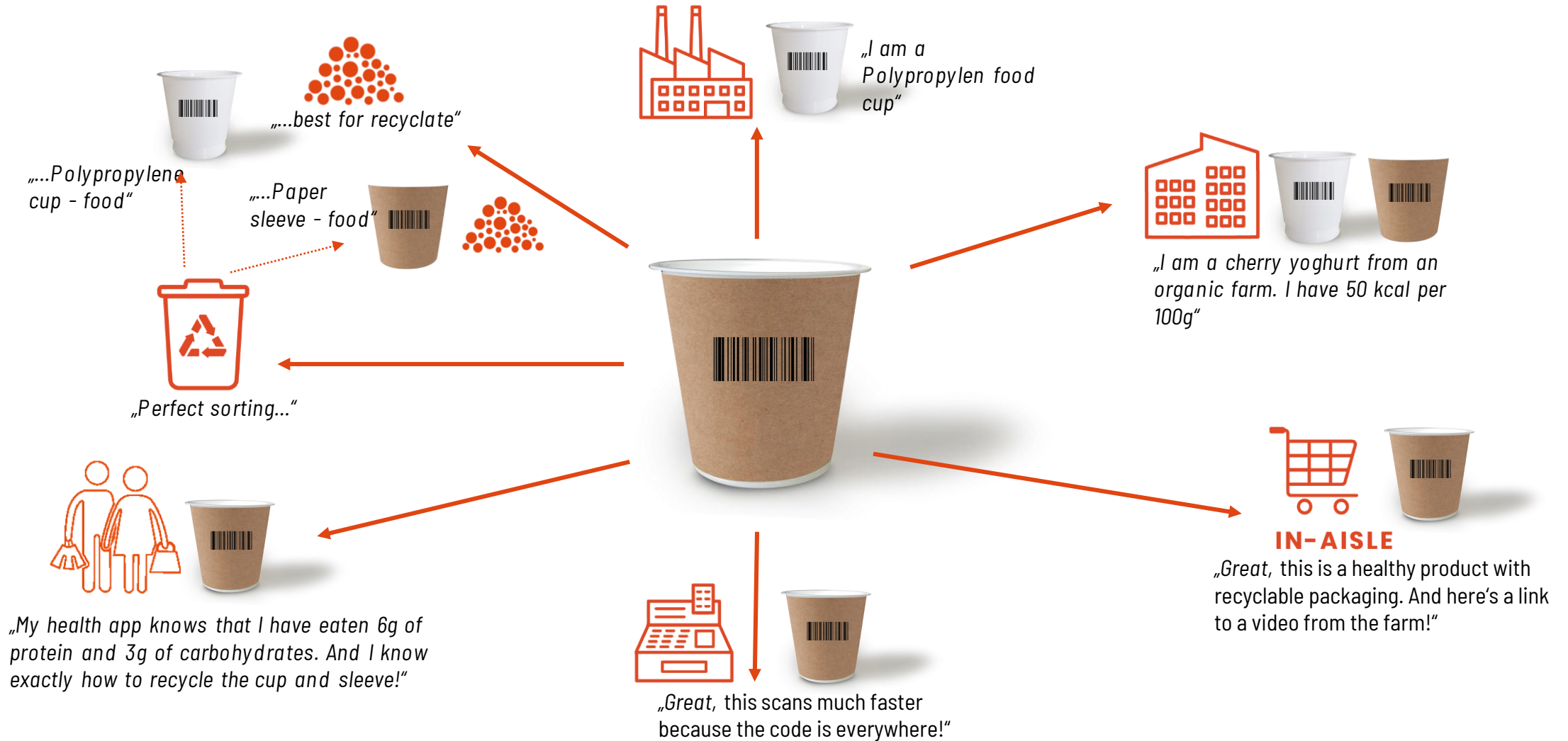


Retailer



# THE PACCOR CLOUD SOLUTION (PCS) ENABLES TANGIBLE BENEFITS

...ALONG THE VALUE CHAIN

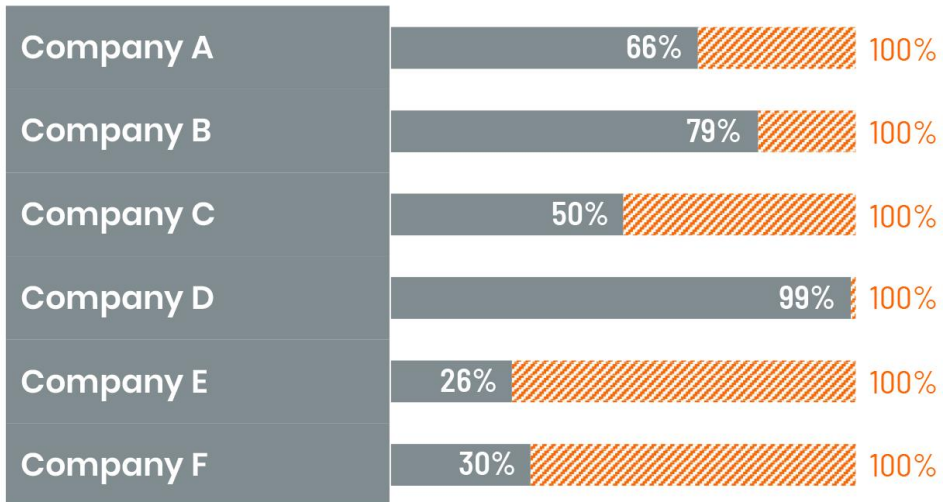


# THE BIG PLAYERS ARE SHAPING THE GAME -AND MORE AND MORE ARE JOINING IN

## PROGRESS BY FMCGs: TOP 10 FMCG COMPANIES

### PACKAGING DESIGN

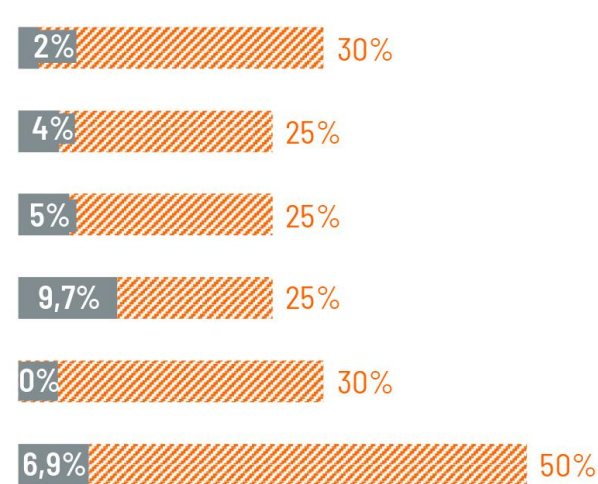
by weight of plastic packaging – reusable, recyclable or compostable, in %



■ 2019    ▨ 2025 target

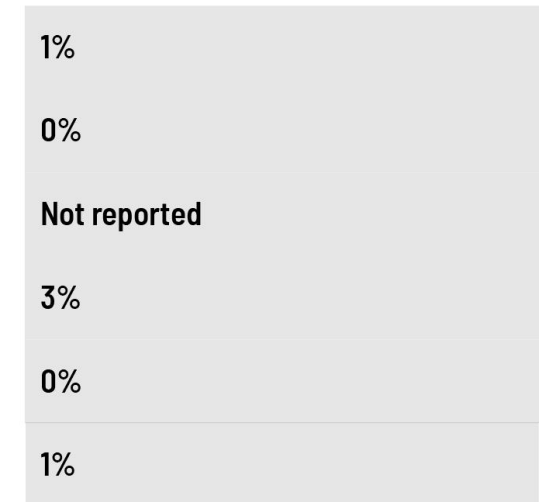
### RECYCLED CONTENT

by weight of post-consumer recycled content in plastic packaging, in %



### REUSABLE PLASTIC PACKAGING

by weight of reusable plastic packaging, in %



Sources: <https://newplasticseconomy.org/news/new-plastics-economy-catalysing-action-launch>;  
<https://www.ellenmacarthurfoundation.org/assets/downloads/Global-Commitment-2020-Progress-Report.pdf>

# **DIGITALIZATION 4.0**

**POLICYMAKERS, MAKE IT A STANDARD AND WE GET RID  
OF PACKAGING WASTE IN THE OCEANS.**

**WHAT ARE YOU WAITING FOR?**

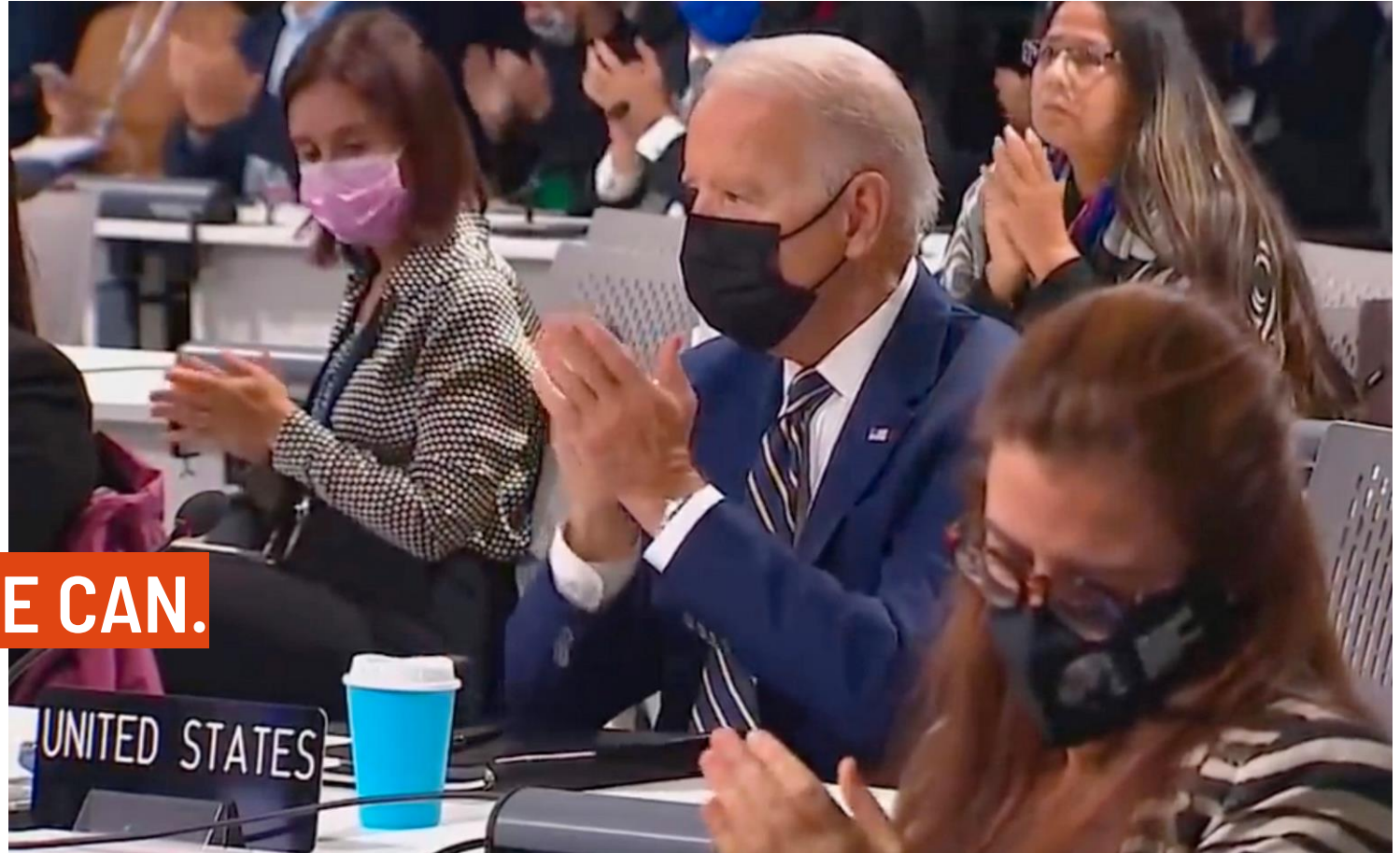


I HAVE SOLD OBAMA AND BIDEN A COFFEE.

IF I CAN DO THAT,  
THEN YOU CAN RECYCLE TOO.



YES, WE CAN.



Sources: Obama\_Cup\_1.jpeg - The New York Times - <https://www.nytimes.com/video/us/100000008066347/barack-obama-cop26-glasgow-activism-young-people.html>

Biden\_Cup\_1.jpeg Bockatech - <https://twitter.com/Bockatech/status/1455660966822174724>

## THANK YOU FOR YOUR ATTENTION.

Any questions? We are happy to help. You are welcome to contact us.

**Nicolas Lorenz**, Chief Commercial Officer at PACCOR  
[nicolas.lorenz@paccor.com](mailto:nicolas.lorenz@paccor.com)

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