



HolyGrail project: improved sorting efficiencies to enable high quality/quantity recycling streams

Standardization of watermark/tracer-based sorting

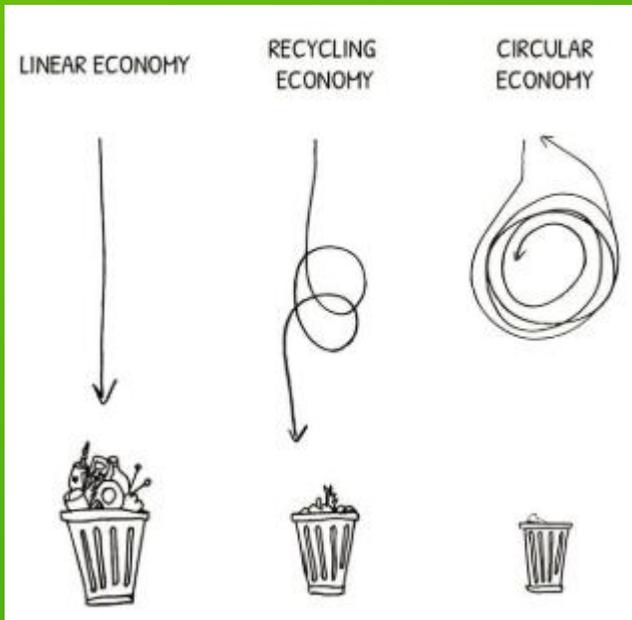
Gian De Belder

Project leader HolyGrail – New Plastics Economy

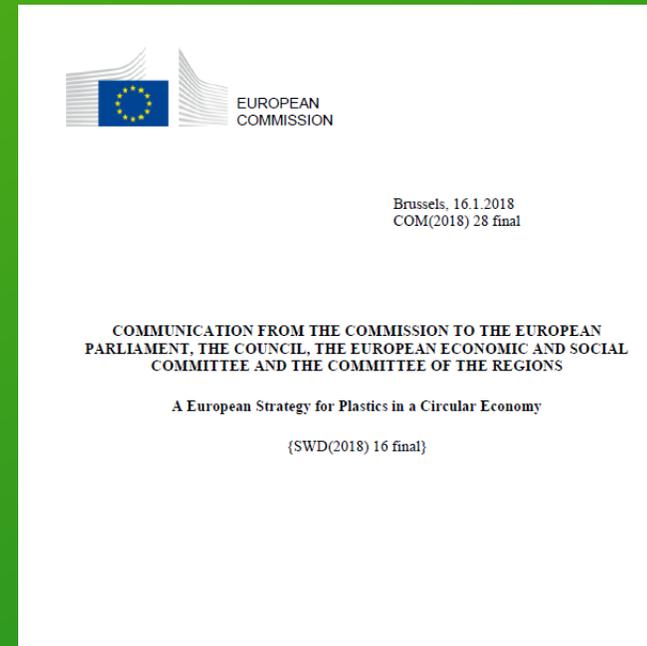
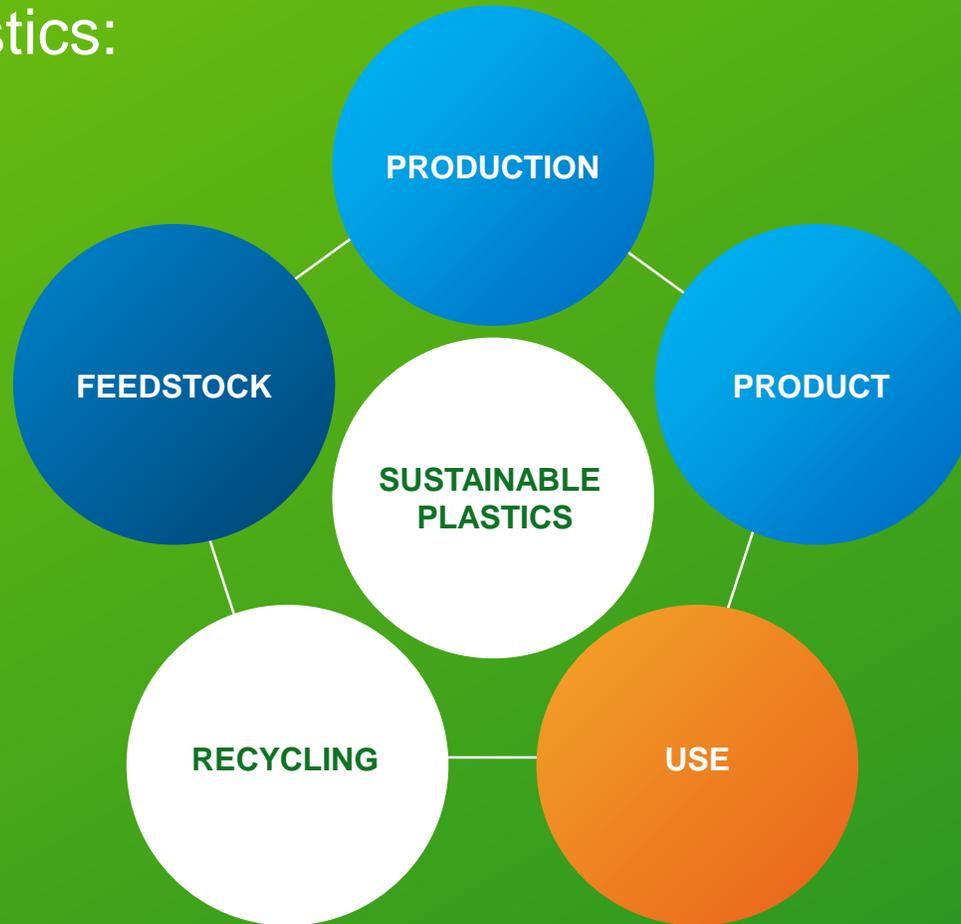
P&G, Packaging R&D - Sustainability

Circular Economy & New Plastics Economy

More sustainable plastics:
A circular approach



T/M/D

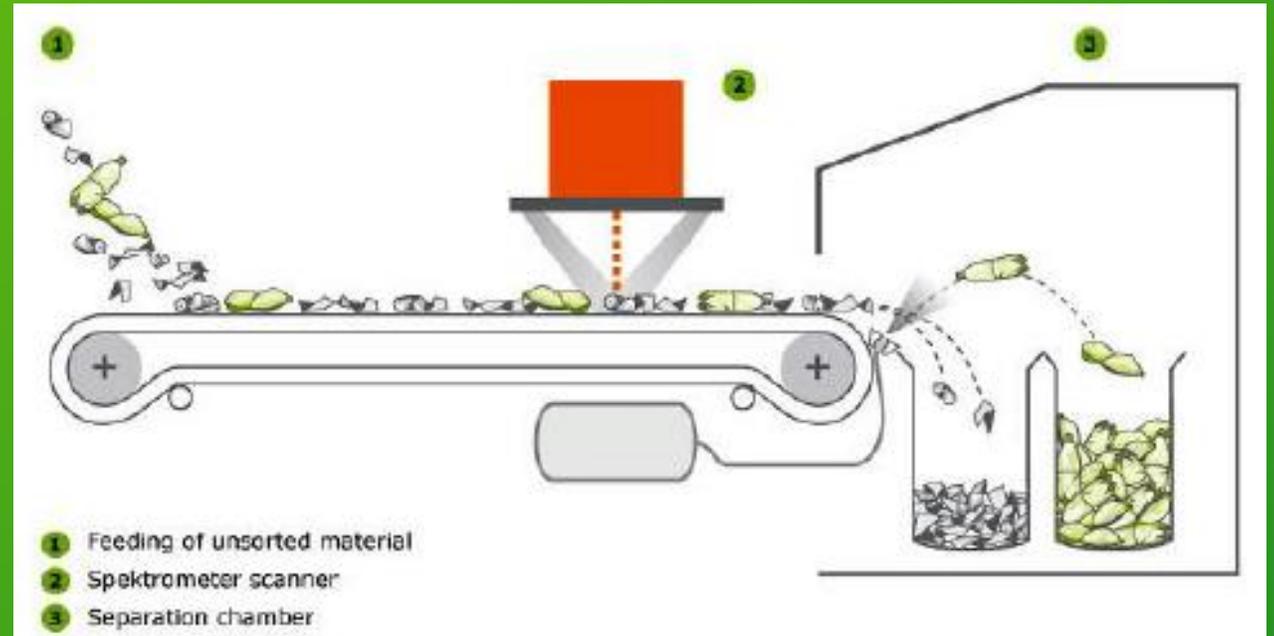


Source: European Commission, DG Grow & DG Environment

5 pillars for a Circular Economy: need partnerships!



Current NIR-based for effective sorting



Source:



New Plastics Economy

3.
SEPARATION



Source: World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, *The New Plastics Economy — Rethinking the future of plastics*(2016,<http://www.ellenmacarthurfoundation.org/publications>)





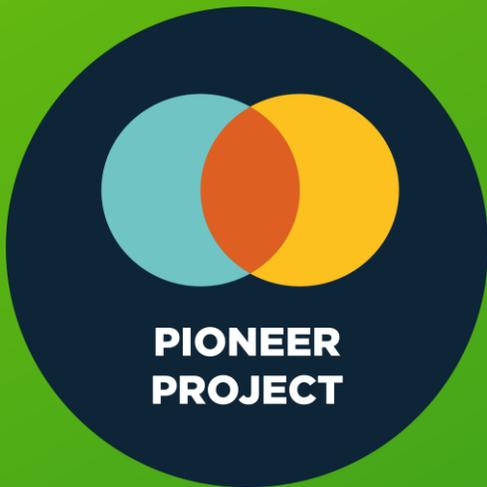
P&G is an active participant of the New Plastics Economy Initiative

The **New Plastics Economy Initiative** is a 3-year initiative led by the Ellen MacArthur Foundation, aiming to build momentum towards a plastics system that works.

Applying the principles of the circular economy, it brings together key stakeholders to rethink and redesign the future of plastics, starting with packaging.

Pioneer Projects are collaboration projects formed, led and run by participant organisations of the New Plastics Economy Initiative.

Pioneer Projects bring together expertise from across the plastic packaging value chain to address questions that one organisation cannot solve in isolation.





Pioneer project "HolyGrail"

Standardization of Tracer/Watermark sorting (including full value chain)





Pioneer project “HolyGrail”

- 2 technology routes: Tracers and Digital Watermarks (DW)
- Packaging industry needs NON-permanent technology
- Public workshop (‘17) to identify top 5 needs:
 - Distinct food from non-food grade bottles (current PET need)
 - Recyclable vs compostable packaging
 - Shrink sleeved PET bottles identification
 - New material introductions
 - Mono vs multi material thermoform and film
- Demo runs on digital watermarks required
- White paper



i. Overview of publicly-known Tracer systems



Markers with UV fluorescence (UV Led excitation and visible detection)

Markers with UV fluorescence (UV Laser excitation (high energy) and visible detection)

DNA markers



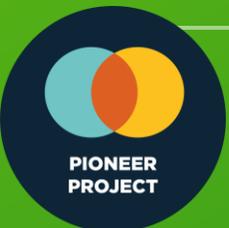
Example of active project: PRISM

Plastic Packaging Rapid Intelligent Sorting System for Materials



Innovate UK and industry funded R&D project ; Leader: Nextek Ltd

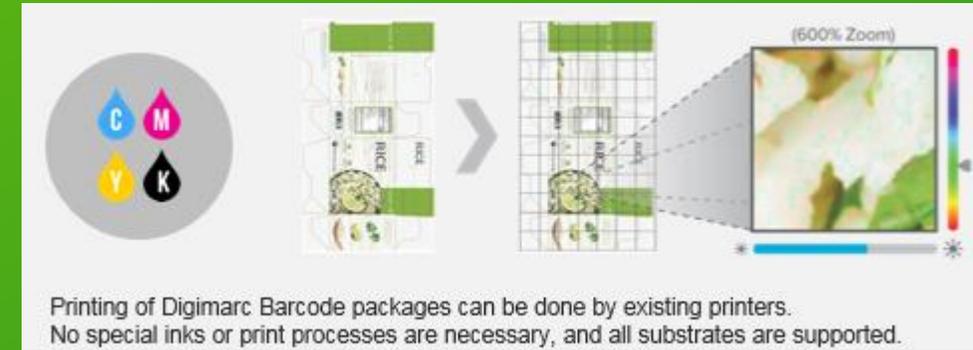
Recovery of 'fluorescent-marked' fully sleeved clear PET bottles:



ii. Demo runs with Digital Watermarks: classical DW in artwork

Printed materials: IML tub

(Verstraete)



codes: unlimited!

Sleeved PET



Exploring the boundaries with DW-based sorting

2D mold integration:



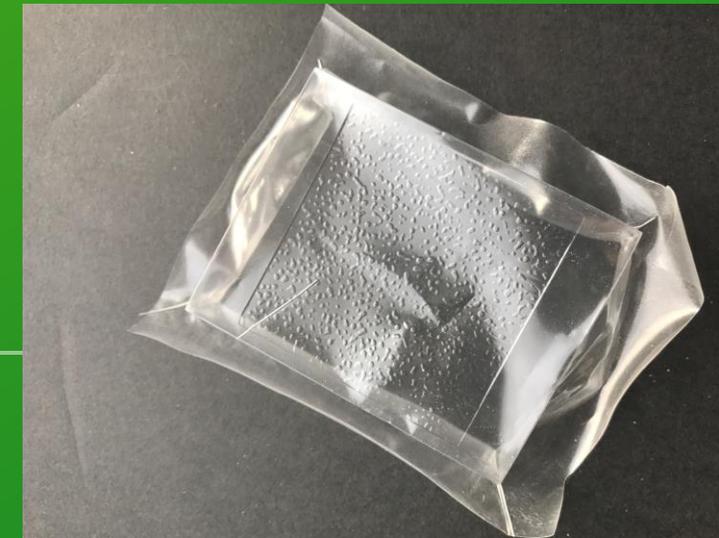
Thermoformed sheet

Black Trays!

Codes in TF mold:
→ readable at both sides!



Foils



Exploring the boundaries with DW-based sorting

3D mold integration:



ISBM molds



EBM molds



Outside-of-box-thinking: intelligent / smart packs

Inventory management & QA

Consumer engagement @ POS and Home -

Fast check-outs -



Digimarc Barcode is a GS1-approved symbology (standardization!)



Thank You!



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