AUSTRALASIAN
Waste &
Recycling Expo

The Future of Packaging

Dr John Williams

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POLYMERS LIMITED

Who we are and what we do

UK-based plastic materials manufacturer

Six-year, £ multimillion investment

Hydropol – a highly functional flexible plastic that has multiple sustainable end-of-life options

History of plastics

Parkesene 1862

Bakelite 1907

PVC 1927

PVOH 1931

HDPE 1933

PP 1954

Kevlar 1964

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Focus on functionality, not end of life

The Plastic Age

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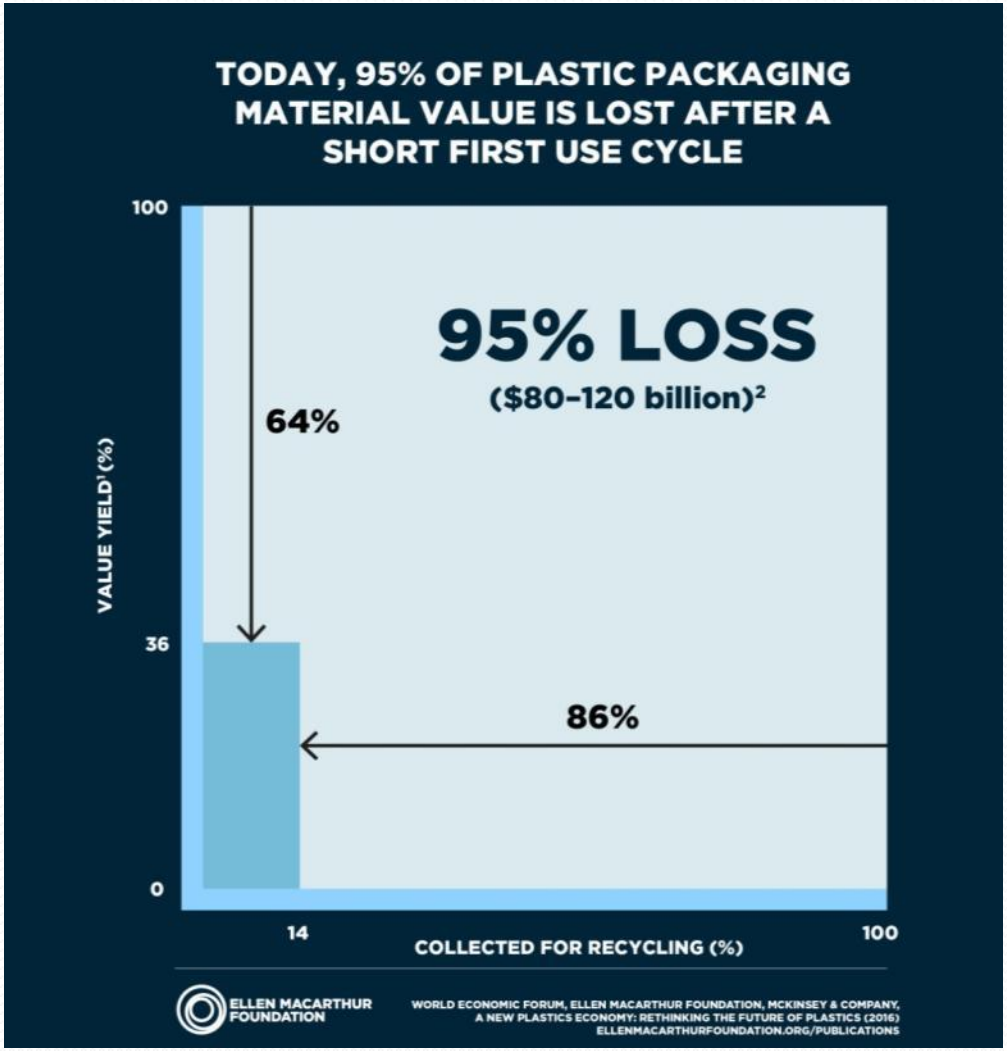
Plastic waste: a global failure



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Flexible plastics in the UK

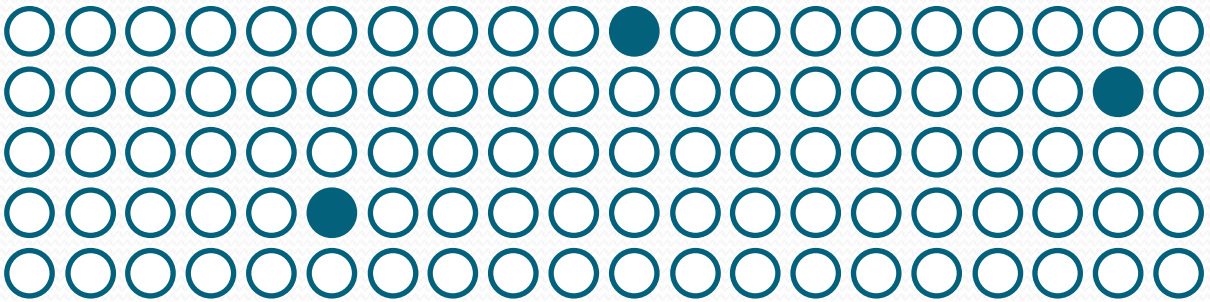
762,000
tonnes p.a.

12% more than the capacity of Belvedere, the UK's largest waste facility

54% post-consumer

carrier bags, pasta and rice bags, and the film on ready meals

Only 1 in 5 local authorities collect it…



…only 3% is recycled

Data from WRAP 2016; Recoup, 2016

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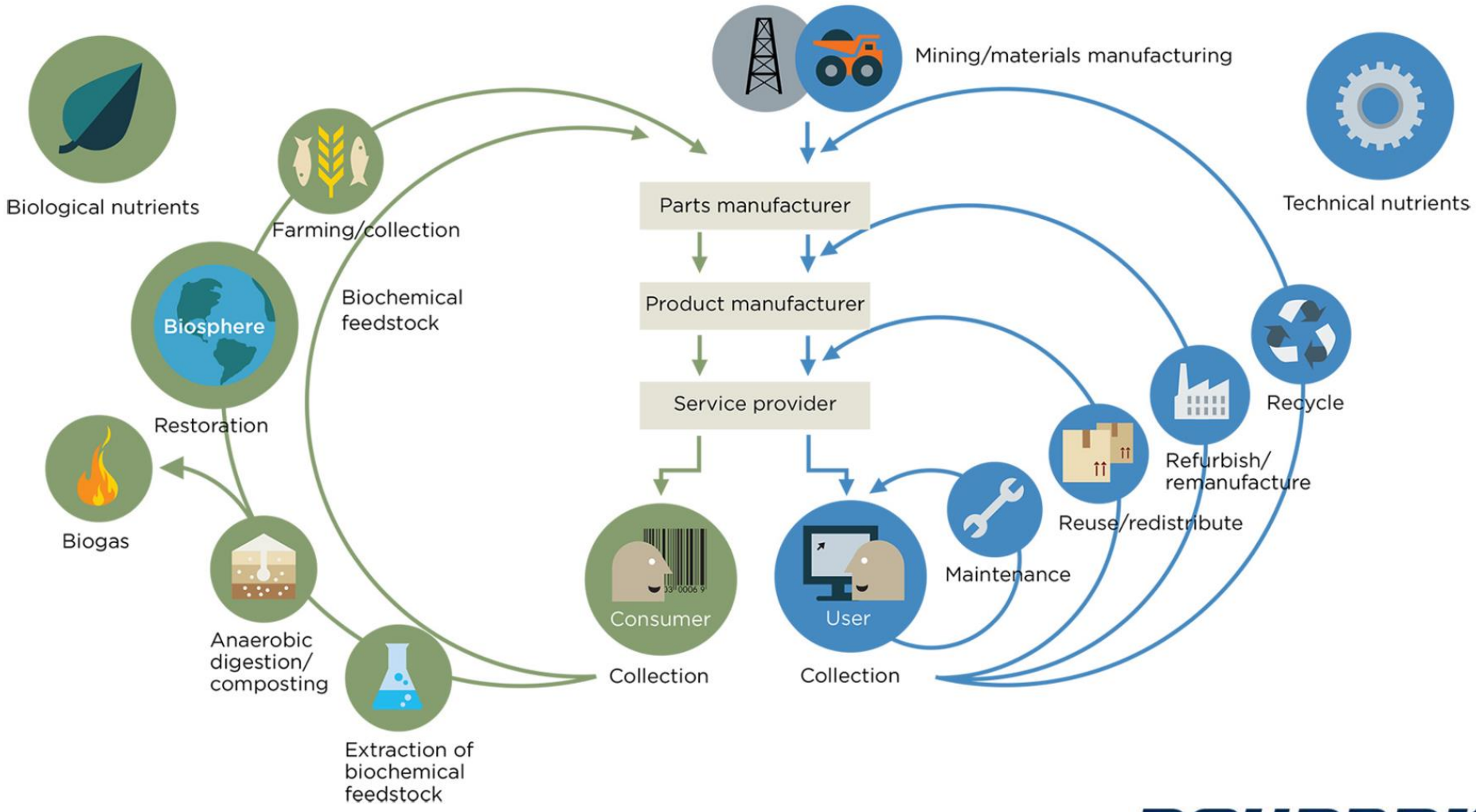
What is a Circular Economy?



Plastic in a circular economy

Existing polymers are holding us back.

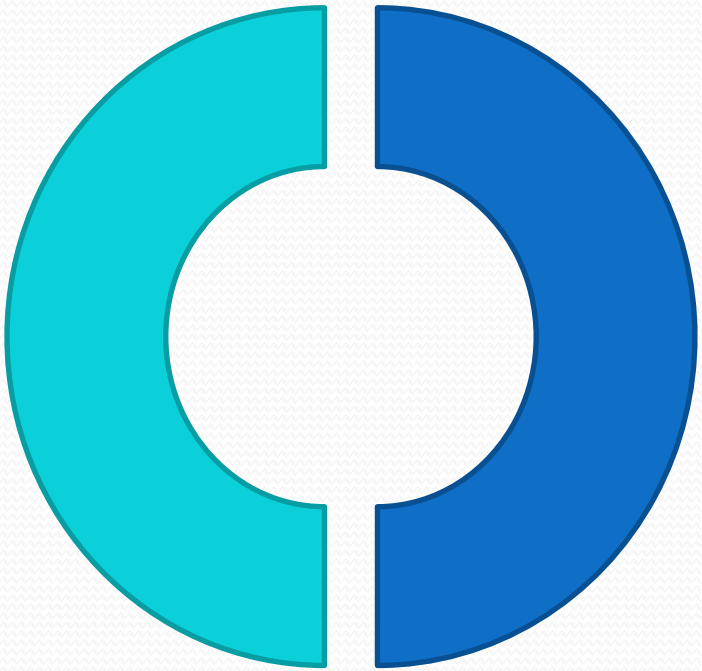
We need new materials – **but they must fit circular principles.**

PRODUCT ⇄ **WASTE**

Is it **compatible** with existing manufacturing equipment?

Functional – does it serve its purpose well?

Versatile – can it be used for multiple applications?



Is it **compatible** with existing waste management equipment?

Recyclable – can I sell high quality material back to manufacturers?

Biodegradable – will it degrade in standard processes & times?

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End of life options

Biodegradability

- Marine conditions – no toxicity, low persistence
- Composting & Anaerobic Digestion – standard residence times, no “flake” residues, CO_2 + biomass
- Food packaging, food waste bags – reduce depackaging

Recyclability

- NIR fingerprint for materials sorting
- Soluble and recoverable from waste water (chemical recycling)
- Reduce contamination of other target materials

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New Plastics Economy, Superpolymers and Moonshoot Innovations

- Bio-based materials
  - Compostable food packaging e.g. Vegware
  - Wool insulation and packaging material e.g. Woolcool
  - Starch-based bags e.g. Starpol from Aquapak
- Bioplastics
  - Flexible cellulose films e.g. Futamura
  - Rigid polylactic acid (PLA) e.g. Floreon
- Petrochemical plastics designed for a circular economy – biodegradable and recyclable (e.g. Hydropol from Aquapak)

All UK-based case studies

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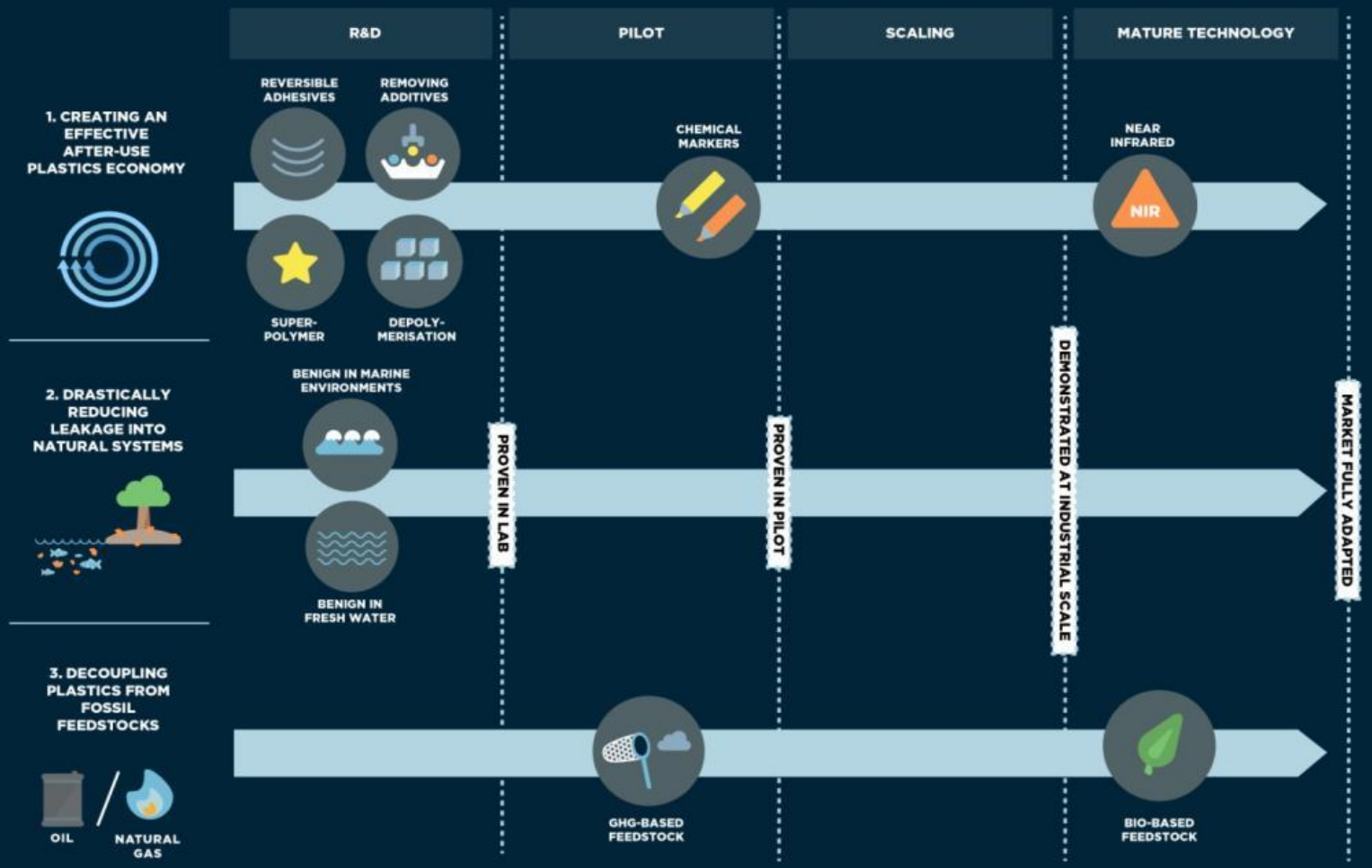
‘MOON SHOT’ INNOVATIONS ARE ESSENTIAL TO THE TRANSITION TO A NEW PLASTICS ECONOMY (SELECTED EXAMPLES)



ELLEN MACARTHUR FOUNDATION

WORLD ECONOMIC FORUM, ELLEN MACARTHUR FOUNDATION, MCKINSEY & COMPANY, A NEW PLASTICS ECONOMY: RETHINKING THE FUTURE OF PLASTICS (2016) ELLENMACARTHURFOUNDATION.ORG/PUBLICATIONS

SOURCE: Project MainStream analysis

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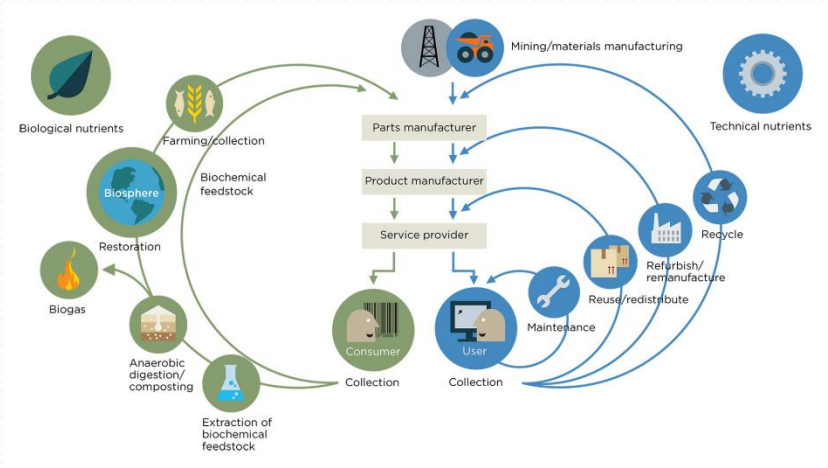
Conclusions

- Plastics are here to stay
- Different polymers will solve different problems
- Designers, retailers and waste managers are around the table – building a new plastics economy
- Recycling and waste management specialists need to support the “front end” with advice and adaptability



The future of packaging **must** be circular.