

ELLEN MACARTHUR FOUNDATION
Rethink the future





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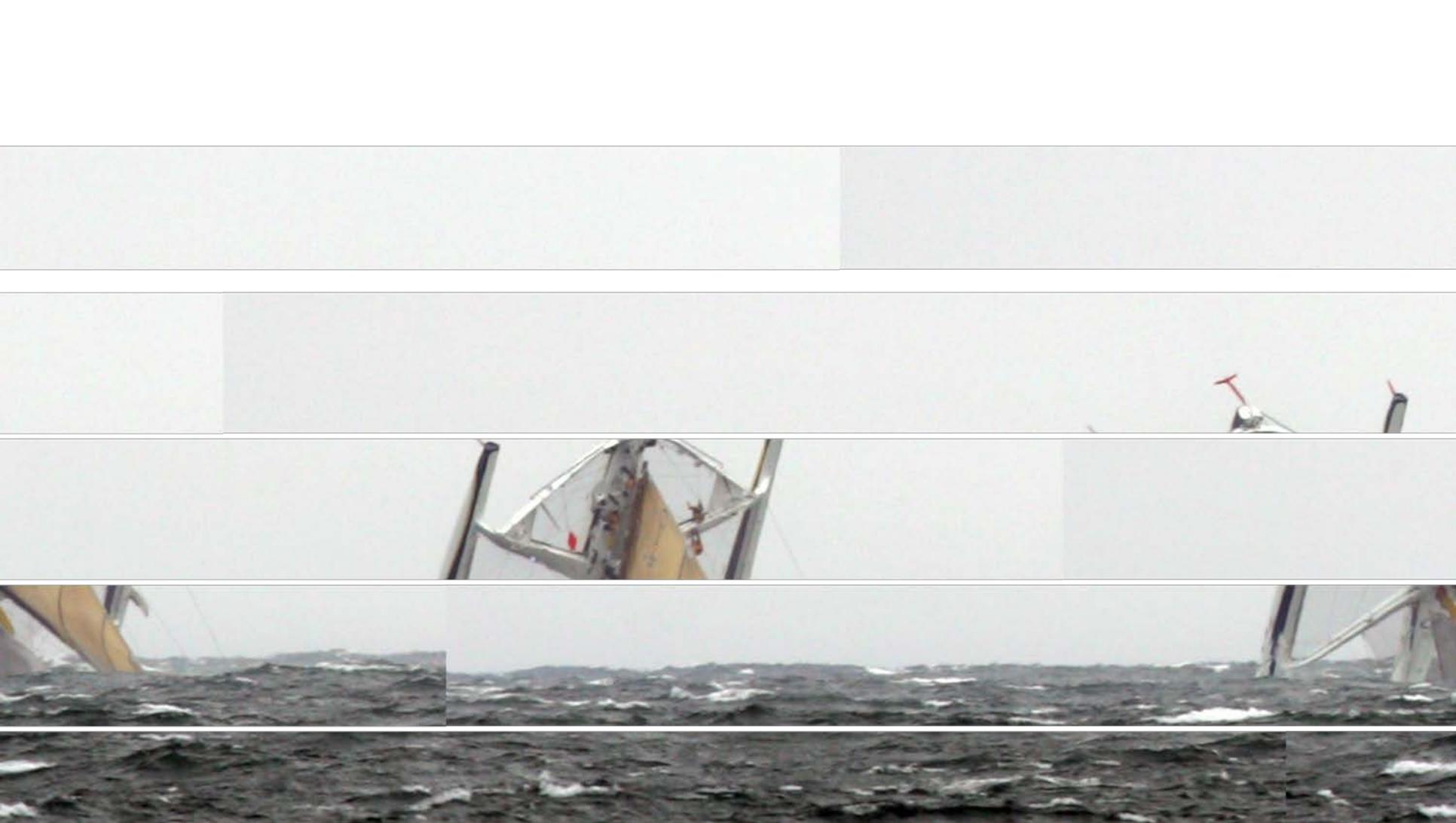
COMET

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Team Philippe exultent



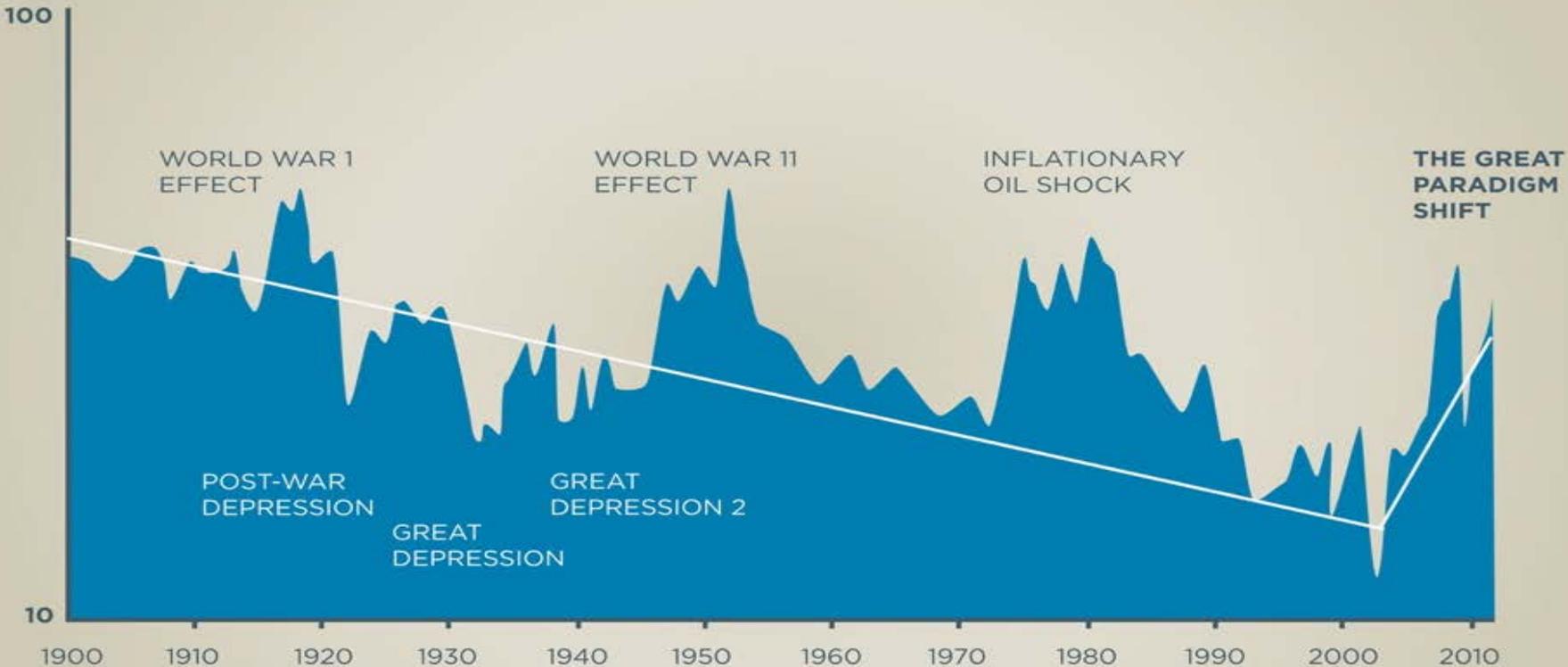


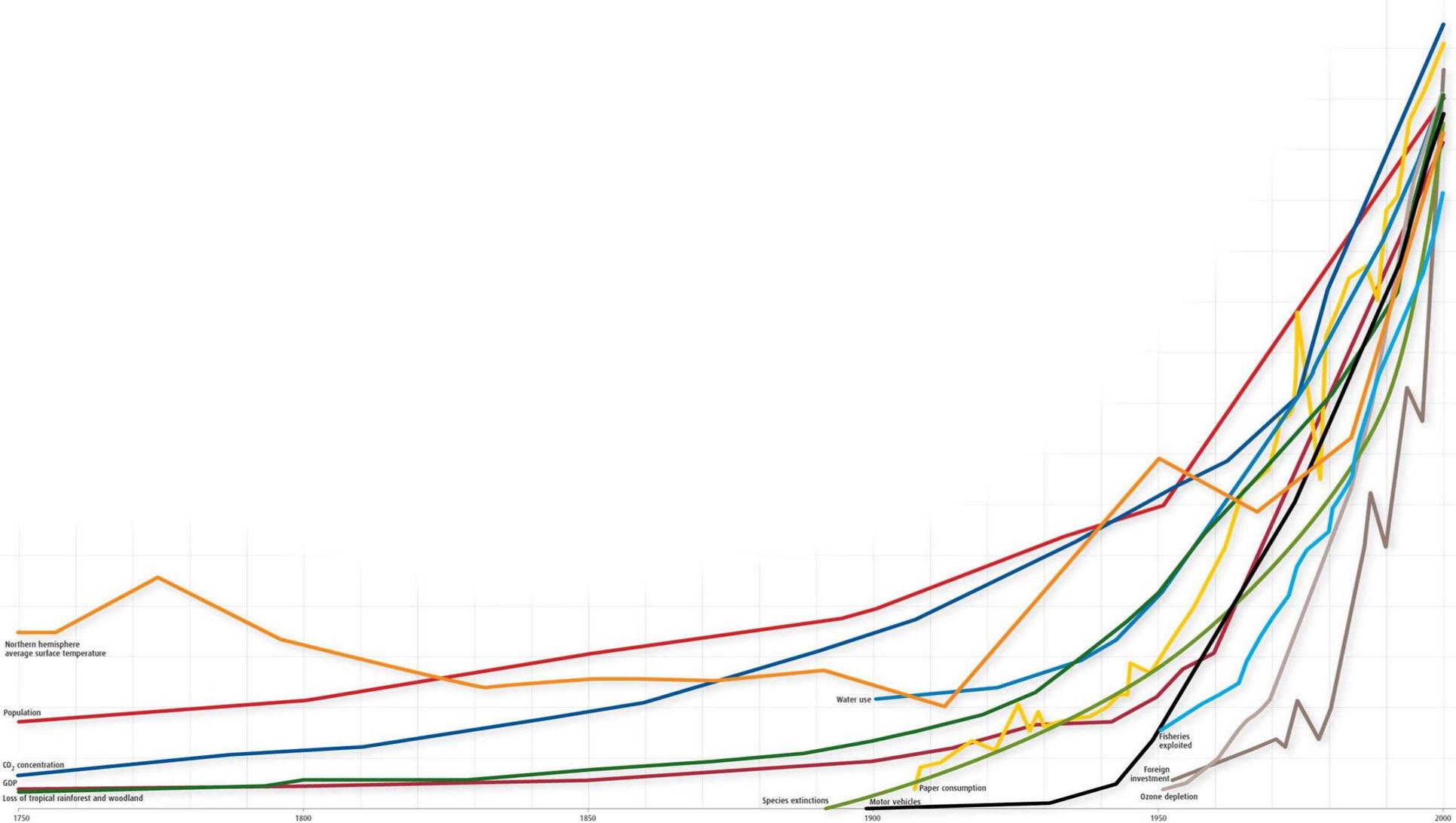






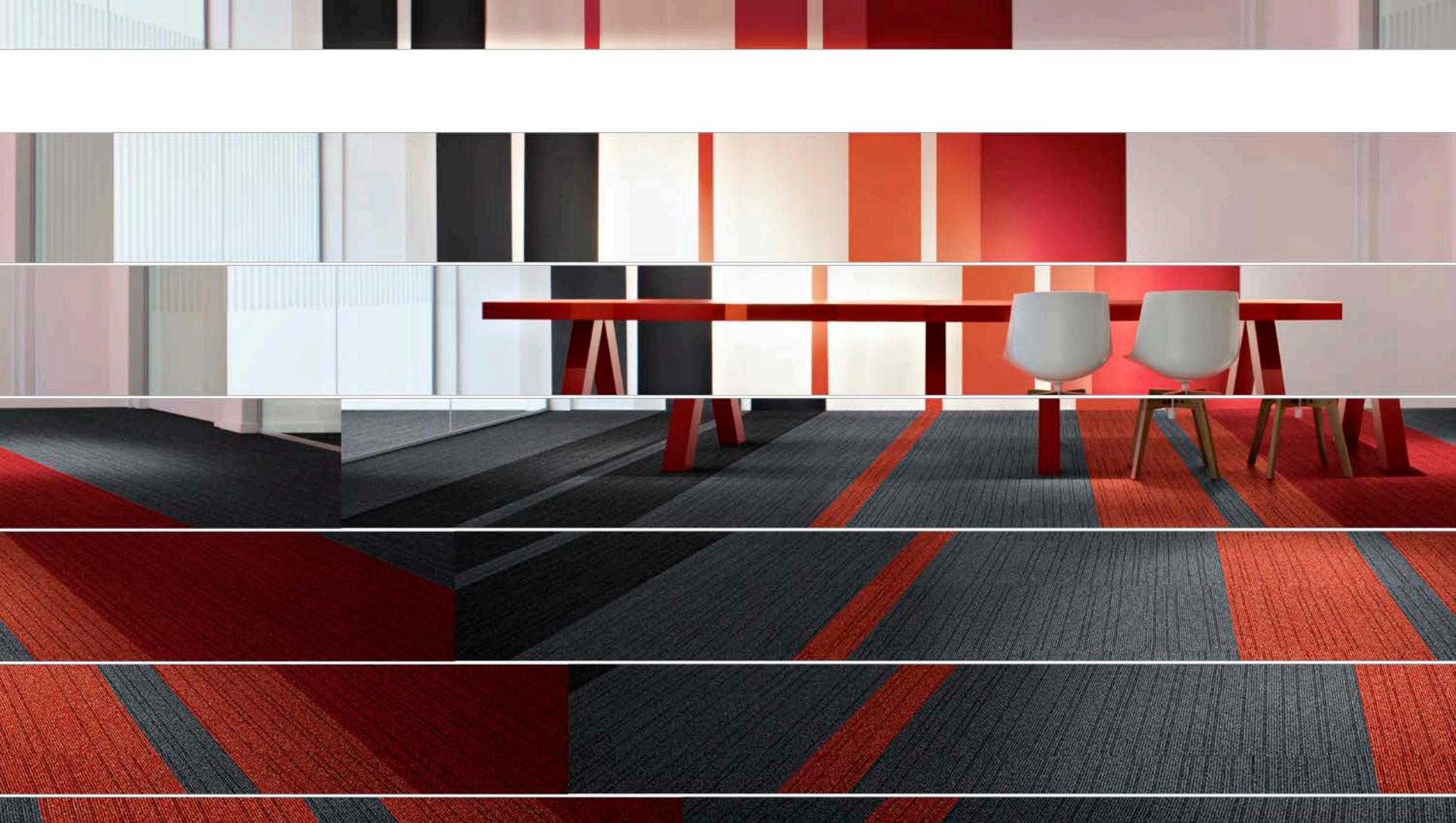
COMMODITY INDEX PARADIGM SHIFT?

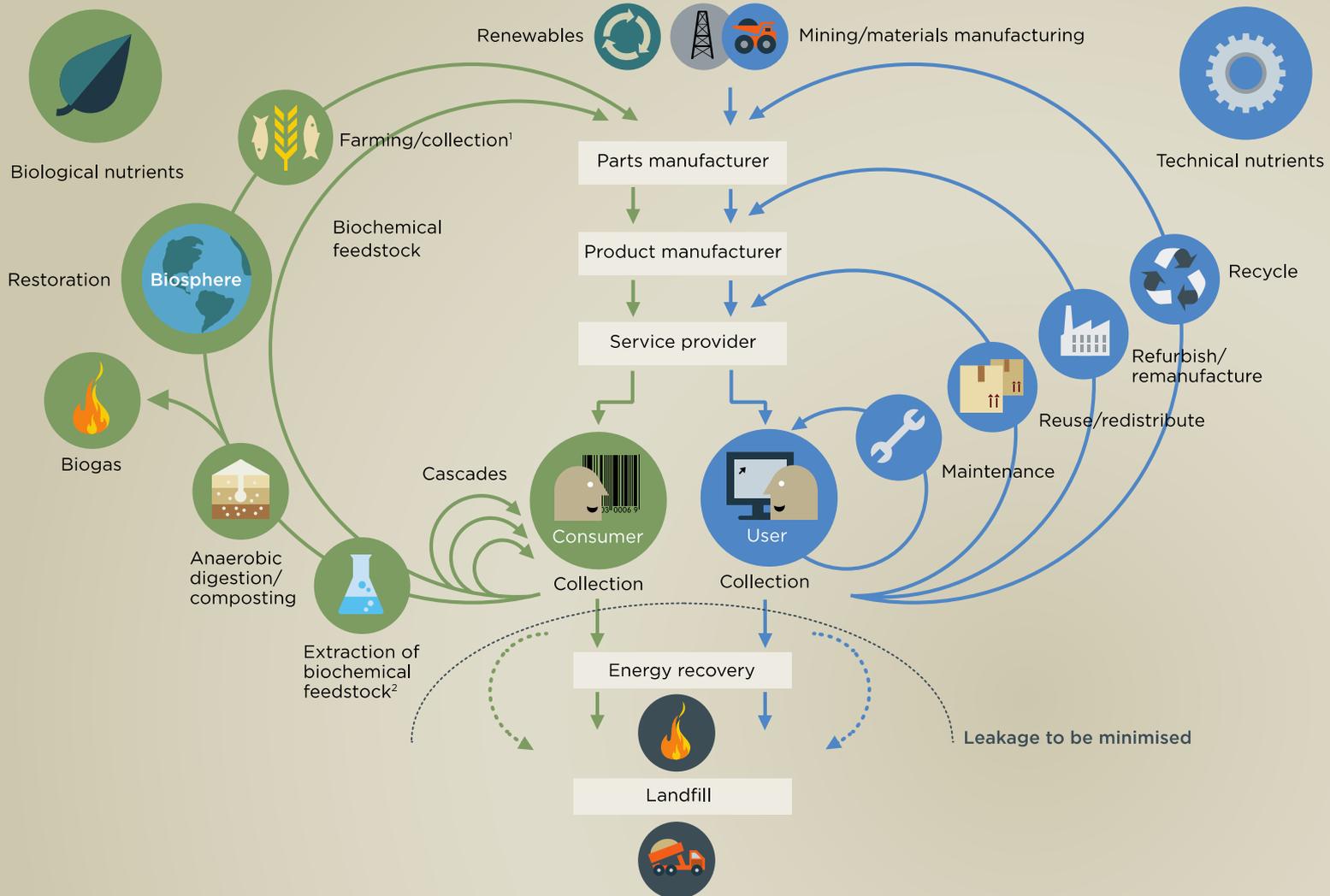




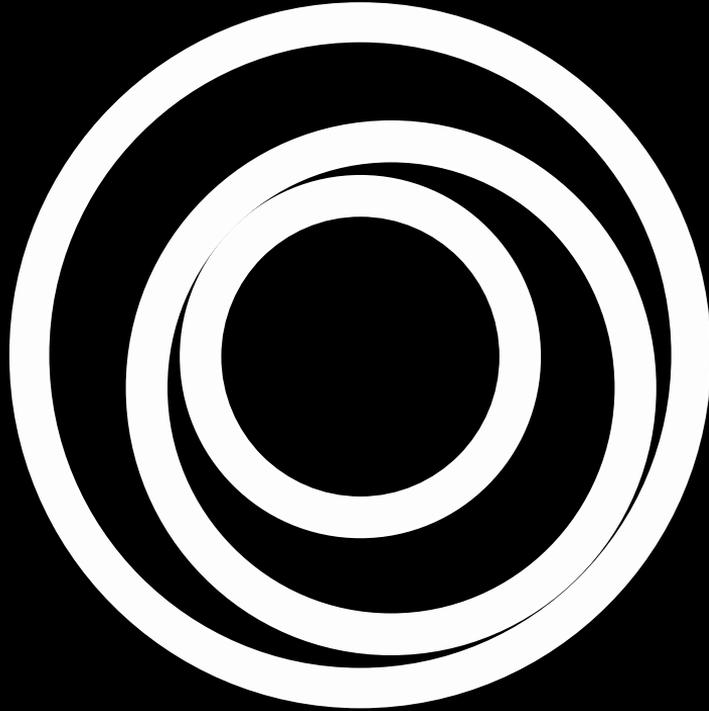












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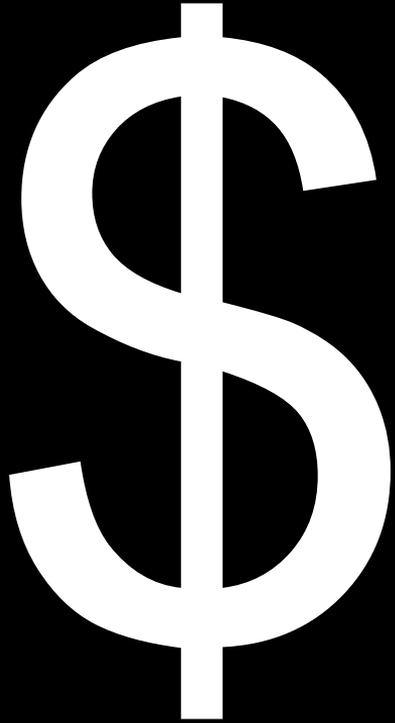
Circular Economy PGCert

An introduction to the principles and application of the 'circular economy'



Innovation, Enterprise and the Circular Economy MBA





\$630bn

2011

2012

2013

GOALS

2,200 secondary schools
in the UK actively engaged with circular economy thinking by September 2013

Evidence of implementation
in cross-sector case studies

Tipping point reached
in terms of exposure of circular economy concept

1,500
6,300
10,000
400,000

100
4,200
11,000
100,000

400
3,000
8,000
200,000

300
1,500
4,000
100,000



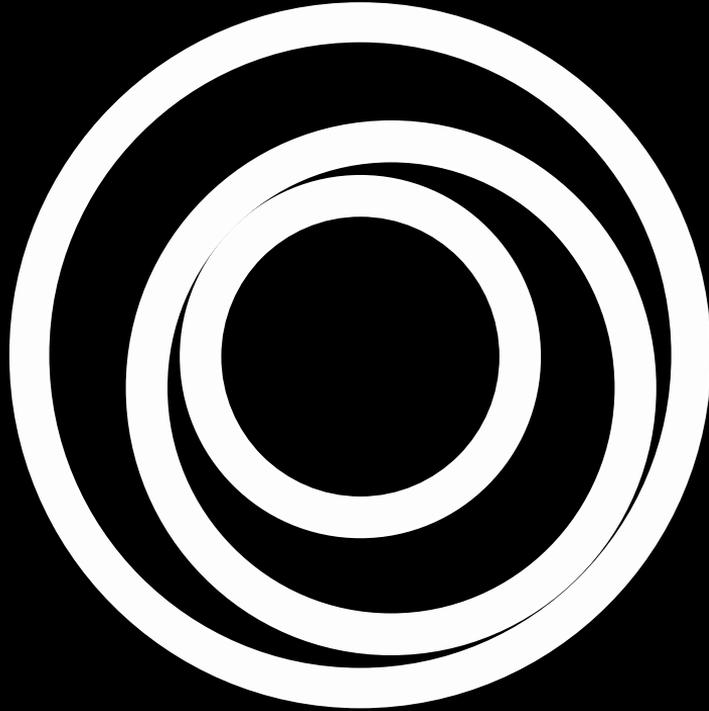
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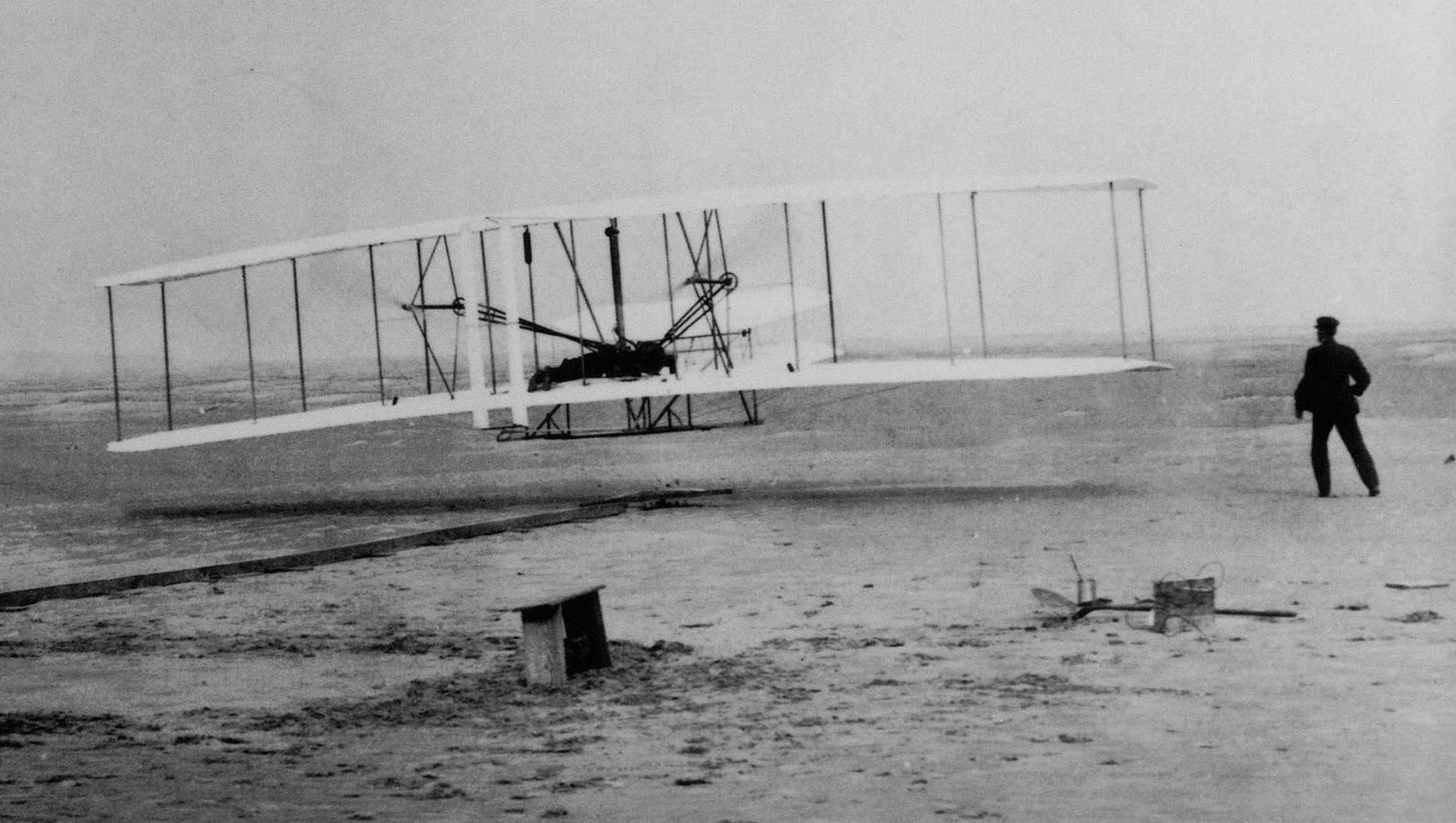
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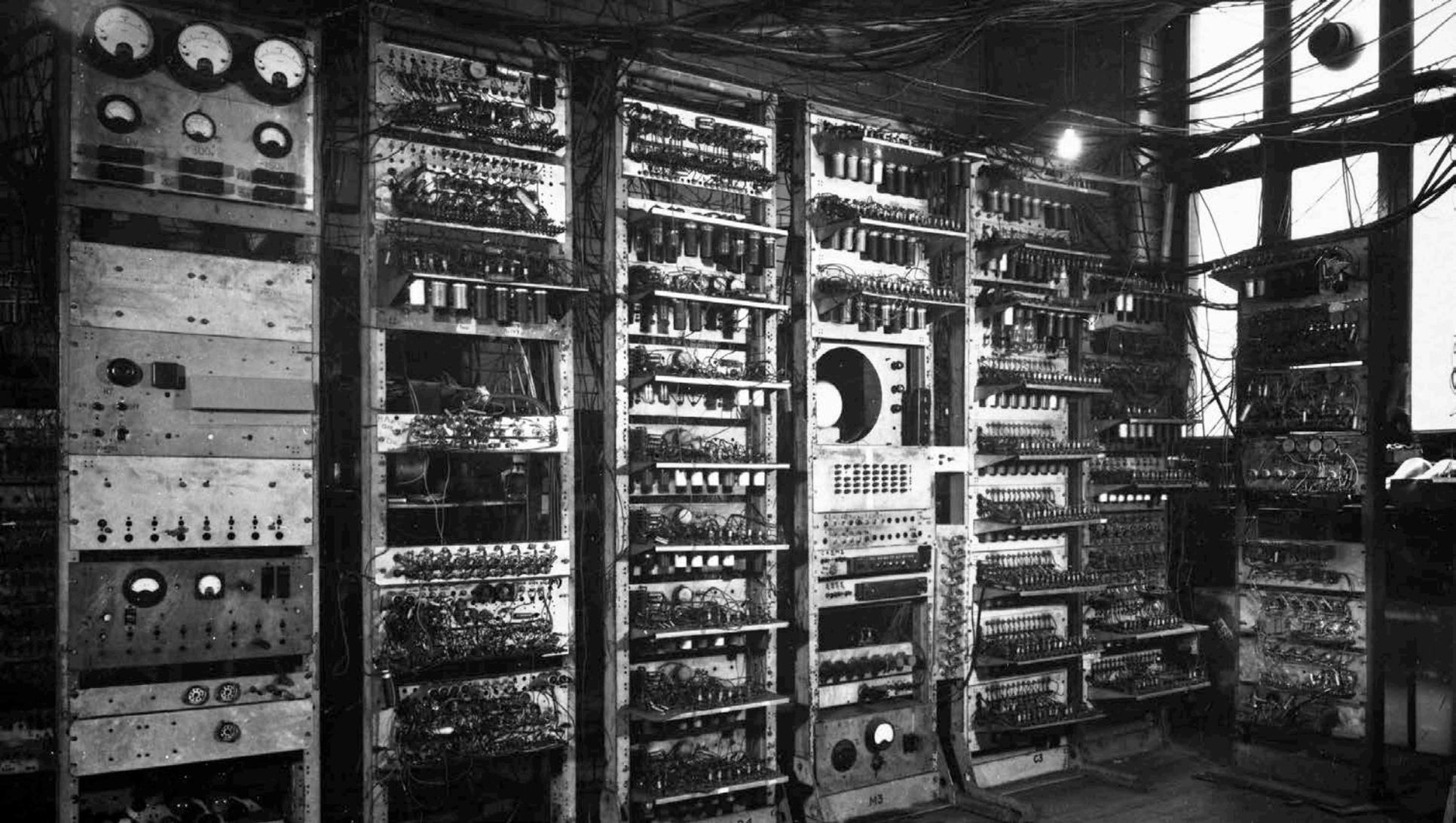


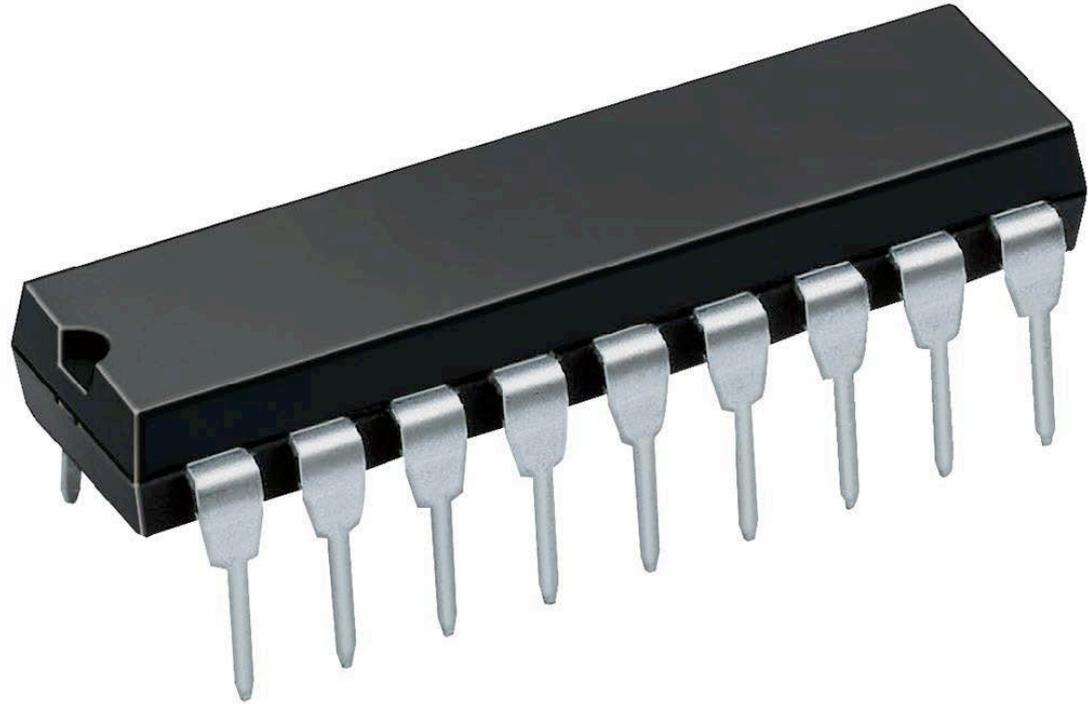
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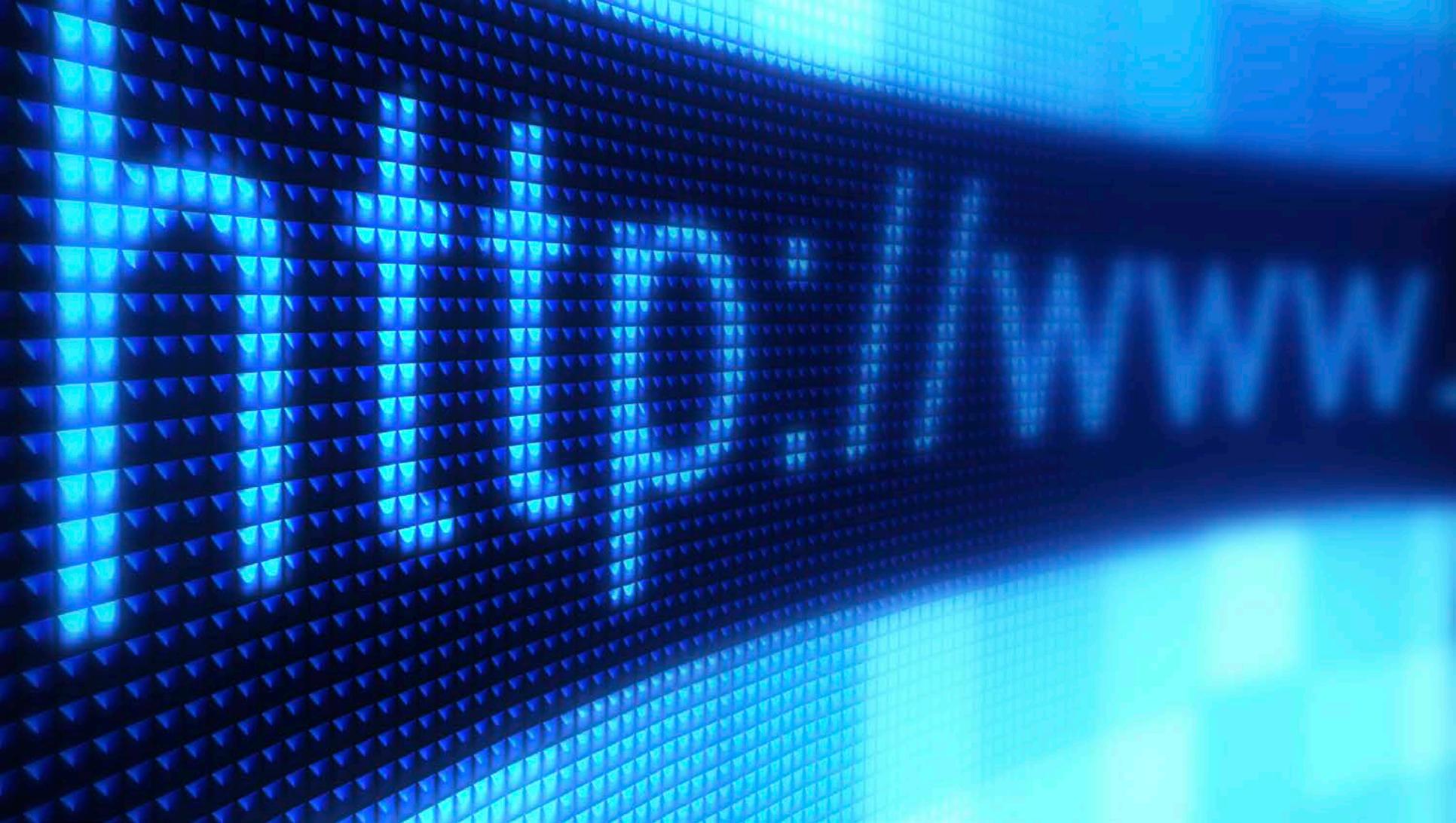


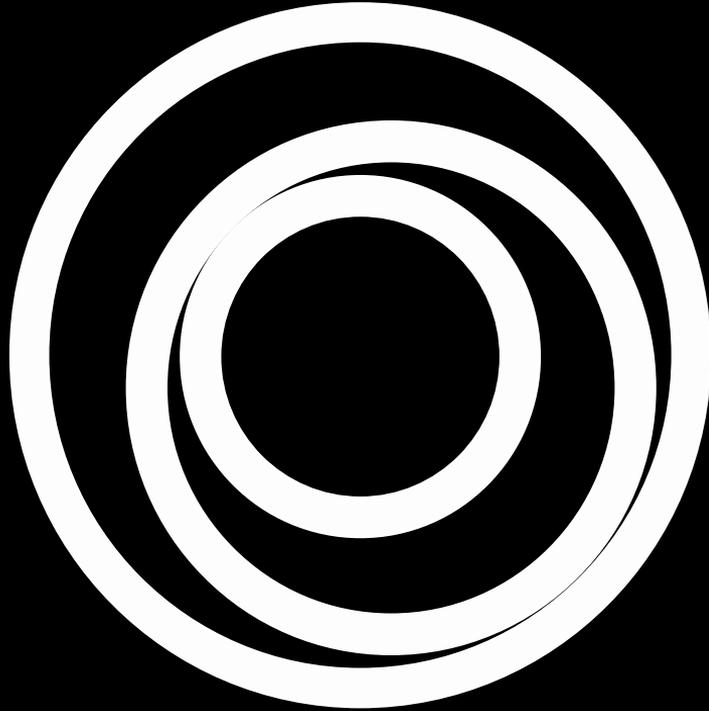




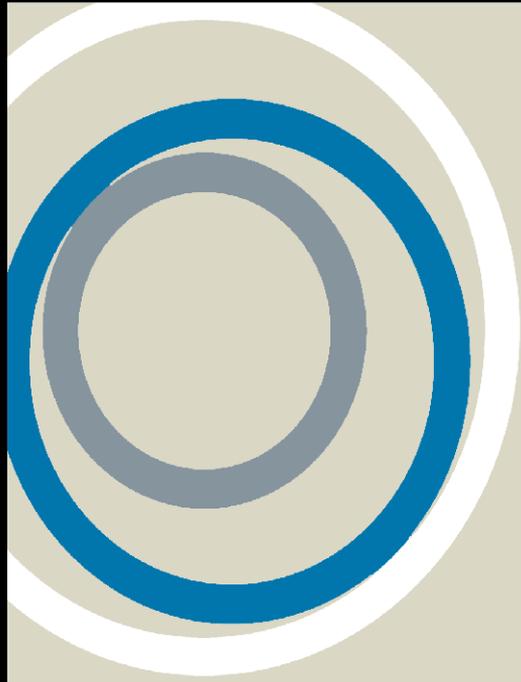








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TOWARDS THE CIRCULAR ECONOMY

Opportunities for the consumer goods sector

Ellen MacArthur Foundation

Breakfast briefing

Davos, 25 January 2013

Last year in Davos ...



... we discussed the battle for resources: Resource prices are higher, more volatile and more correlated than they have been in a century

McKinsey Commodity Price Index (years 1999 - 2001 = 100)¹



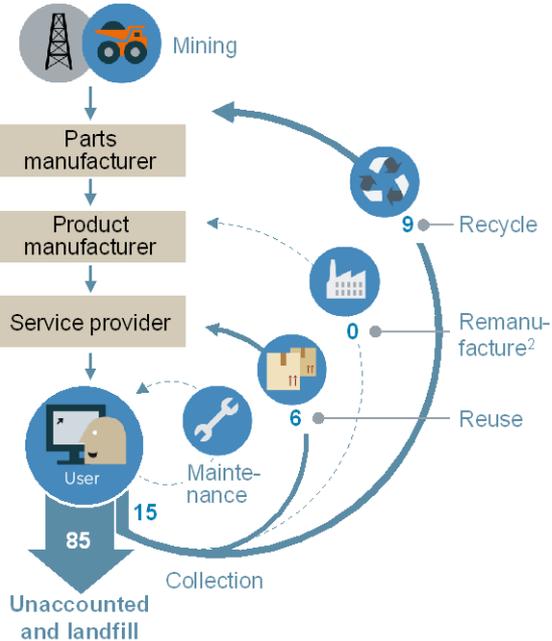
For durable goods, we identified opportunities to boost reuse and remanufacturing rates, and move customers to demand performance, not material—Mobile phone example

End-of-life material flows based on 2010 EU figures

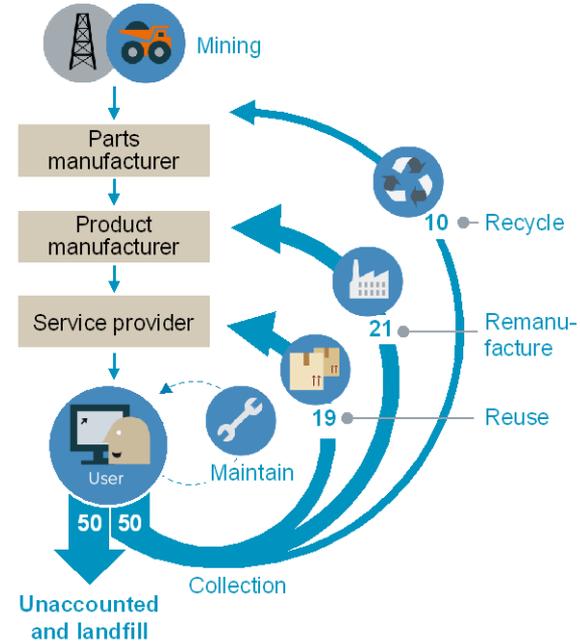
ESTIMATES

Percentage of total end-of-life devices

Status quo



Transition scenario

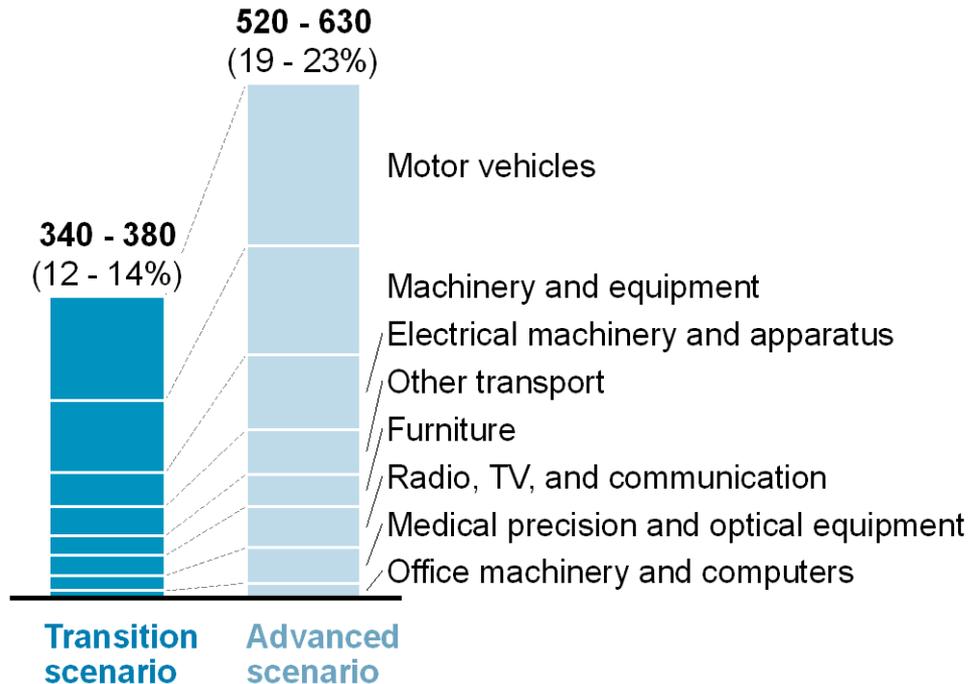


Overall, our numbers indicated a half-a-trillion cost saving opportunity

ROUGH ESTIMATE

Net material cost savings in complex durables with medium lifespans

USD billions per year, based on current total input costs per sector, EU



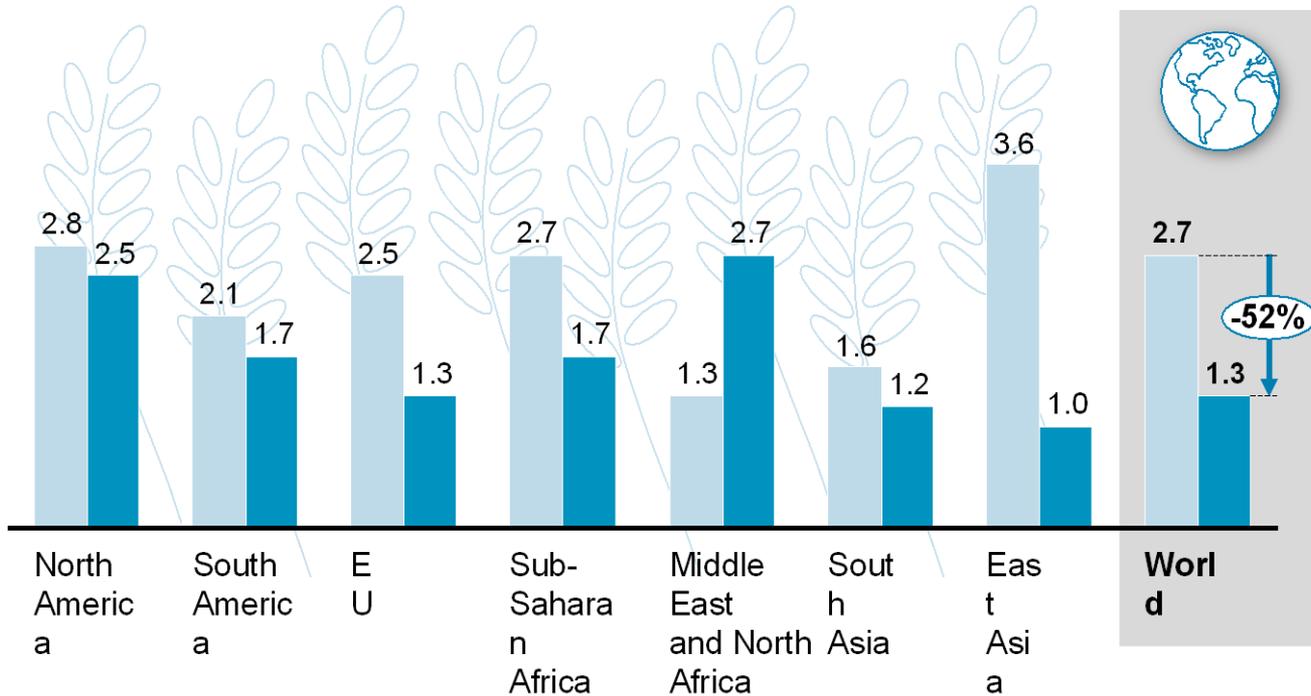
This year in Davos ...



... we focus on the loss of natural capital: Without regeneration, productivity growth is slowing down

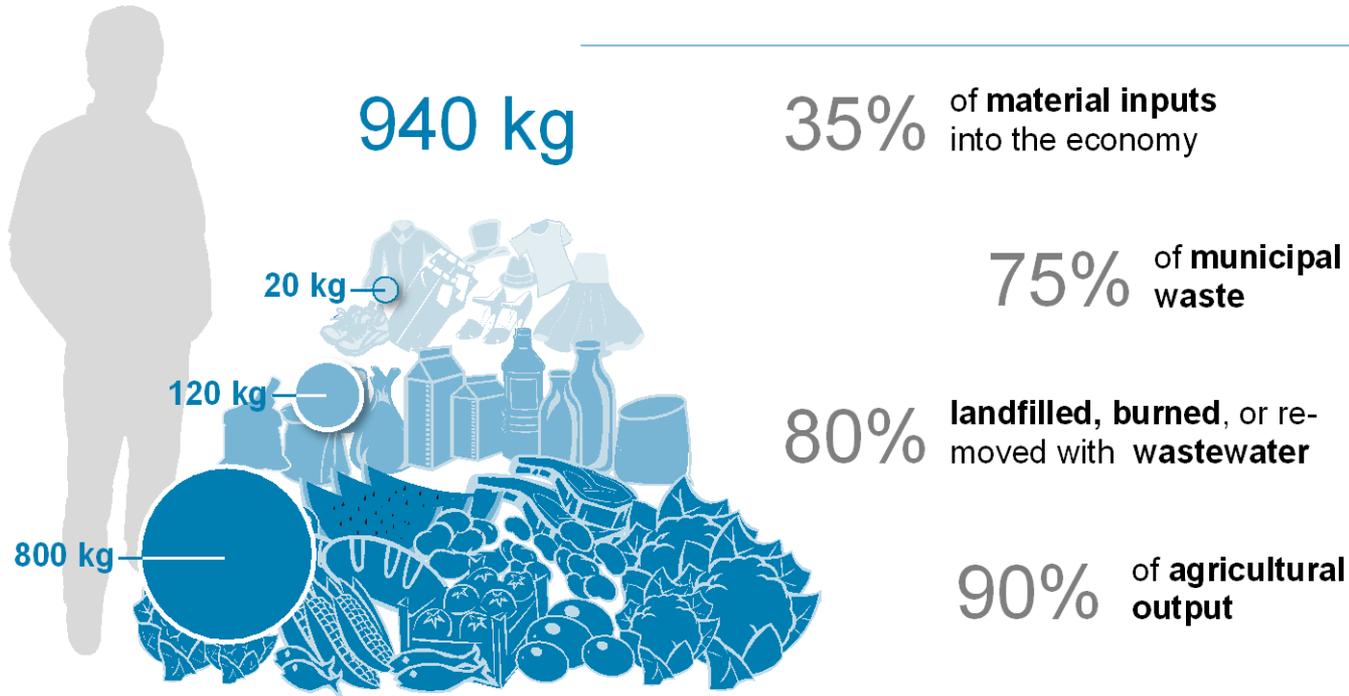
Ton/ha, average annual percentage change in yield over select period

1970s
2000s



Further losses are associated with consumer goods demand

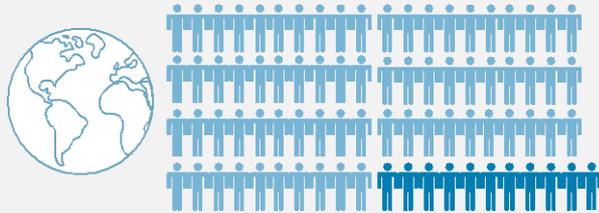
Annual consumption of an average OECD citizen



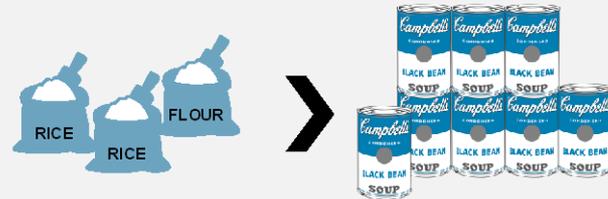
The material repercussions of today's production and consumption are poised to grow significantly by 2025

2010 – 2025

1.1 bn more people



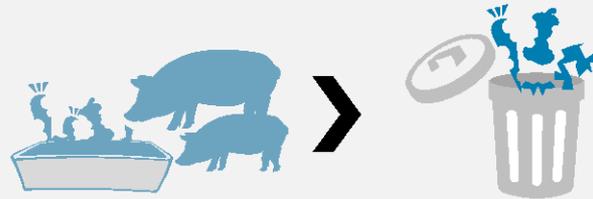
Dramatic shift to packaged products



1.8 bn more middle-class consumers



Much greater waste at end of life



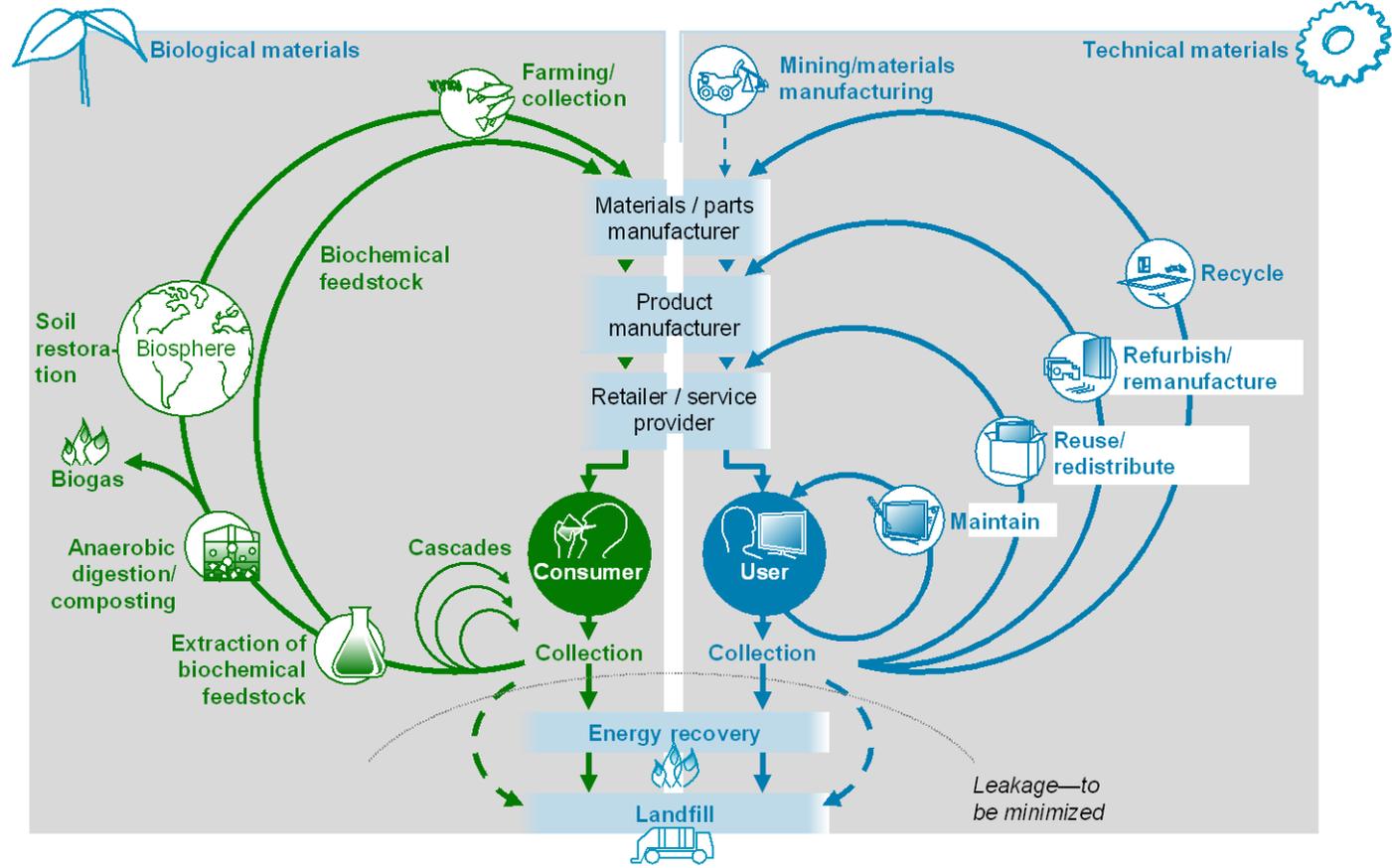
Food: caloric
consumption
+24%

Food
spending
+57%

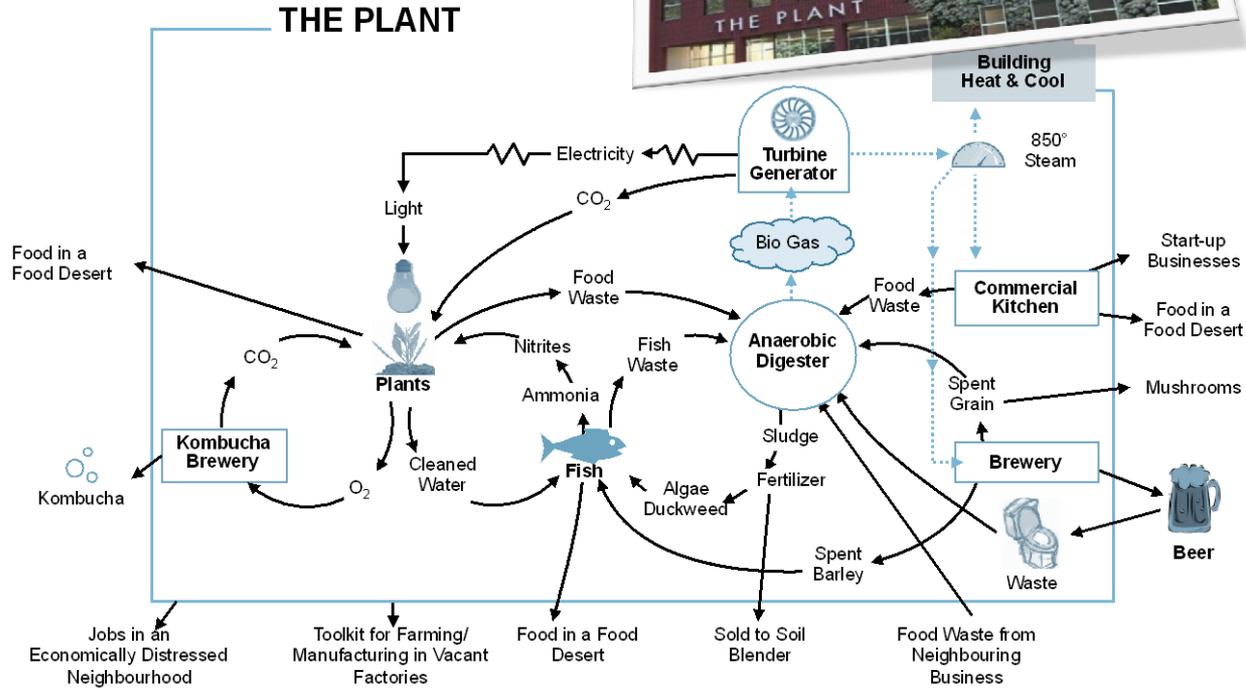
Packaging
+47%

End-of-life
materials
+41%

We therefore focused on the consumer goods sector and also explored the opportunity of cascaded use and regeneration



We encountered promising examples of full valorisation and integration of consumptive material streams, yielding superior outcomes



The Ellen MacArthur Foundation asked us to analyse the economics and business case of the circular model for the consumer goods industry

1

OPPORTUNITIES

Are there profitable opportunities at scale for this sector—today?

2

BENEFITS

What are the benefits of a more circular consumer goods sector for the economy at large?

3

DYNAMICS

How will circular opportunities shift competitive dynamics?

We have investigated multiple examples to assess whether profitable circular solutions are possible



Anaerobic digestion offers an opportunity to extract energy and nutrients from food and other wastes

From

770 USD worth of food waste per UK family

85% of UK food waste landfilled

4.34 TWh

of missed energy opportunity

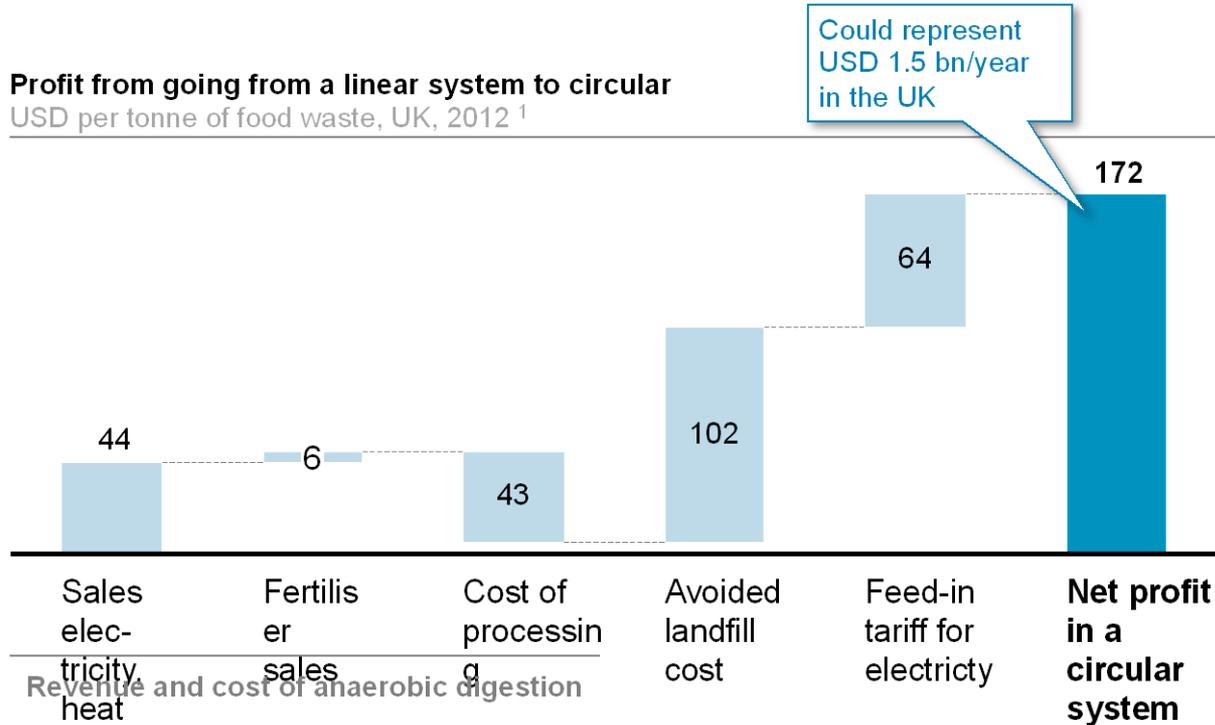
- Full separation of food waste
- Energy and nutrient recovery through anaerobic digestion
- Full recovery of processing waste as valuable resource

To

In our UK example, shifting to a circular system could create profits of \$172 per tonne of food waste

Profit from going from a linear system to circular

USD per tonne of food waste, UK, 2012 ¹



There are opportunities to extract value from end of life clothing

From
USD 1.4 trillion

worth of clothing purchased around the world,
or

1.8 bn tonnes

of material added to our wardrobes

As little as **15%**
recovered after usage

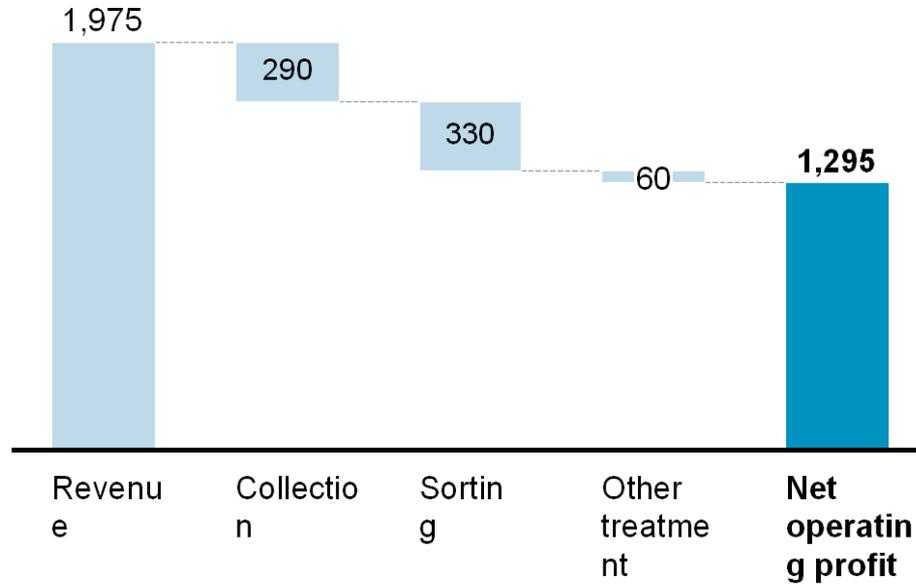
- Shift to durable, high-quality clothing
- Full collection of unwanted clothing
- Maximum value recovery through cascading

To

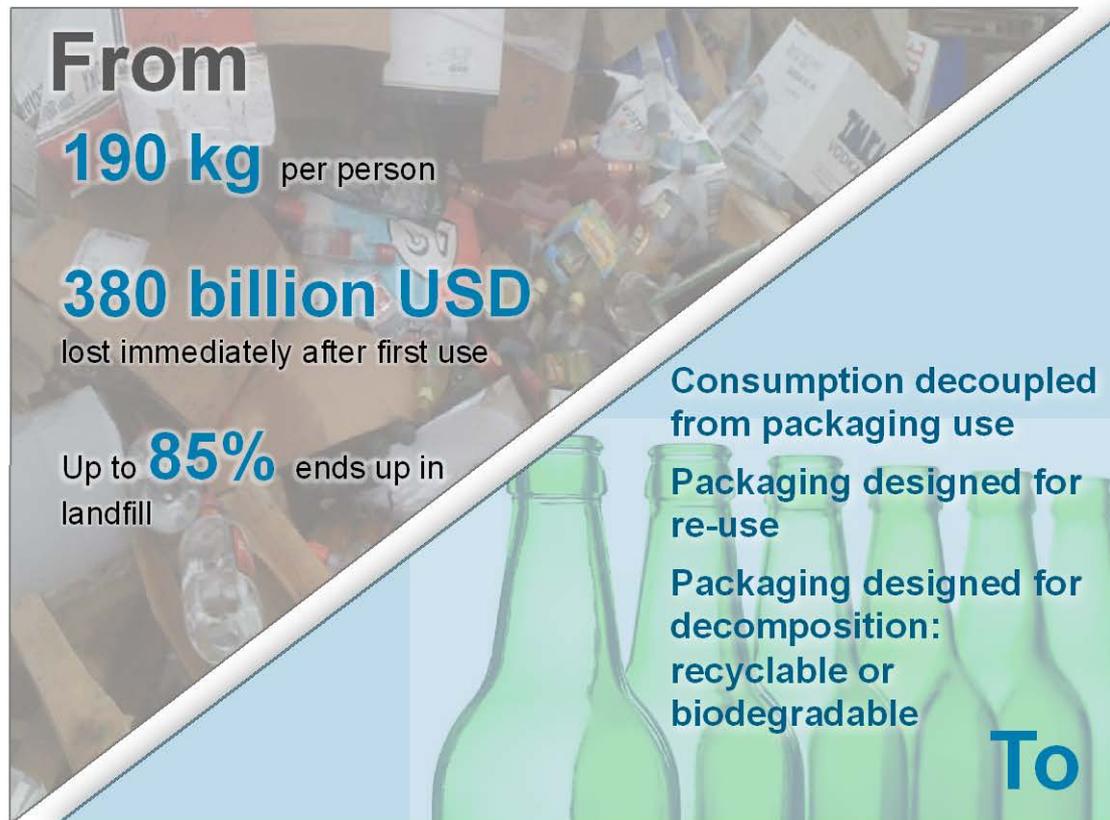
In our UK example, current clothing collection and sorting practices is a profitable circular business model

Net operating profit from collecting and processing end-of-life clothing
USD per tonne of end-of-life clothing collected

UK



Packaging should be designed for decomposition or for re-use

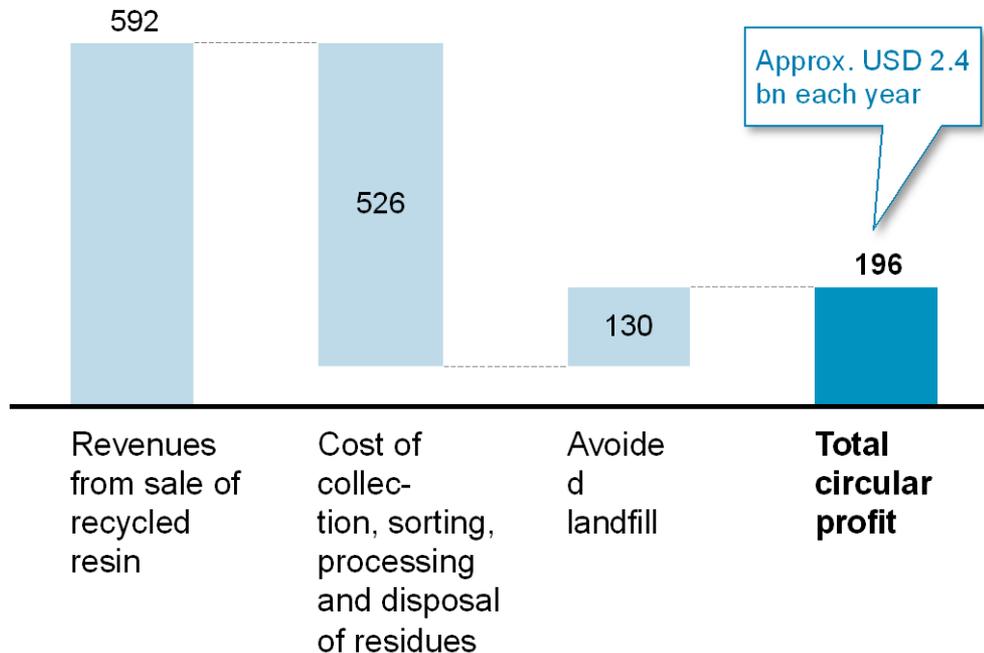


In our US example, moving to better sorting and recycling of all plastic packaging generates a profit of USD 200 per tonne

Profit from 'going circular'

USD per tonne

U.S. ONLY

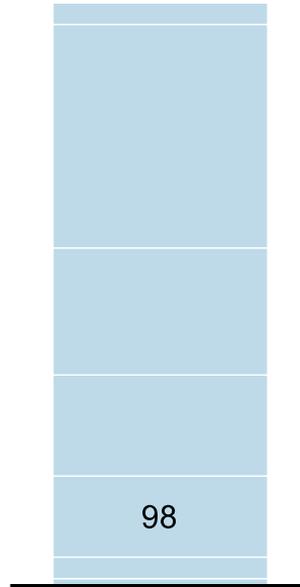


Adoption of circular setups in relevant fast-moving consumer goods sectors could yield net material cost savings of ~ 700 billions USD per year at a global level

ROUGH
ESTIMATE

Net material cost savings in consumers industries

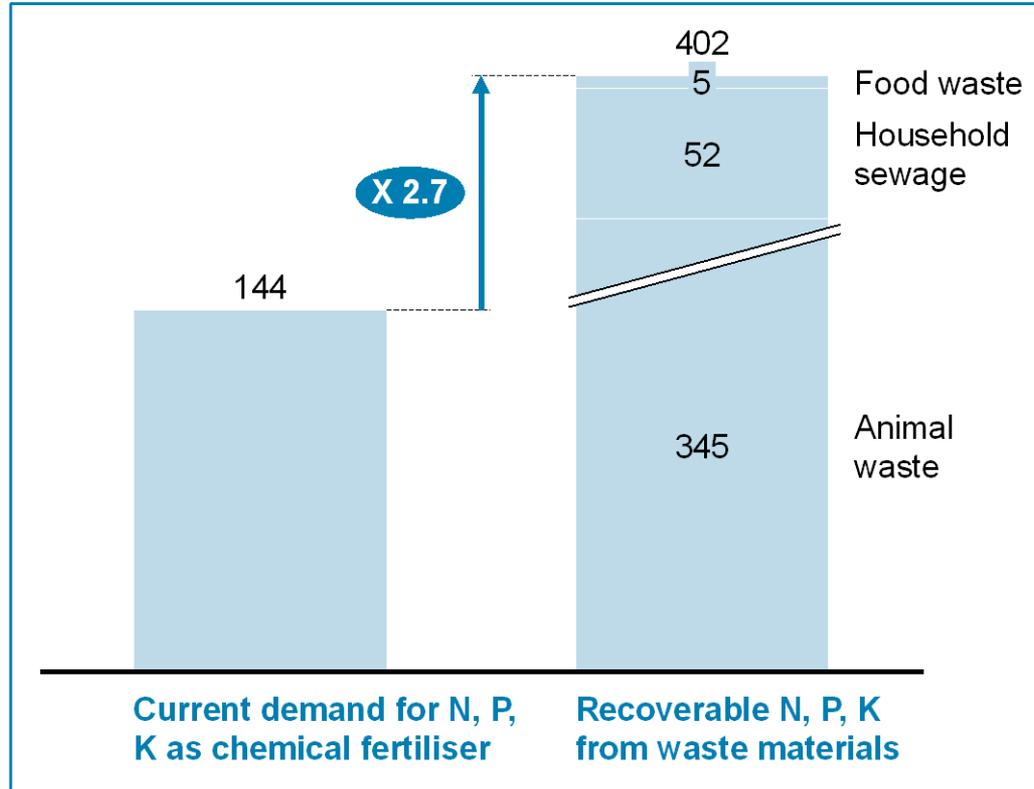
USD billion per year, based on total material savings from consumer categories, Global



ergy and materials at today's prices

- All measures economically viable today

Circular economy principles could also help regenerate soil to replenish the natural capital

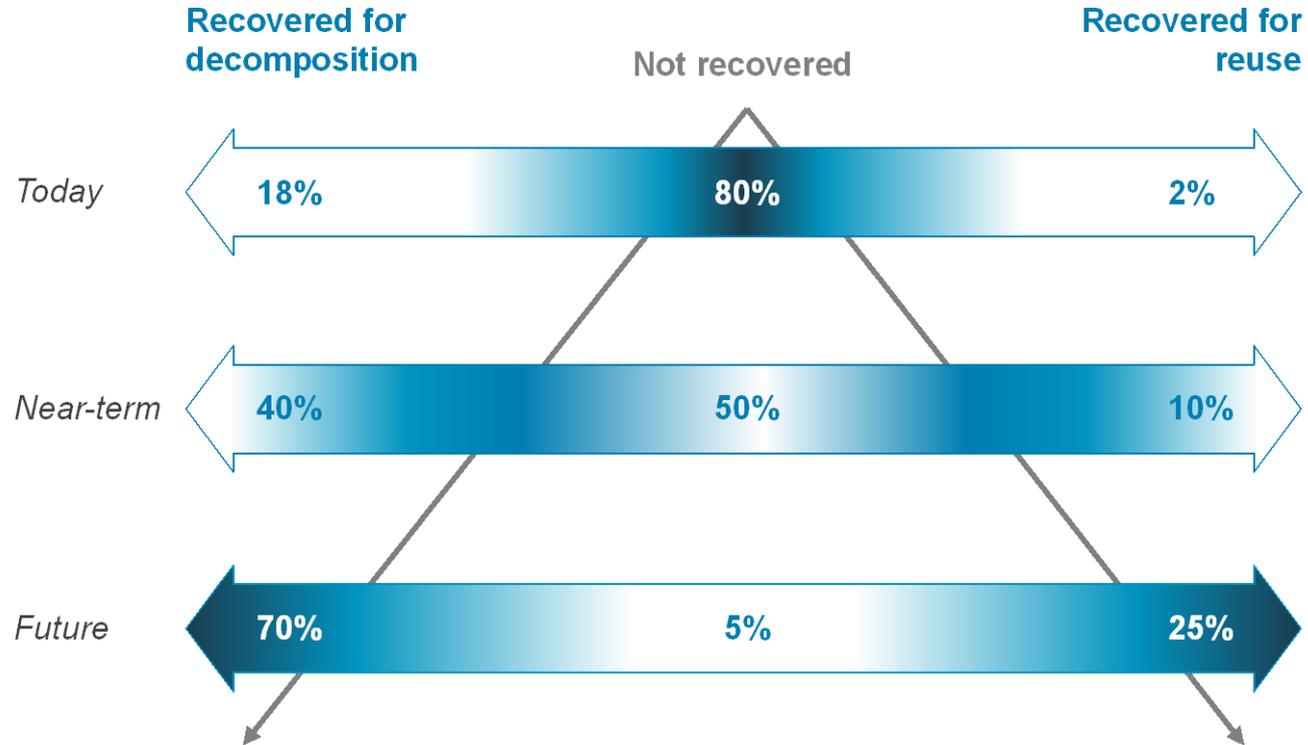


Additional implications of transitioning to a circular economy need to be explored

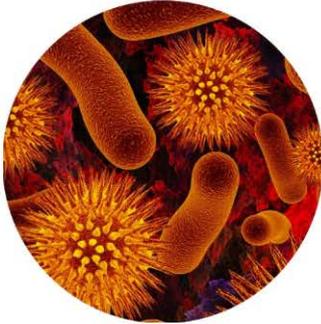


Path to a circular economy—design and recover consumer goods for reuse and decomposition

% of FMCG products (by value)



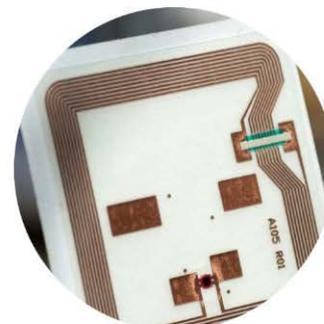
A growing set of technologies is lining up to realize our vision for the end state



Biotech



'Expiring' materials



RFID



Plastics from waste water



Sorting and separation



Processing

The shift has begun



Value extraction technology

IT capabilities

Online channels

Collaborative consumption

Packaging technology and systems

Urbanisation



Pioneer enterprises are starting to gauge the opportunity

Volume aggregators



- ✍ Organising currently severely under-developed markets for residues and by-products

Technology pioneers



- ✍ Financing through private equity capital rush into recycling and circular technology
- ✍ First influx of semi-permanent settlers on this frontier

Micro-marketeers



- ✍ Localizing value chain operations, and ultimately more intimate customer relationships
- ✍ Serving micro-markets at scale, developing integrated 'systems' offering linking products, ordering, delivery, and aftersales service

Urban-loop providers



- ✍ Creating (peri-)urban systems with waste streams of nutrients, heat, partially treated wastewater, and CO2 converted back into high-value biological products
- ✍ Leveraging sophisticated know-how in design, engineering, and infrastructure operations

Product-to-service converters



- ✍ Creating longer and more intimate customer relationships beyond the point of sale
- ✍ Creating value-added offerings like repair, amendment, return and leasing—providing greater customer interaction at multiple touch-points

Across our work on these two reports we came across many companies on the journey towards a circular economy



The circular economy in the consumer goods sector:

1

OPPORTUNITIES

Offers immediate opportunities

2

BENEFITS

Brings benefits to the economy
and its natural capital

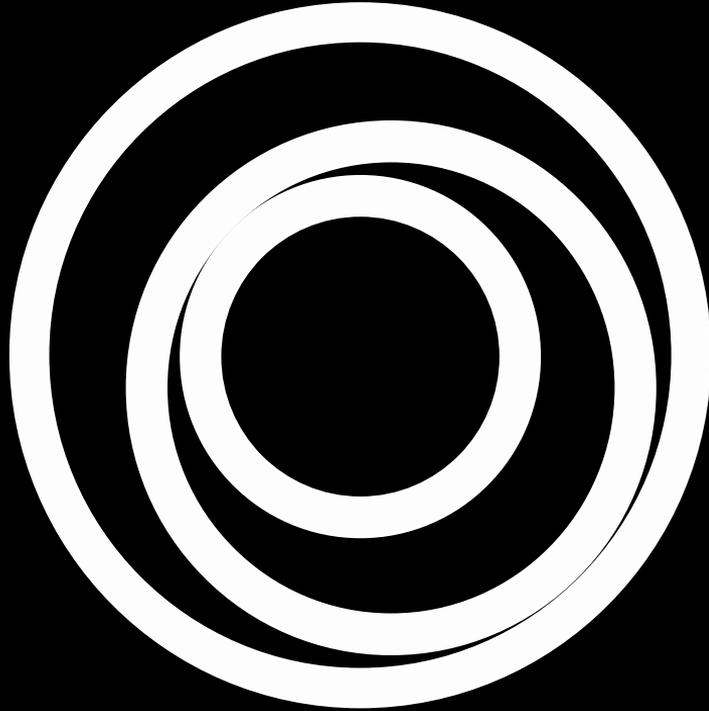
3

DYNAMICS

Creates new ways for incumbents and
entrepreneurs to differentiate themselves

**Nothing is impossible,
particularly if it is inevitable**





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