ELLEN MACARTHUR FOUNDATION

SINTEF

SINTEF Conference
Mo-i-Rana May 2017

Core Philanthropic Partner:

Global Partners:

Kvalvika beach


Jan Mayen (Norway)
Arctic Ocean
N Norway
Feet
Meters
10000
3050
5000
1525
2000
610
1000
305
500
153
Sea Level
Norwegian Sea
SWEDEN
FINLAND
RUSSI
Trondheimsfjorden
Gulf of Bothnia
Helsinki (Helsingfors)
Faroe Islands (Denmark)
NORWAY
Sognefjorden
Glama
Oslo
Stockholm
Hardangerfjorden
Vänern
0 100 200 mi
0 100 200 km
North Sea
UNITED KINGDOM
DEN.
Baltic Sea
10°
5°
0°
5°
10°
15°
20°
25°

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My fingers feels just like a lump.

Circular economy and winter surfing

- Nature
- Ambition
- Technology
- Innovation
- Creativity
- Positive impacts
- Free out of date food (enabling conditions)
- 15 tonnes of plastics washed up on a remote beach

Offshore Challenges

SAILING - SOLO RECORD - START OF FALMOUTH (UK) - 27/11/2004 - PHOTO : JEAN-MARIE LIOT / DPPI / OFFSHORE CHALLENGES
ROUND THE WORLD RECORD ATTEMPT - TRIMARAN B&Q CASTORAMA / SKIPPER : ELLEN MACARTHUR (UK)

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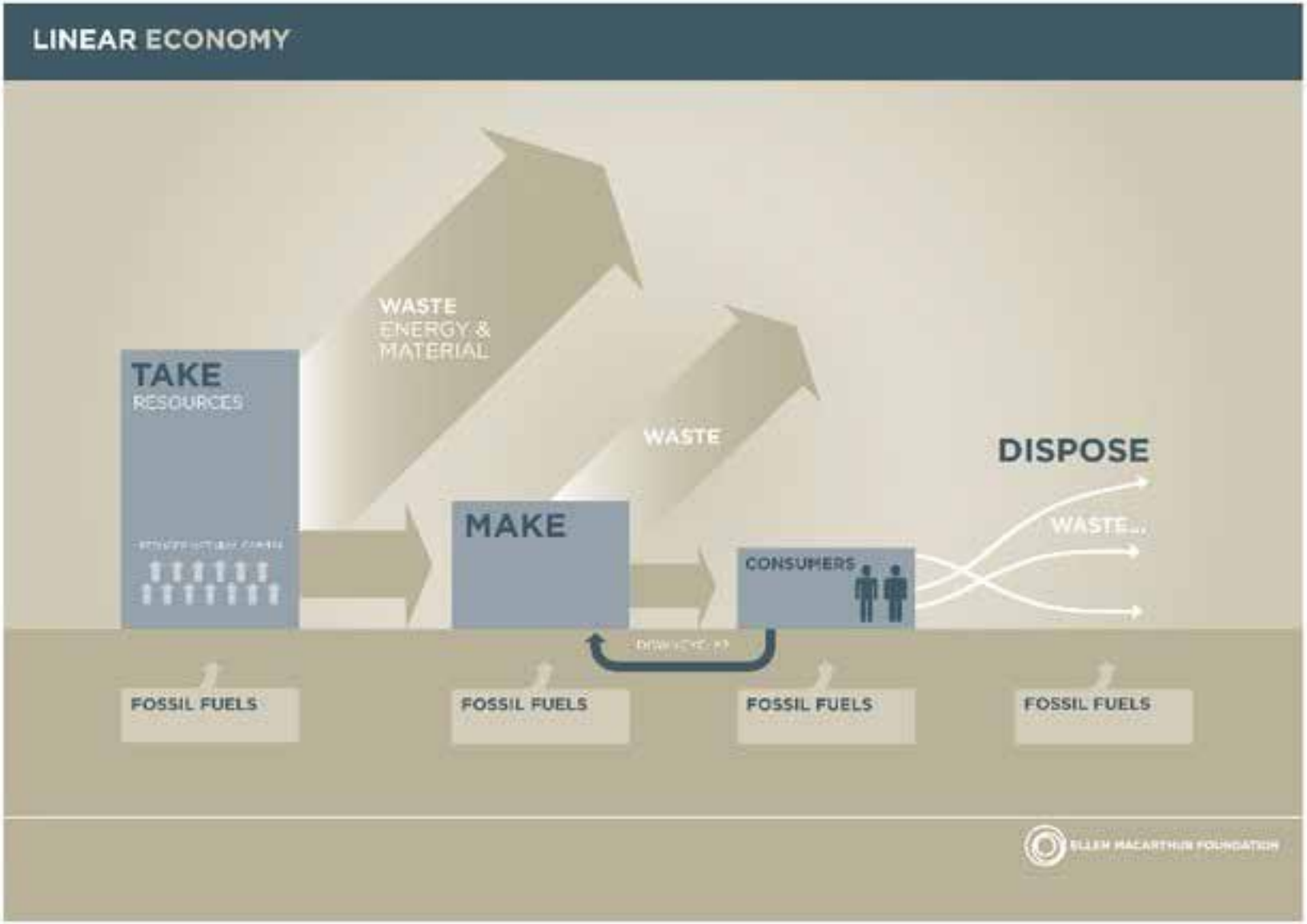
LINEAR ECONOMY
WASTE
ENERGY &
MATERIAL
TAKE
RESOURCES
WASTE
DISPOSE
MAKE
CONSUMERS
WASTE...
FOSSIL FUELS
FOSSIL FUELS
FOSSIL FUELS
FOSSIL FUELS
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Schools of thought

The Performance Economy
Walter Stahel

Cradle to Cradle
Michael Braungarten and William McDonough

Industrial Ecology
Thomas E Graedel

Natural Capital
Amory Lovins

Biomimicry
Janine Beynus

Biomimicry

"Everything comes from the great book of nature"

Antoni Gaudi

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange

PRINCIPLE

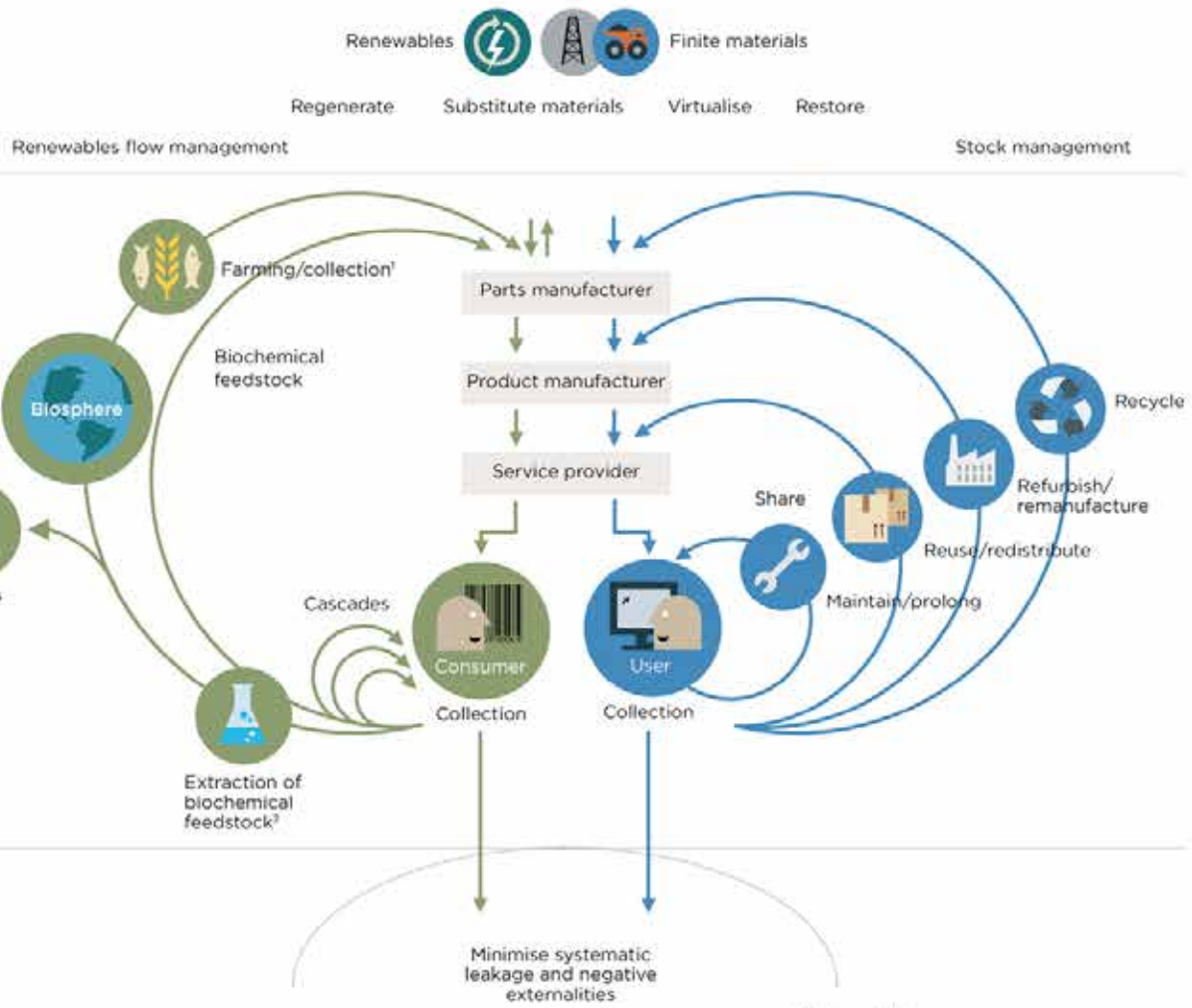
2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop

PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers



1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input

Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment. Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Norsk Ombruk

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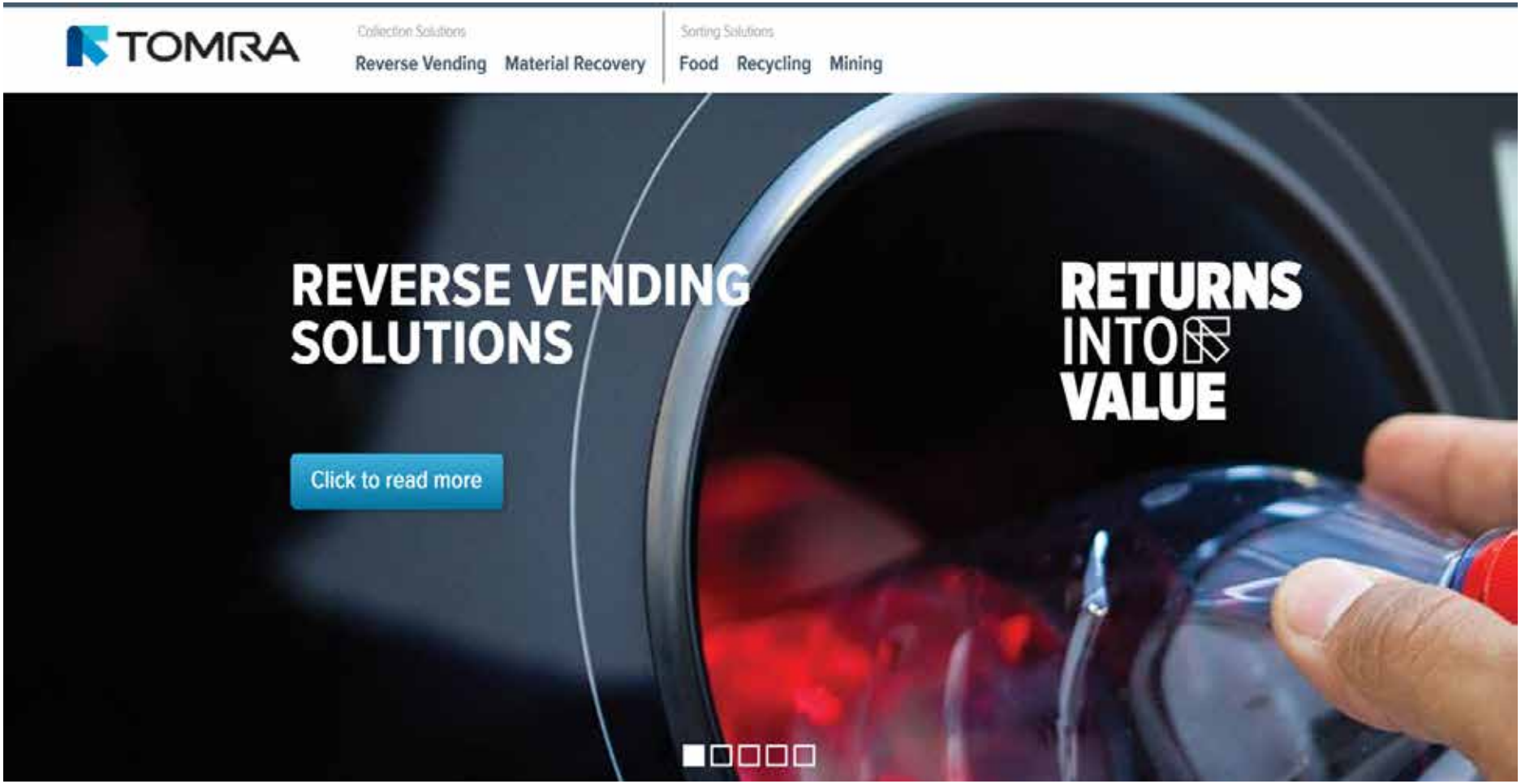
TOMRA
Collection Solutions
Reverse Vending
Material Recovery
Sorting Solutions
Food
Recycling
Mining
REVERSE VENDING SOLUTIONS
Click to read more
RETURNS INTO VALUE

Building block of the circular economy

the design imperative

80% of the environmental impact of today's products, services, and infrastructures is determined at the design stage. (John Thackara, 2002)

Waste is an error of design

TriCidos

THE CIRCULAR DESIGN GUIDE

circulardesignguide.com

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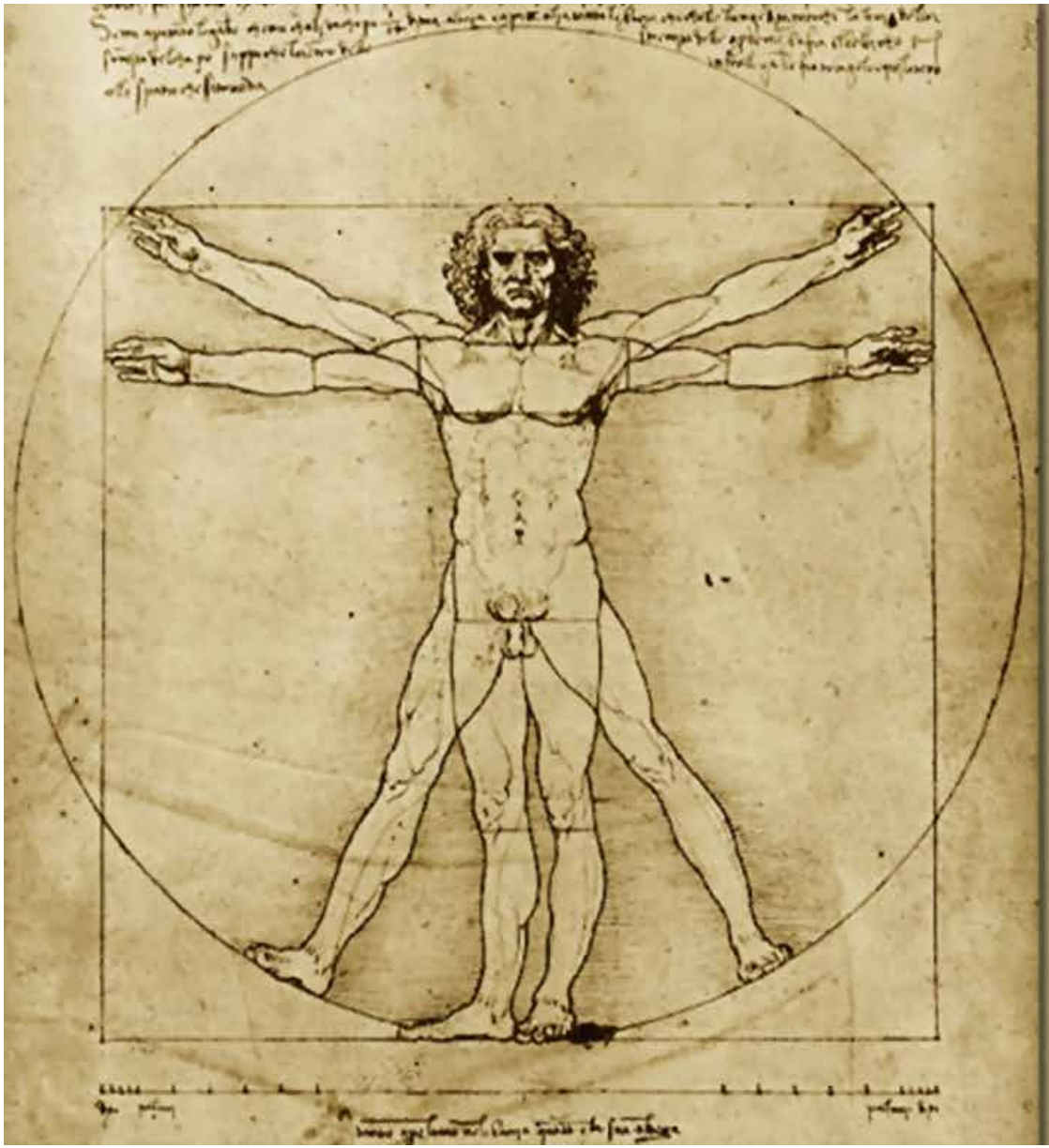

Leonardo Da Vinci

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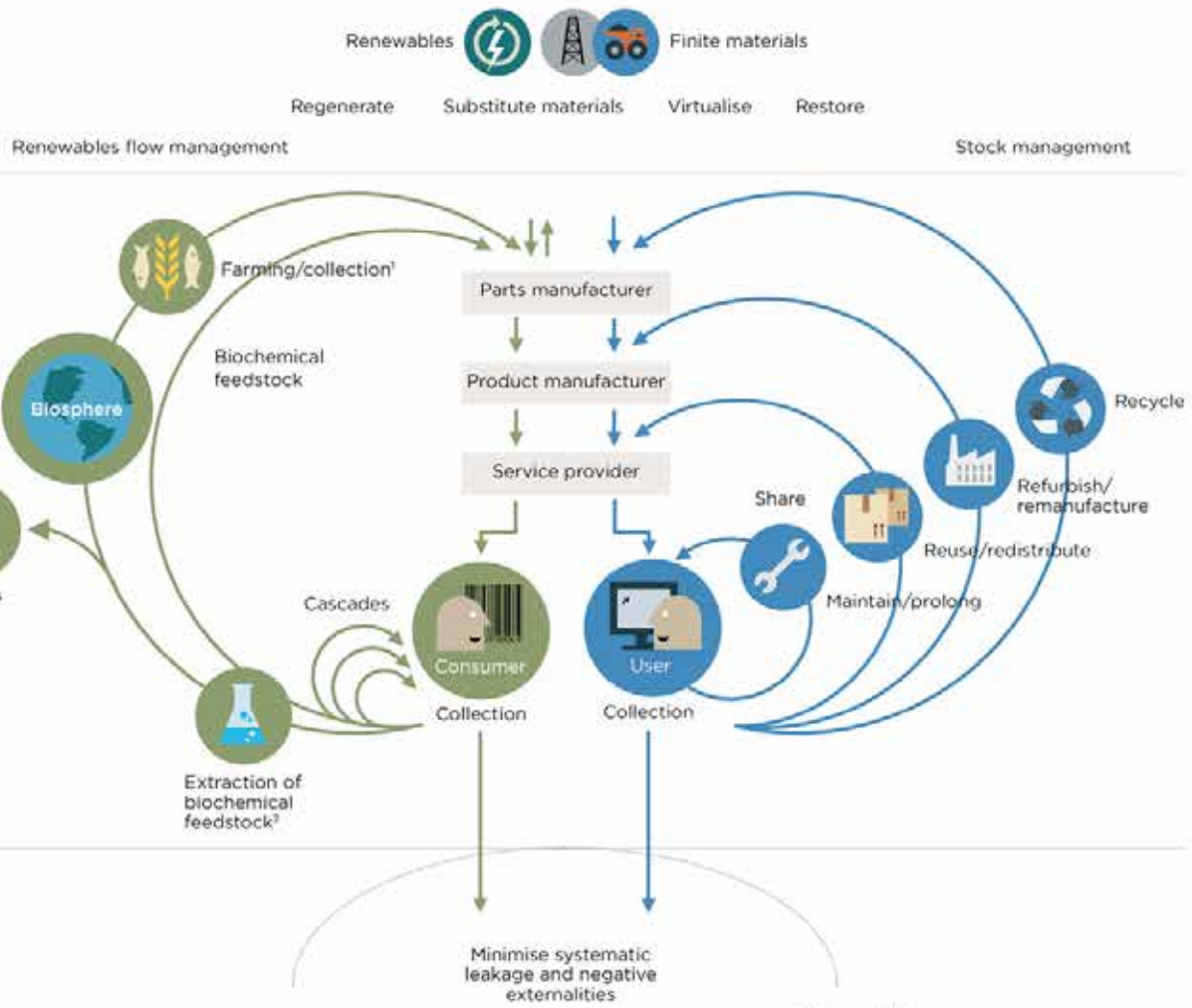

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Towards a bioeconomic future

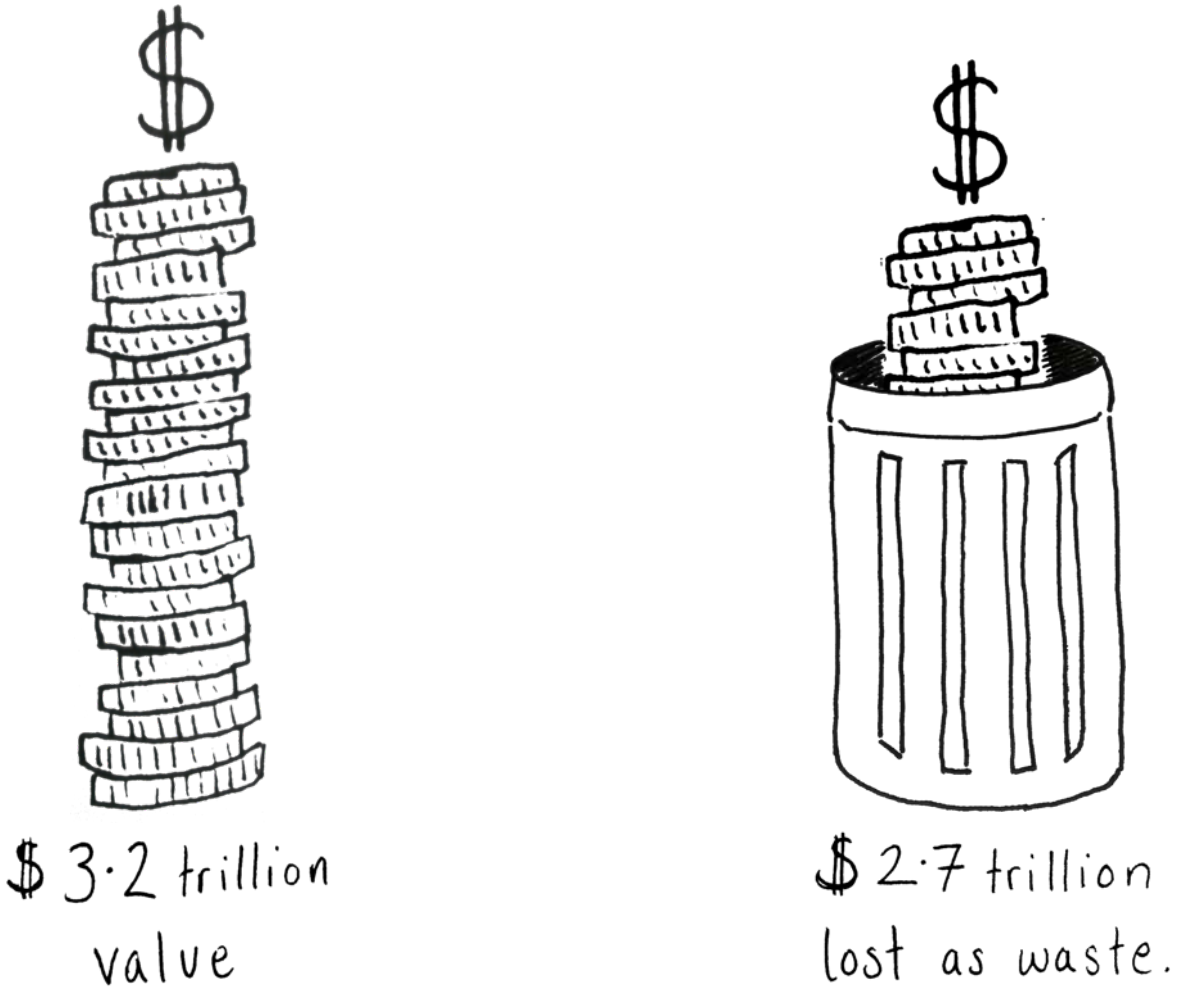
“According to the OECD, bioeconomics will represent the guiding principle of the European economy by 2055. This means that focus will be centred on the production and transformation of renewable biological resources from the agricultural, forestry and marine aquaculture sectors, and biomass will represent the major source of raw materials. If the experts are to be believed, we are in many ways on the brink of a new industrial revolution.”

World's first city to power its water needs with sewage energy

Ellen MacArthur Foundation:
Developing and promoting the circular economy idea

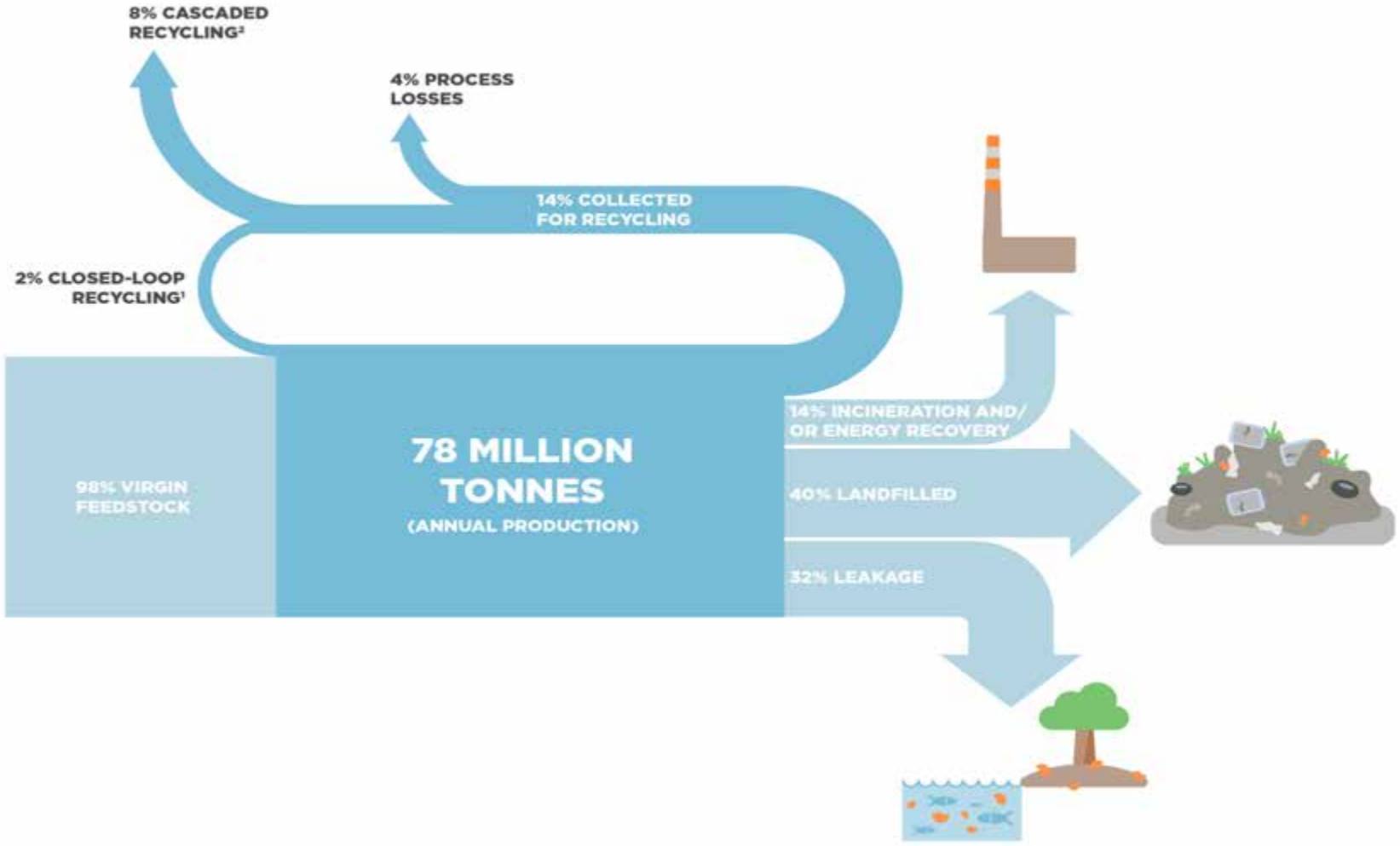
Most of the value is lost as waste

FMCG, globally

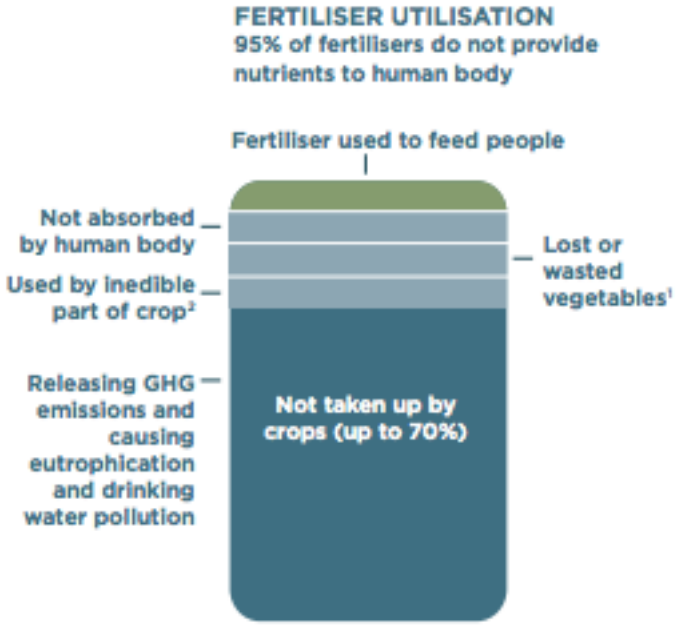


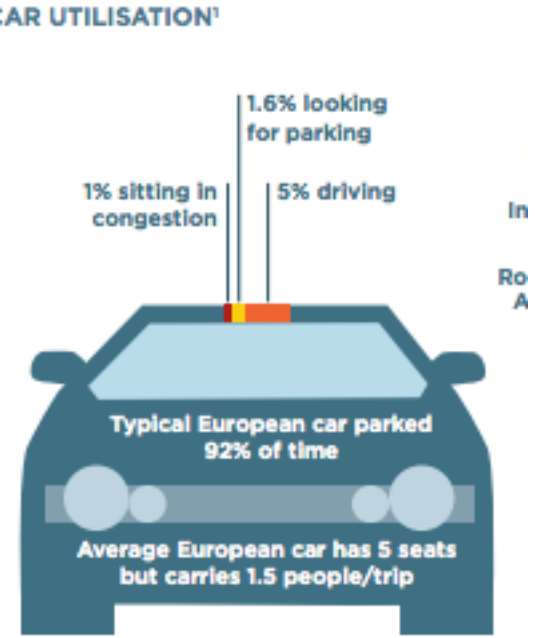
Significant value is lost in linear systems

Plastics, 40 years of effort with little achievement



Structural waste aka underutilised assets



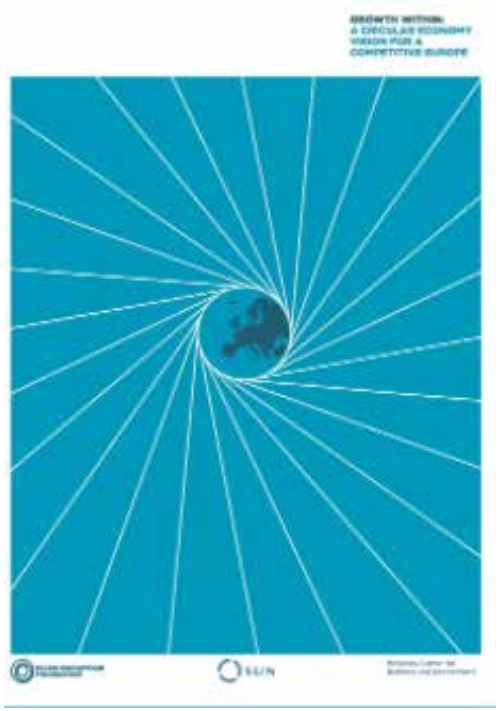


Massive economic opportunities exist

2012

Global $1tn
(2 sectors)

2015



Europe $900bn
(3 sectors)

2016

India $500 bn
(3 sectors)

Social and environmental benefits

- Reduced carbon emissions
- Reduced congestion
- Improved air and water quality
- Positive employment effects
- Healthier living environment

Accelerating the transition:
through catalytic platforms and systemic initiatives

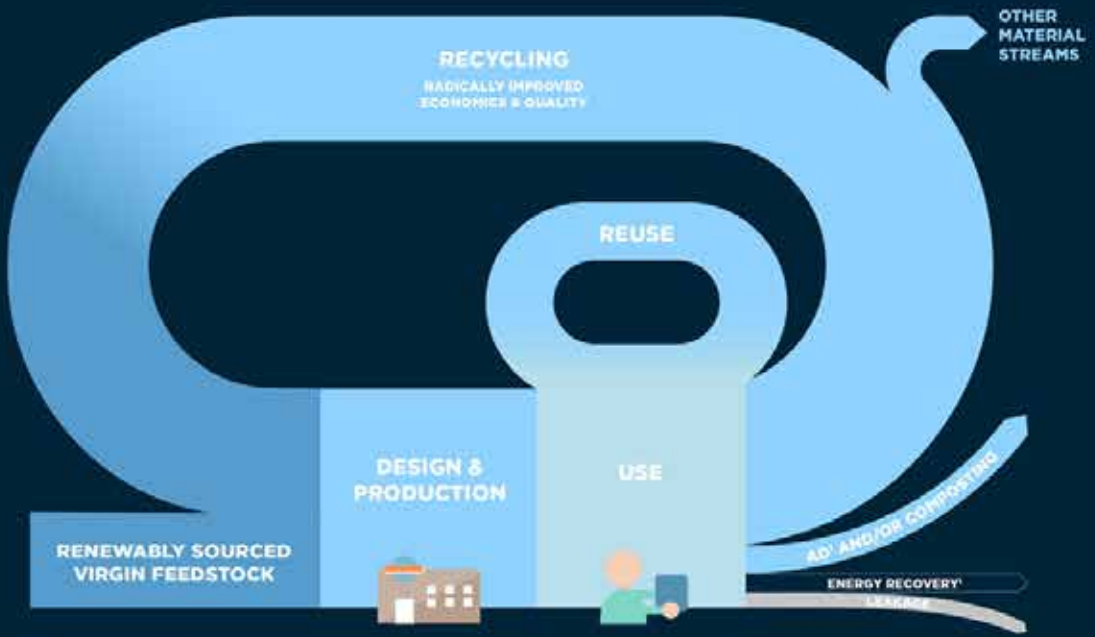
Global Partners

CE100 Members Network

Pre-competitive Innovation platform

THE NEW PLASTICS ECONOMY

1 CREATE AN EFFECTIVE AFTER-USE PLASTICS ECONOMY



3 DECOUPLE PLASTICS FROM FOSSIL FEEDSTOCKS

2 DRASTICALLY REDUCE THE LEAKAGE OF PLASTICS INTO NATURAL SYSTEMS & OTHER NEGATIVE EXTERNALITIES

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

1 Anaerobic digestion
2 The role of, and boundary conditions for, energy recovery in the New Plastics Economy needs to be further investigated.
Source: Project Mainstream analysis

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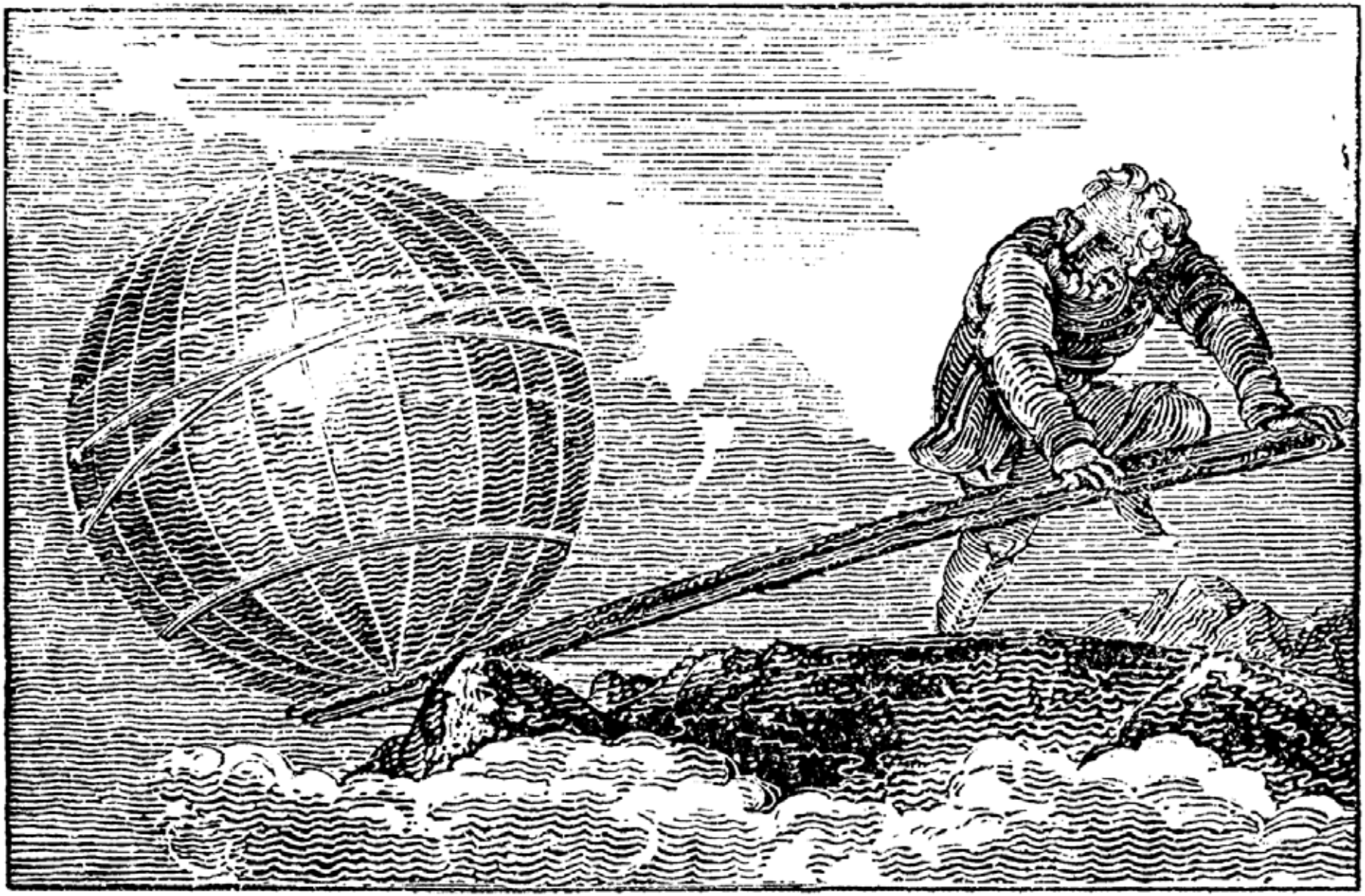
Isle of Wight
300 km
200 mi
© d-maps.com



Current major focus areas

Research projects

- China - 5 sectors
- Cities
- Water

Systemic initiatives

- New plastics economy (year 3)
- Circular fibres (apparel) initiative
- Urban bio-economy

Ambition:
Becoming circular can be difficult (but rewarding)

World's First Ship tunnel

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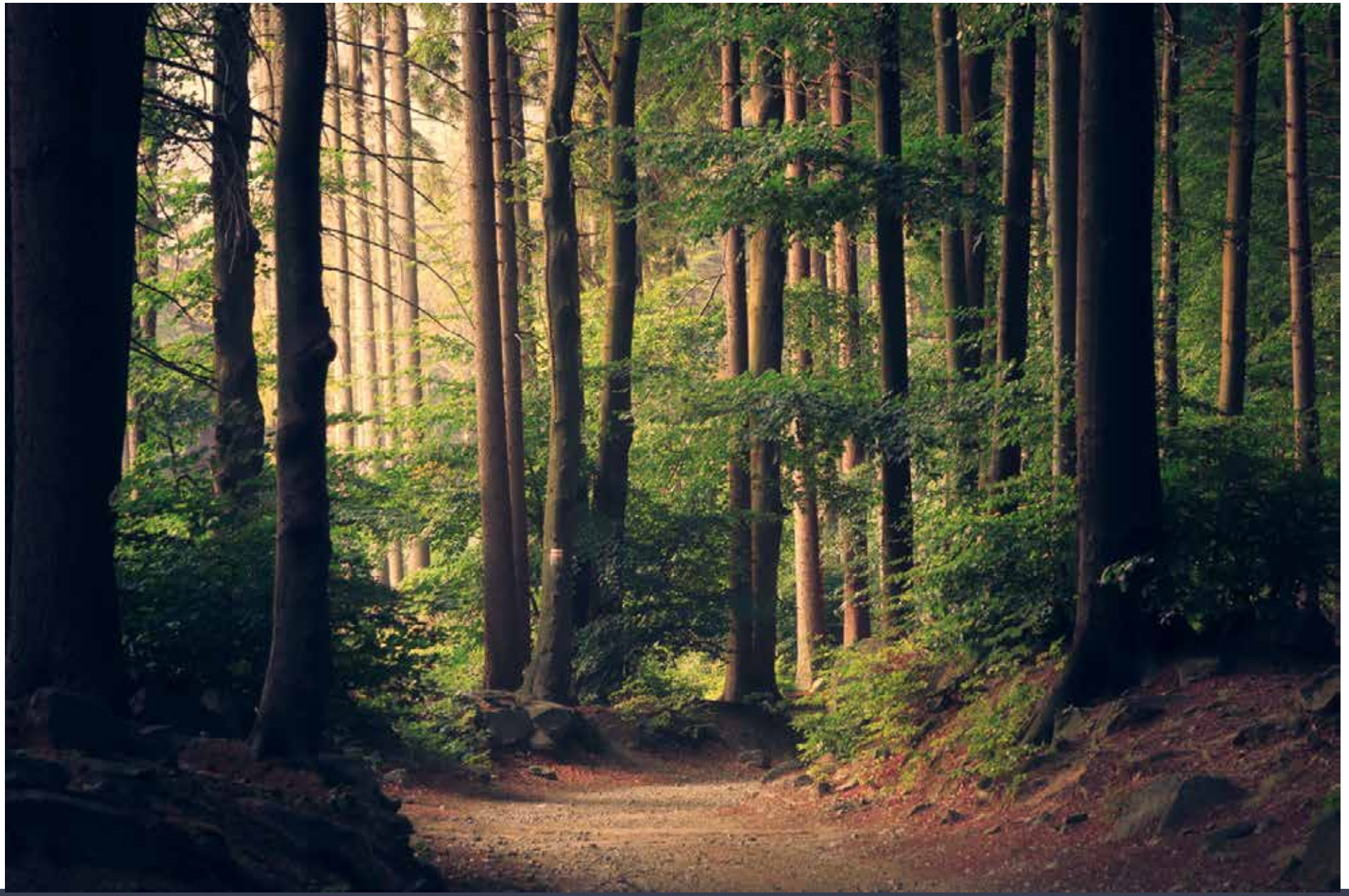
climatex®



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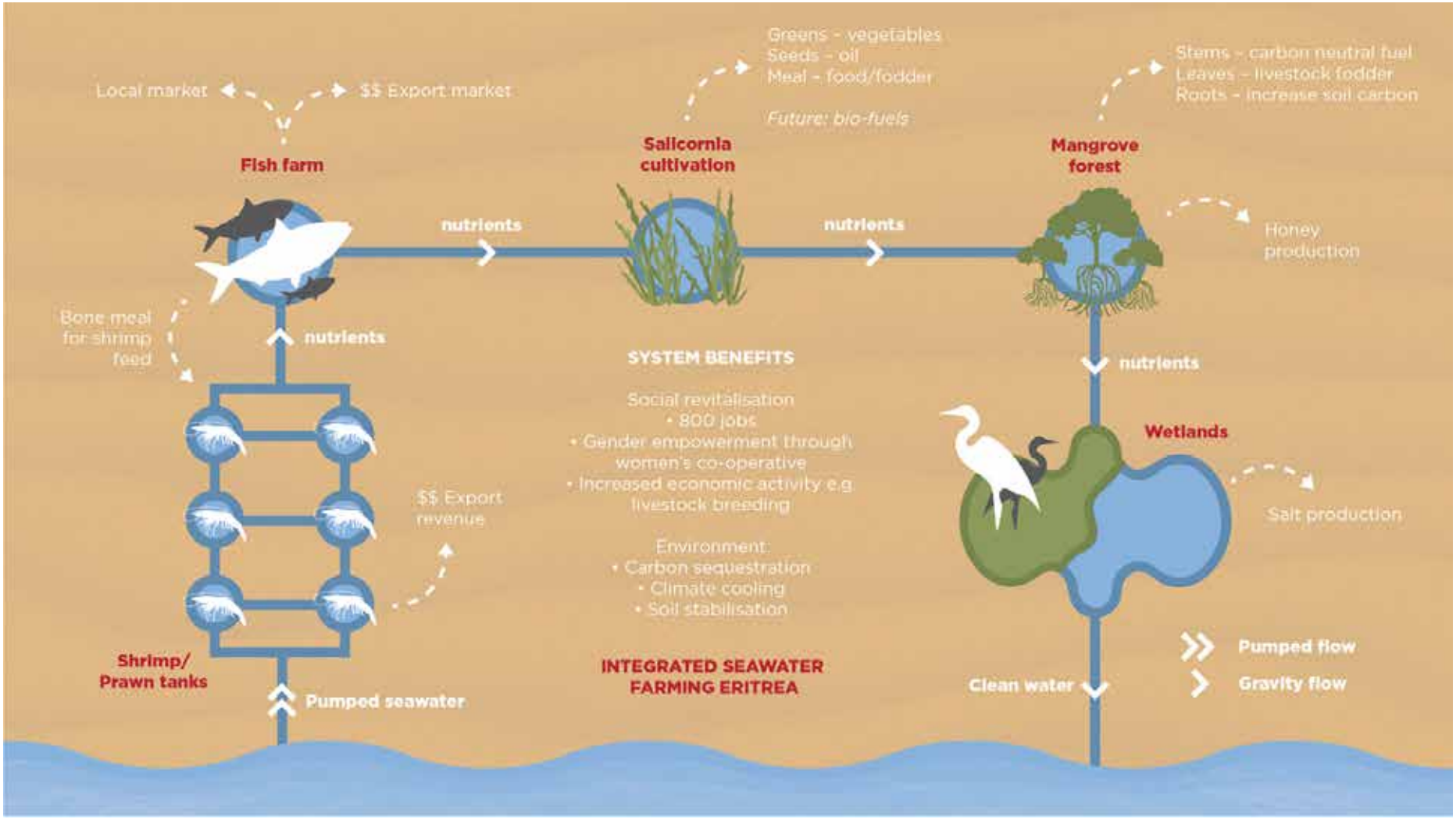
Regenerative:

Leaving things better that how you found them


NASA



Enabling conditions:
Creating the right environment for circular economy to work

THE SANDWICH

SYSTEMS THINKING
- SCIENTIFIC WORLDVIEW
- COMPLEX ADAPTIVE SYSTEMS
- HOW WE TEACH AND LEARN

PRODUCTION & CONSUMPTION
- CRADLE TO CRADLE
- PRODUCT, SERVICE, SYSTEMS ETC

ENABLING CONDITIONS
- GOVERNMENT 'RULES OF THE GAME'
- ICT REVOLUTION ETC

When bike sharing goes wrong

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Enabling conditions

- Protections for users
- New financing mechanisms for service models
- Sustainable taxation
- Favourable taxation for circular activities
- Public procurement
- New approaches to education

A wellspring of new ideas:
Circular economy as an innovation strategy


Interface®


DESSO
A Tarkett Company

Innovative materials and processes

Interface

- Solenium
- Entropy
- Tac-tiles
- Renewable energy from green waste
- Flexible manufacturing
- Microtuft process
- Evergreen Lease

DESSO

- AirMaster
- SoundMaster
- Ecobase
- Refinity

Innovate or die?

Average life expectancy of Fortune 500 company

- 1965 - 75 years
- 2015 - 15 years

"After I learnt about the circular economy, I wanted to go out and redesign the world"

Overheard by student on Schmidt-MacArthur Fellowship program

Final words

Circular Economy

"An economic model that is regenerative and works in the long term"

Ecovative

nick.jeffries@ellenmacarthurfoundation.org

An advanced starting point

	Denmark	**EU28**
Waste generated per unit GDP	40 tonnes/Eur million	69 tonnes/Eur million
Waste diverted from landfill	93%	59%
Recycling rate	60%	53%
GHG emissions per unit of GDP	225 tonnes CO2	343 tonnes CO2
Share of renewable energy as % of gross final consumption	26%	14%

Ref: A toolkit for policymakers, Ellen Macarthur Foundation 2015

Modelling conducted on 25% of Danish Economy:

By 2035:

- Increase in GDP between 0.8 - 1.4%
- 7000 - 13,000 new jobs
- 3 - 7% reduction in carbon footprint
- 5 - 50% reduction in virgin resources

Ref: A toolkit for policymakers, Ellen Macarthur Foundation 2015