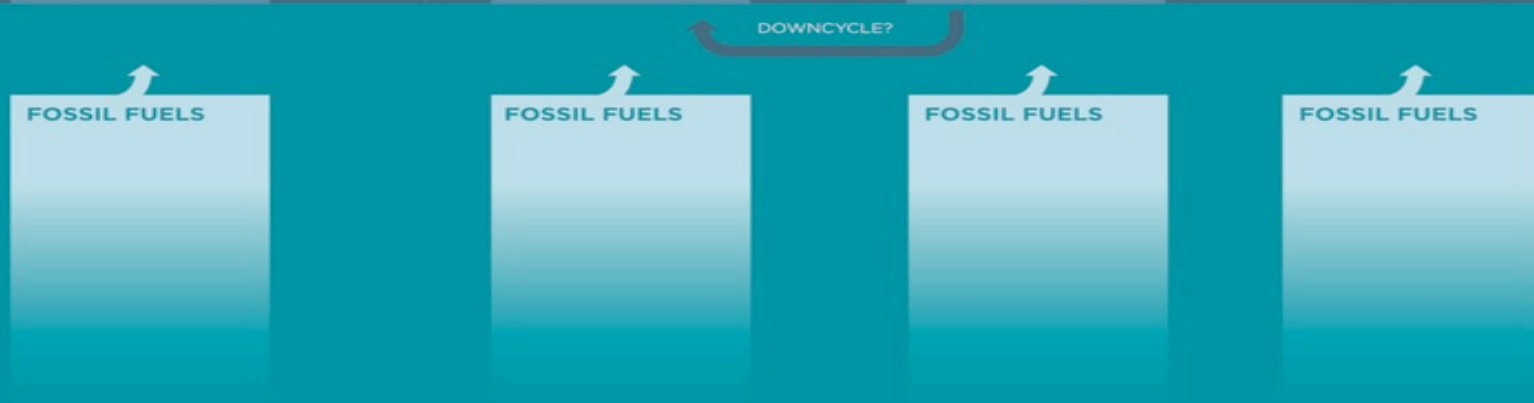


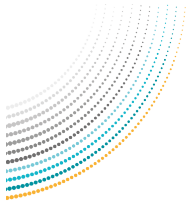
The linear economy



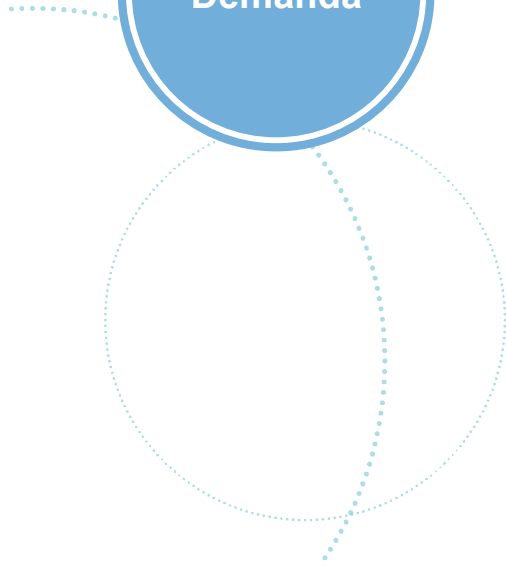
Source: Ellen MacArthur Foundation

What are the six principles of the circular economy?





Demanda



FRANK TRENTMANN
Empire of Things

How We
Became
a World of
Consumers,
from the
15th century
to the 21st



**'Magnificent ...
groundbreaking
... a triumph'**
PETER FRANKOPAN,
AUTHOR OF
THE SILK ROADS





THE LINEAR ECONOMY IS RIPE FOR DISRUPTION



Remaining years until depletion of known reserves (based on current rate of extraction)

- 5-50 years
- 50-100 years
- 100-500 years

Many resources are forecasted to run out within a relatively short period...

1																	He						
3	4											5	6	7	8	9	10						
Li	Be											B	C	N	O	F	Ne						
11	12																	13	14	15	16	17	18
Na	Mg																	Al	Si	P	S	Cl	Ar
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36						
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr						
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54						
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe						
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86						
Cs	Ba	La*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn						
87	88	89	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118						
Fr	Ra	Ac†	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut	Uuq	Uup	Lv	Uus	Uuo						
		Lanthanides*																					
		58	59	60	61	62	63	64	65	66	67	68	69	70	71								
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu								
		Actinides†																					
		90	91	92	93	94	95	96	97	98	99	100	101	102	103								
		Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr								

SOURCE: Professor James Clark, Green Chemistry, The University of York

Ellen MacArthur Foundation and McKinsey & Company, 2014



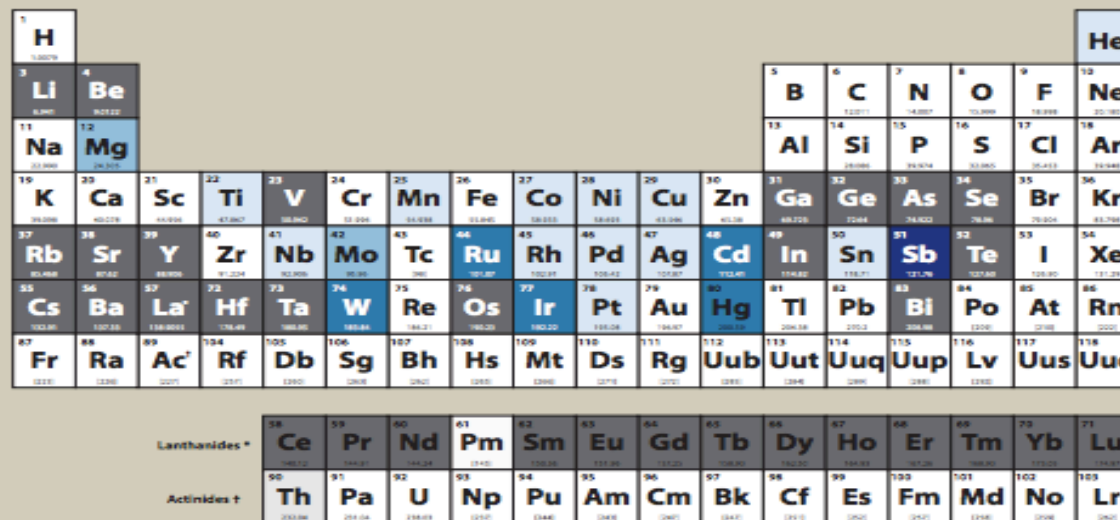
THE LINEAR ECONOMY IS RIPE FOR DISRUPTION



...while only few materials are recycled at scale

Current rates of recycling

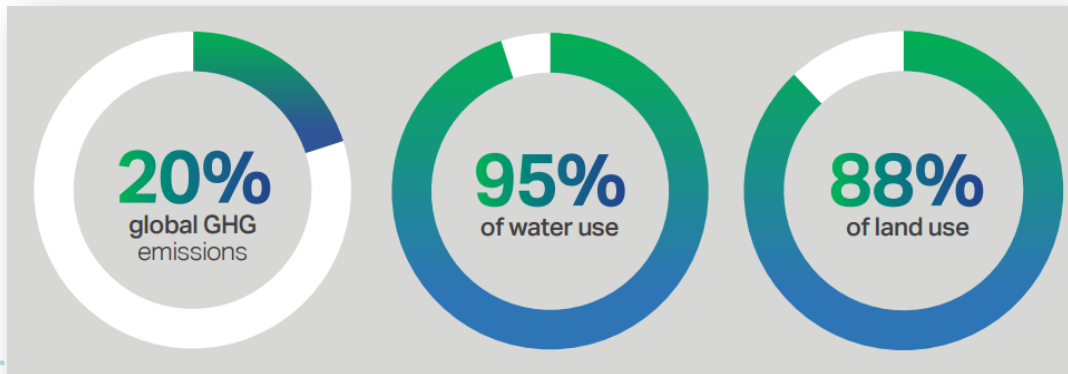
<1%
1-10%
10-25%
25-50%
>50%
No data available



SOURCE: Professor James Clark, Green Chemistry, The University of York

Ellen MacArthur Foundation and McKinsey & Company, 2014

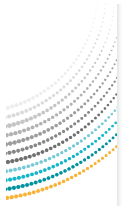
Oito materiais são responsáveis por:



Mitigação de
risco

- Steel;
- Aluminium;
- Plastic;
- Cement;
- Glass;
- Wood;
- Primary crops;
- Cattle.

- Resource scarcity and fluctuating commodity prices.
- Resource price volatility is the new norm.



THE 21ST CENTURY CORPORATION • CIRCULAR ECONOMY AWARDS



Why the Circular Economy Matters



Podcast - October 2016

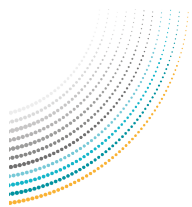
Why the circular economy is all about retaining value



By reassessing where waste is most prevalent in their value chains, companies can learn to close those loops to get more from the resources and materials they use.

Contrary to popular thinking in various companies, the circular economy isn't the latest sustainability fad and shouldn't be thought of as a recycling or green program. It requires top-down management and

Chinese Premier Li Keqiang (L) gives a speech as Founder and executive chairman of the WEF Klaus I



FRAMEWORK DA EC



PRINCÍPIO 1

1

Preservar e aprimorar o capital natural controlando estoques finitos e equilibrando os fluxos de recursos renováveis



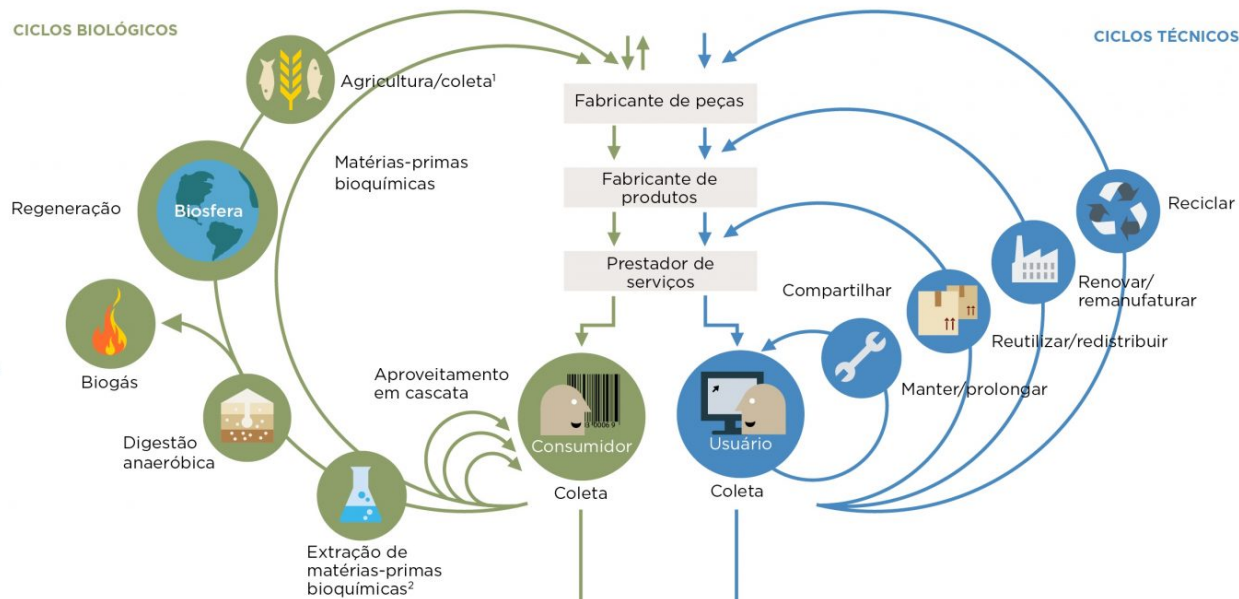
Gestão do fluxo de renováveis

Gestão de estoques

PRINCÍPIO 2

2

Otimizar o rendimento de recursos fazendo circular produtos, componentes e materiais em uso no mais alto nível de utilidade o tempo todo, tanto no ciclo técnico quanto no biológico.



PRINCÍPIO 3

3

Estimular a efetividade do sistema revelando e excluindo as externalidades negativas desde o princípio

Minimizar perdas sistêmicas e externalidades negativas

1. Caça e pesca
2. Pode aproveitar tanto resíduos pós-colheita como pós-consumo insumo

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

Performance Economy – Walter Stahel

Cradle to Cradle – McDonough and Braungart

Natural Capitalism – Amory Lovins

Industrial Ecology – Thomas Graedel

Biomimicry – Janine Benyus

Blue Economy – Gunter Pauli

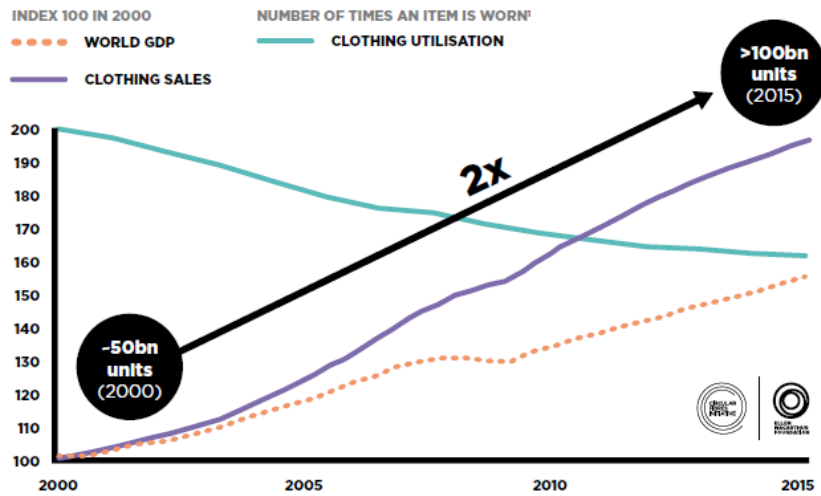


Think Chair, Steelcase





FIGURE 1: GROWTH OF CLOTHING SALES AND DECLINE IN CLOTHING UTILISATION SINCE 2000



¹ Average number of times a garment is worn before it ceases to be used

Source: Euromonitor International Apparel & Footwear 2016 Edition (volume sales trends 2005–2015); World Bank, *World development indicators - GD* (2017)

THE CLOTHING INDUSTRY'S ENVIRONMENTAL IMPACT

20%
OF INDUSTRIAL
WATER POLLUTION
COMES FROM TREATING
AND DYEING TEXTILES

IT TAKES
700 GALLONS
OF WATER



TO PRODUCE ENOUGH
COTTON FOR ONE T-SHIRT



THE CLOTHING INDUSTRY
IS THE **SECOND-MOST**
POLLUTER OF
CLEAN WATER

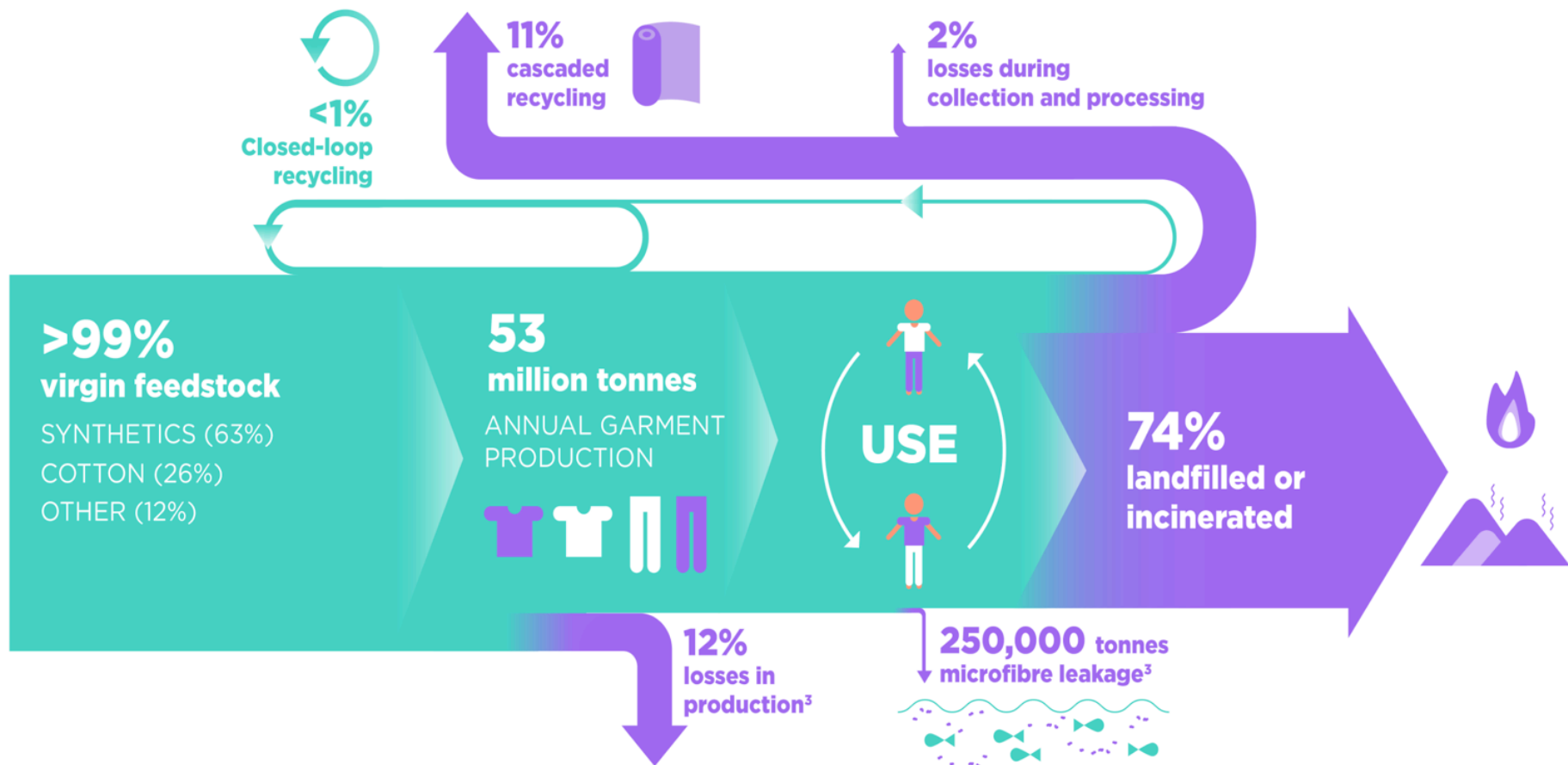
MORE THAN 90%
OF COTTON
IS NOW GENETICALLY MODIFIED

PRODUCTION OF FIBER IS RESPONSIBLE FOR

18% & **25%**
OF PESTICIDE
USED WORLDWIDE & OF INSECTICIDE
USED WORLDWIDE

SOURCES
THE INSTITUTE FOR SUSTAINABLE COMMUNICATION, WORLD WILDLIFE FUND, "THE TRUE COST" DOCUMENTARY

abc NEWS



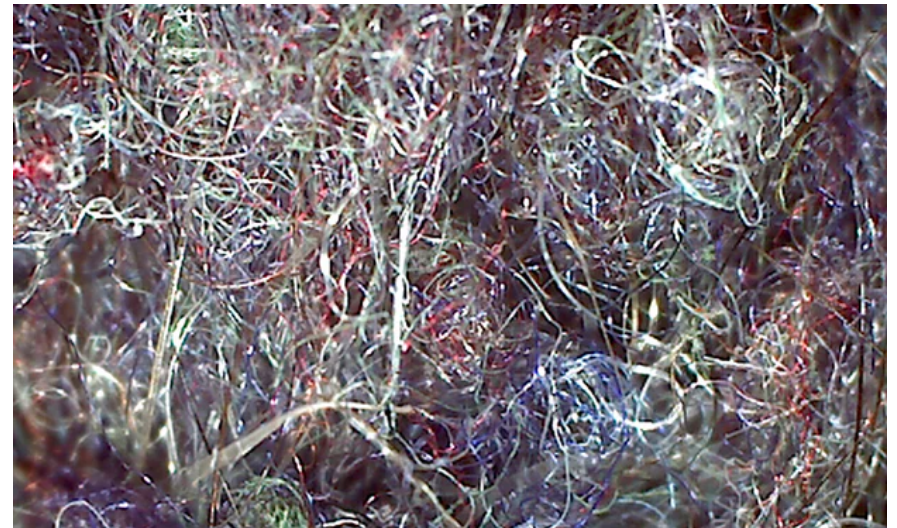


Plastic fibres found in tap water around the world, study reveals

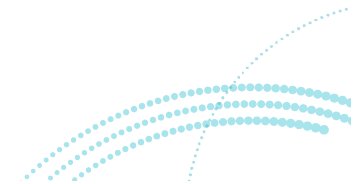
Exclusive: Tests show billions of people globally are drinking water contaminated by plastic particles, with 83% of samples found to be polluted

Damian Carrington Environment editor

Wednesday 6 September 2017 00.01 BST

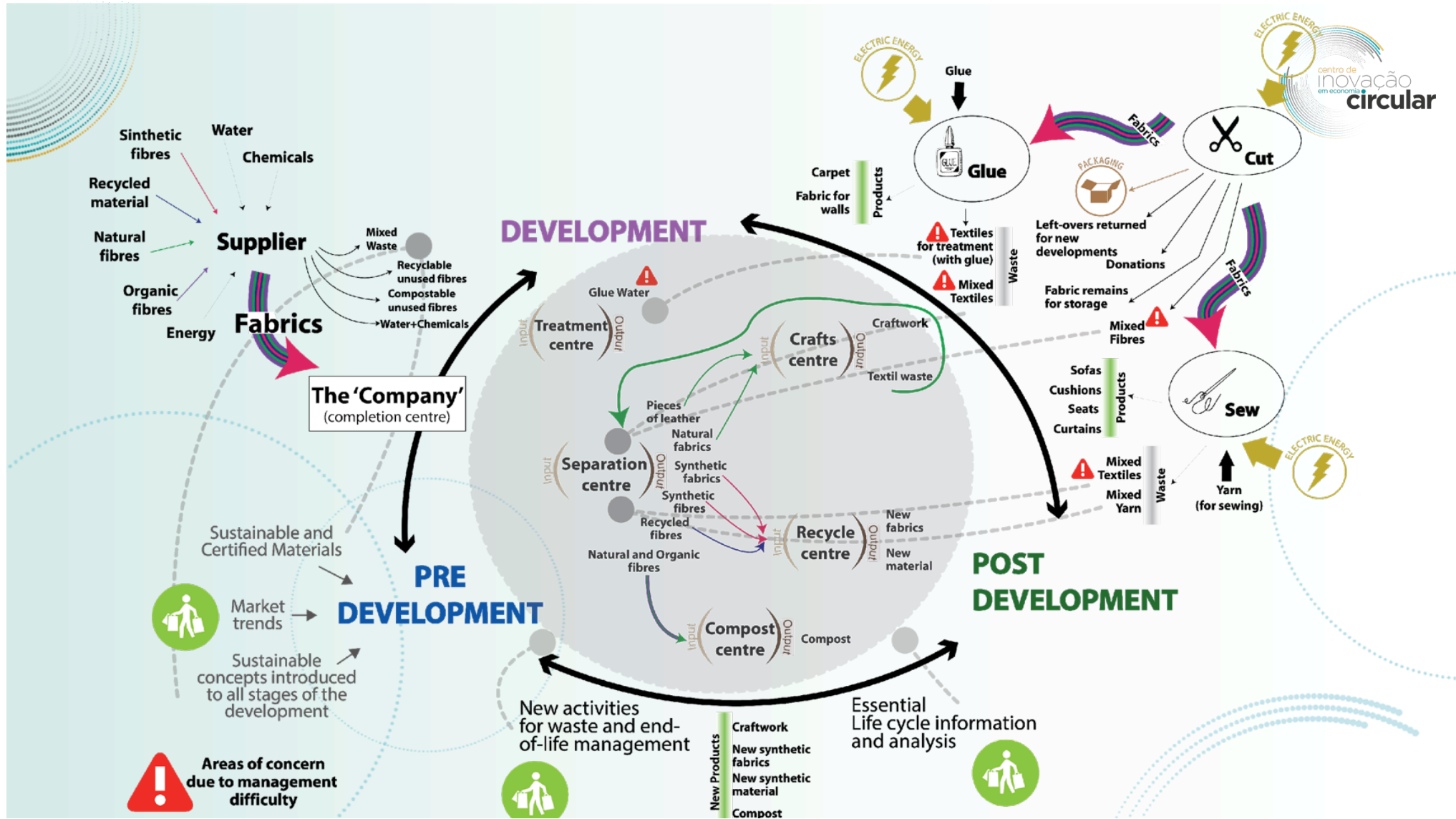


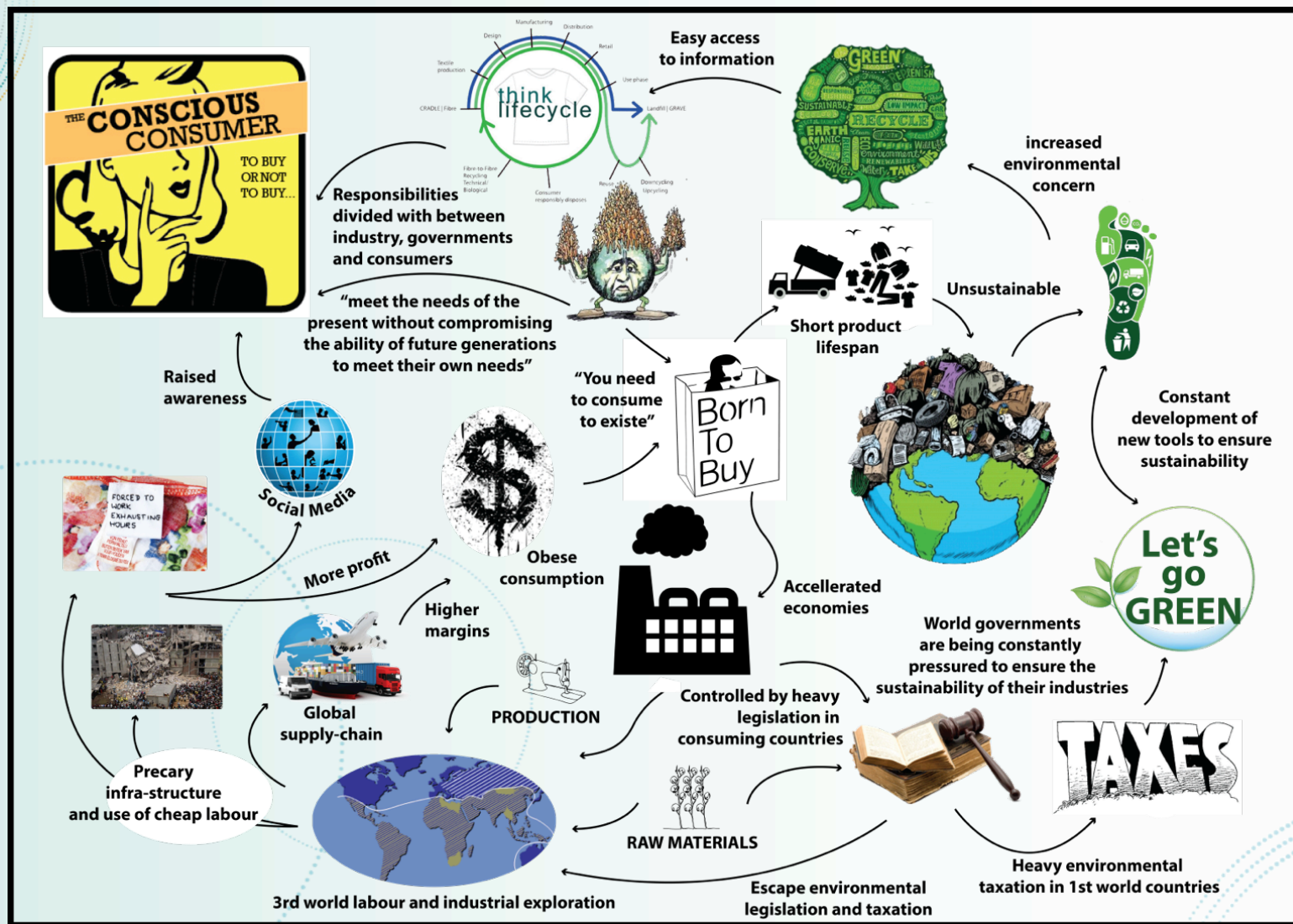
A magnified image of clothing microfibres from washing machine effluent. One study found that a fleece jacket can shed as many as 250,000 fibres per wash. Photograph: Courtesy of Rozalia Project



O mundo das roupas usadas – 4,3 Bi dollars EUA exporta - “Clothing poverty”







2030?

FIGURE 5: AMBITIONS FOR A NEW TEXTILES ECONOMY

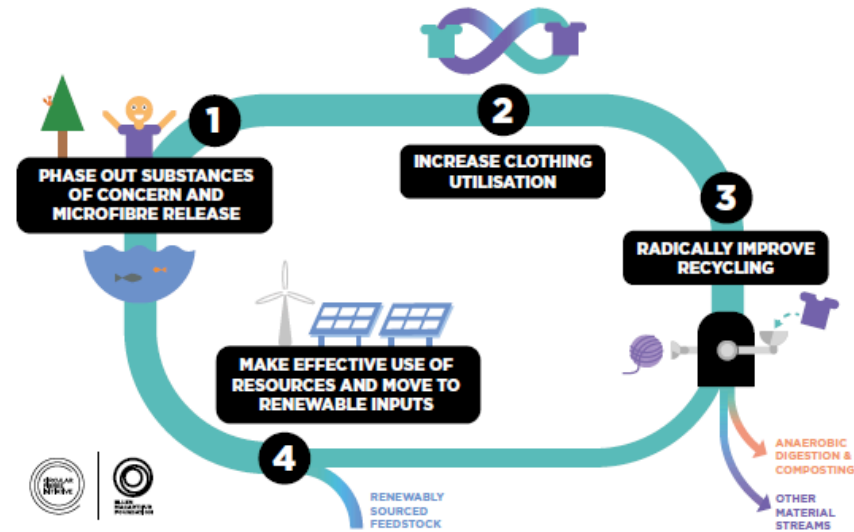
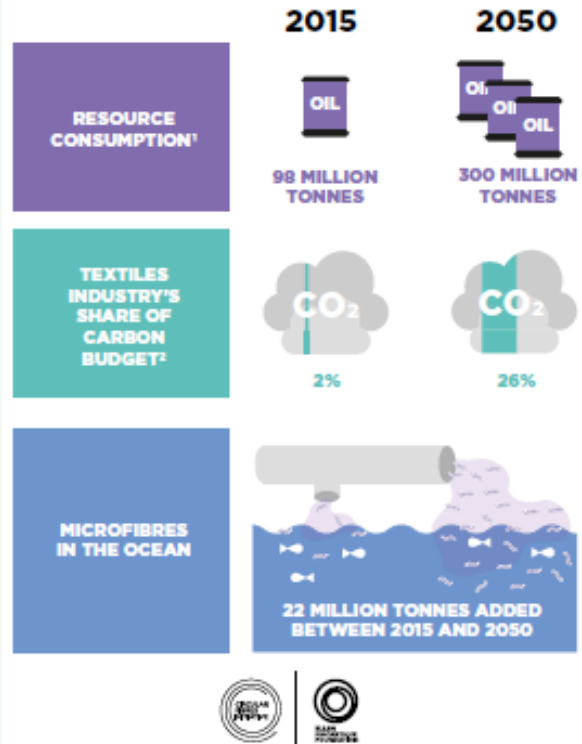


FIGURE 4: THE NEGATIVE IMPACTS OF THE TEXTILES INDUSTRY ARE SET TO DRASTICALLY INCREASE BY 2050











- 1 Consumption of non-renewable resources of the textiles industry, including oil to produce synthetic fibres, fertilisers to grow cotton, and chemicals to produce, dye, and finish fibres and textiles
- 2 Carbon budget based on 2 degrees scenario

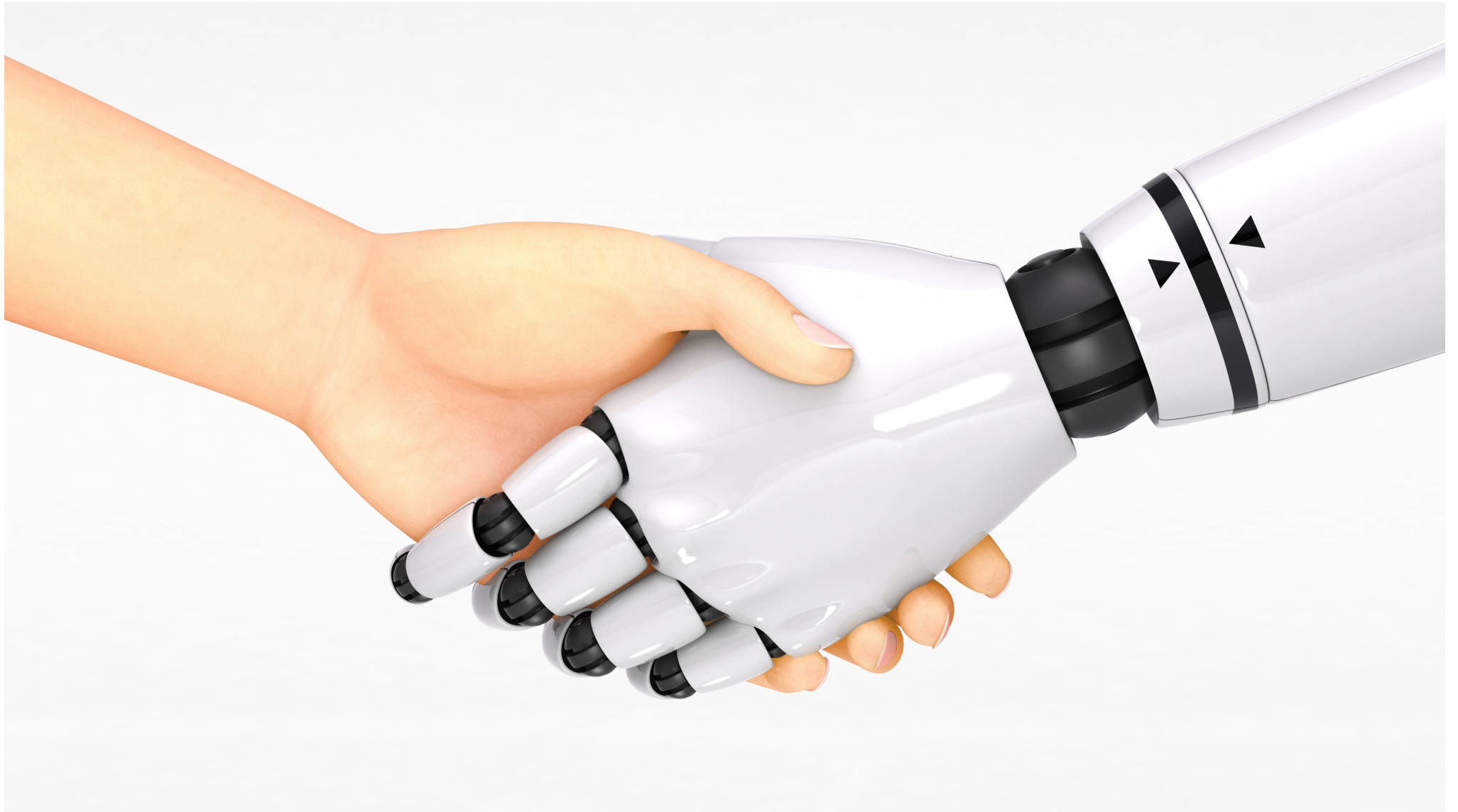
Source: Circular Fibres Initiative analysis - for details see Part I

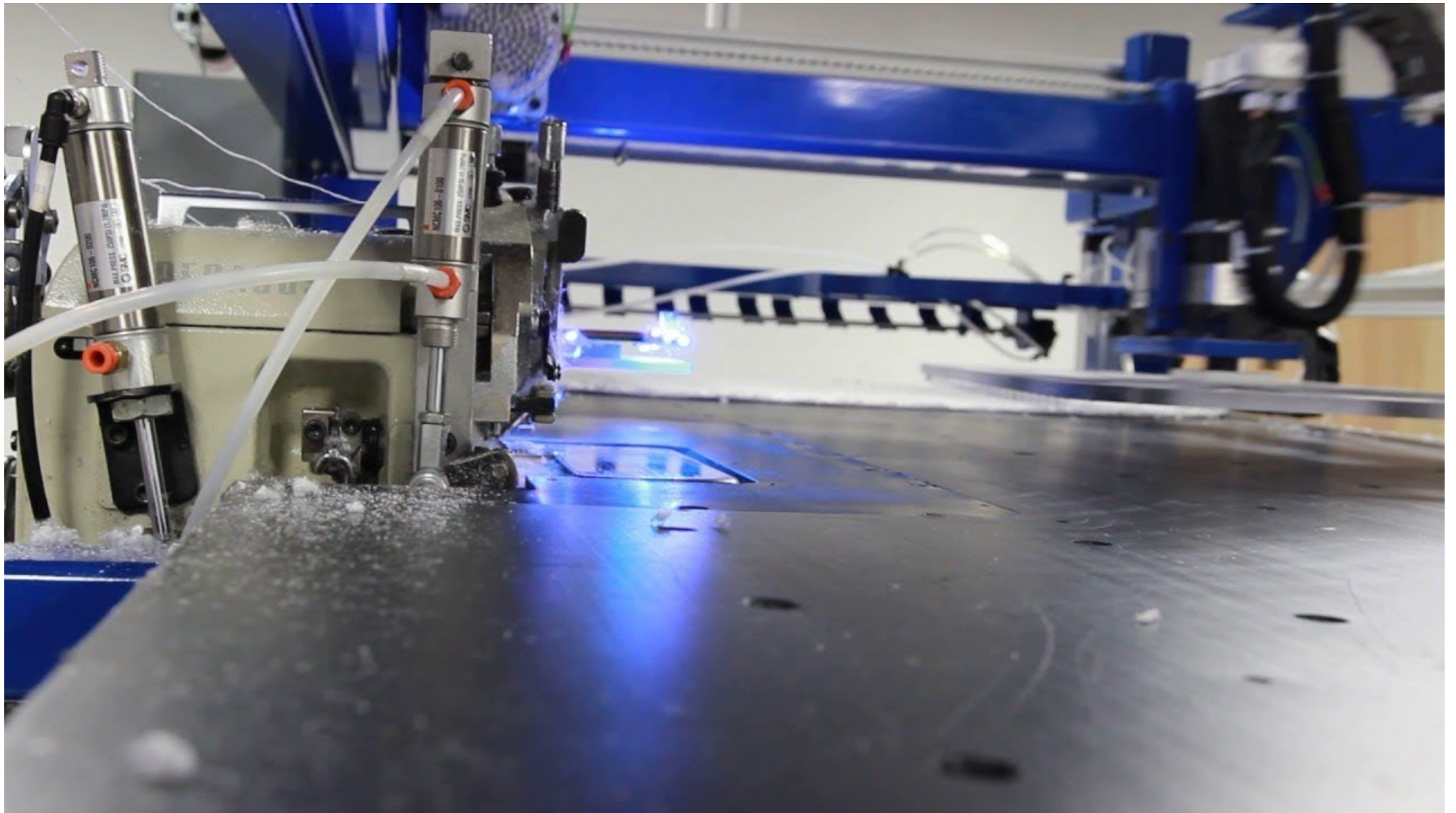
Economia Circular e o Setor Têxtil

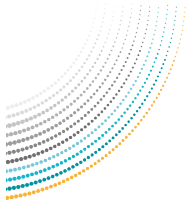
Exhibit 22 In 2017, the shrewder shopper will be characterised by 6 main qualities



Impact area	Magnitude of impact
 Water	High
 Energy	Very high
 Chemicals	Very high
 Waste	Medium
 Labor practices	Very high
 Health & safety	Very high
 Community & ext. eng.	Low
 Ethical practices	Low

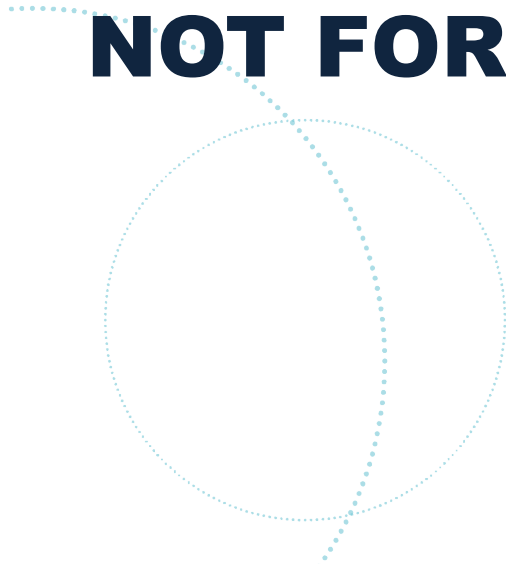










**VALUE By DESIGN,
NOT FOR CHANCE**

V_bD





THE CIRCULAR DESIGN GUIDE

Iniciativas na cadeia da moda



The Waste and Resources Action Programme



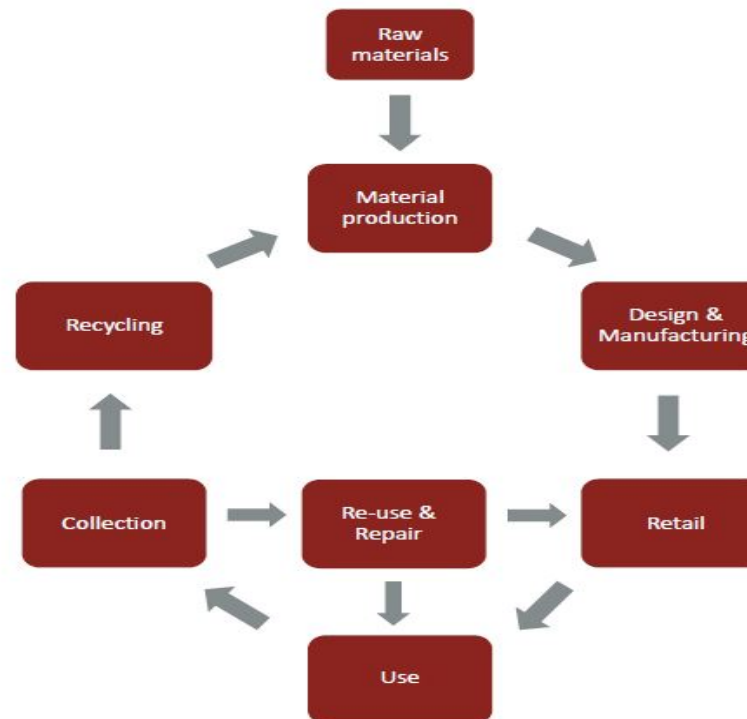
Textiles Circular Economy

WRAP estimates that between **2.5 and 2.7 million tonnes** of household textiles – clothing, footwear and other textiles products like carpets and mattresses – are consumed annually in the UK.

In 2010 an estimated **£238 - £249 million** of re-usable or recyclable textiles were discarded through kerbside residual waste collections.

Recovering just **10%** of this would generate a potential sales value of almost **£25 million**.

Find out more at www.wrap.org.uk/textiles



Iniciativas na cadeia da moda



Search

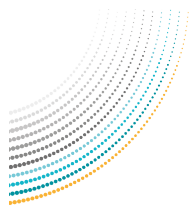
[Home](#) [About ECAP](#) [Action Plan](#) [Get involved](#) [News and events](#)

What is ECAP?

[Read more](#)

Credit: Charity Fashion Live (Image), Rachel Menns (Photographer)





Iniciativas na cadeia da moda



MEMBER ACCESS

The Coalition	Our Members	The Higg Index	Collaboration & Impact	In the Media	Get in Touch
Our Vision		Why Join?		Our Origins	

The Coalition

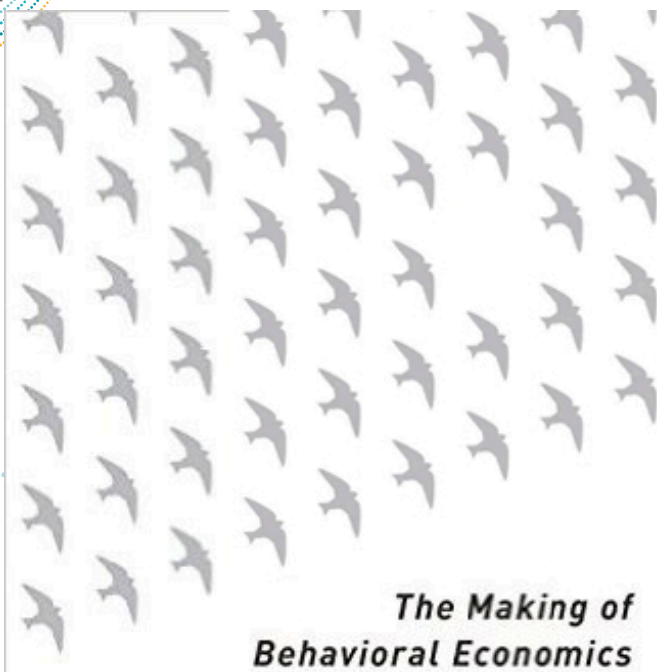
The Sustainable Apparel Coalition's vision is of an apparel, footwear, and home textiles industry that produces no unnecessary environmental harm and has a positive impact on the people and communities associated with its activities.

- 66°NORTH
- American Eagle Outfitters
- Bestseller A/S
- Columbia Sportswear Company
- EILEEN FISHER
- Fenix Outdoor Group
- HanesBrands
- IC Group
- L.L.Bean, Inc.
- Loomstate
- Mara Hoffman
- Odlo International
- Pentland Brands plc.
- PVH Corp.
- SOL Investment
- Vera Bradley Designs, Inc.

- Adidas
- Arc'teryx Equipment Inc.
- Brooks Sports, Inc.
- The Walt Disney Company
- Esprit
- Gap, Inc.
- Helly Hansen AS
- KEEN Inc.
- Lands' End
- Lululemon Athletica
- New Balance
- Orsay
- Piece & Co.
- Salomon
- Threads For Thought
- VF Corporation

- Aldo
- ASICS
- Burberry
- ECCO
- Fast Retailing
- Guess, Inc.
- H&M
- Kering
- Levi Strauss & Co.
- Maiyet, Inc.
- Nike, Inc.
- Patagonia, Inc.
- Puma
- Skunkfunk
- Under Armour, Inc.





*The Making of
Behavioral Economics*

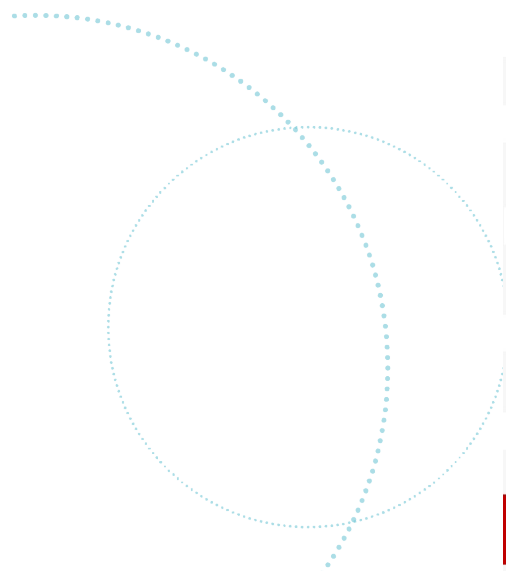
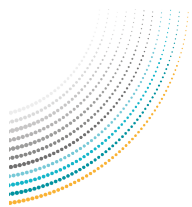
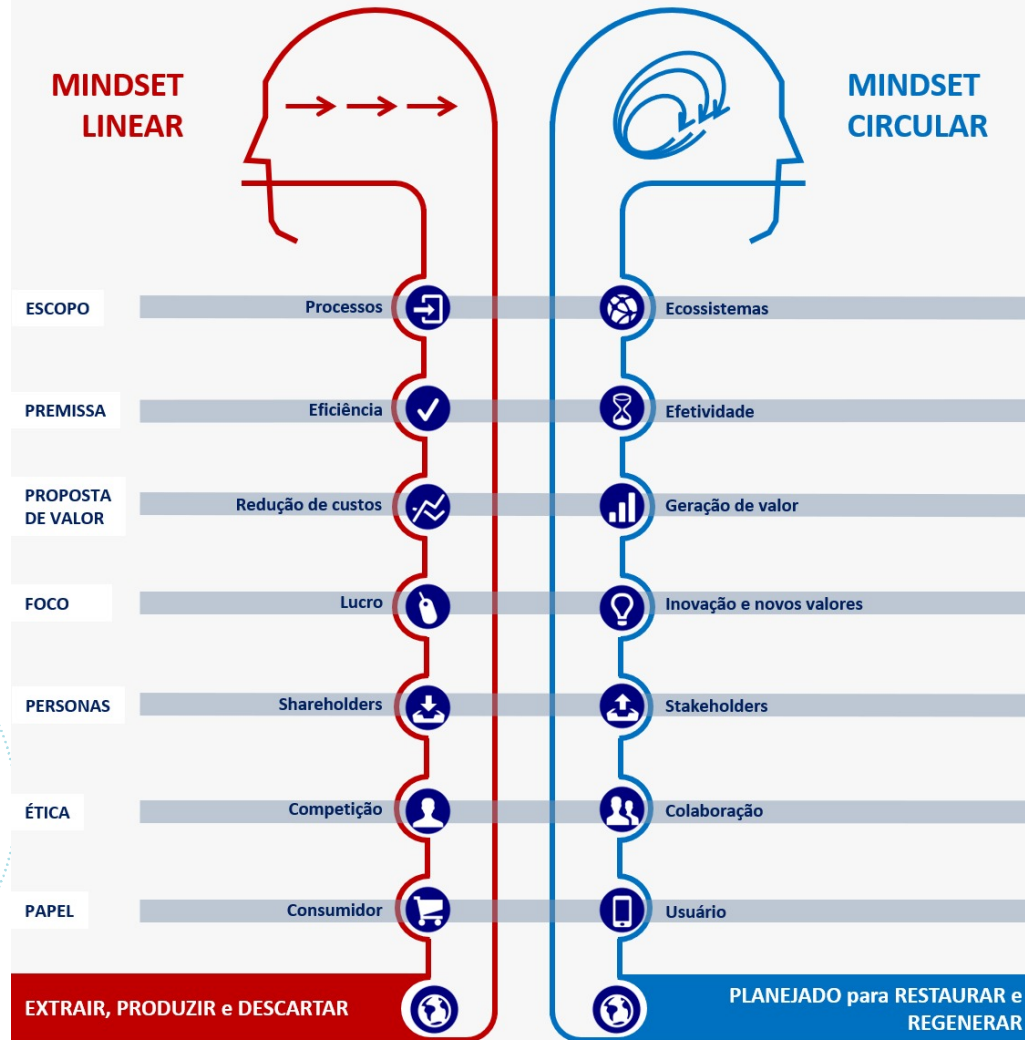
MISBEHAVING

Richard H. Thaler

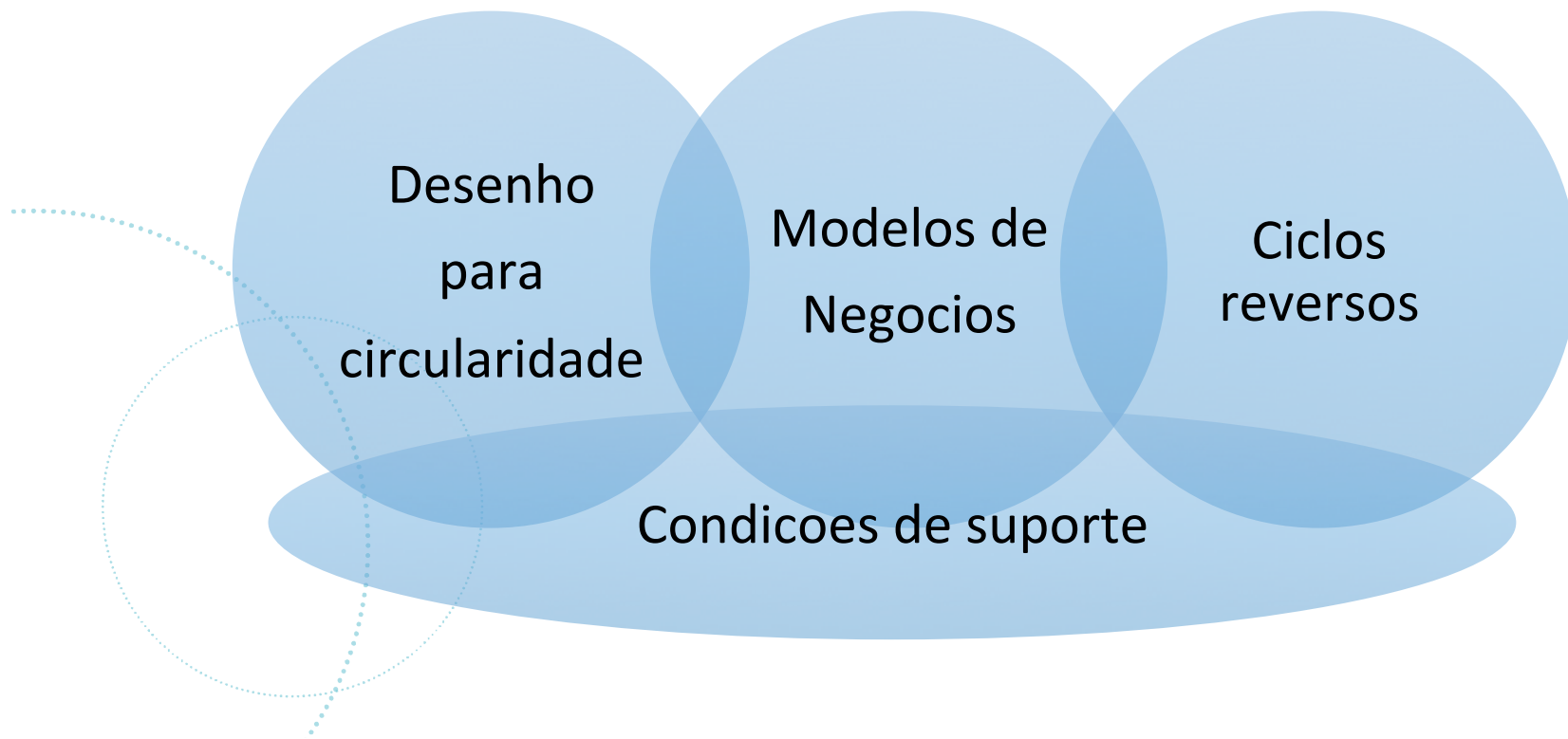
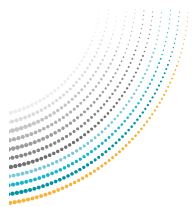
*Best-selling coauthor of **Nudge***



A TRANSIÇÃO DE UM MUNDO LINEAR PARA CIRCULAR

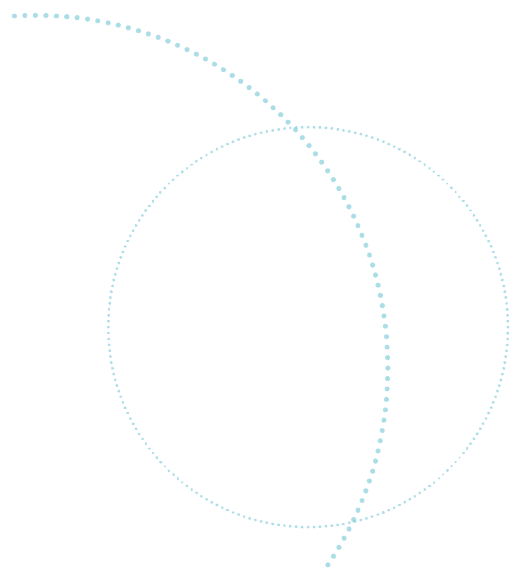


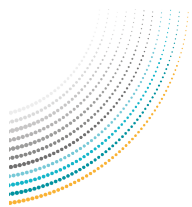
Como realizar a Ece gerar impacto? Uso dos blocos de construcao da EC e SDGs



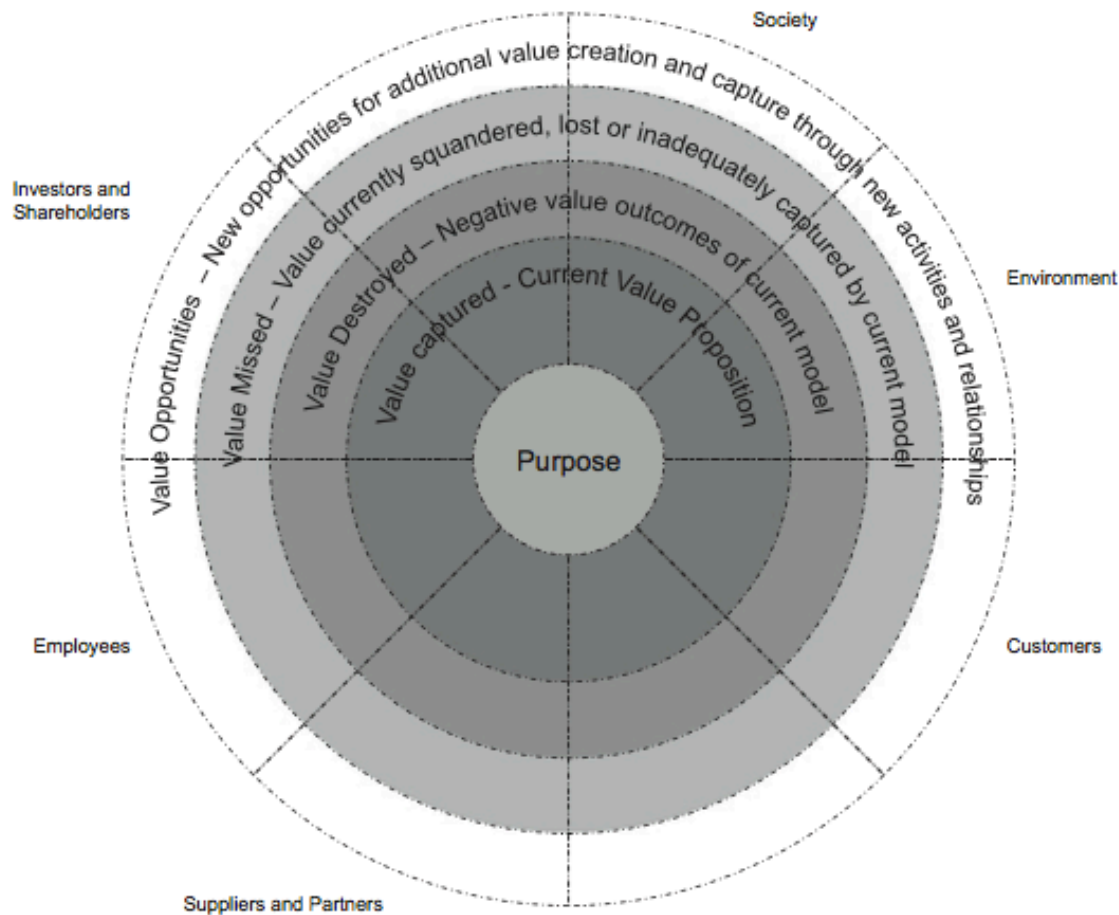


Onde e como os ODSs encontram a EC?

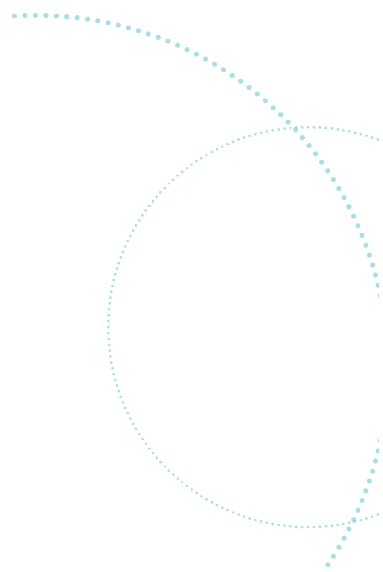




Mapeamento de valor



PROPOSITO
Valor capturado
Valor destruido
Valor perdido
Valor da oportunidade






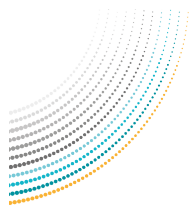




Uma visao inspiradora para
uma economia que
“funcione” com outra lente

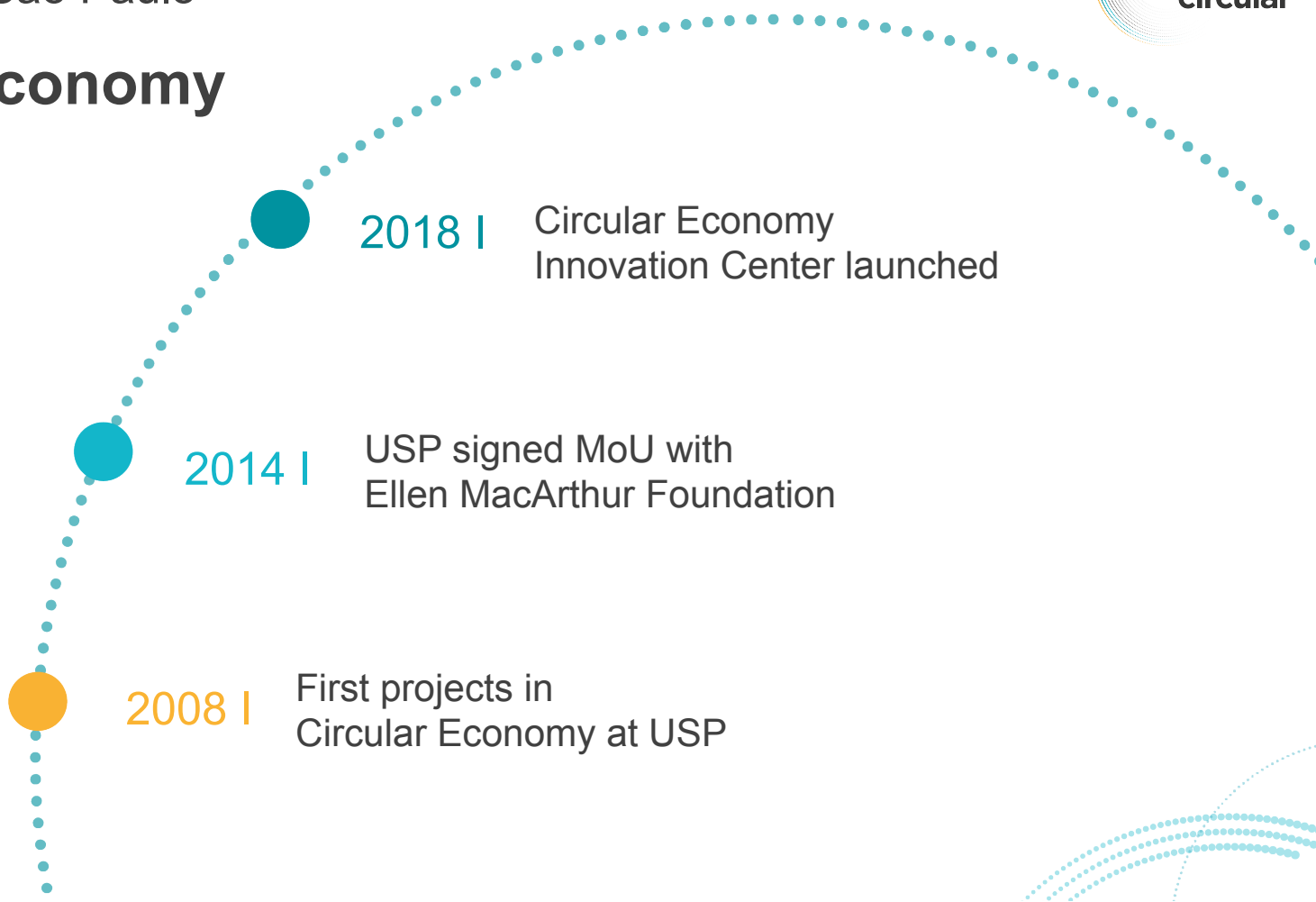
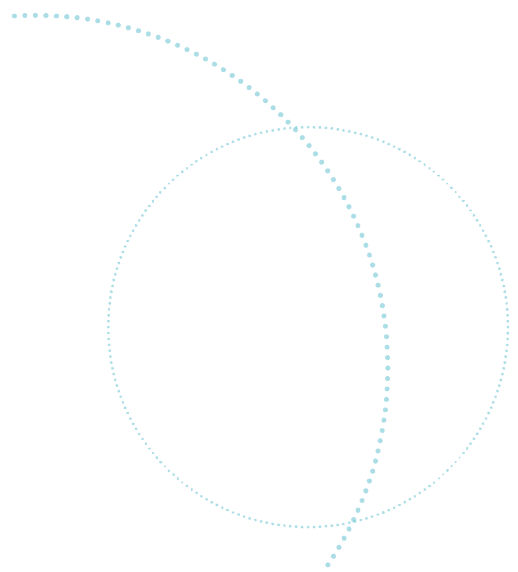



centro de
Inovação
em economia
circular



USP –
University of Sao Paulo

circular economy timeline

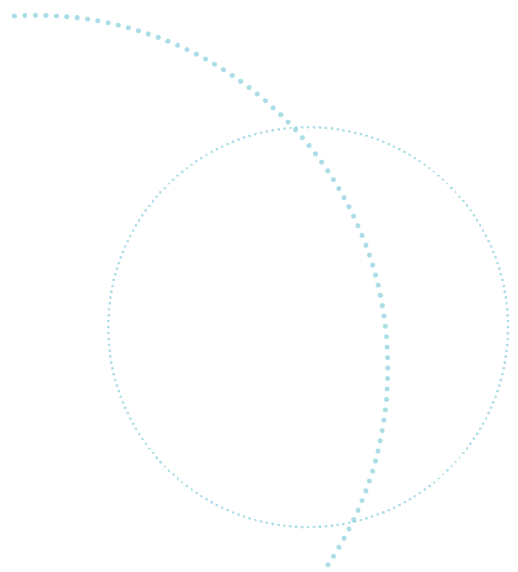




USP a Pioneer University



Pioneer Universities are an international network of higher education institutions developing truly pioneering and innovative circular economy-orientated research or teaching programmes.



TRANSIÇÃO PARA ECONOMIA CIRCULAR

Uma plataforma para desenvolvimento de competências em EC

USP - EMF - Pioneer University

CONTEXTO DA EC

Soluções lineares não resolvem problemas planetários



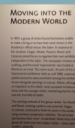
Trajetórias complexas
Volatilidade, instabilidade

Novos referenciais p negócios
circulares podem gerar 1 T dollars



CONTEXTO DA PLATAFORMA

Modelo moderno dos impressionistas
1847 - Fora do Salto



Novos "impressionistas"
Sic. XXI

- Convênio celebrado entre a EMF - USP
- Diversos projetos em andamento em EC - mais de 60 docentes envolvidos
- Pesquisa aplicada em diversos setores da economia
- Resultados traduzidos em competências
- Entendimento da realidade do Brasil: "reality-check"
- Propósito de transformar e impactar a sociedade

FUNDAMENTOS

Ecologia industrial



C2C

Design Thinking e Regenerativo



ACV

Biomimética



Simbiose industrial

Dinâmica de sistemas



Economia da performance

Fluxo de materiais e captura de valor

Novos Modelos de Negócios

PSS

ESTRATÉGIA DA PLATAFORMA

Como as práticas e iniciativas associadas a EC estão inseridas na estratégia e visão da empresa?



Diagnóstico
Customização para competências
Road map



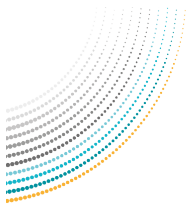
- Plataforma interativa
- Flexibilidade de oferta para criar e desenvolver competências
- Visão sistêmica
- Cases reais e exercícios de "campo"
- Projeto em EC

CONTATO: AOMETTO@SC.USP.BR; WANA@USP.BR

TRANSIÇÃO PARA ECONOMIA CIRCULAR

Uma plataforma para desenvolvimento de competências em EC

USP - EMF - Pioneer University



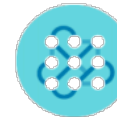
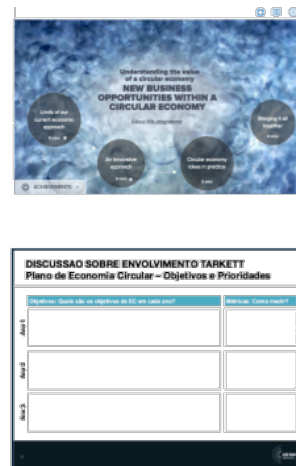
Circular Economy Solutions



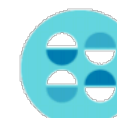
Pesquisas & Análises



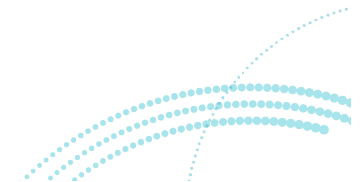
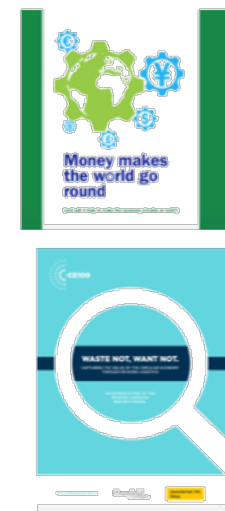
Capacitação



Networking



Colaboração



The Circular Economy Innovation Center

PROJETO 1

PROJETO 2

PROJETO 3

PROJETO 1

PROJETO 2

PROJETO 3

PROJETO 4

PROJETO 5

PROJETO 1

PROJETO 2

PROJETO 3

PROJETO 4

programa
moda circular

programa
modelos de negócios

PROJETO 1

PROJETO 2

PROJETO 3

PROJETO 1

PROJETO 2

PROJETO 3

PROJETO 4

programa
indústria circular

programa
workplace em economia circular

PROJETO 1

PROJETO 2

PROJETO 3

programa
agro circular

centro de
inovação em economia circular

programa
circular cities

Confederação Nacional da Indústria

Projeto desenvolvido seguindo três objetivos principais:

1. Analisar as práticas e os processos adotados por empresas relacionadas às três cadeias de valor pré-selecionadas e caracteriza-las quanto ao alinhamento e a relação destas práticas aos princípios da EC.
2. Estimar quantitativamente os benefícios destas práticas quanto a geração de emprego, renda e de geração de valor agregado, bem como quantificar os fluxos de materiais nestas cadeias, a partir de estudos de caso de empresas envolvidas com este projeto.
3. Identificar possíveis contribuições deste estudo para a definição de políticas públicas e recomendações para elaboração de programas de governo que estimulem e facilitem a transição para a EC no Brasil.



ECONOMIA CIRCULAR

OPORTUNIDADES E DESAFIOS PARA A
INDÚSTRIA BRASILEIRA

Coordenação



Prof. Weber Amaral
wana@usp.br