ECONOMIA CIRCULAR:
UN NUEVO MODELO PRODUCTIVO PARA UNA NUEVA ECONOMÍA

Jose María Fernández Alcalá

This project is funded by the European Union

1.000.000
Botellas de agua se venden cada minuto en el mundo

En un día
1.400 millones de botellas
Cada día se venden en el mundo el equivalente a una montaña con la mitad de altura de la Torre Eiffel.

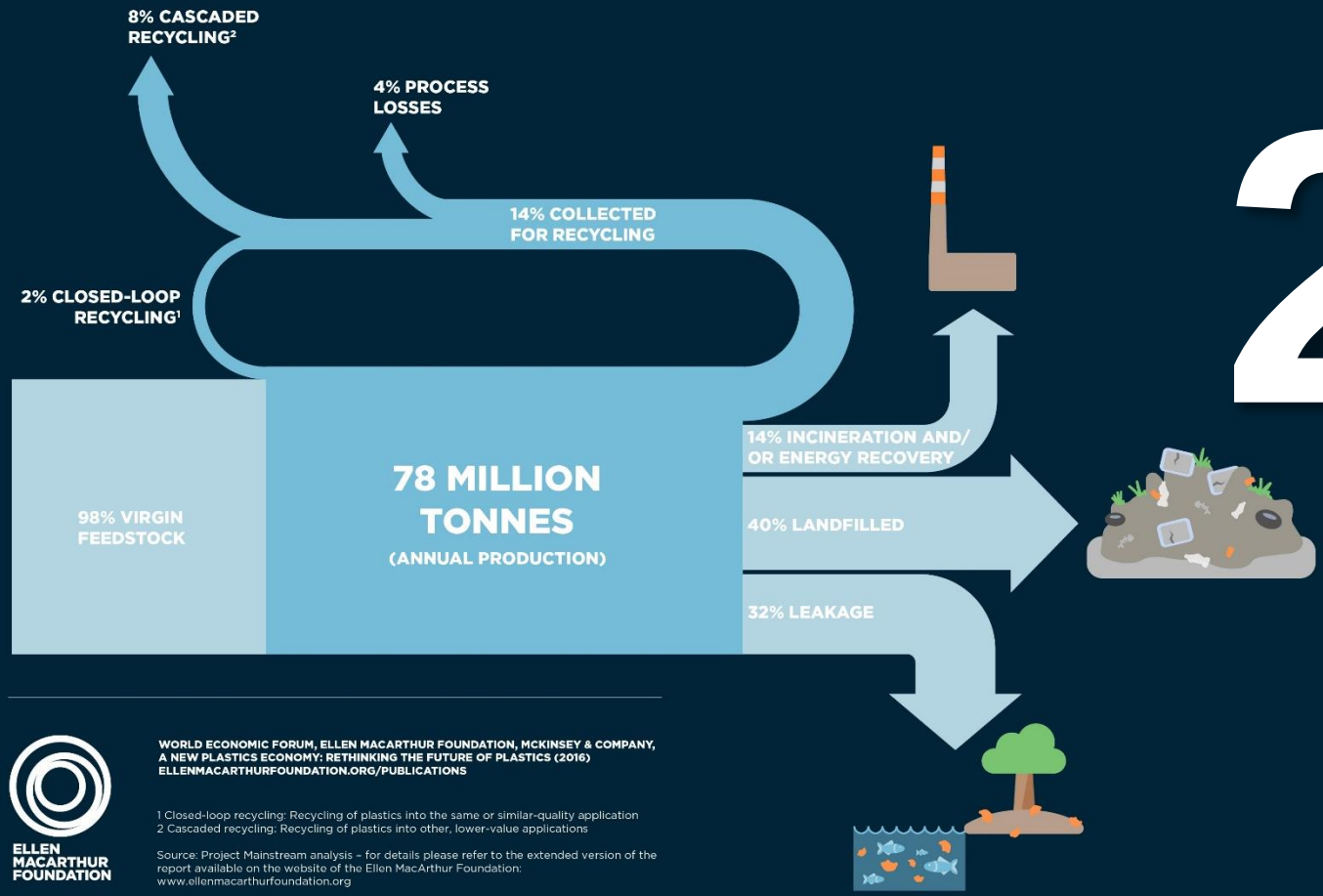
REUTERS

14%
Tasa media de reciclaje a nivel mundial de envases de plástico

En 2050 habrá MÁS PLÁSTICO QUE PECES en el mar

NATIONAL GEOGRAPHIC

TODAY, PLASTIC PACKAGING MATERIAL FLOWS ARE LARGELY LINEAR



2%

circular

ELLEN MACARTHUR FOUNDATION

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

1 Closed-loop recycling: Recycling of plastics into the same or similar-quality application
2 Cascaded recycling: Recycling of plastics into other, lower-value applications

Source: Project Mainstream analysis – for details please refer to the extended version of the report available on the website of the Ellen MacArthur Foundation: www.ellenmacarthurfoundation.org

1:29
258
Messages
31
Google Calendar
App Store
Halide
Google Maps
NYC Ferry
17
Messenger
Dark Sky
Simplenote
YouTube
Settings
Clock
9
Trello
2
Snapchat
Hangouts
Uber
Chartbeat
The Verge
Slack
Authy
Pocket
Facebook
Instagram
201
5,145

20 años

2 años

Los productos cada vez son más complejos y además su vida útil es cada vez menor

2.854
teléfonos móviles se fabrican cada minuto en el mundo
1.500.000.000
teléfonos/año

El volumen total de productos en el mercado cada vez es mayor.

300.000

artículos presentes en cada hogar medio de EEUU.

SOURCE: LA TIMES, THE HUFFINGTON POST, US DOE, WSJ, DEBT.ORG, CLOSETMAID

POLYMERS
Ideas Wall
MCX
Material ConneXion Bilbao

¿Sabemos que hay detrás de los materiales que consumimos?

¿Sabemos que hay detrás de los materiales que consumimos?

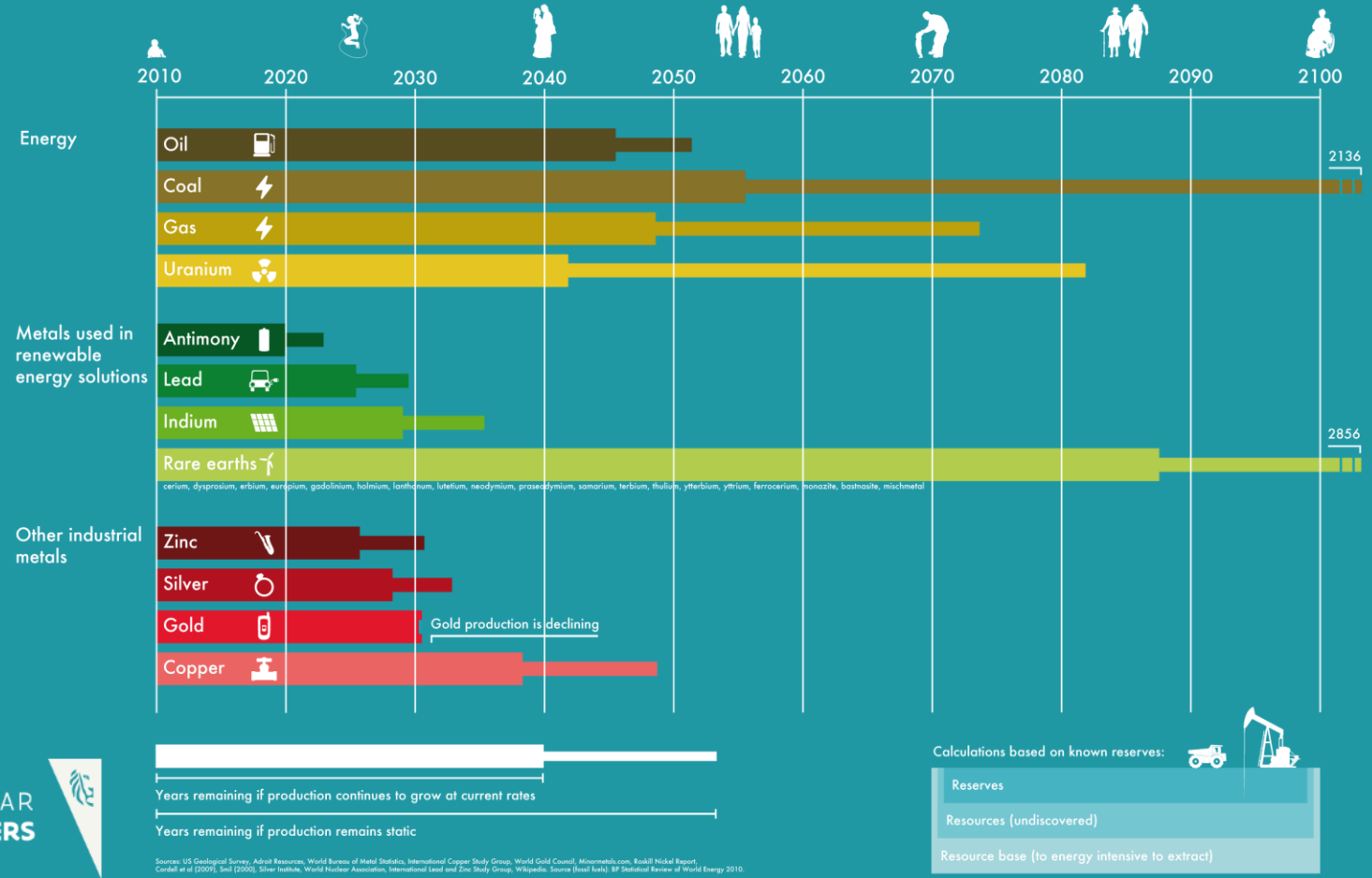
…pero el diseño ha mejorado los productos, ¿no?.

Un vehículo hoy en día consume una tercera parte de lo que consumía hace 25 años.

… pero el número de vehículos se ha multiplicado por 6 en los últimos 25 años.
Zona Leste
Centro

180
Coches se fabrican cada minuto en el mundo
95.000.000
coches/año

Born in 2010: How much is left for me?



Sources: US Geological Survey, Adroit Resources, World Bureau of Metal Statistics, International Copper Study Group, World Gold Council, Minormetals.com, Raskill Nickel Report, Cordell et al (2009), Smil (2000), Silver Institute, World Nuclear Association, International Lead and Zinc Study Group, Wikipedia. Source (fossil fuels): BP Statistical Review of World Energy 2010.

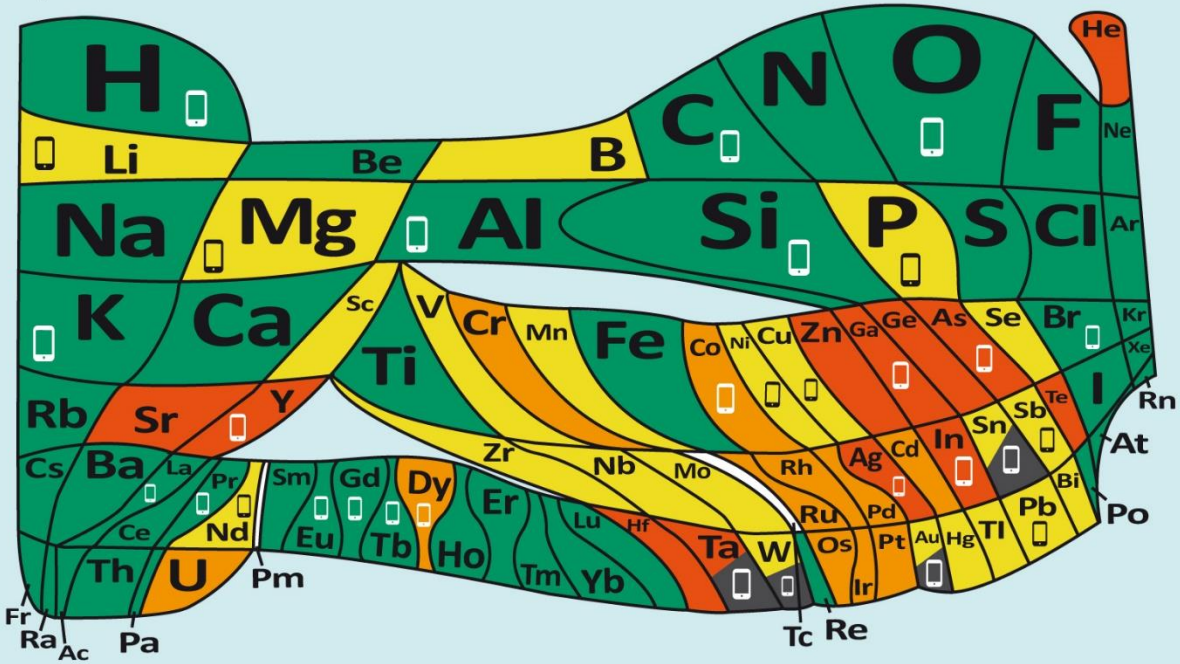
CIRCULAR FLANDERS

United Nations Educational, Scientific and Cultural Organization

2019 IYPT International Year of the Periodic Table of Chemical Elements

The 90 natural elements that make up everything

How much is there? Is that enough?



Serious threat in the next 100 years

Rising threat from increased use

Limited availability, future risk to supply

Plentiful Supply

Synthetic

From conflict minerals

Elements used in a smart phone

Read more and play the video game **http://bit.ly/euchems-pt**

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EuChemS European Chemical Society

Inspired by WF Sheehan's 'A Periodic Table with Emphasis' published in Chemistry, 1976, 49, 17-18'

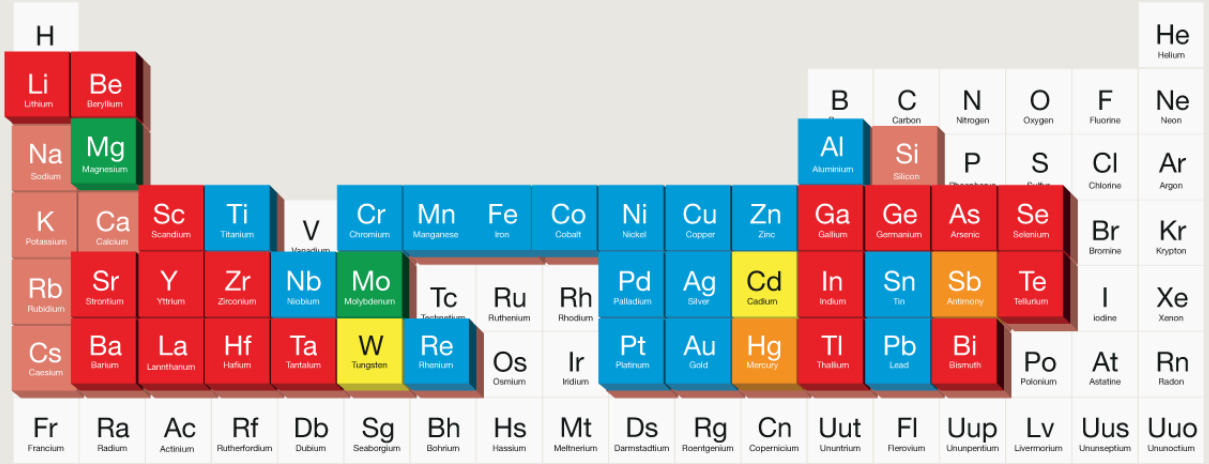
A PERIODIC AND ELEMENTAL PROBLEM

He Helium — Periodic table element

Elements found in e-waste

Recycling rates

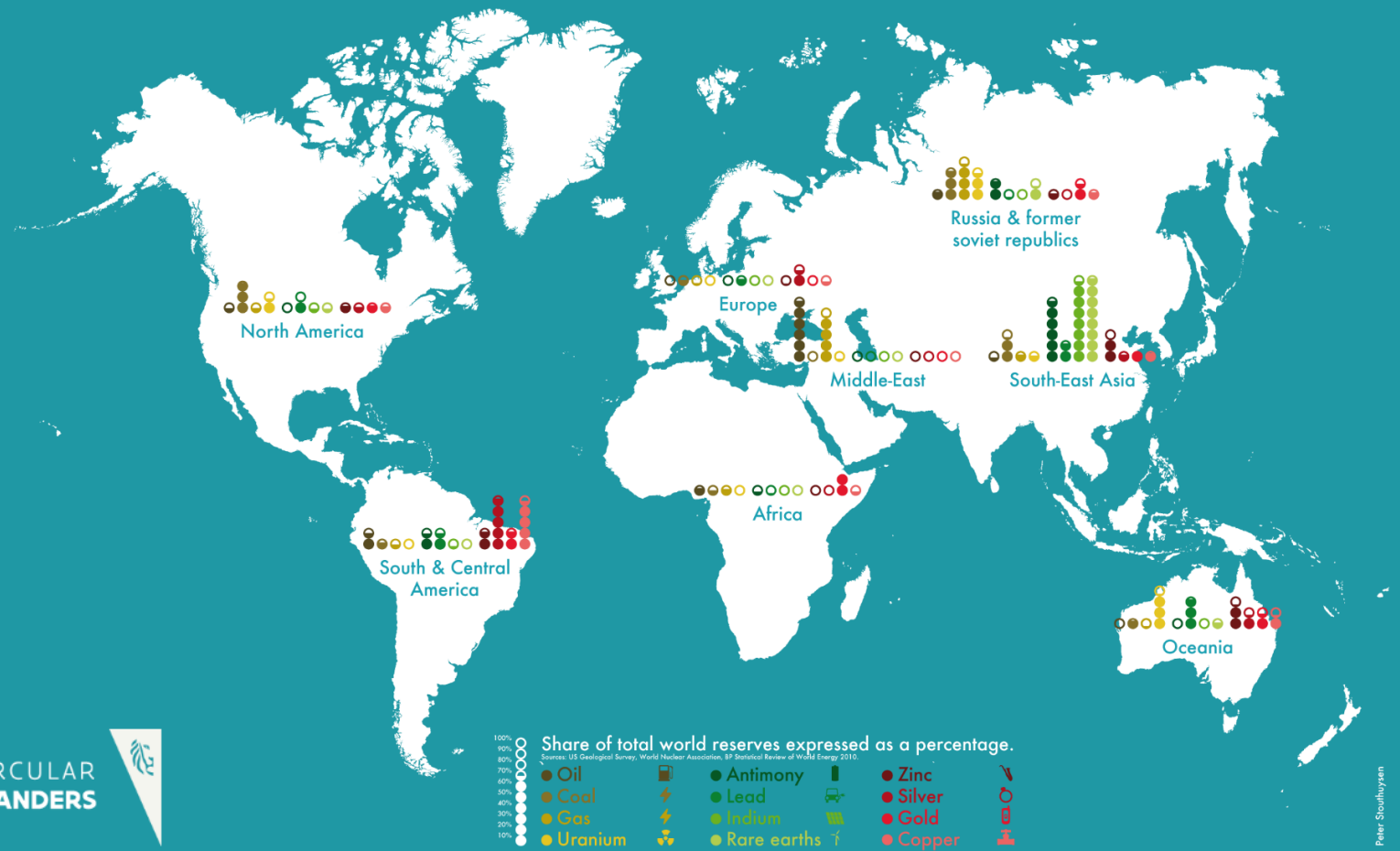
<1% | 1-10% | >10-25% | >25-50% | >50%



PACE
PLATFORM FOR ACCELERATING THE CIRCULAR ECONOMY

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

Where to find the leftovers?



CIRCULAR FLANDERS

Peter Stouthuysen

Los productos se comercializan en todo el mundo.

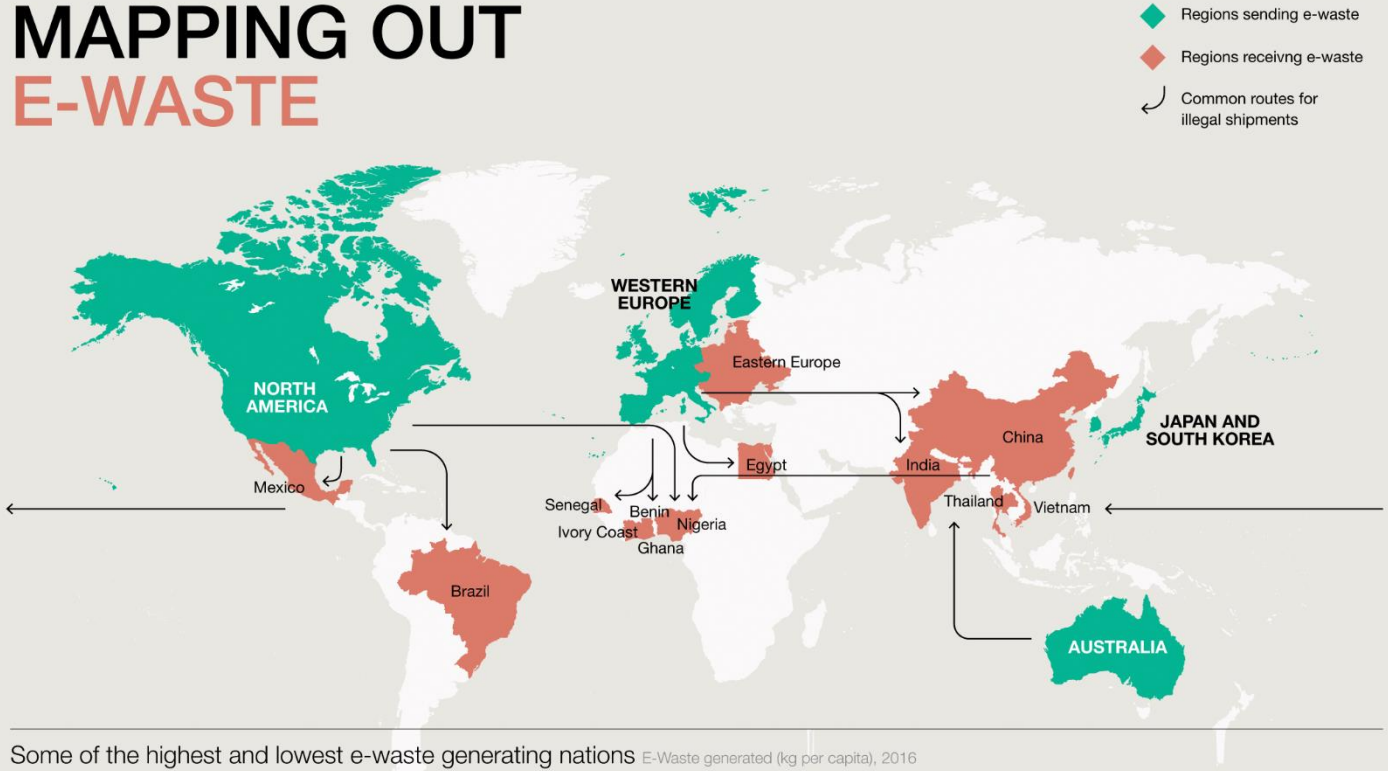
El consumo eléctrico doméstico no para de crecer

Cada vez hay
más variedad de un
mismo producto.

Y el volumen de residuos no para de crecer.

20%
Tasa media de reciclaje a nivel mundial de residuos eléctricos y electrónicos
come on
GREENPEACE

MAPPING OUT
E-WASTE



Some of the highest and lowest e-waste generating nations E-Waste generated (kg per capita), 2016

28.5	24.9	24.8	23.9	23.6	0.4	0.5	0.6	0.6	0.8
Norway	United Kingdom	Denmark	Netherlands	Australia	Niger	Ethiopia	Afganistan	Uganda	Nepal

PACE
PLATFORM FOR ACCELERATING THE CIRCULAR ECONOMY

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

The world's e-waste is a huge problem. It's also a golden opportunity

There is $62.5 billion-worth of value in our discarded electronic items worldwide. Image: REUTERS/Tyrone Siu

24 Jan 2019

Guy Ryder
Director-General, International Labour Organization (ILO)

Houlin Zhao
Secretary-General, International Telecommunication Union (ITU)

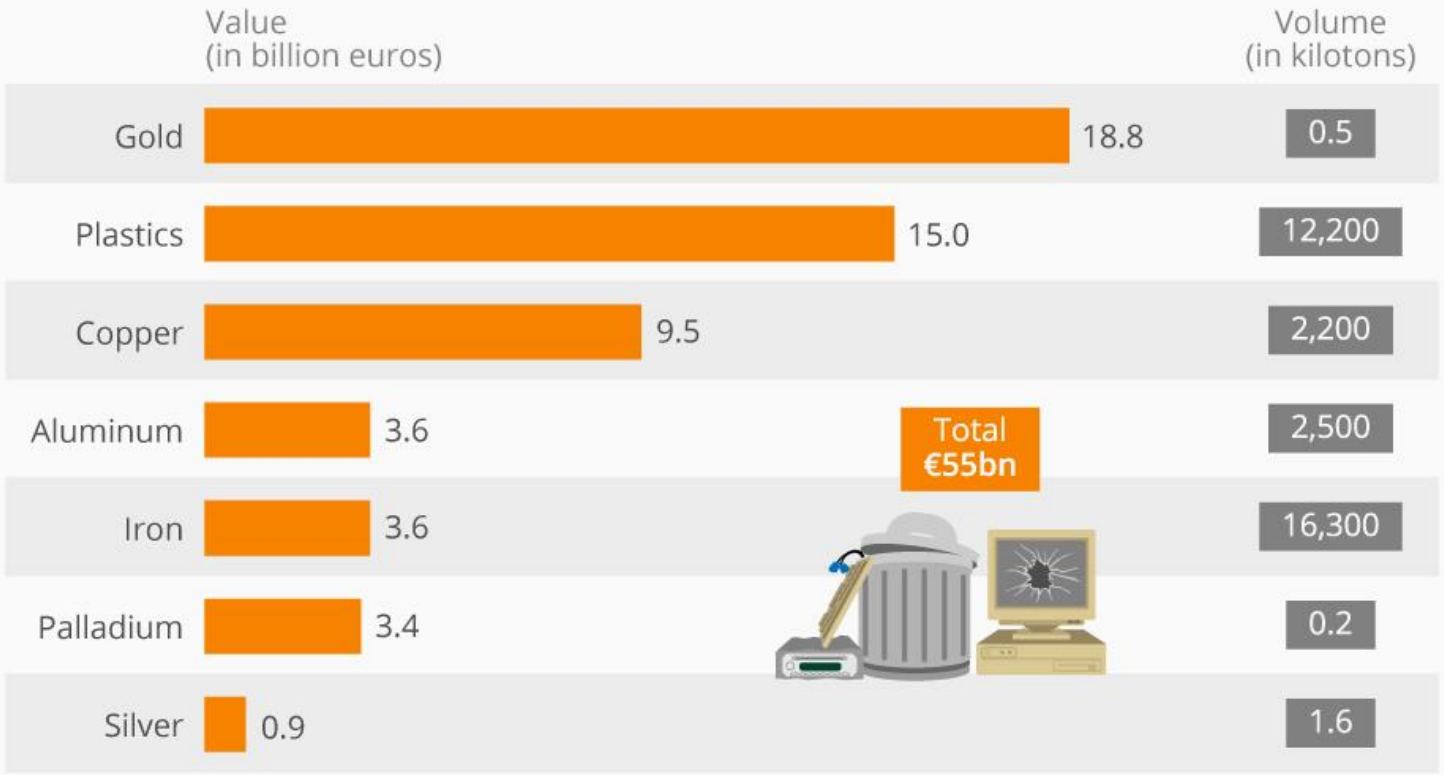
This article is part of the **World Economic Forum Annual Meeting**

Humankind's insatiable demand for electronic devices is creating the world's fastest-growing waste stream. Some forms are growing exponentially. The United Nations calls it a tsunami of e-waste.

While more electronic devices are part of the problem, they also can be a big part of the solution. A more digital and connected world will help us accelerate progress towards the United Nations Sustainable Development Goals (SDGs), offering unprecedented opportunities for emerging economies.

Mining E-Waste Gold

Potential value and volume of raw materials in e-waste worldwide 2016



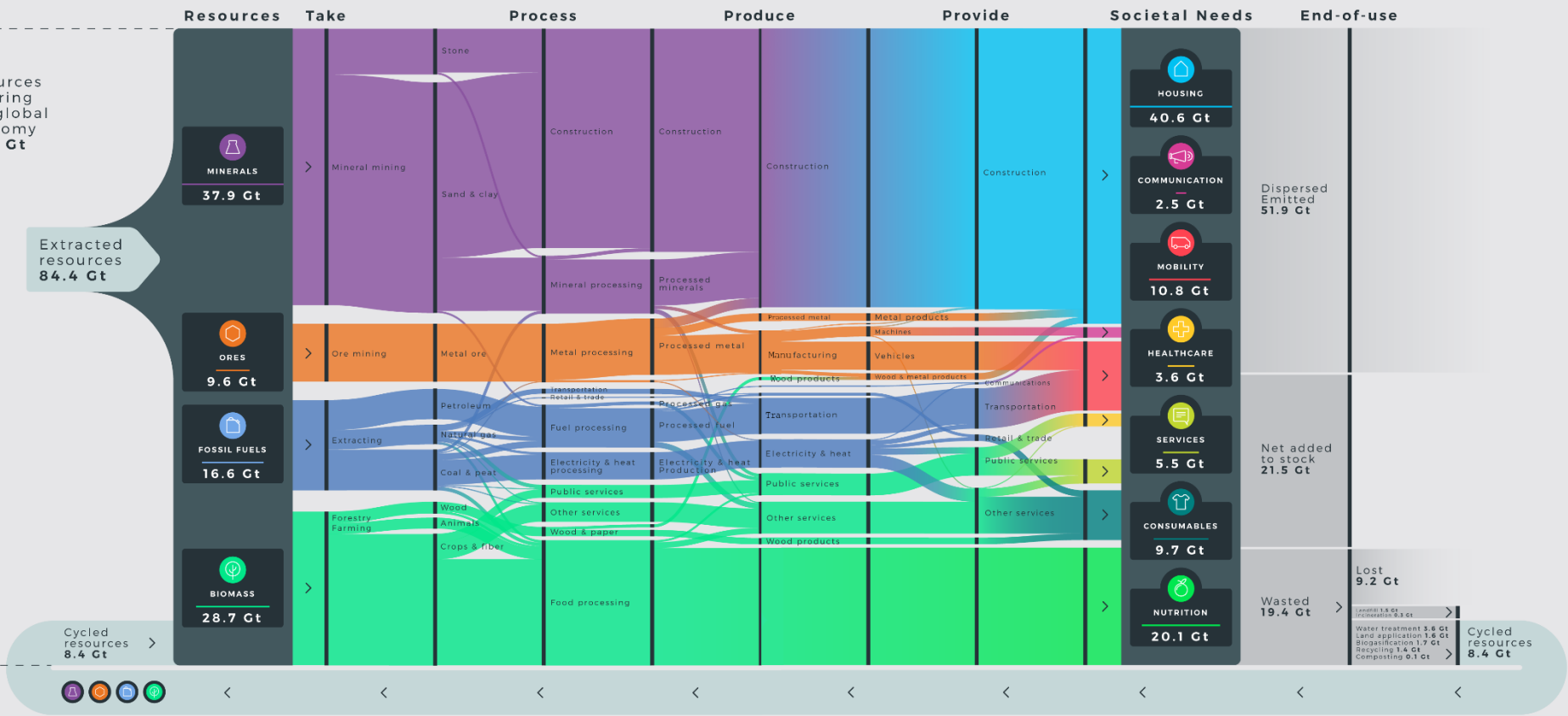
@StatistaCharts

Source: ITU

statista

Este es un sistema LINEAL que depende de los recursos naturales.

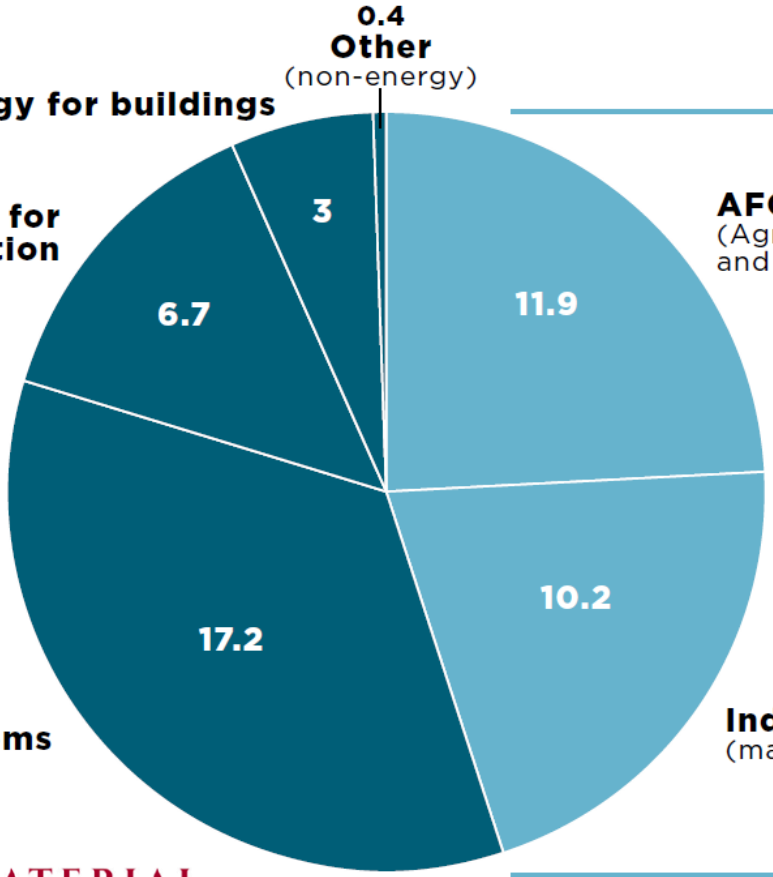
Our world is...
CIRCLE ECONOMY
9%
circular



CIRCLE ECONOMY

70.000
Ton CO_2 emitidas por minuto

Global GHG emissions
Billion tonnes of CO_2e per year, 2010



ELLEN MACARTHUR FOUNDATION

MATERIAL ECONOMICS

GOAL OF THE MONTH

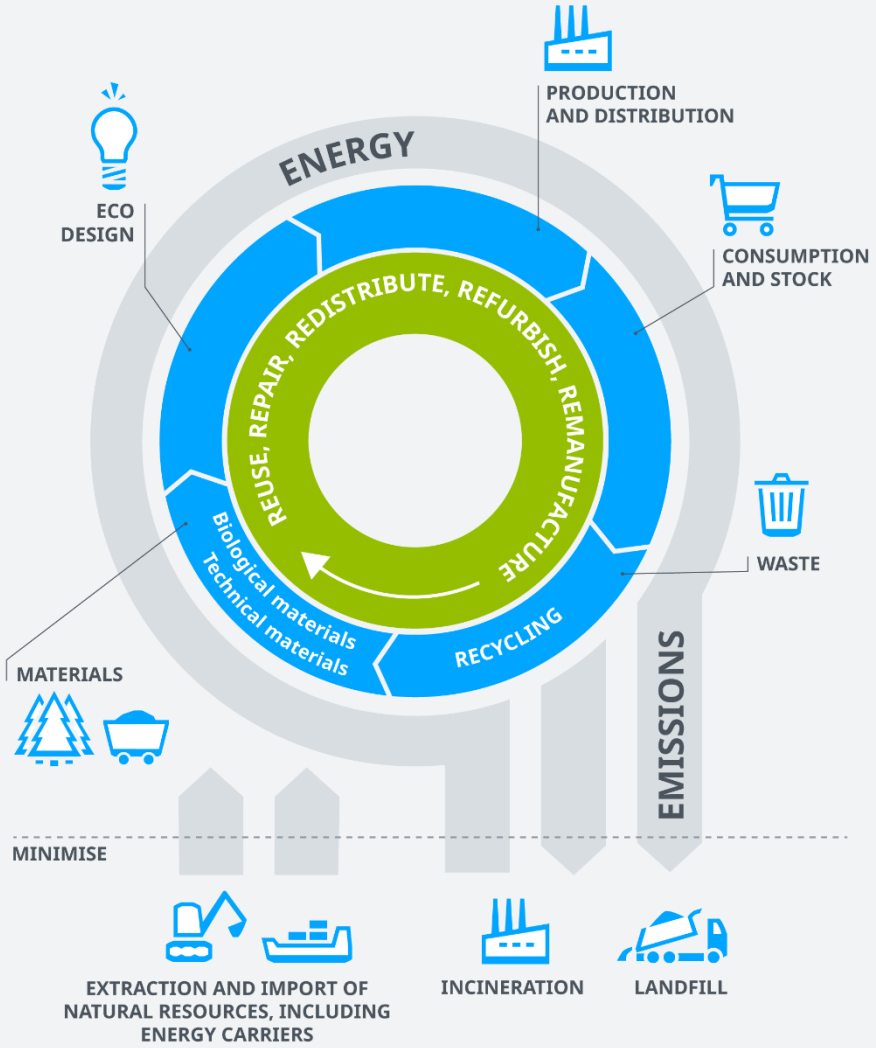
Photo ©Chris Gregory/Time Magazine

Es necesario replantear nuestro modelo económico y el modo en que consumimos

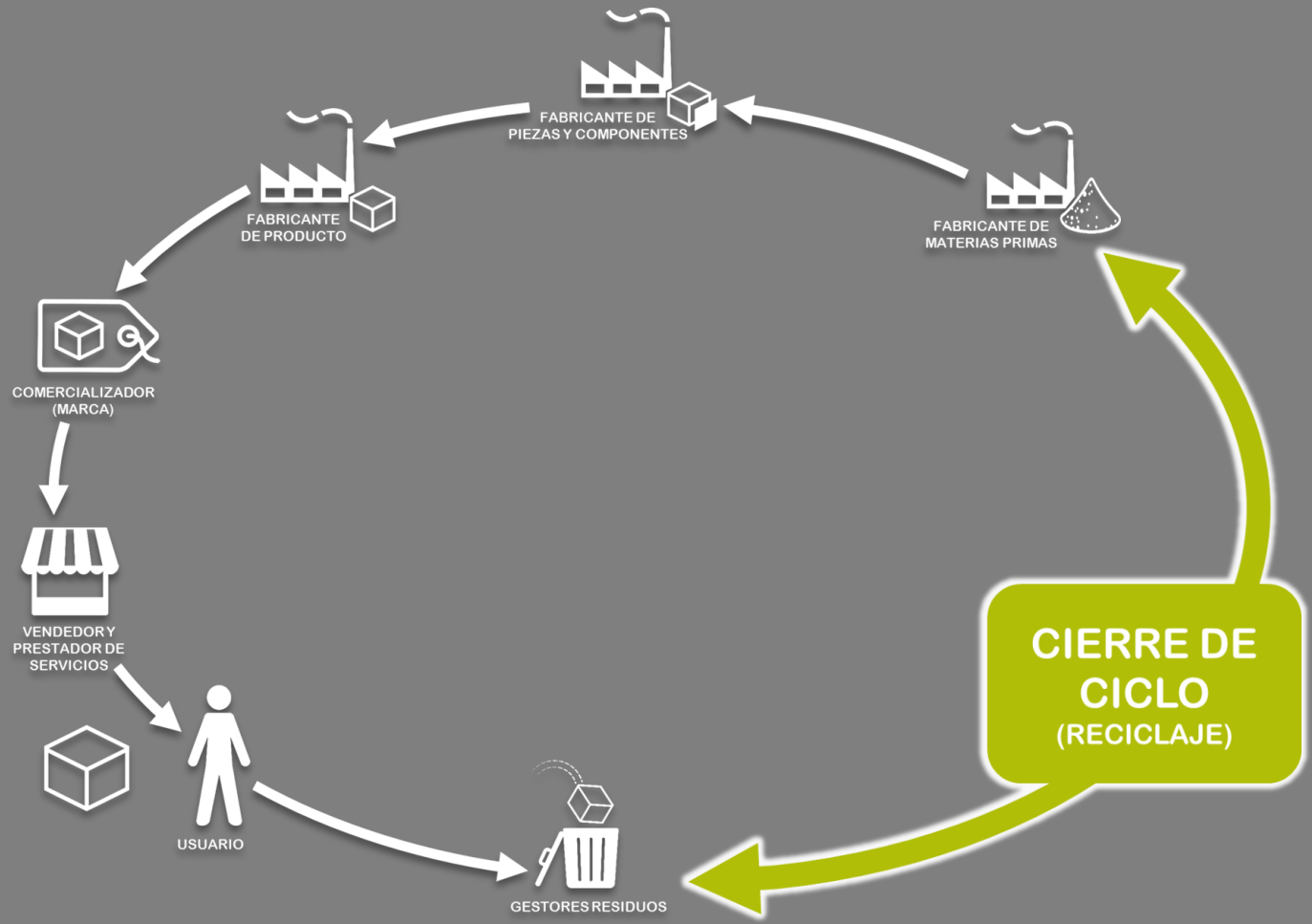
European
Commission
CIRCULAR
ECONOMY

European Union law

¿Qué es la ECONOMÍA CIRCULAR?



RESIDUO FINAL
GESTORES DE RESIDUOS
USUARIO
VENDEDOR Y PRESTADOR DE SERVICIOS
COMERCIALIZADOR (MARCA)
FABRICANTE DE PRODUCTO
FABRICANTE DE PIEZAS Y COMPONENTES
FABRICANTE DE MATERIAS PRIMAS
RECURSOS NATURALES


FABRICANTE DE PIEZAS Y COMPONENTES
FABRICANTE DE MATERIAS PRIMAS
FABRICANTE DE PRODUCTO
COMERCIALIZADOR (MARCA)
VENDEDOR Y PRESTADOR DE SERVICIOS
USUARIO
GESTORES RESIDUOS
CIERRE DE CICLO
(RECICLAJE)

Es mucho más fácil reciclar un producto que ha sido diseñado para ello, que uno que no.

Ecodiseño

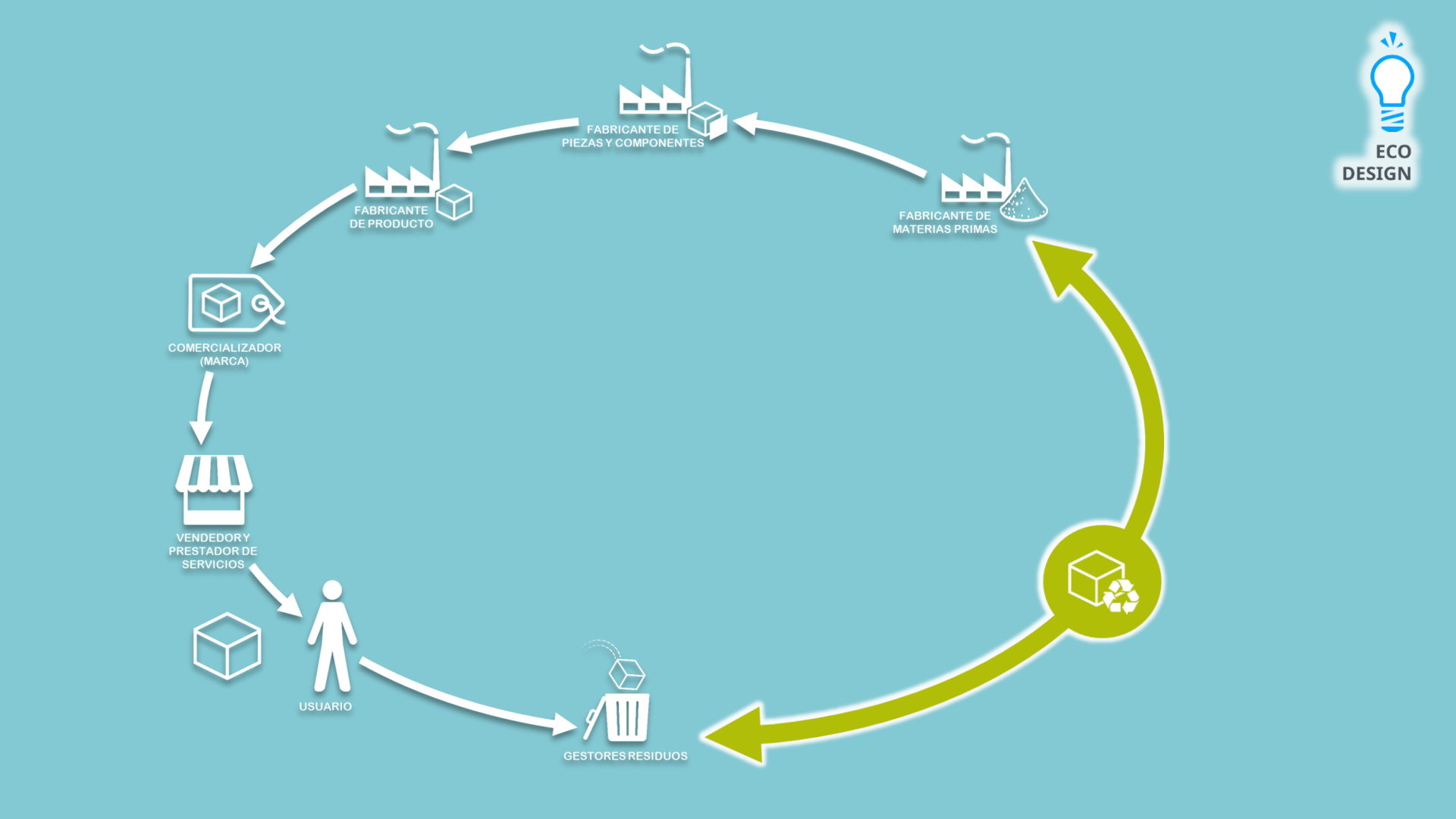
Proceso de diseño que, **además** de criterios técnicos, de usuario y de entorno, integra aquellos **requerimientos ambientales** durante el proceso técnico y creativo para definir y solucionar problemáticas concretas.

Ilustración: A perfect packaging doesn't involve destruction (Timofey Yuriev Voronin, 2011). Campaign for WWF

80%

Impactos ambientales de los productos que se determinan en la fase de diseño

ECO DESIGN


ECO
DESIGN
FABRICANTE DE
PIEZAS Y COMPONENTES
FABRICANTE
DE PRODUCTO
FABRICANTE DE
MATERIAS PRIMAS
COMERCIALIZADOR
(MARCA)
VENDEDOR Y
PRESTADOR DE
SERVICIOS
USUARIO
GESTORES RESIDUOS

Recycling Is Not The Answer To The E-Waste Crisis

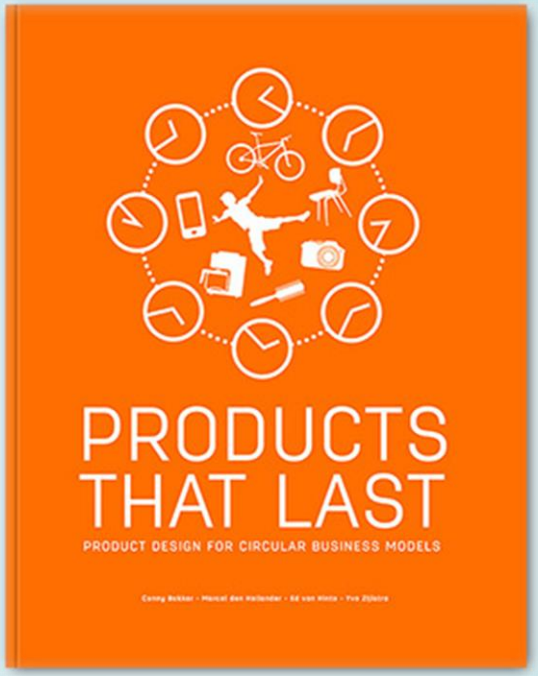
Vianney Vaute Contributor
Green Tech

Time to go beyond recycling. PHOTO BY PAWEŁ CZERWIŃSKI ON UNSPLASH

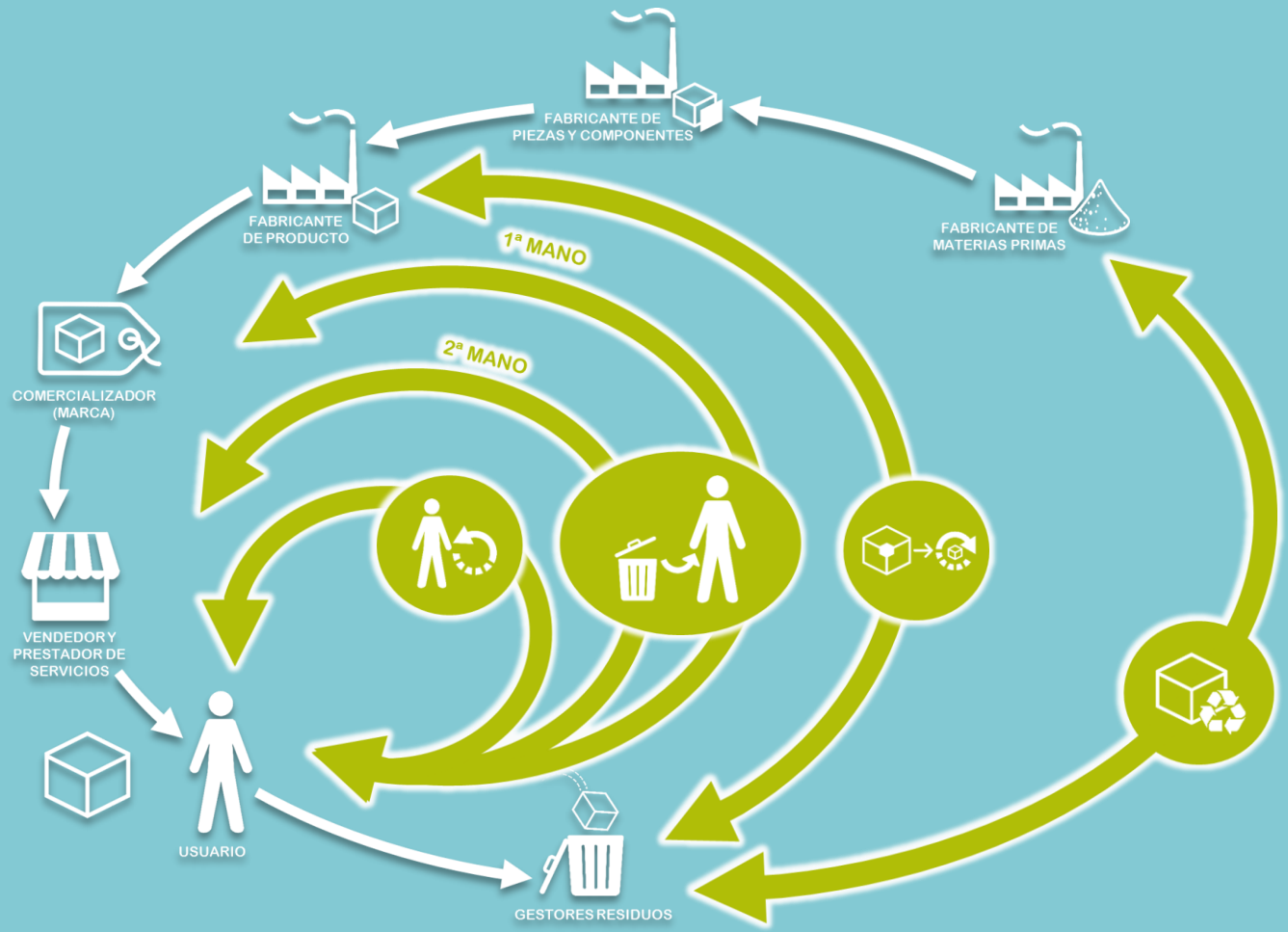
People feel good about recycling, maybe even more so when it comes to electronics. Remembering to take your computer or smartphone and dropping it off to be recycled feels like an accomplishment in itself.

ECO DESIGN

El mejor residuos es aquel que no se genera (o al menos aquel que se genera más tarde).



TU Delft · Agentschap NL Ministerie van Economische Zaken · DU DESIGN UNITED


FABRICANTE DE PIEZAS Y COMPONENTES
FABRICANTE DE PRODUCTO
FABRICANTE DE MATERIAS PRIMAS
1ª MANO
2ª MANO
COMERCIALIZADOR (MARCA)
VENDEDOR Y PRESTADOR DE SERVICIOS
USUARIO
GESTORES RESIDUOS

ECO DESIGN

ECO DESIGN

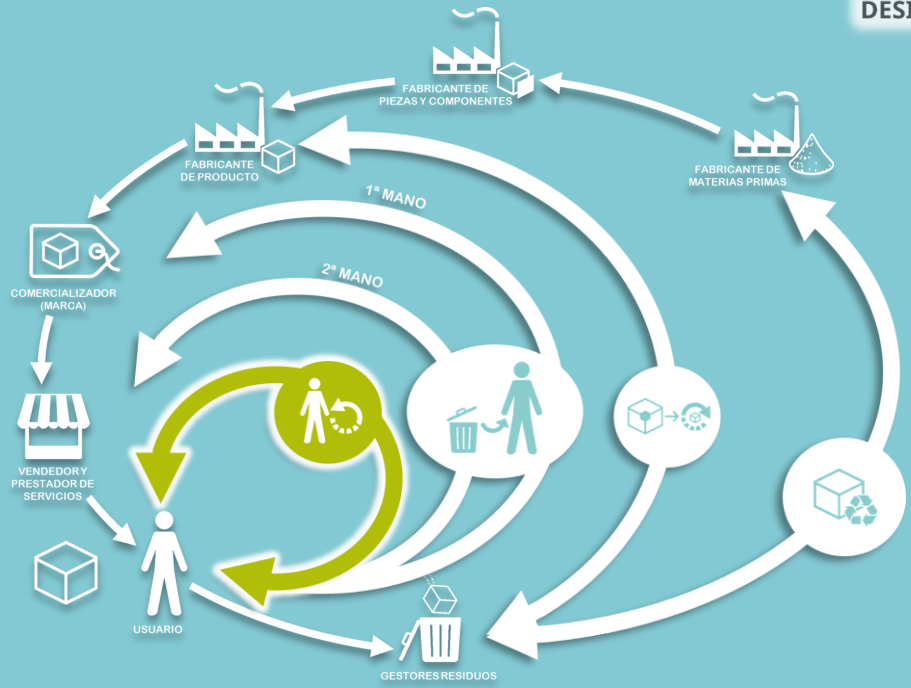
ALARGAR LA VIDA DEL PRODUCTO:

FIDELIZACIÓN

DURABILIDAD

MANTENIMIENTO Y REPARACIÓN:

REPARABILIDAD



REUTILIZACIÓN (2ª MANO):

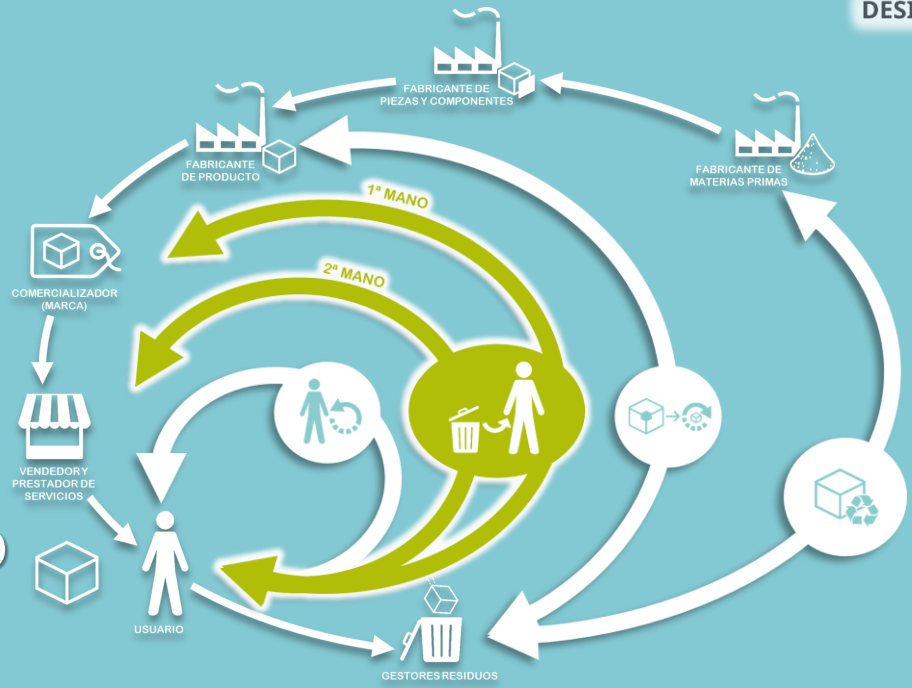
REUTILIZACIÓN

RECUPERACIÓN DEL PRODUCTO:

RENOVACIÓN
(2ª MANO)

REACONDICIONAMIENTO
(2ª MANO)

REMANUFACTURA
(1ª MANO)



ECO DESIGN

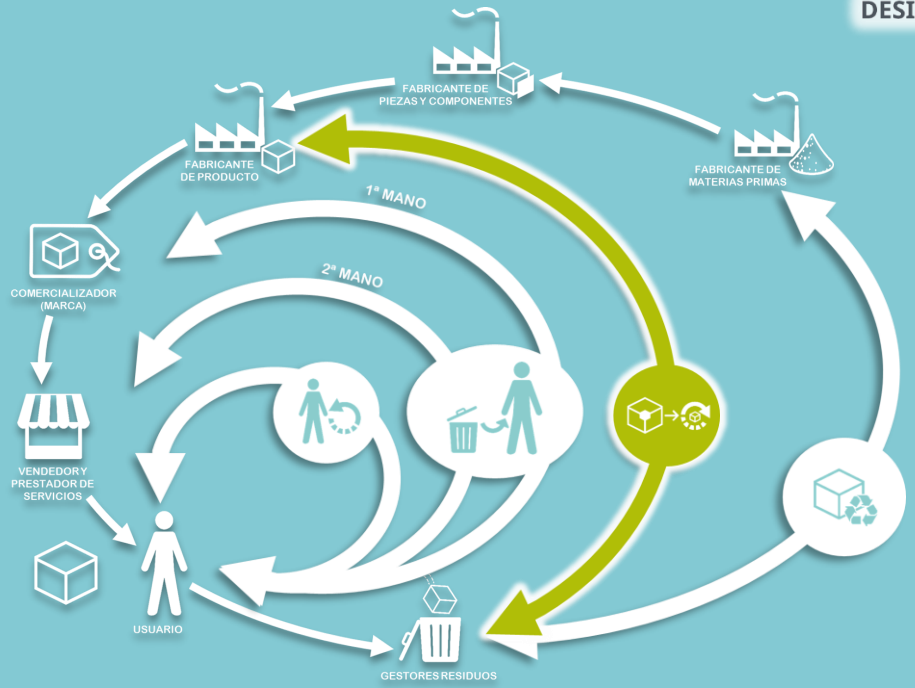
ECO DESIGN

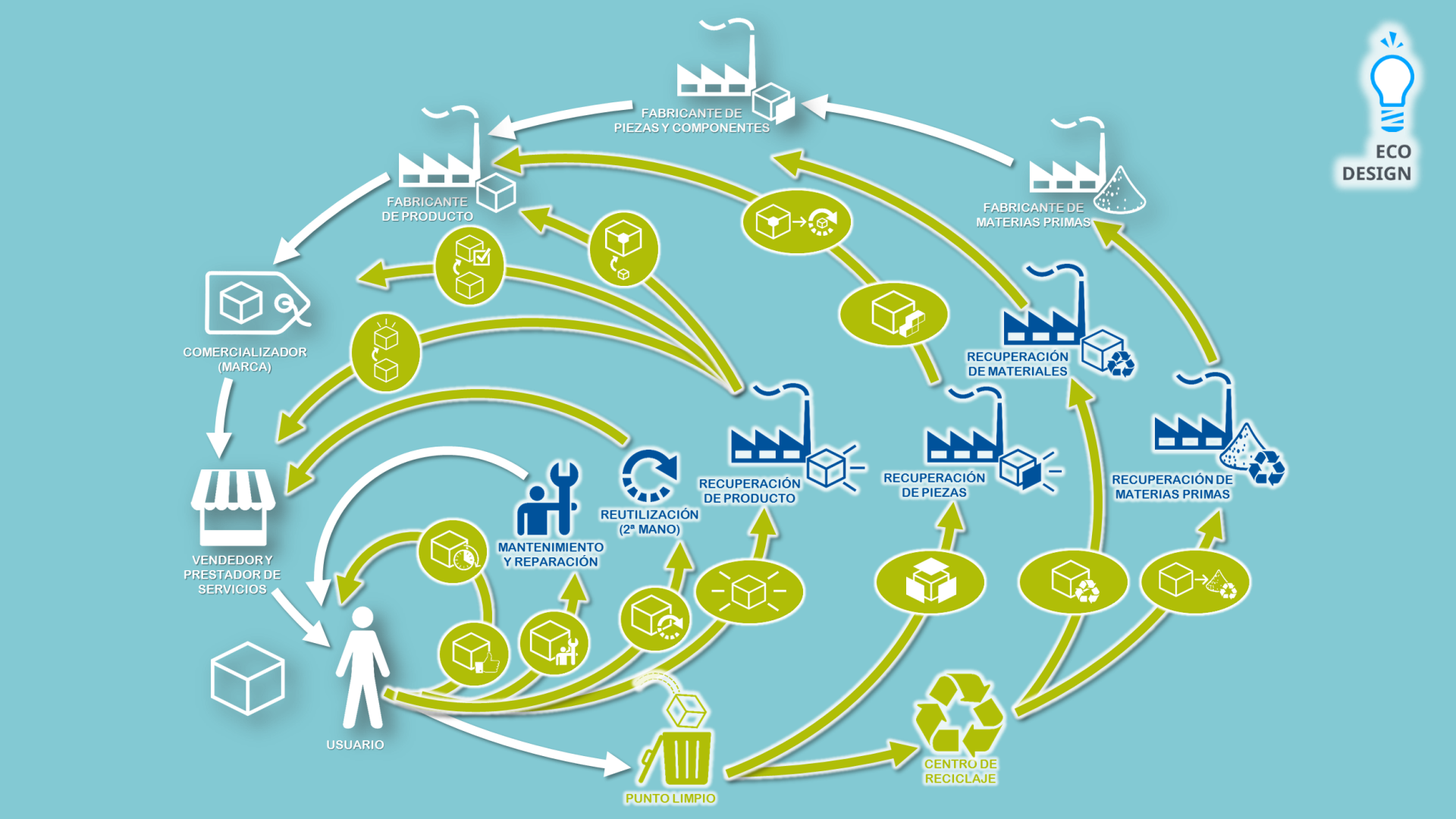
RECUPERACIÓN DE PIEZAS:

DESMONTAJE

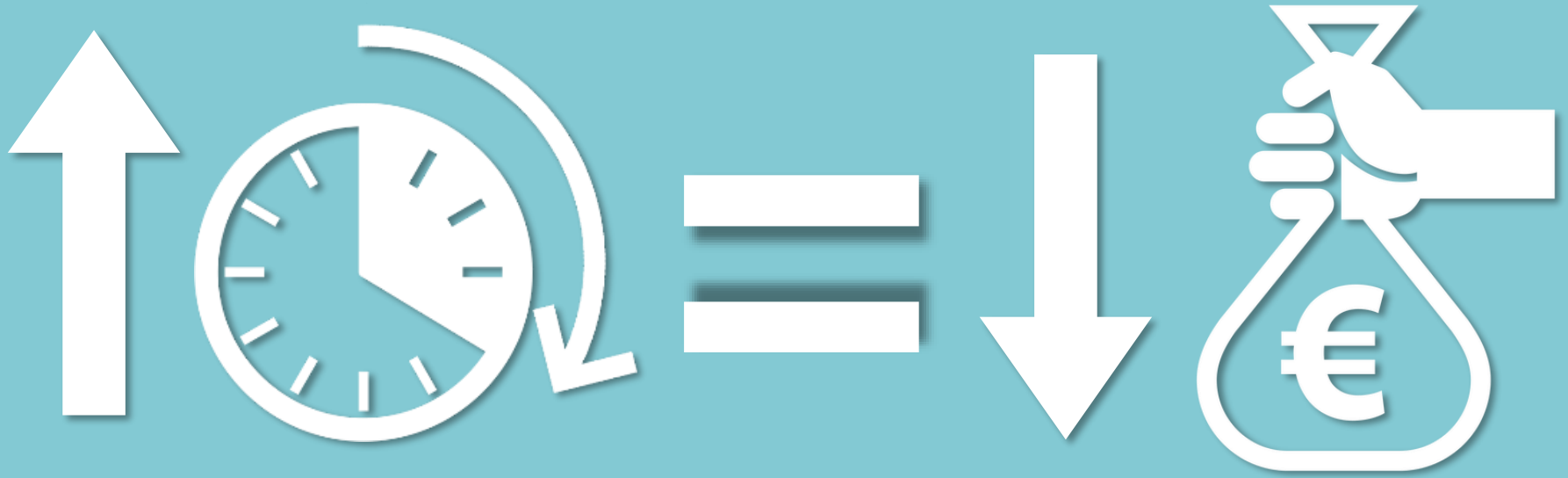
ESTANDARIZACIÓN

REUTILIZACIÓN (DE PIEZAS)




ECO DESIGN
FABRICANTE DE PIEZAS Y COMPONENTES
FABRICANTE DE PRODUCTO
FABRICANTE DE MATERIAS PRIMAS
COMERCIALIZADOR (MARCA)
RECUPERACIÓN DE MATERIALES
VENDEDOR Y PRESTADOR DE SERVICIOS
MANTENIMIENTO Y REPARACIÓN
REUTILIZACIÓN (2ª MANO)
RECUPERACIÓN DE PRODUCTO
RECUPERACIÓN DE PIEZAS
RECUPERACIÓN DE MATERIAS PRIMAS
USUARIO
PUNTO LIMPIO
CENTRO DE RECICLAJE

ECO
DESIGN



ECO
DESIGN

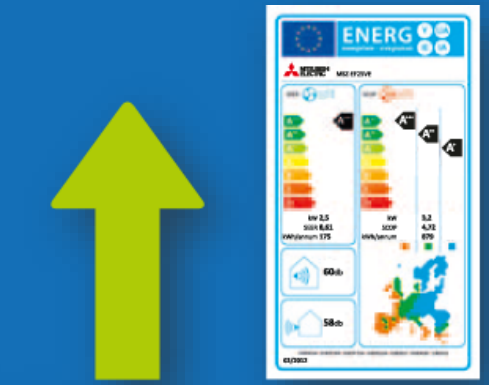
La historia secreta
de la Obsolescencia Programada
COMPRAR
TIRAR
COMPRAR
Un film de Cosima Dannoritzer

ECO
DESIGN

Requisitos legales aplicable a los productos relacionados con la energía:

Ecodesign

Inefficient products below the minimum requirements



Non-CE-compliant

Energy Labelling

European Commission

CONSUMPTION AND STOCK

I shop
therefore
I am

CONSUMPTION AND STOCK

CONSUMPTION AND STOCK

CHANGE THE
POLITICS NOT THE
CLIMATE
FRIDAYS FOR
FUTURE

CONSUMPTION AND STOCK

VENTA DE PRODUCTO

EL PAÍS

CONSUMO ›

La sociedad da la espalda a la propiedad: usuarios de todo; dueños de nada

Un cambio en los hábitos de consumo de los ciudadanos está transformando la economía y las empresas. Bien por necesidad bien por convencimiento, los ciudadanos relegan la adquisición de objetos en favor del arrendamiento de servicios.

SANDRA LÓPEZ LETÓN

Madrid - 6 OCT 2019 - 14:15 CEST

ACCESO AL USO

CONSUMPTION AND STOCK

Car Sharing

1 800
cities globally have car sharing schemes

8 mill.
members are signed up for car sharing

112 000
vehicles are engaged in car sharing

1/10
new cars sold will be a shared vehicle in 2030

+16.5%
more people will use car sharing in 2025

All forecasts.by Frost & Sullivan and McKinsey

DISRUPTING THE CAR

Alternatives to car ownership by trip length

Micromobility

0-5 miles

BIKES & SCOOTERS

motivate, scoot, Lime, SPIN, /skip/, BIRD, JUMP, Razor

60% of trips in the US

Medium distance

5-15 miles

RIDE HAILING

UBER, lyft, VIA, Gett

25% of trips in the US

Long distance

15+ miles

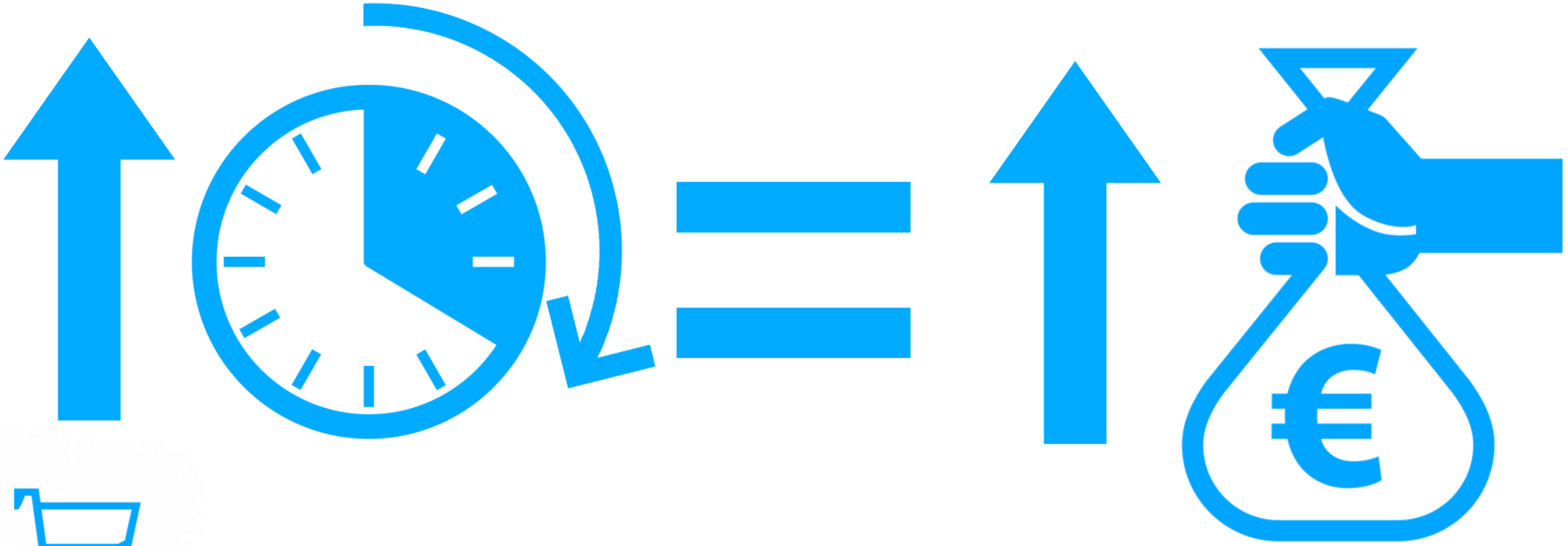
CAR SHARING

MAVEN, CAR2GO, Getaround, TURO

15% of trips in the US

CONSUMPTION AND STOCK

Source: NHTS

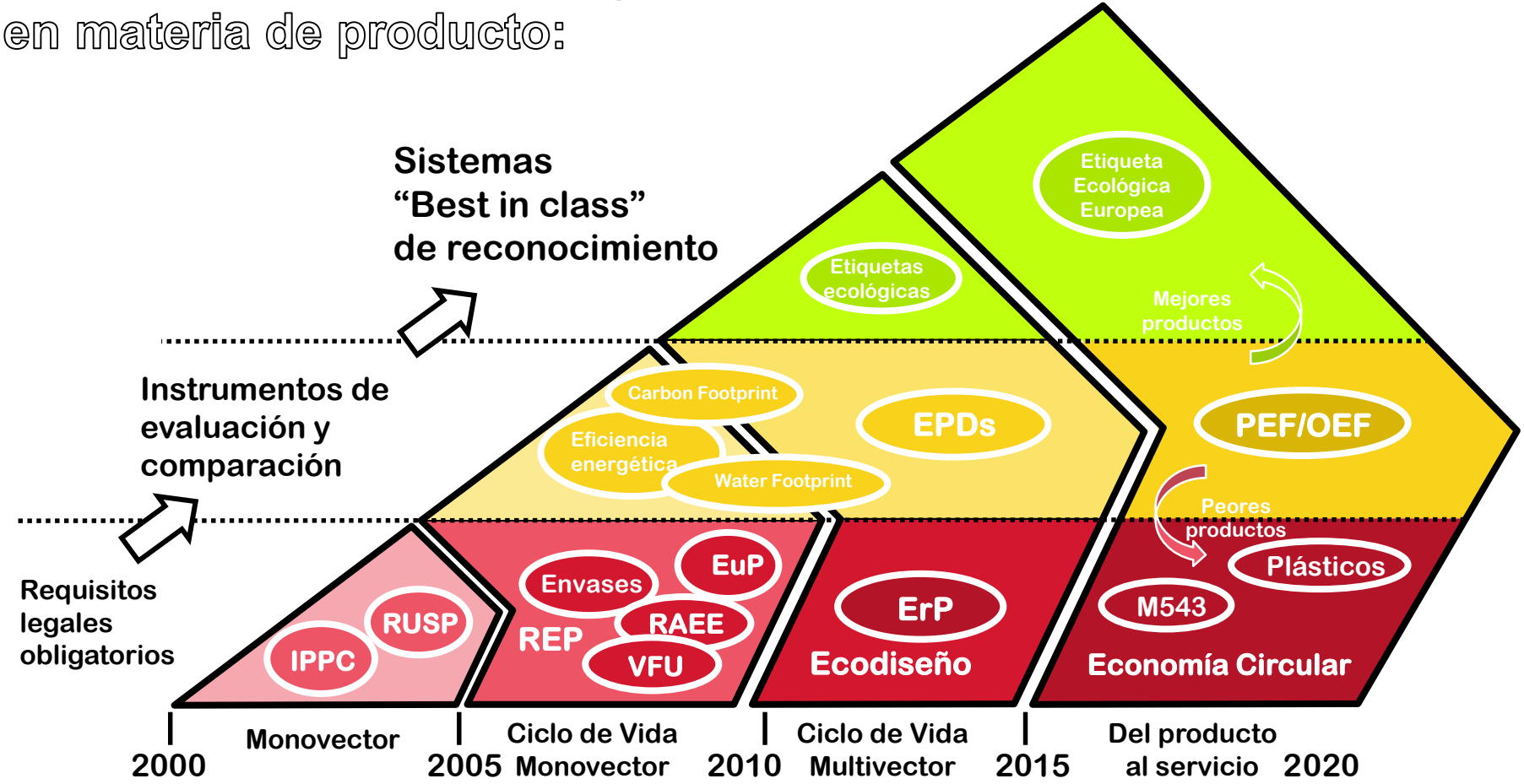


CONSUMPTION
AND STOCK

CONSUMPTION
AND STOCK

BIO
PUREORGANIC
NATURAL
bio
100% NATURAL PRODUCT
NATURAL
ORGANIC
eco
ECO
eco
bio
SUGAR FREE
NATURAL PRODUCT
100% ORGANIC
ECO FRIENDLY
BIO
NON TOXIC
100% NATURAL
ORGANIC FOOD
ECO
GO GREEN
NATURAL
HEALTH
ORGANIC
GIF.TV

Marco de instrumentos legales en Europa en materia de producto:



Business Models for a Circular Economy

Aporte de valor a través del **PRODUCTO**

Aporte de valor a través del **SERVICIO**

Sólo PRODUCTO	Sistema PRODUCTO – SERVICIO (PSS – PRODUCT SERVICE SYSTEM)			Sólo SERVICIO
VENTA DE PRODUCTO	**SERVICIOS DE APOYO**	**ACCESO AL USO**	**ACCESO AL RESULTADO**	**SERVICIO SIN PRODUCTO**

(Fuente: Arnold Tukker – 2004 - *Business Strategy and the Environment*)

SERVICIOS DE ACCESO AL

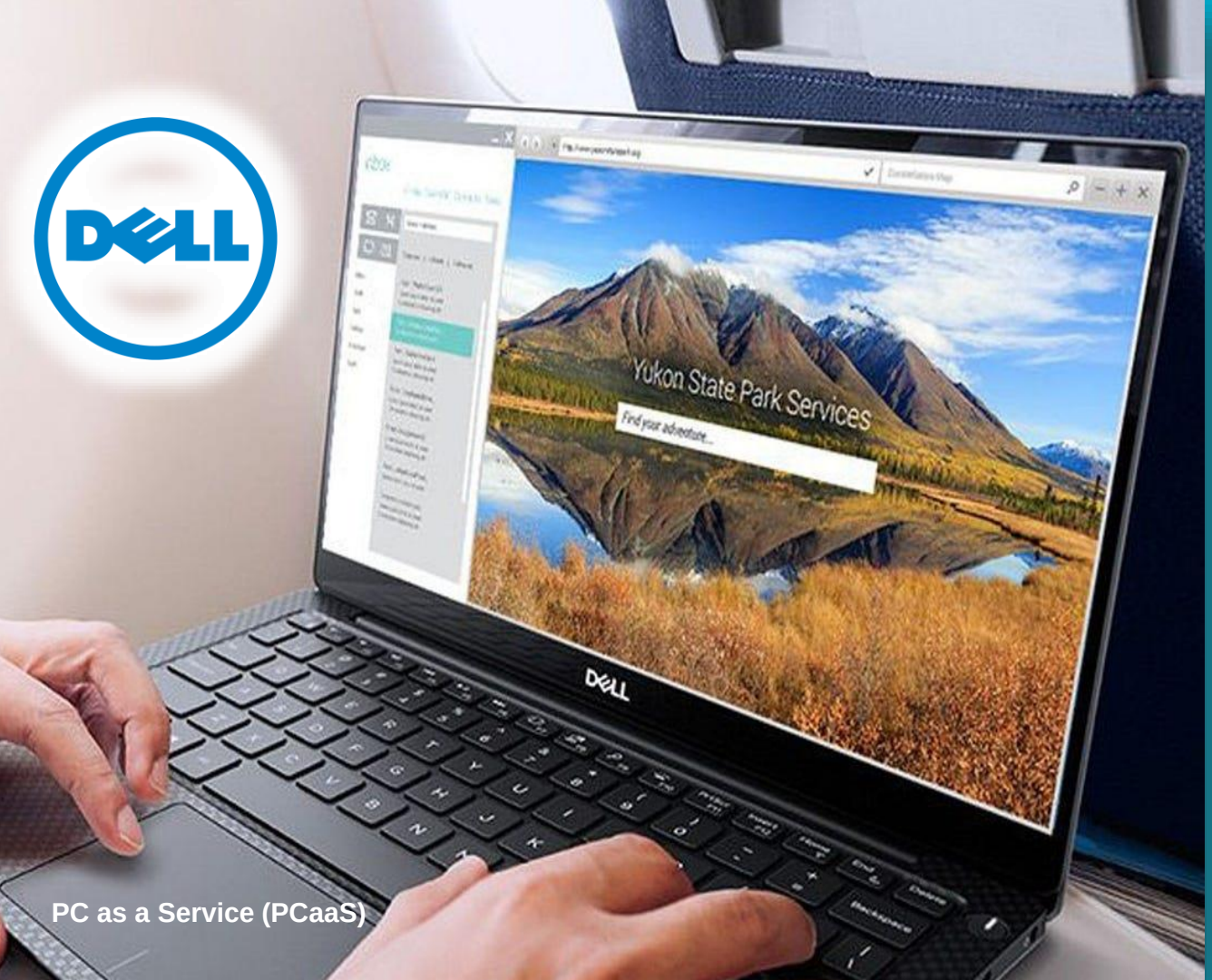
USO

SERVICIOS DE ACCESO AL USO

FAIRPHONE

THE CIRCULAR PHONE
Legal, operational and financial solutions to unlock the potential of the 'Fairphone-as-a-Service' model
FAIRPHONE
NEDERLAND CIRCULAIR!
CIRCLE ECONOMY
NBA
CIRCULARISE
PGGM
ABN·AMRO
ALLEN & OVERY

SERVICIOS DE ACCESO AL
USO



PC as a Service (PCaaS)

SERVICIOS DE ACCESO AL **USO**

SERVICIOS DE ACCESO AL **RESULTADO**

SERVICIOS DE ACCESO AL **RESULTADO**

SERVICIOS DE
ACCESO AL
RESULTADO

WASTE
REMANUFACTURAR
REACONDICIONAR
RENOVAR
REUTILIZAR
RECICLAR

WE SIMPLY CAN'T AFFORD TO WASTE OUR WASTE

*The circular economy is an economic model that treats **waste as a valuable resource** – nothing is wasted. It's good for the environment, good for business and good for the economy.*

WASTE

TODAY'S CHALLENGES...

475kg of annual municipal waste generated per person

~600m tonnes of recyclable materials thrown away or 'wasted' annually

48% of total waste treated is sent to landfill

only **44%** of municipal waste in EU composted or recycled

~30% of plastic waste goes to landfills (30% is recycled)

TOMORROW'S OPPORTUNITIES...

50% less food waste

100% ban on landfilling separated waste

maximum **10%** landfillling of municipal waste

65% of municipal waste recycled

3% boost in GDP from industrial material savings

...AND ALL WITHIN OUR LIFETIME!

CLOSING THE LOOP...

The European Union's circular economy package closes the loop in production, consumption, waste and raw materials.

Because it's time to leave behind the linear – take, make and throw away – economy in favour of the circular – make, use, reuse – economy.

Source: Eurostat and European Commission

European Commission

Con objetivos específicos de material para diferentes materiales de embalaje:

75%

60%

85%

80%

55%

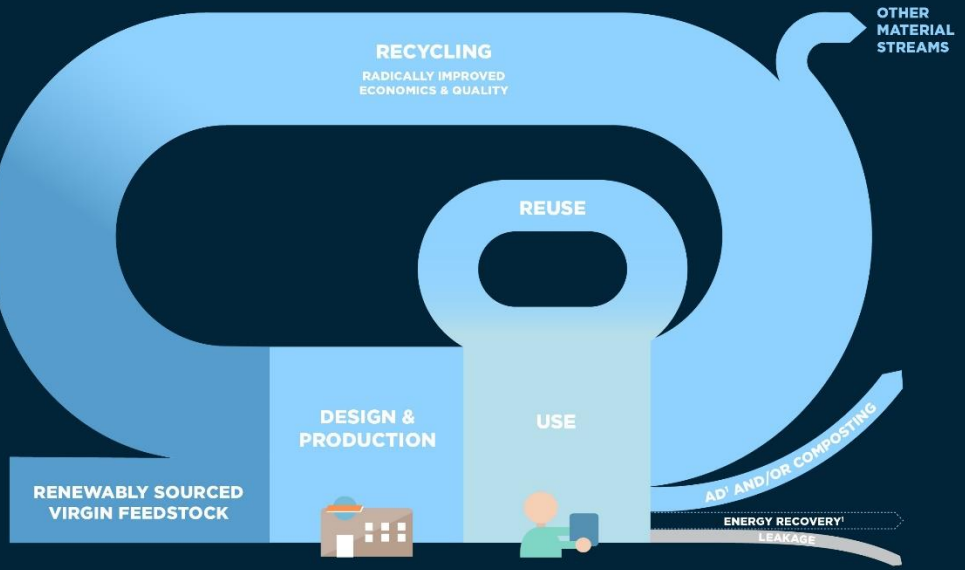
30%

(a alcanzar en UE 2030)

Objetivos UE en botellas de plástico para bebidas de un solo uso en 2030:
30%
Material reciclado
90%
Tasa de recogida

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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The future is circular

#CircularEconomy