



FEDERCHIMICA  
CONFINDUSTRIA



Responsible Care®  
OUR COMMITMENT TO SUSTAINABILITY

# Sustainability and circularity: chemistry as a driving force

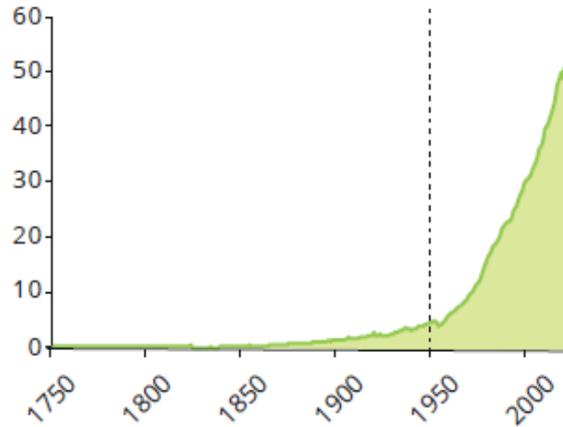
Milan, 30<sup>th</sup> January 2020

# Megatrends

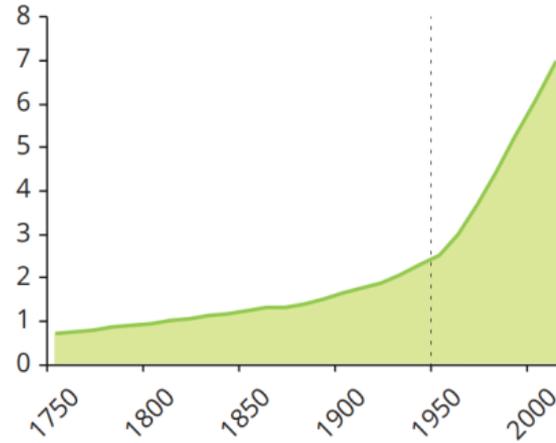


# Global development: economic, social and environmental megatrends

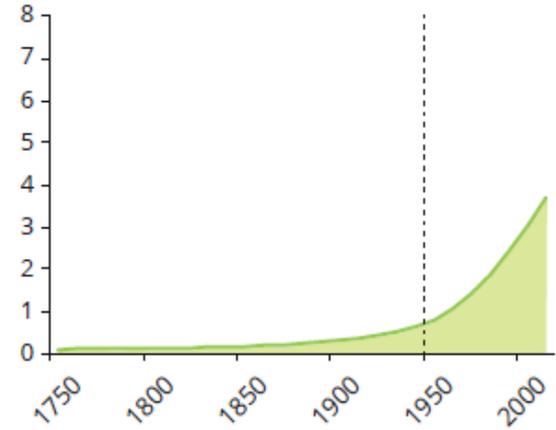
Real GDP  
Trillion USD



World population  
Billion

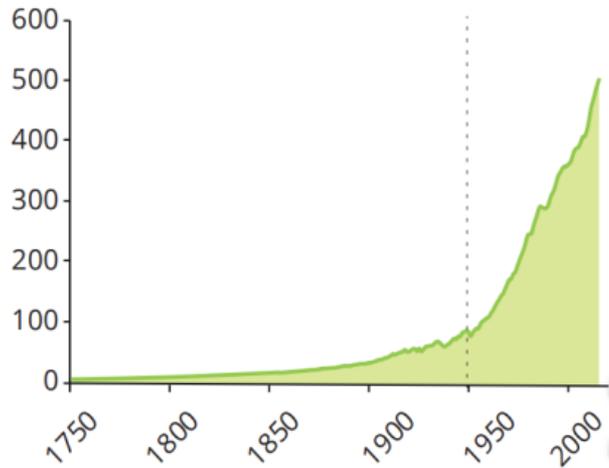


Urban population  
Billion

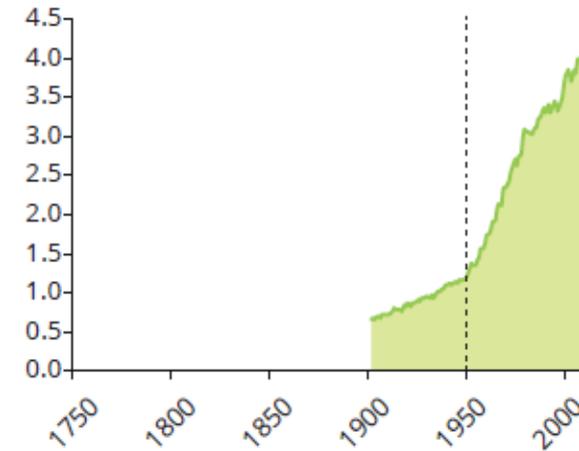


# Global development: economic, social and environmental megatrends

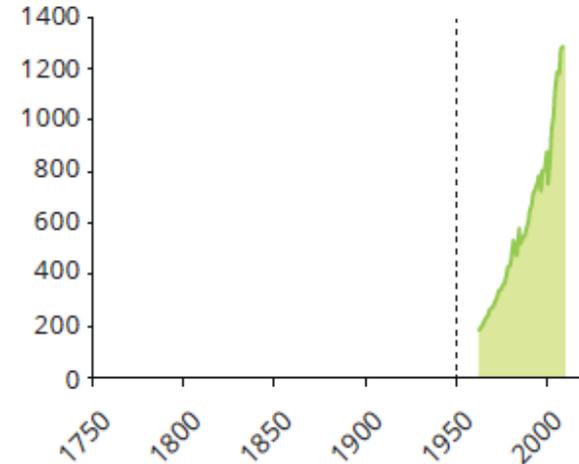
Primary energy use  
Exajoule



Water use  
Thousand km<sup>3</sup>

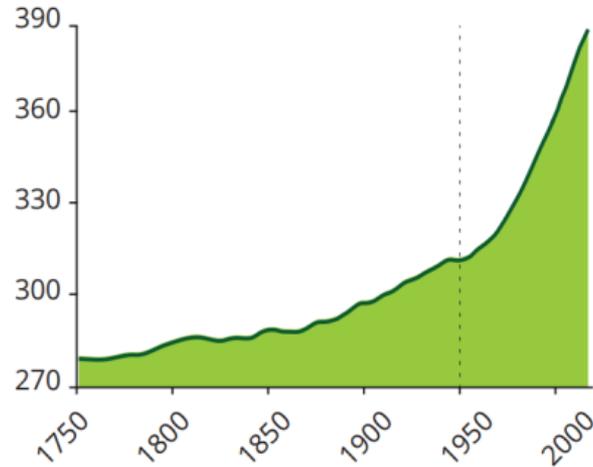


Transport  
Million vehicles

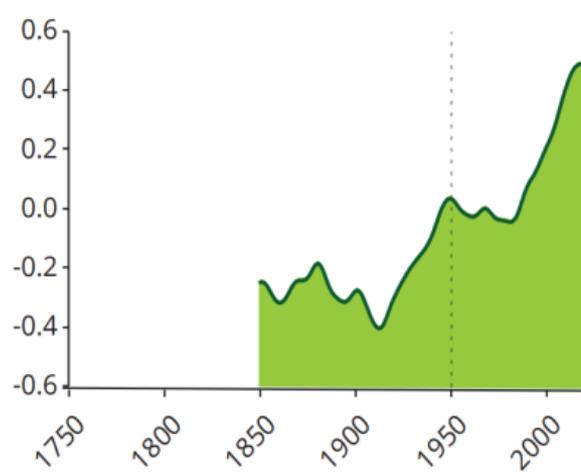


# Global development: economic, social and environmental megatrends

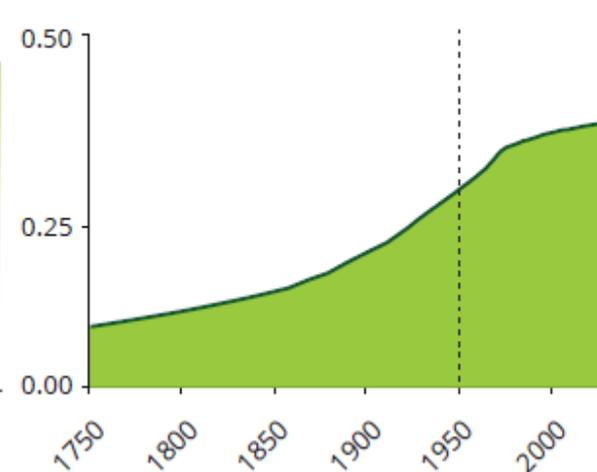
Carbon dioxide  
ppm



Surface temperature  
°C

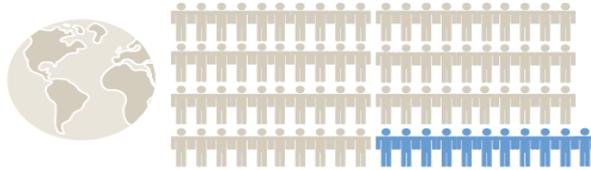


Domesticated land  
%



# 2050: expected megatrends

1.1 bn more people



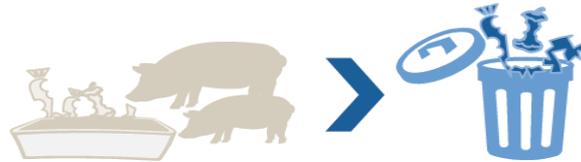
Dramatic shift to packaged products



1.8 bn more middle-class consumers



Much greater waste at end of life



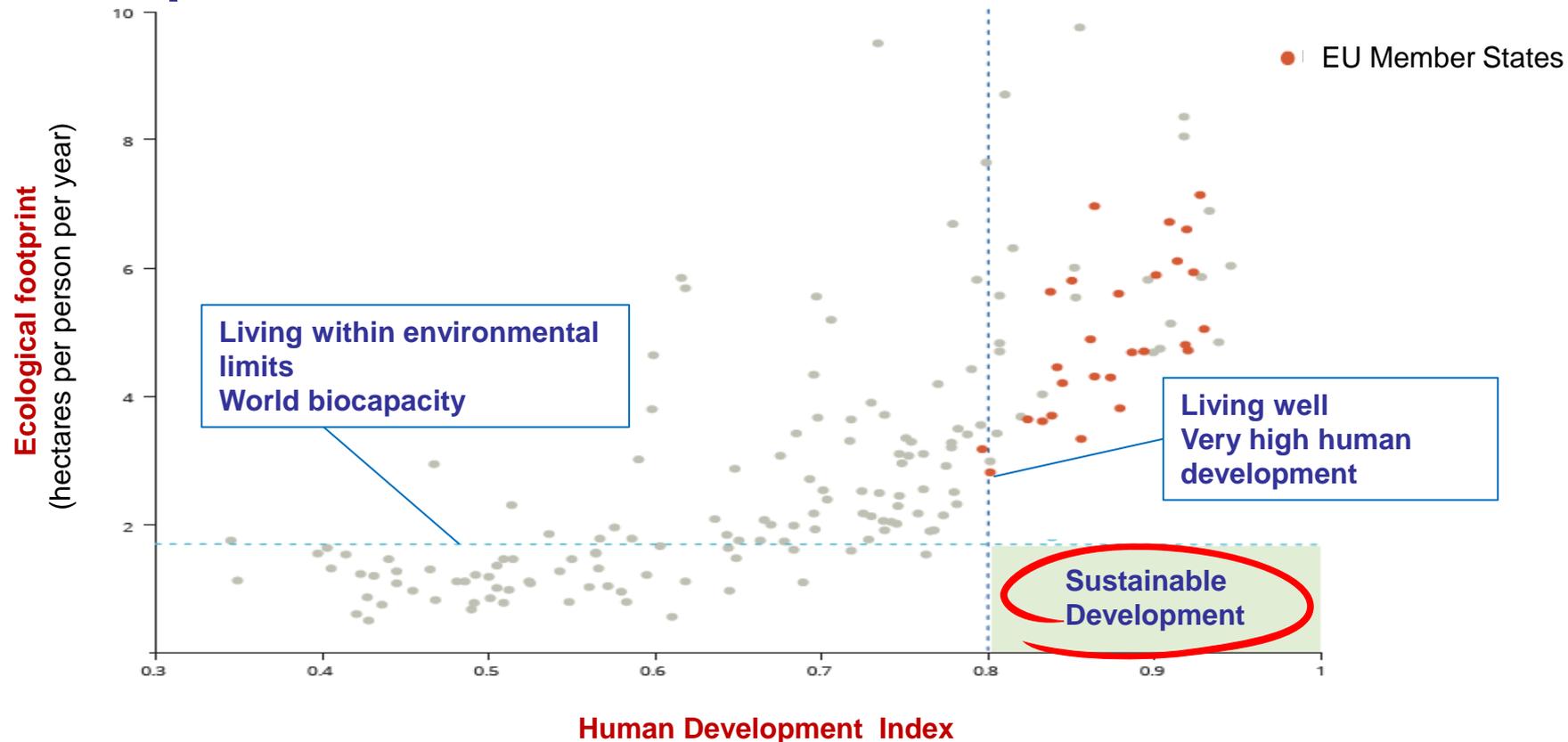
Food: caloric  
consumption  
**+24%**

Food  
spending  
**+57%**

Packaging  
**+47%**

End-of-life  
materials  
**+41%**

# Correlation between ecological footprint and human development



# Political and legislative drivers

## From

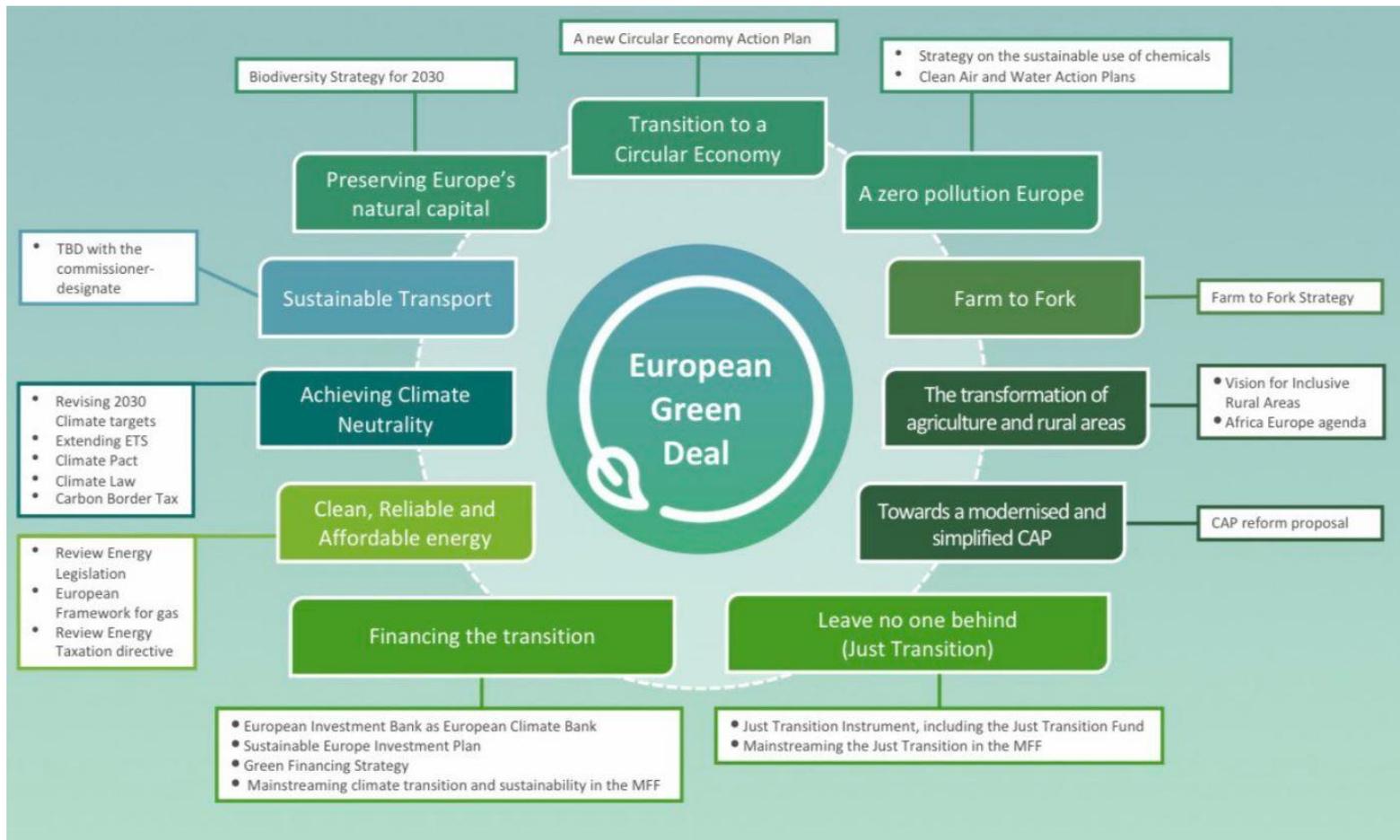
### «Circular Economy Package»

## To

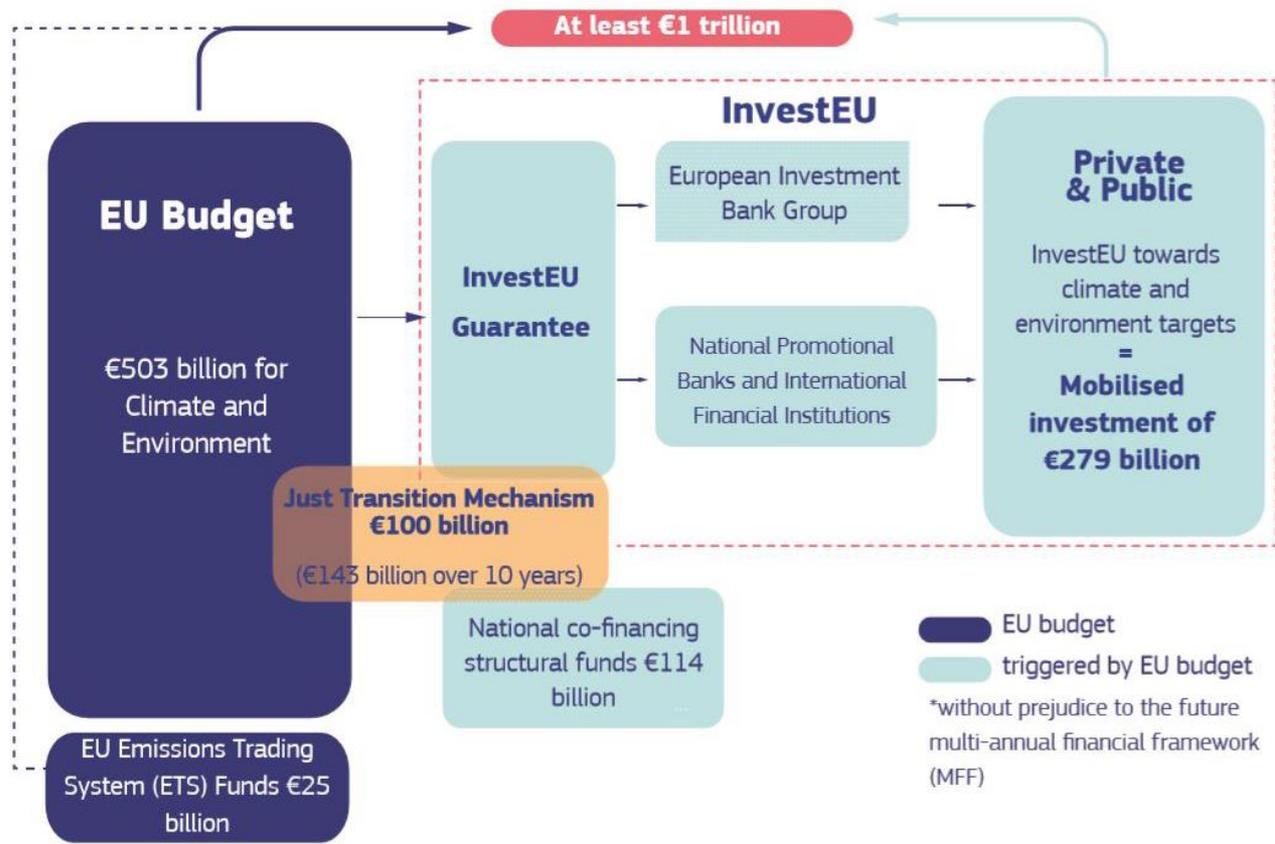
### «Green Deal»



# European Commission Green Deal

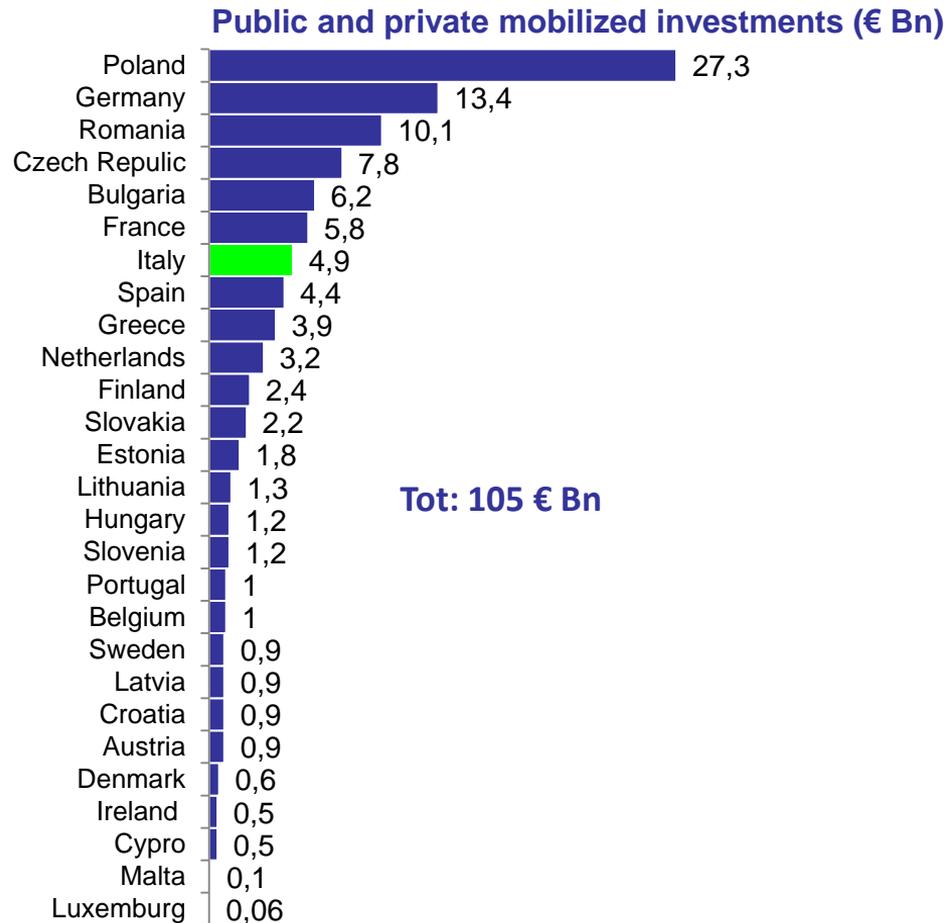
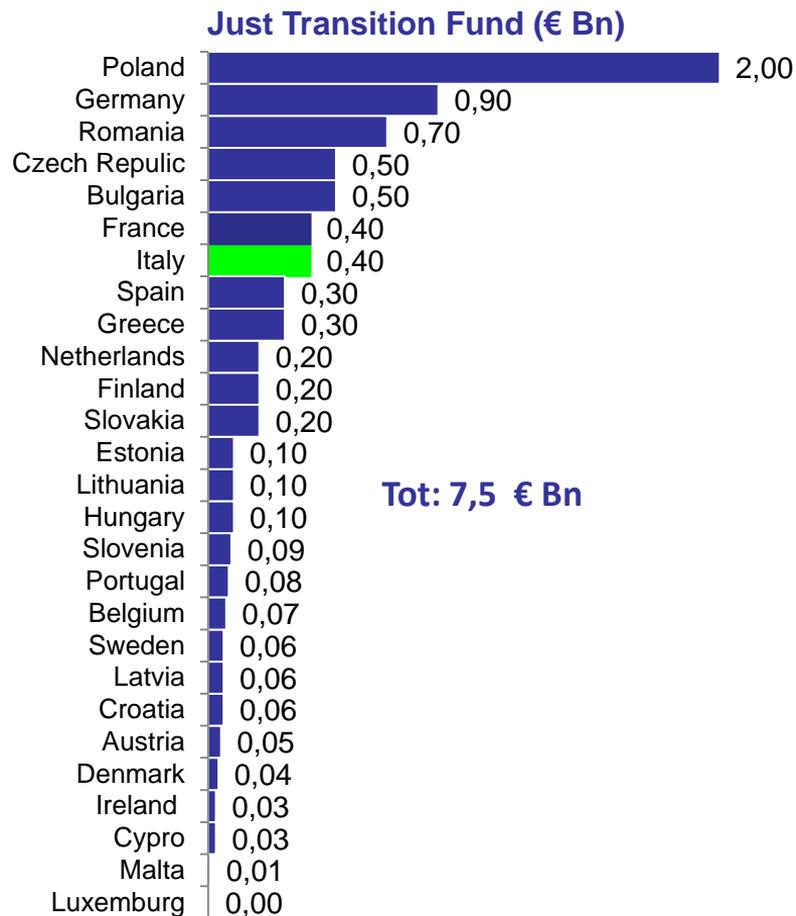


# Sustainable Europe Investment Fund (2021- 2027)



\*The numbers shown here are net of any overlaps between climate, environmental and Just Transition Mechanism objectives.

# The Just Transition Fund of UE



# Economics, market drivers and sustainable finance



# Changing of consumers preferences and retailers and brands reaction



54% of consumer (67% among millennials) is willing to pay a premium for more sustainable products

+

28% not willing but choose such products over others\*



Strong sustainability impact on the whole value chain

\*Source: Accenture Global Consumer Sustainability Survey

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## Rischi globali, perché il «cigno verde» potrebbe essere peggiore del «cigno nero»

L'evento imprevedibile capace di mandare in crisi il sistema finanziario potrebbe essere di natura climatica secondo diversi think tank e policymaker

ALLARME CLIMA

## Bce, il nuovo «bazooka» di Lagarde è contro il climate change

Lagarde, che dal 1° novembre guiderà la Banca centrale europea, ha preso posizione contro il mutamento climatico. E non è sola: su iniziativa di Mark Carney, numero uno della Banca d'Inghilterra, è nato un colossale network finanziario a difesa dell'ambiente con trenta tra banche centrali e istituti di regolamentazione, forte di un portafoglio complessivo di 100mila miliardi di dollari

SERVIZIO | LETTERA DI LARRY FINK



## Il re degli investitori Larry Fink (BlackRock): il climate change trasformerà per sempre la finanza

Il fondatore e ceo della più grande società mondiale di gestione: il rischio climatico ci obbliga «a riconsiderare le fondamenta stesse della finanza moderna»

di Enrico Marro



(AFP)

# Sustainable Finance: ESG investment approaches

## Traditional

Competitive returns: Focus only on profit

## Sustainable

Responsible - ESG risk management

Sustainable - ESG opportunities

Thematic - impact solutions

Impact First - High impact solutions

## Global Sustainable investment 2016-2018

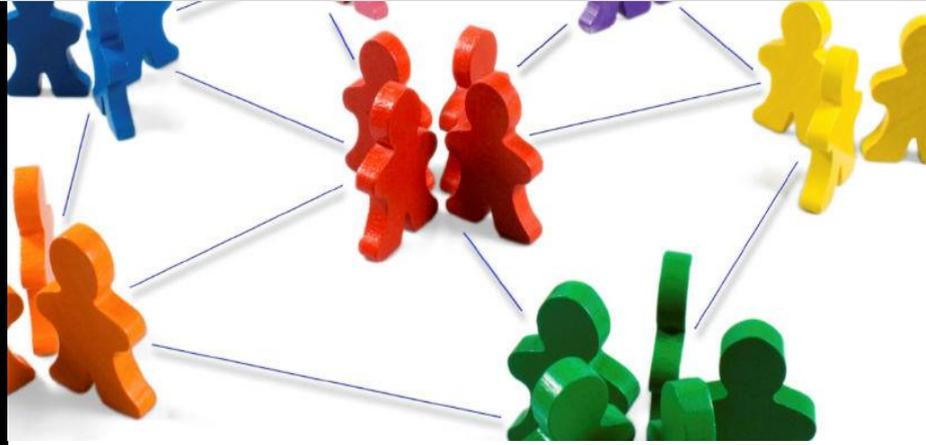
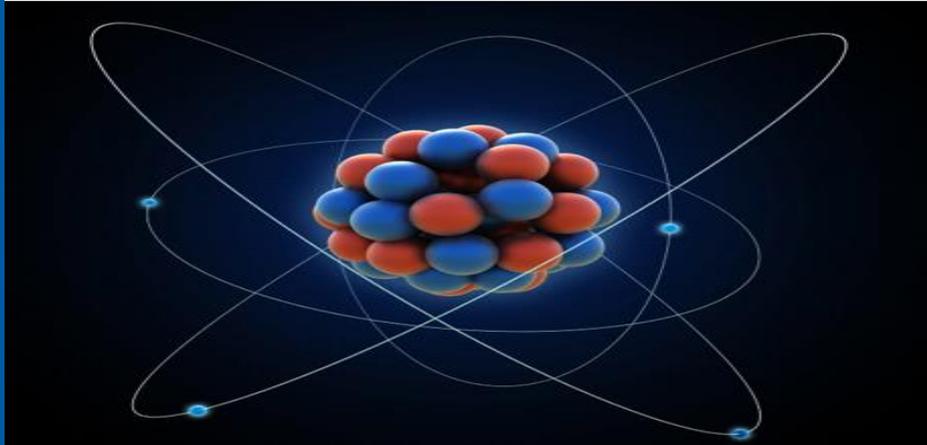
Worldwide \$ 30,7 Trillion (+34%)

Europe \$ 14 Trillion (+17%)

Italy \$ 1,8 Billion

# Sustainable development and circular economy

## The role of Chemical Industry and its value chain



# Chemistry and Sustainability: some examples



**Bio-based products**

**Biodegradable and compostable shoppers**

## Mulching film

High performance **bio-lubricants** for *environmental sensitive* applications

**Biofuels** from non-edible second generation biomass

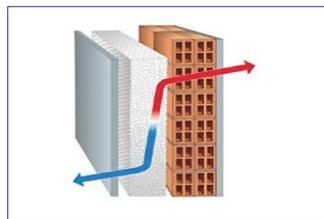


**Food packaging**

## New packaging

solutions with improved barrier properties, capable of increasing the shelf life of the food and reducing its waste (e.g. parmigiano reggiano pack)

*«Shelf Life and feed the planet»*



**Thermal isolation**

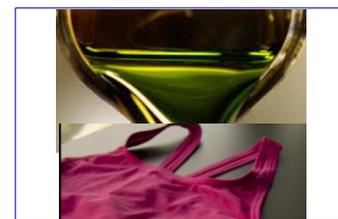
Development of increasingly **high-performance materials** to improve the energy efficiency of buildings



**“Green” tires**

**Innovative elastomers** with improved performance, able to minimize fuel consumption

Possible use of 'bio' additives



**Regenerated and recycled products**

**Nylon** regenerated from post-consumer and production waste

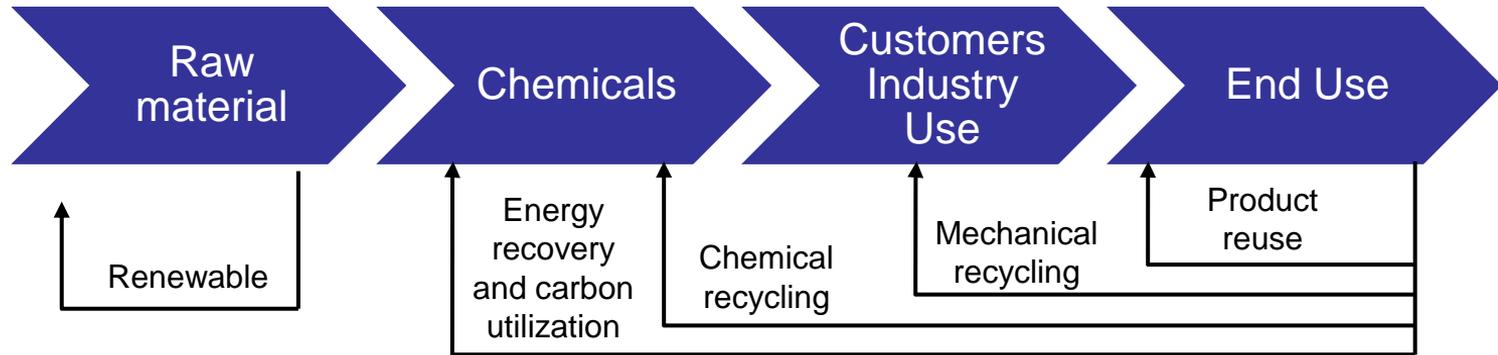
**Regenerated exhausted mineral oils**

**Chemical additives** for the recovery of "returned" concrete

Plastics recovery and recycling

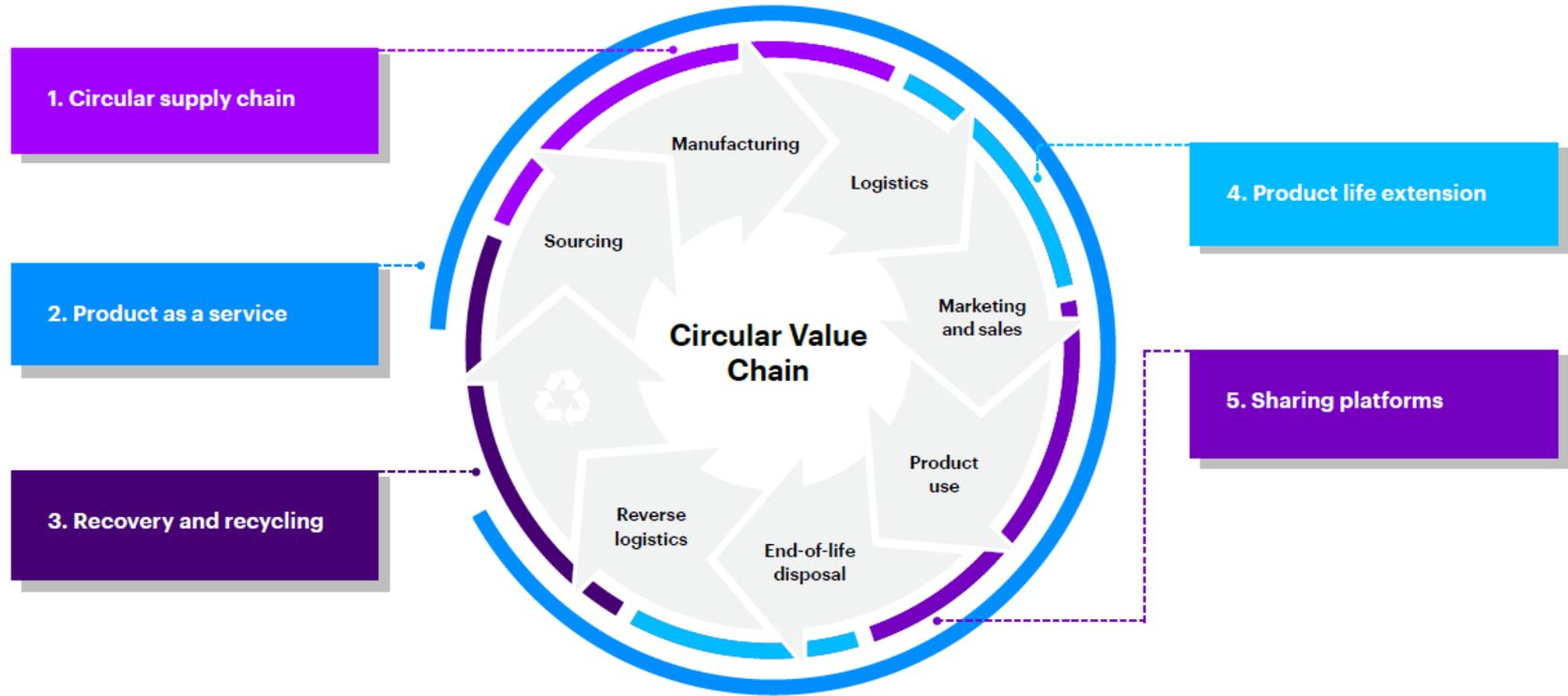
And many other examples of industrial symbiosis

# Circulating molecules through five loops



**Ingent Investment required**

# Five business models for growth in the circular economy



# Chemicals at the centre of technological disruption

2020

2025

2030

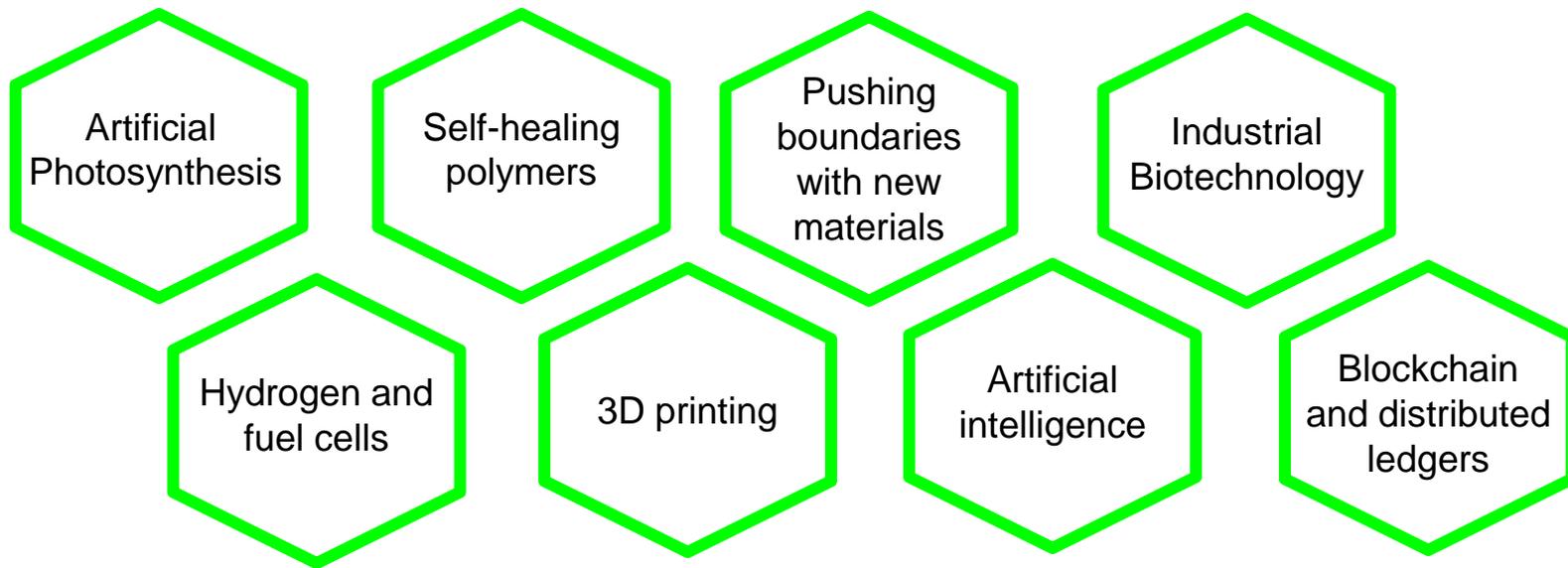
2050

- Chemical recycling of plastics - LS demonstration
- Recycling of CFR composite (e.g. wind blades) – LS demonstration
- CO<sub>2</sub> as feedstock for polymers – CS
- Widespread LS valorisation of biowastes
- Steel mill flue gas valorisation for chemicals
- LS production of advanced materials for EV batteries
- LS recycling of EV battery materials

- CO<sub>2</sub> valorisation with low carbon H<sub>2</sub> - LS demonstration
- LS demonstration of alternative route to H<sub>2</sub>

- Electrification of large chemical processes such as crackers
- Artificial photosynthesis from CO<sub>2</sub> and sunlight – LS demonstration

# Chemicals at the centre of technological disruption



# Chemistry 4.0, circular economy and digitalization

- International competition and growing attention towards sustainable development; **a season of change** for the chemical industry.
- After the challenges of globalization and specialization - **the chemical industry has entered phase 4.0.**
- **Chemistry 4.0** means circular economy and digitalization.
- Ecodesign, R&D, LCA, industrial symbiosis, extended supply chain (including consumer behavior), key elements of a successful sustainability strategy.
- Chemistry plays a fundamental role in this context, as it is located upstream of different supply chains and has the technological skills to lead change.

**“The best way  
to predict  
the future  
is to  
create it.”**

Abraham Lincoln



“The best way to predict the  
future is to create it.”

– Peter Drucker