

# Circular Economy, resource use and industry

State of play and future perspectives

11 November 2022

European Environment Agency

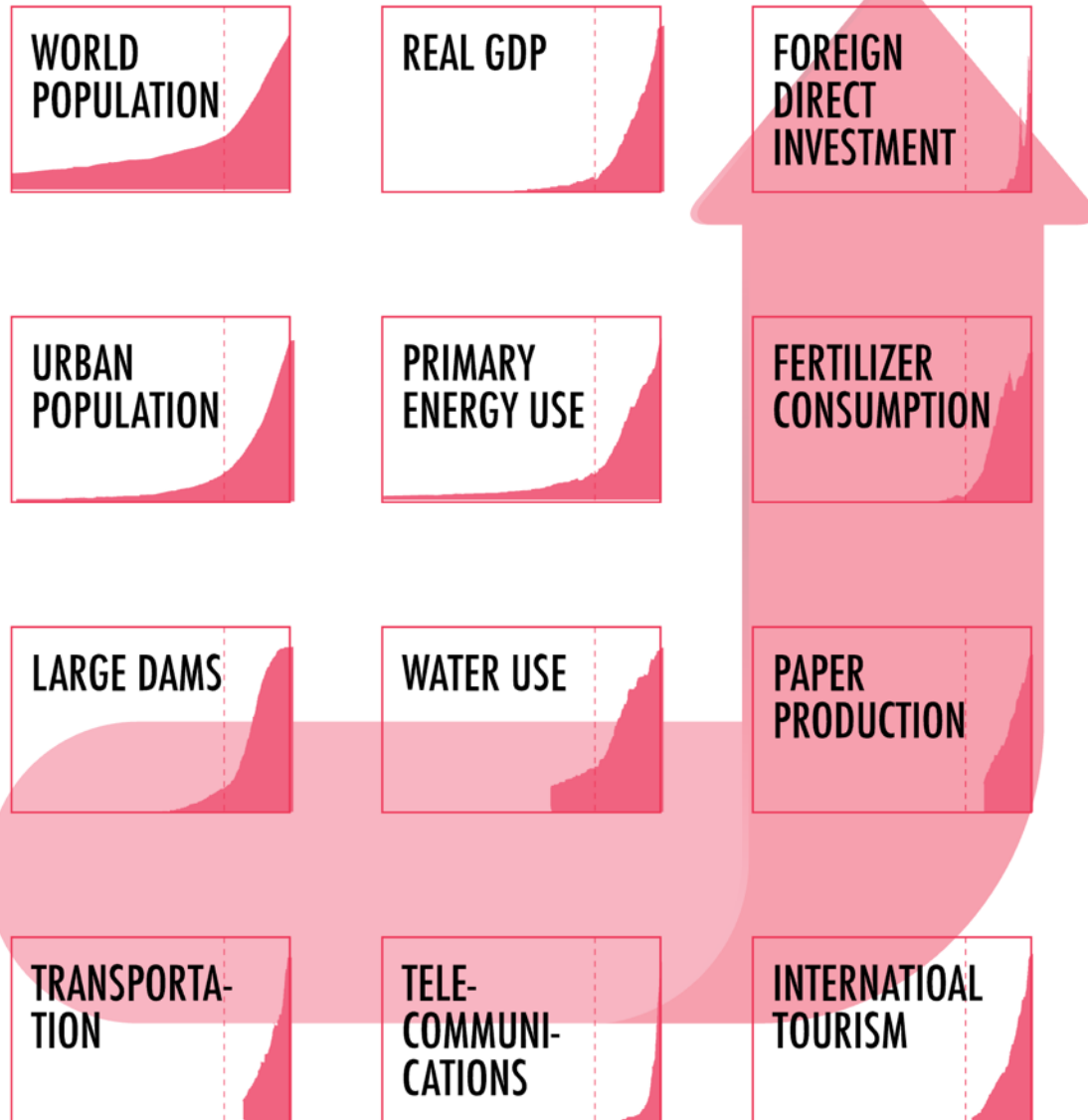


Daniel Martin-Montalvo, European Environment Agency

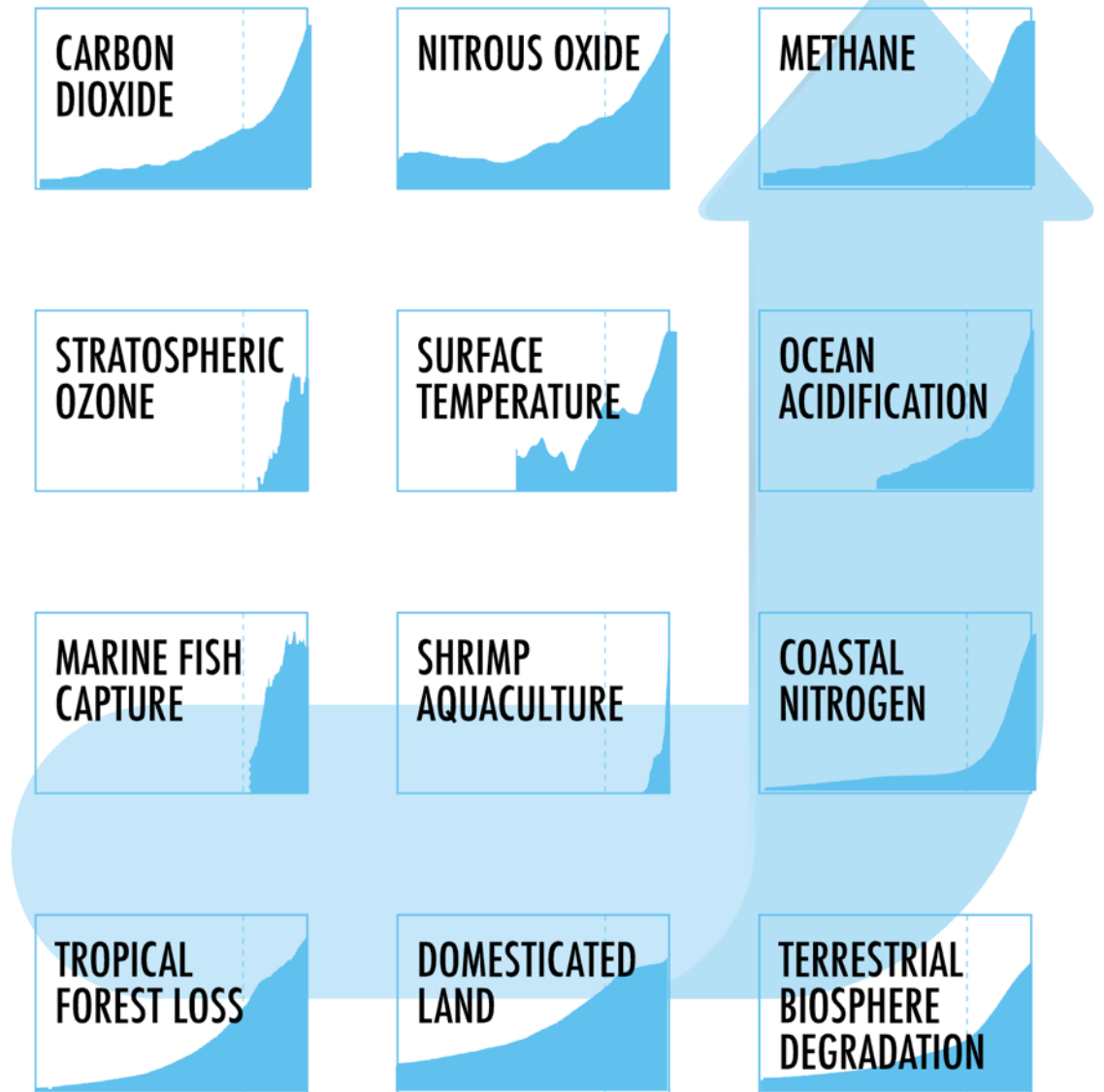


# Off the chart: global trends in the current paradigm

## Socio-economic trends



## Earth system trends





IPCC: cambio  
climático



IPBES: Perdida de  
biodiversidad



IRP: recursos  
naturales



OMS: medio  
ambiente y salud

**Urgency – this decade is key**

**Irreversible changes**

**Tipping points**

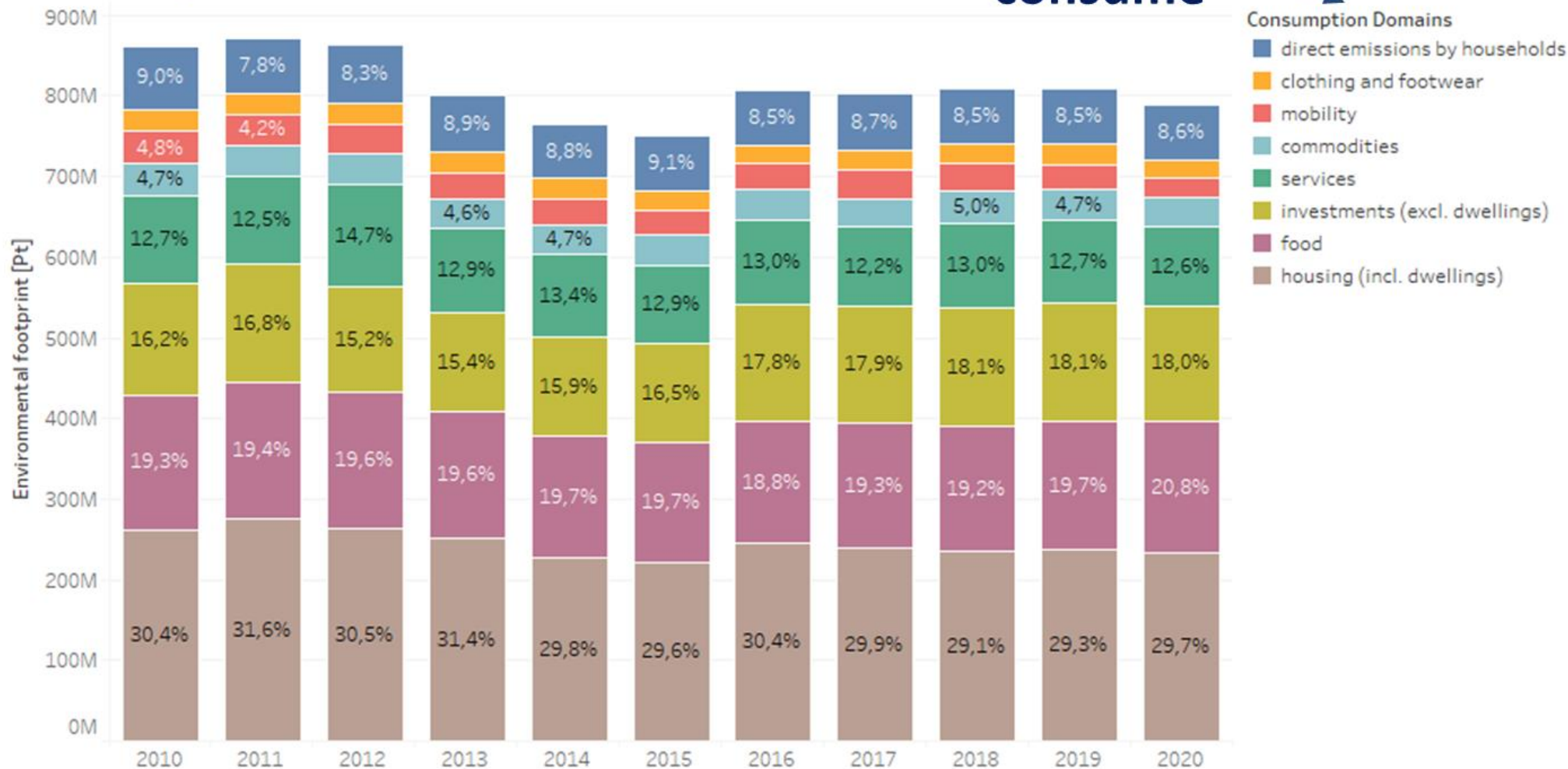
**Interconnections across crisis**



# From economic transactions to environment impacts

## Indexed environmental impact

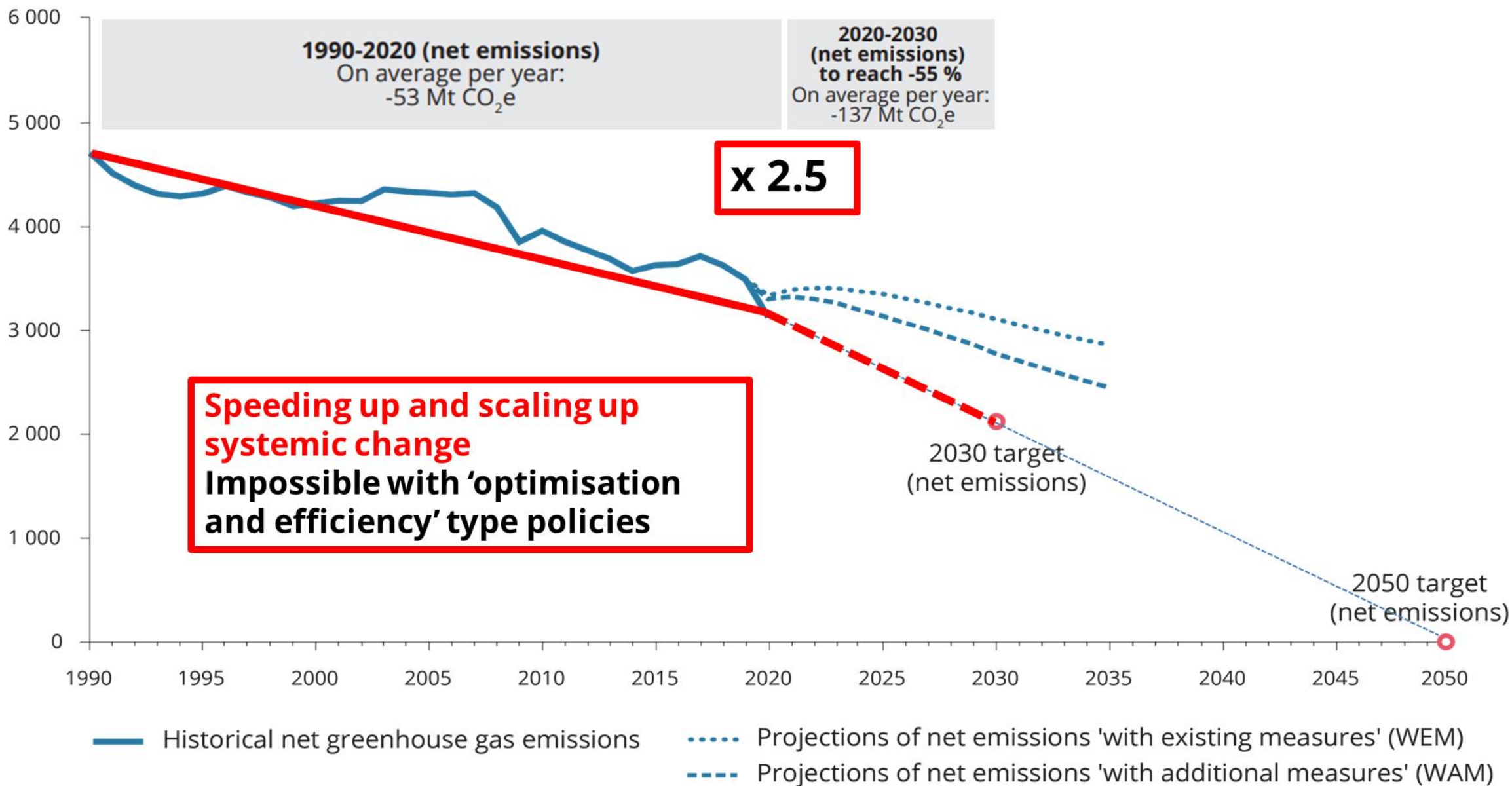
## What we consume





# Transformation energy system more needed than ever

Million tonnes of CO<sub>2</sub> equivalent (Mt CO<sub>2</sub>e)





Resource use down  
Productivity up



More waste  
Better handled



Far from circular  
Downcycling prevails



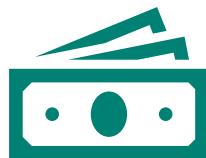
Eco-design  
Design for repair



Lack of  
targets



Not all the same  
High demand, high  
footprint

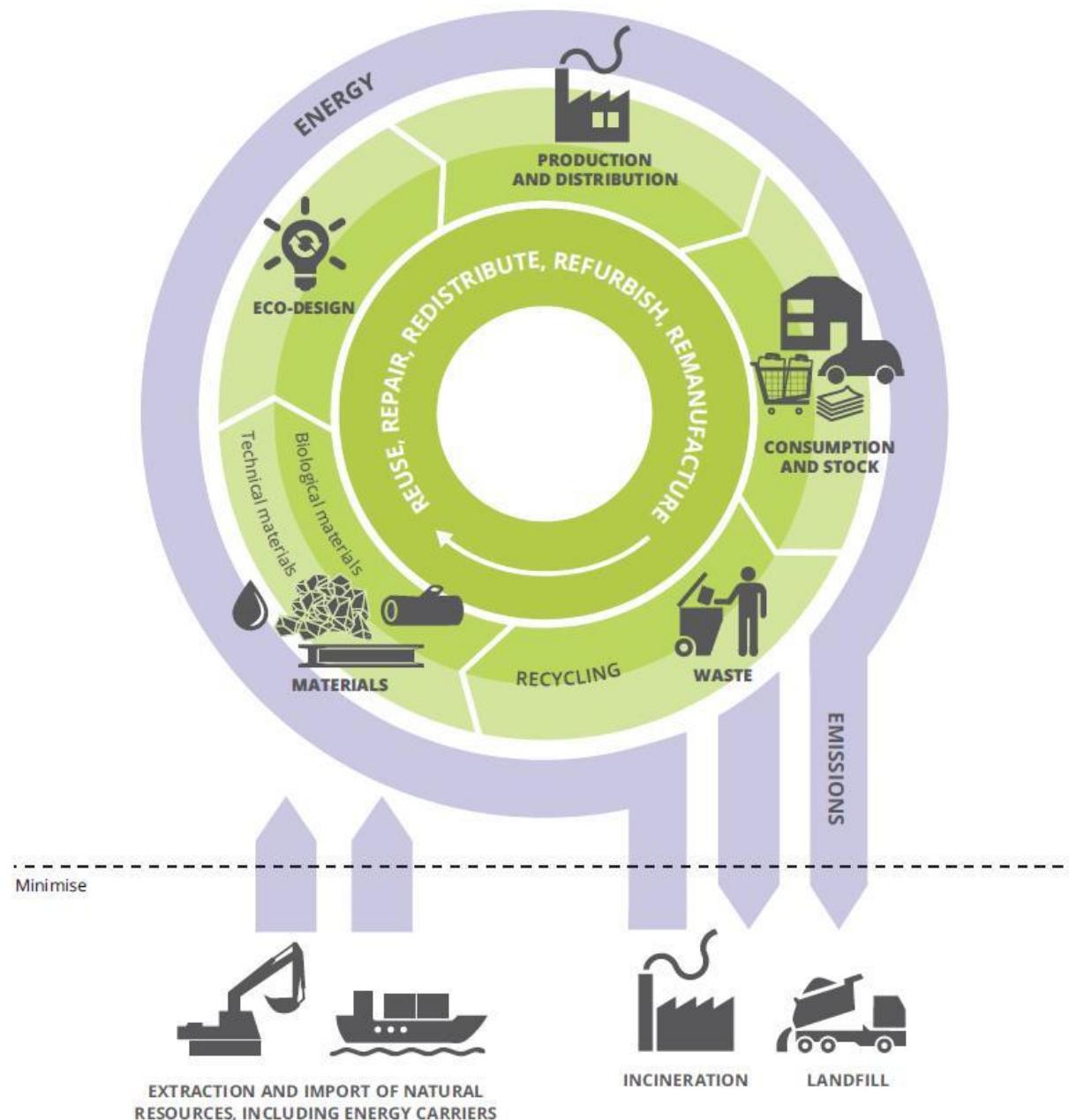


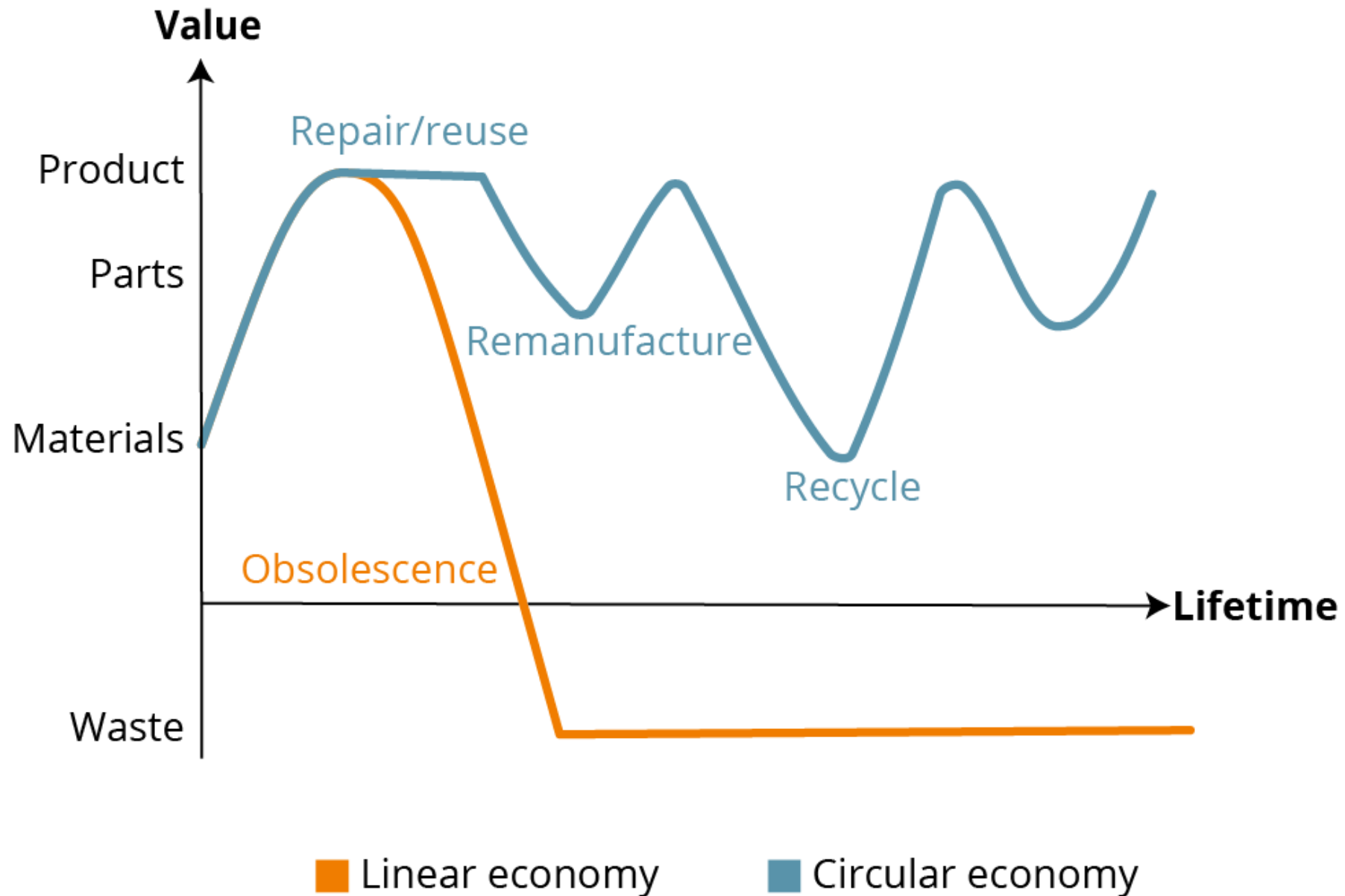
Externalities  
Other barriers



Deficient  
monitoring

# Circular economy is not an end-of-pipe concept







# ...not an engineering intervention either



Product  
quality



Marketing  
strategies



Innovation  
cycles



Repair  
options



Value of  
appliance



Cultural  
trends

...and much  
more



Across  
disciplines,  
across supply  
chain actors

# Safe by design, precautionary principle

~ 100 000 chemicals  
on the market

~ 22 600 chemicals  
with a use over  
1 tonne per year

~ 4 700 chemicals  
with a use over  
100 tonnes per year  
prioritised in  
hazard characterisation  
and evaluation

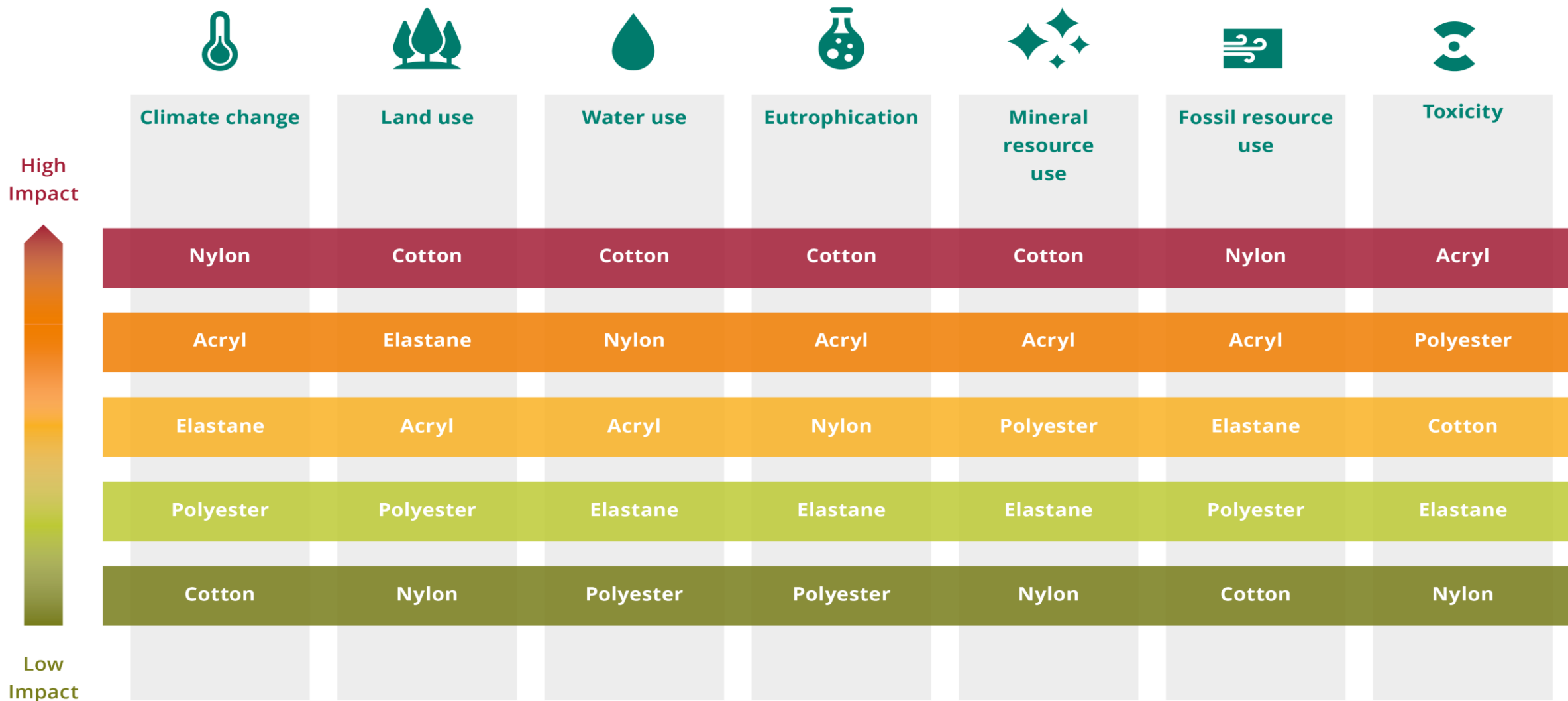
~500 chemicals  
extensively characterised for  
their hazards and exposures

~10 000 chemicals  
fairly well characterised for  
a subset of their hazards and exposures

~20 000 chemicals  
with limited characterisation for  
their hazards and exposures

~70 000 chemicals  
with poor characterisation for  
their hazards and exposures

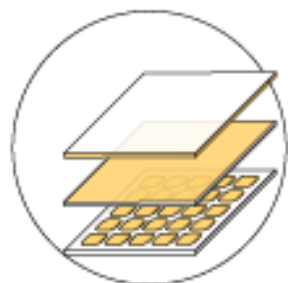




# Transitions come with trade offs and opportunities

## Photovoltaics

1.5 million tonnes  
of glass, metals, and silicon

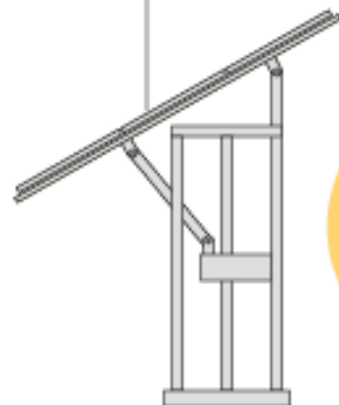


### Principal materials

Aluminium  
Glass and silicon  
Silver  
Copper

### Critical raw materials

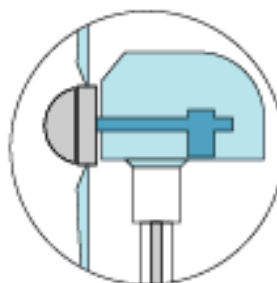
Indium  
Germanium



95 %  
can be  
recycled

## Wind energy

4.75 million tonnes  
of concrete, metals and composites

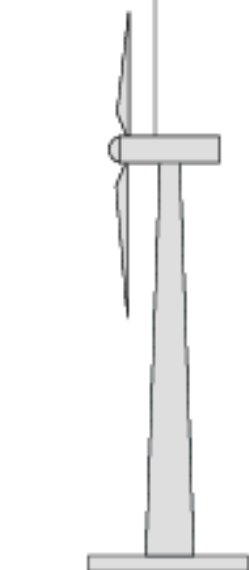


### Principal materials

Steel and iron  
Glass/carbon composites  
Copper  
Zinc

### Critical raw materials

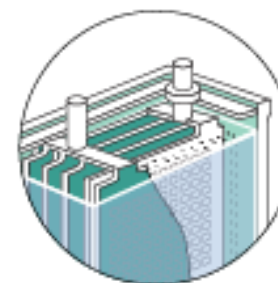
Dysprosium  
Neodymium



90 %  
can be  
recycled

## Energy storage and mobility

240 000 tonnes  
of lithium-ion batteries

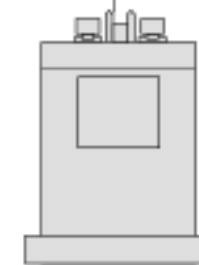


### Principal materials

Graphite  
Aluminium  
Copper  
Nickel

### Critical raw materials

Cobalt  
Lithium



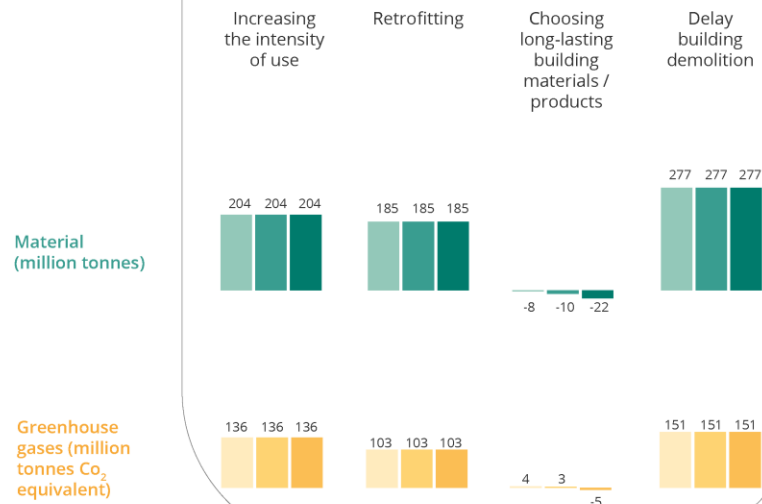
100 %  
can be  
recycled



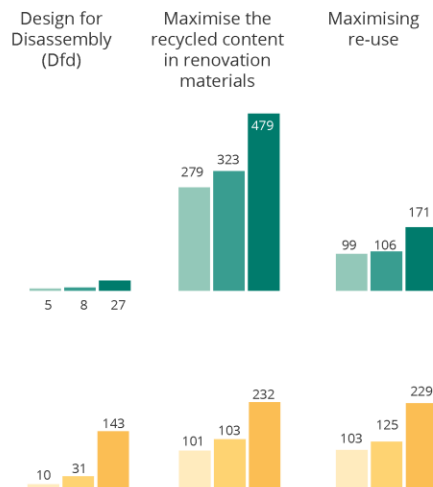
# Business case example: building renovation

## Renovation rate scenarios:

Baseline Policy compliant Ambitious

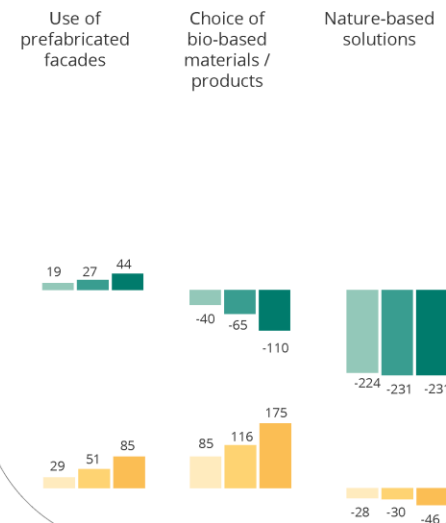
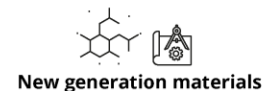


**Total savings**  
655 | 399

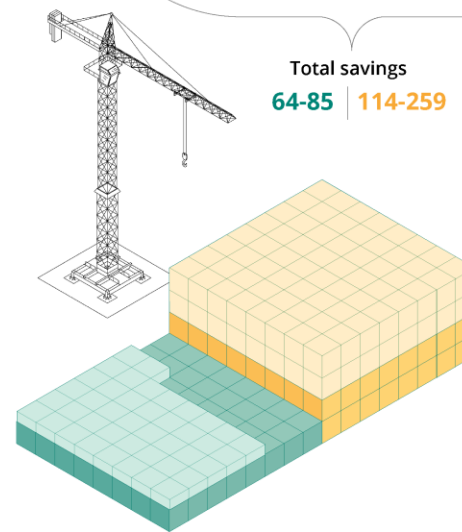
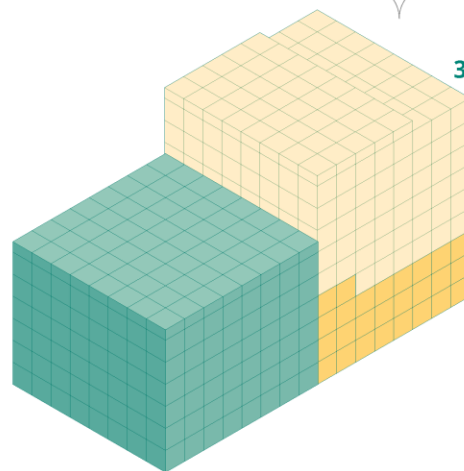
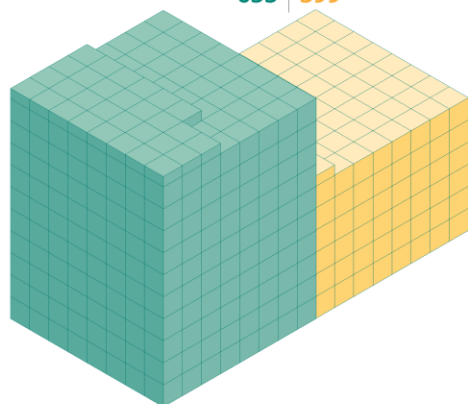


**Total savings**  
346 | 195-595

The range represents results according to each scenario modelled: lower limit for baseline, upper limit for ambitious.



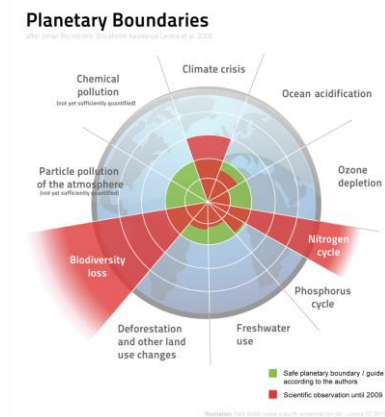
**Total savings**  
64-85 | 114-259



Circular economy is **one** of the necessary **transitions** to ensure that societies operate **within the limits of the planet**



By Leo Reynolds - CC  
BY-NC-SA 2.0,  
<https://www.flickr.com/photos/lwr/>



By Felix Mueller -  
Own work, CC BY-SA  
4.0,  
[https://commons.wiki  
media.org/w/index.p  
hp?curid=36681875](https://commons.wikimedia.org/w/index.php?curid=36681875)

Circular economy is not an end-of pipe concept – the emphasis must be in **solving issues upstream** in the material cycle

Innovation, with technology, but more so with new societal and business models - to **ensure revenue streams** while avoid relying on materials, carbon and resource depletion



By Kay Kim - CC  
BY-2.0,  
<https://www.flickr.com/photos/kaykim/>

Thank you very much

European Environment Agency



[daniel.montalvo@eea.europa.eu](mailto:daniel.montalvo@eea.europa.eu)