

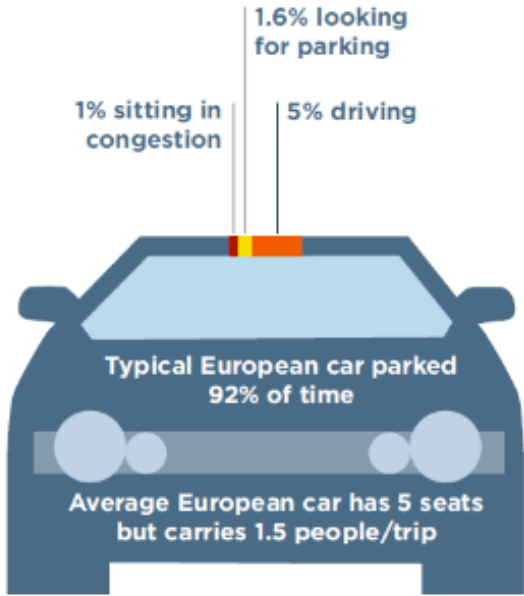
**GROWTH WITHIN:
A CIRCULAR ECONOMY
VISION FOR A
COMPETITIVE EUROPE**



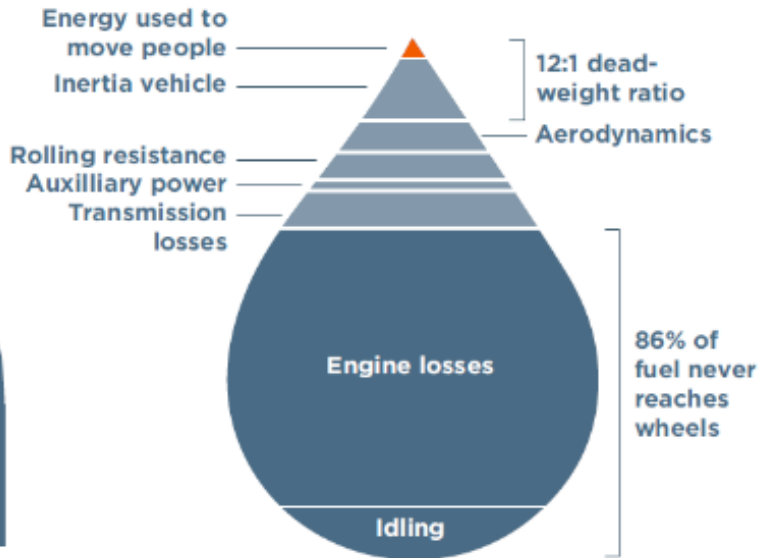
November 9th, 2015

Structural waste in the mobility system

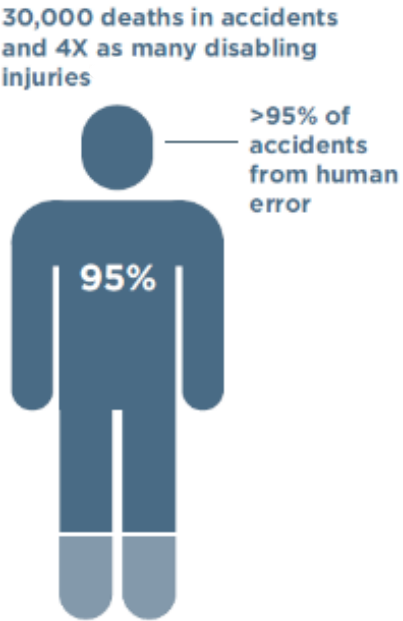
CAR UTILISATION



TANK-TO-WHEEL ENERGY FLOW - PETROL



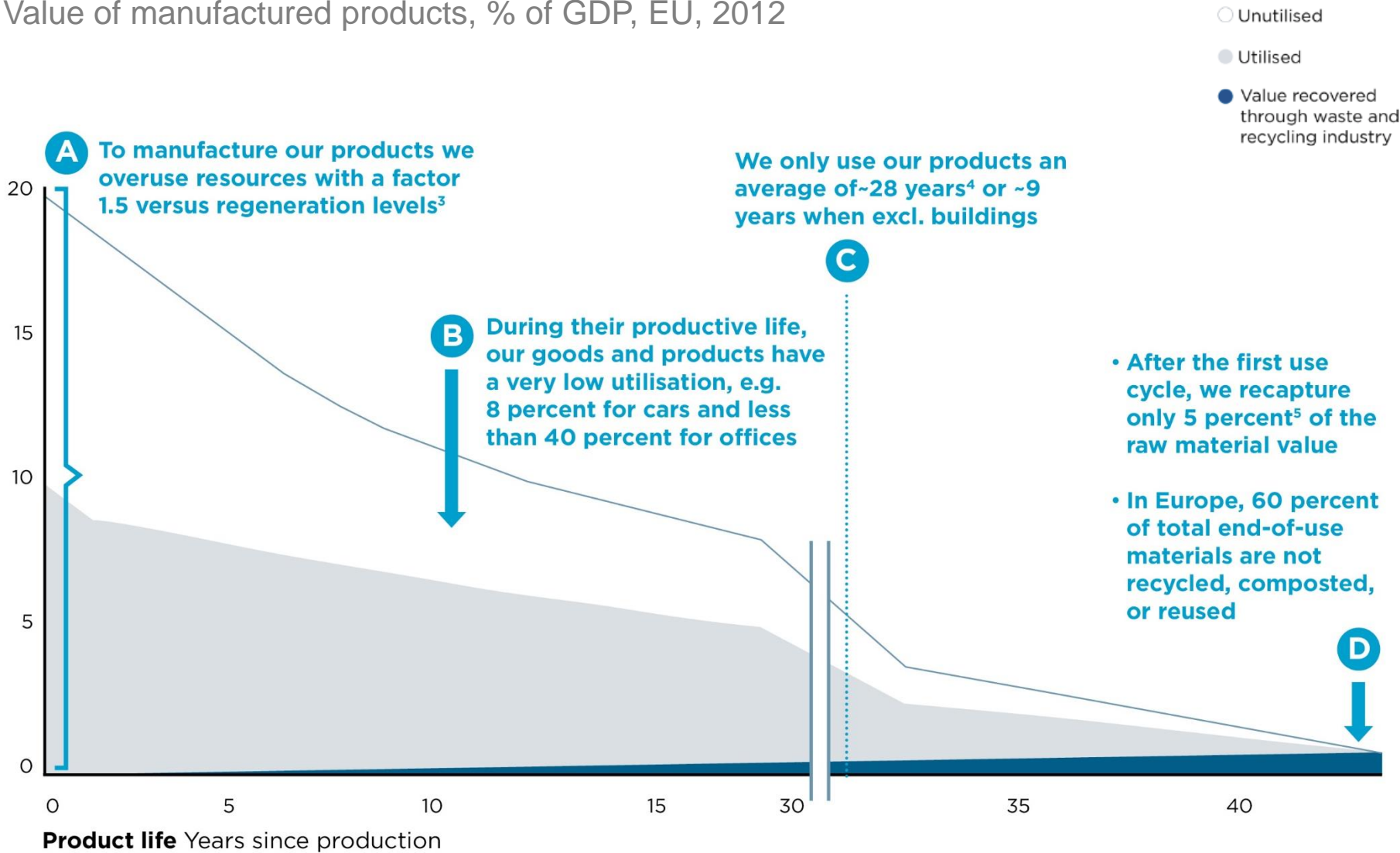
DEATHS AND INJURIES/ YEAR ON ROAD



LAND UTILISATION: **5%** Road reaches peak throughput only 5% of time and only 10% covered with cars then **50%** 50% of most city land dedicated to streets and roads, parking, service stations, driveways, signals, and traffic signs

Value loss of selected manufactured goods across the European economy

Value of manufactured products, % of GDP, EU, 2012



We see massive improvement for all three human needs

Total annual cash-out costs per household; EU average 2012, €
Improvement potential for 2050



And this is the reason why companies started to move

EXAMPLES

REGENERATE 

- Shift to renewable energy and materials
- Reclaim, retain, and restore health of ecosystems
- Return recovered biological resources to the biosphere



SHARE 

- Share assets (e.g. cars, rooms, appliances)
- Reuse/secondhand
- Prolong life through maintenance, design for durability, upgradability, etc.



OPTIMISE 

- Increase performance/efficiency of product
- Remove waste in production and supply chain
- Leverage big data, automation, remote sensing and steering



LOOP 

- Remanufacture products or components
- Recycle materials
- Digest anaerobic
- Extract biochemicals from organic waste



VIRTUALISE 

- Books, music, travel, online shopping, autonomous vehicles etc.



EXCHANGE 

- Replace old with advanced non-renewable materials
- Apply new technologies (e.g. 3D printing)
- Choose new product/service (e.g. multimodal transport)



Outline of a circular economy

PRINCIPLE

1

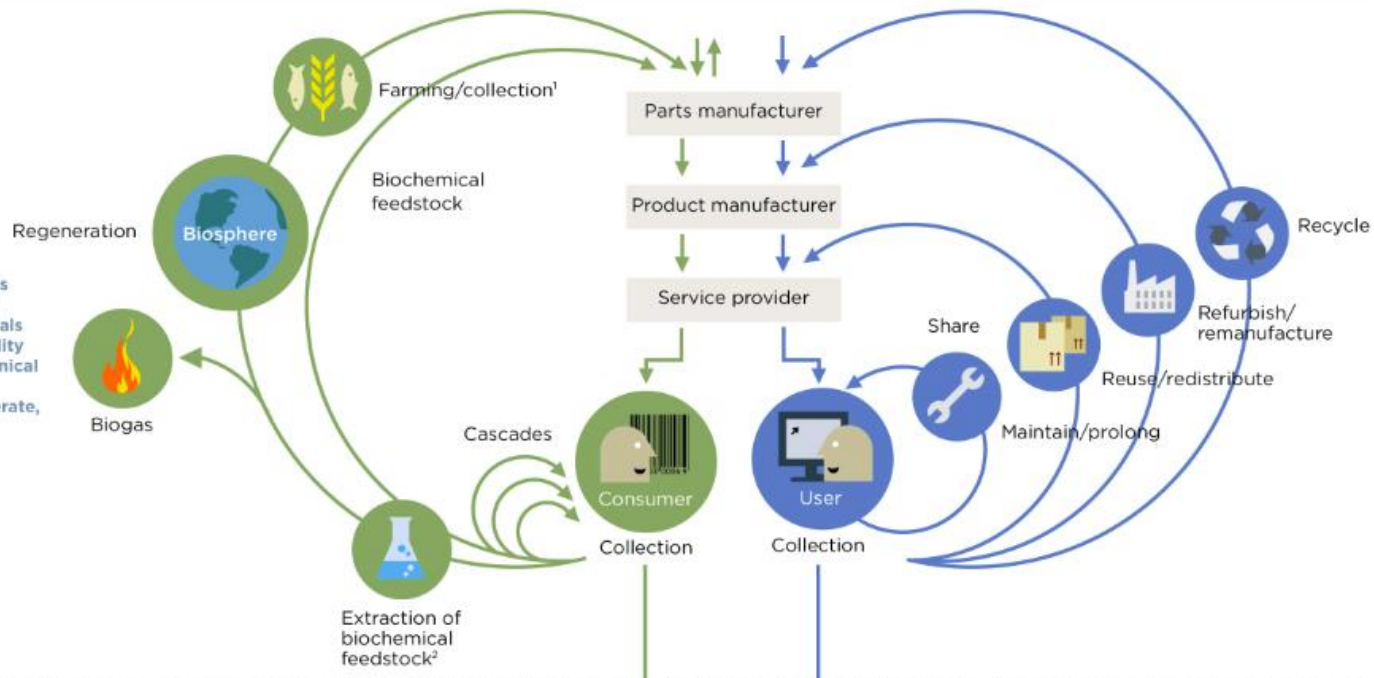
Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
 ReSOLVE levers: regenerate, virtualise, exchange



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; McKinsey Center for Business and Environment; Stiftungsfonds für Umweltökonomie und Nachhaltigkeit (SUN); Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Future scenarios for three human needs

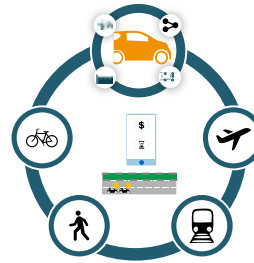
Current development path

Circular scenario

Mobility



- Privately owned “super car” is dominant mode of transportation
- Congestion, pressure on resources



- Multi-modal mobility
- Shared on-demand “super car” designed for durability

Food



- More efficient value chain
- Waste reduction
- No land rehabilitation
- Limited impact on health outcomes



- Closed nutrients loops
- Preserved and rehabilitated natural capital
- Healthier food and diet

Built environment



- More efficient value chain
- Energy efficiency
- Increased sprawl/ land take

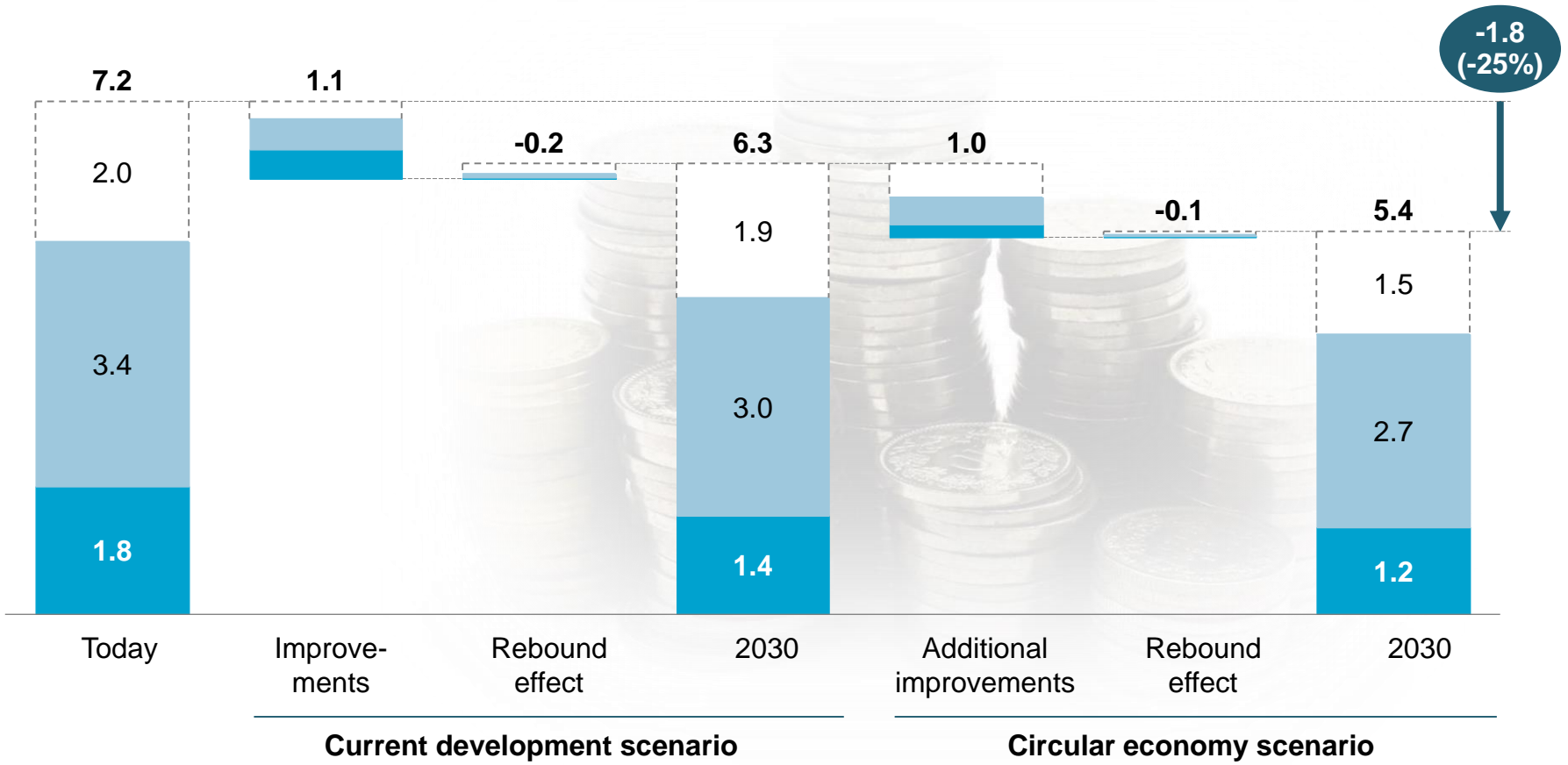


- Smart urban planning leveraging unlocked land in cities
- Modular and shareable buildings

The circular economy opportunity – 2030 scenarios

Mobility, food and built environment, EU27, societal perspective 2030

Annual primary resource costs, other cash-out costs and negative externalities
EU-27, 1000 billion EUR



Comparison of potential development paths: impact on economy...

EU-27, indexed (2012 = 100)

- Current development scenario
- Circular economy scenario

Household disposable income



GDP

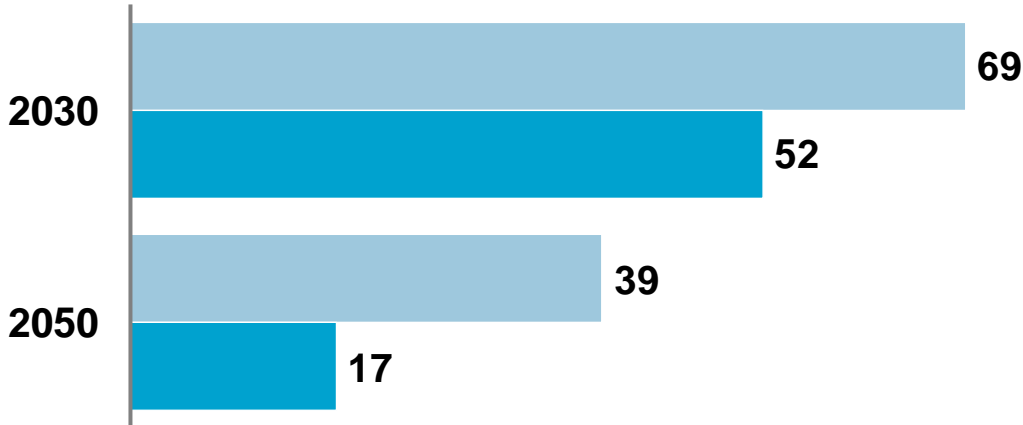


Comparison of potential development paths: impact on the environment

EU-27, indexed (2012 = 100)

- Current development scenario
- Circular economy scenario

CO2 emissions



Primary material consumption

