

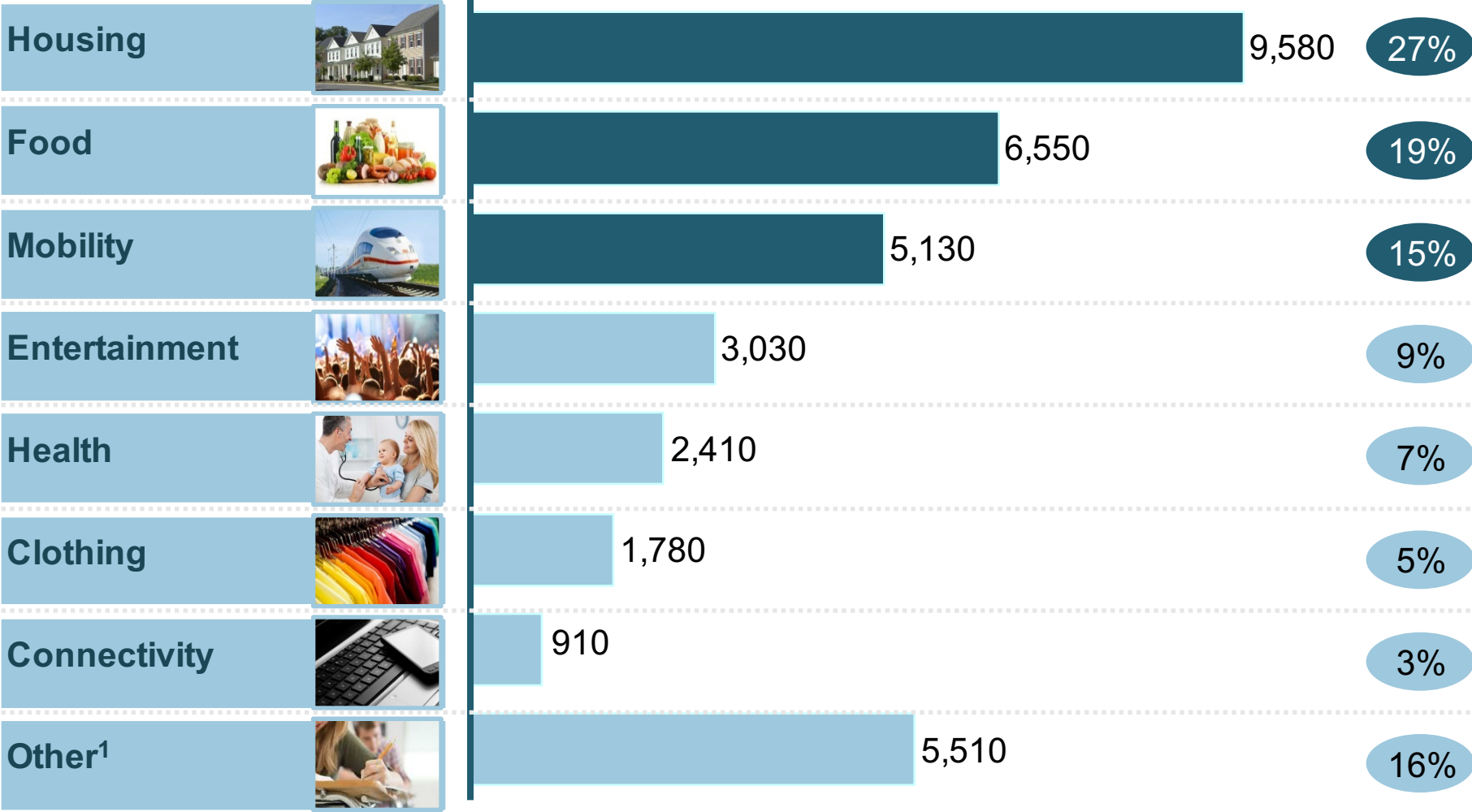
**GROWTH WITHIN:
A CIRCULAR ECONOMY
VISION FOR A
COMPETITIVE EUROPE**



Housing, food & mobility are the largest expenditures for European households

Breakdown of annual household expenditure
 EUR, EU28 average, 2012 (total = € 34,900)

Human needs



¹Includes security, education, social protection, financial services, furniture, carpets, home textiles, household equipment, glassware, tableware, beverages, tobacco, narcotics



Are we asking the right question?



How to **design a system** to fulfill our needs in the most optimal way?

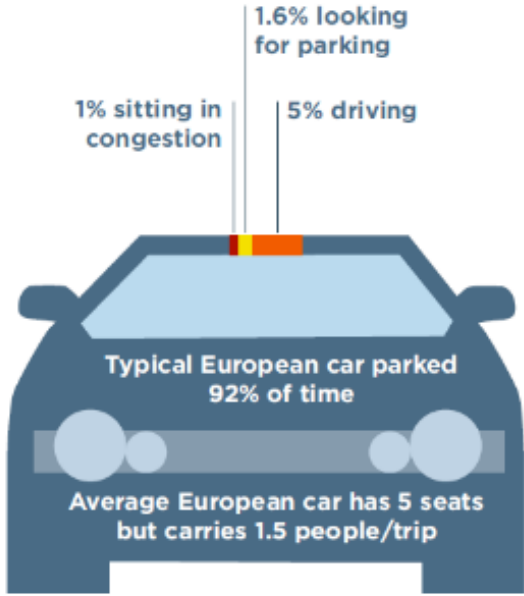
VS



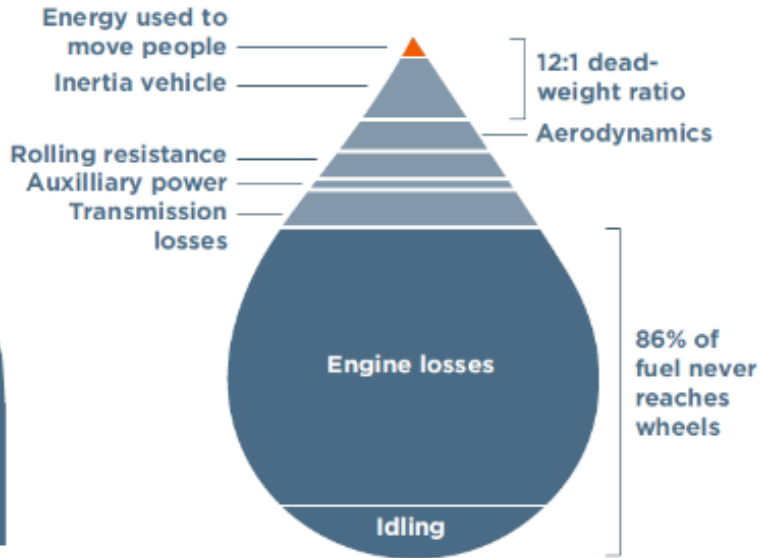
How to **improve our current system** to better fulfill our needs?

Structural waste in the mobility system

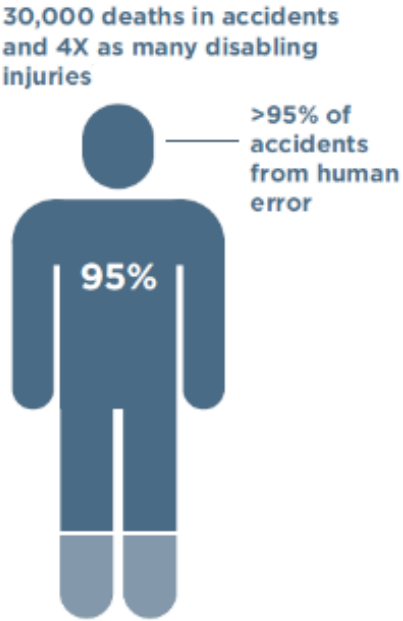
CAR UTILISATION



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

SOURCE: EU Commission mobility and transport, accident statistics; www.fueleconomy.gov; EEA car occupancy rates data; S. Heck and M. Rogers, *Resource revolution: How to capture the biggest business opportunity in a century*, 2014; Centre d'études sur les réseaux, les transports, l'urbanisme et les constructions publiques.

Developing a circular vision



The ReSOLVE framework: a toolbox for the circular economy

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.

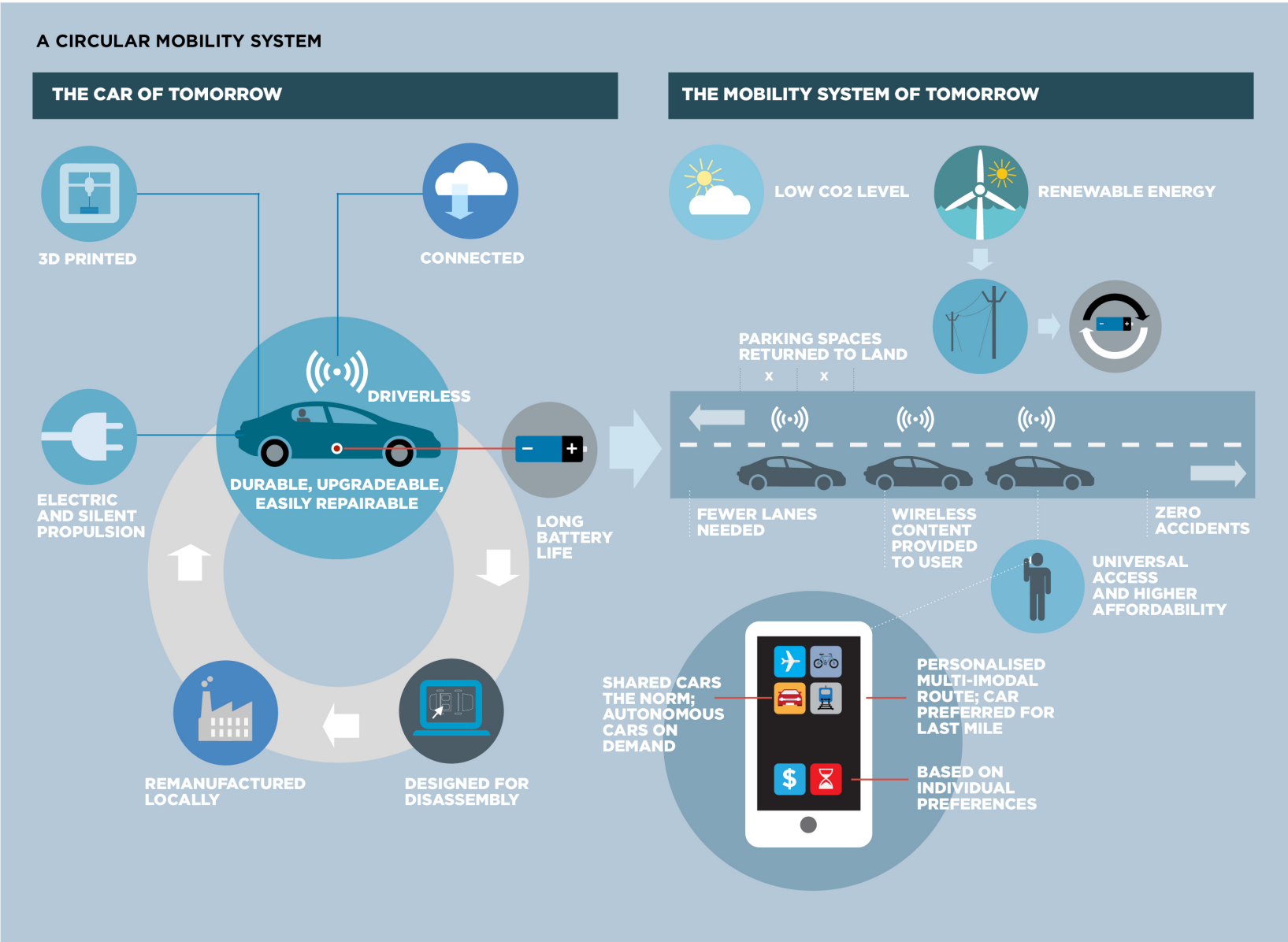


EXCHANGE 

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



Vision: A Circular Mobility System



Five main levers that could transform our mobility systems



- 1 Sharing
- 2 Renewably powered
- 3 Autonomous driving
- 4 Materials evolution
- 5 System-level integration of transport modes

Six levers that could transform Food Systems



- 1 Resource efficient agricultural practices
- 2 Regenerative farming practices
- 3 Closed loops of nutrients and other materials
- 4 Restoration and preservation of natural capital
- 5 Peri-urban and urban farming
- 6 Digital supply chains

Six levers that could transform the Built Environment



- 1 Industrial Production and 3D Printing
- 2 Energy Generation and Use
- 3 Shared Residential Space
- 4 Shared and Virtual Office Space
- 5 Modularity and Durability
- 6 Urban Planning

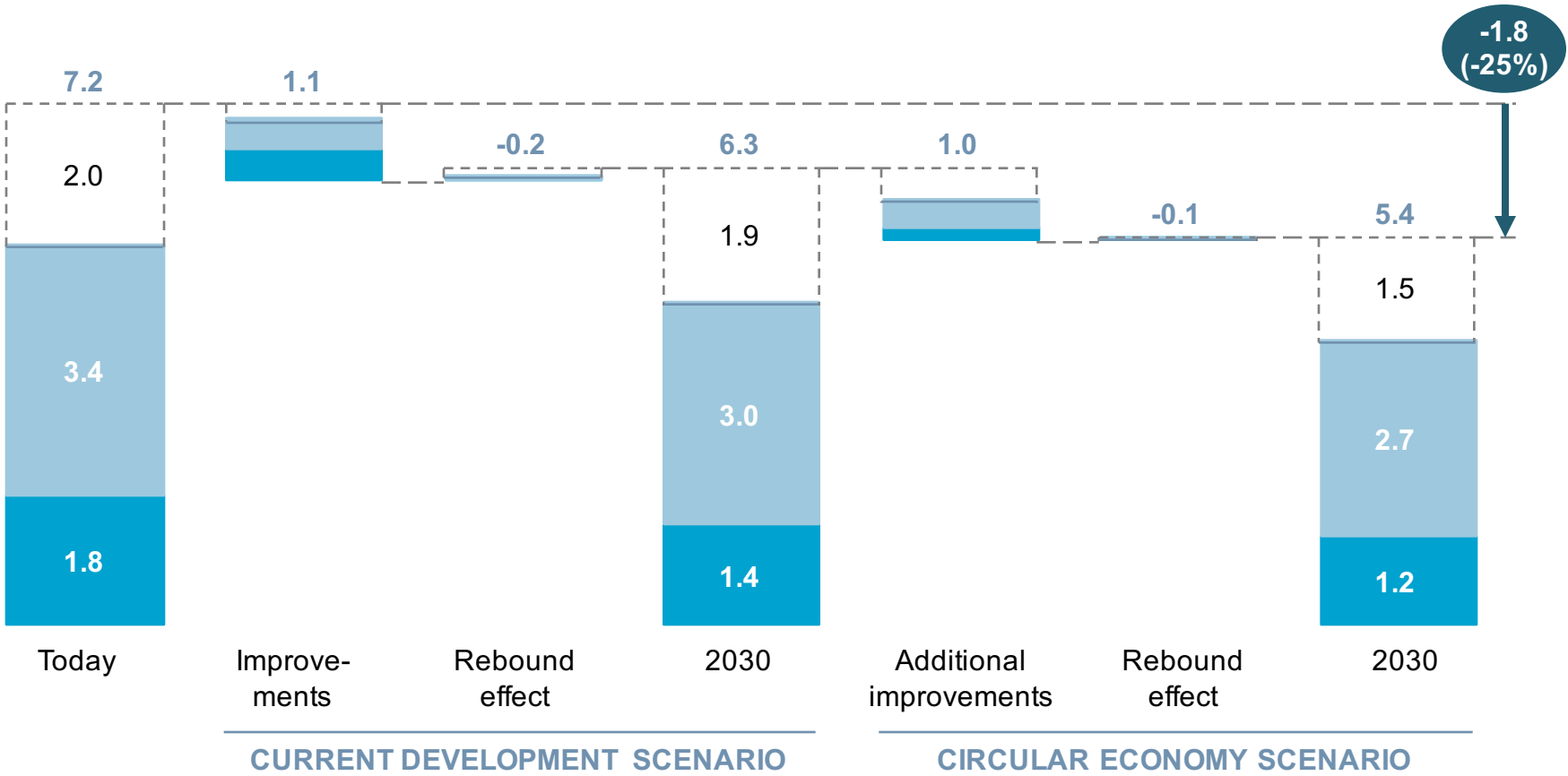
The circular economy opportunity: 2030 scenarios

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

- Primary resource costs
- Other cash-out costs
- Externalities



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

EU-27, indexed (2012 = 100)

- Current development scenario
- Circular economy scenario

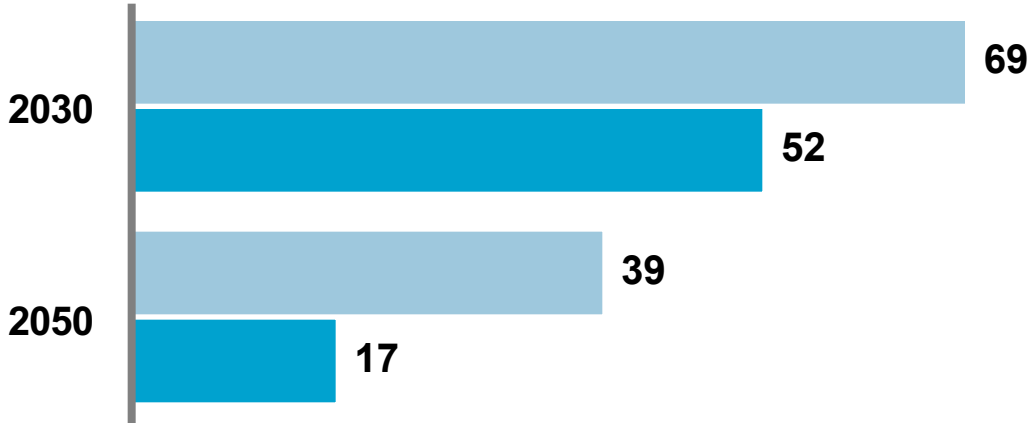


Comparison of potential development paths: impact on the environment

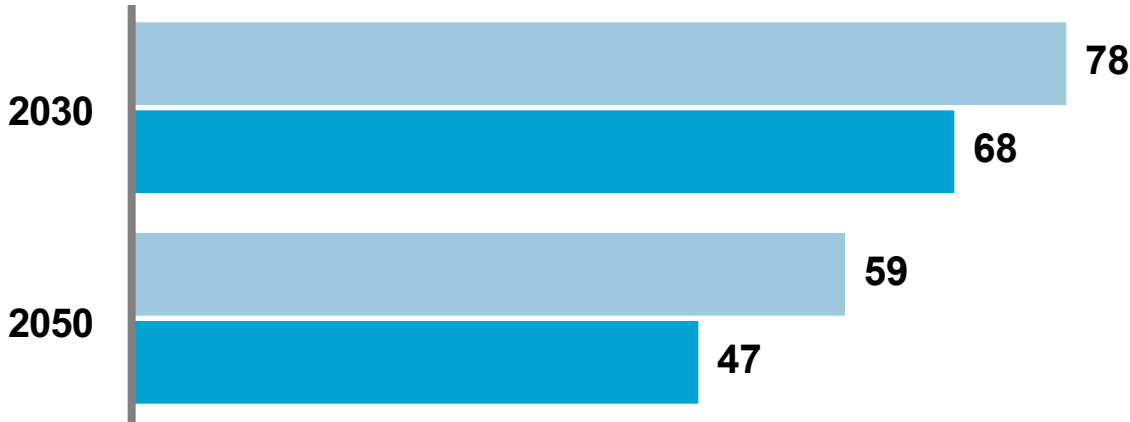
EU-27, indexed (2012 = 100)

- Current development scenario
- Circular economy scenario

CO2 emissions



Primary material consumption



Make sure to follow the direction set out by your long-term vision



Key messages



Start from human needs, to avoid (mental) lock-in in suboptimal systems



Develop a long-term circular vision by considering all levers, their interdependence and their potential impact



Make sure each step brings you closer to your long-term vision, even if this might sometimes entail temporary transition cost/inconvenience

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