

Growth within: Is the circular economy a vision for a competitive Europe?

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University of Bergamo

Albert-Ludwigs-Universität Freiburg



UNI
FREIBURG

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The Circular Economy Study



Funding agency:

SUN (German Post Foundation)

Project Partners:

Ellen Mac Arthur Foundation

McKinsey Center for Business and Environment

Role of IZA:

Member of Steering committee (Alexander Spermann)

Coordination of research on employment effects

McKinsey approach:

Comparing scenarios: Status quo versus Circular Economy

IZA approach:

Survey on literature (ZEW: Jens Horbach, Klaus Rennings, Katrin Sommerfeld)

CGE-modelling (Tom Rutherford, Christoph Böhringer)

1. Circular Scenario: Three deep dives

- Mobility (focus of this talk)
- Food systems
- Built environment

2. Results of ZEW survey on employment effects

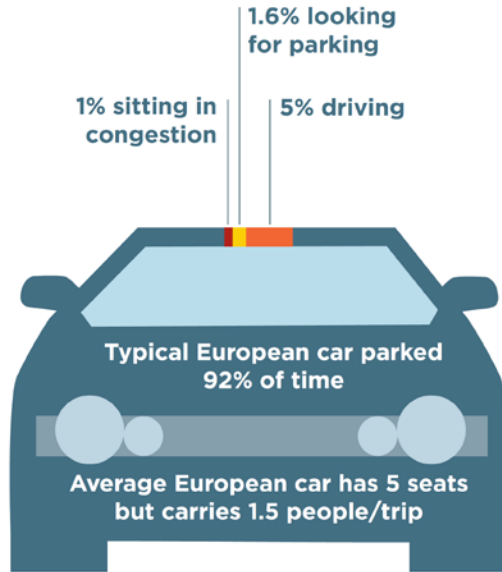
3. Results of CGE modelling for this study

→ This talk: Focus on mobility

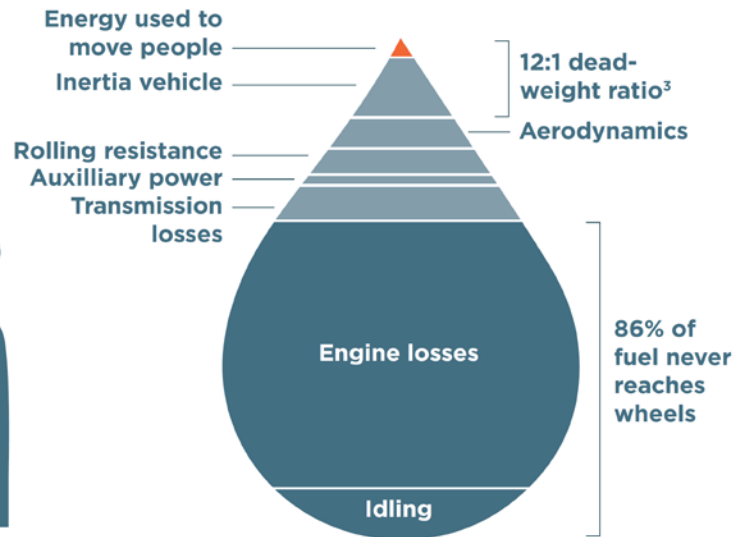
Structural waste in the mobility system



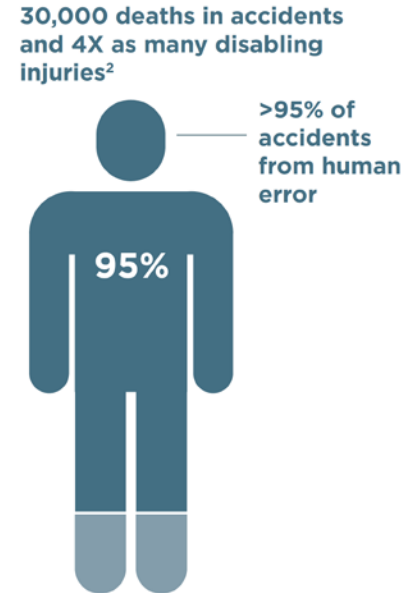
CAR UTILISATION¹



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

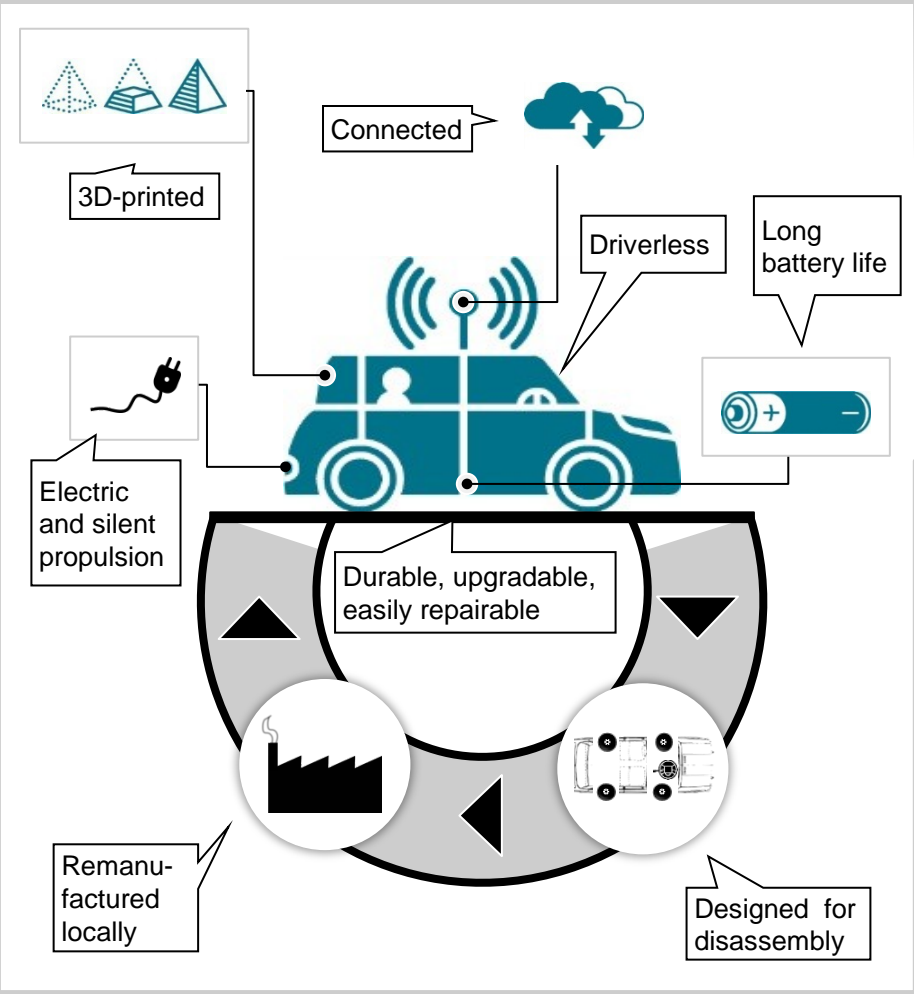
¹ Based on car parked number for France and productive vs unproductive driving time in US. ² For every death on Europe's roads there are an estimated 4 permanently disabling injuries. ³ Based on average car weight of 1.4 tonnes and average occupation of 1.5 passengers of 75 kg.

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.

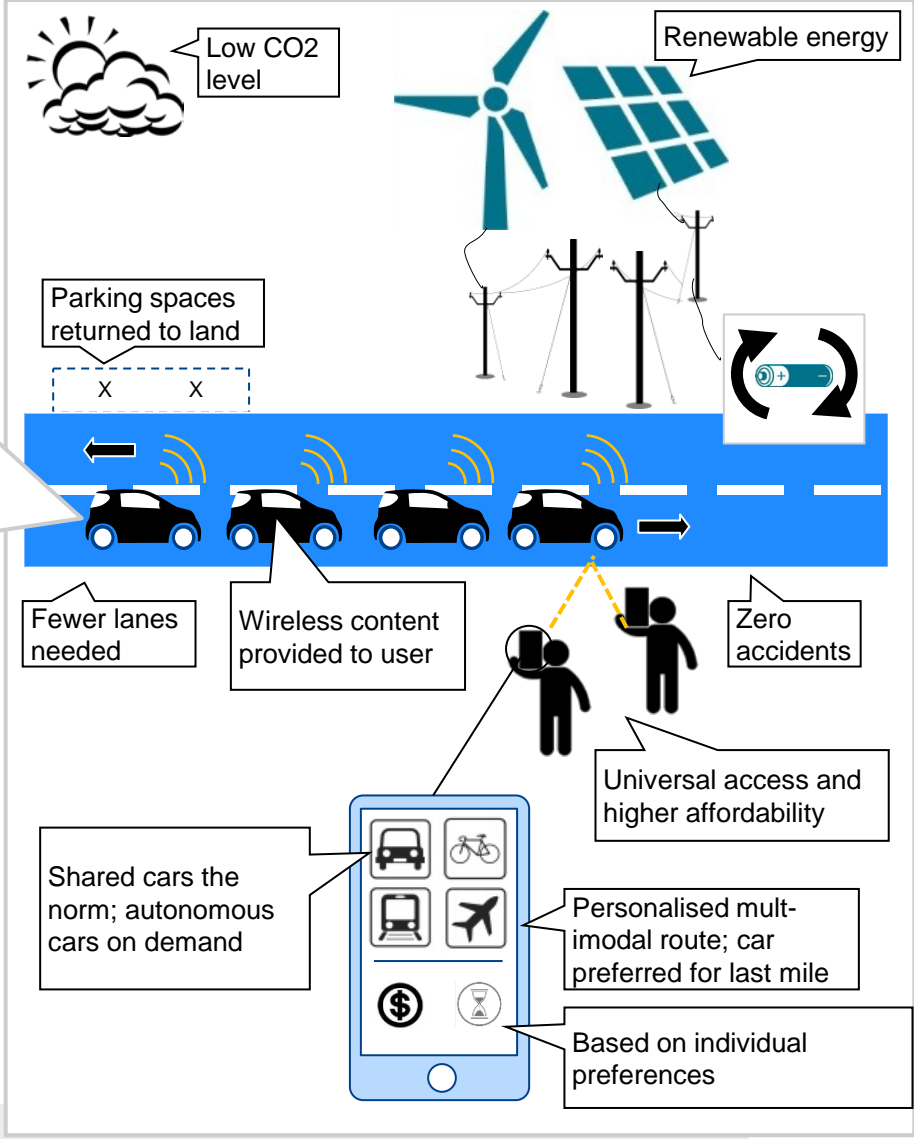
A circular mobility system



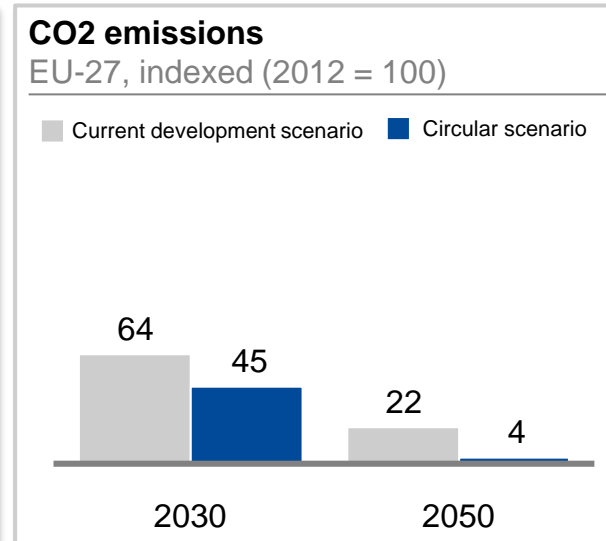
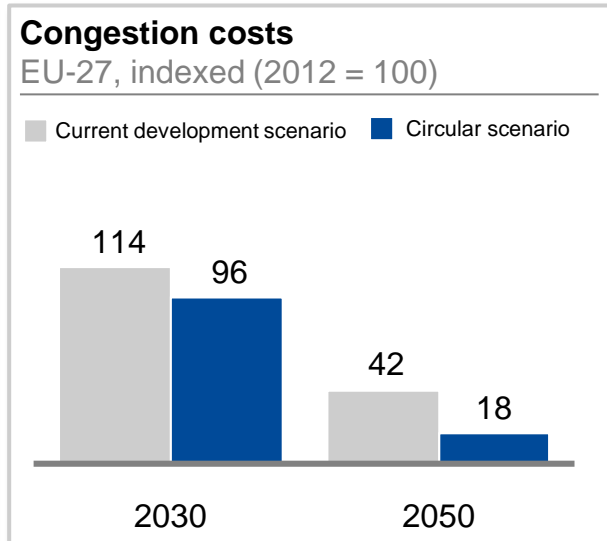
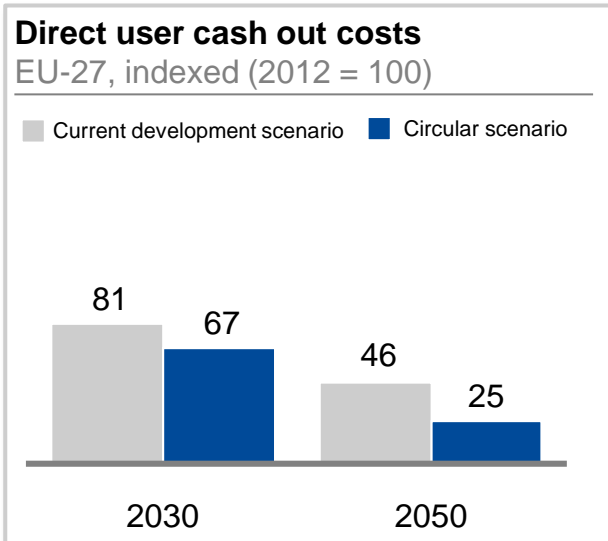
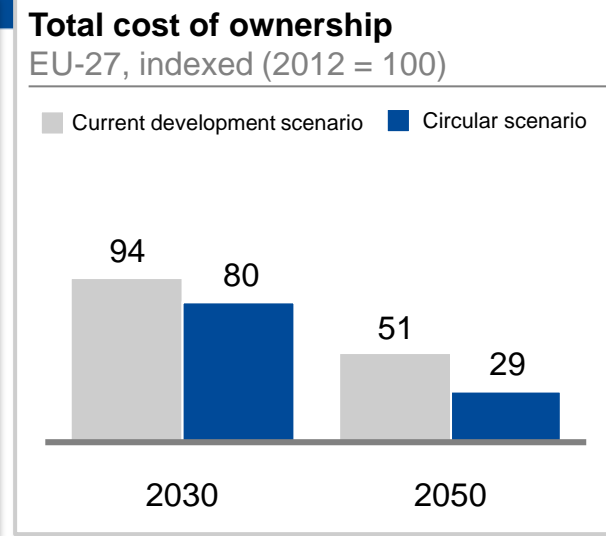
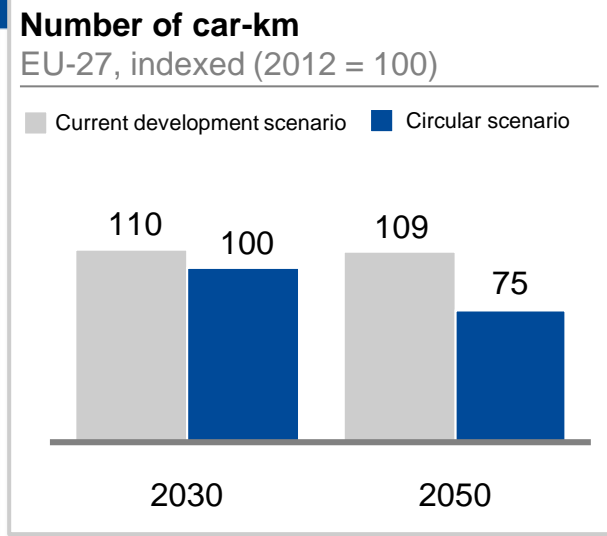
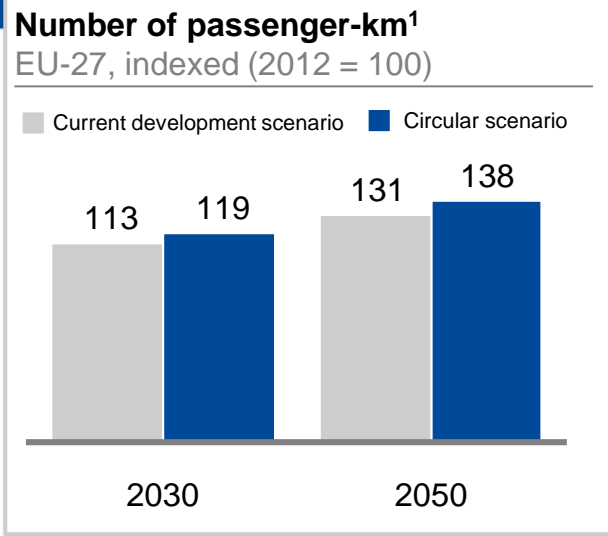
The car of tomorrow



The mobility system of tomorrow



Potential economic and environmental impact of current development scenario vs circular scenario



¹ Including public transport, virtualised mobility, and share of car-km replaced by walking/cycling

Summary

“Analyses on the employment effects of environmental innovations are still rare due to data problems. In general, these studies also detect positive effects of eco-innovations (especially eco-product innovations) on employment”

Source: Horbach/Rennings/Sommerfeld (2015), Circular Economy and Employment, https://sunstiftungsfonds.files.wordpress.com/2015/06/ce_employment_13052015.pdf

- Congestion tax
- And reducing labor taxes
- Taking the rebound effect into account

Results:

→ Could reduce unemployment rate by 0.2 percentage points

→ Increase disposable income of households 2.3 percent

→ Leading to increased consumption and a GDP increase of 1.4 percent.

Source: Böhringer/Rutherford (2015): The Circular Economy – an economic impact assessment.
<https://sunstiftungsfonds.files.wordpress.com/2015/06/report-circular-economy.pdf>

- Natural experiment: Exploiting an exogenous policy shock to measure the causal effect
 - Country A with zero-waste policy, Country B as comparison country
 - Region A with plastic reduction policy, region B w/o

- Field experiment: Randomised Controlled Trials to identify causal effect of policy changes
 - Car Sharing
 - Waste reduction
 - Recycling



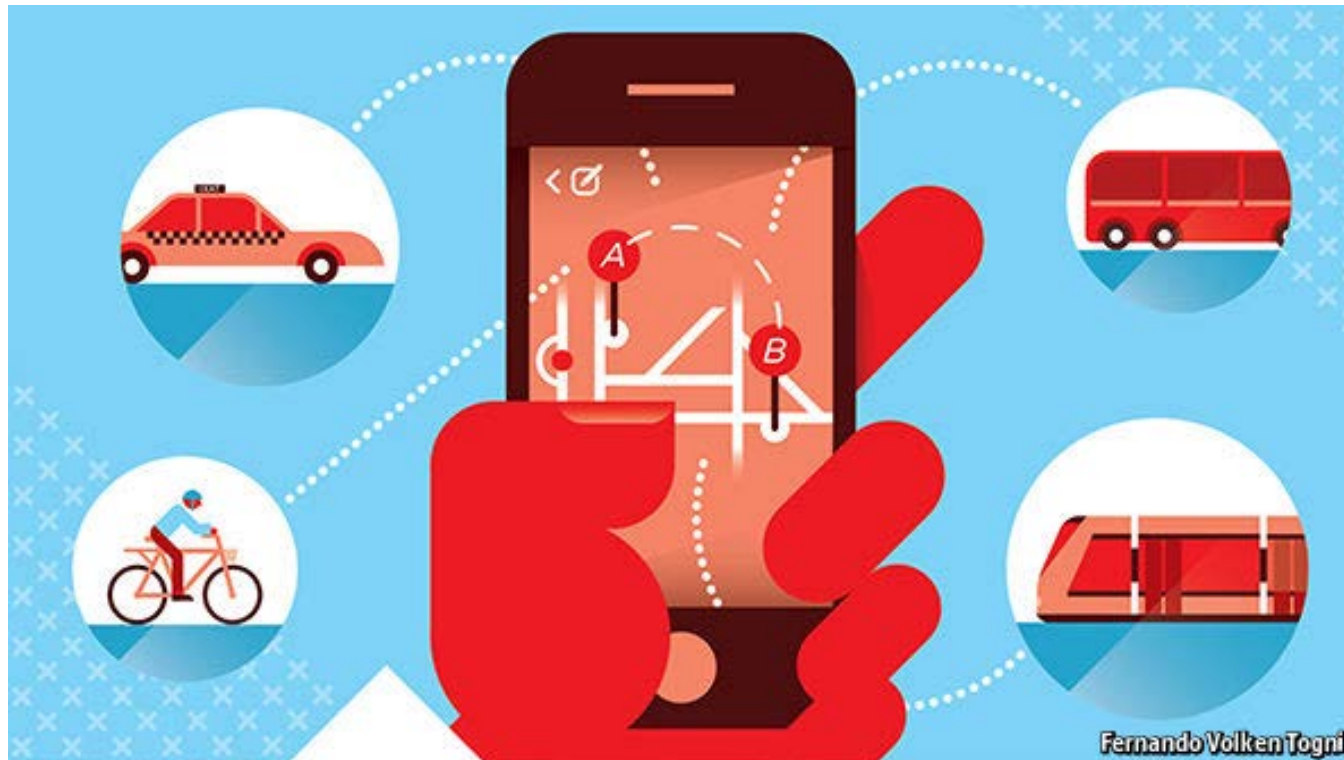
European Union

Circular Economy Package adopted by the European Commission on 2 December 2015

- boost global competitiveness
- foster sustainable economic growth
- generate new jobs

- Elements
 - Funding of over €650 m under Horizon 2020
 - Funding of € 5.5m under the structural funds
 - Actions to reduce food waste, water reuse
 - Revised regulation on fertilisers
 - Quality standards for secondary raw materials
 - Strategy on plastics
 - Revised legislative proposals on waste such as targets for recycling and landfill reduction

Mobility concepts: One App (Helsinki 2016)



- Circular economy is a vision
- CE is more than recycling
- Case study mobility reveals that following a vision may lead to disruptive business models
- Economic modelling is hard to do
- Employment effect might be positive but dynamics behind the stock numbers is crucial
- Evaluation studies by field experiments are feasible

→ We need more experiments with elements of a CE in the future



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