

The background of the slide is a photograph of a paved road stretching into the distance, flanked by green trees. On the right side, the rear wheel and a portion of the orange body of a car are visible. The scene is bathed in warm, golden light, suggesting a sunset or sunrise.

# **The circular car**

**Feasibility study  
2023**

- **Current situation and potential**
- **The circular car**
- **Preliminary insights**

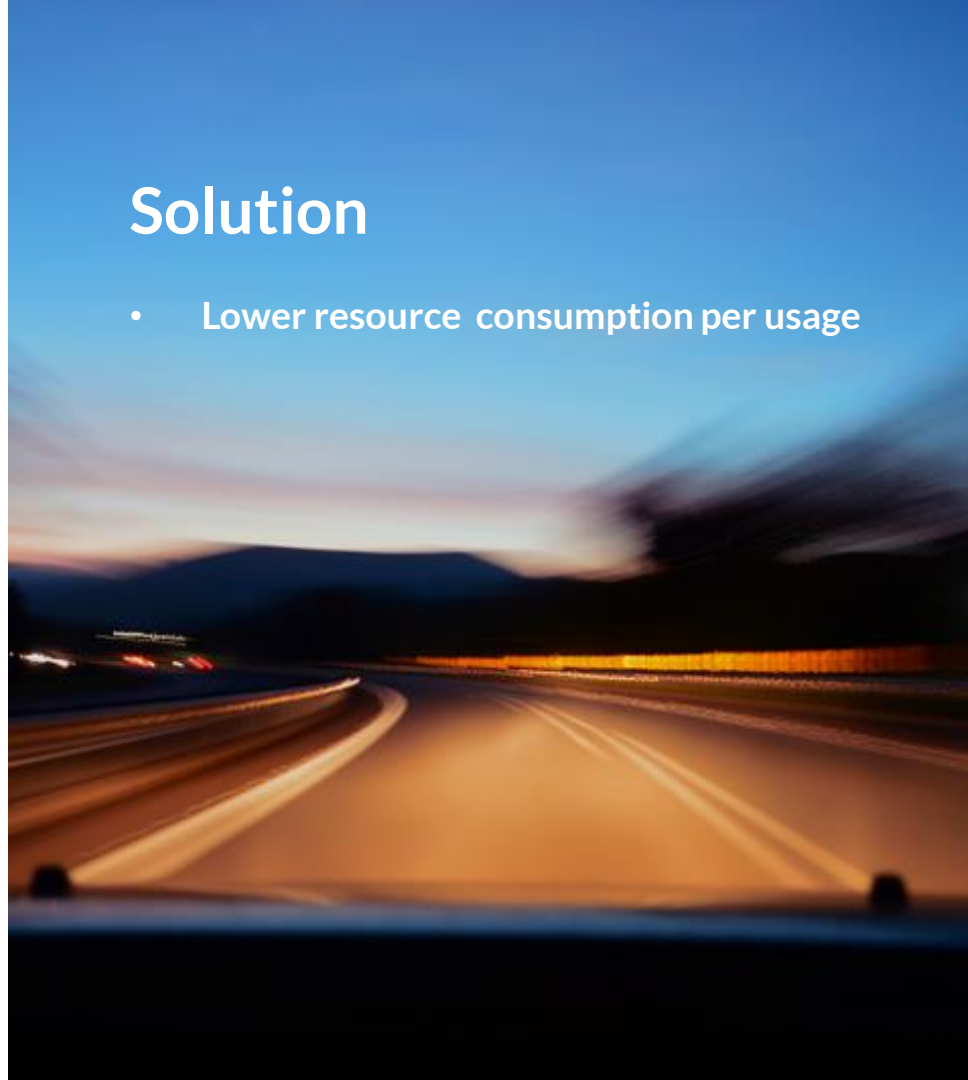
# Current situation & potential

# Challenge

- The car's material weight is high, 1,550 kilograms on average - and it is increasing.
- The utilization rate of a passenger car is no more than around 3-4 %.
- On average, the passenger car is used by 1.5 people.
- Only about 1 percent of Sweden's population are currently active car pool users.
- Approximate 85 % of the material in the car is recycled (steel, iron, copper and aluminum).
- Recycling eg rare earth metals plastics and textiles , is low or non-existent.

# Solution

- Lower resource consumption per usage



# Remanufacturing

*“Remanufacture products and components to a new condition, with the same or improved performance level as in newly manufactured condition”*

# Remanufacturing rate

The percentage of remanufacturing in the automotive industry in Europe is **1.1 percent**, most functional components are lost when the entire vehicle is scrapped.

Parker et al., 2015

# Life cycle assessment (2021-2022)

Selected components:

- Link arm
- Wheel spindle
- Hybride traction battery
- Electric engine
- Stay or bar

MATERIAL AND PRODUCTION  
ENVIRONMENT AND  
SUSTAINABLE CHEMISTRY

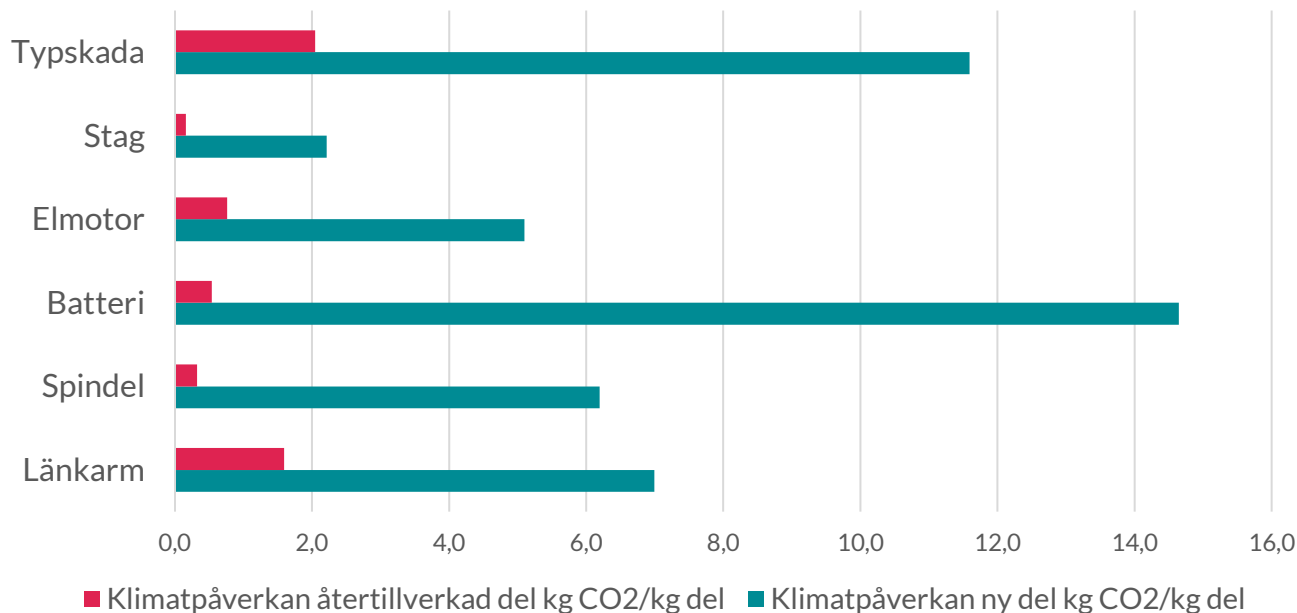


Life cycle assessment and potential of  
remanufacturing of vehicle components

Mats Zackrisson and Jutta Hildenbrand

RISE Report: 2022:119, 2022-10-21

## Climate benefit from remanufacturing compared to new production, kg CO<sub>2</sub>/kg part



### Conclusions

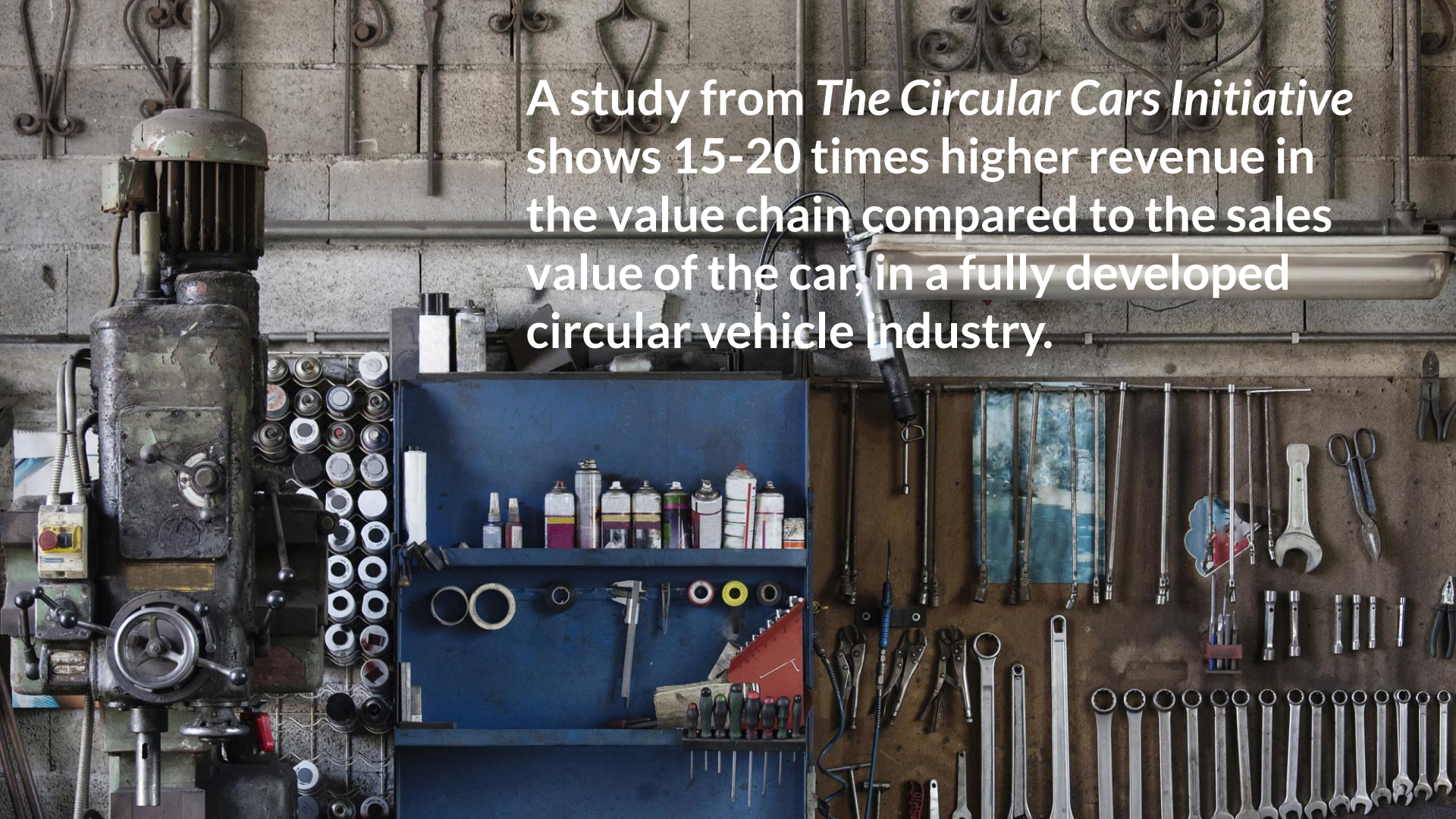
- If it is economically advantageous to remanufacture a car component, it is most likely also environmentally advantageous
- Powertrain components indicate potentially very large environmental benefits of remanufacturing (provided that efficiency is not impaired)



# Example of gaps

- Mapping and identification of components that are prioritized for remanufacturing
- Design for disassembly - The dismantler has extensive knowledge that must be used in the design phase and for the rest of the value chain.
- Develop sensor technology for the user and end of life phase

RISE, Project: SE:Kond2Life



A study from *The Circular Cars Initiative* shows 15-20 times higher revenue in the value chain compared to the sales value of the car, in a fully developed circular vehicle industry.

# The circular car

Feasibility study 2023

# Projektdeltagare



## Parter

AXKID

 bilia



 **STENA**  
RECYCLING

**CEVT**

BORGSTENA

**KGK**

LYNK&CO

elmo   
imagination by you



## Koordinator

**RI.  
SE**

## Finansiär

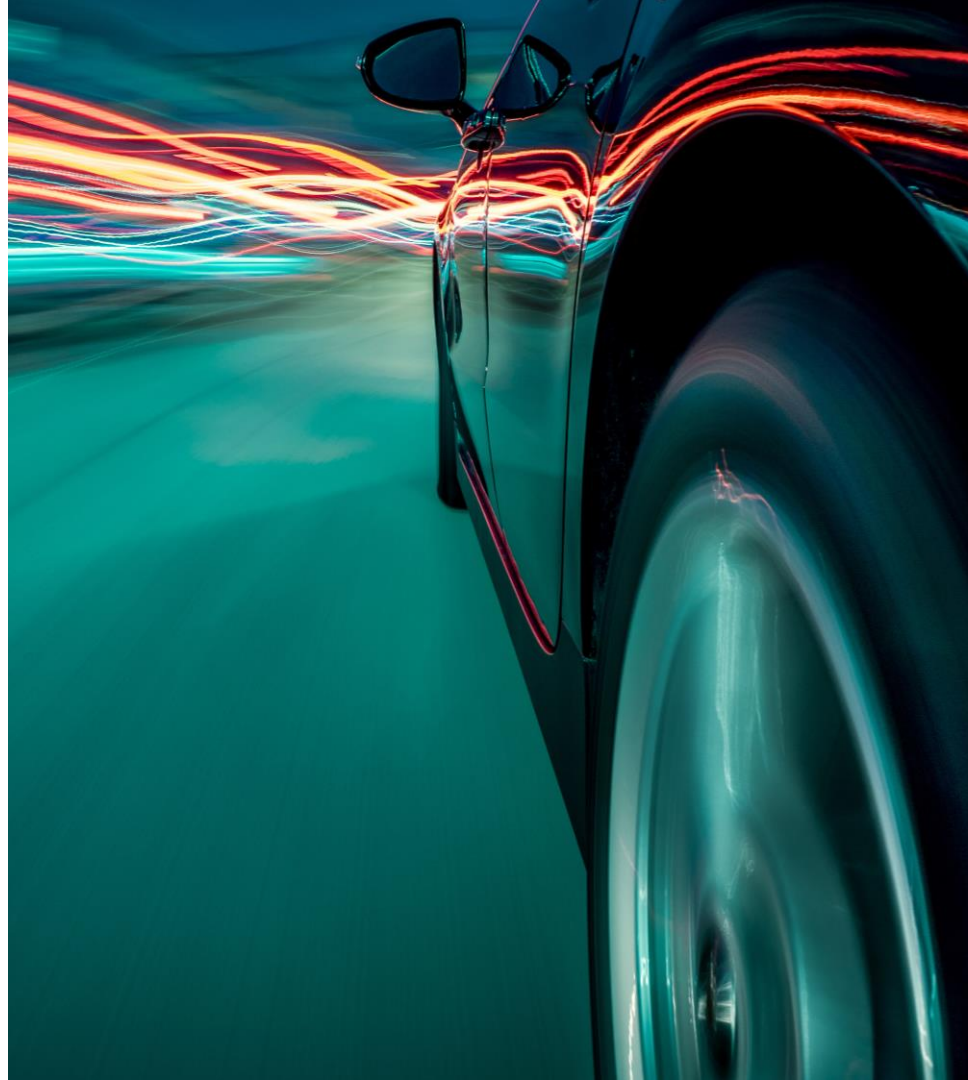
**VINNOVA**  
Sveriges innovationsmyndighet

**RI.  
SE**



# Vision

The project's vision is that by 2045 Sweden will have a circularly adapted car fleet that enables fossil-free and climate-neutral transport.



# Target

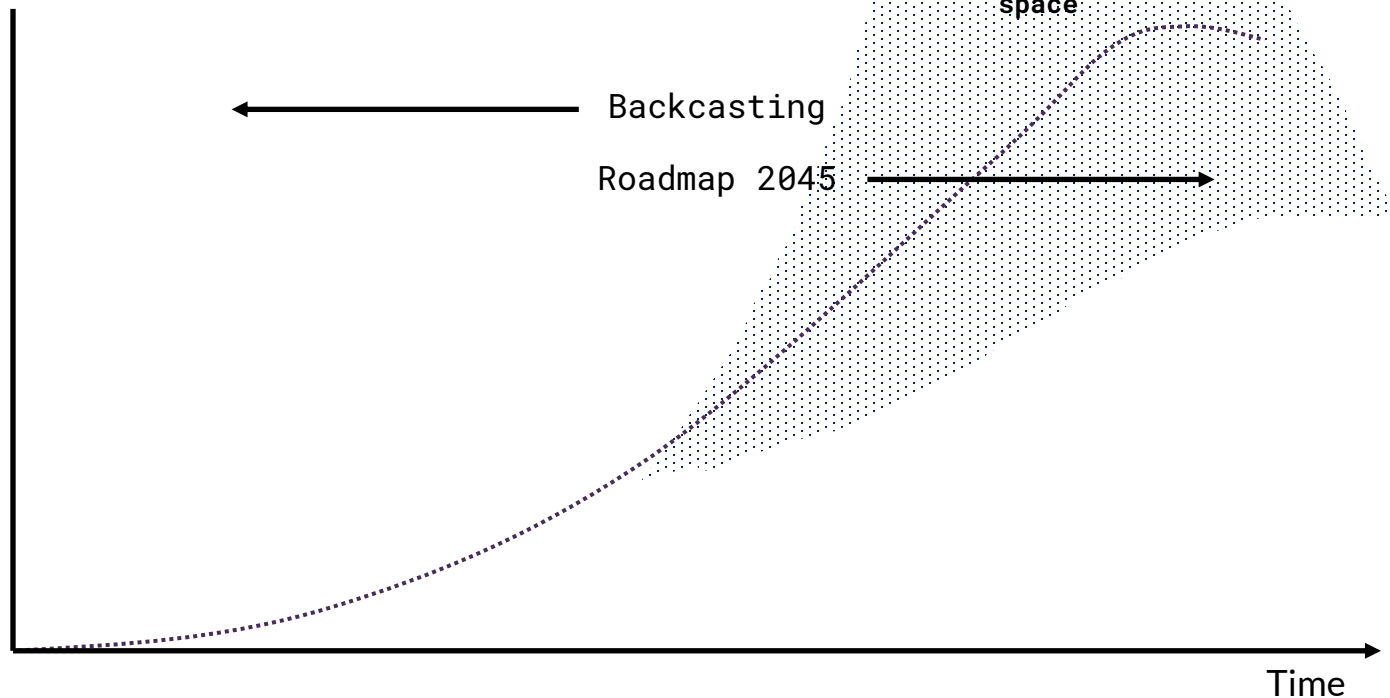
To develop and propose a holistic concept for the car fleet of the future, where recirculation of products and components is standard in the industry and is adapted for a **higher utilization rate by more users.**



# Preliminary insights

# System perspective + scenario

Scope, system  
boundaries





System perspective  
enables co-creation  
and testing of circular  
solutions in the car's  
value chain



# Thank you