

# SE:Kond2Life - Circular car seat

Summary of concept for increased reuse and  
remanufacturing

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# Starting point

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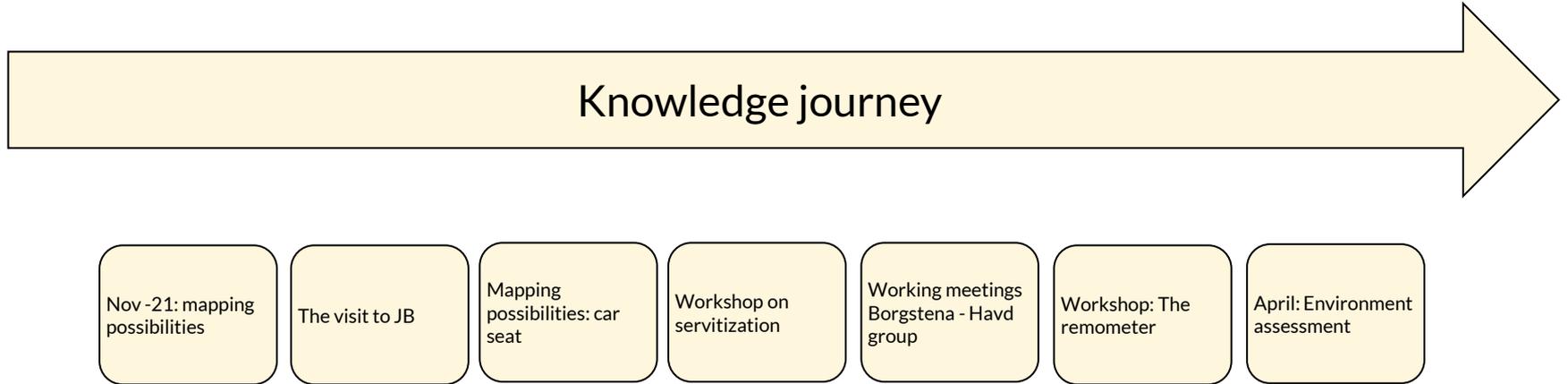
To achieve Sweden's and the world's climate goals, we need to use our resources in a more efficient way. **The transformation** of the automotive industry is not only about electrification but also about **resource efficiency** that can be achieved through e.g. remanufacturing and service.

**In the future**, the car will most likely have to be used to a much greater extent and drive several miles during its lifetime. It requires that the car must be easier to maintain and upgrade during its lifetime for both functional and aesthetic reasons, and that repair and new production must be able to take place with **reused** or **remanufactured** components.

**This study aims to identify possibilities and barriers** for a more **circular car seat** in Sweden with the focus on textile surface materials with a **conceptual design approach**.

# Knowledge journey

# Knowledge journey





# The Circular Car Seat

# Circular car seat

The **concept proposal** for transformation towards a more circular car seat is based on **4 steps** which are described as follows:

**Step 1** Current situation

**Step 2** Describes the possibilities for increased remanufacturing with today's design

**Step 3** Proposals of design and business concepts based on identified challenges that enables more efficient remanufacturing

**Step 4** The most visionary future idea for a conscious circular seat

The proposal is that **1 & 2** takes place in parallel with starting work with **3 & 4**. Cars that are on the market today will be taken care of for a long time to come, in parallel there will be a shift towards the new future concept.



# The current situation

**About 150,000 - 200,000 cars are scrapped annually in Sweden.**

One of Sweden's car dismantling companies announces that they sell around 200 seats annually through their existing channels, typically service workshops or through the digital marketplace laga.se.

Today, a small proportion of all seats are saved during a car dismantling and end up on the market again, this is stated to be due to the fact that demand is low and that it is bulky. The proportion of rescued seats out of a total number received is around 3-7%.

***Source: Mobilitysweden, JB***



# 1

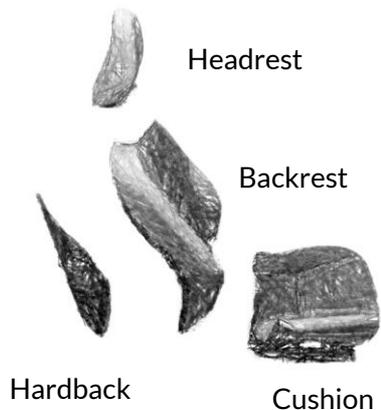
**A seat that for various reasons may need to be replaced is often replaced with a newly produced seat**



- It is possible to reuse car seats, there is an established market for this in Sweden.
- Visual assessment, flawless seats are saved.
- In some cases, only the seat cover is replaced with a new one in the original, in which case the seat's frame is reused.
- The fit of a new seat cover on a recycled foam in a frame cannot be guaranteed. Causes can be deformation of aging or pressure marks after seams.
- Dismantling a car seat is currently complex and resource-intensive.
- There are companies in the market that offer reconditioning of seats for easier repair, cleaning and refreshment.
- It is bulky today to save and store seats.

**The most common when a car is dismantled** is that the seat in its entirety is taken out of the car, compressed and fragmented and, in a recycling process downgraded to a fraction which goes to incineration.

## 2



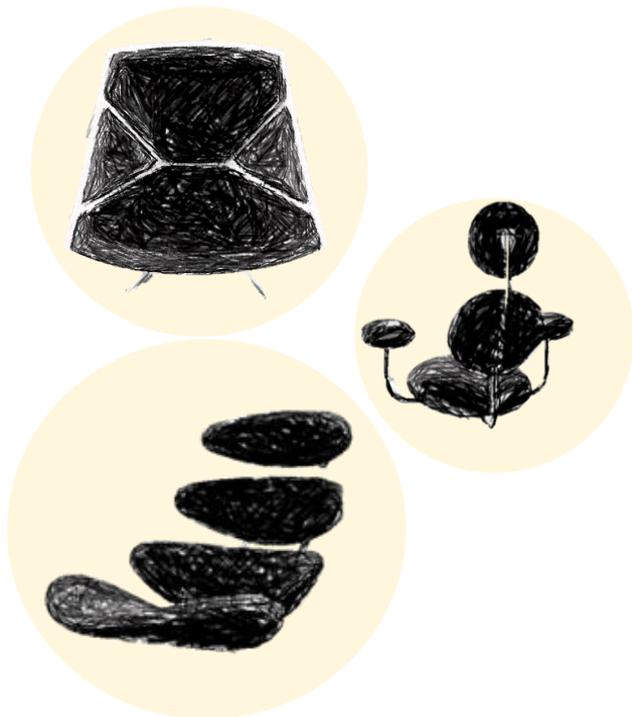
**It is possible to replace or reuse simple parts of a seat with today's design**

- Headrests can be maintained by dressing or cleaning.
- The hardback can be replaced, reused or recycled.
- A backrest or cushion can also be replaced separately with new or used parts, or the upholstery for these.
- Reuse of car seats or parts of seats could possibly go to the flow of newly manufactured cars.
- New production and availability of spare parts are established in the value chain today.
- For the owner of a private vehicle, an upgraded car can lead to an increased resale value.

**The challenges** for this can be in the form of batch similarity of the surface materials, instructions for remanufacturing the various components in the seat, logistics, spare parts, competence, resources and that there is a need for a complementary player.

# The future

### 3



Images: Fritz Hansen Space lounge chair, Poul Volther Corona, Unknown Concept design chair

#### Future concept for a more sustainable and circular product

- Modular design
- Easy and quick assembly and disassembly for upgrading and maintenance
- Can be recycled - designed to separate material types at the end of the use phase (End Of Life) if necessary
- Design open for recycling in facelift
- Controlled to fewer options for resource optimization in all processes
- Maintained fit in product design for more life cycles
- No seams that deform the foam structure
- Light weight construction
- Low CO<sub>2</sub> eq impact
- Easy to clean

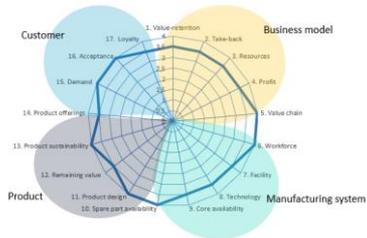
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4

### Holistic approach to a circular car seat, strengths to build on:

- Competence to remanufacture to the right quality, experience and expertise from today has value for the future, education is in the future secured by all players in the value chain.
- Logistics and systems for efficient warehousing for reuse and remanufacturing, the concept design requires reduced space compared to today's design.
- Established value chain for remanufacturing in a dynamic form, close collaborations for common benefit.
- Extended value chain for remanufacturing concepts geographically close to service stations in collaboration Original Equipment Manufacturer - sewing - surface material.
- Makes reusable and remanufactured car seats available through marketing to a larger consumer group.



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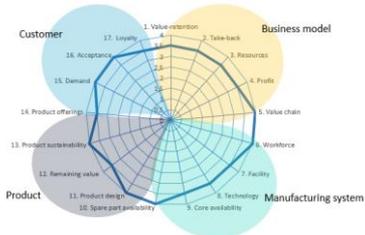
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## Major steps to take from the current situation to reach business models for a circular car seat:

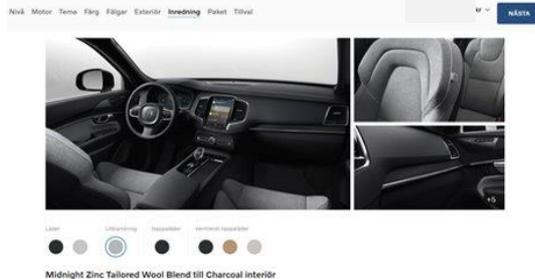
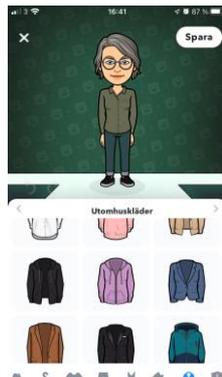
- Service of interior surface materials according to instructions and service intervals. Can be supplemented with sensor data indicating health status at EOL.
- Offer of maintained quality / experience through leasing of the surface material function.
- Independent business of remanufacturing on an industrial scale and process, created with good financial margins.
- Forecast where exchanges will take place, where service will be, logistics and planning from these according to agreements that are produced
- Take-back system as part of business model, a) quality control and into new delivery b) back to established chain for industrial waste material.
- New established value chain for surface materials that are not reused in seats but instead in new material cycles.
- Quality assurance of safety aspects through testing (X-ray, geometric scanner, chemical analysis, non-destructive testing, sensor data).
- Reuse car seats or surface materials in new production, rear seats and other components that have not been subjected to wear and tear or otherwise may have higher financial margins.



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# 4

## The most visionary idea goes Metaverse



Over the last years, we have learnt to have an avatar of ourselves in different social medias and computer games. We have a “look-a-like” on internet. We have created a “second me” that might live a life far from how we live in real life. We select, we buy cars, houses, pets and have friends.

In real life we are relatively familiar to a digital environment where we select and order objects today. We are also able to select and take decisions on expensive purchases such as cars.

Imagine if we combine these two, with our growing interest for sustainability and the environmental consequences of our consumption, step into metaverse where we can consciously choose pre-used seats and design pieces as well as new ones in own cars.

# Future scenarios

Soon

## SCENARIOS

Future

- Car sharing or leasing affects interior choices, renewed usage patterns and needs. The car is used and rolls more. Can affect the needs for maintenance and upgrading of the surface materials, it can also lead to changing needs for surface material performance.
- Raw material shortage for surface material - disturbances in the existing value chain, which may mean that it is not possible to manufacture new surface materials in the traditional way.
- Balancing of environmental benefits in material quality. Environmentally sustainable surface materials are compared to traditional surface materials and their respective performance.
- Legislative bill that governs car seats not to be used for incineration. Leads to new ways that enable increased reuse, remanufacturing and recycling.

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