



**NPD4CE**  
2023

# Case study: vacuum cleaner

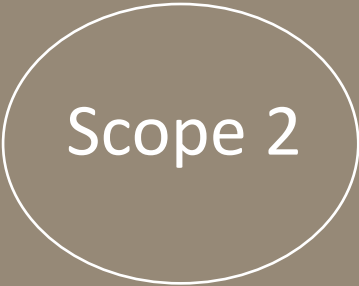
New Product  
Development  
for Upcycling +  
Circular Economy



# Quantifiable metrics: LCA



Direct



Indirect



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# Our expectations of sustainable product design

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A deceptively simple solution?

"Our innovative biomaterial"

"Made with 80% recycled material"

"The 'feelgood' factor of a product made from ocean plastic"

”

# Our expectations of sustainable product design

“

Look to the past to understand the future

1920's



1960's



2015





**Product intent:**

Growth focused business practices

Unethical design methodologies

**EOL triggers:**

Product breakdown

Changing needs

Desire for new

**Infrastructure:**

Processing facilities

Repair shops

Part availability

**User understanding:**

Lack of metrics

Unclear labelling

Waste distancing

**EOL purpose**

Mapping the journey of a conventional vacuum cleaner highlights the stakeholders and problems that contribute to poor lifecycle metrics of sustainability

Journey mapping the problems





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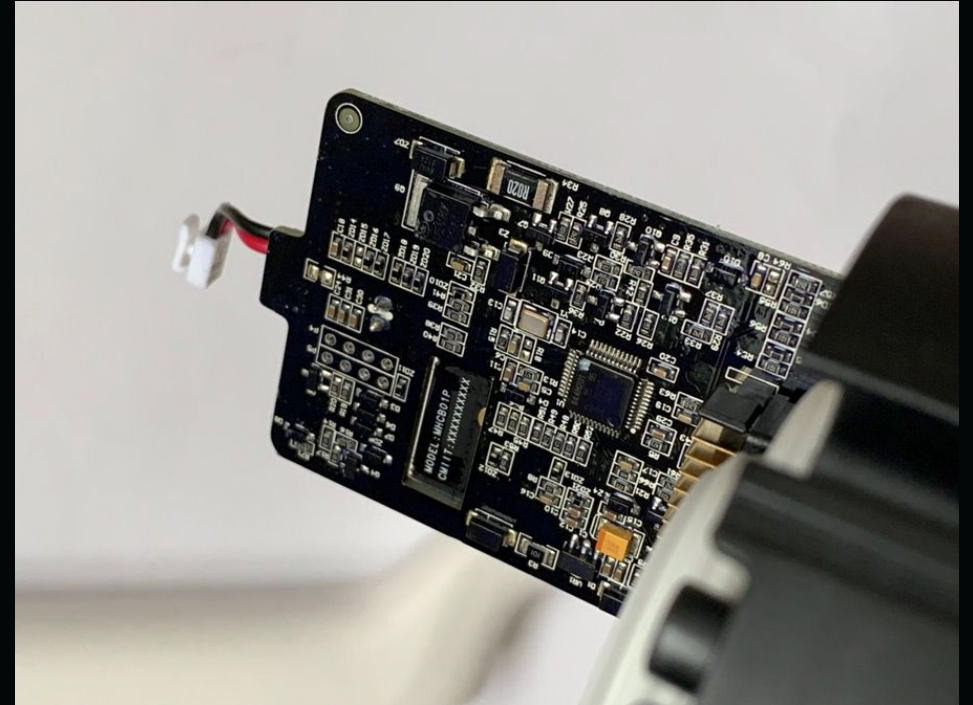
**Journey mapping the problems**



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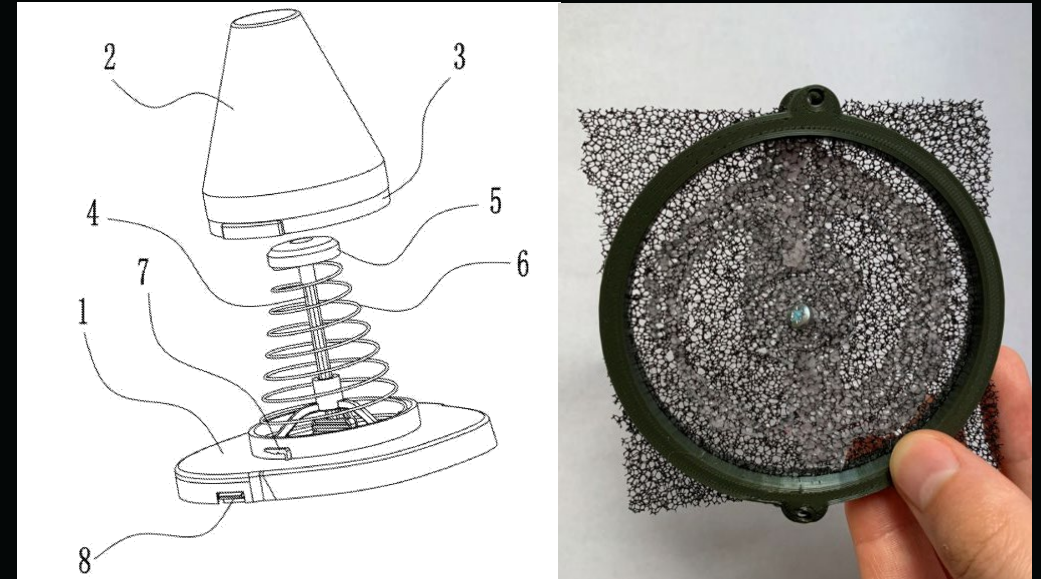
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Electrolux (2014), NTU (2019)



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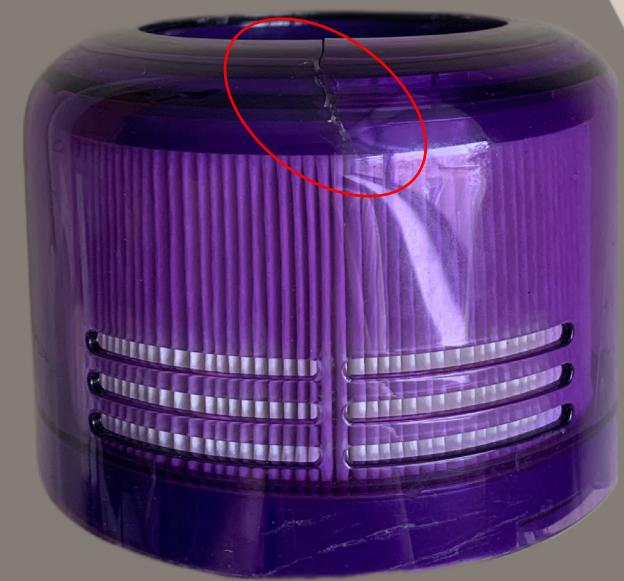
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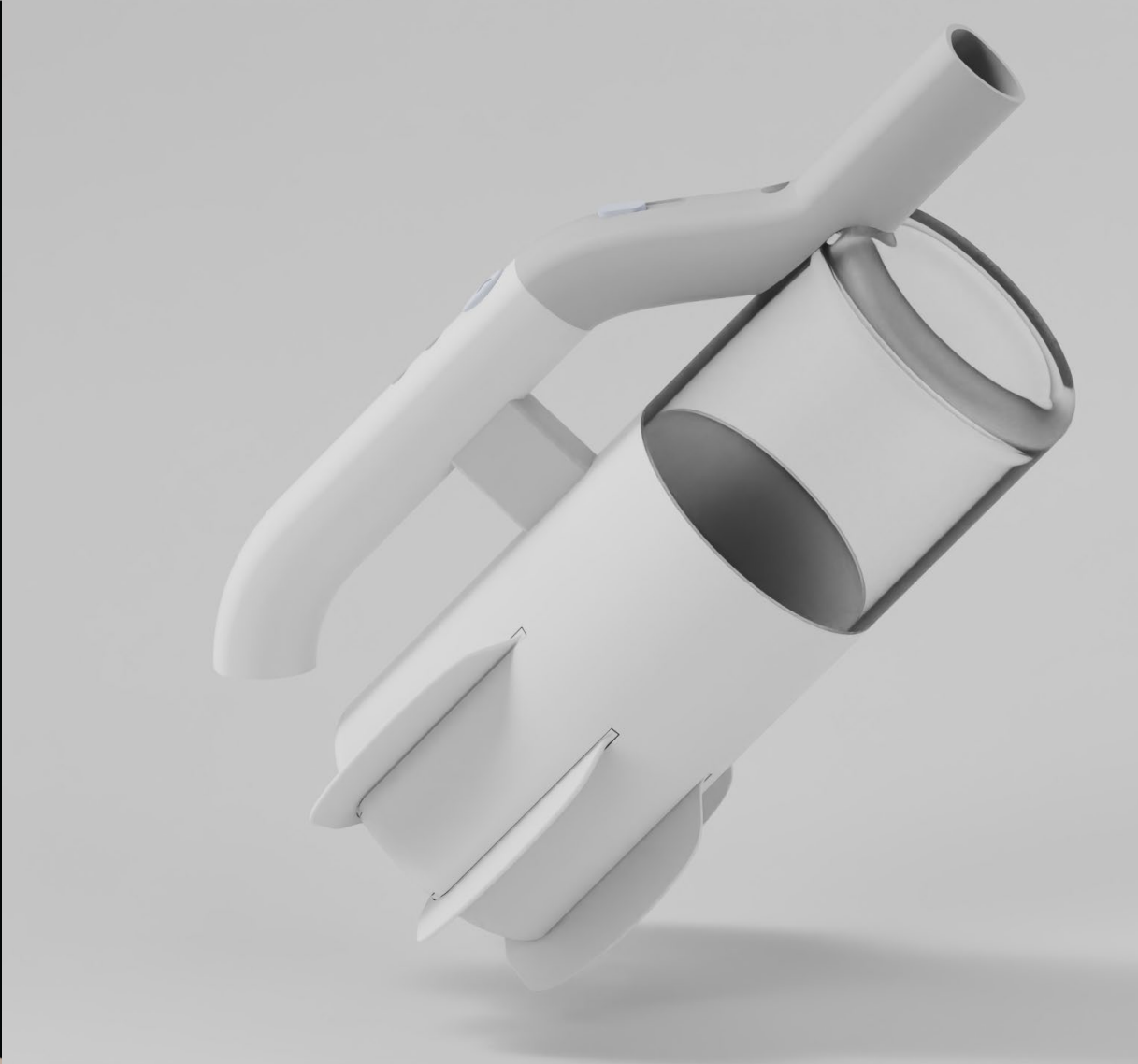
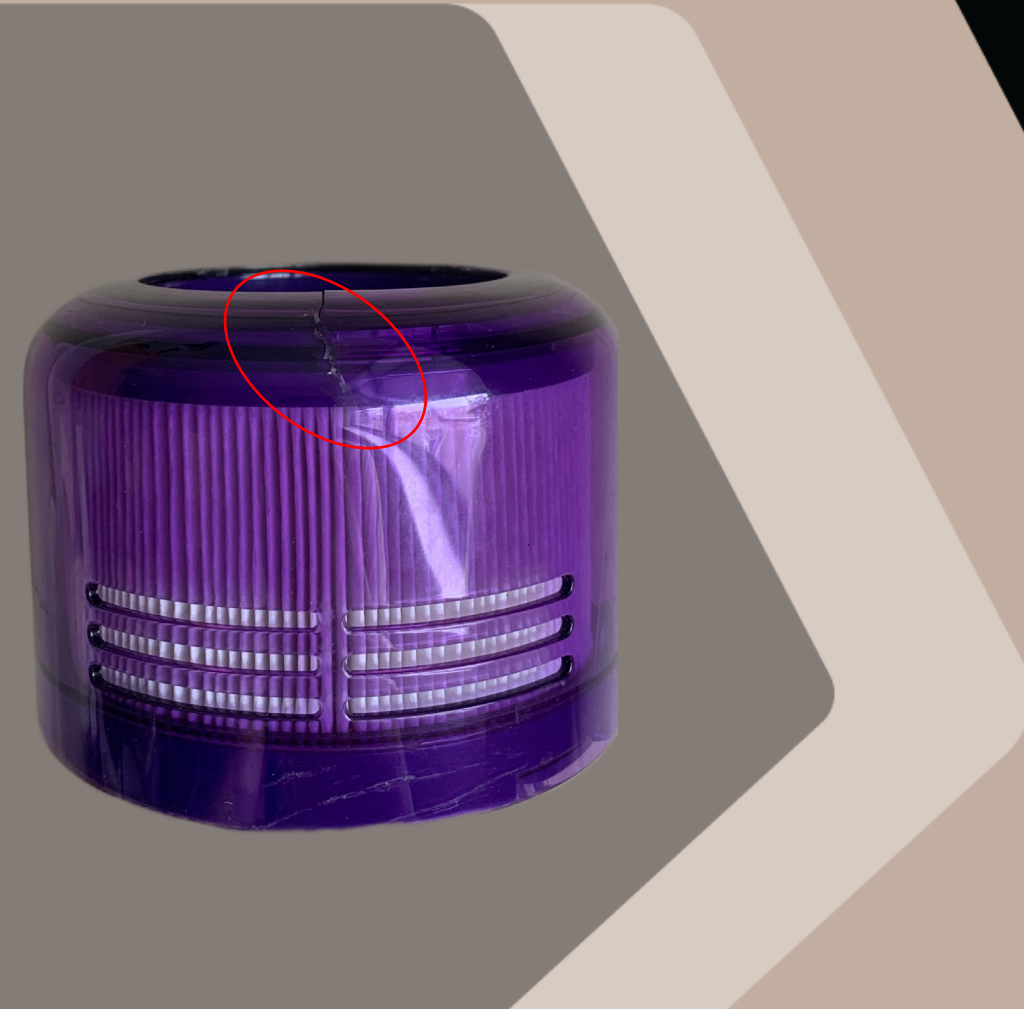
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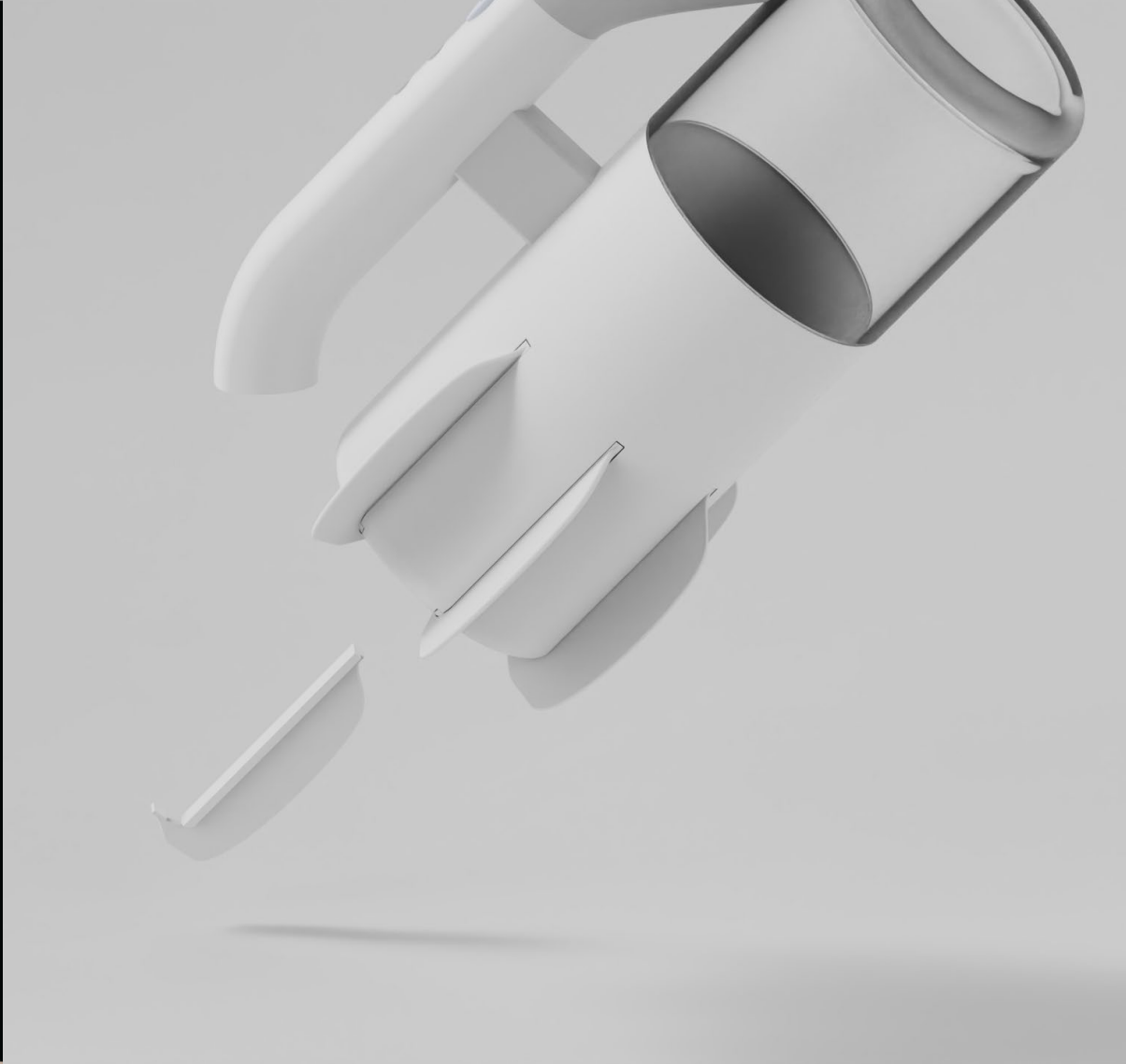
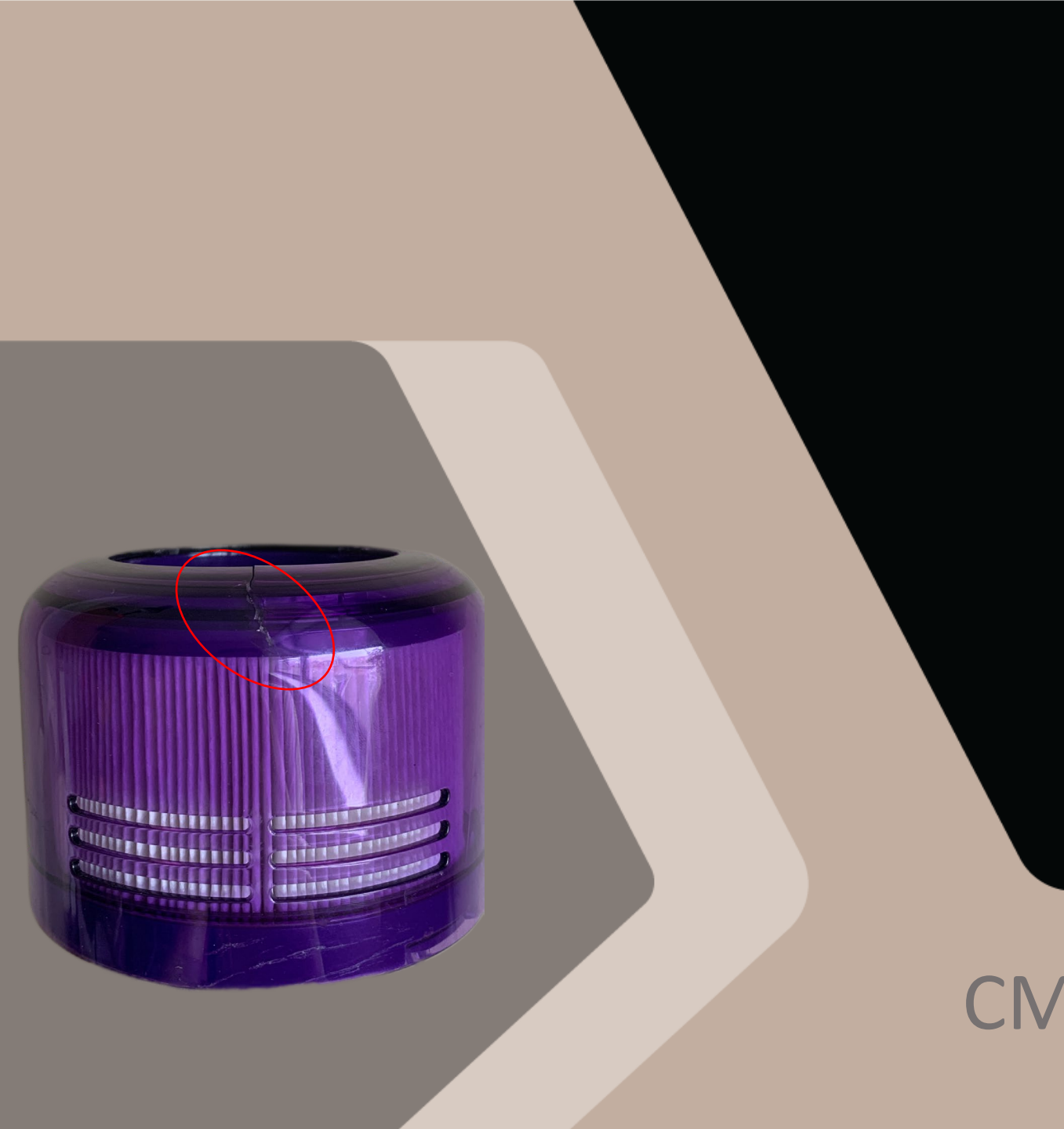


CMF for durability



CMF for durability





CMF for durability



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## dyson outsize



Big cleans in big homes, done quicker – thanks to our largest ever cleaner head and bin.

## dyson v15 detect



Our most powerful cord-free vacuum. Intelligently counts and measure the dust in your home.

## dyson v15 detect absolute



Our most powerful and intelligent machine, with our most advanced filtration ever on a cord-free vacuum. Perfect for pet owners and allergy sufferers.

## dyson v12 detect slim



Powerful and intelligent Dyson cord-free performance – but in a more compact format for smaller homes.

## dyson micro 1.5kg



Our lightest machine at 1.5kg, helping you clean up high, down low and everywhere in between. With 99.99% filtration and no loss of suction.

## dyson omni-glide



A brand new way to clean hard floors. Perfect for smaller homes and hard-to-reach corners.



Life has infinite stages further dictated by choice & circumstance

A product with no adjustment has no future



University



First flat with friends



Co-habiting



Single



Travelling



Growing family

**The Ikea Effect**  
Build emotional connection through assembly process

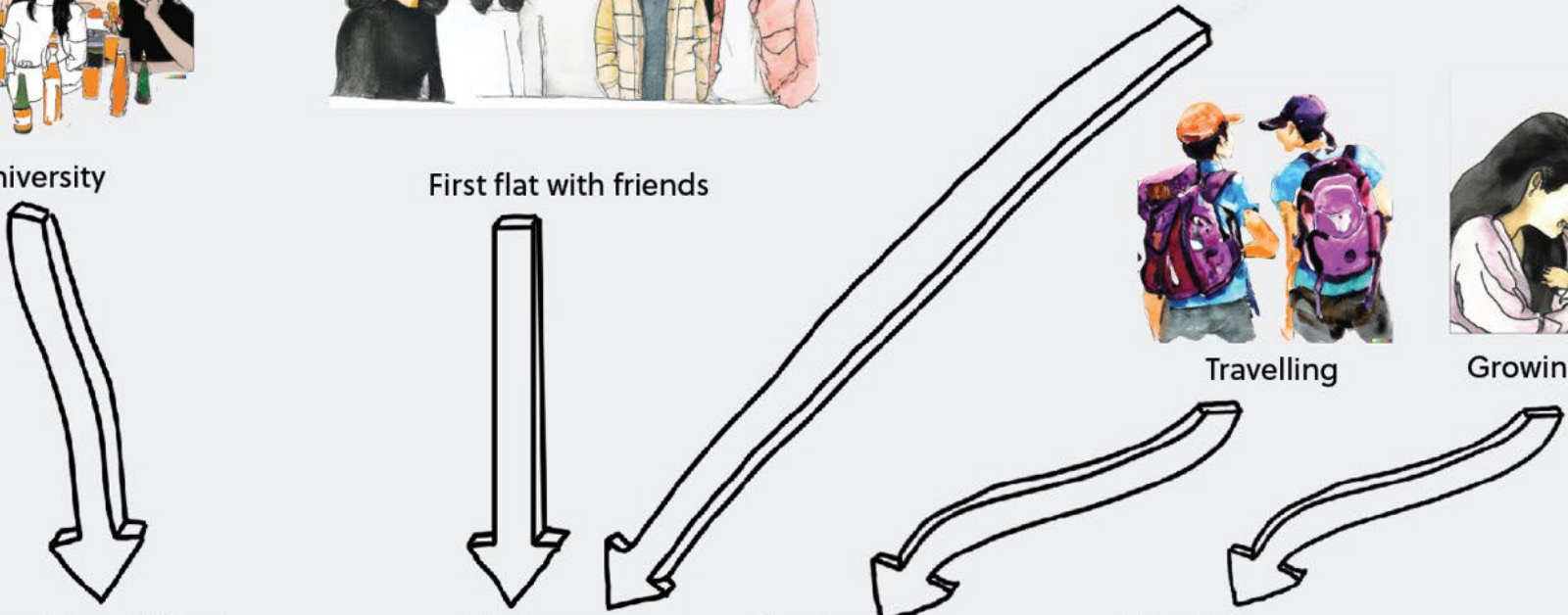
**Put away**  
Make space in small home

**Pack away**  
Avoid throwing away when moving home

**Modular**  
Adapt to changes in circumstance

Key life event

Impart the ability to purchase upgrades



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# Product System App

User

Emotional durability



Lifecycle audit

dyson

Product novelty & circumstantial convenience



- Repair:** Save a beloved product from the destiny of landfill
- Modular changes:** Upgrades product to match the dynamicism of your life
- Global exchange:** Trade in and collect like for like product at new destination
- Trade in:** Opportunity to use the old to help fund something new

Expanded revenue



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GN65 NHP

Blind spot  
Take care

GRUNDON

GRUNDON  
RECYCLE  
www.grundon.com







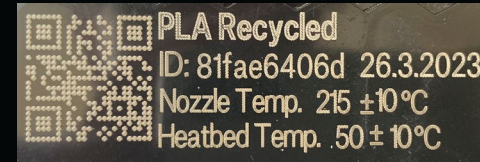
$$D'_n = \frac{\frac{P_n}{T} \cdot X + \frac{E_n}{T} \cdot X - (1-\delta) \cdot U_n \cdot X - R_n}{P_n + U_n \cdot T + E_n} \cdot 100$$

Clear metrics

$$D'_n = \frac{\frac{P_n}{T} \cdot X + \frac{E_n}{T} \cdot X - (1-\delta) \cdot U_n \cdot X - R_n}{P_n + U_n \cdot T + E_n} \cdot 100$$



+



**You're replacing this product prematurely!**

**If you purchase this new product, you will create 10kg more CO2 than if you repaired it for another year.**

Clear metrics

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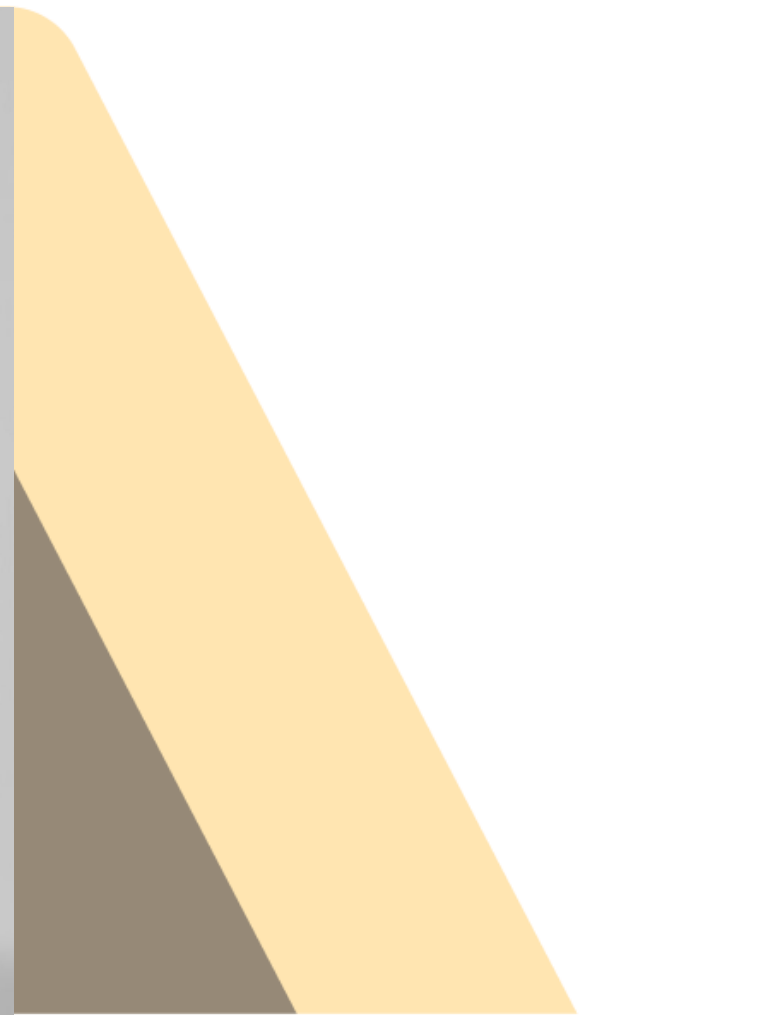
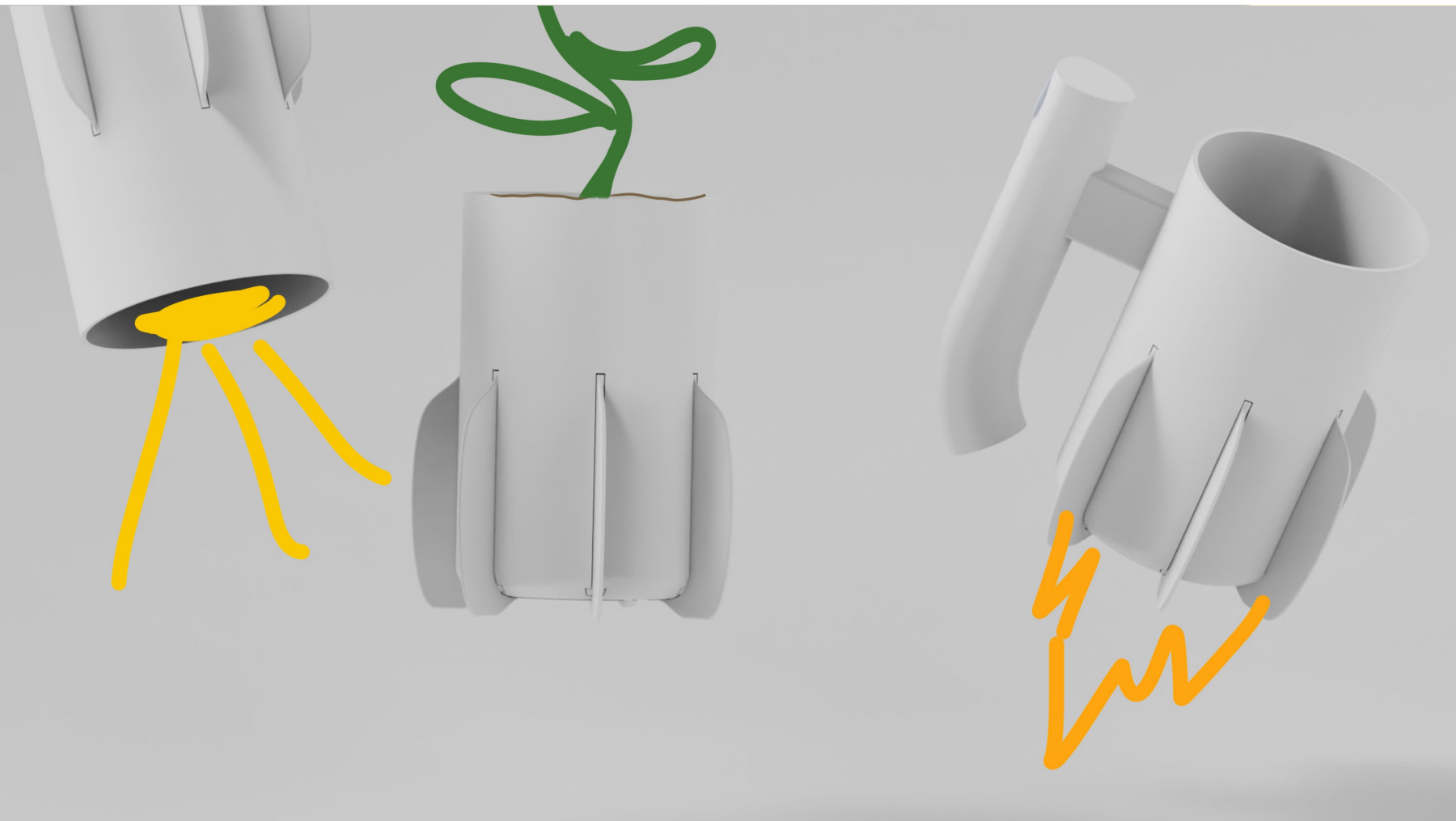
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# EOL purpose





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