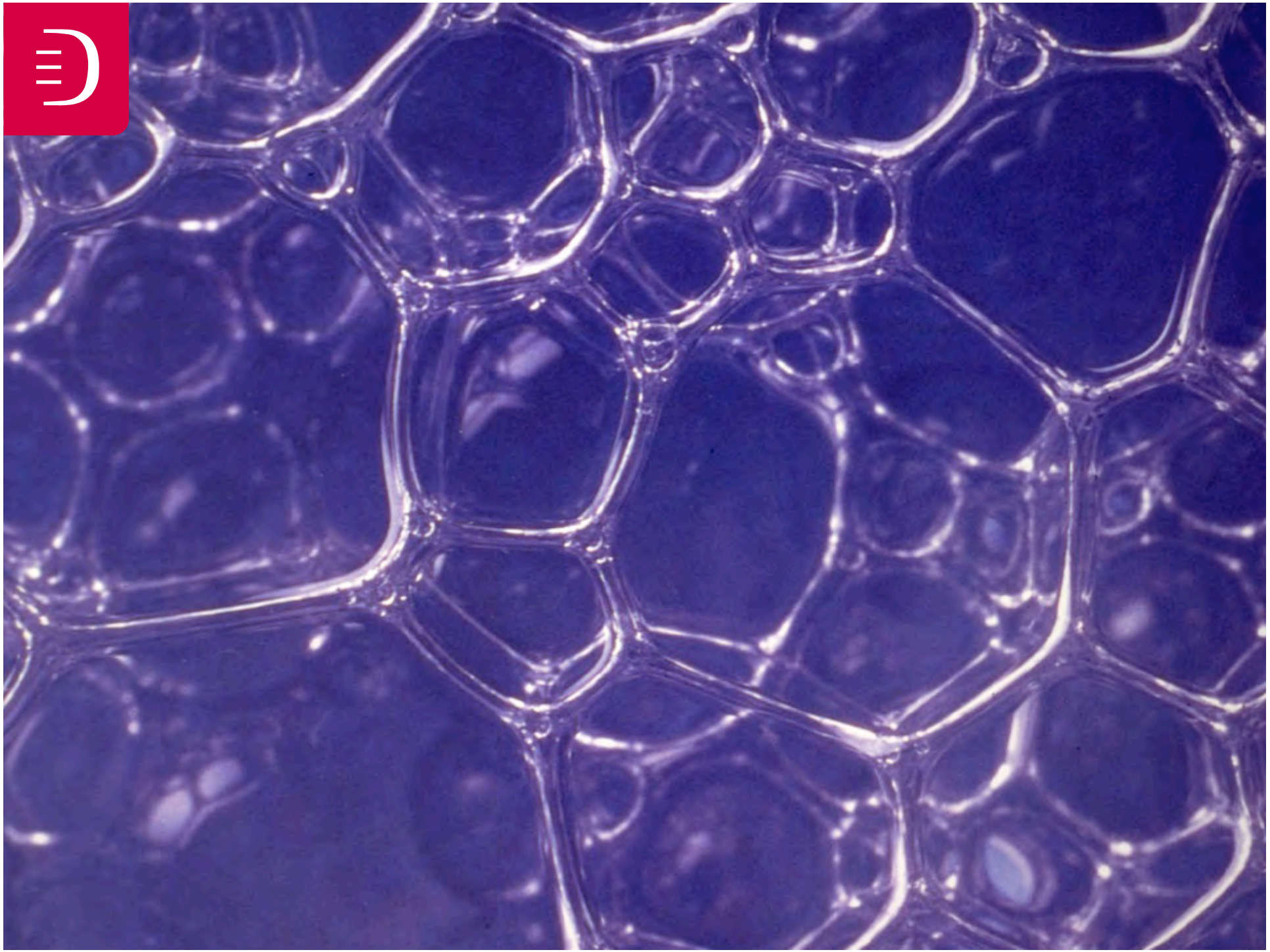


Human Centered Design
Innovation Strategy
Corporate Value

Eco-Design: Inspirierende Zukunft

Möglichkeiten für nachhaltige Inkubationsprojekte

Raimund Erdmann, Erdmann Design AG

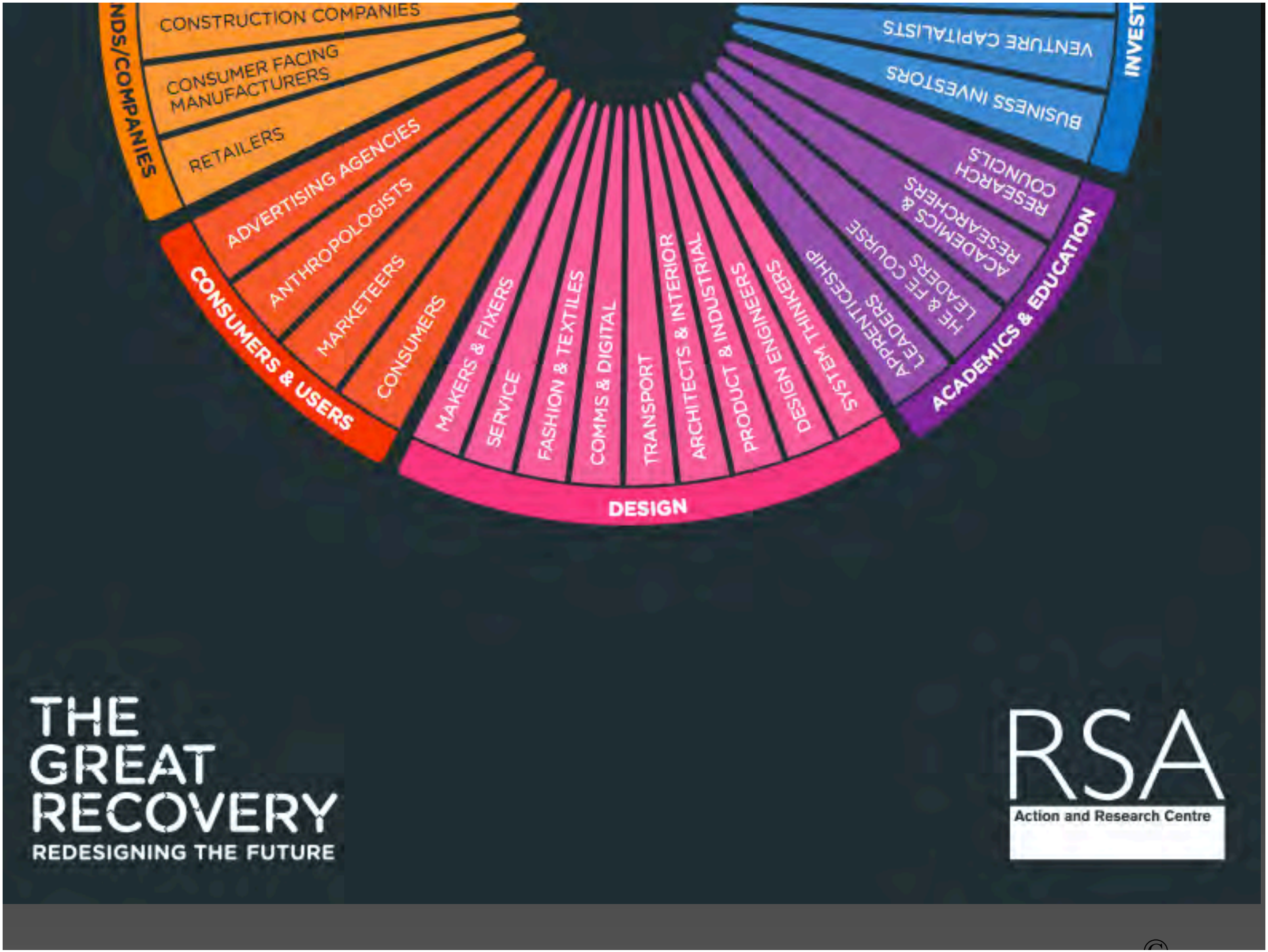
Taxonomy of Innovation

Emerging strategies by Okala

Provide Product as Service
Mimic Biological Systems
Carbon-Neutral Energy
Encourage Low-Consumption Behavior
Design for System Longevity

Report 01: June 2013

Investigating the role of design in the circular economy


NDS/COMPANIES
CONSTRUCTION COMPANIES
CONSUMER FACING MANUFACTURERS
RETAILERS
CONSUMERS & USERS
ADVERTISING AGENCIES
ANTHROPOLOGISTS
MARKETEERS
CONSUMERS
DESIGN
MAKERS & FIXERS
SERVICE
FASHION & TEXTILES
COMMS & DIGITAL
TRANSPORT
ARCHITECTS & INTERIOR
PRODUCT & INDUSTRIAL
DESIGN ENGINEERS
SYSTEM THINKERS
ACADEMICS & EDUCATION
APPRENTICESHIP LEADERS
HE & FE COURSE LEADERS
ACADEMICS & RESEARCHERS
RESEARCH COUNCILS
INVEST
BUSINESS INVESTORS
VENTURE CAPITALISTS
THE GREAT RECOVERY
REDESIGNING THE FUTURE
RSA
Action and Research Centre

GET INVOLVED! Name: Email:

THE GREAT RECOVERY
REDESIGNING THE FUTURE

RSA
An RSA ARC project

Technology Strategy Board
Driving Innovation

HOME | ABOUT US | RESOURCES | EVENTS | COMPETITIONS AND NETWORKS | BLOG

RESOURCES

Technology Strategy Board funded projects

Resource Resilient UK

Closing the loop: Risk or reward?

FILTER

SHOW ALL
advisory board
circular economy
collaborate
community
competition
construction
design
e-waste
education
elements
fashion
fixing
india
networks
rare earth metals
recovery
remanufacture
repair
reports
resource

Inkubation von Eco-Design

Plattform Innovation
Kombinieren und innovieren
neue Werte aufzeigen

CONFIGURATION

OFFERING

EXPERIENCE

Geschäftsmodell Innovation
Geschäftswerte werden zu neuen
Werten konfiguriert

Erlebnis Innovation
Engagieren der Kunden, um Werte
der Zusammenarbeit zu generier


USER
Door2Door
Private initiatives
Shuttles Land
Sharing
Elektro/
Hybrid
Gas
GUI
App
LUCIUS BURCKHARDT
Design
=
unsichtbar
HIER
IST ES
SCHÖ

Human Centered Design
Innovation Strategy
Corporate Value

Design Thinking

Cultural Understanding

Corporate Values

Human Centered Design
Innovation Strategy
Corporate Value

Human Centered Design
Innovation Strategy
Corporate Value

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Human Centered Design
Innovation Strategy
Corporate Value

Design Thinking

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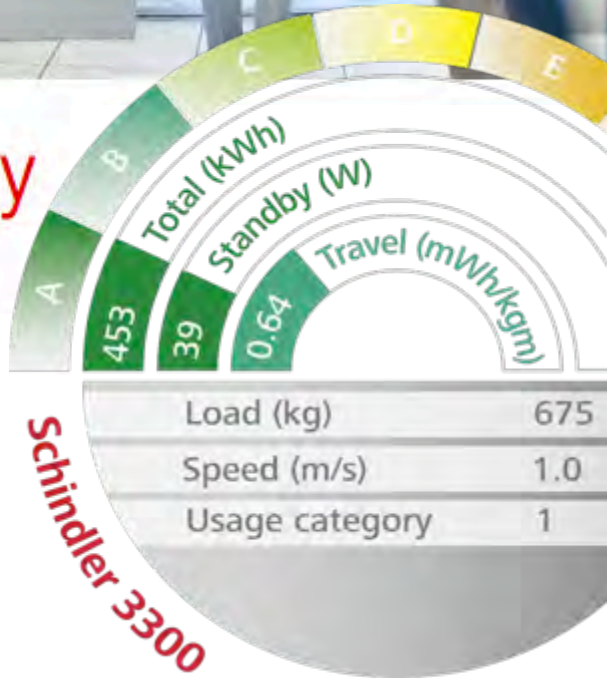
Corporate Values


The big idea behind our brand:
Urban mobility.

Green mobility, sustainable technology

Urban centers cause around 80% of the world's pollution, and buildings consume 40% of world energy.




4
5
6
7
8
9
★
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-

Service Design

Human Centered Design
Innovation Strategy
Corporate Value

Hervorragendes Eco-Design ergibt kundenfreundliche Produkte, diese vermitteln Zufriedenheit und minimieren Prozessfehler.

1 feed forward

Einfache Bedienung.
Optimierung der Prozesse.
Analysieren vor Ort.
«Dive in Methode»
«Experience Map»
«Usability und Eco-Standards»


60%
HABEN MÜHE, DEN AUFREISSFADEN EINER
FOLIENVERPACKUNG ZU FINDEN.
90%
HABEN PROBLEME BEIM ÖFFNEN VON VERPACKUNGEN.

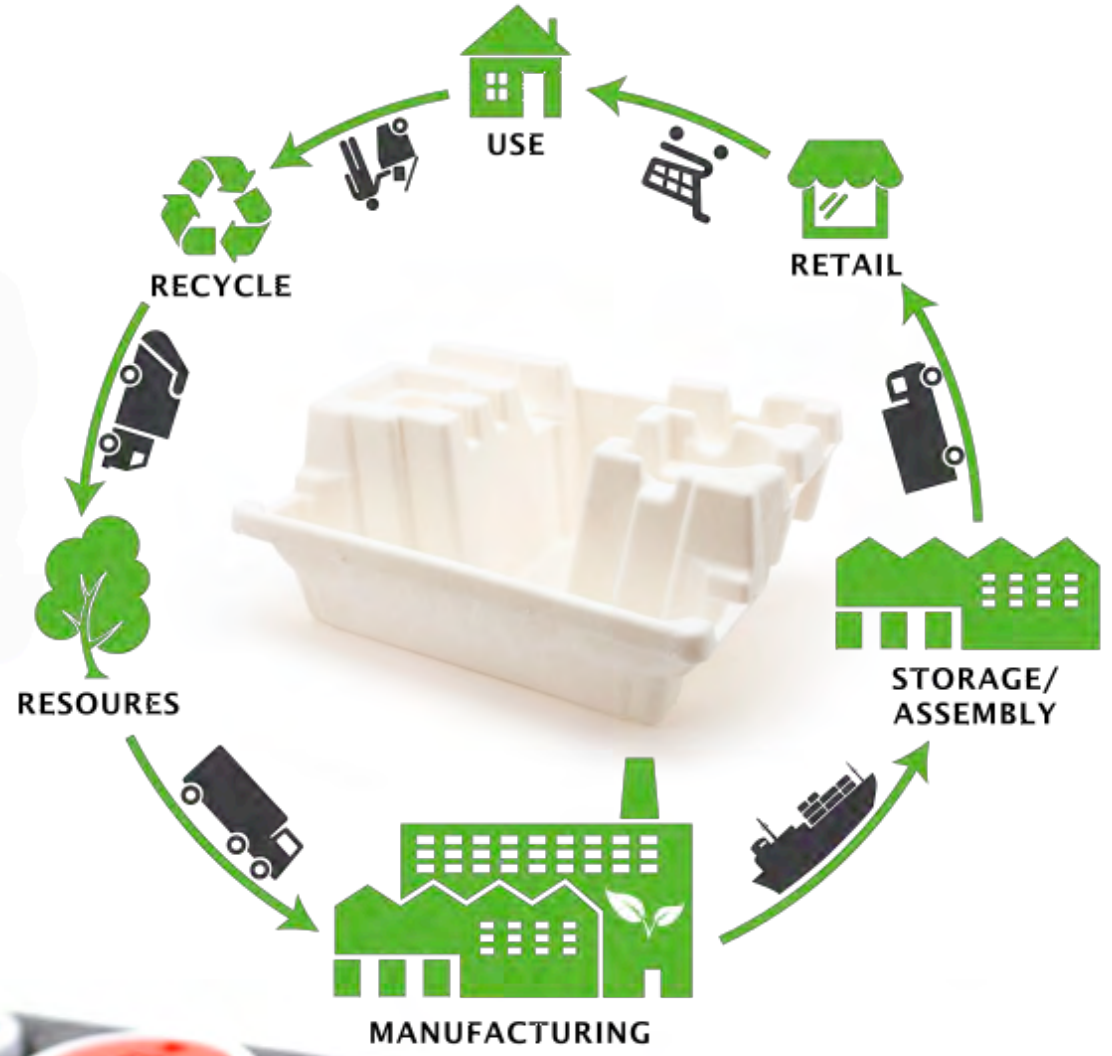
2 feed forward

Frühe Teambildung.
Ausrichten aller Kräfte auf das vereinbarte Projektziel.
Ideen und Prozesse animieren.
«Design Management Methoden»
«Aufbrechen der Denkkreise»
«Ideenfindung Workshop»


Age Explorer.de
Benecol
Benecol
Benecol

3 feed forward

Neue Ideen.
Chancen, Risiken, Ängste.
Entwerfen mit generativen Entwicklungsverfahren.
«Praxistest mit Anwendern»
«Innovationsrisikoanalyse»


USE
RETAIL
RECYCLE
RESOURES
STORAGE/
ASSEMBLY
MANUFACTURING

4 feed forward

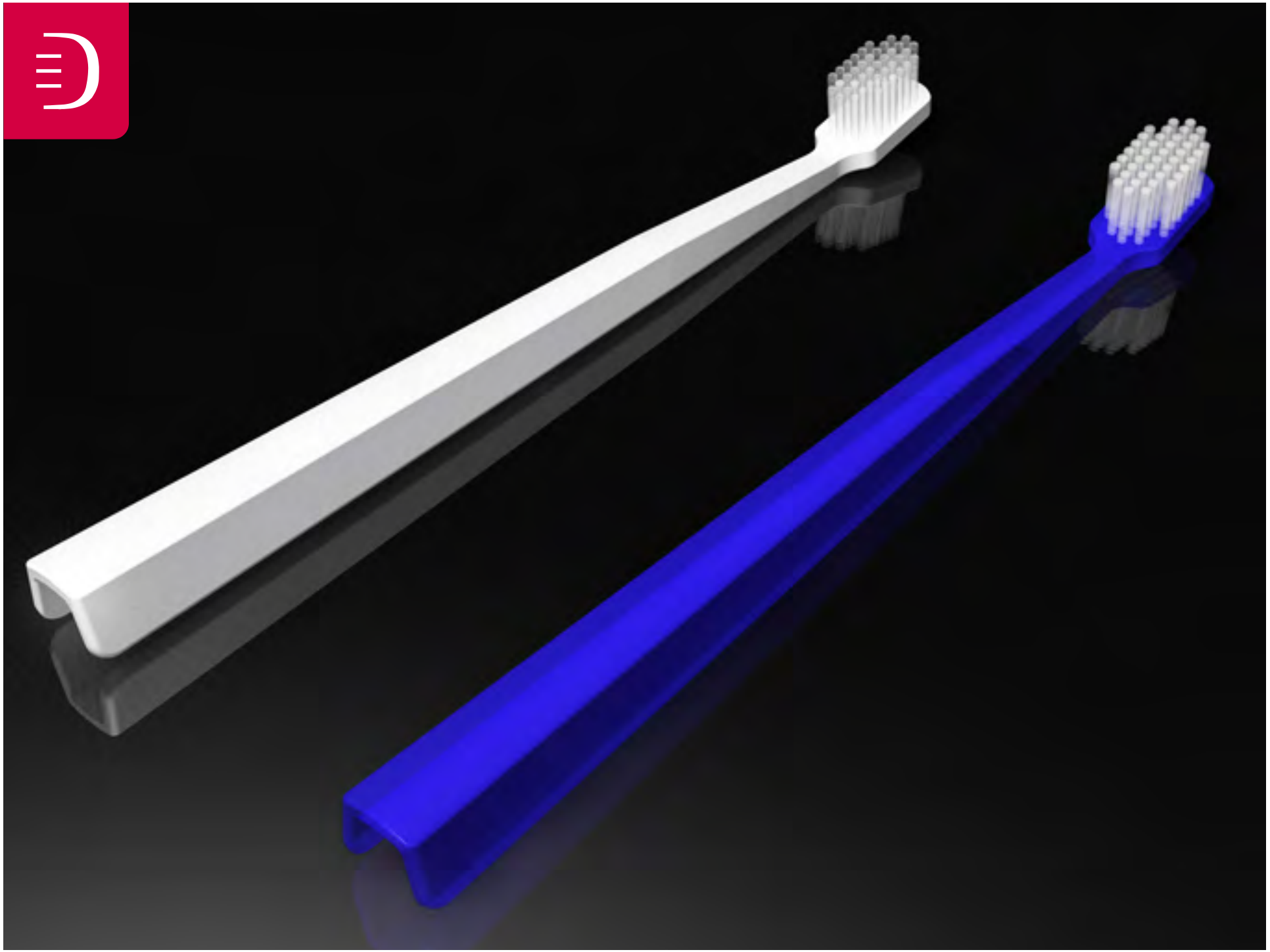
Neue Fragestellungen.
Prüfen der Innovationskraft.
Befragen der Anwender mit Variantenmodellen.
«Feed Forward Methode»
«Usability Check»
«Kundenbedürfnisse verstehen»


nsoles
Handpieces
OR Supporting Products
Supporting Carts/Stan

5 feed forward

Neue Technologien.
Human Centered Eco-Design ein Paradigmenwechsel.

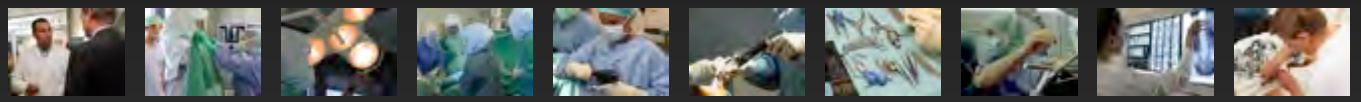
Strukturieren der Kontexte
«Simulation der Abläufe»
«Strategische Absichten»



Planen
Das Zuteilen der Aufgaben

Pre OP Intra OP Post OP

Task Line



Stakeholder

Task

Risk Analysis

Dry Lab
Wet Lab

Usability Testing

Human Centered Design
Innovation Strategy
Corporate Value

Mega Trend

Trend

Eco-Trend

Monika Dittrich, Stefan Giljum, Stephan Lutter, Christine Polzin

for the first time, data on resource use and resource efficiency
orld over three decades, from 1980 – 2008. The data covers
nd country level, featuring illustrative case studies.

ree main issues:

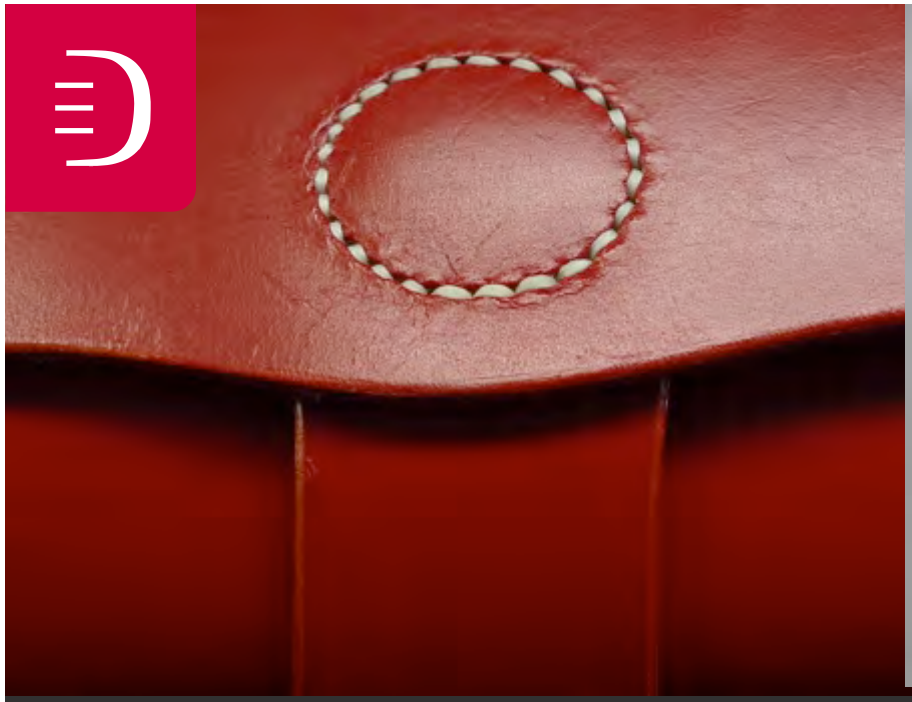
1. Patterns of material extraction, trade, consumption and resource productivity in different world regions and countries;
2. Connections between material use and indicators of economic and social development;
3. Links between material use and selected major environmental problems, such as carbon emissions, land use change and water use.

The report evaluates the performances of different countries, highlighting the critical issues of current trends in resource use. It thus provides innovative input for the current discussion on green economies and poverty reduction in the context of the upcoming Rio+20 Earth Summit in 2012 and beyond.

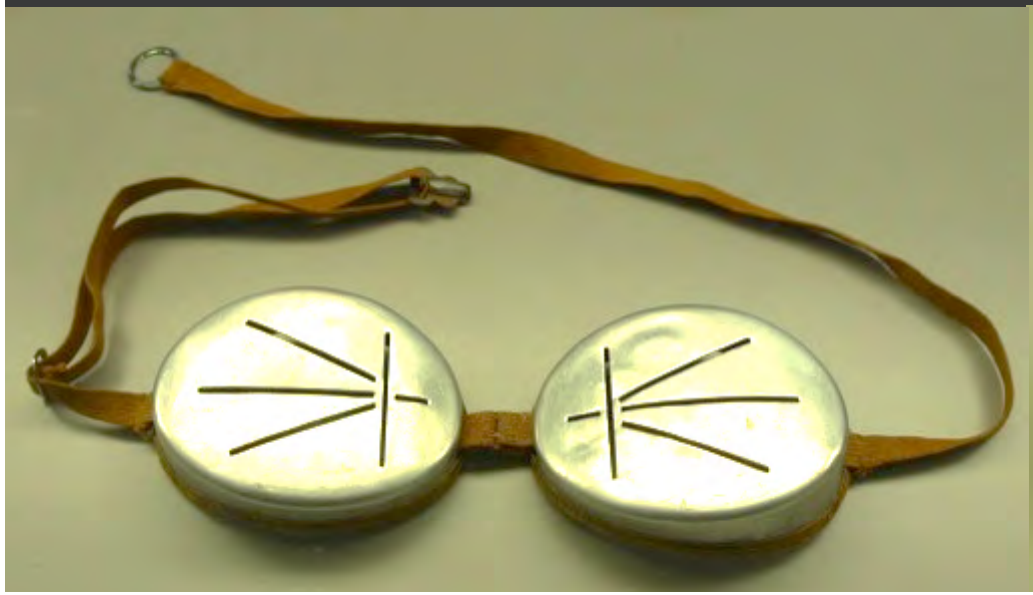
Green economies around the world?

Implications of resource use for development and the environment


B3
B4
B5
B7
B9




Leitz Elmar 1:3.5 F=50mm



eco-design processes

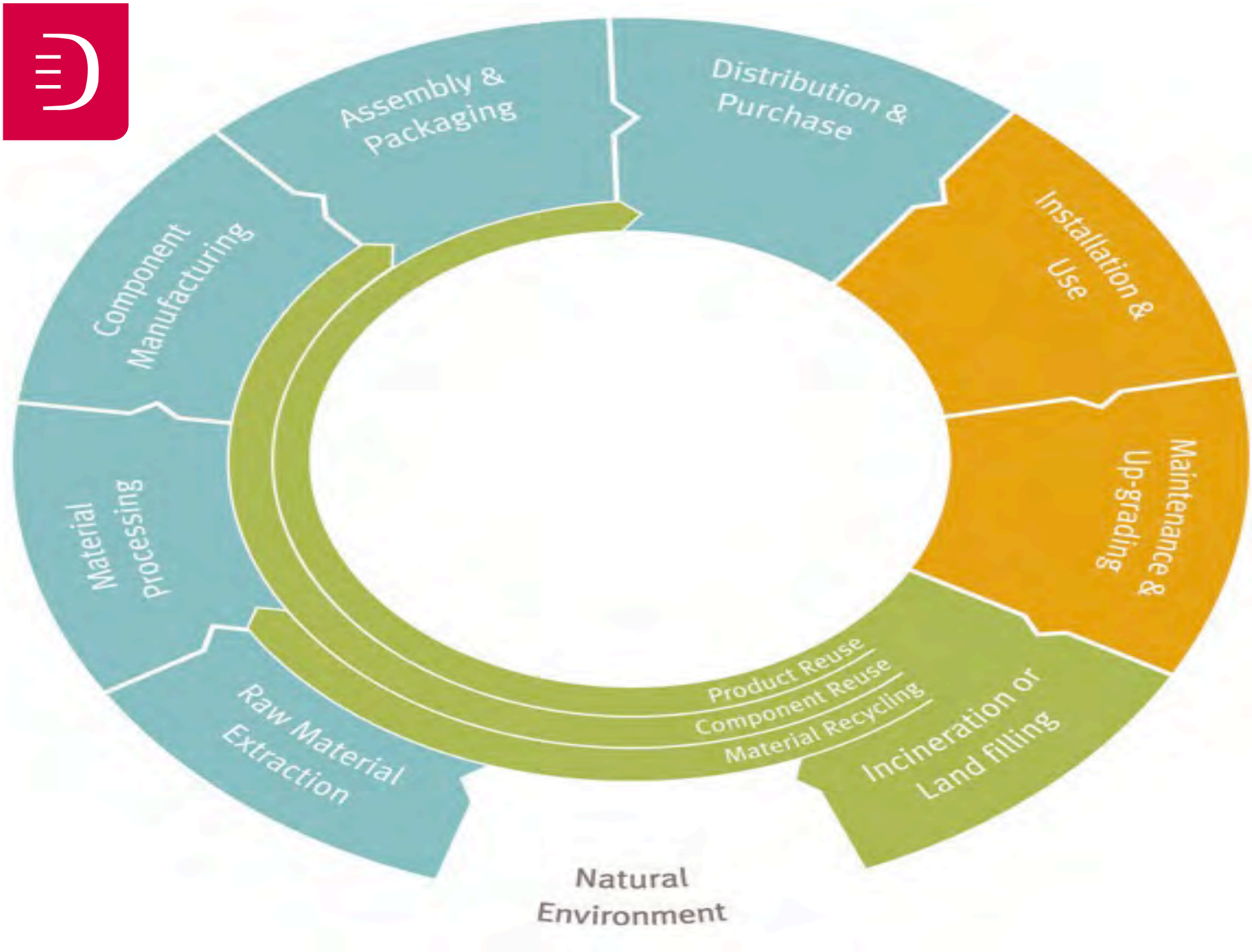
Whenever you have a challenging, seemingly intractable problem, then you need to solve that problem with an interdisciplinary team. In order to help business leaders succeed, desgners need to put together those interdisciplinary teams, and they need to use eco-design processes.

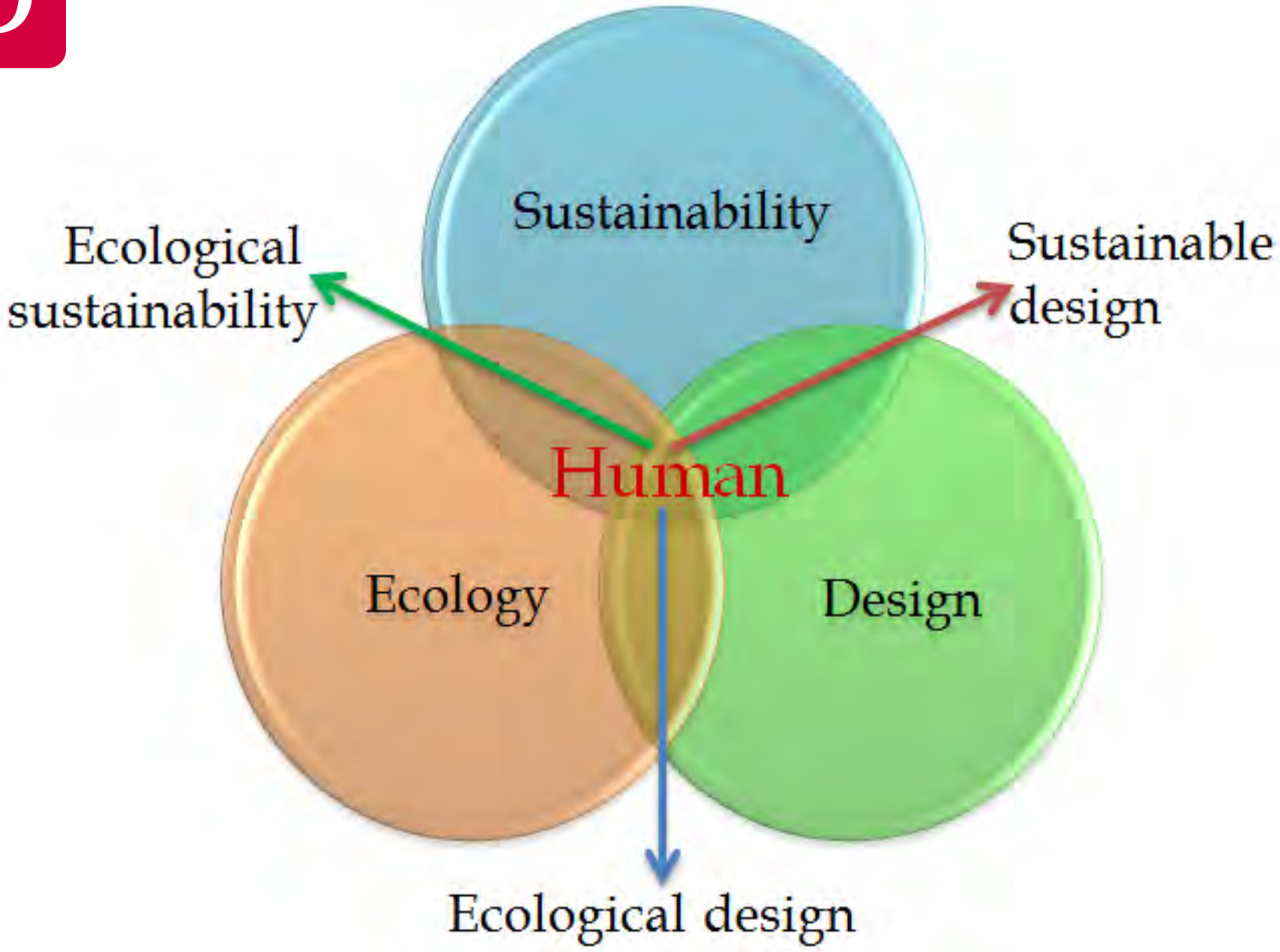

BEER
BEER
BEER
Das Einfache ist nicht einfach.

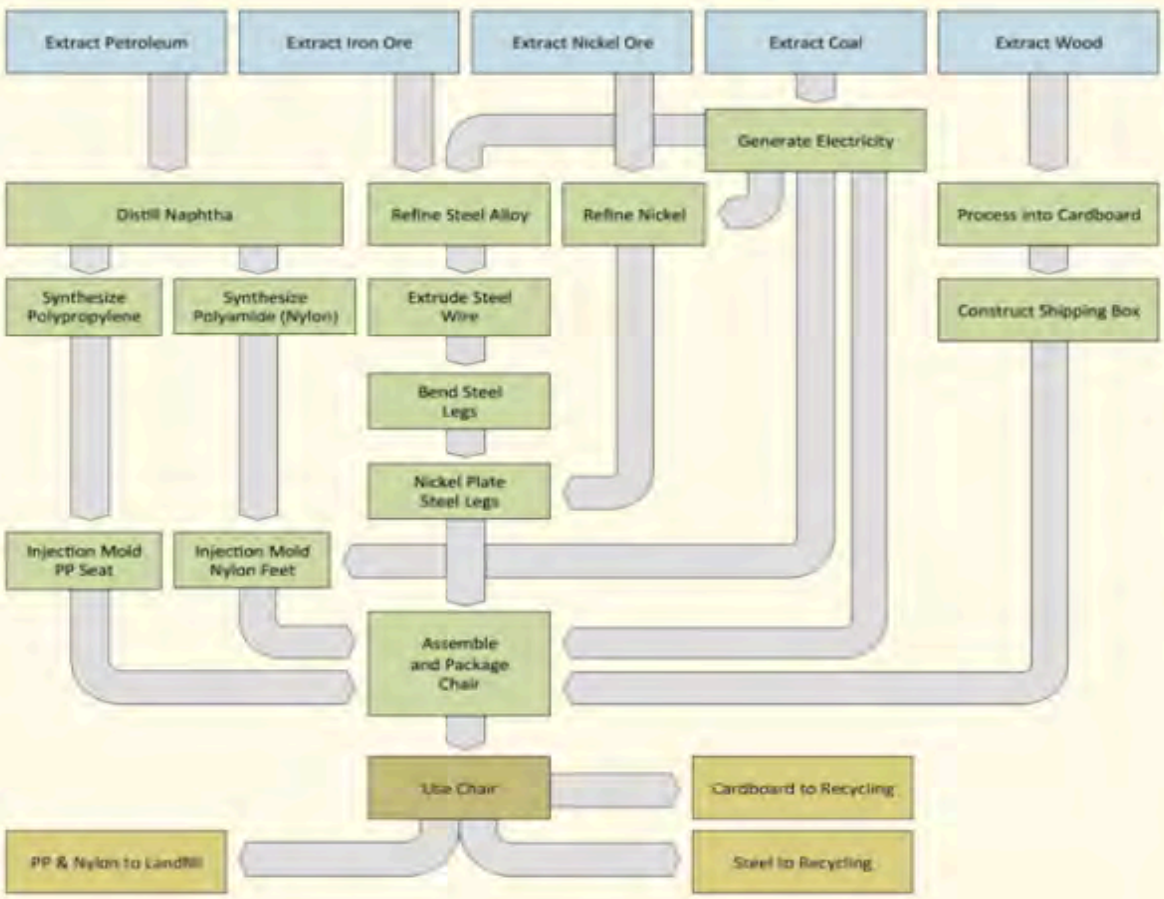

Assembly & Packaging
Distribution & Purchase
Installation & Use
Maintenance & Up-grading
Incineration or Land filling
Raw Material Extraction
Material processing
Component Manufacturing
Product Reuse
Component Reuse
Material Recycling
Natural Environment


Okala Practitioner
Integrating Ecological Design


Design for:
1 Innovation
2 Reduced Material Impacts
3 Manufacturing Innovation
4 Reduced Distribution Impacts
5 Reduced Behavior and Use Impacts
6 System Longevity
7 Transitional Systems
8 Optimized End-of-Life


Assembly & Packaging
Distribution & Purchase
Installation & Use
Maintenance & Up-grading
Incineration or Land filling
Raw Material Extraction
Material processing
Component Manufacturing
Product Reuse
Component Reuse
Material Recycling
Natural Environment


Sustainability
Ecological sustainability
Sustainable design
Human
Ecology
Design
Ecological design



Process Tree

Making a complete process for an existing product often requires considerable time and effort, including consultations with suppliers, their sub-suppliers and manufacturing facilities.

The process tree can uncover critical information about the product system that reveals opportunities for improved functional and environmental performance.

Typical	Trade-offs
Making these choices:	Can sometimes mean:
Using recycled materials	Lower tolerances & specifications
Increasing energy efficiency	Higher electronic design costs
Extending product life	New product sales reduction
Design for disassembly	Higher production costs
Biodegradability	Shorter life, lower strength
Local production	Fewer choices / less selection
Leasing instead of owning	Increased transport impacts
Dematerialization	Fragility / shorter life
Aggressive green marketing	Potential perception of inferior quality

Table A (chapter 10)

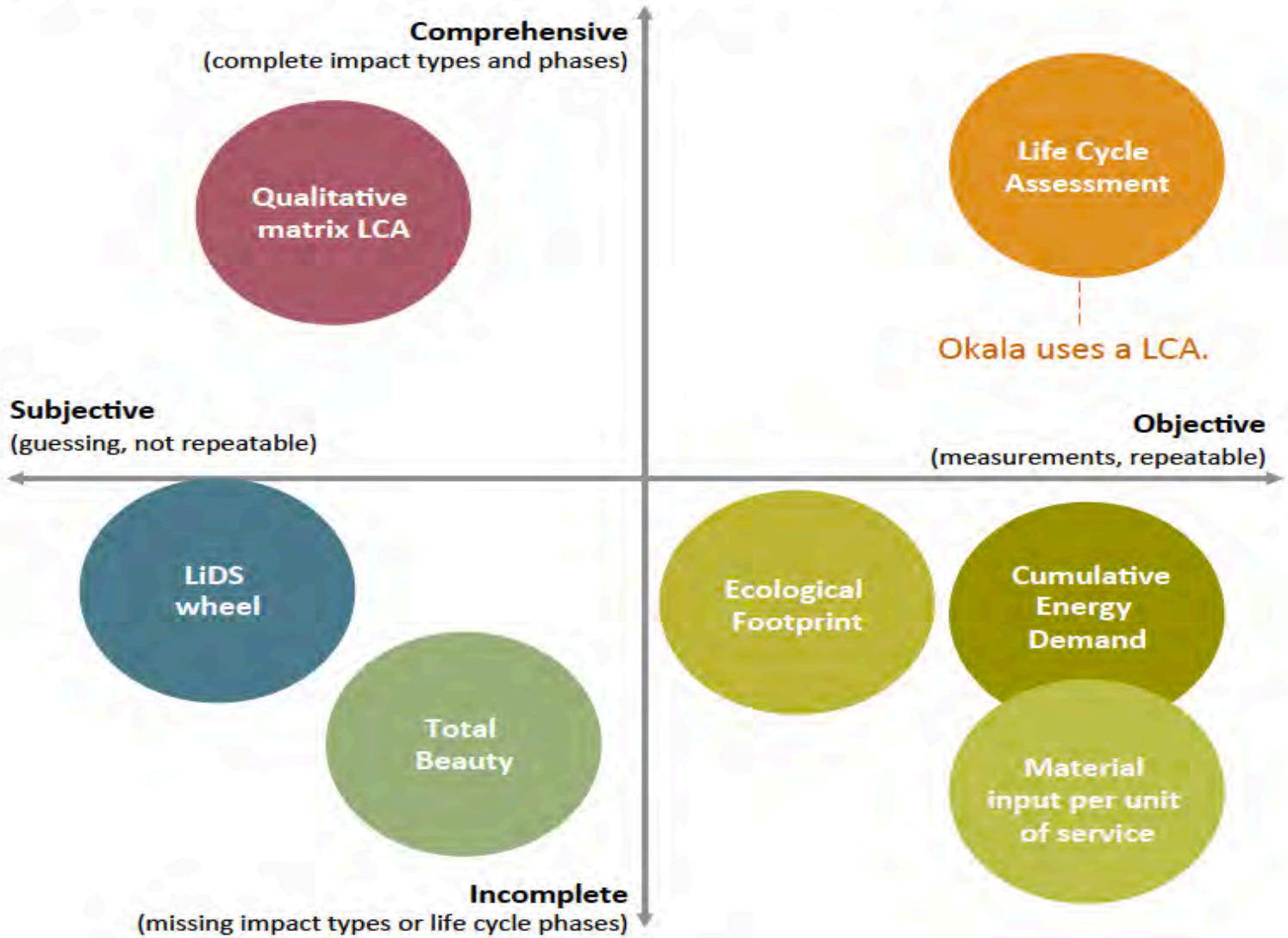
Typical lifetimes of common products

Wear-out life is used to calculate the life-cycle impacts of products. The technology cycle indicates how soon the technology used in the product is significantly modified. Most products will usually find new homes and be used through the duration of their wear-out life. Determining the life of products not on this list may require speaking with product manufacturers.

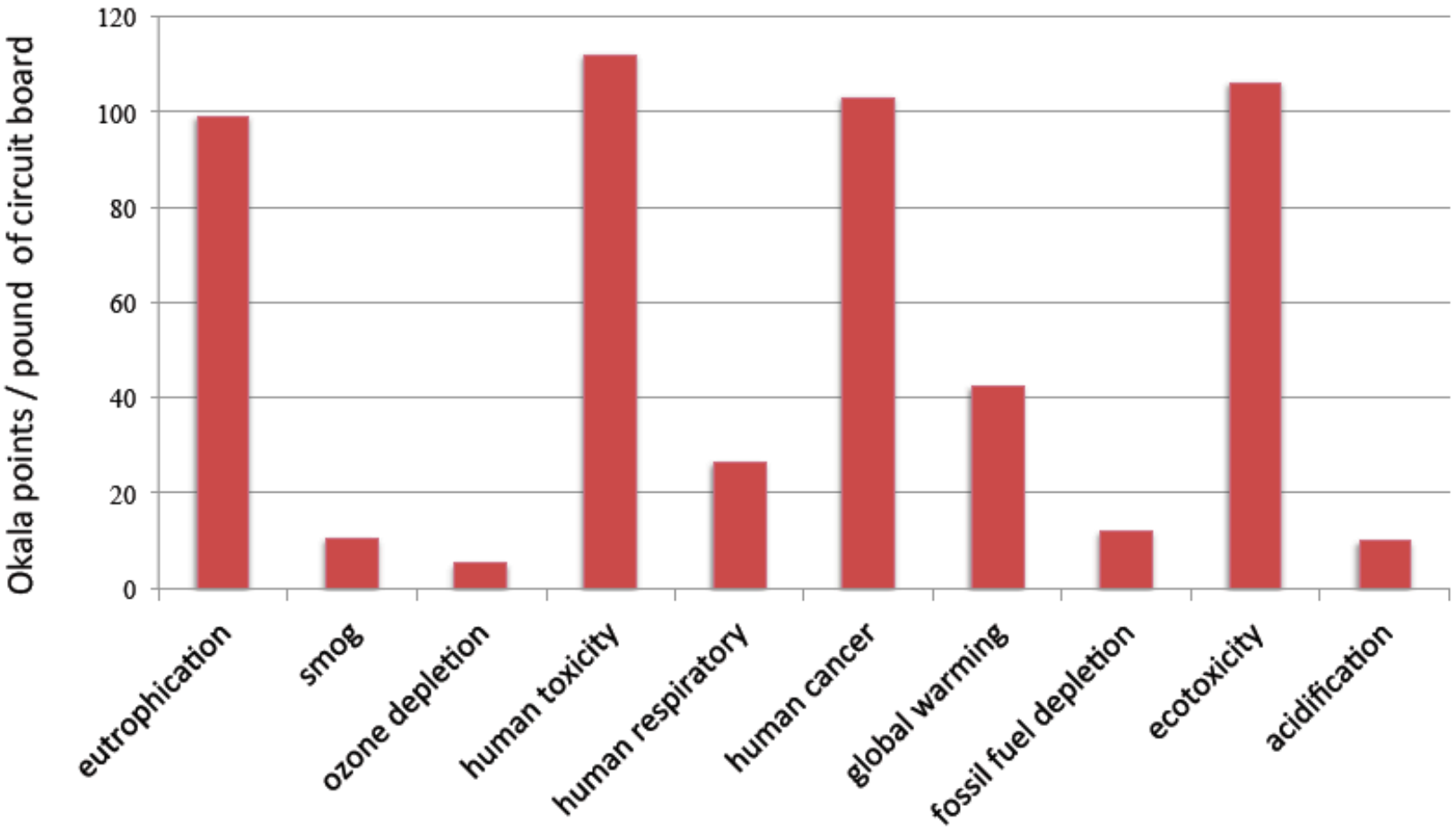
Source: Catherine Rose, A method for formulating Product End-of-life Strategies, Stanford U., 2001

Product	Wear-out life, years	Technology cycle, years
audio system	9	4
automobile	20	7
bubblejet printer	8	5
cellular phone	3	1
computer	6	2
computer mouse	6	4
cordless phone	10	5
CRT display	6	3
digital copier	5	2
fax machine	6	2
hand held vacuum	4	6
inkjet printer	4	2
laserjet printer	8	5
LCD display	5	2
miniature robot	5	5
photocopier	5	5
portable CD player	5	10
portable radio	10	2
single use camera	2	4
telephone	5	2
television	11	4
typerwiter	15	9
vacuum cleaner	8	7
video projector	5	2
washing machine	10	5

Environmental Impact Assessment Methods



Example of a material assessed in ten impact categories

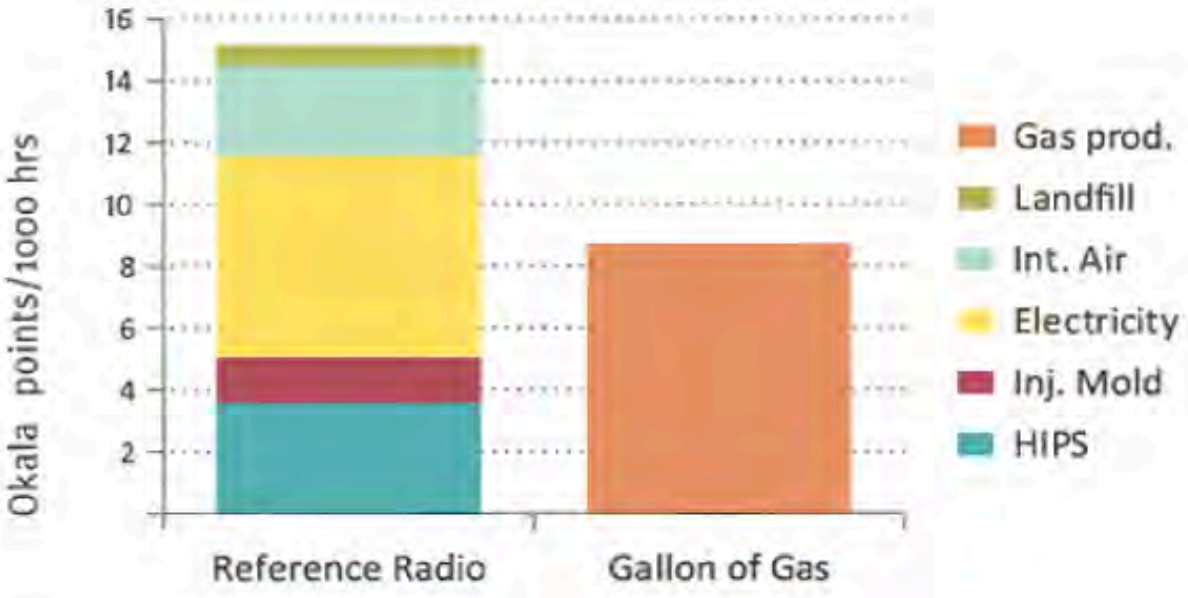


Radio

The life cycle impacts of the elements in the radio are shown.

As a reference, these impacts are compared to the production impacts of one gallon of gasoline.

REFERENCE RADIO			Impact Factor	Impact
HIPS	2	lbs	1.8	3.6
Injection moldinmg	2	lbs	0.72	1.44
Electricity	6	kW-hrs	1.1	6.6
Intercontinental air	1.8	ton-miles	1.6	2.88
Landfill HIPS	2	lbs	0.35	.07
Okala impacts per 1000 hrs:				**15.22**

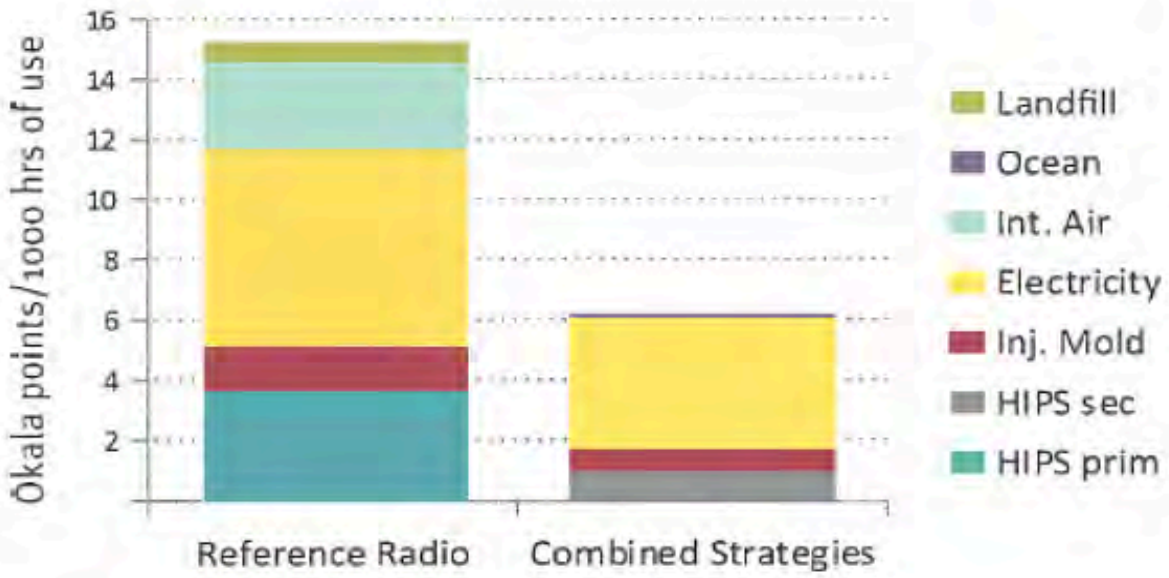


Combine strategies

By combining the strategies from examples A through E, we achieve a large reduction.

They add to 12.4 / 2 = 6.2 points, **a 59% reduction!**

COMBINED STRATEGIES			Impact Factor	Impact
HIPS sec	2	lbs	1.0	2
Injection molding	2	lbs	0.72	1.44
Electricity	8	kW-hrs	1.1	8.8
Intercontinental air	1.8	ton-miles	0.053	0.10
Landfill				0
Okala impacts per 2000 hrs:				**12.44**
Okala impacts per 1000 hrs:				**6.22**



Herman Miller: Setu Chair

Environmental stewardship at Harman Miller began at the company's inception in the 1950s.

Herman Miller evaluates its products with a **Design for Environment protocol**, measuring these factors in each component by weight:

Material chemistry: %of materials with lowest possible human and environmental toxicity

Recycled content: % of post-industrial or post-consumer recycled content

Disassembly: % of manually disassemble-able materials

Recyclability: % of the recyclable materials

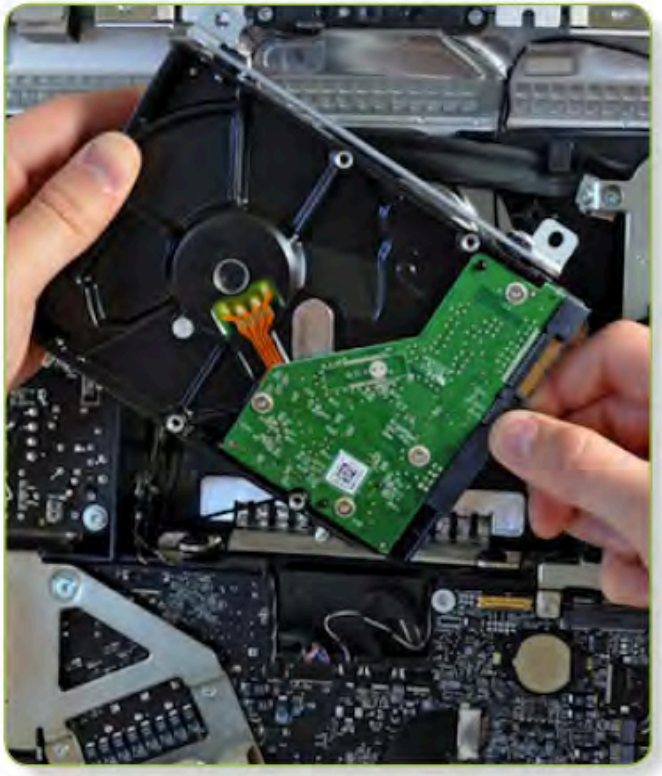
Measured values are compared to the previously defined factor goals. The design is refined closer to the goals. This process iterates until the goals are met.

The Setu chair was designed in 2009 by Studio 7.5

1.1. Lay chair on back.

2.1. Grasp and pull to remove Casters from the Base.

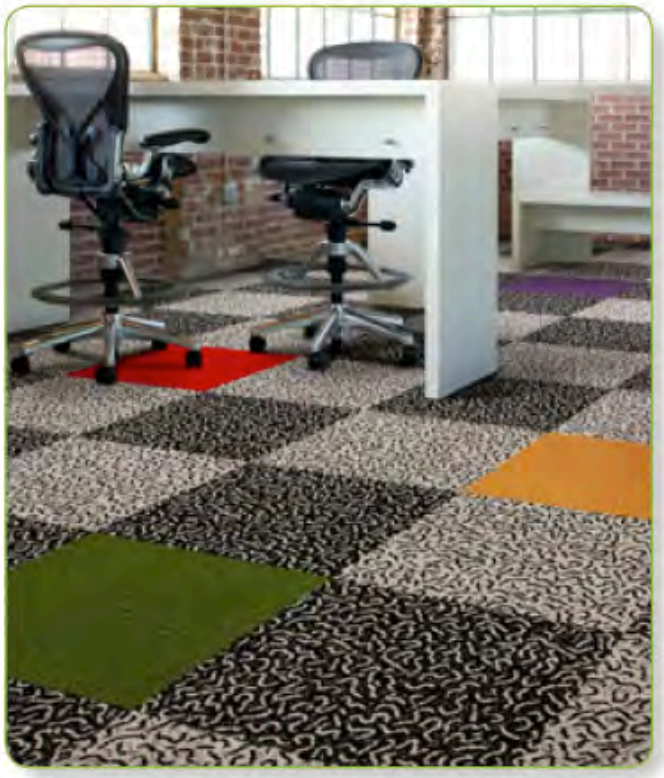
1 Design for Innovation



Design flexibility for technological change

Components in the system that will become technically obsolete can be planned for.

Example: A computer can allow easy replacement of quickly evolving microchips.



Provide product as service

You can envision how the product can become a service.

Example: Lease a floor covering rather than selling it, such as Interface Carpet.

2 Design to Reduce Material Impacts

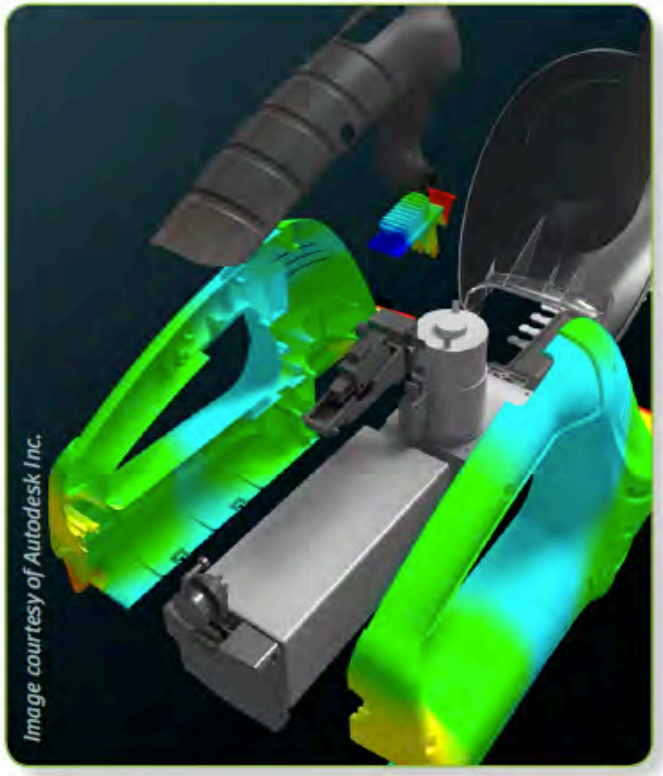


Image courtesy of Autodesk Inc.

Minimize quantity of materials

Light-weighting, miniaturizing or eliminating parts or packaging.

Example: Structural analysis software can identify where to remove unnecessary material in a product system.

2 Design to Reduce Material Impacts

Avoid materials that damage human or ecological health

You can specify materials and finishes that do not compromise human or ecological health.

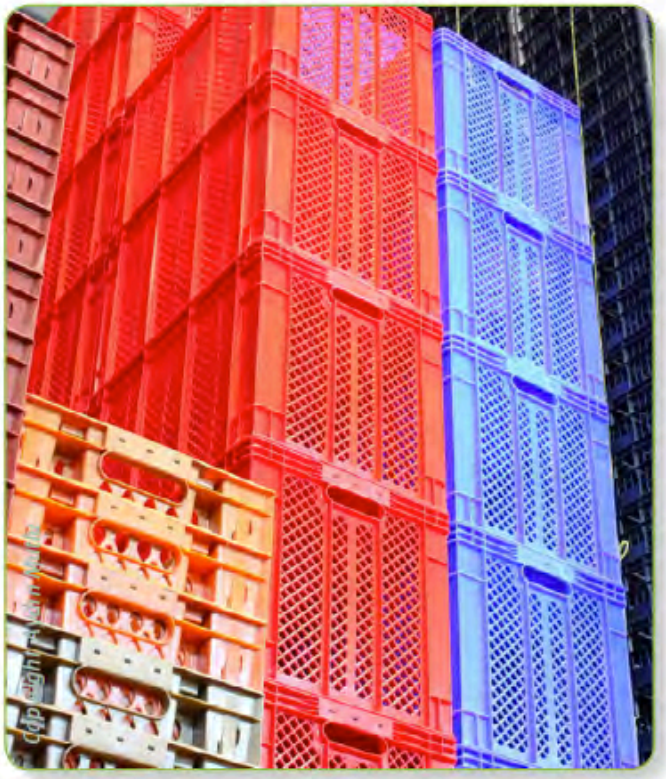
Example: Lithium batteries are much less toxic than lead or cadmium batteries.

Design for production quality control

Working with engineers to implement quality control saves resources.

Example: Six sigma is a manufacturing quality control process.

4 Design to Reduce Distribution Impacts

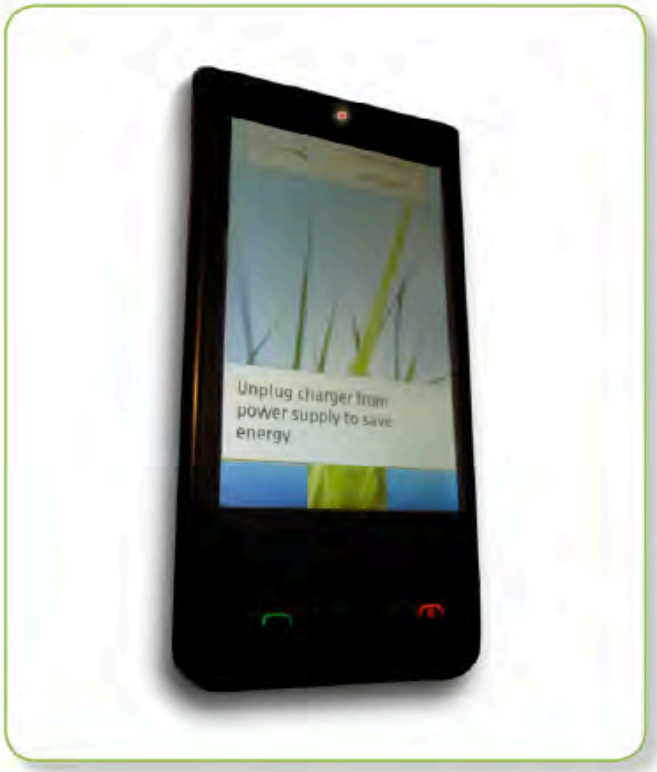


Develop reusable packaging systems

Reusable shipping systems can be used many times, thus reducing impacts.

Example: Polypropylene containers for shipping parts can be used hundreds of times.

5 Design to Reduce Behavior and Use Impacts



Reduce energy consumption during use

A design can influence energy use.

Example: A cell phone can remind users when to unplug the charger.

6 Design for System Longevity

Credit Koichi Okuwaki

Create timeless aesthetic

You can design with graceful classic materials, proportions, and lines.

Example: Braun products from the 1960's are still considered beautiful.

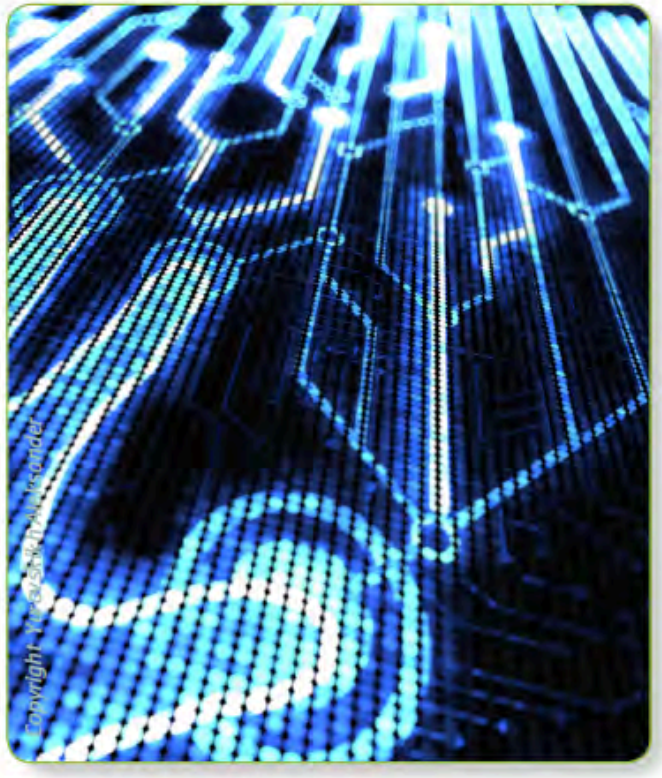
6 Design for System Longevity

Foster emotional connection to product

People keep and use products longer if they have emotional connection to them.

Example: A toy that requires assembly by parent and child together acquires meaning.

7 Design for Transitional Systems



Design upgradeable products

You can design for easy software, hardware or memory upgrade.

Example: Automatic online software updates do not require user effort.

8 Design to Optimize End of LIfe

Design for fast manual or automated disassembly

Contemporary disassembly strategies make recycling and re-use economically viable.

Example: Click fits or snap fits are easy to disassemble.

8 Design to Optimize End of LIfe

Design for safe disposal

You can research a process for safe disassembly and containment of any suspect materials.

Example: Mercury from compact fluorescent bulbs needs to be safely handled at special facilities.

SUSTAINIA

BUILDING THE WORLD
OF TOMORROW

SUSTAINIA

BUILDING THE WORLD
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A SUSTAINIA GUIDE TO CO-CREATING HEALTH

Sustainia is redefining health as you know it. We give you insights, cases and tools to co-create your health in a sustainable society.

READ ONLINE DOWNLOAD PDF

EXPLORE

SCHOOLS
Health Starts Early

WORKPLACE
Where Health Means Business

FOOD
Good for the Environment, Good for You

A World of Solutions

Sustainia100 brings forth cases, trends, and insights from all over the world.

25 solutions are deployed in **Africa**, spanning **26 countries**

19 solutions were developed in **Asia**, spanning **10 countries**

Solutions deployed in emerging economies

- **19** in **India**
- **13** in **Mexico**
- **13** in **South Africa**
- **10** in **Kenya**

26 solutions provide **health benefits**

27 solutions are finding new ways to use **IT for sustainability**

About half of the solutions impact the **energy** sector

In **North America**, **7 solutions** are cleaning up the **fashion** industry

28 solutions have an **educational** purpose

In **South America**, **17 solutions** are impacting the **resource** sector

Solutions deployed in 128 countries

Circle colors correspond to our 10 sectors

Smartphones Helping to Prevent Blindness

Solution by: **Peek Vision**

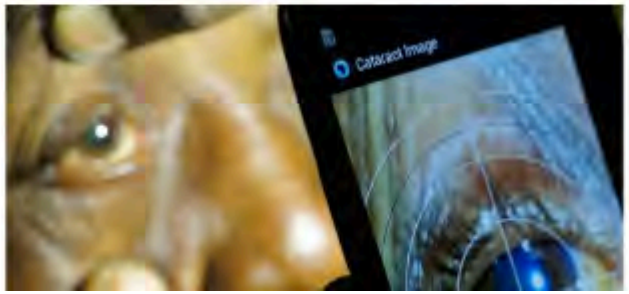
→ This solution is a smartphone application and adapter offering simple, low-cost, high-quality eye examinations to previously isolated patients.

Peek – the Portable Eye Examination Kit – is an **affordable and mobile solution** to the problem of avoidable blindness in low-income countries. Health care workers equipped with a **mobile phone and solar backpack for easy charging** can access extremely remote households, eliminating the need for patients to travel.

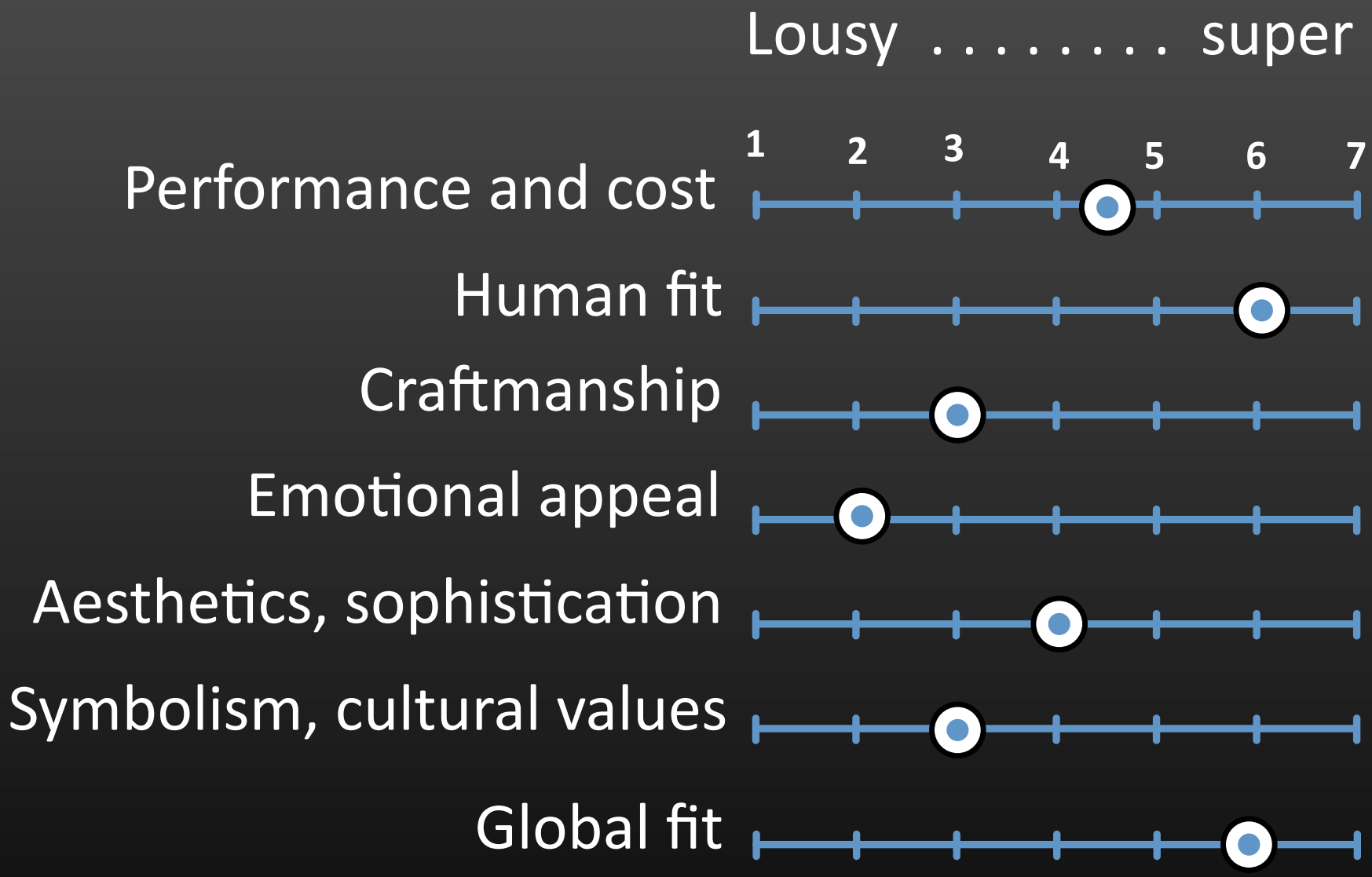
Displaying a shrinking letter on screen can provide a simple yet elegant vision test suitable for all languages. Using a specially designed low-cost adapter, smartphones are used to capture images of the retina. Examination results are stored and can be **shared with experts internationally**. Locations of patients are also stored on GPS, helping to coordinate future treatment.

Why a Sustainia100 solution?

According to the World Health Organization, there are 285 million visually impaired people worldwide, around 90% of whom live in developing countries. At the same time, 80% of blindness can be avoided or cured.[1] This solution, recently tested in a study of 2,000 participants in Kenya, and the subject of a pilot study underway in 30 Kenyan schools, is an extremely promising technology for blindness prevention.



Design quality matrix



Nachhaltigkeits und sorgfältiges Entwickeln entspricht uns:

Teile das Gelernte
Bediene dich den Werkzeugen anderer
Engagiere Benutzergruppen
Technologie unterstütz die Wirkung
Lerne von anderen Industrien
Kreiere Räume für den Austausch

Human Centered Design
Innovation Strategy
Corporate Value

Selbstreflexion Unternehmensentwicklung Trends, Ziele, Nachhaltigkeit Eco-Design Strategie, Beispiele und Evidenzen

Fazit

Eco-Design und Gebrauchstauglichkeit gemeinsam entwickeln

Beweisführung durch Evidenz belegen

Risiken durch Transparenz minimieren