

HELENE CHEUNG

ON A JOURNEY TO ELIMINATE WASTE

Which methodology should product manufacturers and their subcontractors use to apply a zero waste way of thinking when using 2D materials in their products?

WHY WASTE?

- Naivety as a product developer
- Small scale manufacturing
- Time consuming = border to border cutting = very little waste
- High volume production in China
- CAD speed efficiency = lower yield = waste generated

15%

**OF TEXTILE IS STILL
DISCARDED IN THE
FASHION INDUSTRY
AFTER MAXIMISING
THE YIELD USING CAD.**

(Langenheim J., 2015)

25%

**OF A HIDE IS
DOWNGRADED AS
OFFCUTS**

(Carneiro A., 2019)

40%

**OF WOOD IS WASTED
IN THE FURNITURE
INDUSTRY TO BE
CHIPPED**

(Adi Wicaksono, P. and Ahmad Kadafi, C., 2020)

WHAT WASTE

Purchasing,
Materials management,
Inbound logistics
Product/Process Design

WASTE

Production

WASTE

Outbound logistics

WASTE

Use

Reverse
logistics

WASTE

?

Waste management
When waste reduction is
managed

Based on
(Kouhizadeh M.
and Sarkis J., 2018)

RESEARCH PLANNED

Limits of zero waste design techniques

Evaluation of manufacturers' engagements to achieve zero waste using a questionnaire

Interviews (or case studies) to assess the use of waste as raw material

ZERO WASTE DESIGN TECHNIQUE
≠ REDUCE ≠ CIRCULAR ECONOMY

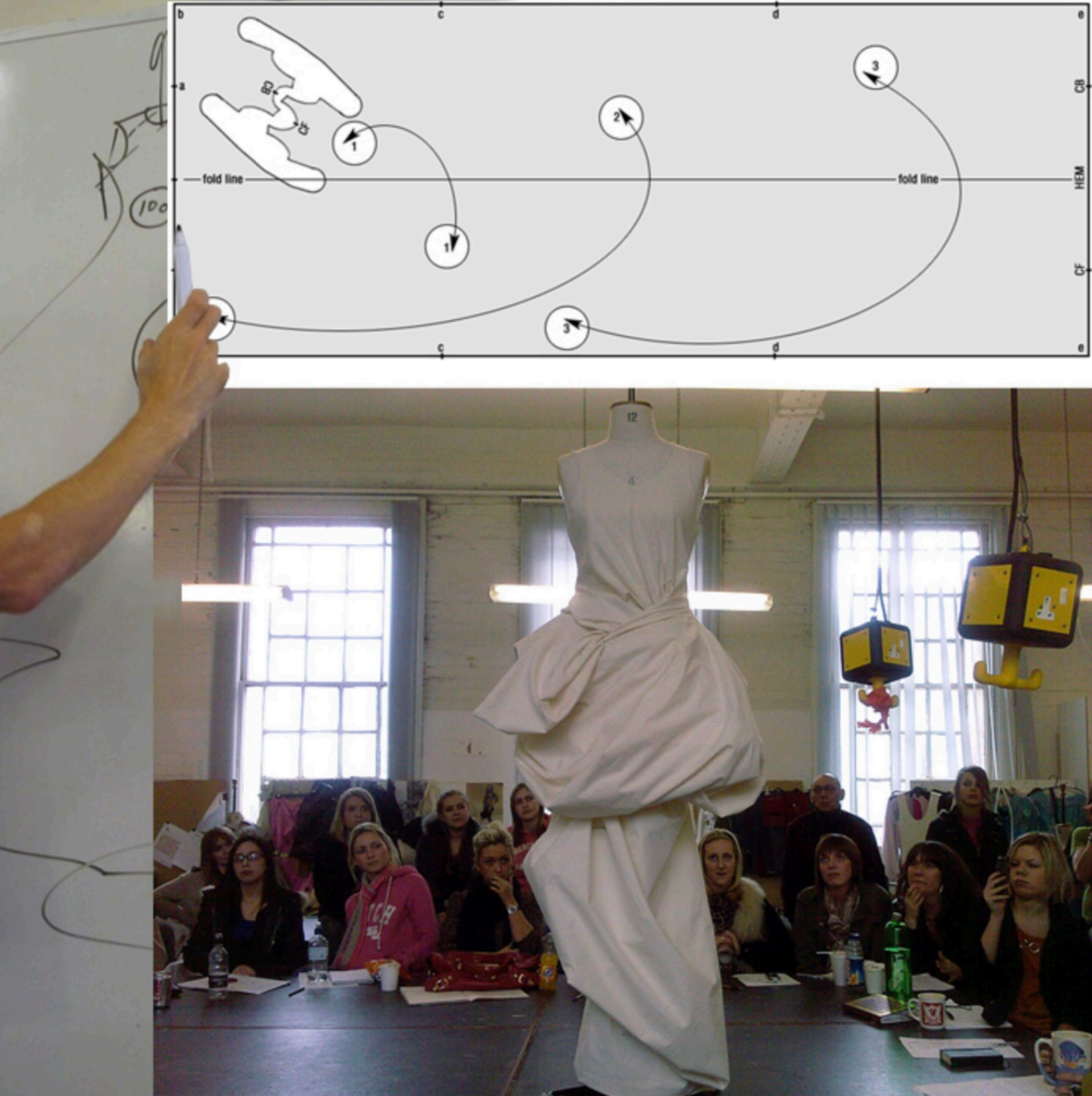


Figure 1: Zero waste fashion by Julian Roberts (<https://subtractioncutting.tumblr.com>)

ARCHITECTURAL DIGEST

WAIT, THAT'S GENIUS - November 19, 2018

This Zero-Waste Furniture Is Made from a Single Sheet of Plywood

FN Furniture is turning our notions of affordable furniture on their head

Text By Amanda Sims



For a long time, Ken Landauer made furniture for the 1 percent: one-of-a-kind, bespoke pieces with price tags to match. Then Occupy Wall Street happened, and the Brooklyn-based artist and woodworker found himself craving change. Specifically, how could he make high-quality, high-design furniture that he and his artist friends could actually afford? There were inherent obstacles—a totally new business model, a new clientele, new designs to figure out—but also personal ones: "I was thinking about alienation and Marx, and I didn't want to use computers," Ken recalls. That meant that potentially useful tools like CNC machines, which convert 2D digital renderings into cut materials, were off-limits. He tried the handmade route, showing off some low-waste plywood designs in 2014, but it wasn't scalable. What was a civic-minded furniture designer to do?

Figure 2: Zero waste furniture by FN Furniture (fnfurniture.com)

Ecological ceiling

Zero waste
systems thinking

Zero waste design
thinking

Zero waste
design method

Zero waste
design
technique

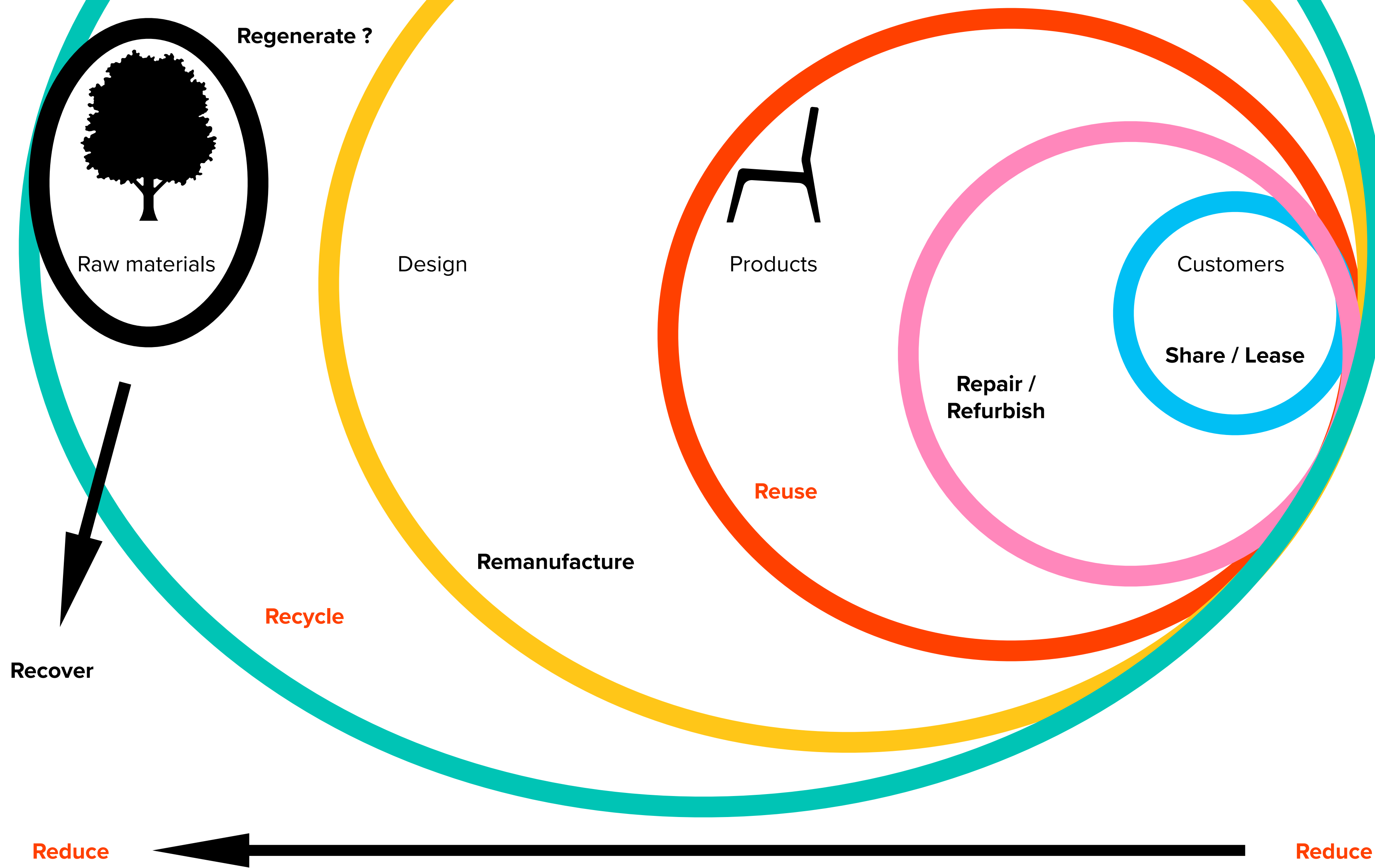
Social foundation

Based on (McQuillan H.,
2020)

ZERO WASTE WAY OF THINKING



**“HOW TO REDUCE USAGE OF MATERIALS
AND ELIMINATE WASTE ACROSS THE
SUPPLY CHAIN AT THE SAME TIME?”**



CIRCULAR ECONOMY

Adapted from
(Doranova et al., 2016)



CIRCULAR ECONOMY - REDUCE

METHODOLOGY - QUESTIONNAIRE TO UK MANUFACTURERS

Rely on frameworks and standards

Interest in collaboration despite unknown outcome

Innovate in zero waste design thinking and inspire subcontractors

USING A FRAMEWORK OR AIMING FOR A STANDARD?

- Establish a list and analyse their scope
- Geographical recognition
- External versus internal audits
- Importance on the focus on eliminating waste
- Stages of implementation
- Positive marketing tool

WHAT TO EXPECT FROM A COLLABORATION?

- Working towards a common approach to waste
- More about the relationship: companies as human interactions
- Facilitate less intimidating “ baby steps “
- Being informal, what companies are prepared to do
- Danger to divert from initial aim
- No accountability
- “Collaboration may make product development more costly, complex, and difficult to control” (Tidd, J. and Bessant, J.R., 2018, p.411)

INTERNAL INNOVATIVE SOLUTIONS WITH COMPANIES' OWN VISION

- **Lean manufacturing/ made to order**
- **Digital Native Vertical Brands**
- **Zerowaste techniques**
 - Zero waste pattern cutting (Piper A., 2019)
 - Textile form (McQuillan H., 2020)
 - 3D printing / Additive manufacturing (Jiang, R., Kleer, R. and Piller, F.T., 2017)
 - Growing design (Karana, E. et al., 2018)
- **Remanufacturing, where every scrap of materials is used**
- **Circular manufacturing (Asif, F.M.. et al. (2021), closed-loop supply chain (Delpla V. et al., 2021) but applied to materials rather than products**

CIRCULAR ECONOMY - REMANUFACTURE / RECYCLE

METHODOLOGY - INTERVIEWS

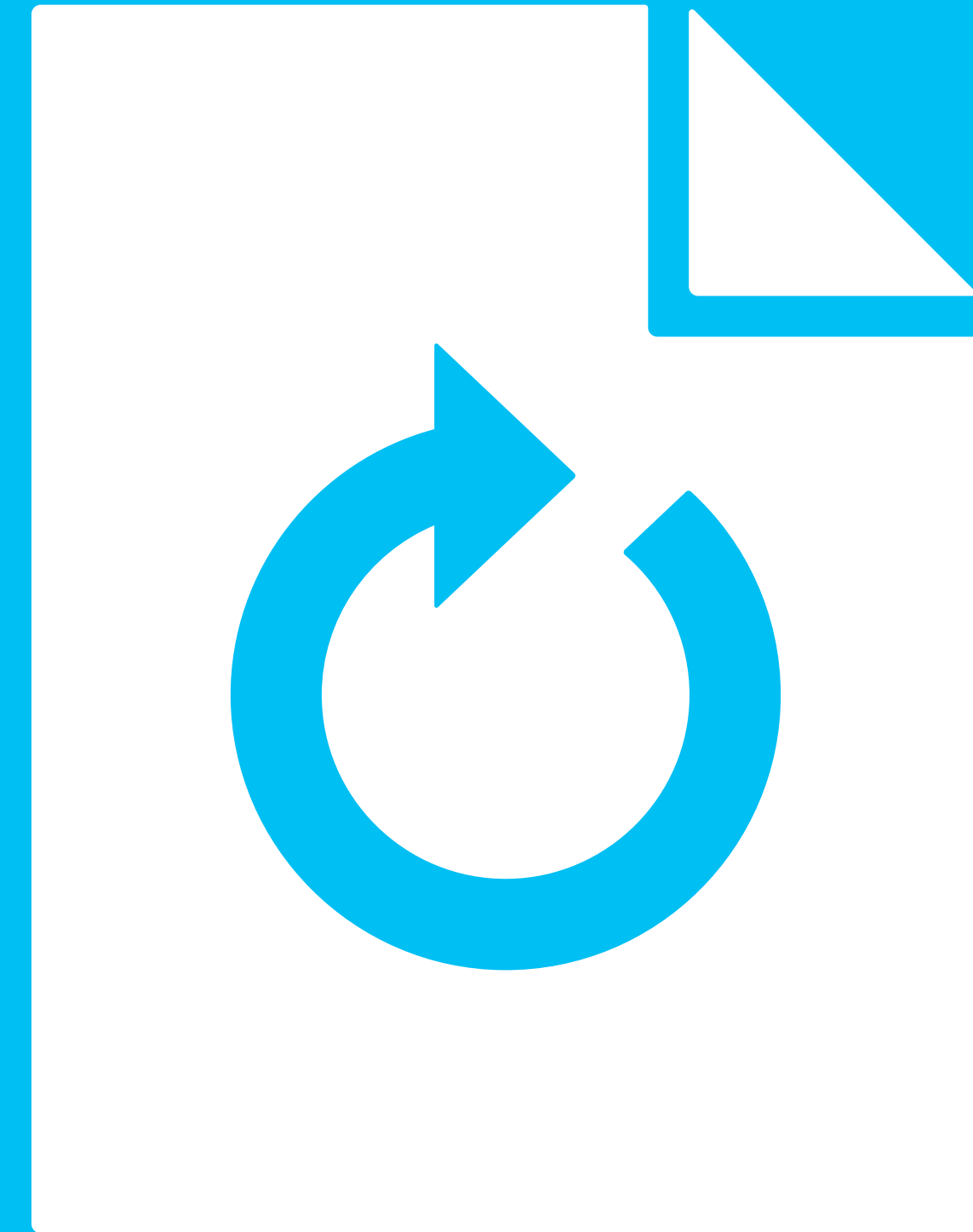
To establish if a common transferable methodology exists

**And what processes and operations this methodology are involved for
companies recycling industrial waste**

INTERVIEWS/CASE STUDIES

RECYCLE

- Elvis & Kresse
- Coterie Leather
- Grain (reduce)
- FN Furniture
- Zero Waste Daniel
- Reet Aus



BLOCKCHAIN TECHNOLOGY

- **Traceability guarantee**
- **Certification verified**
- **Risks managed**
- **Smart contract technology**

**IT IS ABOUT IMPLEMENTING A STRATEGY TO SEED A ZERO WASTE
WAY OF THINKING, IN LINE WITH THE CIRCULAR ECONOMY MODEL.**

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