On behalf of:

Umwelt Bundesamt

circular.fashion

CONTIQ

Technische Universität Berlin

Product Information 4.0

Front-end Demonstrator

Presentation of data availability and needs within a visualization as a front-end demonstrator for different stakeholders. Focus on potential information requirements in the textiles and electronics value chains.

Mario Osterwalder, circular.fashion

Umwelt Bundesamt

Methodology

Development of Role-based Access Profiles

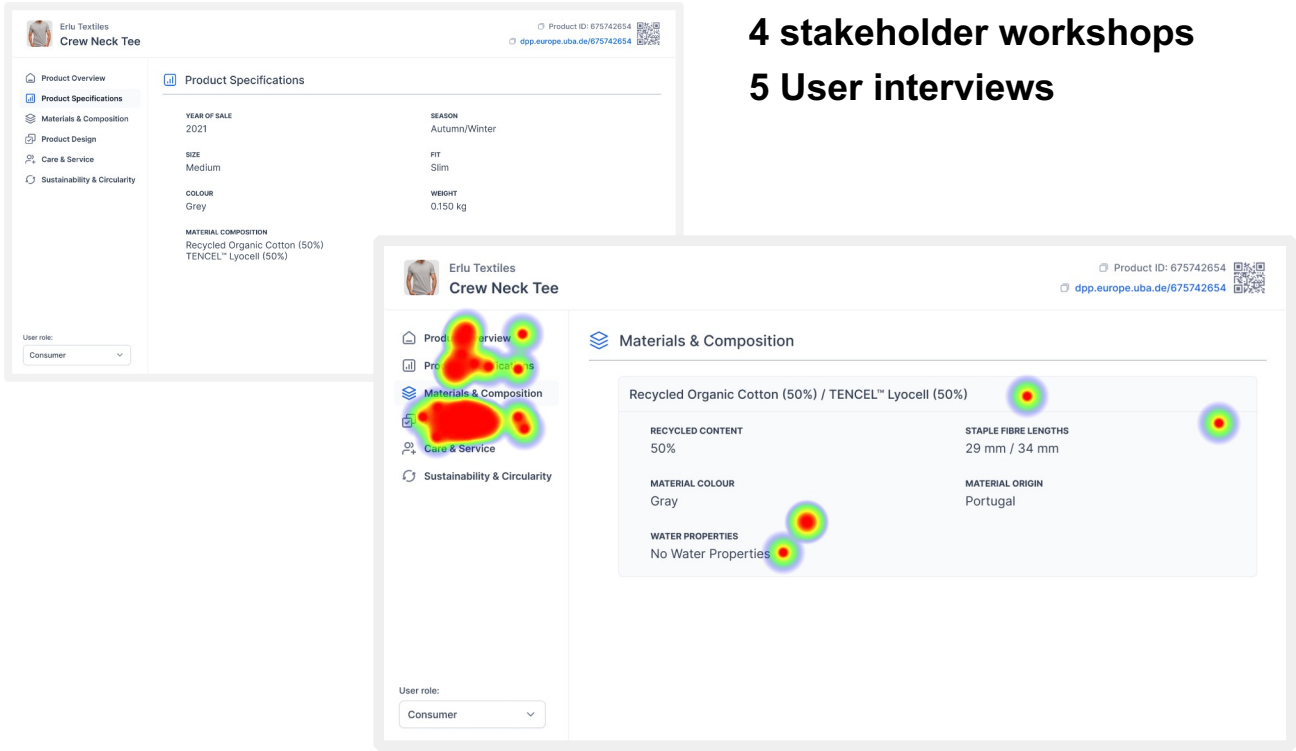
Identification of stakeholder information requirements → **Development of role-based access profiles** → **Development of a frontend-demonstrator** → **Validation of the frontend demonstrator in workshops & interviews**

6 stakeholder workshops

- External, market surveillance and certifiers
- Supply Chain: Manufacturers, Brands, Retailers, Workwear providers
- Reverse Supply Chain: Repairers, Recommerce, Sorters, Recyclers
- Consumers (+survey)

Proposal for 5 roles based on the information requirements:

- Product Design/ Development
- Material producer
- Consumer
- Sorter/ Recycler
- Certifier

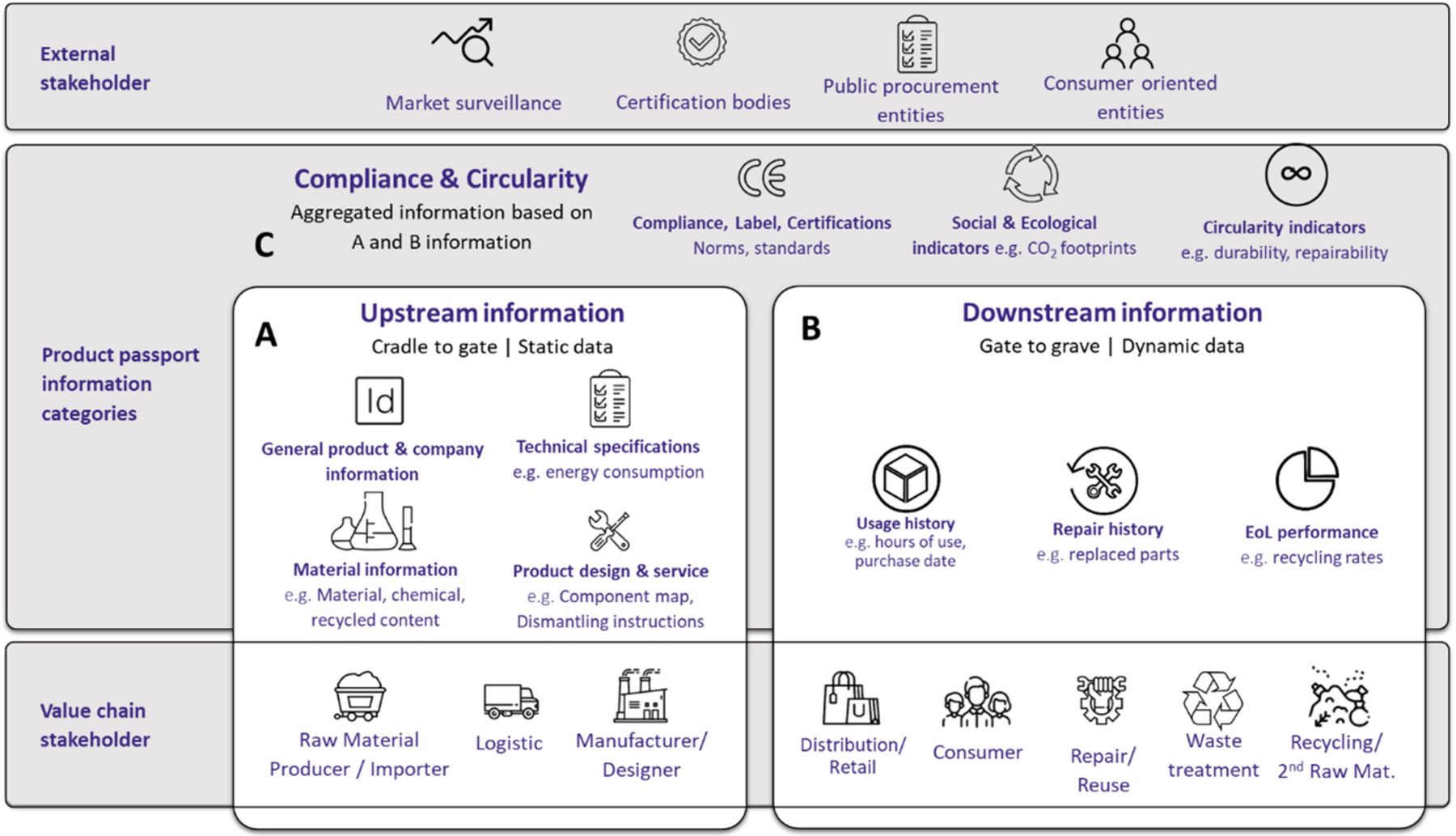


4 stakeholder workshops

5 User interviews

Overview

Framework of Product Information Categories



Product Information 4.0

Textiles

Umwelt Bundesamt

Textiles Workshop Results

Confidentiality and Availability of Needed Information

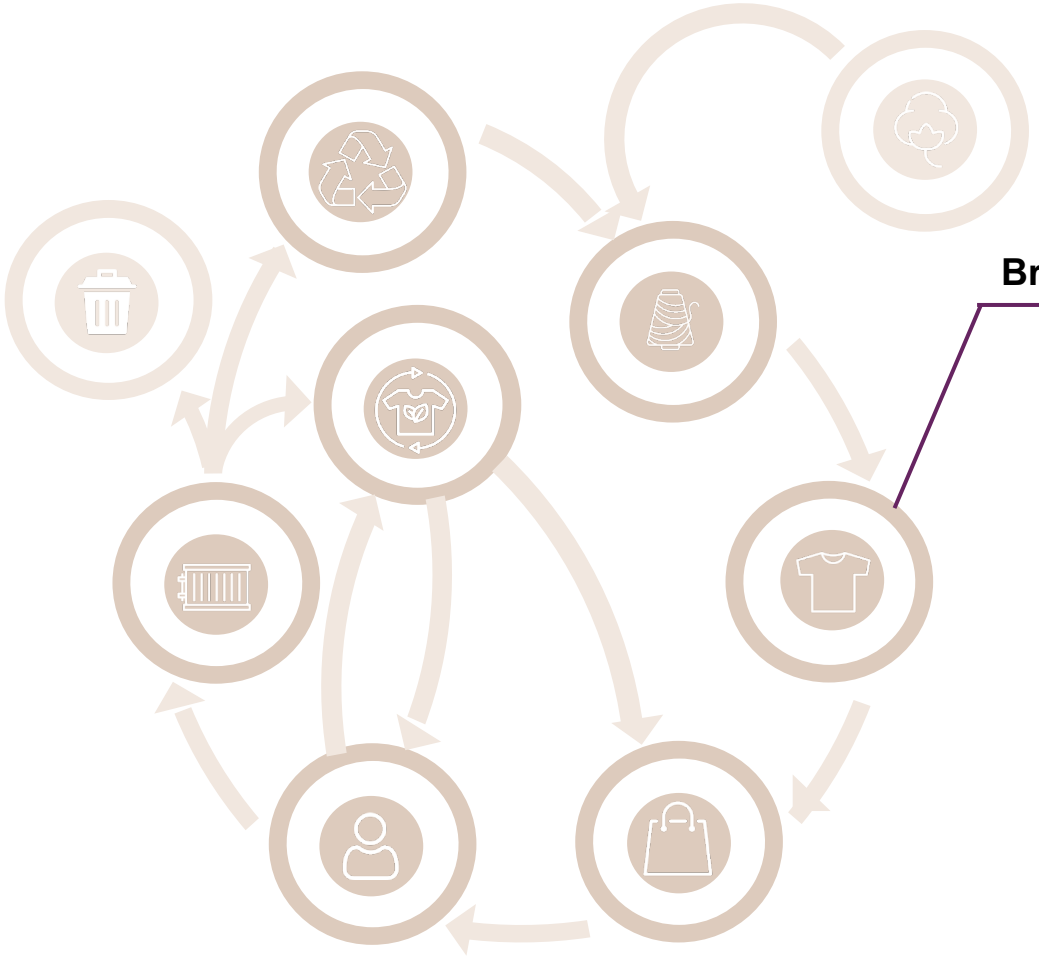
	Upstream Stakeholders		Downstream
Data point	**Availability**	**Confidential**	**Need**
Commercial information (descriptions, ...)	0.17	0.42	0.5
Warranty information	0.05	0.18	0.5
Care instructions	0.04	0	0.08
LCA / footprint of goods or services	1.54	0.83	0.25
Design strategy (for reuse, refurbish, repair, ...)	0.82	0.09	0.58
Durability test results	0.5	1.04	0.58
Disassembly instructions	1.05	0.27	0.42
Instructions for disposal / take back	0.96	0	0.67
Staple fibre length	1	1.18	0.25
Material composition	0.04	0.08	0.83
Component weight	0.42	0.83	0.5
Hazardous substances	0.45	0.68	0.67
Material origins	1.08	1.08	0.42
Biodegradability	1	0.27	0.17
Recycled content	0.38	0.17	0.42
Chemical content	0.85	1.55	0.67
Tier 1 company data (e.g. cutting, sewing)	0.33	0.83	
Tier 2 company data (e.g. weaving, knitting)	0.92	1.08	
Tier 3 company data (e.g. spinning, dyeing)	1.71	1.04	
Tier 4 company data (e.g. farm, oil drilling)	2	0.92	

Material and supplier information

Confidentiality:	0 = not confidential	3 = confidential
Availability:	0 = available	3 = not available
Need:	0 = no need	1 = high need

Textile Workshop Results

Upstream Perspectives



Brands, Designer, Manufacturers

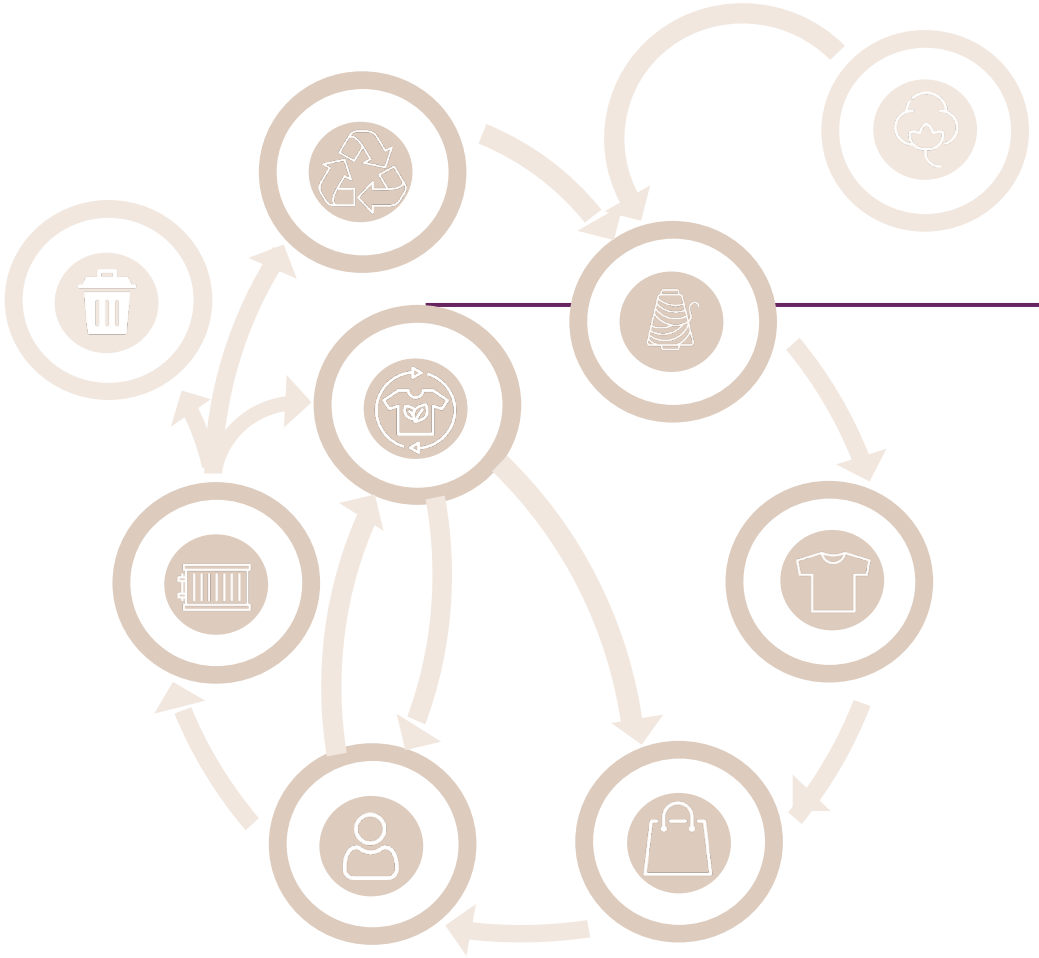
Material composition as required now highly available

Full material information often not provided by the suppliers

Information from suppliers are likely to be false

Textile Workshop Results

Downstream Perspectives



Rental, Laundries and Repair

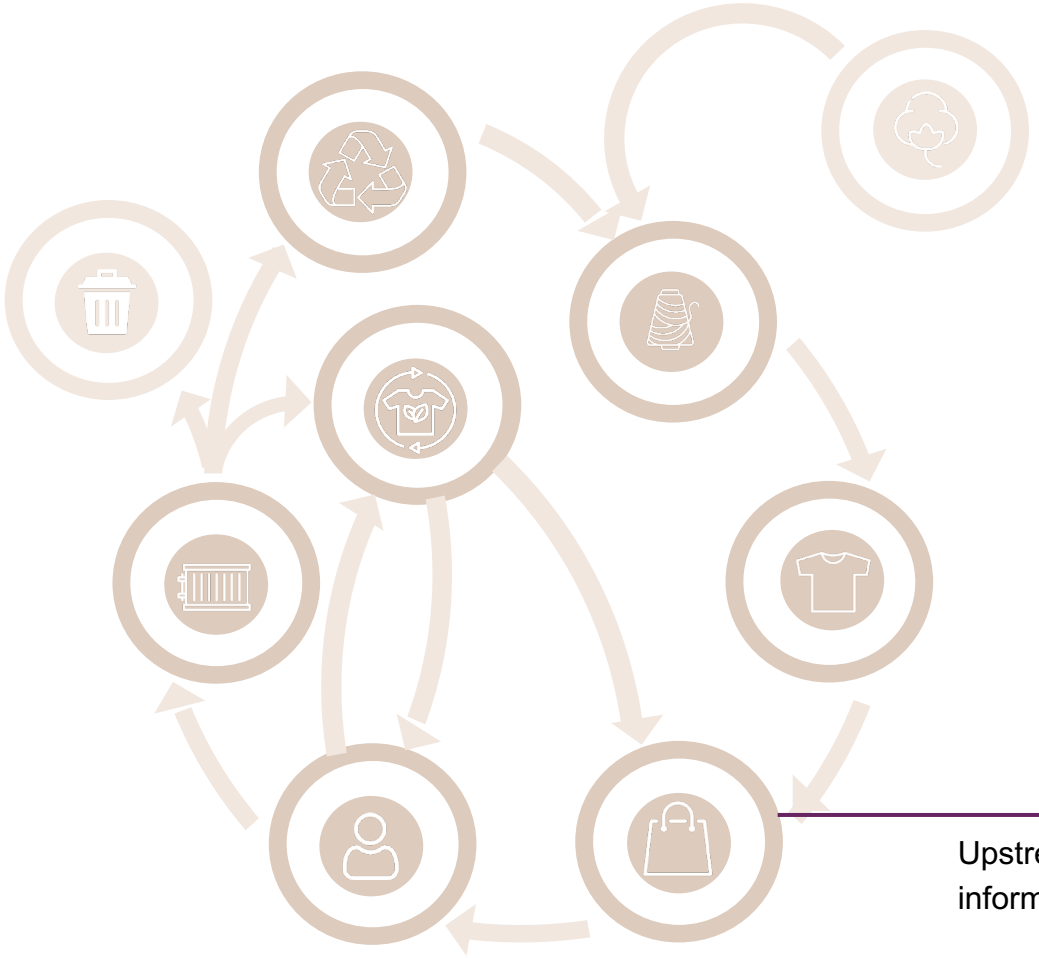
Correct care instructions

Material composition, washability, longevity, repairability to predict operations and costs of services

Optional tracking points

Textile Workshop Results

Downstream Perspectives



Recommerce & Second-hand

Upstream enriched with downstream product information helpful as commercial information

Textile Workshop Results

Downstream Perspectives

Collection & Sorting

Sort for reuse and recycling and share requirements

Identify reusable and valuable textiles for resale

Better sorted feedstock for recycling increases qualities and value

Lean process integration important

Textile Workshop Results

Downstream Perspectives

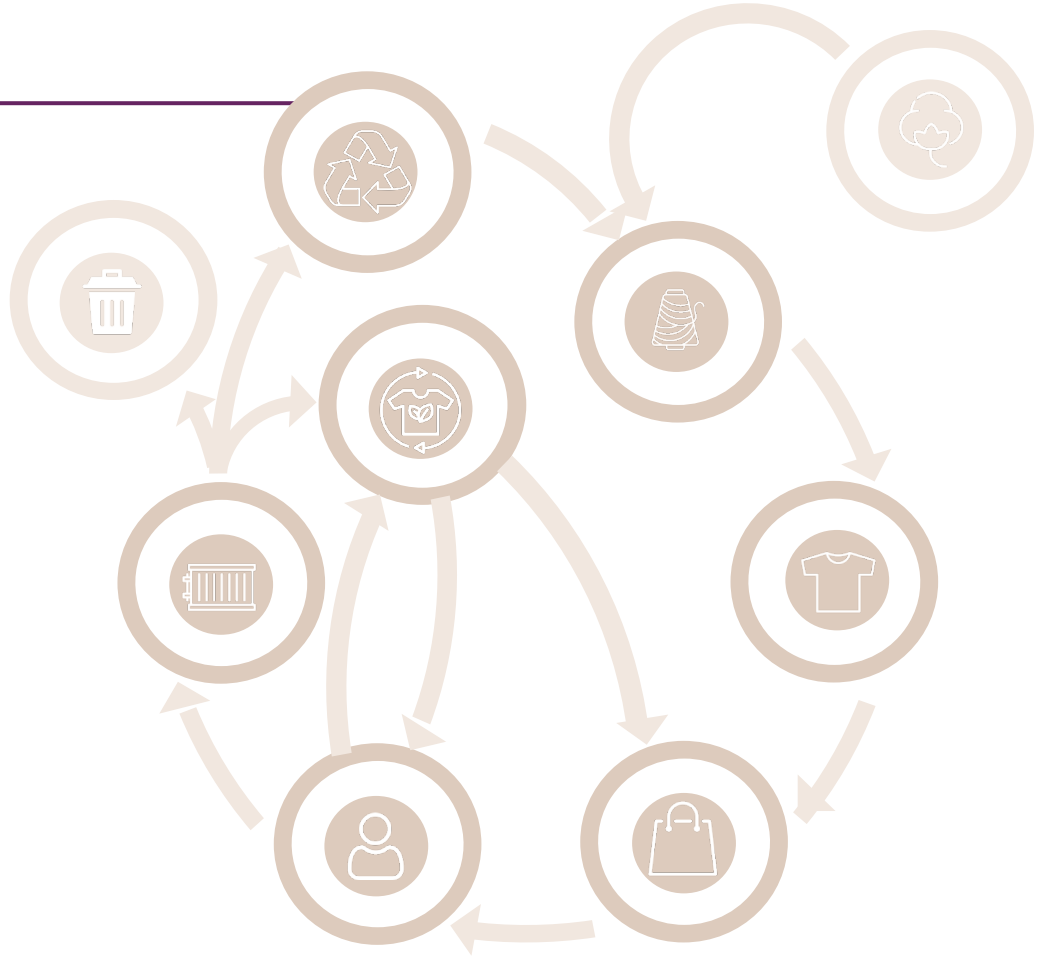
Recycling & Pre-Processing

Information gaps about materials due to exemptions in textile regulation

Information need based on recycling technology (mechanical, chemical etc.)

Non-textile materials present (i.e. buttons, metals, membranes) need to be accessible

Relevant aspects such as dyes, hazardous substances, staple fibre length etc.



Workshop Results

Public Authorities & Certifiers

Market Surveillance

Even mandatory information provided in different formats and not required language

Compliance tests got more complex

Certifiers

High demand on information to perform tasks

Depends on specific certification approach and subject

Certification can be given when certain percentage of transparency can be assured

Public Procurement

Guidelines for Green Public Procurement

Circularity Information of major importance

Information not legally required and barely available

Textiles Consumer Survey

Buying Aspects

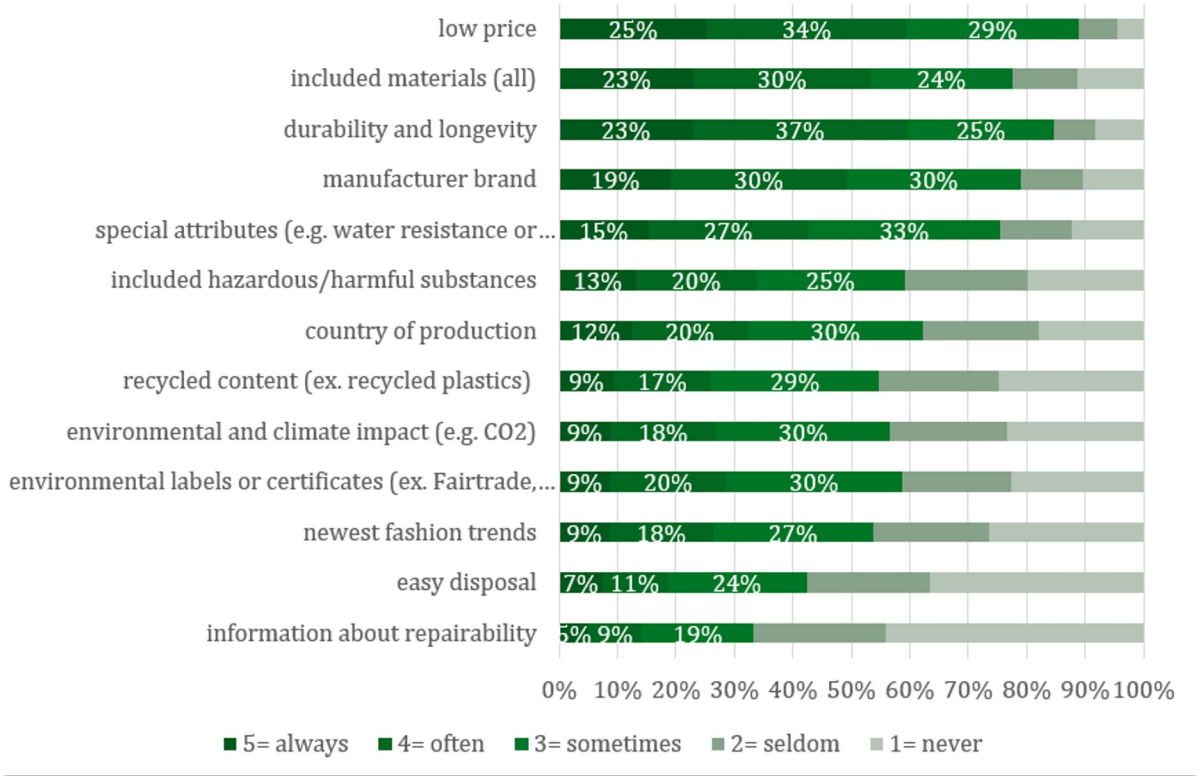
Top 5 buying aspects

- Design / appearance
- Low price
- Durability and longevity
- Materials
- Brand

41% inform themselves very little before buying clothes

Majority consider environmental labels at least sometimes

Question of the "frequency of considering different information aspects when buying clothing"



Source: Technical University Berlin 2022

Frontend Demonstrator

Textile (T-Shirt)

This prototype is designed to simulate the communication of Product Information to various stakeholders.

Here, you can select a user persona to view the Prototype as a specific persona. This selection is not a part of the prototype itself

Material Producer

Product Designer / Developer

Certifier

Consumer

Sorter / Recycler

Erlu Textiles

Crew Neck Tee

Product ID: 675742654

dpp.europe.uba.de/675742654

- Product Overview
- Materials & Composition
- Service
- Sustainability & Circularity

User role:

Consumer

Product Overview

BRAND NAME
Erlu Textiles

PRODUCT IDENTIFIER
675742654

COUNTRY OF MANUFACTURE
Turkey

SEASON
Autumn/Winter

SIZE
Medium

WEIGHT
0.150 kg

FIT
Slim

YEAR OF SALE
2021

COLOUR
Grey

CATEGORY
Clothing

PRICE (RRP)
€ 30

TYPE
T-Shirt

MATERIAL COMPOSITION
Recycled Organic Cotton (50%)

PRODUCT DESCRIPTION

Designed with circularity in mind, our signature crew neck T-Shirt is made from premium heavyweight cotton jersey.

Erlu Textiles

Crew Neck Tee

Product ID: 675742654

dpp.europe.uba.de/675742654

- Product Overview
- Materials & Composition
- Service
- Sustainability & Circularity

Materials and Composition

Fabric

CATEGORY
Fabric

COUNTRY OF PRODUCTION
Portugal

COMPOSITION
Recycled Organic Cotton (50%)
TENCEL™ Lyocell (50%)

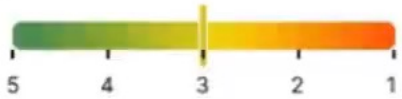
RECYCLED CONTENT
50%

COLOUR
Gray

WATER PROPERTIES
No Water Properties

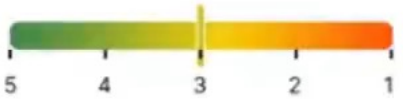
MATERIAL DURABILITY

COLOUR FASTNESS TO RUBBING
3



Scale: 1-5
(according to ISO 105-A03)

COLOUR FASTNESS TO LAUNDERING
3



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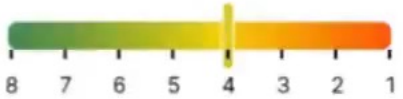
(according to ISO 105-A03)

LIGHT FASTNESS
4



Scale: 1-8
(according to ISO 105-B01)

User role:

Consumer

Erlu Textiles

Crew Neck Tee

Product ID: 675742654

dpp.europe.uba.de/675742654

- Product Overview
- Materials & Composition
- Service
- Sustainability & Circularity

User role:

Consumer

Service

The manufacturer of this product offers a takeback service.

Details from the manufacturer can be found **below** and at https://www.erlu-textiles.de/takeback

Care Instructions

- 30°C mild fine wash
- Iron at low temperature
- Do not tumble dry
- Do not bleach
- Do not dry clean
- Dry flat

Take-back and Return

Erlu Textiles Takeback Service

Product Information 4.0

Electronics

Umwelt Bundesamt

Electronics Workshop Results

Availability and Confidentiality of Needed Information

	Data point	Upstream Stakeholder Availability	Upstream Stakeholder Confidentiality	Downstream Need	Covered in legislation
	Circularity indicator (e.g. French repair index)	0.875	0.4	0.67	
	Compliance tests (for legislation. standards)	0.375	1.4	0.5	
	Instructions for waste treatment	0.625	0.8	0.5	
	LCA eg. CO2 footprint of product	1.0	0.8	0.17	
	Original sales price	0.0	0.4	0.17	
	Presence of hazardous substance	0.625	0.8	1	✓ for waste treatment
	Location of hazardous substance in product	0.625	0.8	0.83	
	Repair history	1.875	1.8	0.83	
	Biodegradability of product	1.375	0.4	0.67	
Material and supplier information	Recycled content per product	0.75	0.4	0.58	
	Materials type + amount per component	1.375 a	1.6	0.75	
	Material origin	2.0	2.4	0.83	for conflict materials (3TG)
	Tier 1 company data (e.g. product/ system assembly)	0.5	1.8		
	Tier 2 company data (e.g. components)	0.750	2.4		
	Tier 3 company data (e.g. mixtures)	0.875	2.4		
	Tier 4 company data (e.g. material producer)	2.0	2.4		

Confidentiality:	0 = not confidential	3 = confidential
Availability:	0 = available	3 = not available
Need:	0 = no need	1 = high need

Electronics Workshop Results

Upstream Perspectives

Brands, Designer, Manufacturers

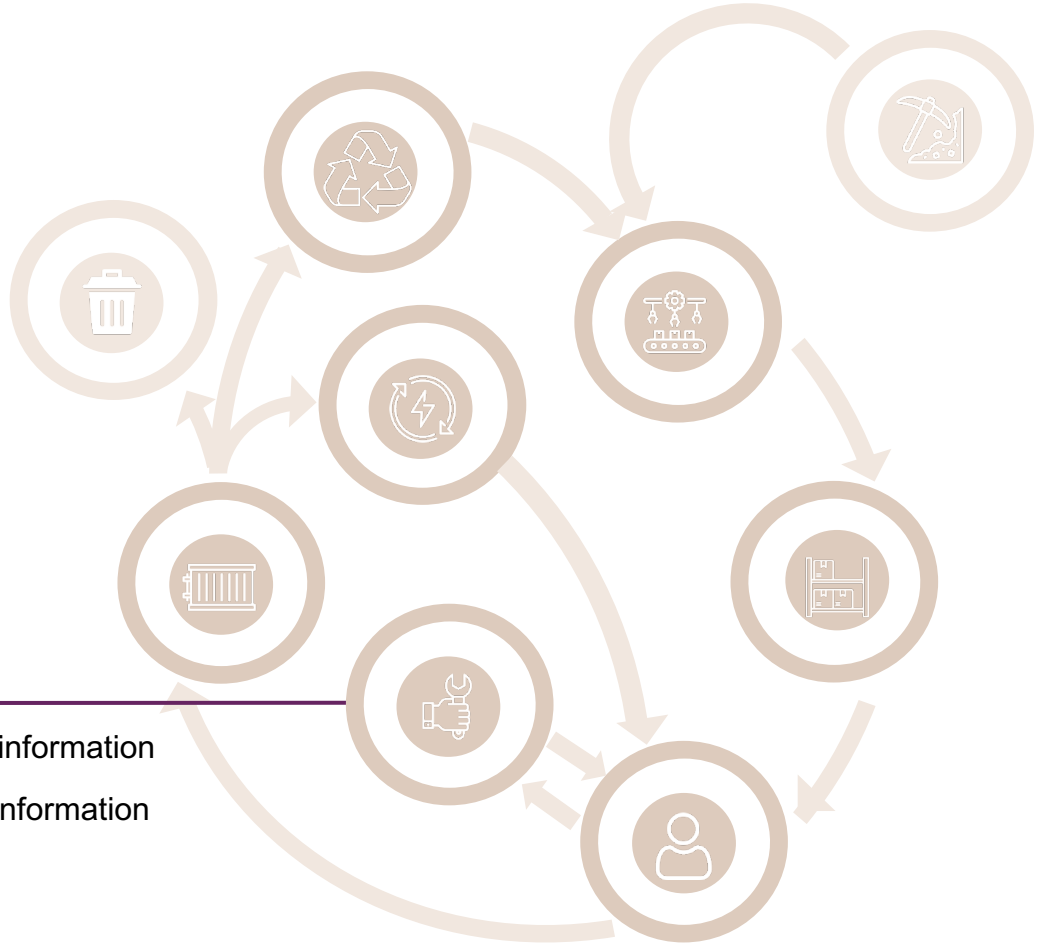
Demand for validated compliance tests to be provided by suppliers

SCIP database for tracing SVHC useful

Build services that help suppliers to provide data for compliance

Electronics Workshop Results

Downstream Perspectives



Repair

Authorized repairers receive sufficient information

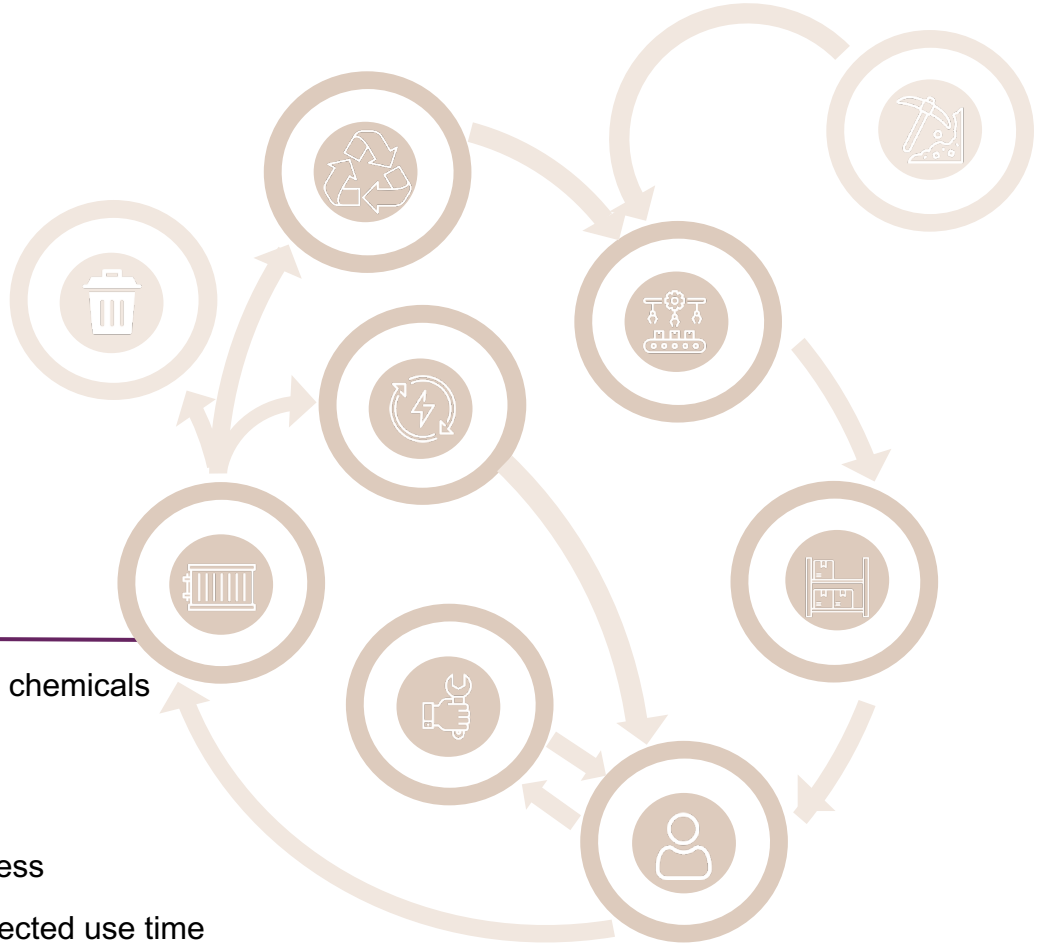
Independent repairers criticize lack of information

Wish for additional information:

- sales date and warranty information
- spare part availability
- needed repair skills
- disassembly instructions

Electronics Workshop Results

Downstream Perspectives



Waste - Collection and Sorting

Experienced staff could detect hazardous chemicals

Difficult if technologies change

Material information helpful

SCIP could be helpful but too slow to access

Material information needed after ~½ expected use time

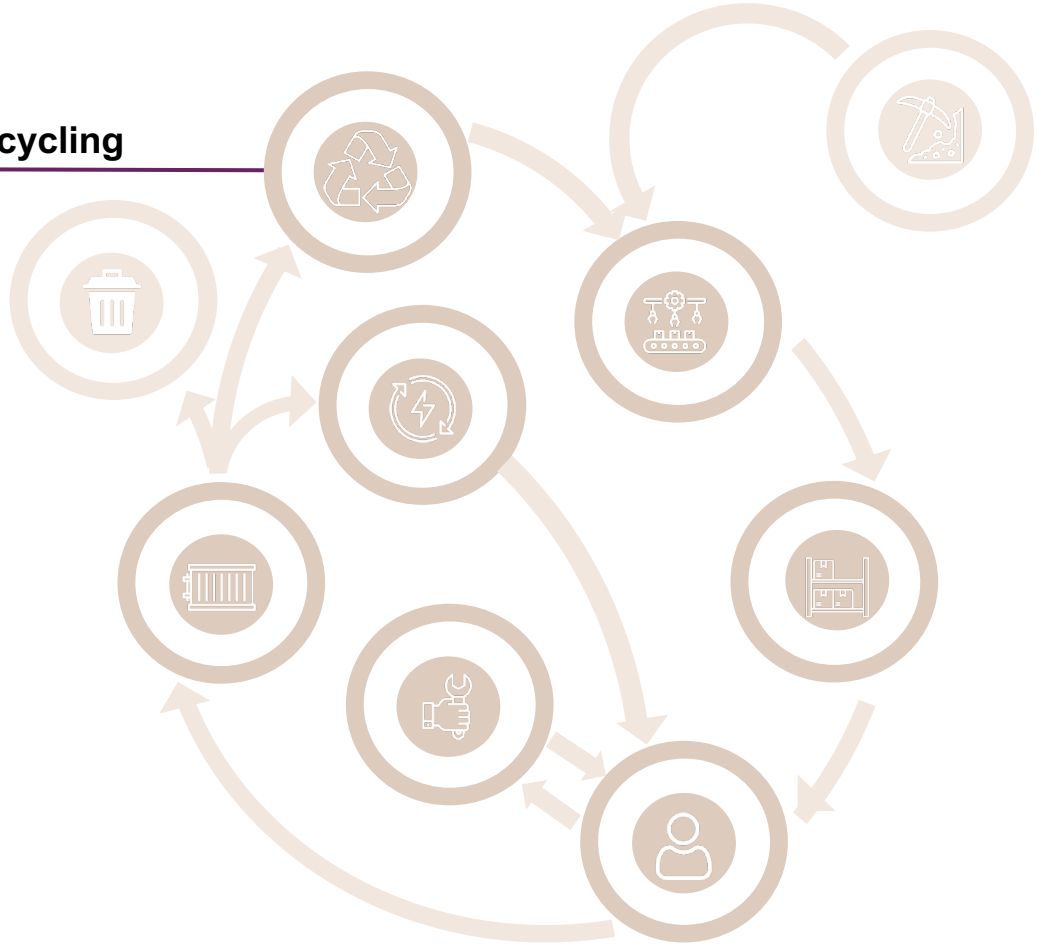
Electronics Workshop Results

Downstream Perspectives

Waste - Crushing, Shredding, Recycling

Wish for detailed material information
e.g. types of metals, specific additives

Processing method could be an alternative to exact material declaration



Electronics Consumer Survey

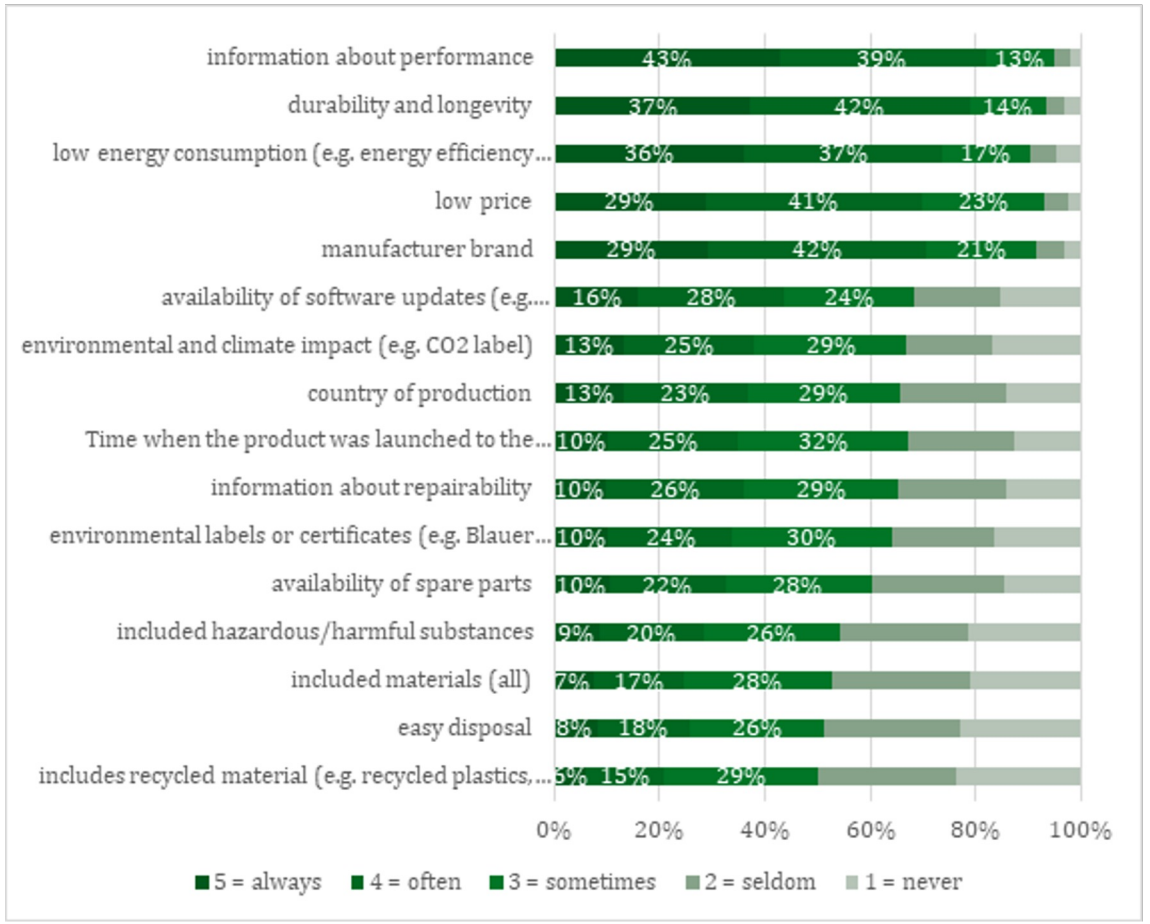
Relevant Information

Top 5

- Performance
- Durability and longevity
- Energy labelling
- Price
- Brand

Wish for all information in one place

Question on the “frequency of considering different information aspects when buying an electrical appliance”



Source: Technical University Berlin 2022

Frontend Demonstrator

Electronics (Refrigerator)

Erlu Electro

Side-by-Side Refrigerator, Stainless Steel

Product ID: 8016361898547

dpp.europe.uba.de/8016361898547

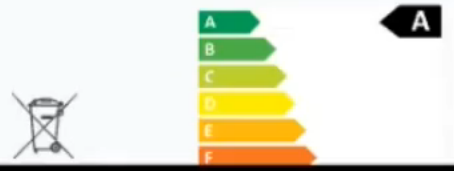
User role:

Certifier

Product Overview

Model Identifier	RB38A7B6AS9
Overall Dimensions	2030 (H) x 595 (W) x 658 (D) mm
Total Volume	387 L
Annual energy consumption	108 kWh/annum
Energy Efficiency Class	A
Product Identifier	8016361898547
Price	€899
Date of market entry	July 2020

EPREL ID: 546987



Erlu Electro

Side-by-Side Refrigerator, Stainless Steel

Product ID: 8016361898547

dpp.europe.uba.de/8016361898547

Materials and Composition

Hazardous Substances

Substance	Location	Relevant Standard	Percentage	Hazards
Isobutane	Cooling System	REACH SVHC	> 0.1%	

Recycled Content

Components	Weight (kg)	Materials	Composition (%)	Recycled Content (%)
Door	25	Stainless Steel	100	15
Interior Shelves	1	Polypropylene	100	10
Exterior				

User role:

Certifier

Erlu Electro

Side-by-Side Refrigerator, Stainless Steel

Product ID: 8016361898547

dpp.europe.uba.de/8016361898547

Usage & History

Manufactured Turkic Whitegoods	**4 September 2021** Istanbul, Turkey	
Shipped Maersk	**11 October 2021** Istanbul, Turkey	
Import EU Customs	**20 October 2021** Amsterdam, Netherlands	
Distributor / Retailer Erlu Retail	**1 November 2021** Rotterdam, Netherlands	
Sold Erlu Factory Outlet	**15 January 2022** Berlin, Germany	Purchase Receipt
Repair Erlu Warranty Workshop	**19 June 2022** Hamburg, Germany	Details

User role:

Consumer

Frontend Demonstrator

Conclusions Textiles & Electronics

Umwelt Bundesamt

Front-End Demonstrator

Feedback Consumers

Data verification and certification to avoid green-washing

Sustainability indexes need to be understandable and comparable

Brands/Producers also wanted this

Maintenance and care information more on point and better findable

Front-End Demonstrator

Feedback Upstream Stakeholders

Need precise and accurate data especially on material composition

Integrating digital care instructions and user manuals is handy and saves costs

Entering data in system must be easy to avoid big efforts

→ different input options needed

Front-End Demonstrator

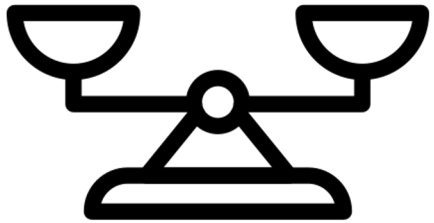
Conclusions

Information Needs

Sustainability and social performance

More details about products and supply chain

More accurate and verified information



Challenges

Limited availability material details and tier 3 + 4

Investments needed

Challenge especially for SMEs

Producers see some information as IP sensitive

Way forward

Good balance between legitimate IP protection and the need for information

Aggregated and threshold information combined with need-to-know principle

Incrementally increased information requirements over time

Supply chain transparency and sustainability indicators no alternative to legally binding minimum requirements

Chance to digitalize the European industry in the sense of an industrie 4.0

On behalf of:

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circular.fashion

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Product Information 4.0

extension of legal information requirements for products and digital implementation by the example of energy-related products and textiles

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Umwelt Bundesamt