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Appendix

# 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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# A Appendix

## A.1 Part A & B: Overview regulatory profiles

| Legal area | | Description |
|---|---|---|
| Chemicals legislation | "REACH Regulation" | Regulation (EC) No 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals |
| | "CLP Regulation" | Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures |
| Product legislation | "Textile Regulation" | Regulation (EU) No 1007/2011 on textile fibre names and related labelling and marking of the fibre composition of textile products |
| | "Ecodesign Directive" | Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products |
| | "Ecodesign Regulation PC" | Example: Commission Regulation (EU) No 617/2013 with regard to ecodesign requirements for computers and computer servers |
| | "Ecodesign Regulation WM" | Example: Commission Regulation (EU) 2019/2023 laying down ecodesign requirements for household washing machines and household washer-dryers |
| | "Ecodesign Regulation Displays" | Example: Commission Regulation (EU) 2019/2021 laying down ecodesign requirements for electronic displays |
| | "ELV Directive" | Directive 2000/53/EC on end-of life vehicles |
| | "Energy Labelling Regulation" | Regulation (EU) 2017/1369 setting a framework for energy labelling |
| | "ESPR Regulation Proposal" | Proposal establishing a framework for setting ecodesign requirements for sustainable products, COM(2022) 142 final, 2022/0095(COD) |
| | "Circular Textiles Strategy" | EU Strategy for Sustainable and Circular Textiles ( COM(2022) 141 final) |
| | "Type Approval Regulation" | Regulation (EU) 2018/858 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC |

| Legal area | | Description |
|---|---|---|
| Waste legislation | "Battery Directive" | Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators |
| | "Battery Regulation" | Regulation (EU) 2023/1542 concerning batteries and waste batteries |
| | "ELV Directive" | Directive 2000/53/EC on end-of life vehicles |
| | "Packaging Directive" | Directive 94/62/EC on packaging and packaging waste |
| | "RoHS Directive" | Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment |
| | "WEEE Directive" | Directive 2012/19/EU on waste electrical and electronic equipment |
| | "WFD" | Directive 2008/98/EC on waste (Waste Framework Directive) |
| Corporate legislation | "CSDD Directive Proposal" | Proposal for a Directive on Corporate Sustainability Due Diligence, COM(2022) 71 final, 2022/0051(COD) |
| | "Conflict Mineral Regulation" | Regulation (EU) 2017/821 on supply chain due diligence |

### A.1.1 Chemical legislation

| **Legal act** | **Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)**<br>Regulation (EC) No 1907/2006<br>"REACH Regulation" | |
|---|---|---|
| **Subject matter and goal** | Ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation | |
| **Scope** | **Article 31**<br>Substances, mixtures | **Article 33**<br>Articles as such or complex objects (colloquial term is "products") |

| **Legal act** | **Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)**<br>Regulation (EC) No 1907/2006<br>"REACH Regulation" | |
|---|---|---|
| **Information category** | Substance identification<br>Risk related information | Substance identification (SVHCs)<br>Substance handling and usage information |
| **Information requirement and granularity** | **Article 31 (5)**<br>Requirements for safety data sheets<br>▪ Identification of the substance/mixture and of the company/undertaking<br>▪ On request: Identification of non-hazardous mixtures containing hazardous substance (above threshold)<br>▪ Hazards identification<br>▪ Composition/information on ingredients;<br>▪ physical and chemical properties;<br>▪ Information on handling and storage, toxicological; disposal; transport regulatory;<br>▪ Ecological info. (waste treatment):<br>• waste treatment containers and methods<br>• physical/chemical properties that may affect waste treatment<br>• special precautions for any recommended waste treatment option | **Article 33**<br>Duty to communicate information on substances in articles<br>▪ Identification of the article (name, category, ID)<br>▪ Identification of the substances of very high concern (SVHCs) on the Candidate List in a concentration above 0.1% weight by weight (w/w) and location in that article<br>▪ Other information to allow the safe use of the article, notably information to ensure proper management of the article once it becomes waste. |
| **Data provider** | Companies producing and importing chemicals and materials in the EU | EU producers and assemblers, importers, distributors of articles and other actors in the supply chain placing articles on the market. |
| **Data user** | User/recipient of substance incl. part and product manufacturer; ECHA | User/recipient of the article, including consumers and waste operators; ECHA |

| **Legal act** | **Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)**<br>Regulation (EC) No 1907/2006<br>"REACH Regulation" | |
|---|---|---|
| **Validity period of directive** | Since 1.6.2007 | Since 1.6.2007<br>(Since 5.1.2021 registration obligation to SCIP based on Waste Framework Directive Art. 5(1)(i) and Art. 5(2)) |
| **Access / format of information provision** | ▪ Registration dossier to ECHA<br>▪ Safety data sheet (SDS) according to ANNEX II | ▪ Art. 33 (1) Paper or electronic format<br>▪ Art. 33 (2) to the consumers (paper or electronic)<br>▪ (Waste Framework Directive requires registration of products with SVHCs > 0.1% in "SCIP" database) |
| **Access rights and periods** | Art. 31 (1) SDS to be made accessible for the recipient of the substance or mixture | ▪ Art. 33 (1) Information on SVHCs > 0.1% must be provided by the supplier to the recipient at the time of delivery<br>▪ Art. 33 (2) Publicly accessible to the consumers upon request, free of charge, within 45 days |
| **Administration of data(-base)** | Peer to peer information exchange (SDS)<br>ECHA (registration dossier) | Peer to peer information exchange |

| **Legal act** | **Classification, labelling and packaging of substances and mixtures (CLP)**<br>Regulation (EC) No 1272/2008<br>"CLP Regulation" |
|---|---|
| **Subject matter and goal** | Ensure a high level of protection of human health and the environment as well as the free movement of substances, mixtures and articles |
| **Scope** | Substances, mixtures and articles |
| **Information category** | ▪ Identification of hazardous substance or mixture (above threshold) + quantitates + supplier identification<br>▪ Article with explosive properties |

| **Legal act** | **Classification, labelling and packaging of substances and mixtures (CLP)**<br>Regulation (EC) No 1272/2008<br>"CLP Regulation" |
|---|---|
| **Information requirement and granularity** | **Article 17** General rules<br>▪ The name, address and telephone number of the supplier<br>▪ The nominal quantity of a substance or mixture in packages made available to the general public (unless this quantity is specified elsewhere on the package)<br>▪ Product identifiers<br>▪ Where applicable, hazard pictograms, signal words, hazard statements, precautionary statements and supplemental information required by other legislation. |
| **Data provider** | Manufacturers, supplier, importers or downstream users of substances or mixtures |
| **Data user** | Actors in the supply chain, including to consumers |
| **Validity period of directive** | since 1 June 2015 |
| **Access / format of information provision** | Label |
| **Access rights and periods** | Public |
| **Administration of data(-base)** | ECHA |

### A.1.2 Product legislation

| **Legal act** | **Framework for the setting of ecodesign requirements for energy-related products**<br>Directive 2009/125/EC<br>"Ecodesign Directive" |
|---|---|
| **Subject matter and goal** | Ensuring the free movement of products within the internal market, contribution to sustainable development by increasing energy efficiency and the level of protection of the environment, while at the same time increasing the security of the energy supply.<br>Minimise its impact on the environment and to ensure optimal life expectancy, |
| **Scope** | Energy-related products |

| **Legal act** | **Framework for the setting of ecodesign requirements for energy-related products**<br>Directive 2009/125/EC<br>"Ecodesign Directive" |
|---|---|
| **Information category** | **Article 4 Responsibilities of the importer**<br>▪ Declaration of conformity<br>▪ CE marking<br>▪ Technical documentation<br>▪ provision of information in one or more other official languages<br><br>**Article 11 Requirements for components and sub-assemblies** (to product manufacturer)<br>▪ energy consumption<br>▪ information on material composition<br><br>**Article 14 Consumer information**<br>manufacturers have to ensure, in the form they deem appropriate, that consumers of products are provided with:<br>▪ consumers role in the sustainable use of the product<br>▪ ecological profile of the product and the benefits of ecodesign<br><br>**ANNEX I Part 2. Requirements relating to the supply of information**<br>▪ information from the designer relating to the manufacturing process;<br>▪ for consumers: significant environmental characteristics and performance of a product, when it is placed on the market to allow consumers to compare these aspects of the products;<br>▪ for consumers: installation, use and maintenance, return options at EoL, period of availability of spare parts, possibilities of upgrading products;<br>▪ for treatment facilities: information on disassembly, recycling or disposal at end-of-life.<br><br>Further requirements are set out throughout the directive e.g. the documentation of the management system after ANNEX V 3.3. |
| **Information requirement and granularity** | **Article 2: Definitions**<br>Manufacturer or authorised representative or EU importer |
| **Data provider** | Market surveillance, consumer, treatment facilities |
| **Data user** | Energy efficiency, Reducing environmental impact |
| **Validity period of directive** | 20.11.2009 |

| **Legal act** | **Framework for the setting of ecodesign requirements for energy-related products**<br>Directive 2009/125/EC<br>"Ecodesign Directive" |
|---|---|
| **Access / format of information provision** | CE Marking, datasheets |
| **Access rights and periods** | Public, when product is placed on the market |
| **Administration of data(-base)** | Member states authorities |

| **Legal act** | **Ecodesign requirements for household washing machines and household washer-dryers**<br>Regulation (EU) 2019/2023<br>"Ecodesign Regulation Washing Machines" |
|---|---|
| **Subject matter and goal** | See ecodesign framework Directive 2009/125/EC |
| **Scope** | Washing machine and washer-dryers (incl. battery-operated if 230V connectable) |
| **Information category** | Use instructions, Repair and maintenance information |
| **Information requirement and granularity** | **ANNEX II, 8. RESOURCE EFFICIENCY REQUIREMENTS**<br>(3) Repair and Maintenance Information (for professional repairers):<br>▪ the unequivocal household washing machine or household washer-dryer identification;<br>▪ a disassembly map or exploded view;<br>▪ technical manual of instructions for repair;<br>▪ list of necessary repair and test equipment;<br>▪ component and diagnosis information (such as minimum and maximum theoretical values for measurements);<br>▪ wiring and connection diagrams;<br>▪ diagnostic fault and error codes (including manufacturer-specific codes, where applicable);<br>▪ instructions for installation of relevant software and firmware including reset software;<br>▪ information on how to access data records of reported failure incidents stored on the household washing machine or washer-dryer (where applicable);<br>(4) information requirements for refrigerant gases: for machines with heat pump, the chemical name of the refrigerant gas used, or equivalent reference such as a commonly used and understood symbol, label or logo, shall be displayed permanently and in a visible and readable way on the exterior of the household washing machines or household washer-dryers, for example on the back panel. |

| **Legal act** | **Ecodesign requirements for household washing machines and household washer-dryers**<br>Regulation (EU) 2019/2023<br>"Ecodesign Regulation Washing Machines" |
|---|---|
| | **ANNEX II, 9. INFORMATION REQUIREMENTS**<br>(3) the user instructions shall also include (for users)<br>▪ correct installation, correct use of detergent, softeners and other additives, and main consequences of incorrect dosage; foreign object removal, periodic cleaning and checks<br>▪ identification of errors, the meaning of the errors, and the action required, including identification of errors requiring professional assistance;<br>▪ how to access professional repair (internet webpages, addresses, contact details); such instructions shall also include information on:<br>▪ any implications of self-repair or non-professional repair for the safety of the end-user and for the guarantee;<br>▪ the minimum period during which the spare parts for the household washing machine or the household washer-dryer are available.<br><br>"Use and installer instructions" incl. instruction on how to find the model information stored in the product database, as defined in Regulation (EU) 2019/2014 by means of a weblink that links to the model information as stored in the product database or a link to the product database and information on how to find the model identifier on the product; |
| **Data provider** | Manufacturer, importer or authorised representative |
| **Data user** | User, professional repair, market surveillance |
| **Validity period of directive** | Since 01.10.2019 |
| **Access / format of information provision** | User manual, technical/service/repair manual |
| **Access rights and periods** | "After a period of two years after the placing on the market of the first unit of a model and until the end of the period mentioned under (1), shall provide access to repair and maintenance information to professional repairers.<br>User manual on a free access website of the manufacturer, importer or authorised representative |
| **Administration of data(-base)** | Manufacturer |

| **Legal act** | **Ecodesign requirements for computers and computer servers**<br>Regulation (EU) No 617/2013<br>"Ecodesign Regulation PC" | |
|---|---|---|
| **Subject matter and goal** | See ecodesign framework Directive 2009/125/EC | |
| **Scope** | Computer, Desktop-Computer, integrated Desktop-Computer, Notebook-Computer, Tablet-Computer, Slates, mobile Thin-Clients, Desktop-Thin-Clients, Workstations, mobile Workstations, Small-Scale-Server, Computerserver | |
| **Information category** | Energy consumption in different modes, energy efficiency label/class, general product information | |
| **Information requirement and granularity** | **Annex II, 7,1: INFORMATION TO BE PROVIDED BY MANUFACTURERS**<br><br>**Desktop computer, integrated desktop computer, and notebook computer**<br><br>▪ product type and category<br>▪ manufacturer's name, registered trade name<br>▪ product model number;<br>▪ year of manufacture;<br>▪ Technical measures e.g. ETEC value (kWh), idle state power demand (Watts); sleep mode power demand (Watts); etc.<br>▪ for products with an integrated display containing mercury, the total content of mercury as X,X mg; | **Annex II, 7,3: INFORMATION TO BE PROVIDED BY MANUFACTURERS**<br><br>**Workstation, mobile workstation, desktop thin client, small-scale server and computer server**<br><br>▪ (a) product type as defined in Article 2 (one and only one category);<br>▪ (b) manufacturer's name, registered trade name or registered trade mark, and the address at which they can be contacted;<br>▪ (c) product model number;<br>▪ (d) year of manufacture;<br>▪ (e) internal/external power supply efficiency;<br>▪ (f) test parameters for measurements:<br>• test voltage in V and frequency in Hz,<br>• total harmonic distortion of the electricity supply system,<br>• information and documentation on the instrumentation, set-up and circuits used for electrical testing.<br>▪ (g) maximum power (Watts);<br>▪ (h) idle state power (Watts);<br>▪ (i) sleep mode power (Watts);<br>▪ (j) off mode power (Watts); |

| **Legal act** | **Ecodesign requirements for computers and computer servers**<br>Regulation (EU) No 617/2013<br>"Ecodesign Regulation PC" |
|---|---|
| | ▪ (k) noise levels (the declared A-weighted sound power level of the computer;<br>▪ (l) the measurement methodology used to determine information mentioned in points (e) to (k). |
| **Data provider** | Manufacturer, authorised representative, importer |
| **Data user** | Market surveillance, User, Waste treatment |
| **Validity period of directive** | Since 01.01.2016 |
| **Access / format of information provision** | Technical data sheets, websites, packaging |
| **Access rights and periods** | Public website (manufacturer); limited access via product database (EPREL) and energy efficiency label |
| **Administration of data(-base)** | European Commission |

| **Legal act** | **Ecodesign requirements for electronic displays**<br>Regulation (EU) 2019/2021<br>"Ecodesign Regulation Displays" |
|---|---|
| **Subject matter and goal** | See ecodesign framework Directive 2009/125/EC |
| **Scope** | Electronic displays, including televisions, monitors and digital signage displays |
| **Information category** | Design for dismantling, recycling and recovery, Marking of plastic components, logo, Design for repair and reuse, availability of updates |
| **Information requirement and granularity** | **Annex II**<br>**D. MATERIAL EFFICIENCY REQUIREMENTS**<br>1. **Design for dismantling, recycling and recovery**<br>▪ Information about dismantling (dismantling steps, tools or technologies) needed to access any of the products components according to ANNEX VII WEEE Directive 2012/19/EU, e.g. Batteries) on a free-access website (target user not specified)<br>▪ End-of-life information shall be available at least 15 years after the placing on the market of the last unit of a product model. |

| **Legal act** | **Ecodesign requirements for electronic displays**<br>Regulation (EU) 2019/2021<br>"Ecodesign Regulation Displays" |
|---|---|
| | 2. **Marking of plastic components: Plastic components heavier than 50 g:**<br>▪ (a) Shall be marked by specifying the type of polymer with the appropriate standard symbols or abbreviated terms<br>▪ (b) Components containing flame retardants shall additionally be marked with the abbreviated term of the polymer followed by hyphen, then the symbol 'FR' followed by the code number of the flame retardant in parentheses.<br>3. **Cadmium logo**<br>▪ Electronic displays which concentration values of Cadmium (Cd) exceed 0,01 % (see RoHS) shall be labelled with the 'Cadmium inside' logo.<br>5. **Design for repair and reuse**<br>▪ List of spare parts, the procedure for ordering them and repair instructions free access website, at the moment of the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts (end-users and professional)<br>▪ repair and maintenance information shall include (professional repair):<br>• the unequivocal appliance identification;<br>• a disassembly map or exploded view;<br>• list of necessary repair and test equipment;<br>• component and diagnosis information (such as minimum and maximum theoretical values for measurements);<br>• wiring and connection diagrams;<br>• diagnostic fault and error codes (including manufacturer-specific codes, where applicable); and<br>• data records of reported failure incidents stored on the electronic display (where applicable).<br><br>**E. INFORMATION AVAILABILITY REQUIREMENTS**<br>1. Availability of software and firmware updates<br>Information on the minimum guaranteed availability of software and firmware updates, availability of spare parts and product support shall be indicated in the product information sheet |
| **Data provider** | Product manufacturer, importer or authorised representative |
| **Data user** | User, Market surveillance, Waste treatment, Repair, Recycler |
| **Validity period of directive** | Since 1.3.2021 |
| **Access / format of information provision** | Technical data sheets, websites |
| **Access rights and periods** | Public website (manufacturer), Limited access website |

| **Legal act** | **Ecodesign requirements for electronic displays**<br>Regulation (EU) 2019/2021<br>"Ecodesign Regulation Displays" |
|---|---|
| **Administration of data(-base)** | Manufacturer |

| **Legal act** | **Framework for energy labelling**<br>Regulation (EU) 2017/1369<br>"Energy Labelling Regulation" |
|---|---|
| **Subject matter and goal** | Labelling of energy-related products and the provision of standard product information regarding energy efficiency, the consumption of energy and of other resources by products during use and supplementary information concerning products and enabling customers to choose more efficient products in order to reduce their energy consumption |
| **Scope** | Energy-related products |
| **Information category** | Product and manufacturer identification, energy efficiency label/class, product information sheet, technical documentation |
| **Information requirement and granularity** | **ANNEX I**<br>**1. Information to be entered in the public part** of the database by the supplier:<br>▪ (a) name or trademark, address, contact details<br>▪ (b) model identifier;<br>▪ (c) label in electronic format;<br>▪ (d) energy efficiency class(es) and other parameters of the label;<br>▪ (e) parameters of the product information sheet in electronic format.<br><br>**3. Information to be entered in the compliance part** of the database by the supplier:<br>▪ (a) model identifier of all equivalent models already placed on the market;<br>▪ (b) technical documentation as specified in Article 12(5).<br><br>**4. Functional criteria for the public part of the product database:**<br>▪ (a) each product model shall be retrievable as an individual record;<br>▪ (b) it shall generate a single viewable, downloadable and printable file of the energy label of each model, as well as the linguistic versions of the complete product information sheet, in all official languages of the Union;<br>▪ (c) the information shall be machine readable, sortable and searchable, respecting open standards for third party use, free of charge;<br>▪ (d) an online helpdesk or contact point for the supplier shall be established and maintained, clearly referenced on the portal. |

| **Legal act** | **Framework for energy labelling**<br>Regulation (EU) 2017/1369<br>"Energy Labelling Regulation" |
|---|---|
| | **Article 12(5)**<br>▪ (a) description of the model, sufficient for it to be unequivocally and easily identified;<br>▪ (b) references to the harmonised standards applied or other measurement standards used;<br>▪ (c) specific precautions that shall be taken when the model is assembled, installed, maintained or tested;<br>▪ (d) the measured technical parameters of the model;<br>▪ (e) the calculations performed with the measured parameters;<br>(f) testing conditions if not described sufficiently in point (b). |
| **Data provider** | Manufacturer, supplier |
| **Data user** | User, Market surveillance, Distributor and retailer |
| **Validity period of directive** | Since 1.3.2021 or 4.7.2017 |
| **Access / format of information provision** | ▪ Public: Product information sheet, website, packaging<br>▪ Market surveillance: technical data sheets, |
| **Access rights and periods** | ▪ Public: Energy label on product, product information sheet via packaging, website/EPREL<br>▪ Market surveillance: technical data sheet (test reports) via EPREL |
| **Administration of data(-base)** | European Commission |

| **Legal act** | **Textile fibre names and related labelling and marking of the fibre composition of textile products**<br>Regulation (EU) No 1007/2011<br>"Textile Regulation" |
|---|---|
| **Subject matter and goal** | Improve the functioning of the internal market and to providing accurate information to consumers to make informed choices |
| **Scope** | Textile products, textile products containing non-textile parts of animal origin, other products containing >60% weight of textile e.g. furniture, umbrella sunshade, list of (non-) relevant textile fibres in ANNEX |
| **Information category** | Material composition, label |

| **Legal act** | **Textile fibre names and related labelling and marking of the fibre composition of textile products**<br>Regulation (EU) No 1007/2011<br>"Textile Regulation" |
|---|---|
| **Information requirement and granularity** | Textile fibre names listed in **ANNEX I**, including fur and other animal parts<br><br>**Article 11: Multi-component textile products**<br>1. Any textile product containing two or more textile components which have different textile fibre contents shall bear a label or marking stating the textile fibre content of each component.<br><br>**Article 14: Labels and markings**<br>1. Textile products shall be labelled or marked to give an indication of their fibre composition whenever they are made available on the market. The labelling and marking of textile products shall be durable, easily legible, visible and accessible and, in the case of a label, securely attached.<br>▪ Textile fibre name and composition for each component<br>▪ Trade marks or the name of the undertaking<br>▪ Labelling or marking have to be provided in the official language or languages of the Member State on the territory of which the textile products are made available to the consumers<br>Specific rules apply for certain products (ANNEX IV) |
| **Data provider** | EU manufacturer, importer, distributor |
| **Data user** | Market surveillance, consumer |
| **Validity period of directive** | Since 27.09.2011 |
| **Access / format of information provision** | ▪ Label or marking on textile or packaging<br>▪ Product accompanied with commercial documents |
| **Access rights and periods** | ▪ Publicly accessible before the (online) purchase clearly visible to the consumers<br>▪ Publicly accessible via label or marking when placing a textile product on the market<br>For textile products sold by meter and listed in Annex VI fibre compositions are required to be made available on the market together with an inclusive labelling to each purchaser in the supply chain, including the consumers |
| **Administration of data(-base)** | EU manufacturer, importer, distributor |

| **Legal act** | **EU Strategy for Sustainable and Circular Textiles**<br>COM(2022) 141 final, Document 52022DC0141<br>"Circular Textiles Strategy" |
|---|---|
| **Subject matter and goal** | Circular economy, sustainability, health, due diligance |
| **Scope** | Textiles |
| **Information category** | mandatory information requirements on circularity and other key environmental aspects |
| **Information requirement and granularity** | **2(4).** **NEW**<br>**PATTERN FOR EUROPE: KEY ACTIONS FOR SUSTAINABLE AND CIRCULAR TEXTILES**<br>**Introducing information requirements and a Digital Product Passport:**<br><br>sustainability and circularity parameters,<br>products' size and, where applicable,<br>the country where manufacturing processes take place ('made in'). |
| **Data provider** | Manufacturer, authorised representatives, importer |
| **Data user** | customers, end-users, manufacturers, importers and distributors, dealers, repairers, remanufacturers, recyclers, competent national authorities, public interest organisations and the Commission, or any organisation acting on their behalf |
| **Validity period of directive** | Strategy |
| **Access / format of information provision** | Digital product passport |
| **Access rights and periods** | tbd |
| **Administration of data(-base)** | tbd |

| **Legal act** | **Proposal establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC**<br>Proposal Regulation 2022/0095 (COD)<br>"ESPR - Regulation Proposal" |
|---|---|
| **Subject matter and goal** | Improve the environmental sustainability of products and to ensure free movement in the internal market by setting ecodesign requirements; Circular economy; prevent unsold consumer products from being destroyed |

| **Legal act** | **Proposal establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC**<br>Proposal Regulation 2022/0095 (COD)<br>"ESPR - Regulation Proposal" |
|---|---|
| **Scope** | Any physical good that is placed on the market or put into service, including components and intermediate products<br>(without food, medicinal products, plants, animals, micro-organisms, products of human origin, products of plants and animals relating directly to their future reproduction) |
| **Information category** | product durability, reparability, upgradability and reusability, presence of substances that inhibit circularity, energy and resource efficiency, recycled content, remanufacturing and recycling, carbon and environmental footprints ( |
| **Information requirement and granularity** | **Article 7(2): Information requirements**<br>▪ (a) include, as a minimum, requirements related to the product passport referred to in Chapter III and requirements related to substances of concern referred to in paragraph 5; and<br>▪ (b) as appropriate, require products to be accompanied by:<br>• (i) information on the performance of the product in relation to the product parameters referred to in Annex I;<br>• (ii) information for consumers and other end-users on how to install, use, maintain and repair the product in order to minimise its impact on the environment and to ensure optimum durability, as well as on how to return or dispose of the product at end-of-life;<br>• (iii) information for treatment facilities on disassembly, recycling, or disposal at end-of-life;<br>• (iv) other information that may influence the way the product is handled by parties other than the manufacturer in order to improve performance in relation to product parameters referred to in Annex I.<br><br>**Article 7(5)**<br>The information requirements referred to in paragraph 1 shall enable the tracking of all substances of concern throughout the life cycle of products, unless such tracking is already enabled by another delegated act adopted pursuant to Article 4 covering the products concerned, and shall include at least the following:<br>▪ (a) the name of the substances of concern present in the product;<br>▪ (b) the location of the substances of concern within the product;<br>▪ (c) the concentration, maximum concentration or concentration range of the substances of concern, at the level of the product, its main components, or spare parts;<br>▪ (d) relevant instructions for the safe use of the product;<br>▪ (e) information relevant for disassembly.<br>**ANNEX III**<br>▪ (b) the unique product identifier (UPI) at the level indicated in the applicable delegated act adopted pursuant to Article 4;<br>▪ (c) the Global Trade Identification Number (GTIN) as provided for in standard ISO/IEC 15459-6 or equivalent of products or their parts; |

| **Legal act** | **Proposal establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC**<br>Proposal Regulation 2022/0095 (COD)<br>"ESPR - Regulation Proposal" |
|---|---|
| | ▪ (d) relevant commodity codes, such as a TARIC code as defined in Council Regulation (EEC) No 2658/871;<br>▪ (e) compliance documentation and information required under this Regulation or other Union law applicable to the product, such as the declaration of conformity, technical documentation or conformity certificates;<br>▪ (f) user manuals, instructions, warnings or safety information, as required by other Union legislation applicable to the product;<br>▪ (g) information related to the manufacturer, such as its unique operator identifier and the information referred to in Article 21(7);<br>▪ (h) unique operator identifiers other than that of the manufacturer;<br>▪ (i) unique facility identifiers;<br>▪ (j) information related to the importer, including the information referred to in Article 23(3) and its EORI number;<br>▪ (k) the name, contact details and unique operator identifier code of the economic operator established in the Union responsible for carrying out the tasks set out in Article 4 of Regulation (EU) 2019/1020, or Article 15 of Regulation (EU) […/…] on general product safety, or similar tasks pursuant to other EU legislation applicable to the product.<br>▪ …information relevant to ecodesign requirements that manufacturers may include in the product passport in addition to the information required pursuant to Article 8(2), point (a), including information on specific voluntary labels applicable to the product. That shall include EU Ecolabel |
| **Data provider** | Manufacturer, authorised representatives, importer |
| **Data user** | Customers, end-users, manufacturers, importers and distributors, dealers, repairers, remanufacturers, recyclers, competent national authorities, public interest organisations and the Commission, or any organisation acting on their behalf |
| **Validity period of directive** | Proposal |
| **Access / format of information provision** | Digital product passport |
| **Access rights and periods** | "consumers, economic operators and other relevant actors shall have free access to the product passport based on their respective access rights set out in the applicable delegated act adopted pursuant to Article 4" (Article 10 (b)) |

| | |
|---|---|
| **Legal act** | **Proposal establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC**<br>Proposal Regulation 2022/0095 (COD)<br>"ESPR - Regulation Proposal" |
| **Administration of data(-base)** | Economic operator responsible for its creation or by operators authorised to act on their behalf |

| | |
|---|---|
| **Legal act** | **Regulation on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles**<br>Regulation (EU) 2018/858 amending Regulations (EC) No 715/2007 and (EC) 595/2009<br>"Type Approval Regulation" |
| **Subject matter and goal** | Administrative provisions and technical requirement for the type-approval and market entry as well as requirements for the market surveillance of vehicles, systems, components, separate technical units and equipment that are subject to approval. |
| **Scope** | Motor vehicles of categories M and N and their trailers of category O, that are intended to be used on public roads, including those designed and constructed in one or more stages, and to systems, components and separate technical units, as well as to parts and equipment, designed and constructed for such vehicles and their trailers |
| **Information category** | Reparability, usage |
| **Information requirement and granularity** | **Annex X, ACCESS TO VEHICLE OBD INFORMATION AND VEHICLE REPAIR AND MAINTENANCE INFORMATION, Access to vehicle OBD information and vehicle repair and maintenance information**<br>▪ 2.5. The vehicle OBD information and vehicle repair and maintenance information shall include the following:<br>▪ 2.5.1. an unequivocal identification of the vehicle, system, component or separate technical unit for which the manufacturer is responsible;<br>▪ 2.5.2. service handbooks, including service and maintenance records;<br>▪ 2.5.3. technical manuals;<br>▪ 2.5.4. component and diagnosis information (such as minimum and maximum theoretical values for measurements);<br>▪ 2.5.5. wiring diagrams;<br>▪ 2.5.6. diagnostic trouble codes, including manufacturer specific codes;<br>▪ 2.5.7. the software calibration identification number applicable to a type of vehicle;<br>▪ 2.5.8. information provided concerning, and delivered by means of, proprietary tools and equipment;<br>▪ 2.5.9. data record information and two-directional monitoring and test data;<br>▪ 2.5.10. standard work units or time periods for repair and maintenance tasks if they are made available to authorised dealers and repairers of the manufacturer either directly or through a third party; |

| **Legal act** | **Regulation on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles**<br>Regulation (EU) 2018/858 amending Regulations (EC) No 715/2007 and (EC) 595/2009<br>"Type Approval Regulation" |
|---|---|
| | ▪ 2.5.11. in case of multi-stage type-approval, the information required under point 3, and all other information necessary to comply with the requirements set out in Article 61.<br>▪ 2.6. The manufacturer shall make available to interested parties the following information:<br>▪ 2.6.1. relevant information to enable the development of replacement components that are critical to the correct functioning of the OBD system;<br>▪ 2.6.2. information to enable the development of generic diagnostic tools.<br><br>**Multi-stage type-approval**<br>▪ 3.1. In the case of a multi-stage type-approval, the final manufacturer shall be responsible for providing access to vehicle OBD information and vehicle repair and maintenance information regarding its own manufacturing stage(s) and the link to the previous stage(s).<br>▪ 3.2. In addition, the final manufacturer shall on its website provide independent operators with the following information:<br>▪ 3.2.1. the website address of the manufacturer(s) responsible for the previous stage(s);<br>▪ 3.2.2. the name and address of all the manufacturers responsible for the previous stage(s);<br>▪ 3.2.3. the type-approval number(s) of the previous stage(s);<br>▪ 3.2.4. the engine number. […]<br>▪ 3.4. The manufacturer responsible for a particular stage or stages of type-approval shall provide the following information to the manufacturer responsible for the next stage:<br>▪ 3.4.1. the certificate of conformity relating to the stage(s) for which he is responsible;<br>▪ 3.4.2. the certificate on access to vehicle OBD information and vehicle repair and maintenance information, including its annexes;<br>▪ 3.4.3. the type-approval number corresponding to the stage(s) for which he is responsible;<br>▪ 3.4.4. the documents referred to in points 3.4.1, 3.4.2 and 3.4.3 as provided by the manufacturer(s) involved in the previous stage(s). |
| **Data provider** | Manufacturer |
| **Data user** | Consumers, repairers |
| **Validity period of directive** | Since July 2020 |

| | |
|---|---|
| **Legal act** | **Regulation on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles**<br>Regulation (EU) 2018/858 amending Regulations (EC) No 715/2007 and (EC) 595/2009<br>"Type Approval Regulation" |
| **Access / format of information provision** | Certificate, Website (SERMI)<br>**Article 66**<br>1. The Forum on Access to Vehicle Information regarding access to vehicle OBD information and vehicle repair and maintenance information, established in accordance with Article 13(9) of Commission Regulation (EC) No 692/2008 ([7]), shall also cover all vehicles within the scope of this Regulation |
| **Access rights and periods** | **Annex X, ACCESS TO VEHICLE OBD INFORMATION AND VEHICLE REPAIR AND MAINTENANCE INFORMATION, Requirements**<br>▪ 6.2. Access to vehicle security features used by authorised dealers and repairers shall be made available to independent operators under protection of security technology in accordance with the following requirements:<br>▪ 6.2.1. data shall be exchanged ensuring confidentiality, integrity and protection against replay;<br>▪ 6.2.2. the standard https//ssl-tls (RFC4346) shall be used;<br>▪ 6.2.3. security certificates in accordance with international standard ISO 20828 shall be used for mutual authentication of independent operators and manufacturers;<br>▪ 6.2.4. the independent operator's private key shall be protected by secure hardware. |
| **Administration of data(-base)** | ACEA: European Automobile Manufacturers' Association<br>AIRC: Association Internationale des Réparateurs en Carrosserie<br>CECRA : European Council for Motor Trades and Repairs<br>FIA: Fédération Internationale de l'Automobile<br>FIGIEFA: European Federation of Automotive Aftermarket Distributors |

### A.1.3 Revision of the ecodesign and energy labelling requirements

The regulation on energy efficiency labelling and ecodesign include product specific and underlying information requirements. In 2019 the European Commission adopted 10 ecodesign implementation regulations, of which 6 are also subject to new or revised energy labelling rules. A rescaling of energy label and introduction of a European Product Registry for Energy Labelling (EPREL) has been in force since 2021, with new information requirements and technical infrastructure.

| # | Product group | Energy label rescaling & EPREL 2021 | Ecodesign Directive revision 2019 |
|---|---|---|---|
| **1** | Refrigerating appliances | X | Repair, Energy |
| **2** | Washing machines and household washer-dryers | X | Repair, Energy, Resource |
| **3** | Household dishwashers | X | Repair, Energy, Resource |
| **4** | Electronic displays (including televisions) | X | Repair, Energy |
| **5** | Light sources and separate control gears | X | Repair, Energy |
| **6** | External power suppliers | | Repair, Energy |
| **7** | Electric motors | | Repair, Energy |
| **8** | Power transformers | | Repair, Energy |
| **9** | New: Refrigerators with a direct sales function (e.g. fridges in supermarkets, vending machines for cold drinks) | X | Repair, Energy |
| **10** | New: Welding equipment | | Repair, Energy |

### A.1.4 Waste legislation

| **Legal act** | **Restriction of the use of certain hazardous substances in electrical and electronic equipment**<br>Directive 2011/65/EU<br>„RoHS Directive“ |
|---|---|
| **Subject matter and goal** | Restriction of the use of hazardous substances in electrical and electronic equipment (EEE) with a view to contributing to the protection of human health and the environment, including the environmentally sound recovery and disposal of waste EEE. |
| **Scope** | Energy-related products |

| **Legal act** | **Restriction of the use of certain hazardous substances in electrical and electronic equipment**<br>Directive 2011/65/EU<br>„RoHS Directive“ |
|---|---|
| **Information category** | Absence of hazardous substances |
| **Information requirement and granularity** | Quotes of used Substances (%)<br>**ANNEX VI EU DECLARATION OF CONFORMITY:**<br>▪ No … (unique identification of the EEE)<br>▪ Name and address of the manufacturer or his authorised representative:<br>▪ This declaration of conformity is issued under the sole responsibility of the manufacturer (or installer) |
| | ▪ Object of the declaration (identification of EEE allowing traceability. It may include a photograph, where appropriate)<br>▪ The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (1)<br>▪ Where applicable, references to the relevant harmonised standards used or references to the technical specifications in relation to which conformity is declared<br><br>**ANNEX II Restricted substances**<br>▪ Lead (0,1 %)<br>▪ Mercury (0,1 %)<br>▪ Cadmium (0,01 %)<br>▪ Hexavalent chromium (0,1 %)<br>▪ Polybrominated biphenyls (PBB) (0,1 %)<br>▪ Polybrominated diphenyl ethers (PBDE) (0,1 %) |
| **Data provider** | Manufacturer |
| **Data user** | Market surveillance |
| **Validity period of directive** | 13.08.2004 |
| **Access / format of information provision** | Datasheets, CE label |
| **Access rights and periods** | manufacturers keep the technical documentation and the EU declaration of conformity for 10 years after the EEE has been placed on the market |
| **Administration of data(-base)** | Manufacturer |

| **Legal act** | **Batteries and accumulators and waste batteries and accumulators**<br>Directive 2006/66/EC and amendment Directive 2018/849<br>"Battery Directive" |
|---|---|
| **Subject matter and goal** | Improve the environmental performance; prohibition batteries and accumulators containing hazardous substances; promote a high level of collection and recycling of waste batteries and accumulators. |
| **Scope** | All types of batteries and accumulators |
| **Information category** | ▪ Collection and recycling quotes<br>▪ Available collection and recycling schemes<br>▪ Label |
| **Information requirement and granularity** | **Article 20: Information for end-users**<br>1. Member States shall ensure, in particular through information campaigns, that end-users are fully informed of:<br>▪ the potential effects on the environment and human health of the substances used in batteries and accumulators;<br>▪ the desirability of not disposing of waste batteries and accumulators as unsorted municipal waste and of participating in their separate collection so as to facilitate treatment and recycling;<br>▪ the collection and recycling schemes available to them;<br>▪ (d) their role in contributing to the recycling of waste batteries and accumulators;<br>▪ (e) the meaning of the symbol of the crossed-out wheeled bin shown in Annex II and the chemical symbols Hg, Cd and Pb. |
| **Data provider** | Manufacturer |
| **Data user** | User, public authorities (commission, member states) |
| **Validity period of directive** | 26.9.2006 |
| **Access / format of information provision** | Label, report, information campaign |
| **Access rights and periods** | Public: see Article 20<br>Member states to EC: Collection and recycling quotes |
| **Administration of data(-base)** | Member states, commission |

| **Legal act** | **Batteries and accumulators and waste batteries and accumulators**<br>Regulation (EU) 2023/1542 amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC<br>"Battery Regulation" |
|---|---|
| **Subject matter and goal** | Improve the environmental performance, safety and due diligence; promote a high level of collection and recycling of waste batteries and accumulators. |
| **Scope** | All types of batteries and accumulators |
| **Information category** | Product and company identification, Functional and technical specifications, Material information, Product design related information, Circularity information |
| **Information requirement and granularity** | **Article 13: Labelling and marking of batteries**<br>▪ 5. All batteries containing more than 0,002 % cadmium or more than 0,004 % lead, shall be marked with the chemical symbol for the metal concerned: Cd or Pb.[…]<br>▪ 6. From 18 February 2027, all batteries shall be marked with a QR code as described in Part C of Annex VI. The QR code shall provide access to the following:<br>• (a) for LMT batteries, industrial batteries with a capacity greater than 2kWh and electric vehicles batteries, the battery passport in accordance with Article 77;<br>• (b) for other batteries, the applicable information referred to in paragraphs 1 to 5 of this Article, the declaration of conformity referred to in Article 18, the report referred to in Article 52(3) and the information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f);<br>• (c) for SLI batteries, the amount of cobalt, lead, lithium or nickel recovered from waste and present in active materials in the battery, calculated in accordance with Article 8.<br>**Article 77: Battery passport (for ELV batteries and capacity >2kWh)**<br>2. The battery passport shall contain information relating to the battery model and information specific to the individual battery, including resulting from the use of that battery, as set out in Annex XIII<br>The information in the battery passport shall comprise:<br>▪ (a) information accessible to the general public in accordance with point 1 of Annex XIII;<br>▪ (b) information accessible only to notified bodies, market surveillance authorities and the Commission in accordance with points 2 and 3 of Annex XIII; and<br>▪ (c) information accessible only to any natural or legal person with a legitimate interest in accessing and processing that information for the purposes referred to in points (a) and (b) of the third subparagraph in accordance with points 2 and 4 of Annex XIII. |

| **Legal act** | **Batteries and accumulators and waste batteries and accumulators**<br>Regulation (EU) 2023/1542 amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC<br>"Battery Regulation" |
|---|---|

**ANNEX VI, LABELLING, MARKING AND INFORMATION REQUIREMENTS, Part A: General information on batteries**

Information on the label of a battery shall comprise the following information regarding the battery:

- 1. information identifying the manufacturer in accordance with Article 38(7);
- 2. the battery category and information identifying the battery in accordance with Article 38(6);
- 3. the place of manufacture (geographical location of a battery manufacturing plant);
- 4. the date of manufacture (month and year);
- 5. the weight;
- 6. the capacity;
- 7. the chemistry;
- 8. the hazardous substances present in the battery, other than mercury, cadmium or lead;
- 9. usable extinguishing agent;
- 10. critical raw materials [cobalt, natural graphite, lithium, nickel, chemical compounds of those (ANNEX X)] present in the battery in a concentration of more than 0,1 % weight by weight.

**ANNEX XIII INFORMATION TO BE INCLUDED IN THE BATTERY PASSPORT**

**1. PUBLICLY ACCESSIBLE INFORMATION RELATING TO THE BATTERY MODEL**

A battery passport shall include the following information relating to the battery model, which shall be accessible to the public:

- (a) the information specified in Part A of Annex VI;
- (b) the material composition of the battery, including its chemistry, hazardous substances present in the battery, other than mercury, cadmium or lead, and critical raw materials present in the battery;
- (c) the carbon footprint information referred to in Article 7(1) and (2);
- (d) information on responsible sourcing as indicated in the report on battery due diligence policy referred to in Article 52(3);
- (e) recycled content information as contained in the documentation referred to in Article 8(1);
- (f) the share of renewable content;
- (g) rated capacity (in Ah);
- (h) minimal, nominal and maximum voltage, with temperature ranges when relevant;
- (i) original power capability (in Watts) and limits, with temperature range when relevant;
- (j) expected battery lifetime expressed in cycles, and reference test used;
- (k) capacity threshold for exhaustion (only for electric vehicle batteries);
- (l) temperature range the battery can withstand when not in use (reference test);

| **Legal act** | **Batteries and accumulators and waste batteries and accumulators**<br>Regulation (EU) 2023/1542 amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC<br>"Battery Regulation" |
|---|---|
| | ▪ (m) period for which the commercial warranty for the calendar life applies;<br>▪ (n) initial round trip energy efficiency and at 50 % of cycle-life;<br>▪ (o) internal battery cell and pack resistance;<br>▪ (p) c-rate of relevant cycle-life test.<br>▪ (q) the marking requirements laid down in Article 13(3) and (4);<br>▪ (r) the EU declaration of conformity referred to in Article 18;<br>▪ (s) the information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f).<br><br>**2. INFORMATION RELATING TO THE BATTERY MODEL ACCESSIBLE ONLY TO PERSONS WITH A LEGITIMATE INTEREST AND THE COMMISSION**<br>A battery passport shall include the following information relating to the battery model, which shall be accessible only to persons with a legitimate interest and the Commission:<br>▪ (a) detailed composition, including materials used in the cathode, anode and electrolyte;<br>▪ (b) part numbers for components and contact details of sources for replacement spares;<br>▪ (c) dismantling information, including at least: exploded diagrams of the battery system/pack showing the location of battery cells; disassembly sequences; type and number of fastening techniques to be unlocked; tools required for disassembly; warnings if risk of damaging parts exist; amount of cells used and layout;<br>▪ (d) safety measures.<br><br>**3. INFORMATION ACCESSIBLE ONLY TO NOTIFIED BODIES, MARKET SURVEILLANCE AUTHORITIES AND THE COMMISSION**<br>A battery passport shall include the following information relating to the battery model, which shall be accessible only to notified bodies, market surveillance authorities and the Commission: results of test reports proving compliance with the requirements laid down in this Regulation or any delegated or implementing act adopted pursuant to this Regulation.<br><br>**4. INFORMATION AND DATA RELATING TO AN INDIVIDUAL BATTERY ACCESSIBLE ONLY TO PERSONS WITH A LEGITIMATE INTEREST**<br>A battery passport shall include the following specific information and data relating to an individual battery, which shall be accessible only to persons with a legitimate interest:<br>▪ (a) the values for performance and durability parameters referred to in Article 10(1), when the battery is placed on the market and when it is subject to changes in its status;<br>▪ (b) information on the state of health of the battery pursuant to Article 14; |

| **Legal act** | **Batteries and accumulators and waste batteries and accumulators**<br>Regulation (EU) 2023/1542 amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC<br>"Battery Regulation" |
|---|---|
| | ▪ (c) information on the status of the battery, defined as 'original', 'repurposed', 're-used', 'remanufactured' or 'waste';<br>▪ (d) information and data resulting from its use, including the number of charging and discharging cycles and negative events, such as accidents, as well as periodically recorded information on the operating environmental conditions, including temperature, and on the state of charge |
| **Data provider** | Manufacturer, economic operator placing the battery on the market |
| **Data user** | Customers, end-users, manufacturers, importers and distributors, dealers, repairers, remanufacturers, recyclers, market surveillance, public interest organisations and the Commission |
| **Validity period of directive** | Implementation from february 2024 to February 2027 |
| **Access / format of information provision** | QR code, Labelling, Battery passport |
| **Access rights and periods** | Role based |
| **Administration of data(-base)** | **Article 78 Technical design and operation of the battery passport**<br>(d) if the data included in the battery passport are stored or otherwise processed by operators authorised to act on behalf of the economic operator responsible for the fulfilment of the obligations under Article 77(4) or (7), those operators shall not be allowed to sell, re-use or process such data, in whole or in part, beyond what is necessary for the provision of the relevant storing or processing services; |

| **Legal act** | **End-of-life vehicles**<br>Directive 2000/53/EC and amendment Directive 2018/849<br>"ELV Directive" |
|---|---|
| **Subject matter and goal** | Prevention and reduction of (hazardous) waste by reuse, recycling and recovery of end-of life vehicles and their components; improvement in the environmental performance of all of the economic operators |
| **Scope** | vehicles and end-of life vehicles, including their components and materials |
| **Information category** | dismantling, recovery, recyclability, treatment per vehicle and component;<br>reporting of recycling |

| **Legal act** | **End-of-life vehicles**<br>Directive 2000/53/EC and amendment Directive 2018/849<br>"ELV Directive" |
|---|---|
| **Information requirement and granularity** | ▪ Producers, in concert with material and equipment manufacturers, are urged use component and material coding standards, in particular to facilitate the identification of those components and materials which are suitable for reuse and recovery (**25)**.<br>▪ Provide authorised treatment facilities with all requisite dismantling information, in particular for hazardous materials. […] for each type of new vehicle put on the market **(24)**<br>▪ Information on dismantling, storage and testing of components (**24**)<br>▪ Consumers have to be adequately informed in order to adjust their behaviour and attitudes (**27**)<br>▪ Design of vehicles and their components with a view to their recoverability and recyclability (**19**).<br>**Article 9(1): Reporting and information**<br>▪ Report/data on end-of life vehicles are needed in order to monitor the implementation of the objectives (**26**): report has to contain relevant information on possible changes in the structure of motor vehicle dealing and of the collection, dismantling, shredding, recovery and recycling industries, leading to any distortion of competition between or within Member States.<br>**Article 9(2): Reporting and information**<br>▪ The environmentally sound treatment of end-of life vehicles, in particular the removal of all fluids and dismantling,<br>▪ The development and optimisation of ways to reuse, recycle and recover end-of life vehicles and their components,<br>▪ The progress achieved with regard to recovery and recycling to reduce the waste to be disposed of and to increase the recovery and recycling rates. |
| **Data provider** | Manufacturer (producer) |
| **Data user** | End-users (buyers), commission |
| **Validity period of directive** | 21. April 2002 |
| **Access / format of information provision** | Database, Manual |
| **Access rights and periods** | Dismantling for each type of new vehicle put on the market within six months after the vehicle is put on the market as well as storage and testing information of components to authorised treatment facilities in particular for hazardous materials. Consumers have to be adequately informed in order to adjust their behaviour and attitudes |

| **Legal act** | **End-of-life vehicles**<br>Directive 2000/53/EC and amendment Directive 2018/849<br>"ELV Directive" |
|---|---|
| | Commission: report has to contain relevant information on possible changes in the structure of motor vehicle dealing and of the collection, dismantling, shredding, recovery and recycling industries, |
| **Administration of data(-base)** | n/a |

| **Legal act** | **Waste electrical and electronic equipment** (**WEEE**)<br>Directive 2012/19/EU amendment (EU) 2018/849<br>"WEEE Directive" |
|---|---|
| **Subject matter and goal** | Protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste from electrical and electronic equipment (WEEE) and by improving and reducing overall impacts of resource use and improving the efficiency |
| **Scope** | Each type of EEE put on the market |
| **Information category** | Material, component, product, recycling quotes |
| **Information requirement and granularity** | **ANNEX X: INFORMATION FOR REGISTRATION AND REPORTING to national waste register**<br>**A. Registration:**<br>▪ Name, address, national identification code, European or national tax number of the producer/ authorised representative<br>▪ Category of EEE set out in Annex I or III, as appropriate.<br>▪ Type of EEE (household or other than household equipment).<br>▪ Brand name of EEE.<br>▪ Information on how the producer meets its responsibilities: individual or collective scheme, including information on financial guarantee.<br>▪ Selling technique used (e.g. distance selling).<br>▪ Declaration stating that the information provided is true.<br><br>**ANNEX X B. Reporting (additionally to A.):**<br>▪ Quantity of EEE placed on the national market, by weight<br>▪ Quantity, by weight, of waste of EEE separately collected, recycled (including prepared for re-use), recovered and disposed<br><br>**Article 15: Information provided by producer to treatment facilities**<br>▪ Information on different EEE components and materials<br>▪ location of dangerous substances and mixtures in EEE |

| **Legal act** | **Waste electrical and electronic equipment** (**WEEE**)<br>Directive 2012/19/EU amendment (EU) 2018/849<br>"WEEE Directive" |
|---|---|
| | **Article 8(2): General treatment requirement**<br>Selective treatment for materials and components of WEEE referred to in ANNEX VII incl. polychlorinated biphenyls, mercury, batteries, PCB, plastics containing BFRs, etc. |
| **Data provider** | Manufacturer, EEE producer |
| **Data user** | Preparation for re-use, treatment, recycling facilities |
| **Validity period of directive** | Since 13.08.2012 |
| **Access / format of information provision** | ▪ ANNEX X B. Reporting : (Online-)Register of producers of EEE<br>▪ Article 15: manuals or by means of electronic media (e.g. CD-ROM, online services) |
| **Access rights and periods** | ▪ ANNEX X B. Reporting: Registration of EEE when put on the market<br>▪ Article 15: To be provided one year after EEE placed on the market<br>▪ Public website, Roles: Manufacturer, Provider, User, Disposal, Waste treatment |
| **Administration of data(-base)** | ▪ ANNEX X B. Reporting: Member states in registries (e.g. Stiftung EAR)<br>▪ Article 15: - |

| **Legal act** | **Packaging and packaging waste**<br>Directive 94/62/EC and amendment Directive 2018/852/EC<br>"Packaging directive" |
|---|---|
| **Subject matter and goal** | preventing the production of packaging waste and reusing, recycling and other forms of recovering packaging waste; prevent any impact on the environment |
| **Scope** | Packaging |
| **Information category** | Available return, collection and recovery systems<br>Reuse, Recycling, Recovery, Waste, RoHS, REACH |
| **Information requirement and granularity** | **Article 13: Information for users of packaging and consumers**<br>▪ the return, collection and recovery systems available to them,<br>▪ their role in contributing to reuse, recovery and recycling of packaging and packaging waste,<br>▪ the meaning of markings on packaging existing on the market,<br>▪ the appropriate elements of the management plans for packaging and packaging waste as referred to in Article 14.<br>**Annex III: To be reported by member states and EoL (in tonnage and percentage)**<br>**1. For primary, secondary and tertiary packaging:**<br>▪ quantities, for each broad category of material, of packaging consumed within the country (produced + imported − exported) |

| **Legal act** | **Packaging and packaging waste**<br>Directive 94/62/EC and amendment Directive 2018/852/EC<br>"Packaging directive" |
|---|---|
| | ▪ quantities reused<br>**2. For household and non-household packaging waste**:<br>▪ quantities for each broad category of material, recovered and disposed of within the country (produced + imported − exported)<br>▪ quantities recycled and quantities recovered for each broad category of material<br>**3a. Reporting of reusable packaging**<br><br>The database should provide information on the magnitude, characteristics and evolution of the packaging and packaging waste flows at the level of individual Member States, including information on the toxicity or danger of packaging materials and components used for their manufacture.'; |
| **Data provider** | Manufacturer, Distributor<br>"All economic operators involved to provide competent authorities with reliable data on their sector" |
| **Data user** | Users of packaging and consumers, public authorities (member states), commission |
| **Validity period of directive** | 30.06.1996 |
| **Access / format of information provision** | ▪ To member states database on packaging and packaging waste<br>▪ Member States have to report the data for each year to the Commission<br>▪ User "shall obtain the necessary information" |
| **Access rights and periods** | ▪ Public (article 13)<br>▪ Restricted (ANNEX III) |
| **Administration of data(-base)** | Member states |

| **Legal act** | **Waste framework directive**<br>Directive 2008/98/EC on waste<br>"WFD directive" |
|---|---|
| **Subject matter and goal** | Protection of the environment and human health by preventing or reducing the generation of waste, the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use |
| **Scope** | Waste |
| **Information category** | Information on hazardous substances, Reusability, Recyclability |

| **Legal act** | **Waste framework directive**<br>Directive 2008/98/EC on waste<br>"WFD directive" |
|---|---|
| **Information requirement and granularity** | **Article 7: List of Waste**<br>2. A Member State may consider waste as hazardous waste where, even though it does not appear as such on the list of waste, it displays one or more of the properties listed in Annex III. The Member State shall notify the Commission of any such cases without delay and provide the Commission with all relevant information.<br><br>**Article 8: Extended producer responsibility**<br>1. […] Such measures may include an acceptance of returned products and of the waste that remains after those products have been used, as well as the subsequent management of the waste and financial responsibility for such activities. These measures may include the obligation to provide publicly available information as to the extent to which the product is re-usable and recyclable. |
| **Data provider** | Producer, Member states |
| **Data user** | Market surveillance |
| **Validity period of directive** | 12.12.2008 |
| **Access / format of information provision** | Member states inform European Commission, Website |
| **Access rights and periods** | Public |
| **Administration of data(-base)** | |

### A.1.5 Due diligence legislation

| **Legal act** | **Supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas**<br>Regulation (EU) 2017/821<br>„Conflict Mineral Regulation“ |
|---|---|
| **Subject matter and goal** | Supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas; Human rights, transparency; |
| **Scope** | Minerals or metals containing or consisting of tin, tantalum, tungsten or gold, |
| **Information category** | Name, Type, Material volume, Material origin |
| **Information requirement and granularity** | **Article 4: Management System Obligations**<br>▪ Mineral description, trade name and type.<br>▪ name and address of the supplier<br>▪ Country/mine of origin of the minerals<br>▪ Quantities and dates of extraction [m^3/kg]<br>▪ if available, records of the third-party audit reports of the smelters and refiners, or evidence of conformity with a supply chain due diligence scheme recognised by the Commission pursuant to Article 8;<br>▪ if from conflict area: locations where minerals are consolidated, traded and processed, and taxes, fees and royalties paid |
| **Data provider** | EU importers of 3TG (tin, tungsten, tantalum and gold) in the form of mineral ores, concentrates or processed metals. |
| **Data user** | Public authorities |
| **Validity period of directive** | 1.1.2021 |
| **Access / format of information provision** | Documentation, Audits |
| **Access rights and periods** | Controlled by member states market surveillance |
| **Administration of data(-base)** | Manufacturer |

| **Legal act** | **Corporate Sustainability Due Diligence Directive**<br>Proposal for a Directive on Corporate Sustainability Due Diligence, COM(2022) 71 final, 2022/0051(COD)<br>"CSDD Proposal" |
|---|---|
| **Subject matter and goal** | Obligations for companies regarding actual and potential human rights adverse impacts and environmental adverse impacts, with respect to their own operations, the operations of their subsidiaries, and the value chain operations carried out by entities with whom the company has an established business relationship |
| **Scope** | Companies |
| **Information category** | Due Diligence |
| **Information requirement and granularity** | **Article 10: Monitoring**<br>Member States shall ensure that companies carry out periodic assessments of their own operations and measures, those of their subsidiaries and, where related to the value chains of the company, those of their established business relationships, to monitor the effectiveness of the identification, prevention, mitigation, bringing to an end and minimisation of the extent of human rights and environmental adverse impacts. Such assessments shall be based, where appropriate, on qualitative and quantitative indicators and be carried out at least every 12 months and whenever there are reasonable grounds to believe that significant new risks of the occurrence of those adverse impacts may arise. The due diligence policy shall be updated in accordance with the outcome of those assessments. |
| **Data provider** | Company |
| **Data user** | Public authorities, public |
| **Validity period of directive** | Proposed |
| **Access / format of information provision** | Reports |
| **Access rights and periods** | Report every 12 months, publicly available |
| **Administration of data(-base)** | n/a |

| **Legal act** | **Lieferkettensorgfaltspflichtengesetz [LkSG]** |
|---|---|
| **Subject matter and goal** | CSR improvement, avoidance of violations of human rights, environmental protection |
| **Scope** | General |
| **Information category** | Supply chain actors, Importers |
| **Information requirement and granularity** | ▪ Identification of risks with regard to human rights or environmental protection<br>▪ Measurements taken against identified risks<br>▪ Impact of measurements<br>▪ Conclusions<br>▪ Explanation if no risks or violations could be identified |
| **Data provider** | Manufacturer |
| **Data user** | Market surveillance, User |
| **Validity period of directive** | 1.1.2023 (companies with at least 3.000 employees)<br>1.1.2024 (companies with at least 1.000 employees) |
| **Access / format of information provision** | Report |
| **Access rights and periods** | Public report, published four months after the end of the business year, Available for a period of seven years |
| **Administration of data(-base)** | Manufacturer |

### A.1.6 Mandatory markings

https://legacy.export.gov/article?id=European-Union-Marking-Labeling-Requirements

| Name / Regulation | Country | Area | Goal | Label |
|---|---|---|---|---|
| CE | EU | General | Conformity |  |
| Ecodesign Regulation (product specific) *Logos specified in standard ISO 11469* | EU | Plastic components | Recycling |   |
| Ecodesign Regulation (product specific) *Cadmium logo* | EU | Hazardous substances | Recycling |   |
| WEEE Directive *Crossed-out wheeled bin* | EU | EEE | Recycling |  |
| Dangerous Goods Transport Directive *Battery shipping label* | Global | Batteries | Safety |  |
| CLP Regulation *Hazard pictograms* | Global | Hazardous substances | Safety |  |

## A.2 Part A & B: Voluntary approaches and concepts

**Table 1: Overview of voluntary approaches with information requirements**

| Category | Description |
|---|---|
| Label | ▪ **Electronic: TCO**, TÜV Rheinland Green Product Mark (Laptops), Energy star, EPEAT, Nordic Ecolabel<br>▪ Textile: OEKO-TEX® (z.B. ECO PASSPORT), bluesign® product, IVN, GOTS, GRS, UN Global Compact, Grüner Knopf, etc.<br>▪ **Consumer Products: Siegelklarheit.de**, Fairtrade, Blauer Engel, EU Ecolabel |
| Initiatives, concepts | Product group specific<br>▪ **Electronics: KeepElectronics**<br>• **Textile: circularity.ID,** GTS, Tex.IT, Euratex<br>▪ Battery: Battery Passport, Sprint4Green<br>▪ Construction: Material Passport, BAMB/BIM, Madaster<br>▪ **Automotive: IMDS**, Catena-X, Caruso Dataplace, CEWI<br>▪ Packaging / Plastics: HolyGrail, R-cycle<br>Cross-sectorial<br>▪ **Concepts: PCDS,** Cradle-to-cradle e.V. (Digital Nameplate 4.0)<br>▪ Dataspaces: IMDS, Gaya-X<br>▪ **Content service provider/Platforms: I4R-platform, IDIS**, iPoint SustainHub, atrify,<br>▪ **Smartphone Apps: CodeCheck, Scan4Chem, ToxFox, Yuka** |
| Norms, standards | Substance and material related<br>▪ **IPC 1752 Materials Declaration Standard**<br>▪ **DIN EN IEC 62474 „Material declaration“**<br>▪ **DIN EN 50581 Standard for RoHS2 technical documentation**<br>Social responsibility and due dilligance related<br>▪ **OECD Guidelines for Multinational Enterprises**<br>▪ **UN Guiding Principles on Business and Human Rights (UNGP)**<br>▪ ISO 26000 Corporate social responsibility standard<br>Information communication / DPP related<br>▪ **IEC TS 61406 / DIN SPEC 91406 „Digital Nameplate 4.0” -** Automatic identification of physical objects and information on physical objects in IT systems<br>▪ ISO/AWI 59040 Circular Economy — Product Circularity Data Sheet<br>▪ DIN 77005 Lifecycle record of technical objects<br>▪ **ECLASS (distribution)**<br>Environmental related<br>▪ **Environmental product declaration (EPD)**<br>▪ **Product environmental footprint (PEF)**<br>▪ **ISO 14000 Environmental Management**<br>Circularity related<br>▪ **TCO certified**<br>▪ **Circular transition indicator (WBCSD)**<br>▪ **Circularity Indicator MCI** |

| Category | Description |
|---|---|
| | ▪ **Product circularity indicator (KU Leuven)**<br>▪ **EN4555X (45552 durability, reliability; 45554 repair, reuse, upgrade; 45555 recycle and recover)**<br>Ongoing activities and working groups<br>▪ ISO / TC 324 Sharing Economy (Japan & USA)<br>▪ ISO / TC 324 Circular Economy<br>▪ Normungsroadmap Circular Economy AG7 Digitalisierung, Geschäftsmodelle, Management (AG1 ICT, AG5 textiles)<br>▪ ISO TC38 / WG 35 Textilien |
| Projects | ▪ Kurzstudie zum Digitalen Produktpass im Rahmen der Digitalagenda des BMU<br>▪ Interoperable Informationsmodelle in Industrie 4.0 (PAiCE Studie)<br>▪ FKZ 3718 12 306 0: Umweltdaten in Industrie 4.0<br>▪ FKZ 3718 16 314 0: Digitalisierung von Märkten und Lebensstilen<br>▪ FKZ 3720 33 303 0: Dialoge zur Ausschleusung besorgniserregender Stoffe aus dem Wertstoffkreislauf<br>▪ FKZ 033R083A: CIRTEX - Intelligente Produkt-ID basierte Altkleidersortierung für eine Kreislaufwirtschaft<br>▪ FKZ 033R228A: DiTex - Digitales Tracking-ID für die Kreislaufführung von B2B Textilien |

**Overview of selected approaches and initiatives**

| Year | Context | Name (full) | Status | Area | Goal (SKPIs) | Scope (stakeholder) | Information requirements (categories) |
|---|---|---|---|---|---|---|---|
| 2019 | Research | Keep Electronics | Pilot phase | Electronics | Durability, Reparability, Energy Efficiency, Social Conditions, Recyclability | Product manufacturer, Certification bodies, User, Remanufacturer, Recycler | Tech Specs, Product History, Material, Social Impact, Envir. Impact, Usage, Support, End of Use, Certifications |
| 2019 | Industry | circularity.ID | In use | Textile | Circular Economy | Product manufacturer, User, Sorting Company, Recycler, Supplier | Immutable and mutable product details, Assembly, Material, Components, Production |

| Year | Context | Name (full) | Status | Area | Goal (SKPIs) | Scope (stakeholder) | Information requirements (categories) |
|---|---|---|---|---|---|---|---|
| 2018 | Policy | PCDS | Pilot phase | Consumer Products | Circular Economy | Raw material producer and importer, Product manufacturer, Distributor and retailer, User, Recycler | Product (general), Manufacturer (general), Composition, Design, Maintanance, Reparability, Reuse |
| 2016 | Industry | Digimarc | In use | Packaging | Recyclability, Circular Economy | Product developer and designer, Product manufacturer, Distributor and retailer, User, Recycler | Instructions for use, Material, Price |
| 2012 | Research | SustainHub | In use | Electronics, Automotive | Compliance | Product manufacturer, User | Conflict minerals, Material compliance, Supply chain survey, Product chem risk |
| 2014 | Research | myEcoCost | In use | Data infrastructure | Transparency | N.A. | N.A. |
| 2020 | Research | Digital Product Pass (trustrace) | Started | Consumer Products | Sustainability | Product manufacturer, Certification bodies, User, Remanufacturer, Recycler | N.A. |
| 2020 | Industry | Resources Passport | Unknown | Consumer Products | Circularity, Transparency | Product manufacturer, Certification bodies, User, Remanufacturer, Recycler | Composition, Origin, Volumes, Quality, Deconstructabilty etc. |

| Year | Context | Name (full) | Status | Area | Goal (SKPIs) | Scope (stakeholder) | Information requirements (categories) |
|---|---|---|---|---|---|---|---|
| 2005 | Research/Label | Cradle2Cradle | In use | Consumer Products | Environmental and social assessment | User, Product manufacturer | Material health, Material usage, Material reutilization, Renewable energy, Water consumption, Social Impact, Pollution, Chemicals, Management, Material production and manufacturing process |
| | Policy | Gaya X | Started | Data infrastructure | Standardization, Interoperability | Companies | N.A. |
| 2015 | Research | International Data Space | Started | Data infrastructure | Data exchange, Business models | N.A. | N.A. |

### A.2.1 Overview of DPP-relevant voluntary approach

In total, 16 labels, 28 initiatives and concepts, 26 norms and standards and 7 projects were screened. The approaches that were analysed in more detail and used as references or examples throughout the chapters of this study are highlighted in bold in the table below.

**Table 1: Overview of voluntary approaches with information requirements**

| Category | Description |
|---|---|
| Labels | ▪ **Electronic: TCO Certified**, TÜV Rheinland Green Product Mark (Laptops), Energy star, EPEAT, Nordic Ecolabel<br>▪ **Textile**: **OEKO-TEX®** (z.B. ECO PASSPORT), bluesign® product, IVN, GOTS, GRS, UN Global Compact, Grüner Knopf, etc.<br>▪ **Consumer Products: Siegelklarheit.de**, Fairtrade, Blauer Engel, EU Ecolabel |
| Initiatives, concepts | Product group-specific<br>▪ **Electronics: KeepElectronics**<br>▪ **Textile: circularity.ID,** GTS, Tex.IT, Euratex<br>▪ Battery: Battery Passport, Sprint4Green<br>▪ Construction: Material Passport, BAMB/BIM, Madaster<br>▪ **Automotive: IMDS**, **Catena-X**, Caruso Dataplace, CEWI<br>▪ Packaging / Plastics: HolyGrail, R-Cycle<br>Cross-sectorial<br>▪ **Concepts: PCDS,** Cradle to Cradle – Wiege zur Wiege e.V. (Digital Nameplate 4.0)<br>▪ Dataspaces: IMDS, Gaya-X<br>▪ **Content service provider/Platforms: I4R-platform, IDMS**, iPoint SustainHub, atrify,<br>▪ **Smartphone Apps: CodeCheck, Scan4Chem, ToxFox, Yuka** |
| Norms, standards | Substance and material related<br>▪ IPC 1752 Materials Declaration Standard<br>▪ **DIN EN IEC 62474 „Material declaration“**<br>▪ DIN EN 50581 Standard for RoHS2 technical documentation<br>Social responsibility and due diligence related<br>▪ **OECD Guidelines for Multinational Enterprises**<br>▪ **UN Guiding Principles on Business and Human Rights (UNGP)**<br>▪ ISO 26000 Corporate social responsibility standard<br>Information communication / DPP related<br>▪ **IEC TS 61406 / DIN SPEC 91406 „Digital Nameplate 4.0” -** Automatic identification of physical objects and information on physical objects in IT systems<br>▪ ISO/AWI 59040 Circular Economy — Product Circularity Data Sheet<br>▪ DIN 77005 Lifecycle record of technical objects<br>▪ **ECLASS** |

| Category | Description |
|---|---|
| | Environmental related<br>▪ Environmental Product Declaration (EPD)<br>▪ **Product Environmental Footprint (PEF)**<br>▪ **ISO 14000 Environmental Management**<br>Circularity related<br>▪ **Circular Transition Indicator**<br>▪ **Circularity Indicator (MCI)**<br>▪ **Product Circularity Indicator (PCI)**<br>▪ **EN4555X**<br>Ongoing activities and working groups<br>▪ ISO / TC 324 Sharing Economy (Japan & USA)<br>▪ ISO / TC 324 Circular Economy<br>▪ Normungsroadmap Circular Economy AG7 Digitalisierung, Geschäftsmodelle, Management (AG1 ICT, AG5 textiles)<br>ISO TC38 / WG 35 Textilien |
| Projects | ▪ Kurzstudie zum Digitalen Produktpass im Rahmen der Digitalagenda des BMU<br>▪ Interoperable Informationsmodelle in Industrie 4.0 (PAiCE Studie)<br>▪ FKZ 3718 12 306 0: Umweltdaten in Industrie 4.0<br>▪ FKZ 3718 16 314 0: Digitalisierung von Märkten und Lebensstilen<br>▪ FKZ 3720 33 303 0: Dialoge zur Ausschleusung besorgniserregender Stoffe aus dem Wertstoffkreislauf<br>▪ FKZ 033R083A: CIRTEX - Intelligente Produkt-ID basierte Altkleidersortierung für eine Kreislaufwirtschaft<br>▪ FKZ 033R228A: DiTex - Digitales Tracking-ID für die Kreislaufführung von B2B Textilien |

### A.2.2 Method for clustering label criteria

**Information requirements from voluntary approaches (right) clustered into research framework categories (left)**

| Information categories | Information requirements |
|---|---|
| Material composition | Material composition |
| | Conflict minerals |
| | Dangerous substances |
| | prohibition of plasticizer |
| | Chemicals |
| | Minimise virgin material |
| Energy consumption | Energy consumption |
| | Energy efficiency |
| | Maximum energy usage |
| | Minimum energy usage during stand-by |
| | Low water and energy usage |
| Social indicators | Social aspects |
| | Social production |
| | No child labour |
| | No animal tests |
| | Workers rights |
| | Ethical economize |
| | Social impact |
| | No synthetic material |
| | Biological material |
| | Percentage of usage of recycling materials |
| | Human rights |
| | Working condition |
| | Corruption |
| | Social ecological and economical standards |

| Information categories | Information requirements |
|---|---|
| | impacts on human and workers rights and the environment |
| Recycling information | Recycling |
| | Recycle |
| Environmental impact | Environmental impact |
| | Pollution |
| | Carbon Footprint |
| | Sustainable forestment |
| | Water |
| | Pollution |
| | Environmental management |
| | Biological production |
| | Energy water usage |
| | Environmental friendly |
| | Social ecological and economical standards |
| | Against landfill/pollution |
| | Effective use of resources |
| | impacts on human and workers rights and the environment |
| Disposal instructions | Disposal instructions |
| | Return information |
| | EoL |
| Functional aspects | Cleaning information |
| | Functional aspects |
| | Upgradability |
| | Longevity |
| | Durability |
| | Reusability |
| | Products have to turn off automatically |

| Information categories | Information requirements |
|---|---|
| | Quality |
| | Maintainability |
| | Design |
| | Using |
| | Reuse |
| Repair information | Spare part availability |
| | Repair information |
| | Reparability |
| Manufacturer contact | Manufacturer contact |
| Technical information | Noise level |
| | Battery information |
| | Technical specifications |
| | Radiation |
| | Fibre making |
| | Spinning |
| | Finishing |
| | Assembling |
| | Traceability |
| Return information | Collection |

### A.2.3 Material declaration strategies

In 2014 the **ZVEI "Leitfaden Materialdeklarationen innerhalb der Lieferkette"** specifies three potential stretegies of material disclosure. The technical documentation required to establish legal conformity is contained in the harmonized standard EN 50581: 2012 'Technical documentation for the assessment of electrical and electronic devices with regard to the restriction of hazardous substances'. [ZVEI 2014]

**Level 1** "minimum approach" A supplier's declaration or contractual agreement confirms that the concentrations of the defined substances contained in the material, component or assembly do not exceed the maximum permitted values.

**Level 2** Material declaration based on a list of substances: e.g. in the IEC 62474 database 'Declarable substances and groups of substances', identifies all substances on the list with an indication of their amount or proportion if they are in the product.

**Level 3** demand specific material declaration incl. weight like Full Material Declaration (FMD): no standard definition exist. Materials as well as their depth of declaration are individually to specify and not generalisable.

Every strategy comes with benefits and risks or efforts which can be clustered into:

- IP protection – risks of disclosing critical information in an FMD are low, as relevant substances can be declared anonym, except restricted, prohibited or declarable substances
- Effort for declaration – is low for level 1 and 2. The effort to maintain a FMD in particular for complex parts or products is high.
- Data availability – very low on the level of complex parts and therefore a FMD can't be maintained. In the optimal case, the precious supplier provides all necessary declaration for a FMD at the complex product.
- Assessment of new substances obligations – FMD allows for an assessment when substance list will be updated.

In IEC-62474 and similar IPC 1752, necessary data point follow the requirements from lists of RoHS substance restrictions, REACH Candidate List SVHC, REACH Substance Restrictions and RoHS Exemptions, which include, if applicable:

- ID, substance group, specific substance, substance clarification, Chemical Abstracts Services (CAS) number, common synonyms
- Typical EEE applications / uses, basis for including, description of basis (specific regulatory citation or specific market demand)
- Reportable application(s), reporting threshold level in product (unless otherwise specified), reporting requirement (whether mandatory or optional), mass information requirements
- First added, last revised, comments / footnotes

Based on the similar minimum-maxium material declaration principle, the **Proactive Alliance** evualtes different strategies and existing standards for substance and material reporting. The alliance aims to provide recommendations and strategies for "a cross sectoral harmonization on

how to report on Substances in Articles along the supply chain on a global level". It is represented by global stakeholders from 12 sectors including automotive, chemicals, electrical and electronic, textiles as well as research and software developers. In 2020 a discussion paper has been published with technical recommendations.

The alliace provides an overview with options and recommendations usable for each sectors to develop their own sectoral **Substances Reporting List** (SRL) to facilitate the "Substances in Articles" reporting in their supply chain (**Table 2**). The outcome of the discussions of the proactive alliance are recomndations on the right side of the table with a positive (+) recommendation, neutral (0) to be considered in spacific cases or no (-) recommendation. The recommendations can be seen decleration options and discussion basis wihtin the DPP developments.

**Table 2: Options and recommendations to determine the Substances Reporting List [Pro-active Alliance 2021]**

| Criterion | Option | Description | Rec. |
|---|---|---|---|
| 1. Definition of the reporting requirements | a: Hazard based requirements | Only those substances that fulfill the criterion of being "hazardous substances"[1] are included (refers to the respective triggers described in criterion 2a-d). | + |
| | b: other requirements | Substances are added because of other reporting requirements (e.g. rare earth, conflict minerals, recycling, responsible/sustainable sourcing, etc.) | 0 |
| 2. Definition of the trigger for substance selection/addition/ inclusion | a: Legal approach | Is the substance regulated[2] globally/regionally (à4) by a governmental agency or authority as a "hazardous substance" [1]? E.g., EU REACH Candidate list (SVHC), California Prop65, China REACH, EU RoHS & China RoHS. | + |
| | b: Proactive legal approach | Is the substance projected to be regulated[3] globally/regionally (à4) by a governmental agency or authority as a "hazardous substance" [5]? | + |
| | c: Risk approach | Is the substance associated with a hazard[4] to human health or the environment, and could its presence in a material or part in an assembly create a significant risk[5] to human health or the environment? | + |
| | d: Hazard approach | Is the substance associated with a hazard[4] to human health or the environment (without currently being covered by 2a-c)? | 0 |
| | e: Reputation approach | Is the substance not "hazardous" but associated with a significant public discussion which might endanger a company/sector reputation (applicable only if 1b selected) | 0 |

| | | | |
|---|---|---|---|
| 3. Definition of the threshold | a: Threshold by law | Threshold levels will be based on the global/regional levels required by regulation. The same substance could require different obligations (e.g. thresholds) àMultiple entries/parameters per substance (à4) | + |
| | b: Threshold by own/external data | Threshold levels will be reasonably required by scientific evaluation of own/external data. The same substance could have different requirements (e.g. thresholds) à Multiple entries/parameters per substance (à4) | 0 |
| 4. geographic scope of the jurisdiction | a: Global scope (Best in Class) | If a substance is regulated differently in individual regions it results in one SRL entry following the most stringent requirement that is globally applicable. | + |
| | b: Regional scope | If a substance is regulated differently in individual regions, it results in several SRL entries for each individual requirement. | - |

The alliance further states the need for a harmonised “Material Reporting Standard” compatible with the Full Material Declaration (FMD) that is intended be able to handle all types of information levels, support data collection for conformity along all industries, refer to unique identifiers (e.g. substance lists/CAS numbers) and needs to be future-proof. Industrial material reporting standards to be considered for harmonisation include IPC 1752A and B, IEC-62474 and other (proprietary) formats and tools like the IMDS or chemSHERPA. The IPC 1752A and IEC-62474-2 are mostly aligned towards interoperability and a translator tool available. Revised IPC 1752B supports ECHA SCIP reporting and new automotive requirements.

### A.2.4 TCO criteria

The TCO certified, generation 9 criteria compises a comprehensive set of information requierements clustered into 8 main categories, relevant for product and manufacturing process certification.

**Table 3: „TCO certified generation 9" product and manufacturing process criteria[TCO criteria]**

| Category | Information requirement |
|---|---|
| Product and sustainability information | Information to end users: Users must be given access to information about TCO Certified and what the certification includes.<br>Product specification: Product specifications must be provided and conform to the actual design of the product.<br>Sustainable performance indicators: More than 40+ sustainable performance indicators are evaluated including data on recycled materials, replaceable components and PCF availabilty. |
| Socially responsible manufacturing | Supply chain responsibility: Code of conduct compliance and corrective actions independently verified, covering labor and health & safety laws in the country of manufacture, ILO's core conventions and United Nations Convention on the Rights of the Child.<br>Supply chain transparency: Major sub-suppliers must be declared. The brand owner must appoint a Senior Management Representative (SMR) with the authority to ensure that certified products meet criteria on socially responsible manufacturing.<br>Anti-bribery management system: The brand owner must have a anti-bribery management system that meets the requirements of ISO 37001.<br>Responsibly sourced minerals: Independent verification of due diligence all the way to the source of the minerals.<br>Process chemicals management: Process chemicals must be independently assessed as safer before being used. |
| Environmentally responsible manufacturing | Environmental management system: Final assembly factories must meet must be certified in accordance with ISO 14001.<br>Energy efficiency indicators: Energy efficiency in manufacturing must be reported annually.<br>Energy management system: Final assembly factories must be certified in accordance with ISO 50001.<br>Post-consumer recycled content: Percentage of post-consumer recycled content and renewable materials must be declared.<br>Product carbon footprint: The method for determining the product's carbon footprint is evaluated. |
| User health and safety* | Electrical safety: Electrical insulation and other arrangements must be in place to prevent the user from touching live components.<br>SAR measurements: Reduced SAR values to minimize electromagnetic energy absorption into human tissue.<br>Acoustic noise: Limited acoustic noise levels for user comfort.<br>Acoustic impulse test: Protection against high sound levels and sound spikes. |

| Category | Information requirement |
|---|---|
| | Alternating electric and magnetic fields: Reduction of electromagnetic fields.<br>Vertical tilt and height: It must be possible to tilt the computer display.<br>Individual adjustment and adaptation: Headsets must be adjustable and adaptable for user comfort. |
| Reduction of hazardous substances* | Heavy metals: The product must not contain cadmium, mercury, lead and hexavalent chromium.<br>Halogens: The use of halogens is restricted.<br>Non-halogenated substances: Substances must be independently assessed as safer alternatives before use.<br>Plasticizers: Substances must be independently assessed as safer alternatives before use.<br>Hazardous substances in product packaging: Packaging materials must not contain lead, cadmium, mercury, hexavalent chromium or organically bound halogens. |
| Product lifetime extension* | Product warranty: At least one year's product warranty must be included. The brand owner is incentivized to offer longer warranty periods.<br>Replaceable components: Key replacement parts and service manuals must be available.<br>Standardized connectors: The product must have standardized connectors for charging and data transfer.<br>Product durability: The product must be durable and withstand drop tests, and high and low temperatures.<br>Battery longevity and replaceability: The battery must maintain good quality through many charging cycles and be replaceable.<br>Battery information and protection: Software that prolong battery life and monitor battery health must be included.<br>Secure data removal: Software that removes data from the product must be available, free of charge.<br>Standardized external power supply compatibility: The product must have standardized connectors for wired and wireless charging.<br>Cable flexing: Cables must withstand pull and flex tests without breaking. |
| Product performance* | Energy efficiency: The product must be energy efficient and meet the requirements of Energy Star® or equivalent.<br>Energy efficiency — external power supply: The external power supply must meet at least the International Efficiency Protocol requirement for level VI.<br>Display resolution, colour, luminance, contrast: The product must meet a number of criteria on image quality.<br>Keyboard gloss: The keyboard must not reflect ambient light in a way that influences visual comfort negatively.<br>Easily accessible connectors: At least one USB port must be placed on the front of the desktop computer.<br>Sound quality test, volume control: Information on the sound quality of a headset is collected. The volume must be possible to control in an efficient way. |

| Category | Information requirement |
|---|---|
| Material recovery | Product packaging: Non-reusable packaging materials must be easily separable.<br>E-waste management: The brand owner must declare which take-back schemes and recycling facilities they use today.<br>Material coding of plastics: Plastic parts of >25 grams must be material coded. |

### ECLASS attributes

Example smartphone:

https://www.eclass.eu/en/standard/search-in-eclass.html?tx_eclasssearch_ecsearch%5Baction%5D=show&tx_eclasssearch_ecsearch%5Bcontroller%5D=Release&tx_eclasssearch_ecsearch%5Bdischarge%5D=0&tx_eclasssearch_ecsearch%5Bid%5D=19060302&tx_eclasssearch_ecsearch%5Blanguage%5D=2&tx_eclasssearch_ecsearch%5Bversion%5D=12.0&cHash=062267d9b53740f741c6eed86e7d39e4

| Attribute (english) | Attribut (german) |
|---|---|
| 1. Brand<br>2. Manufacturer product description<br>3. Manufacturer name<br>4. GTIN<br>5. product article number of manufacturer<br>6. URI of the product<br>7. Product type<br>8. URI of manufacturer<br>9. GLN of manufacturer<br>10. Manufacturer product root<br>11. Manufacturer product order suffix<br>12. Manufacturer product designation<br>13. Manufacturer product family<br>14. Product check date according to RoHS<br>15. Werteliste RoHS attention of conformity<br>16. number of batteries/accumulators<br>17. Werteliste Batteries included<br>18. Werteliste Use of customs tariff number<br>19. Werteliste Type of customs tariff number<br>20. HS-Code of the WCO<br>21. Polystyrene weight portion of the individual packaging<br>22. Cardboard weight portion of the individual packaging<br>23. Weight of the individual packaging | 1. Marke<br>2. Herstellerproduktbeschreibung<br>3. Herstellername<br>4. GTIN<br>5. Herstellerartikelnummer<br>6. URI des Produkts<br>7. Herstellerprodukttyp<br>8. URI des Herstellers<br>9. GLN des Herstellers<br>10. Herstellerproduktstamm<br>11. Herstellerproduktbestellzusatz<br>12. Herstellerproduktbezeichnung<br>13. Herstellerproduktfamilie<br>14. Produkt überprüft nach RoHS am<br>15. Werteliste RoHS Nachweis der Konformität<br>16. Anzahl der Batterien/Akkus<br>17. Werteliste Batterien im Lieferumfang enthalten<br>18. Werteliste Verwendung der Zolltarifnummer<br>19. Werteliste Typ der Zolltarifnummer<br>20. HS-Code der WCO<br>21. Gewichtsanteil Styropor der Artikeleinzelverpackung<br>22. Gewichtsanteil Pappe der Artikeleinzelverpackung<br>23. Gewicht der Artikeleinzelverpackung |

| Attribute (english) | Attribut (german) |
|---|---|
| 24. address of additional link<br>25. type of device (WEEE)<br>26. registration number (WEEE)<br>27. Werteliste WEEE labeling present<br>28. net weight to record marketed quantities (WEEE)<br>29. Werteliste Designation of battery<br>30. Net weight<br>31. Customs tariff number<br>32. customs tariff number (TARIC)<br>33. name of supplier<br>34. product article number of supplier<br>35. Supplier product description<br>36. Werteliste certificate/approval<br>37. Werteliste type of protection<br>38. Supplier product designation<br>39. Werteliste Explosion protection zone<br>40. product identifier<br>41. GLN of supplier<br>42. Werteliste Category<br>43. Supplier product root<br>44. Supplier product family<br>45. Supplier product type<br>46. Supplier product order suffix<br>47. Foil weight portion of the individual packaging | 24. zusätzlicher Online-Verweis<br>25. Art des Geräts (WEEE)<br>26. Registrierungsnummer (WEEE)<br>27. Werteliste Kennzeichnung (WEEE) vorhanden<br>28. Nettogewicht zur Erfassung in Verkehr gebrachter Mengen (WEEE)<br>29. Werteliste Benennung der Batterie<br>30. Nettogewicht<br>31. Zolltarifnummer<br>32. Zolltarifnummer (TARIC)<br>33. Lieferantenname<br>34. Lieferantenartikelnummer<br>35. Lieferantenproduktbeschreibung<br>36. Werteliste Zertifikat/Zulassung<br>37. Werteliste Zündschutzart<br>38. Lieferantenproduktbezeichnung<br>39. Werteliste Explosionsschutz Zone<br>40. Produktidentifikator<br>41. GLN des Lieferanten<br>42. Werteliste Kategorie<br>43. Lieferantenproduktstamm<br>44. Lieferantenproduktfamilie<br>45. Lieferantenprodukttyp<br>46. Lieferantenproduktbestellzusatz<br>47. Gewichtsanteil Folie der Artikeleinzelverpackung |

## A.3 Part C

### A.3.1 Workshop Slides Expert Workshop


(source: TU Berlin, Circular Fashion 2022)

## Operating Project Team

Project duration: **29 month**, 04/2021 – 08/2023
Product groups: **textile, electronic,** batteries, automotive, packaging, plastics

**TU Berlin**
Coordination, informational WPs
product group: electronic


Melanie Jäger-Erben


Eduard Wagner


Erik Poppe

**circular.fashion**
Front-End dev., technical WPs
Product group: textil


Ina Budde


Diana Baumgärtel


Mario Malzacher

**Evolution Rechtsanwälte**
Legal consultation towards
digitalisation and product rights


Anna-Lena Hoffmann

Product Information 4.0

(source: TU Berlin, Circular Fashion 2022)

# Agenda

**Check-in & introduction round**

**Project overview & workshop introduction**

- Project context: brief overview on motivation, goals, project & workshop goals
- Intro to aspects of Digital Product Passports

**Interactive workshop**

- Evaluation of the technical realisation of Digital Product Passports
- Identification of barriers and pitfalls, as well as possible solutions and opportunities

(source: TU Berlin, Circular Fashion 2022)

# Consent to processing and storing workshop data

**Thank you for participating in this study. By leaving information in the documents of this workshop (Miro board), you are giving your consent and approval for the following:**

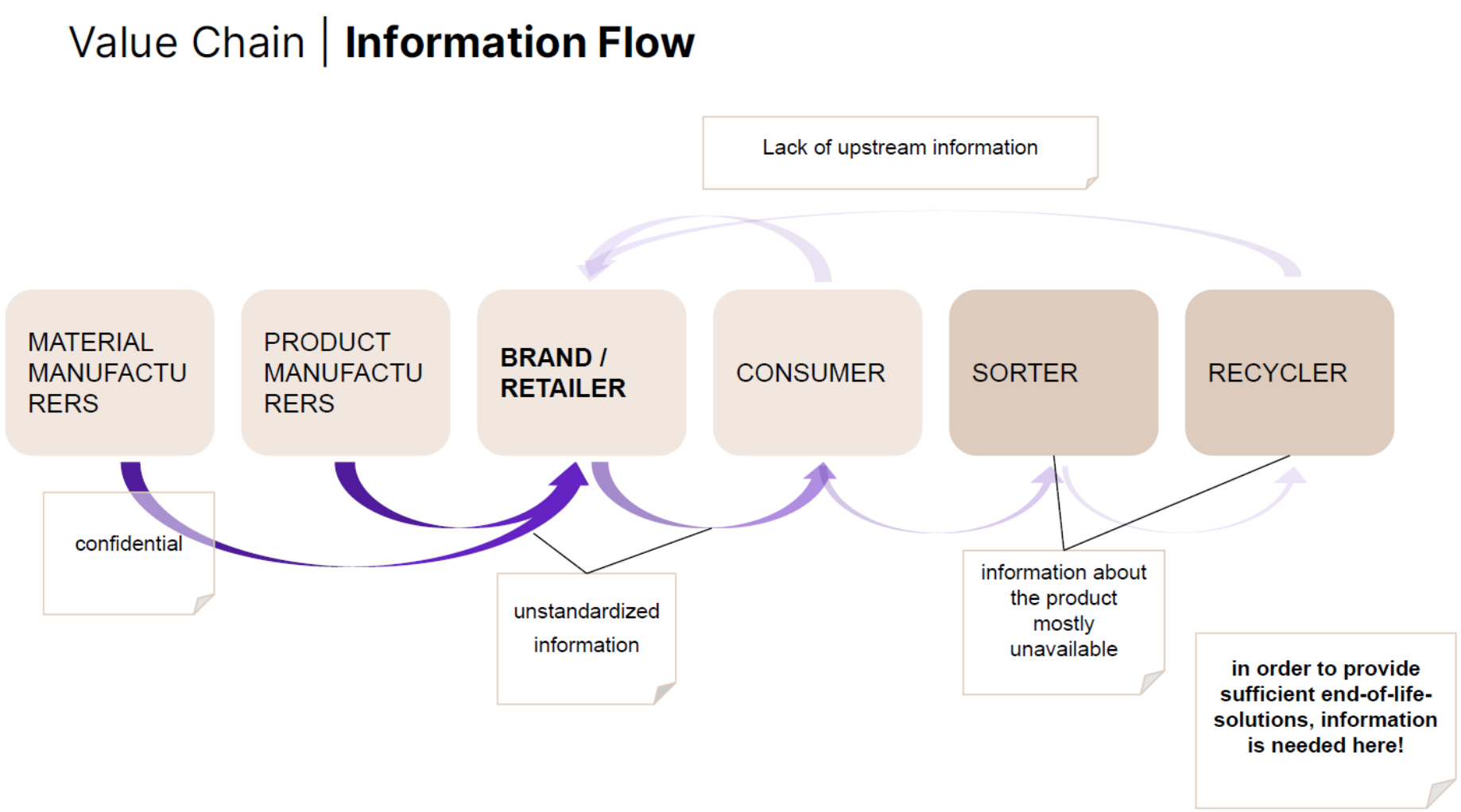
- collection and processing of the data you share shall be made through electronic data carriers and/or paper forms and processed by members of the circular.fashion and TU Berlin research team.
- this collection and processing of the data you share will only be carried out for the purposes of the Product Information 4.0 project.
- the results can be communicated or published in electronic and/or paper reports and articles, both within the Product Information 4.0 project and in the public domain
- your consent for collecting, processing and storing the data you share may be revoked at any time without providing reasons, by sending an email to team@circular.fashion

(source: TU Berlin, Circular Fashion 2022)

# Project Overview

Product Information 4.0

(source: TU Berlin, Circular Fashion 2022)




(source: Circular Fashion 2022)

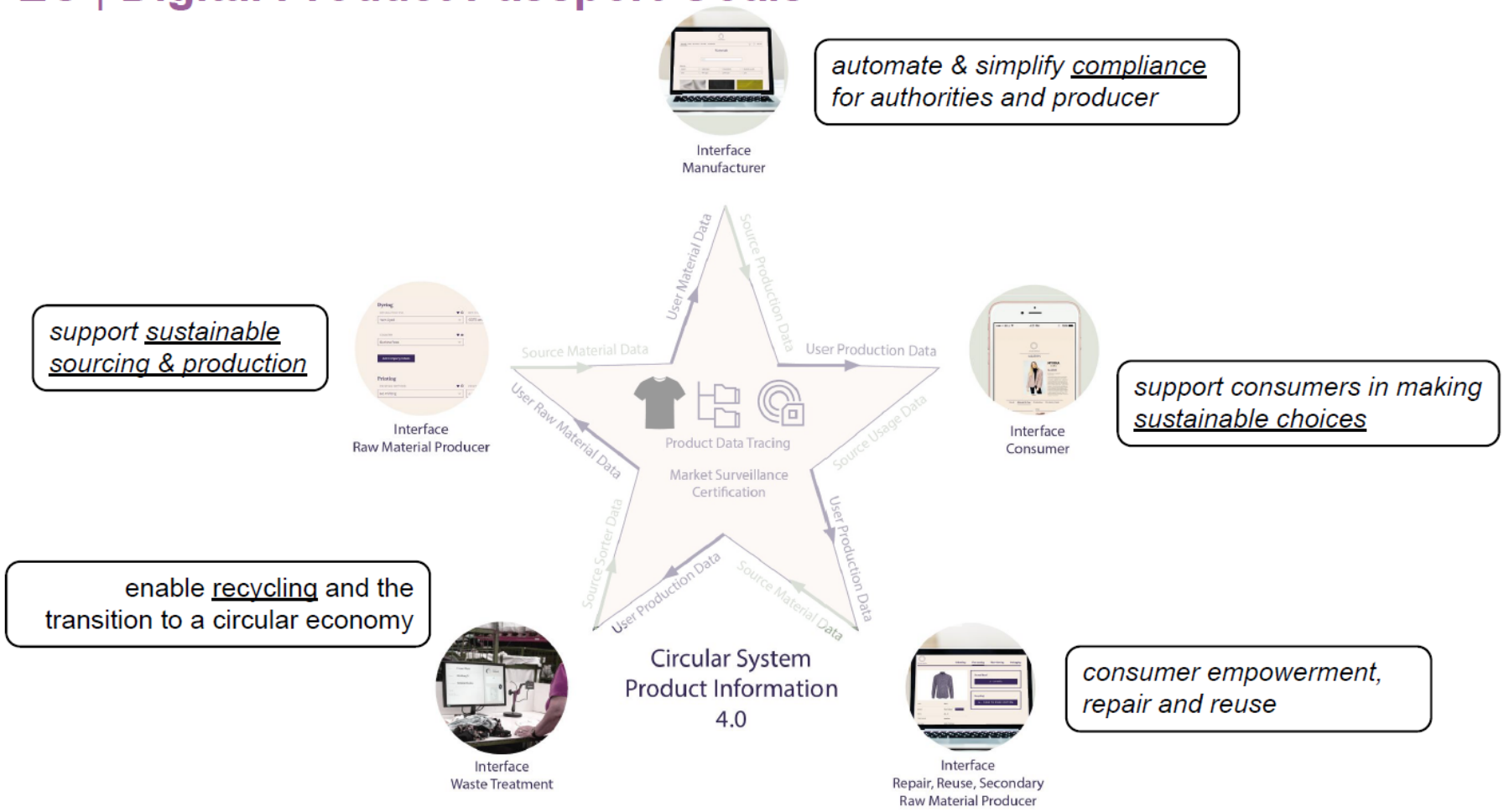
# EU | Green Deal & Sustainable Product Initiative

"[...] the following measures will be considered [...]establishing EU rules for **setting requirements on mandatory sustainability labelling and/or disclosure of information to market actors along value chains** in the form of a digital product passport."

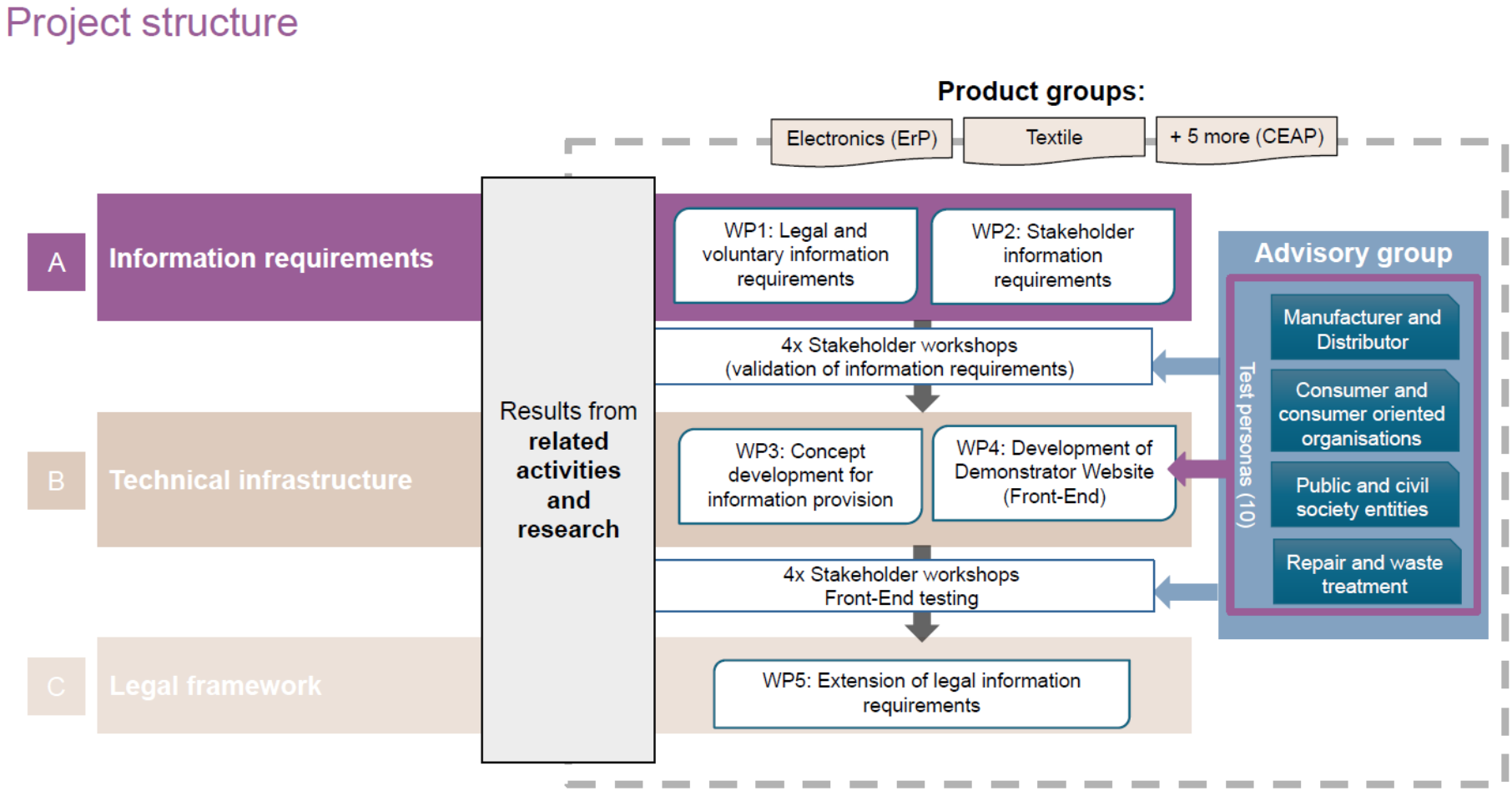
Digital Product Passport
*Prototype envisioned by 2024*

"This will enable the setting at EU level of appropriate minimum sustainability and/or information requirements for specific groups of products, [...] such as electronics, ICT and textiles [...]."

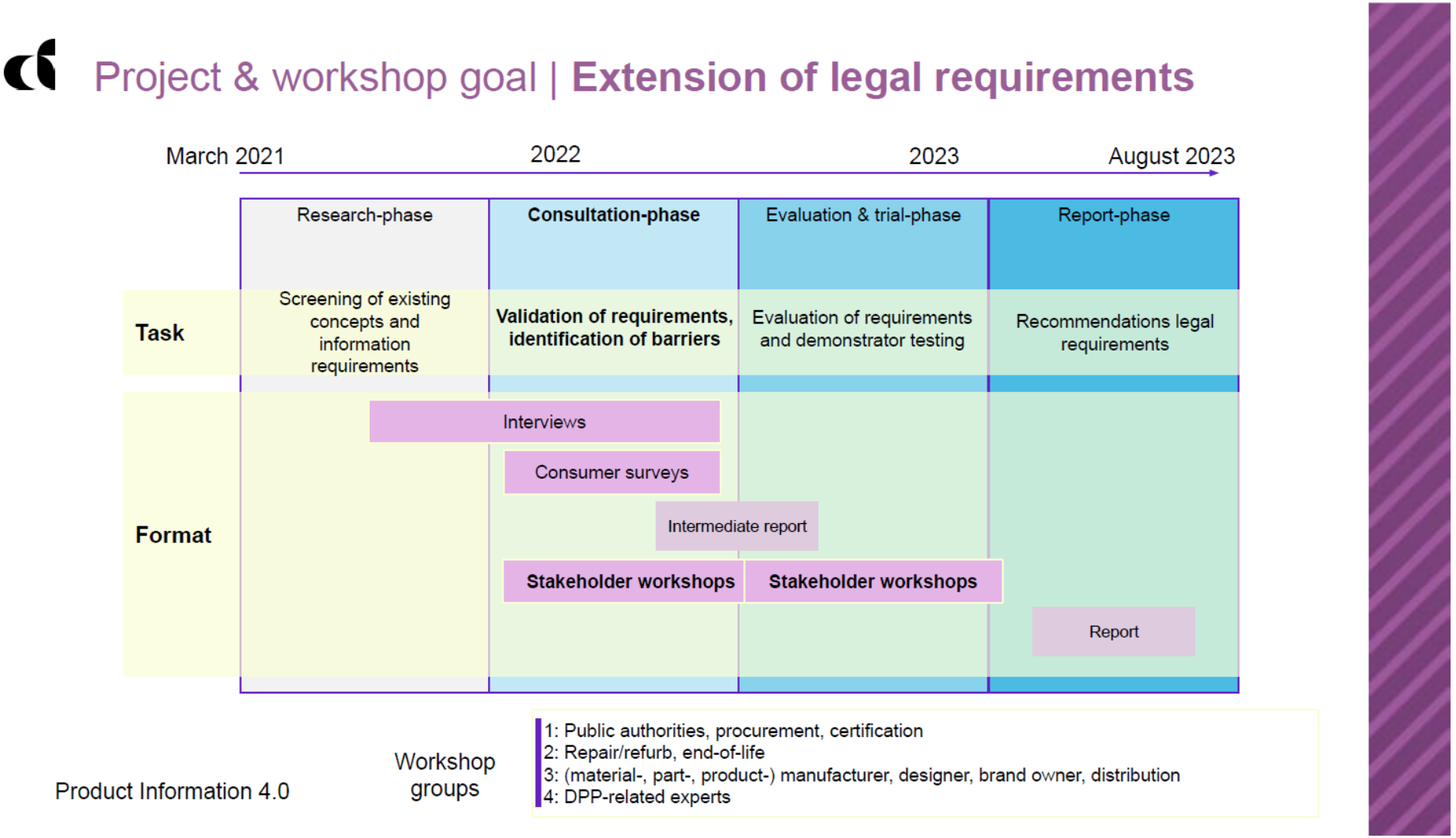
(source: Circular Fashion 2022)




(source: Circular Fashion 2022)




(source: Circular Fashion 2022)

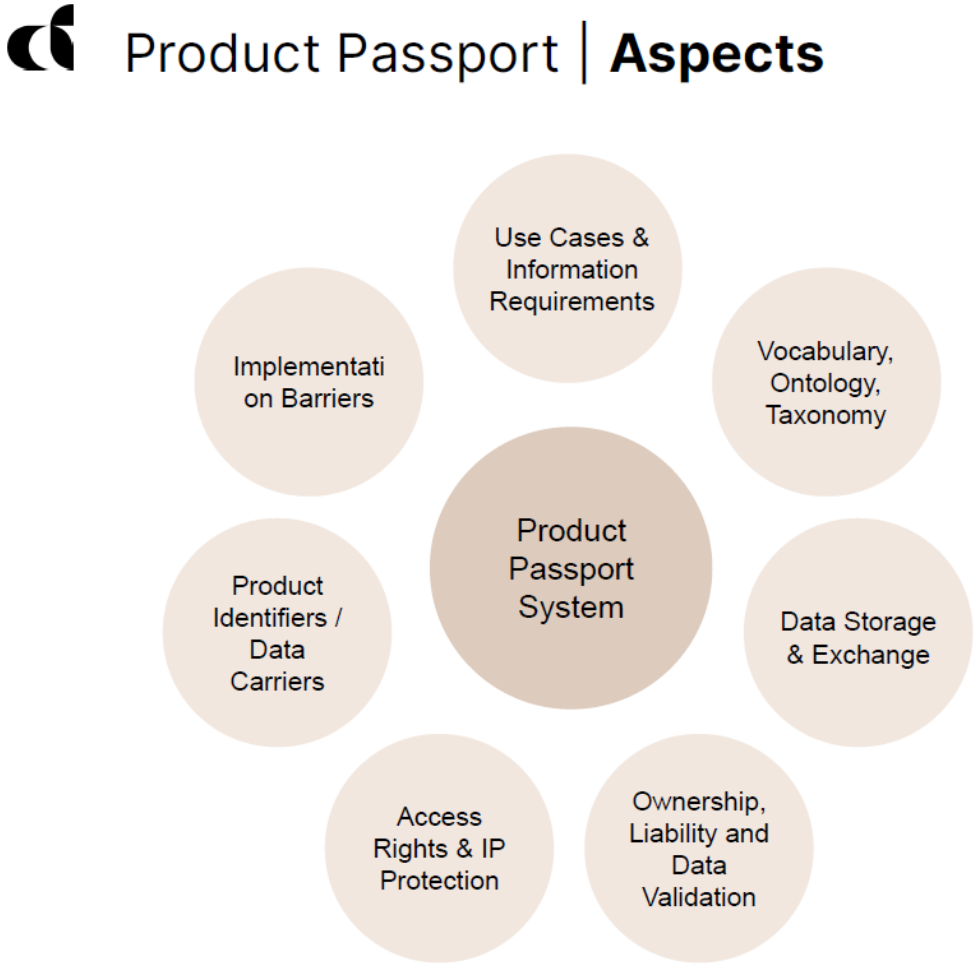


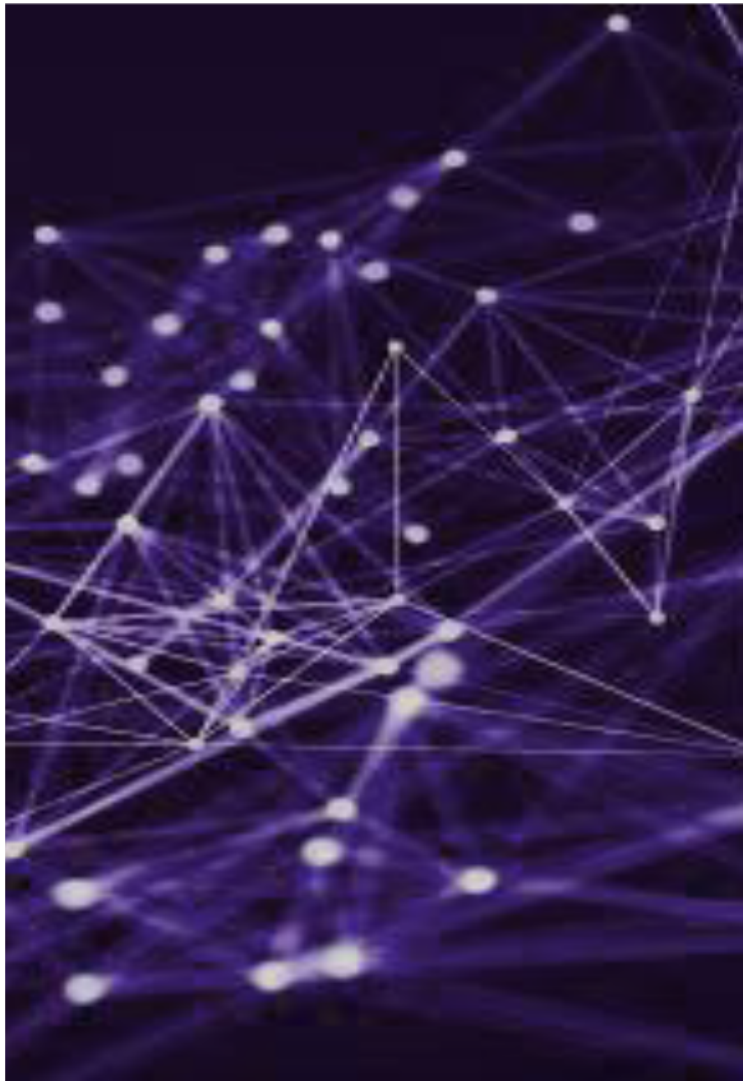

(source: Circular Fashion 2022)

# Workshop Introduction

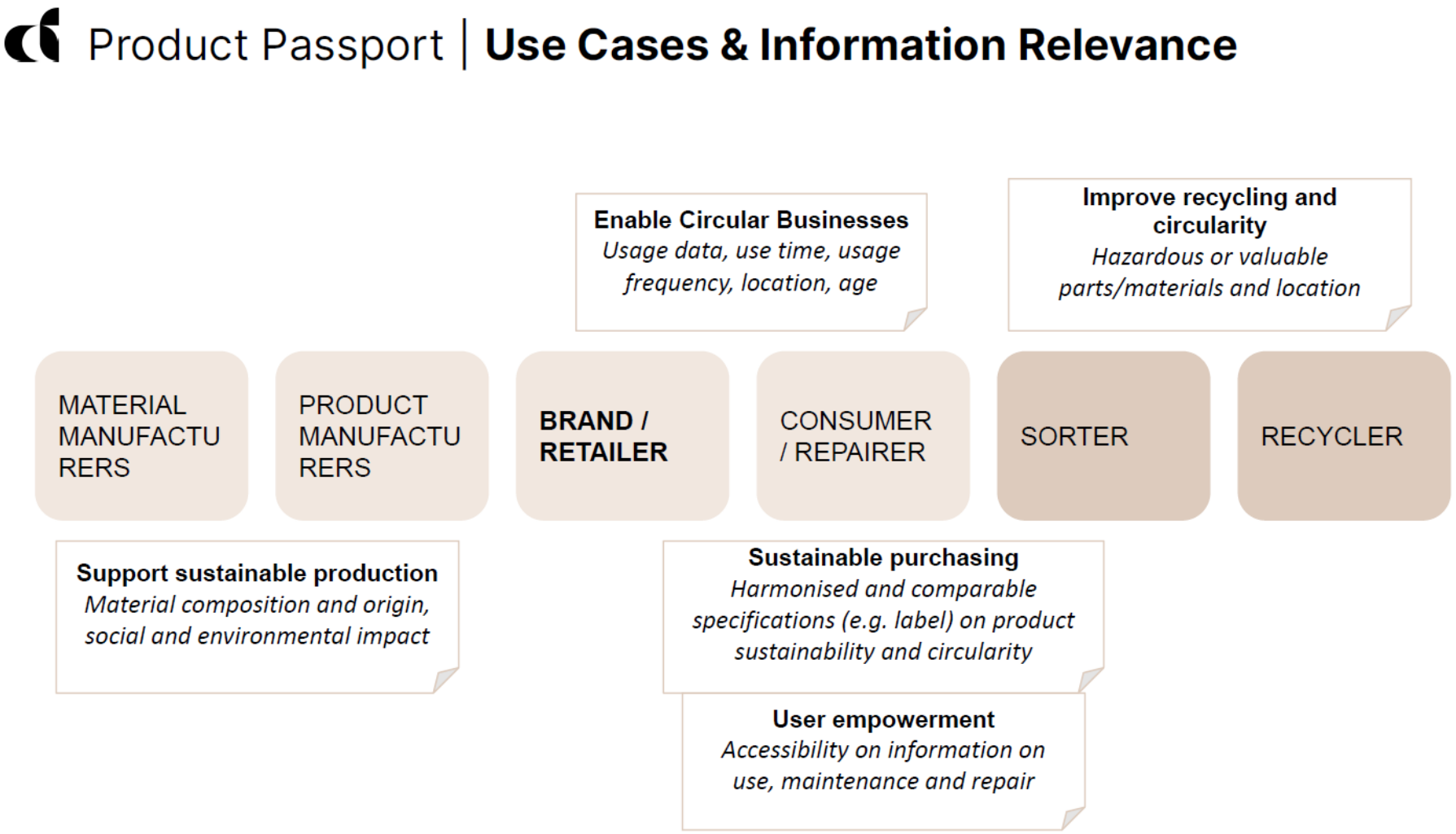
Product Information 4.0

(source: TU Berlin, Circular Fashion 2022)

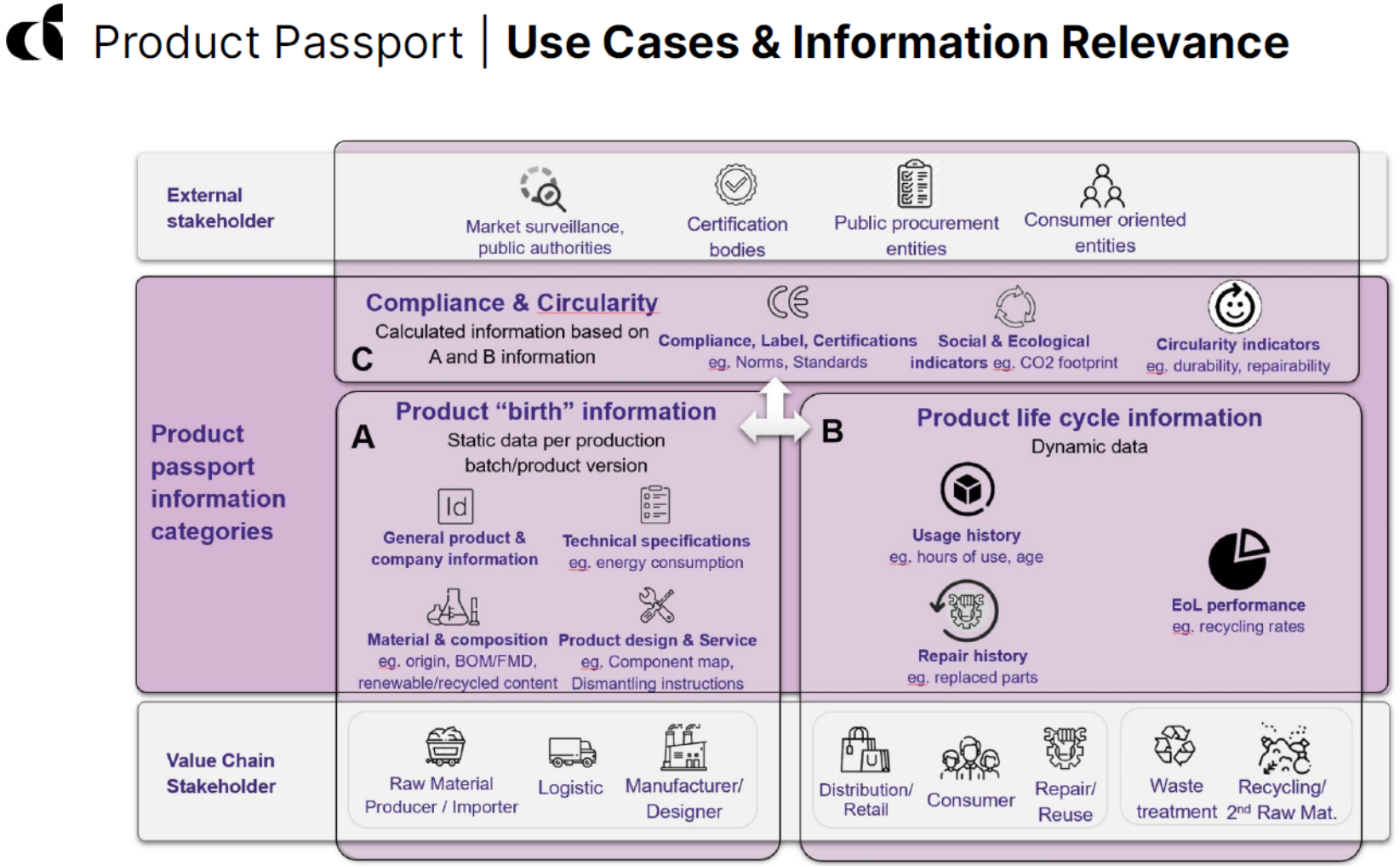


(source: Circular Fashion 2022)




(source: Circular Fashion 2022)




(source: Circular Fashion 2022)

## Standardization | **Vocabulary, Ontology, Taxonomy**

| | | |
|---|---|---|
| Global | ISO TECHNICAL COMMITTEES ISO/TC 38 Textiles | ISO/DIS 5157 Textiles<br>Environmental aspects — Vocabulary<br>ISO/AWI 59040 Circular Economy<br>Product Circularity Data Sheet |
| EU | CEN | TC 248 WG 39 Circular Textiles Chain - Requirements and Categories |
| Germany | DIN DKE VDI | Normungsroadmap Circular Economy |



(source: Circular Fashion 2022)

# Product Passport | **Data Storage and Exchange**

## **Storage and Exchange** | REQUIREMENTS

- **Safety, reliability, trustworthiness**
- **Access management**
- **Interoperability** of systems
  - Standardised vocabulary
  - Standardized exchange formats
  - Integration of existing systems
- **Availability**

## **Storage** | OPTIONS

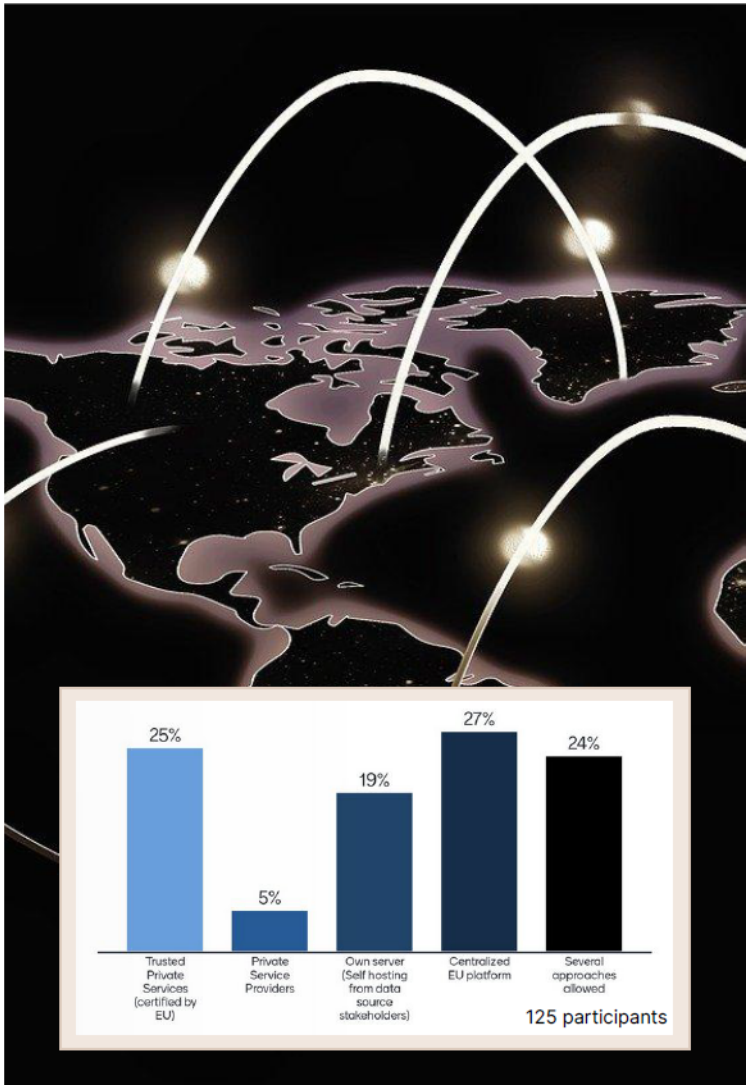
**trusted parties**
Certified by EU

**private service providers**
using standardized databases and interfaces

**own server**
accessible for others via self-hosted interfaces

**central EU database**

**mix of approaches**
each organization chooses preferred version: different approaches for clients of different size




(source: Circular Fashion 2022)

## Product Passport | **Ownership and Liability**

**Source** | E.G. MANUFACTURER
has the information due to his activity or is able to produce the information e.g. by measurement or evaluation of other data

**Owner** | E.G. BRAND
usually the addressees of the legal requirements / information obligations and responsible for the publication or entry of the data in the corresponding databases and their correctness

**Administrator** | E.G. DATABASE PROVIDER
often bodies, governmental or private, determined by the information requirements, take the data from owners and make it available to users for use

**User** | E.G. SORTING FACILITY
performs actions with the data that contribute to the goals of the circular economy


(source: Circular Fashion 2022)

## Product Passport | **Data Validation**

**CORRECTNESS, COMPLETENESS**

**INTEGRITY**

**self-commitment**

- voluntary
- mandatory under certain circumstances
- mandatory (with different levels of consequences)

**3rd party certification**

**technical solutions**
(e.g. blockchain)

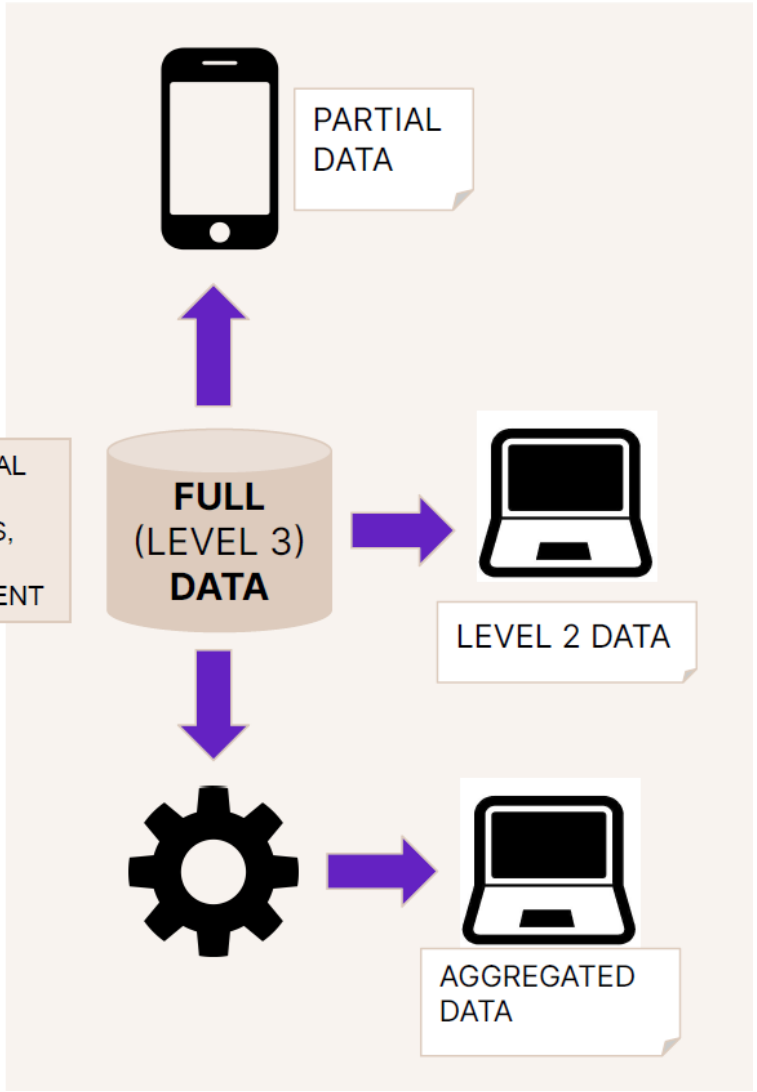
**...**

(source: Circular Fashion 2022)

# Product Passport | **Access Rights & IP Protection**

## 3 Levels of information depth

1. TRUE/FALSE
   - (does this product contain x?)
2. THRESHOLD
   - (does this product contain more than eg. 0,1% of x?)
3. EXACT AMOUNT
   - (How much of x does this product contain?)




(source: Circular Fashion 2022)

# Product Passport | **Product Identifiers & Data Carriers**

## **Product Identifiers** | REQUIREMENTS

- Unique identification on product or item level

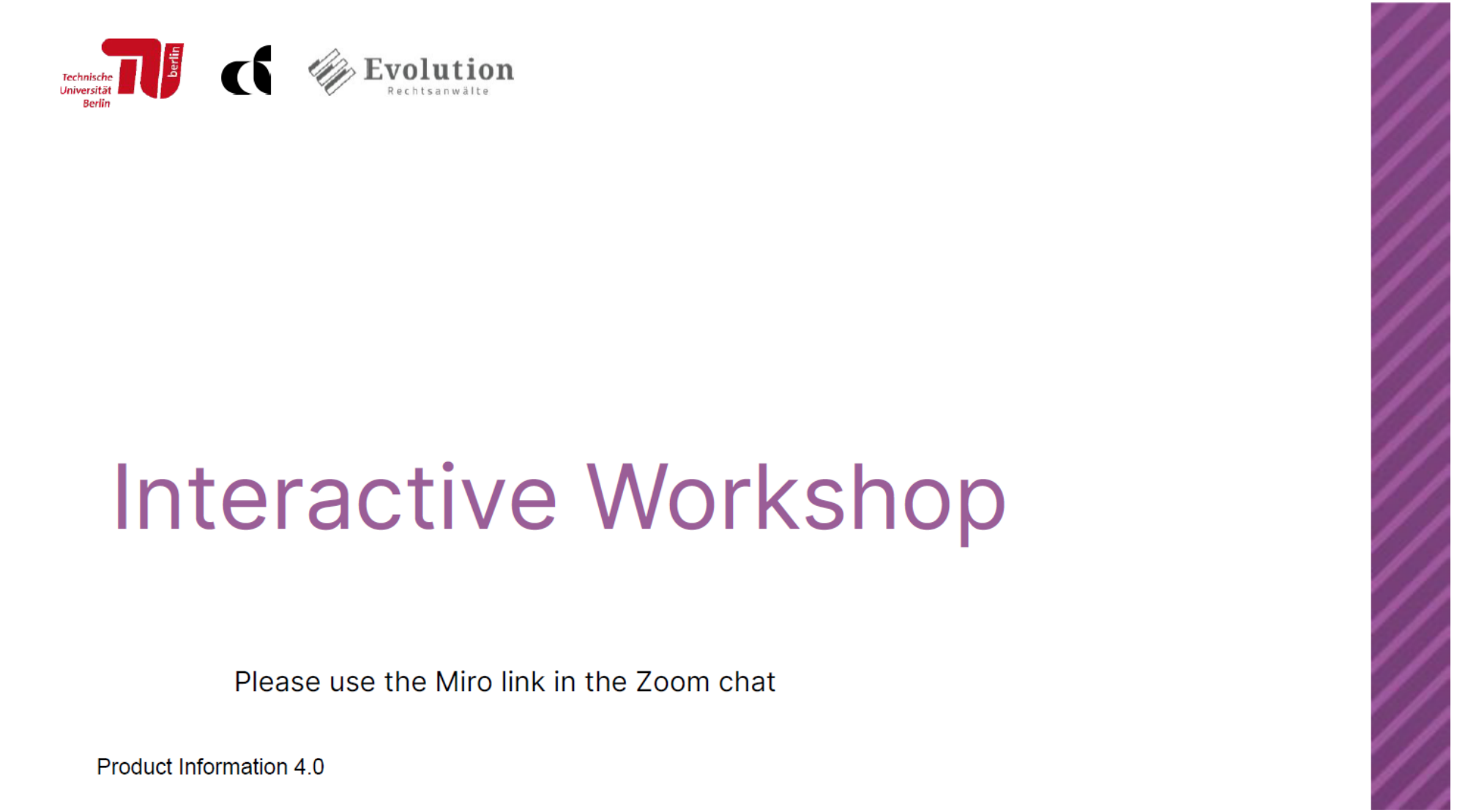
## **Data Carriers** | OPTIONS

- **Optical codes**: QR, datamatrix, barcodes, digital watermarks, text
- **Electronic tags**: RFID/NFC, Bluetooth tags
- **DNA, micro particle (and chemical tracking)**

## **Data Carriers** | REQUIREMENTS

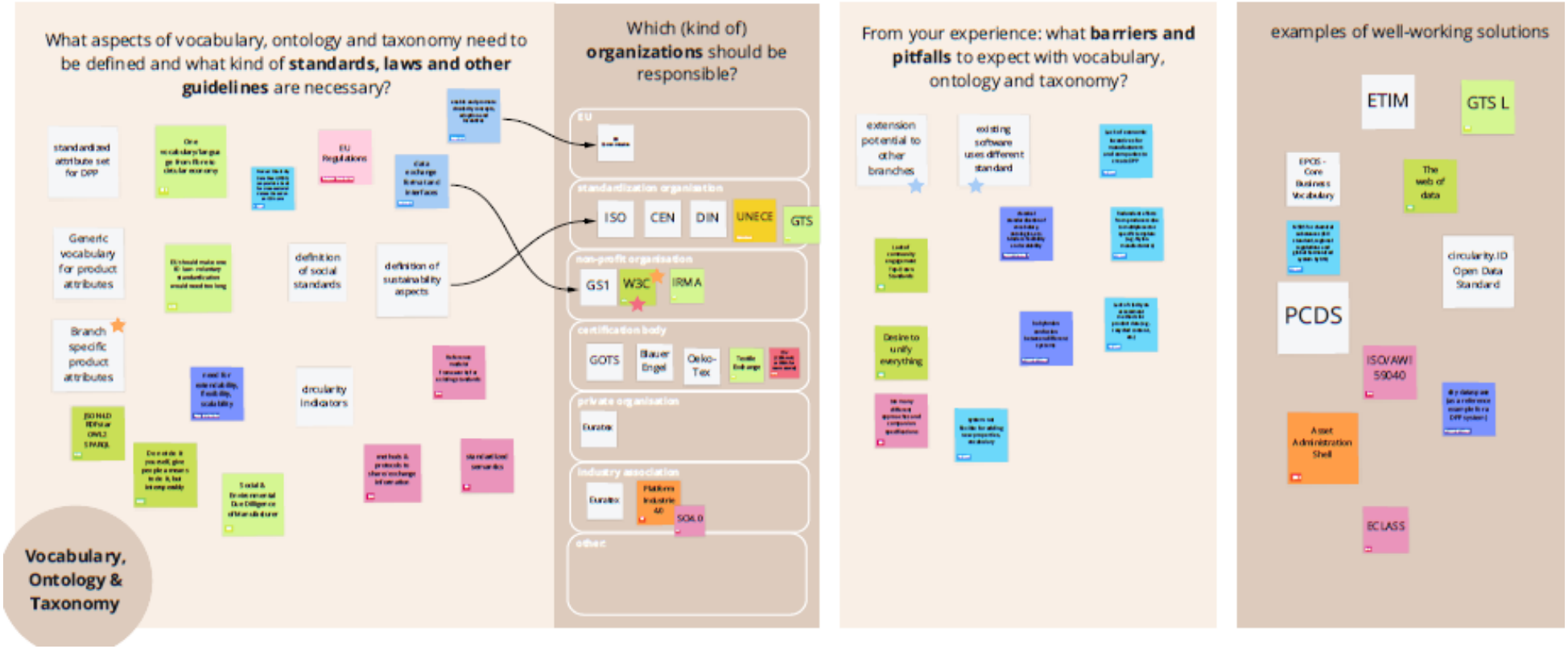
- link product to database entry
  → *excludes e.g. DNA & chemical tracking*
- apply to product
  → *for textiles, this excludes e.g. digital watermarks*
- durability (for textiles: washability, passive technology, etc.)
  → *for textiles, this excludes bluetooth tags*


(source: Circular Fashion 2022)




(source: TU Berlin, Circular Fashion 2022)

### A.3.2 Expert Workshop




(source: TU Berlin, Circular Fashion 2022)


(source: TU Berlin, Circular Fashion 2022)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(source: TU Berlin, Circular Fashion 2022)

### A.3.3 Questionnaire Expert Interview

<Date>

<Person to be interviewed>

<Company, position>

**Introduction**

Can we record the meeting?

Is it okay to do the interview in english?

Short intro to the project

**Ownership**

When thinking about a national or international product passport system, who should be considered the owner of the data, what would that mean and who should be liable for the correctness and integrity of the data in the system? Why?

**Access Management**

In order to decide who should be able to gain access to which data, we are developing an access management concept. Would you advise to have strict policies about who can access which data or enable the data owners to decide? Why?

How could authorization and authentication be solved? (also on a technical level)

**Data Storage**

Data can be stored in different ways. There's a possibility to have a central EU server to store the data completely centralised or, on the other extreme, to use e.g. a blockchain system to have a completely decentralised storage. Where on this spectrum would you envision a "perfect" product information system and why? Do we might need components from both ends of the spectrum?

**Identifiers and Data Carriers**

Product model series and individual products need some kind of identifier that links the product to its information. This identifier can be stored on a data carrier that is attached to the product. Would you advise to use an industry standard (such as GTIN) or to use/develop another identifier system?

As mentioned, the identifiers can be stored on a data carrier. This is a physical object that can be scanned in order to find out the identifier. Would you advise requiring certain data carriers by law or leaving the choice up to the stakeholders? Why? How would you ensure that data carriers are used that are suitable for all parties involved?

**Data Exchange**

In order to provide the data, they first need to be put into the system. What interface options would you ideally provide for data sources to contribute data and why?

**Validation**

How would you get the data sources to provide correct and complete data?

**Data Standard**

In order to provide for interoperability of systems, data standards can be used to align database structures and attribute names. Such data standards need to continuously adapt to the requirements of the stakeholders. How could a standardised process for the development of a data standard work and what (kind of) organisation would be appropriate to govern this process?

In your opinion, would the process to provide for interoperability have to be stipulated by law or could it be adhered to on a voluntary basis?

## A.3.4 Information Sources

| | | | European Systems | | | | |
|---|---|---|---|---|---|---|---|
| information publicly available? | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| information source | | | Raw Material Information System | | | EPREL | Minerals4EU |
| Comment on suitability to close information gaps | | | Material Flow/System Analysis for Raw Materials in context of generic supply chains, but not a product information tool | | | product-specific and mandatory to be used for energy relevant products, but no API to access data | not product specific, rather looking into mineral occurences, |
| information requirement | | description/link<br>Availability of information from examined sources | https://rmis.jrc.ec.europa.eu / https://rmis.jrc.ec.europa.eu/apps/scv/#/ / | Battery https://rmis.jrc.ec.europa.eu/apps/bvc/#/p/demand | Material Flow/System Analysis for Raw Materials in context of generic supply | https://eprel.ec.europa.eu/screen/home | http://www.minerals4eu.eu |
| general manufacturer and product information | product category | YES, 14 | it is called application | | | Yes | |
| | product type | YES, 16 | it is called application | | | Yes | |
| technical specifications | product description | YES, 11 | No | | | Yes | |
| | warranty information | YES, 2 | No | | | Yes | |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | No | | | Yes (performances, consumptions), no size or dimension | |
| material & composition | recycled content | YES, 2 | No | | | No | |
| | material composition | YES, 7 | Yes | | | No | |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | No | | | No | |
| | full material declaration (also of chemicals) | YES, 2 | Yes | | | No | |
| | staple fibre lenght | YES, 1 | No | | | No | |
| | material quality information (durability) | YES, 1 | No | | | No | |
| | material origin | YES, 5 | Yes | | | No | |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | No | | | No | |
| | design for longevity | YES, 1 | No | | | No | |
| | durability test results | NO | No | | | No | |
| | care instructions | YES, 3 | No | | | No | |
| | instructions for disposal and take-back | YES, 1 | No | | | No | |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | No | | | No | |
| | repair history | NO | No | | | No | |
| | purchase date | YES, 1 | No | | | No | |
| circularity | environmental footprint | YES, 4 | No | | | Yes | |
| | LCA of goods/services | YES, 4 | No | | | No | |
| | sustainability certificates | YES, 5 | No | | | No (but of course energy label) | |
| | biodegradability | YES, 1 | No | | | No | |
| | restricted substances list (e.g. AFIRM) | YES, 4 | No | | | No | |

(source: TU Berlin, Circular Fashion 2022)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | information publicly available? | ✓ | ✓ | ✓ | partly obtainable | partly obtainable |
| | | information source | Exiobase | Urban Mining Platform (UMP) | Panorama | EPLCA https://eplca.jrc.ec.europa.eu | |
| | Comment on suitability to close information gaps | | generic database about supply chains of minerals and metals, not product specific | generic database to check overall consumption of biggest EEE streams, mineral and waste flows, not product specific | generic database for supply chains of raw materials and product categories, not product specific | different databases with different info information partly publicly available, r to get data from. Organisation in so-ca | |
| | | description/link | https://www.exiobase.eu | http://www.urbanmineplatform.eu/homepage | https://www.panoramaproject.eu/index.php/data-by-product | https://eplca.jrc.ec.europa.eu/LCDN/ | https://eplca.jrc.ec.europa.eu/EUFRP/ |
| information requirement | | Availability of information from examined sources | | | | | |
| general manufacturer and product information | product category | YES, 14 | | | | | Yes |
| | product type | YES, 16 | | | | | Yes |
| technical specifications | product description | YES, 11 | | | | | No |
| | warranty information | YES, 2 | | | | | No |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | | | | | No |
| material & composition | recycled content | YES, 2 | | | | | No |
| | material composition | YES, 7 | | | | | No |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | | | | | No |
| | full material declaration (also of chemicals) | YES, 2 | | | | | No |
| | staple fibre lenght | YES, 1 | | | | | No |
| | material quality information (durability) | YES, 1 | | | | | No |
| | material origin | YES, 5 | | | | | No |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | | | | | No |
| | design for longevity | YES, 1 | | | | | No |
| | durability test results | NO | | | | | No |
| | care instructions | YES, 3 | | | | | No |
| | instructions for disposal and take-back | YES, 1 | | | | | No |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | | | | | No |
| | repair history | NO | | | | | No |
| | purchase date | YES, 1 | | | | | No |
| circularity | environmental footprint | YES, 4 | | | | | No |
| | LCA of goods/services | YES, 4 | | | | | Yes |
| | sustainability certificates | YES, 5 | | | | | No |
| | biodegradability | YES, 1 | | | | | No |
| | restricted substances list (e.g. AFIRM) | YES, 4 | | | | | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | information publicly available? | partly obtainable | ✓ | ✓ | ✓ | ✓ |
| | | information source | /ELCD3/ | Ecosystem | Global LCA Data Access | CircularityID | DigitalID |
| | Comment on suitability to close information gaps | | rmation, o single endpoint alled data-nodes | rather generic information, seems rather in concept phase | does not directly host data but refers to other databases to search specific datasets | product related data, schema documented, implementation of API to get data is in progress | product related data, schema documented |
| | | description/link | https://eplca.jrc.ec.europa.eu/SDPDB/ | https://weee-lci.ecosystem.eco | https://www.globallcadataaccess.org/search | https://circularity.id | https://7a5f6f52-74f4-4d72-92f5-680e4691a8ba.usrfiles.com/ugd/7a5f6f_ |
| information requirement | | Availability of information from examined sources | | | | | |
| general manufacturer and product information | product category | YES, 14 | Yes | Yes | Yes | Yes | Yes |
| | product type | YES, 16 | Yes | Yes | Yes | Yes | Yes |
| technical specifications | product description | YES, 11 | No | No | Yes | Yes | Yes |
| | warranty information | YES, 2 | No | No | No | No | No |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | No | weight is the flow property for the functional unit | No | - season - market segment - weight (unit) - colourway/ colours - size (metric) | - Size -Main Color/Assigned Color Category - Season - Age Group - Gender. - final product net weight |
| material & composition | recycled content | YES, 2 | No | production of recycled plastics from Waste Electrical and Electronic Equipment (WEEE | No | Optional: according to Global Recycling Standard | No |
| | material composition | YES, 7 | No | Partly | No | Yes | Yes |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | No | No | No | Yes | Yes |
| | full material declaration (also of chemicals) | YES, 2 | No | No | No | Yes | No |
| | staple fibre lenght | YES, 1 | No | No | No | Yes | No |
| | material quality information (durability) | YES, 1 | No | No | No | Yes | No |
| | material origin | YES, 5 | No | No | No | No | Yes |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | No | No | No | Yes | Yes |
| | design for longevity | YES, 1 | No | No | No | Yes | No |
| | durability test results | NO | No | No | No | No | No |
| | care instructions | YES, 3 | No | No | No | Yes | No |
| | instructions for disposal and take-back | YES, 1 | No | No | No | No | No |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | No | No | No | No | No |
| | repair history | NO | No | No | No | No | No |
| | purchase date | YES, 1 | No | No | No | No | No |
| circularity | environmental footprint | YES, 4 | No | No | Yes | Yes | No |
| | LCA of goods/services | YES, 4 | Yes | No | Yes | No | No |
| | sustainability certificates | YES, 5 | No | No | No | Yes | Yes/No |
| | biodegradability | YES, 1 | No | No | No | Yes | No |
| | restricted substances list (e.g. AFIRM) | YES, 4 | No | No | No | Yes | Yes |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | information publicly available? | ✓ | ✓ | ✓ | obtainable | obtainable |
| | | information source | SCIP | PCDS | Keep? | Datarade | Bright Data |
| | | Comment on suitability to close information gaps | product related data, schema documented | product related data, stores only answers to yes/no questions, schema documented | demonstrator phase, product related data | commercial platform where data e.g. for stock keeping can be purchased | commercial platform where data can be purchased from other datasets, API available |
| | | description/link | https://echa.europa.eu/scip-database | https://pcds.lu/pcds-system/#data-template | https://keepelectronics.com/#/ | Comparison portal to buy datasets of apperal & Fashion | Comparison portal to buy datasets of apperal & Fashion |
| information requirement | | Availability of information from examined sources | | | | | |
| general manufacturer and product information | product category | YES, 14 | Yes | No | | | |
| | product type | YES, 16 | Yes | No | | | |
| technical specifications | product description | YES, 11 | Yes | No | | | |
| | warranty information | YES, 2 | No | No | | | |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | No | No | | | |
| material & composition | recycled content | YES, 2 | No | Yes | | | |
| | material composition | YES, 7 | No - specific substances of high concern are named and if metal | Yes | | | |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | - toxicity - concentration range -metal | No | | | |
| | full material declaration (also of chemicals) | YES, 2 | No | No | | | |
| | staple fibre lenght | YES, 1 | No | No | | | |
| | material quality information (durability) | YES, 1 | No | No | | | |
| | material origin | YES, 5 | No | Yes | | | |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | No | Yes | | | |
| | design for longevity | YES, 1 | No | No | | | |
| | durability test results | NO | No | No | | | |
| | care instructions | YES, 3 | No | No | | | |
| | instructions for disposal and take-back | YES, 1 | No | No | | | |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | No | No | | | |
| | repair history | NO | No | No | | | |
| | purchase date | YES, 1 | No | No | | | |
| circularity | environmental footprint | YES, 4 | No | No | | | |
| | LCA of goods/services | YES, 4 | No | No | | | |
| | sustainability certificates | YES, 5 | No | Yes | | | |
| | biodegradability | YES, 1 | No | No | | | |
| | restricted substances list (e.g. AFIRM) | YES, 4 | No | Yes | | | |

| | | | Domains from specific expert review | | Producer specific Databasis | | |
|---|---|---|---|---|---|---|---|
| | | information publicly available? | X | X | X | X | X |
| | | information source | smartPCN (Industry) - VDMA Einheitsblatt 24903 | Ecoinvent | ERP | PLM | OIM |
| | Comment on suitability to close information gaps | | not really a product information database - rather provides tools for suppliers to store data about product change notices and product discontinuation notices | no free access to the data | Umbrella terms for many different databases that stakeholders use internally, different documentation and interfaces, also different data sets, not publicly accessible. | | |
| | | description/link | https://smartpcn.org | https://ecoinvent.org/the-ecoinvent-database/ | | | |
| information requirement | | Availability of information from examined sources | | | | | |
| general manufacturer and product information | product category | YES, 14 | | | | | |
| | product type | YES, 16 | | | | | |
| technical specifications | product description | YES, 11 | | | | | |
| | warranty information | YES, 2 | | | | | |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | | | | | |
| material & composition | recycled content | YES, 2 | | | | | |
| | material composition | YES, 7 | | | | | |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | | | | | |
| | full material declaration (also of chemicals) | YES, 2 | | | | | |
| | staple fibre lenght | YES, 1 | | | | | |
| | material quality information (durability) | YES, 1 | | | | | |
| | material origin | YES, 5 | | | | | |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | | | | | |
| | design for longevity | YES, 1 | | | | | |
| | durability test results | NO | | | | | |
| | care instructions | YES, 3 | | | | | |
| | instructions for disposal and take-back | YES, 1 | | | | | |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | | | | | |
| | repair history | NO | | | | | |
| | purchase date | YES, 1 | | | | | |
| circularity | environmental footprint | YES, 4 | | | | | |
| | LCA of goods/services | YES, 4 | | | | | |
| | sustainability certificates | YES, 5 | | | | | |
| | biodegradability | YES, 1 | | | | | |
| | restricted substances list (e.g. AFIRM) | YES, 4 | | | | | |

| | | | Community based databases | | | Commercial comparison portals and | |
|---|---|---|---|---|---|---|---|
| | | information publicly available? | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | information source | GSMarena | Notebookcheck | Open Repair Alliance | idealo.de | geizhals.de |
| | Comment on suitability to close information gaps | | commercial data and reviews stored on product model level, openly accessible via browser, no API | commercial data and reviews stored on product model level, openly accessible via browser, no API | openly accessible data on product level about repair of small electronic products, standard documented, full download of the data possible | product model based commercial data, API + docs available | product model based commercial data, no public API available |
| | | description/link | https://www.gsmarena.com | https://www.notebookcheck.com | https://openrepair.org | | |
| information requirement | | Availability of information from examined sources | | | | | |
| general manufacturer and product information | product category | YES, 14 | No | No | Yes | Yes | Yes |
| | product type | YES, 16 | No | Yes | Yes | Yes | Yes |
| technical specifications | product description | YES, 11 | Yes | Yes | No | Yes | Yes |
| | warranty information | YES, 2 | No | No | No | Partly | Yes |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | - size - weight - build - MISC (colors, model, SAR, SAR EU) | - size - weight | - product age | - size - color - weight | - size - color - weight etc. |
| material & composition | recycled content | YES, 2 | No | No | No | Partly | No |
| | material composition | YES, 7 | No | No | No | No | - Housing material Plastic (back) |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | No | No | No | - color - water properties - dustproof | No |
| | full material declaration (also of chemicals) | YES, 2 | No | No | No | No | No |
| | staple fibre lenght | YES, 1 | No | No | No | No | No |
| | material quality information (durability) | YES, 1 | No | No | No | Partly | No |
| | material origin | YES, 5 | No | No | No | No | No |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | No | No | Yes? | Partly to choose | No |
| | design for longevity | YES, 1 | No | No | No | No | No |
| | durability test results | NO | No | No | No | No | No |
| | care instructions | YES, 3 | No | No | No | No | No |
| | instructions for disposal and take-back | YES, 1 | No | No | No | No | No |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | No | No | No | No | No |
| | repair history | NO | No | No | No | No | No |
| | purchase date | YES, 1 | No | No | Yes | No | No |
| circularity | environmental footprint | YES, 4 | No | No | No | Partly | No |
| | LCA of goods/services | YES, 4 | No | No | No | No | No |
| | sustainability certificates | YES, 5 | No | No | No | Partly | No |
| | biodegradability | YES, 1 | No | No | No | No | No |
| | restricted substances list (e.g. AFIRM) | YES, 4 | No | No | No | Yes | No |

| | | | internet stores | | |
|---|---|---|---|---|---|
| | | information publicly available? | ✓ | ✓ | ✓ |
| | | information source | amazon.de | zalando.de | aboutyou.de |
| | Comment on suitability to close information gaps | | product model based data, no reliable uniform dataset, offers a "scraper" to get data | product model based commercial data, API + documentation available | product model based commercial data, api + documentation available |
| information requirement | | description/link<br>Availability of information from examined sources | | | |
| general manufacturer and product information | product category | YES, 14 | Yes | No | Yes |
| | product type | YES, 16 | Yes | Yes | Yes |
| technical specifications | product description | YES, 11 | Yes | No | No |
| | warranty information | YES, 2 | No | 100 day return policy & "selling back" | 100 day return policy |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | YES, 0 | - size - color - weight etc. | - choose your size (info: the size runs large , recommend going down/ ususal size)<br>- color | - select size (size advisor) |
| material & composition | recycled content | YES, 2 | No | No | Yes |
| | material composition | YES, 7 | - Material: Faux leather | Yes | Yes |
| | material properties<br>- color<br>- water properties<br>- weight ... | YES, 4 | No | Yes | Yes |
| | full material declaration (also of chemicals) | YES, 2 | No | No | No |
| | staple fibre lenght | YES, 1 | No | No | No |
| | material quality information (durability) | YES, 1 | No | No | No |
| | material origin | YES, 5 | Yes | No | Yes |
| product design & service | design for reuse/ refurbishment / repairability | YES, 5 | No | Yes | Yes |
| | design for longevity | YES, 1 | No | No | No |
| | durability test results | NO | No | No | No |
| | care instructions | YES, 3 | No | Yes | Yes |
| | instructions for disposal and take-back | YES, 1 | Yes | No | No |
| Downstream data (usage, product history, ...) | usage (washing cycles) | NO | No | No | No |
| | repair history | NO | No | No | No |
| | purchase date | YES, 1 | No | No | No |
| circularity | environmental footprint | YES, 4 | No | No | No |
| | LCA of goods/services | YES, 4 | No | No | No |
| | sustainability certificates | YES, 5 | Yes | Yes | Yes |
| | biodegradability | YES, 1 | No | No | No |
| | restricted substances list (e.g. AFIRM) | YES, 4 | No | No | No |

### A.3.5 Result Stakeholder Survey 1

A stakeholder survey was carried out to supplement the first workshops and former research (conducted stakeholder workshops described in Part A) about what information is needed for the different user groups for their role in the circular economy. Two surveys with mostly similar questions were sent to the advisory group of the project. The group was divided between stakeholders from the textile sector and the electrical and electronic equipment senergy-relevant sector, with a total of 18 respondents. First, the participants' role for both industries in the circular economy was assessed. Based on the results the importance of the individual requirements of information needed was rated on three levels - Necessary, Nice to have and Not needed. The results confirm the findings from the Stakehodler workshops.

Within the user group Electronics, six responses were collected. Each user in this group represents a different role in the circular economy:

- User from the association of PROs
- Product developer
- Manufacturer of products
- Brands/design
- Person from the data storage and information system group
- Waste management

Since all participants represent different user groups and therefore no representative statement can be made about the individual groups, the results are summarised. When examining the desired product information, it is noticeable that the respondents particularly require information on Material & composition. The seven items of information on material and composition are rated on average as necessary (69%) or at least as nice to have (28.6%). The General manufacturer and product information scores similarly. Here too, respondents see the information as absolutely necessary or nice to have. The six items of information in the Product design & service category are considered necessary by at least 50% of respondents. The categories Downstream data and Circularity are both rated in a balanced way, so that it is not possible to clearly determine whether the data is perceived as necessary or not. The user group Textile is made up of ten stakeholder groups, whereof 25% are active in the retail sector. The nine other roles are distributed among manufacturers of products, material

producers and manufacturers, sustainability management, certification bodies, waste management, recyclers, sorters, collectors and consumers. Despite the different roles, almost two-thirds (62.5%) agree that information from the category General manufacturer and product information that contains e.g., product category and type is absolutely necessary. One in four (25%) find information about the product category and product type nice to have, and only 12.5% see no need for it. Technical specifications are rated very similarly. Again, around 63% of the Textile user group consider this information to be particularly essential. They consider information about product attributes such as size, colour or weight to be most important (83%). The material composition

appears to be the most important attribute for stakeholders in the textile value chain. Here, almost 92% state that this information is indispensable. Recycled content also plays a major role, as do material properties such as colour. Further information in the Material & composition subgroup is not absolutely necessary but would be nice to have. With regard to Product design & service and circularity properties, similar preferences can be measured. On average, in both groups, at least 50% of the individual sub-elements are regarded as necessary and around one third as nice to have. Only in the case of Downstream data (i.e. usage and product history) do the respondents consider the information to be nice to have but not absolutely necessary.

The results of the survey show that users from both sectors are particularly interested in general manufacturer and product information as well as information on materials and composition. This information should therefore be taken into account. Though the survey was answered by a low number of participants, the results confirm the findings from the earlier Stakeholder workshops. Detailed results can be found in the following table.

| Information | Sector | Necessary | Nice to have | Not needed |
|---|---|---|---|---|
| **General manufacturer and product information** | | | | |
| Component supplier details and sustainability info | Electronics | 83,3% | 16,7% | 0% |
| | Textile | 58,3% | 33,3% | 8,3% |
| Field of usage | Electronics | 50% | 50% | 0% |
| | Textile | 66,7% | 16,7% | 16,7% |
| **Technical specifications** | | | | |
| Product description | Textile | 66,7% | 33,3% | 0% |
| Warranty information | Textile | 38,5% | 38,5% | 23% |
| Product attributes (size, color, weight) | Textile | 83,3% | 16,7% | 0% |
| **Material & Composition** | | | | |
| Recycled content | Electronics | 83,3% | 16,7% | 0% |
| Full material declaration of chemicals (per component and product | Electronics | 66,7% | 33,3% | 0% |
| Component weight | Electronics | 83,3% | 0% | 16,7% |

| Information | Sector | Necessary | Nice to have | Not needed |
|---|---|---|---|---|
| Location of hazardous substances in product | Electronics | 83,3% | 16,7% | 0% |
| Material composition per component | Electronics | 66,7% | 33,3% | 0% |
| Recycled content per material | Electronics | 66,7% | 33,3% | 0% |
| Material origin | Electronics | 33,3% | 66,7% | 0% |
| Recycled content | Textile | 75% | 25% | 0% |
| Material composition | Textile | 91,7% | 8,3% | 0% |
| Material properties (color, water p., weight) | Textile | 58,3% | 33,3% | 8,3% |
| Full material declaraction (also of chemicals) | Textile | 46,2% | 46,2% | 7,6% |
| Staple fibre length | Textile | 23,1% | 53,8% | 23,1% |
| Material quality information (durability) | Textile | 38,5% | 46,2% | 15,3% |
| Material origin | Textile | 41,7% | 58,3% | 0% |
| **Product design & service** | | | | |
| Design for reuse/ refurbishment / repairability | Electronics | 66,7% | 0% | 33,3% |
| | Textile | 58,3% | 33,3% | 8,3% |
| Design for longevity | Electronics | 66,7% | 0% | 33,3% |
| | Textile | 58,3% | 25% | 16,7% |
| Component weight | Electronics | 50% | 16,7% | 33,3% |
| Durability test results | Electronics | 50% | 16,7% | 33,3% |
| | Textile | 33,3% | 58,3% | 8,3% |
| Material composition per component | Electronics | 66,6% | 16,7% | 16,7% |
| Care instructions | Textile | 66,7% | 25% | 8,3% |

| Information | Sector | Necessary | Nice to have | Not needed |
|---|---|---|---|---|
| Instructions for disposal and take-back | Electronics | 66,7% | 0% | 33,3% |
| | Textile | 50% | 41,7% | 8,3% |
| **Downstream Data** | | | | |
| Usage (hours of use) | Electronics | 16,7% | 66,7% | 16,7% |
| Usage (washing cycles) | Textile | 25% | 75% | 0% |
| Repair history | Electronics | 33,3% | 33,3% | 33,3% |
| | Textile | 33,3% | 50% | 16,7% |
| Purchase date | Electronics | 33,3% | 33,3% | 33,3% |
| | Textile | 25% | 75% | |
| Feedback from users | Electronics | 33,3% | 50% | 16,7% |
| Product condition when repaired, reused, resold | Electronics | 33,3% | 33,3% | 33,3% |
| **Circularity** | | | | |
| Recycling performance | Electronics | 33,3% | 50% | 16,7% |
| Environmental footprint | Textile | 58,3% | 41,7% | 0% |
| Footprint, LCA of goods | Electronics | 50% | 16,7% | 33,3% |
| LCA of goods/services | Textile | 41,7% | 50% | 8,3% |
| Sustainability certificates | Electronics | 50% | 33,3% | 16,7% |
| | Textile | 75% | 25% | 0% |
| Biodegradability | Electronics | 28,5% | 43% | 28,5% |
| | Textile | 50% | 33,3% | 16,7% |

### A.3.6 Workshop Slides Frontend Demonstrator Workshop

These are the slides that have been used in the workshop with the reverse supply chain group. The other workshop slides were similar with adapted examples in the information requirement section.


(source: TU Berlin, Circular Fashion 2022)

## Operating Project Team

Project duration: **29 month**, 04/2021 – 08/2023
Product groups: **textile, electronic,** batteries, automotive, packaging, plastics

**TU Berlin**
Coordination, informational WPs
product group: electronic


Melanie Jäger-Erben


Eduard Wagner


Erik Poppe

**circular.fashion**
Front-End dev., technical WPs
Product group: textil


Mario Malzacher


Diana Baumgärtel


Tim Lassaire

**Lawyer**
Legal consultation towards
digitalisation and product rights


Anna-Lena Hoffmann

Product Information 4.0

(source: TU Berlin, Circular Fashion 2022)

# Agenda

**Check-in & introduction round**

**Project introduction & status update**

- Project context: brief overview on motivation, goals
- Intro to aspects of Digital Product Passports

**Presentation of the demonstrator mockups**

- Interaction with the physical product
- Demonstrator Mockups
- Interaction with the data carrier

**Introduction of the feedback process**

**Q&A**

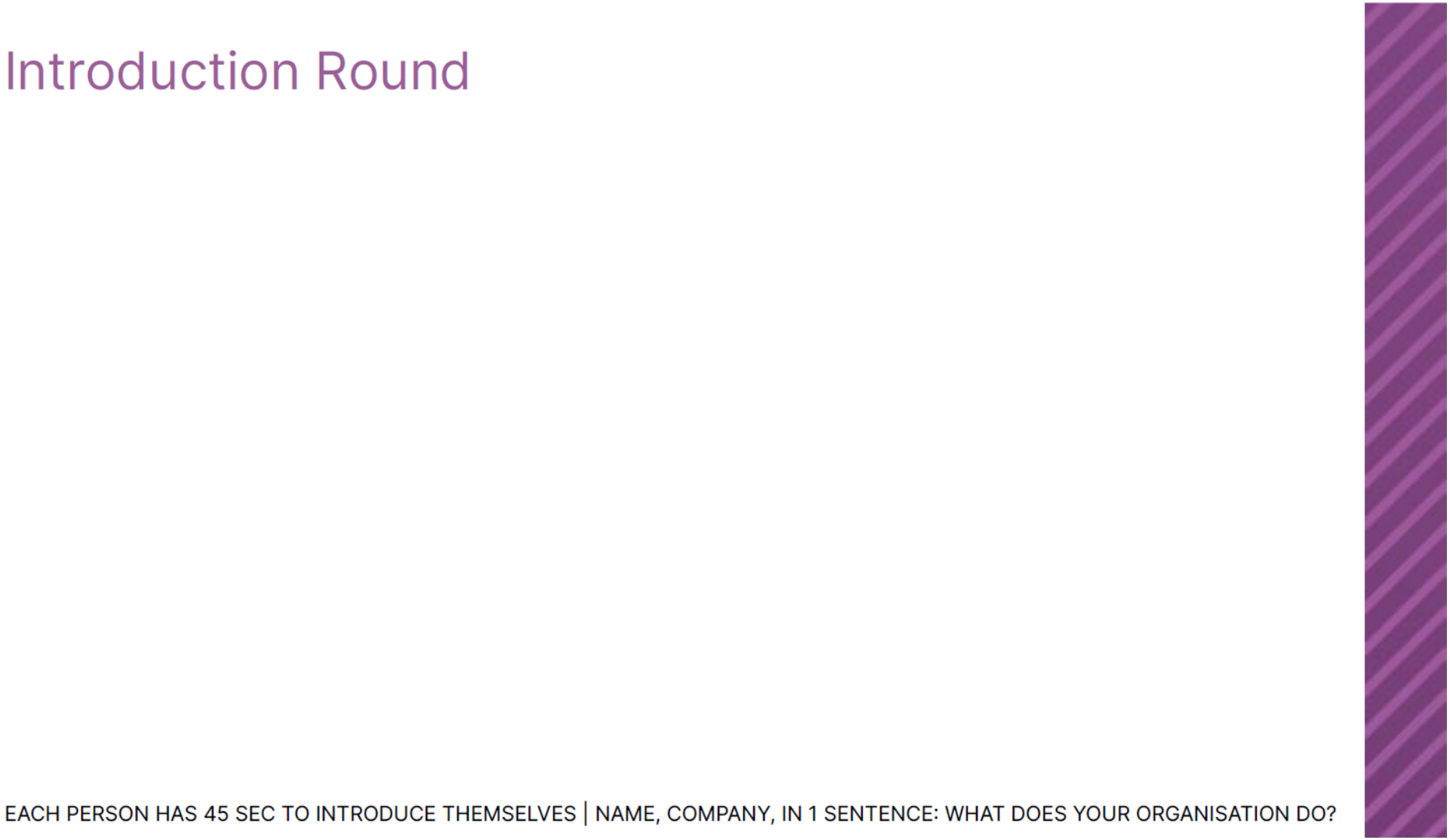
(source: TU Berlin, Circular Fashion 2022)

# Consent to processing and storing workshop data

**Thank you for participating in this study. By leaving information in the documents of this workshop, you are giving your consent and approval for the following:**

- collection and processing of the data you share shall be made through electronic data carriers and/or paper forms and processed by members of the circular.fashion and TU Berlin research team.
- this collection and processing of the data you share will only be carried out for the purposes of the Product Information 4.0 project.
- the results can be communicated or published in electronic and/or paper reports and articles, both within the Product Information 4.0 project and in the public domain
- your consent for collecting, processing and storing the data you share may be revoked at any time without providing reasons, by sending an email to team@circular.fashion

(source: TU Berlin, Circular Fashion 2022)

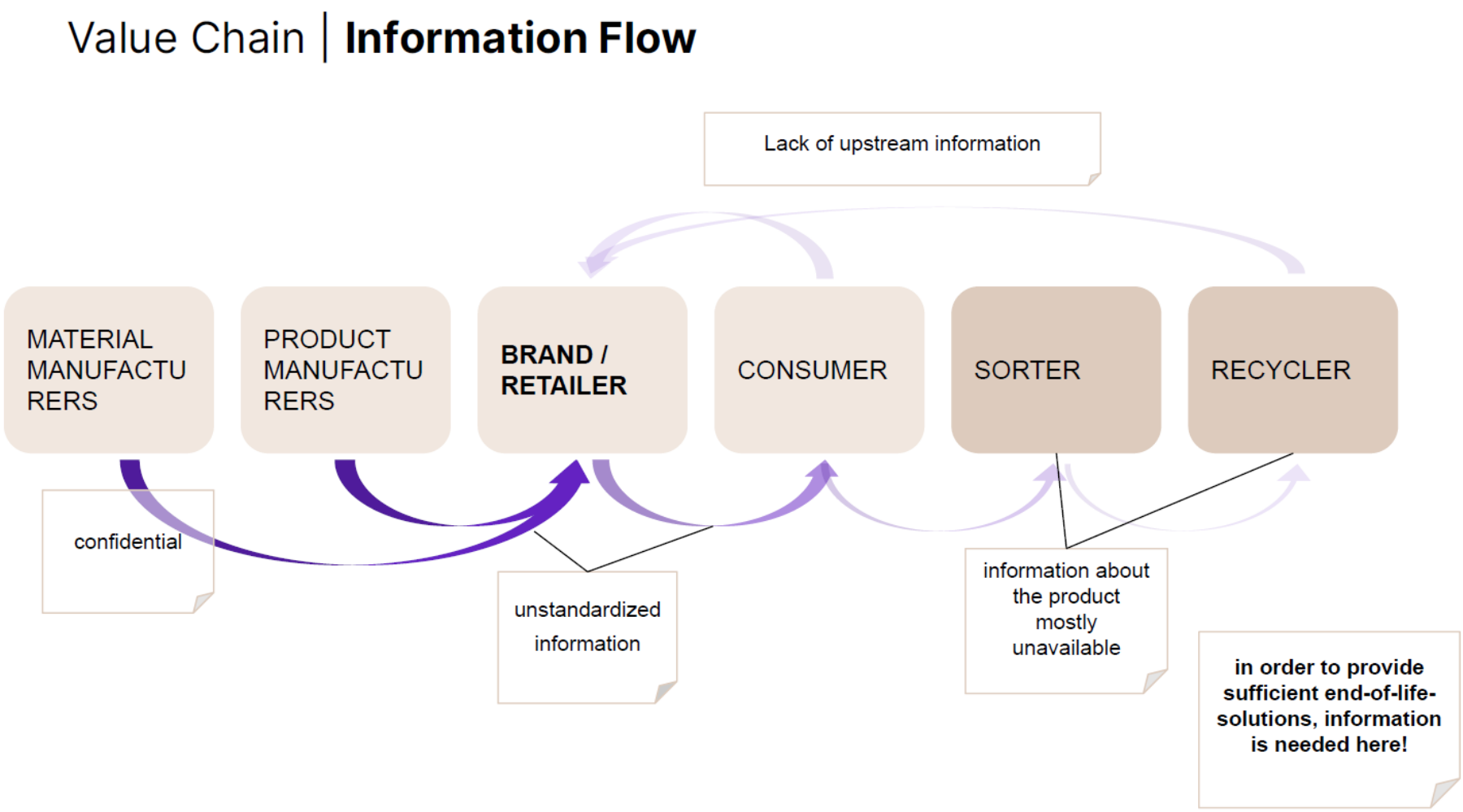



(source: TU Berlin, Circular Fashion 2022)

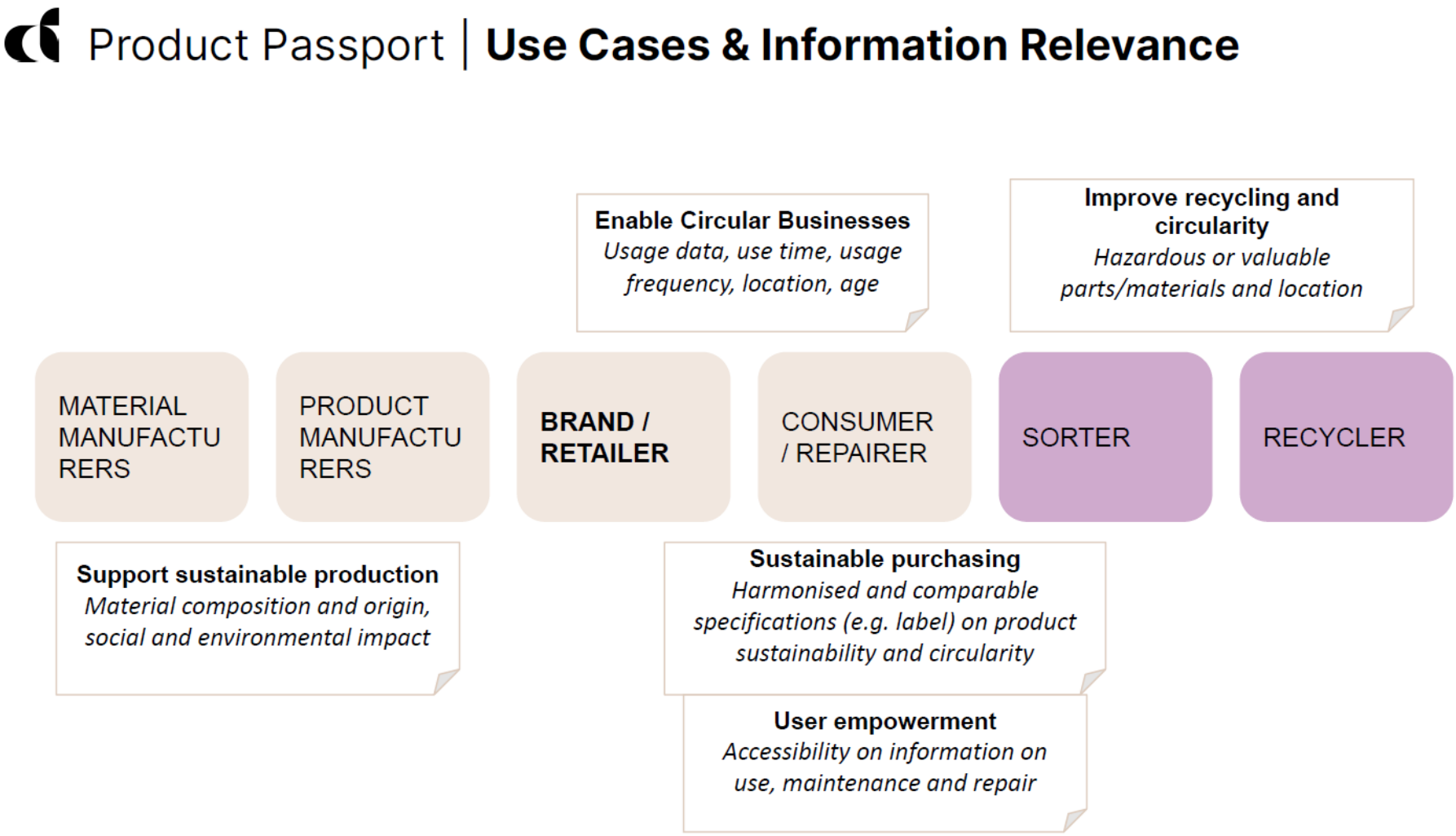
# Project Overview

Product Information 4.0

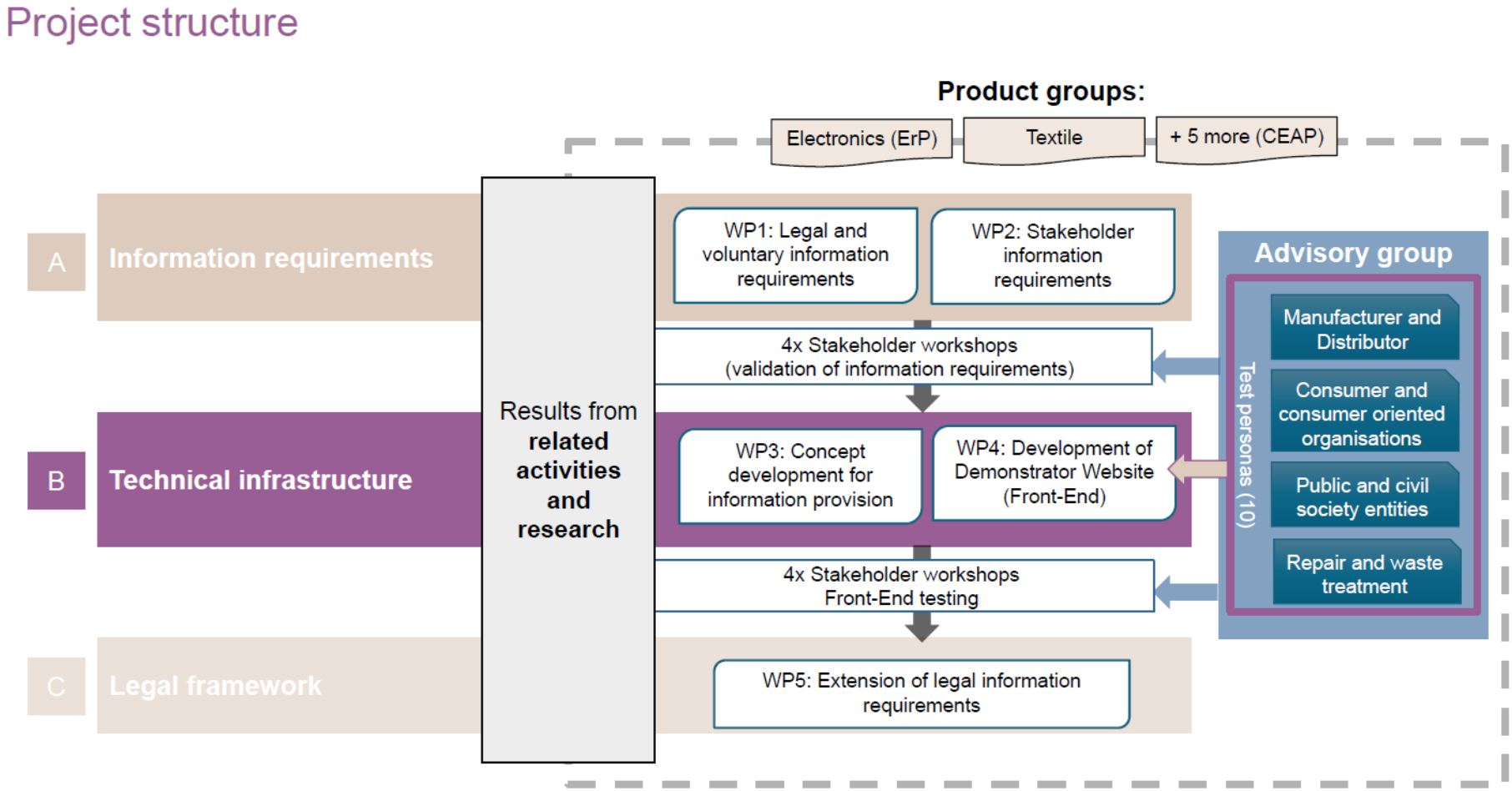
(source: TU Berlin, Circular Fashion 2022)



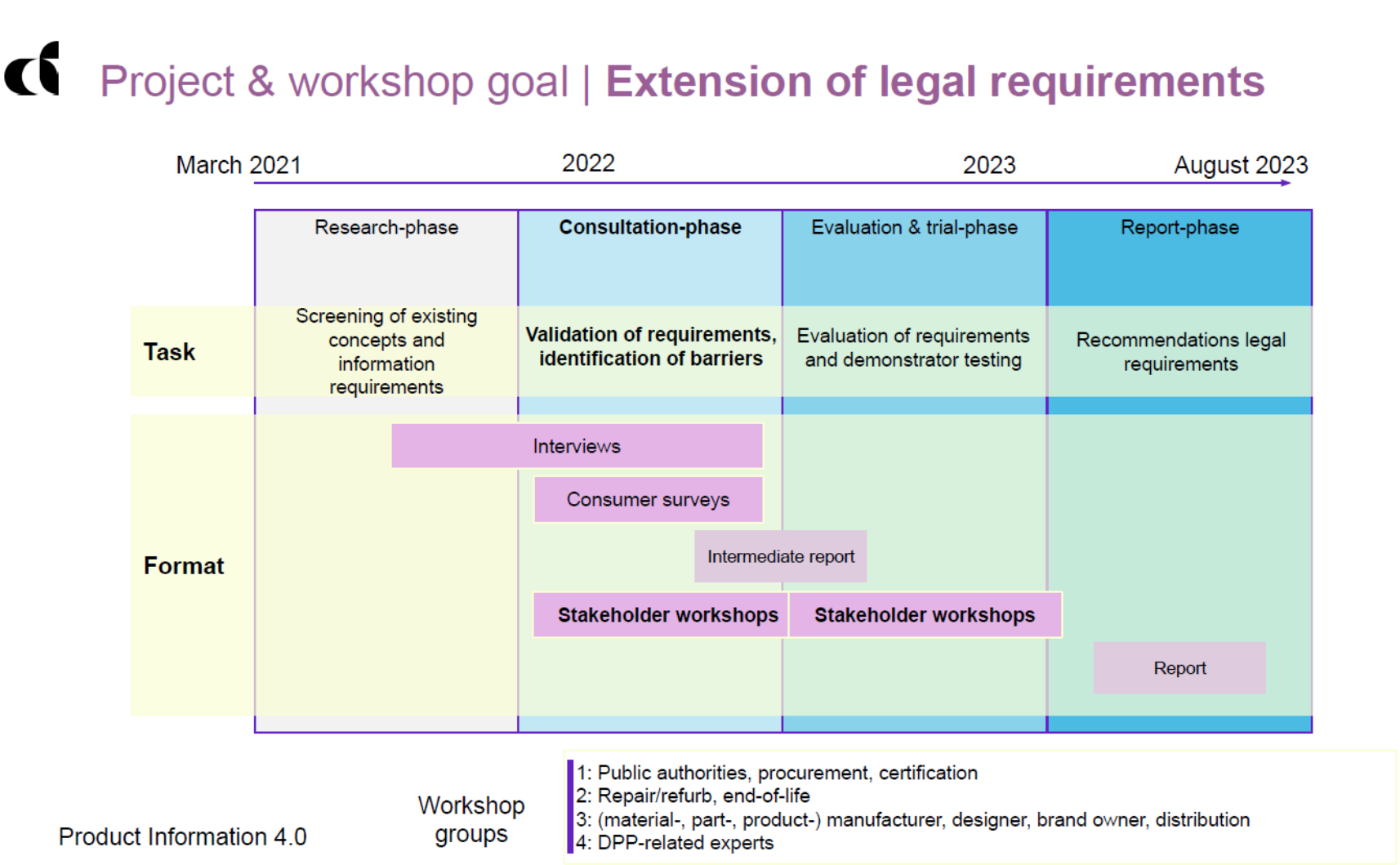

(source: Circular Fashion 2022)



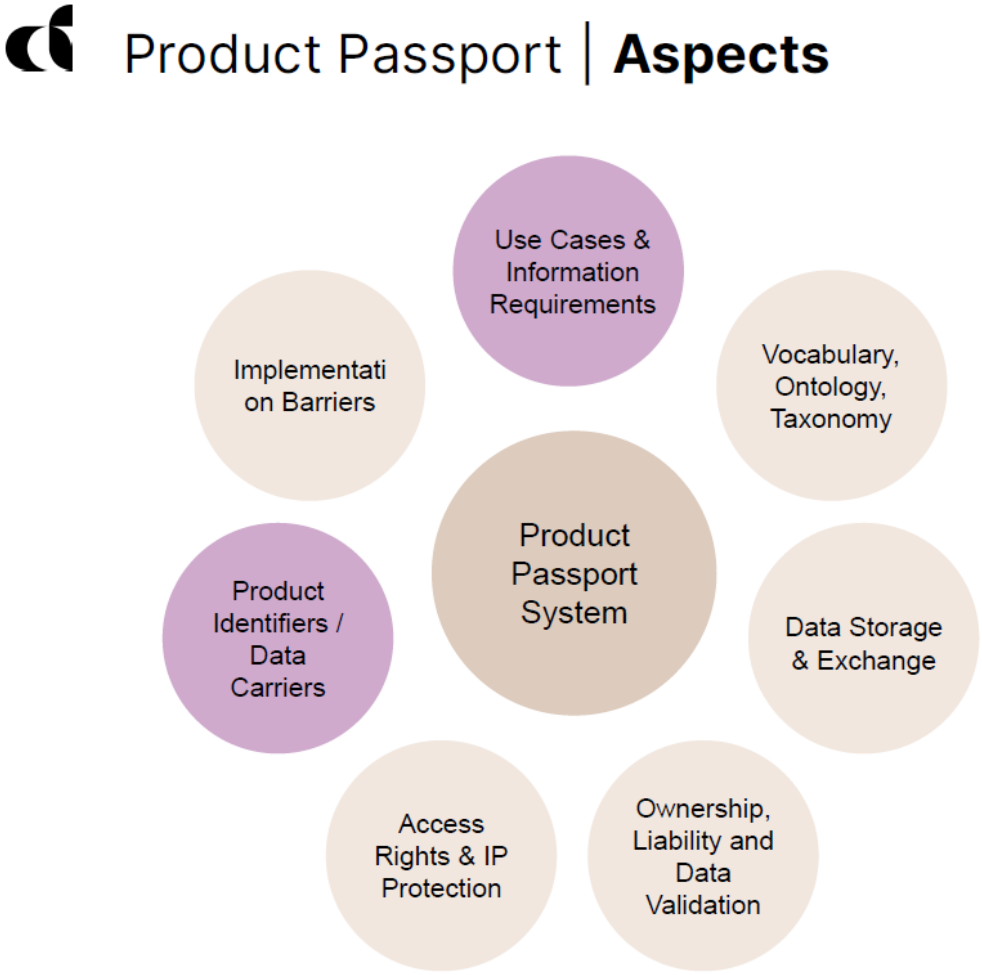

(source: Circular Fashion 2022)

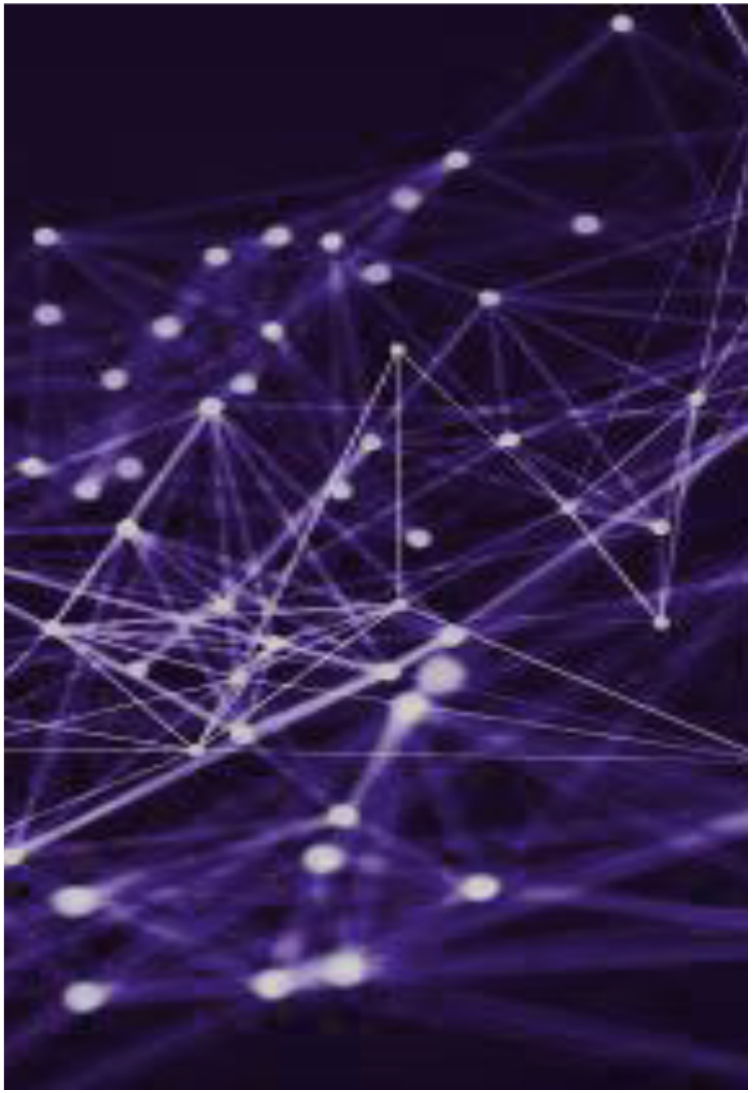



(source: Circular Fashion 2022)




(source: Circular Fashion 2022)



(source: Circular Fashion 2022)

## Product Passport | **Roles and Usage Rights**

**Source** | E.G. MANUFACTURER
has the information due to his activity or is able to produce the information e.g. by measurement or evaluation of other data

**Owner** | E.G. BRAND
usually the addressees of the legal requirements / information obligations and responsible for the publication or entry of the data in the corresponding databases and their correctness

**Custodian** | E.G. DATABASE PROVIDER
often bodies, governmental or private, determined by the information requirements, take the data from owners and make it available to users for use

**User** | E.G. SORTING FACILITY
performs actions with the data that contribute to the goals of the circular economy


(source: Circular Fashion 2022)

## Literature Analysis | **Information Requirements**

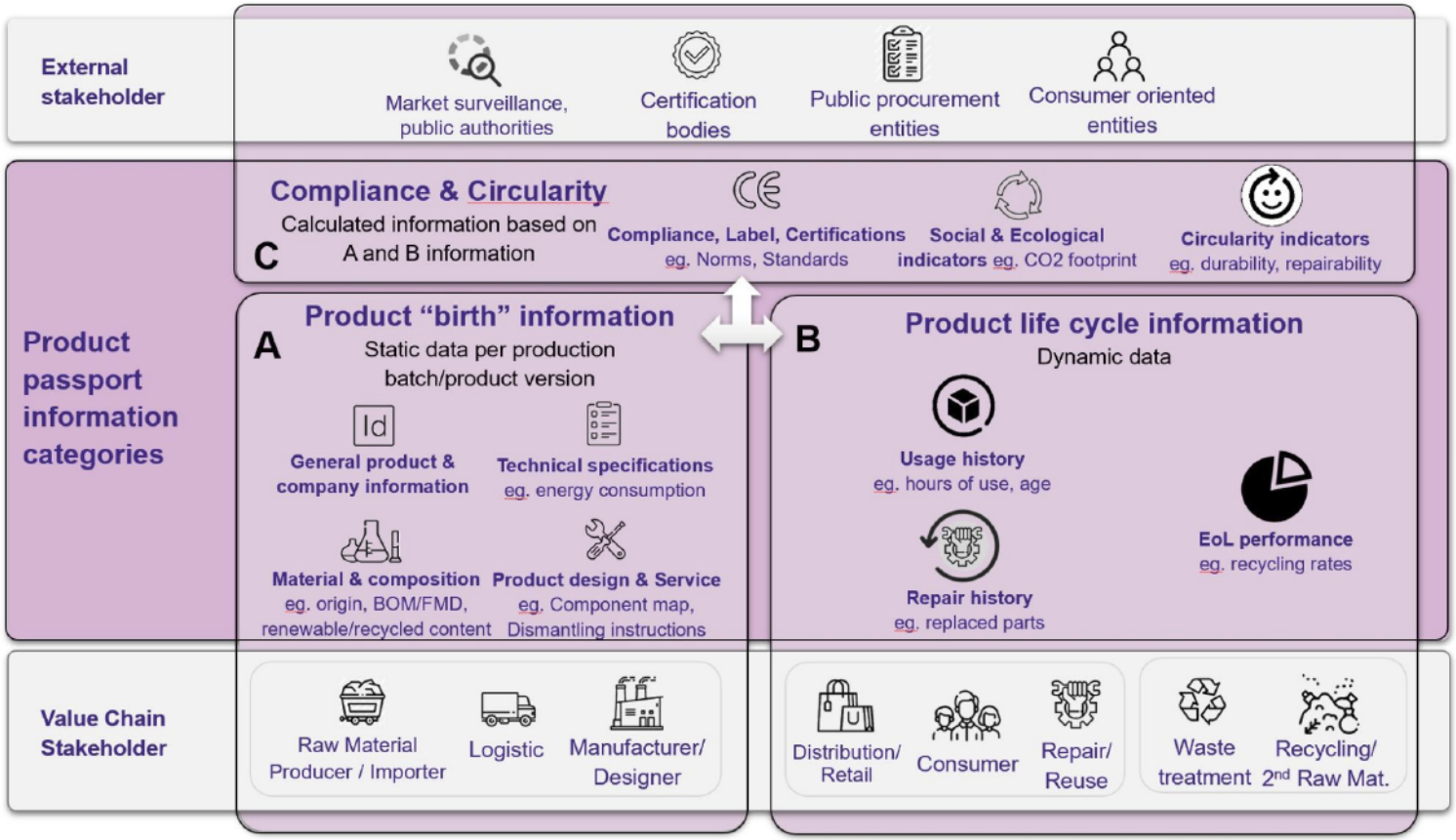
Information gap analysis on 22 explicit legal information requirements in current EU legislation

- Potential **information gaps** and **insufficient level of detail** found in several cases
- When working with upstream stakeholders outside the EU, **data is often unavailable**
- the **accessibility of data** is sometimes limited by complex acquisition processes
- **Heterogenic identification of stakeholders and products**
- **Standardization** of data formats, identification of stakeholders and products and communication media is missing
- **Validation** of information is not explicitly required

Product Information 4.0

(source: Circular Fashion 2022)

# Product Passport | **Use Cases & Information Relevance**



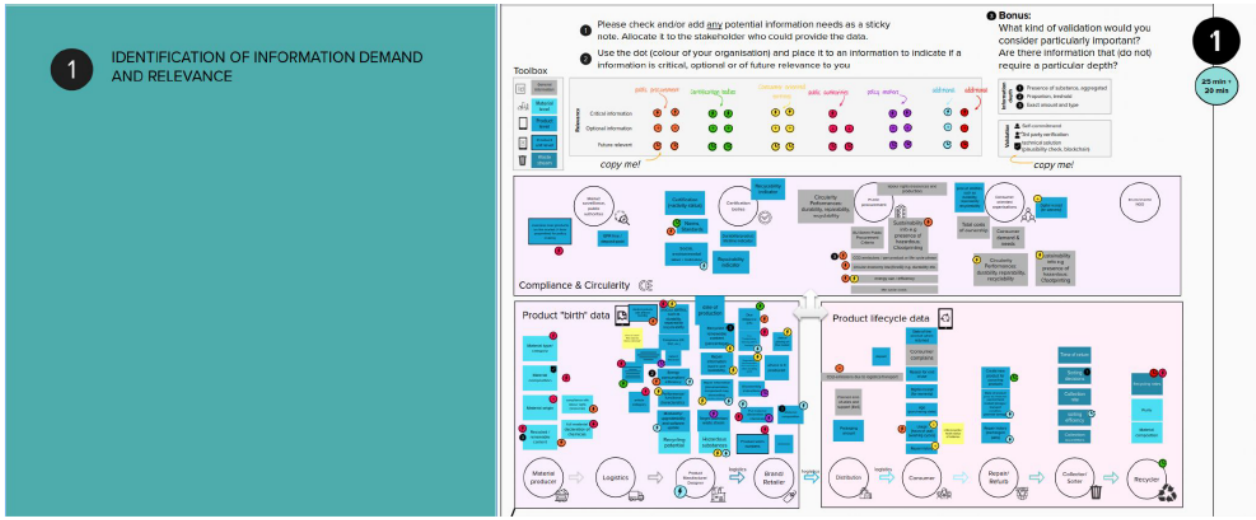

(source: Circular Fashion 2022)

# Stakeholder Workshops

4 groups of stakeholders:

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

+ a workshop with technical experts in product information systems




Product Information 4.0

(source: Circular Fashion 2022)

# Stakeholder Workshops | **Information Requirements**

| Data providing stage | Information category | Data point | N | no | yes | counts | relevance | Covered in legislation |
|---|---|---|---|---|---|---|---|---|
| **Upstream Data (A)** *General info, Tech specs, Materials level, Product level,* | General product & company information | Registered WEEE/fee paid | 9 | 0 | 6 | 6 | 67% | n |
| | | Original sales price | 9 | 2 | 5 | 7 | 56% | n |
| | | Component supplier company details | 9 | 0 | 9 | 9 | 100% | y |
| | | **Supplier sustainability info** | 9 | 0 | 9 | 9 | 100% | n |
| | Technical specifications | **Main functionalities as advertised** | 9 | 0 | 8 | 8 | 89% | n |
| | | Technical parameter | 9 | 0 | 9 | 9 | 100% | y |
| | | Material composition of dismantled faction | 9 | 2 | 3 | 5 | 33% | ~ |
| | | Material composition of shredded faction | 9 | 2 | 4 | 6 | 44% | ~ |
| | Material & composition | **Material origin** | 9 | 1 | 7 | 8 | 78% | ~ |
| | | Hazardous substances | 9 | 0 | 9 | 9 | 100% | y |
| | | **Material composition per component** | 9 | 0 | 9 | 9 | 100% | ~ |
| | | Material composition of product | 9 | 0 | 9 | 9 | 100% | y |
| | | **Recycled content per material** | 9 | 0 | 9 | 9 | 100% | n |
| | | **Recycled content per product** | 9 | 0 | 8 | 8 | 89% | n |
| | | Recycled material origin | 9 | 0 | 1 | 1 | 11% | n |
| | Product design & Service | Repair information (spare part availability, documentation, component map, dismantling instructions) | 9 | 0 | 8 | 8 | 89% | y |
| | | **Design for reuse/refurbishment/repair** | 9 | 0 | 7 | 7 | 78% | n |
| | | **Component map (name/ID)** | 9 | 0 | 7 | 7 | 78% | n |
| | | **Durability test results** | 9 | 0 | 9 | 9 | 100% | n |
| | | **Design for longevity/durability score** | 9 | 0 | 9 | 9 | 100% | n |
| **Downstream Data (B)** *Usage, Product history, End of Use* | | **Usage (hours of use, washing cycles)** | 9 | 1 | 6 | 7 | 67% | n |
| | | **Repair history (exchanged parts)** | 9 | 2 | 6 | 8 | 67% | n |
| | | **Purchase date** | 9 | 2 | 7 | 9 | 78% | n |
| | | **Feedback from users** | 9 | 0 | 8 | 8 | 89% | n |
| | | Product condition when recycled | 9 | 0 | 5 | 5 | 56% | n |
| | | **product condition when repaired** | 9 | 1 | 7 | 8 | 78% | n |
| | | **product condition when reused/resold** | 9 | 1 | 6 | 7 | 67% | n |
| | | Date of recycling | 9 | 1 | 5 | 6 | 56% | n |
| | | **Recycling performance** | 9 | 0 | 8 | 8 | 89% | n |
| **Circularity** *Social Impact, Environmental impact, Certifications* | | Digital receipt (for warranty) | 9 | 0 | 1 | 1 | 11% | n |
| | | **LCA of goods/services** | 9 | 0 | 7 | 7 | 78% | ~ |
| | | **Sustainability certificates** | 9 | 0 | 9 | 9 | 100% | n |
| | | Biodegradability | 9 | 2 | 5 | 7 | 56% | n |
| | | Recyclability score | 9 | 0 | 1 | 1 | 11% | n |

- **Textiles**
  - Brand/Designer Requirements:
    - Information needed for compliance
    - Validation barrier
  - Retail requirements:
    - material composition, recycled content, hazardous substances
    - Sustainability certificates
    - Buyback options
- **Electronics**
  - Manufacturer/brand
    - Validation barrier
    - Material origin
  - Retail and distribution
    - Overload of information for consumers, need for aggregated and comparable information

Participants: producers, manufacturers, retailers, distributors

Product Information 4.0

(source:Circular Fashion 2022)

# Stakeholder Workshops | **Information Requirements**

| Data providing stage | Information category | Data point | N | no | yes | counts | relevance | Covered in legislation |
|---|---|---|---|---|---|---|---|---|
| Upstream Data (A) General info., Tech specs, Materials level, Product level | General product & company information | Product sales numbers (products put on the market) | 7 | 0 | 3 | 3 | 43% | n |
| | | Identical products with diff. branding (white label products) | 7 | 0 | 1 | 1 | 14% | n |
| | | Place of production and assembly | 7 | 0 | 1 | 1 | 14% | not SMEs |
| | | Date of placing on market | 7 | 0 | 2 | 2 | 29% | n |
| | Technical specifications | Product performance /characteristics/abilities (e.g. energy consumption) | 7 | 0 | 5 | 5 | 71% | y (electronics) |
| | Material & composition | Material type/category | 7 | 0 | 2 | 2 | 29% | y |
| | | Material origin | 7 | 0 | 2 | 2 | 29% | 3GTs importer |
| | | Recycled/renewable content (percentage) | 7 | 0 | 4 | 4 | 57% | n |
| | | Full material declaration of chemicals | 7 | 0 | 4 | 4 | 57% | n |
| | | Hazardous substances | 7 | 0 | 4 | 4 | 57% | y |
| | | Ingredients in products, ideally with comprehensive BOM, but with phasing in stages, starting with most important data | 7 | 0 | 2 | 2 | 29% | if hazardous |
| | Product design & Service | Alternative ways to identify products in waste stream (for AI recognition/marker) | 7 | 0 | 2 | 2 | 29% | n |
| | | Modularity/upgradeability and software update | 7 | 0 | 2 | 2 | 29% | some product groups |
| | | Recycling potential | 7 | 0 | 2 | 2 | 29% | n |
| | | Repair information (spare part availability, documentation, component map) | 7 | 0 | 3 | 3 | 43% | for prof. repair |
| | | Target collection/waste stream | 7 | 0 | 1 | 1 | 14% | n |
| | | Fitness for use | 7 | 0 | 1 | 1 | 14% | n |
| | | Disassembly instructions | 7 | 0 | 2 | 2 | 29% | for waste treatment |
| Downstream Data (B) *Usage, Product History, End of Use* | | Usage (hours of use), (washing cycles) | 7 | 0 | 2 | 2 | 29% | n |
| | | Repair history (exchanged parts) | 7 | 0 | 2 | 2 | 29% | n |
| | | Create new product for upcycling products | 7 | 0 | 1 | 1 | 14% | n |
| | | Condition (state of product prior to refurb for second hand market (storage / transport condition, potential damage) | 7 | 0 | 1 | 1 | 14% | n |
| | | Sorting efficiency | 7 | 0 | 1 | 1 | 14% | n |
| | | Digital receipt (for warranty) | 7 | 0 | 1 | 1 | 14% | n |
| | | Recycling rates | 7 | 0 | 3 | 3 | 43% | to EC |
| Circularity *Social Impact, Environmental impact, Certifications* | | Norms, Standards, Regulations | 7 | 0 | 3 | 3 | 43% | n |
| | | Expected life time/extended free warranty or other durability performance | 7 | 0 | 2 | 2 | 29% | n |
| | | Compliance with labour rights | 7 | 0 | 2 | 2 | 29% | not SMEs |
| | | Environmental footprinting (e.g. CO2-emissions) of goods/services | 7 | 0 | 2 | 2 | 29% | n |
| | | Energy Efficiency Indicator | 7 | 0 | 2 | 2 | 29% | y |
| | | Circularity Performances: durability, reparability, recyclability (RrwG) | 7 | 0 | 3 | 3 | 43% | n |
| | | Due diligence info | 7 | 0 | 2 | 2 | 29% | not SMEs |

Market Surveillance & Governance

| Data providing stage | Information category | Data point | N | no | yes | counts | weighted relevance |
|---|---|---|---|---|---|---|---|
| Upstream Data (A) *General info., Tech specs, Materials level, Product level,* | General product & company information | Field of usage | 12 | 4 | 4 | 8 | 33% |
| | | Manufacturer name | 12 | 3 | 7 | 10 | 58% |
| | | Company information | 12 | 3 | 6 | 9 | 50% |
| | | Product name/identifier | 12 | 5 | 4 | 9 | 33% |
| | | Original sales price | 12 | 5 | 3 | 8 | 25% |
| | | Product category and type | 12 | 2 | 9 | 11 | 75% |
| | | Product attributes (size/weight/colour) | 12 | 1 | 10 | 11 | 83% |
| | | Product description | 12 | 4 | 6 | 10 | 50% |
| | Technical specifications | Warranty information | 12 | 4 | 6 | 10 | 50% |
| | | Product photos | 12 | 6 | 4 | 10 | 33% |
| | | Performance (e.g. hydrostatic head) | 12 | 0 | 2 | 2 | 17% |
| | Material & composition | Material origin | 12 | 3 | 5 | 8 | 42% |
| | | Recycled/renewable content (percentage) | 12 | 0 | 1 | 1 | 8% |
| | | Hazardous substances | 12 | 0 | 8 | 8 | 67% |
| | | Component weight | 12 | 3 | 6 | 9 | 50% |
| | | **Chemical content** | 12 | 1 | 8 | 9 | 67% |
| | | Location of hazardous substances in product | 12 | 0 | 1 | 1 | 8% |
| | | Staple fibre length | 12 | 6 | 3 | 9 | 25% |
| | | **Material properties** | 12 | 2 | 8 | 10 | 67% |
| | | **Material composition per component** | 12 | 0 | 10 | 10 | 83% |
| | | **Material composition of product** | 12 | 2 | 8 | 10 | 67% |
| | | Recycled content per material | 12 | 3 | 5 | 8 | 42% |
| | Product design & Service | Repair information (spare part availability, documentation, component map, dismantling instructions) | 12 | 2 | 7 | 9 | 58% |
| | | Durability indicator - (Expected life time/extended free warranty or other durability performance) | 12 | 2 | 7 | 9 | 58% |
| | | Disassembly instructions | 12 | 4 | 5 | 9 | 42% |
| | | Available recycling/waste stream | 12 | 0 | 1 | 1 | 8% |
| | | Design for reuse/refurbishment/repairability | 12 | 2 | 7 | 9 | 58% |
| | | Maintenance instructions (textile: care instructions) | 12 | 3 | 5 | 8 | 42% |
| | | Professional care labelling | 12 | 0 | 1 | 1 | 8% |
| Product lifecycle data *Usage, Product History, End of Use* | | Usage (hours of use), (washing cycles) | 12 | 1 | 7 | 8 | 58% |
| | | Repair history (exchanged parts) | 12 | 3 | 5 | 8 | 42% |
| | | Condition (state of product prior to refurb for second hand market (storage / transport condition, potential damage) | 12 | 2 | 7 | 9 | 58% |
| | | **Instructions for disposal/takeback** | 12 | 0 | 8 | 8 | 67% |
| Circularity *Social Impact, Environmental Impact, Certifications* | | LCA of goods/services | 12 | 5 | 3 | 8 | 25% |
| | | Availability of recycling/waste streams | 12 | 2 | 6 | 8 | 50% |
| | | Sustainability certificates | 12 | 3 | 7 | 10 | 58% |
| | | Biodegradability | 12 | 5 | 2 | 7 | 17% |
| | | Recyclability score | 12 | 2 | 6 | 8 | 50% |

Textile
Downstream Supply Chain

| Data providing stage | Information category | Data point | N | no | yes | counts | relevance | Covered in legislation |
|---|---|---|---|---|---|---|---|---|
| Upstream Data (A) *General info., Tech specs, Materials level, Product level,* | General product & company information | Registered WEEE/fee paid | 9 | 0 | 6 | 6 | 67% | n |
| | | Original sales price | 9 | 2 | 5 | 7 | 56% | n |
| | | Component supplier company details | 9 | 0 | 9 | 9 | 100% | y |
| | | **Supplier sustainability info** | 9 | 0 | 9 | 9 | 100% | n |
| | Technical specifications | **Main functionalities as advertised** | 9 | 0 | 8 | 8 | 89% | n |
| | | Technical parameter | 9 | 0 | 9 | 9 | 100% | y |
| | | Material composition of dismantled faction | 9 | 2 | 3 | 5 | 33% | ~ |
| | | Material composition of shredded faction | 9 | 2 | 4 | 6 | 44% | ~ |
| | Material & composition | **Material origin** | 9 | 1 | 7 | 8 | 78% | ~ |
| | | Hazardous substances | 9 | 0 | 9 | 9 | 100% | y |
| | | **Material composition per component** | 9 | 0 | 9 | 9 | 100% | ~ |
| | | Material composition of product | 9 | 0 | 9 | 9 | 100% | y |
| | | **Recycled content per material** | 9 | 0 | 9 | 9 | 100% | n |
| | | **Recycled content per product** | 9 | 0 | 8 | 8 | 89% | n |
| | | Recycled material origin | 9 | 0 | 1 | 1 | 11% | n |
| | Product design & Service | Repair information (spare part availability, documentation, component map, dismantling instructions) | 9 | 0 | 8 | 8 | 89% | y |
| | | **Design for reuse/refurbishment/repair** | 9 | 0 | 7 | 7 | 78% | n |
| | | **Component map (name/ID)** | 9 | 0 | 7 | 7 | 78% | n |
| | | **Durability test results** | 9 | 0 | 9 | 9 | 100% | n |
| | | **Design for longevity/durability score** | 9 | 0 | 9 | 9 | 100% | n |
| Downstream Data (B) *Usage, Product History, End of Use* | | **Usage (hours of use, washing cycles)** | 9 | 1 | 6 | 7 | 67% | n |
| | | **Repair history (exchanged parts)** | 9 | 2 | 6 | 8 | 67% | n |
| | | **Purchase date** | 9 | 2 | 7 | 9 | 78% | n |
| | | **Feedback from users** | 9 | 0 | 8 | 8 | 89% | n |
| | | Product condition when recycled | 9 | 0 | 5 | 5 | 56% | n |
| | | **product condition when repaired** | 9 | 1 | 7 | 8 | 78% | n |
| | | **product condition when reused/resold** | 9 | 1 | 6 | 7 | 67% | n |
| | | Date of recycling | 9 | 1 | 5 | 6 | 56% | n |
| | | **Recycling performance** | 9 | 0 | 8 | 8 | 89% | n |
| Circularity *Social Impact, Environmental Impact, Certifications* | | Digital receipt (for warranty) | 9 | 0 | 1 | 1 | 11% | n |
| | | **LCA of goods/services** | 9 | 0 | 7 | 7 | 78% | ~ |
| | | **Sustainability certificates** | 9 | 0 | 9 | 9 | 100% | n |
| | | Biodegradability | 9 | 2 | 5 | 7 | 56% | n |
| | | Recyclability score | 9 | 0 | 1 | 1 | 11% | n |

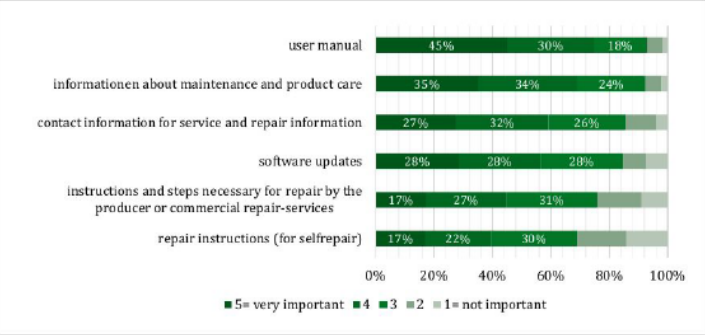
Electronics
Upstream Supply Chain

(source: Circular Fashion 2022)

# Consumer Survey | **Information Requirements**

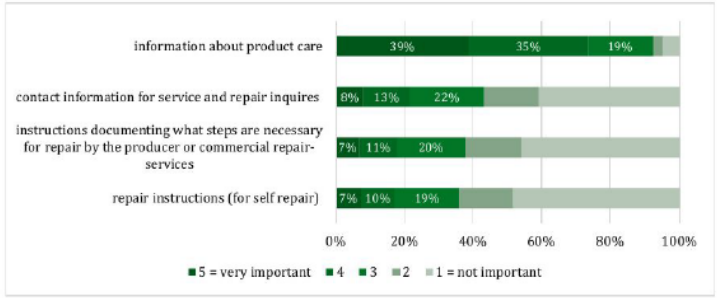
What information is important to you when using a product?

## Electronics




Relative importance of information regarding the use phase of an electronic product (N=1001). Multiple answers are possible. Source: Technical University Berlin 2022

## Textiles




Relative importance of information regarding the use phase of clothing (N=1001). Multiple answers are possible. Source: Technical University Berlin 2022

Participants: 1001 consumers

Product Information 4.0

(source: Circular Fashion 2022)

# Stakeholder Workshops | **User Groups**

| | | supply chain | | | | | in-use | | | | end of life | | | | | certification | data storage providers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | producers and manufacturers of raw materials, trims, textiles, dyes etc. | manufacturers of products | brands/ designers | retail | workwear providers | rental services | repair services | laundry services | consumers | collectors | sorters | reuse parties | recyclers | waste management | certification bodies | data storage and information system providers |
| **general manufacturer and product information** | product category | | | data source<br>data owners | | | | | | | | data users | | data users | | | data custodians |
| | product type | | | data source<br>data owners | | | | | | | | data users | | data users | | | data custodians |
| **technical specifications** | product description | | | data source<br>data owners | data users | | | | | | | | | | | | data custodians |
| | warranty information | | | | data users | | | | | data users | | | | | | | data custodians |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | | data source | data owners | data users | | | data users | | | data users | data users | data users | data users | | | data custodians |
| **material & composition** | recycled content | data source | data users | data owners | | | | | | data users | | | | | | | data custodians |
| | material properties<br>- color<br>- water properties | data source | | data owners | | | | | | | | data users | | data users | | | data custodians |
| | full material declaration of chemicals | data source | data source | data owners | | | | | | | | | | | | | data custodians |
| | staple fibre lenght | data source | | data owners | | | | | | | | | | | | | data custodians |
| | material quality information (durability) | | | data owners | | | | | | | | | | | | data source | data custodians |
| | material origin | data source<br>data owners ? | | data owners ? | | | | | | | | data users | | data users | | | data custodians |
| **product design & service** | design for reuse/ refurbishment / repairability | | | data source<br>data owners | | | | data users | | data users | | | data users | | | | data custodians |
| | design for longevity | | | data source<br>data owners | | | | data users | | data users | | | data users | | | | data custodians |
| | durability test results | data users | data users | data source<br>data owners | | | | | | | | | | | | data source | data custodians |
| | care instructions | | data source? | data source<br>data owners | | | | | data users | data users | | | | | | | data custodians |
| | instructions for disposal and take-back | | | data source?<br>data owners | | | | data users | | data users | data source? | | data users | | | | data custodians |
| **Downstream data (usage, product history, ...)** | usage (washing cycles) | data users | data users | | | | | | | data source<br>data owners | | | | | | | data custodians |
| | repair history | data users | data users | | | | | data source | | data source | | | | | | | data custodians |
| | purchase date | | | | data source<br>data owners? | | | data users | | data owners? | | data users | data users | | | | data custodians |
| **circularity** | environmental footprint | | data users | | | | | | | | | | | | | data source,<br>data users | data custodians |
| | LCA of goods/services | | | | | | | | | | | | | | | data source | data custodians |
| | sustainability certificates | | | | | | | | | | | | | | | data source | data custodians |
| | biodegradability | | | | | | | | | | | data users | | data users | | data source | data custodians |
| | restricted substances list (e.g. AFIRM) | | ? | data source? | | | | | | | | | | | | data source? | data custodians |

(source: TU Berlin, Circular Fashion 2022)

# Presentation of the Demonstrator

1. **Presentation of the mockups**
2. **Presentation of the interaction with the product**
3. **Klick-through**
4. **Feedback forms**
5. **Discussion**

*We will send the links for the feedback forms in the chat and via mail.*

*Please take your time with the feedback, you can send it in **until end of next week**.*

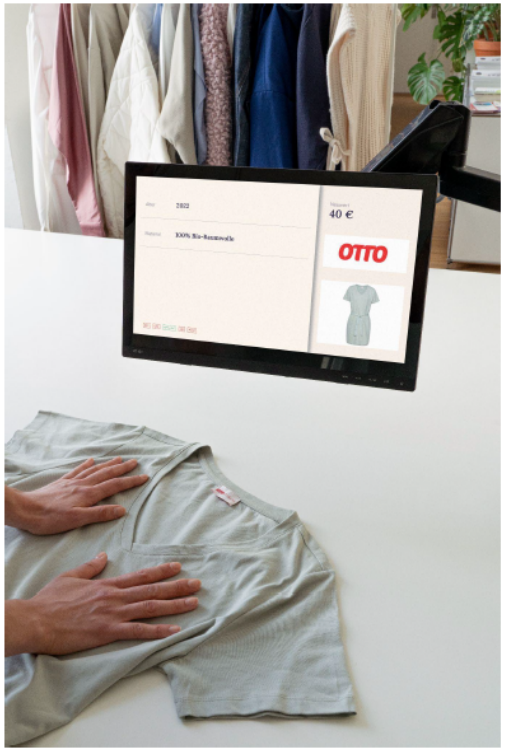
*Feel free to **share the links** with interested colleagues!*

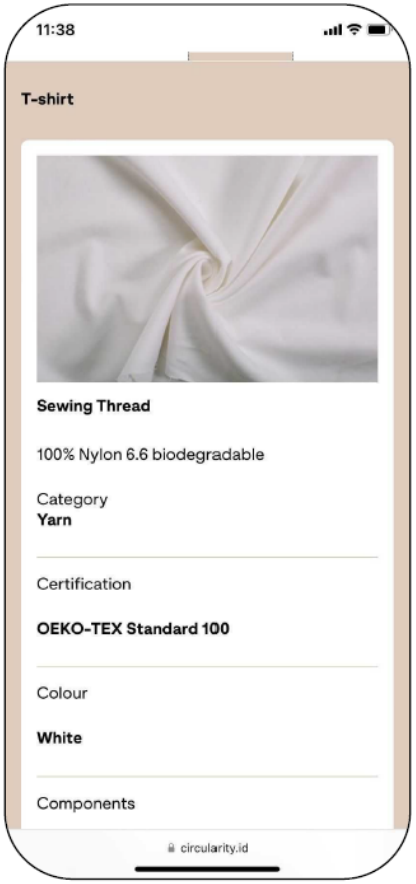
Product Information 4.0

(source: TU Berlin, Circular Fashion 2022)

# Connection to 3rd party services

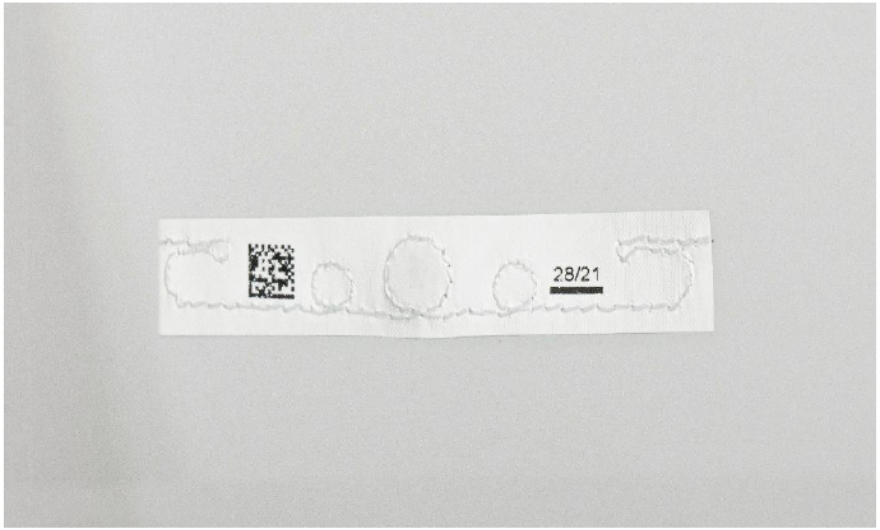

```
"product_category": "clothing",
"product_type": "shirt",
"size_metric": "international",
"size": "XS-XL",
"weight": 200.0,
"weight_unit": "g",
"disassembly_instructions_sorters": "remove buttons",
"disassembly_instructions_user": "",
"certification": [
  {
    "id": 23,
    "certification_type": "grs_global_recycled_standard",
    "file_data": null
  }
],
"assemblies": [
  {
    "id": 82,
    "name": "Polyester",
    "materials": [
      {
        "id": 413,
        "components": [
          {
            "id": 459,
            "component_name": null,
            "content": "polyester",
            "percentage": 100.0,
            "is_recycled": false,
            "source_recycled_input": null,
            "source_raw_material": null,
            "steps": [],
            "part": null
          }
        ],
        "steps": [],
        "thumbnail": null,
        "technical_data_sheet": null,
```

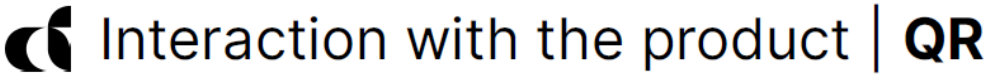

(source: Circular Fashion 2022)

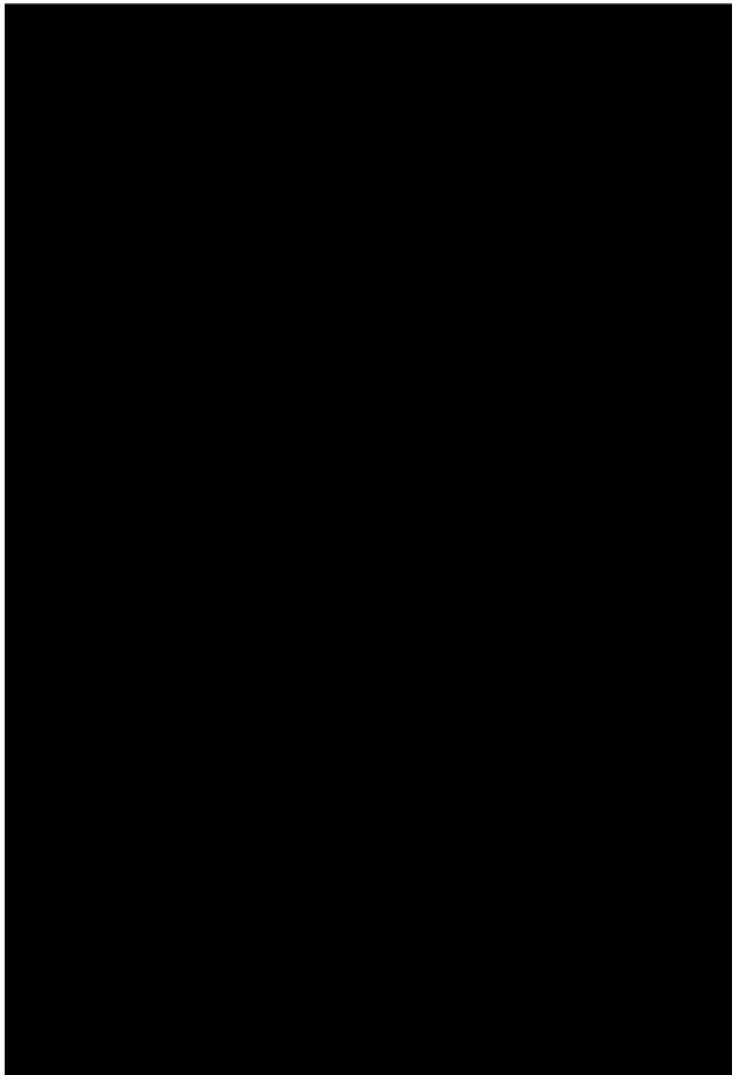
## Interaction with the product | **RFID**




[redacted]

(source: Circular Fashion 2022)



(source: Circular Fashion 2022)

# Presentation of the Feedback process

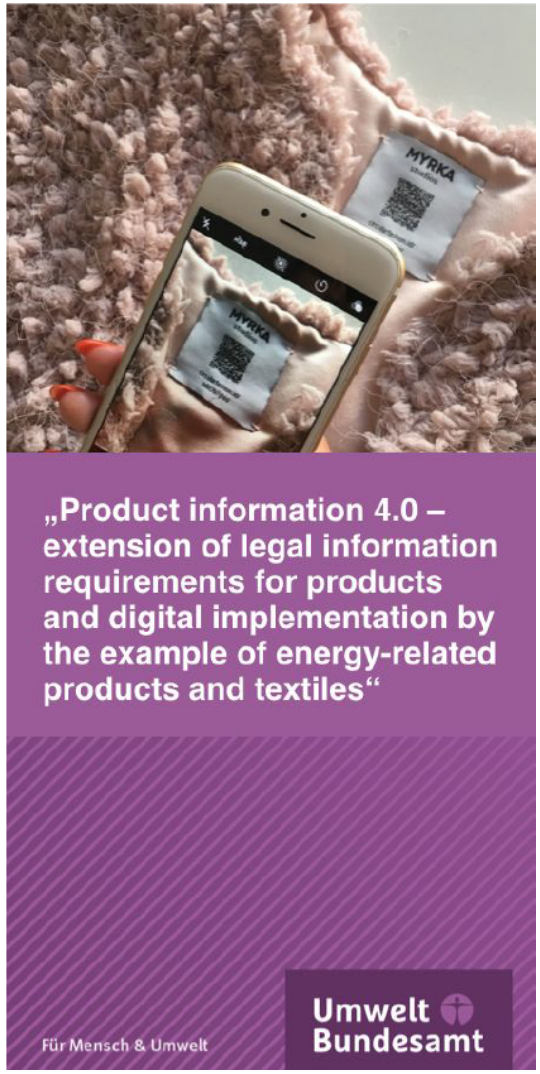
Product Information 4.0

(source: TU Berlin, Circular Fashion 2022)

# Thank you for your participation!

Please provide your feedback via useberry until the end of next week
Please share the link with interested colleagues!

Product Information 4.0




(source: TU Berlin, Circular Fashion 2022)

### A.3.7 Results Frontend Demonstrator Workshop

## Design

#### Design Process

The data collected through earlier research sessions was analyzed. Further desk research and stakeholder feedback was undertaken in order to specify the exact data that should appear in the Demonstrator prototype. The overall design approach was to include good navigation and wayfinding through the interface, and ensure that the data was applicable and appropriate to the product types and user personas being tested. After sketching and potential layouts, the final layout was decided in collaboration with internal feedback. Hi-fidelity mockups of the screens were then created in Figma, an interface design tool (www.figma.com). After internal review of these mockups, a clickable prototype of the digital product passport demonstrator was then created.

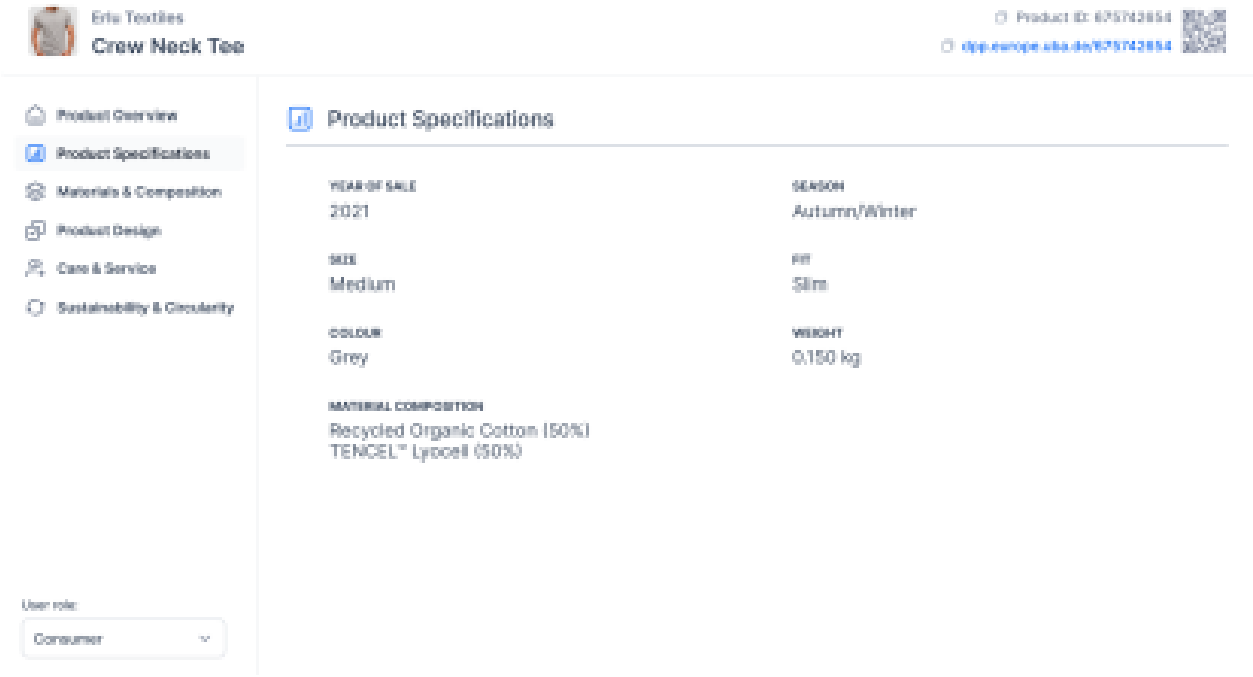
#### Navigation Design

The Demonstrator features global navigation in a left sidebar menu that remains consistent across all pages of the interface. A topbar also provides the main product information - Image Thumbnail, Brand, Product Name, ID and a direct link (URL). In the bottom left is an option for changing the user profile role – this would not appear in a live version of the DPP but was included to allow feedback from users on different profile views during testing.

### Menu Items

#### Electronics Textiles

- Product Overview
- Product Overview
- Technical Specifications
- Product Specifications
- Materials and Composition
- Materials and Composition
- Product Design and Manuals
- Product Design
- Usage and History
- Care and Service
- Warranty and Service
- Sustainability and Circularity
- Sustainability and Circularity




Global navigation on top and left.

### Product Overview

The Product Overview provides the basic details of each product, including product images, identifiers, brand information and product categories. For the Demonstrator prototype of the refrigerator, the data used came from the information provided for a similar product in the European Product Registry for Energy Labelling (EPREL) database.

### Product / Technical Specifications

The Specifications pages show more detailed technical information for each product. For the Demonstrator prototype of the refrigerator, the data used came from the information provided for a similar product in the EPREL database. In this case the textile and electronic mockups feature different layouts to take into account the different types and details of information available for each.

The EU Energy rating label and WEEE disposal notices were also included here.

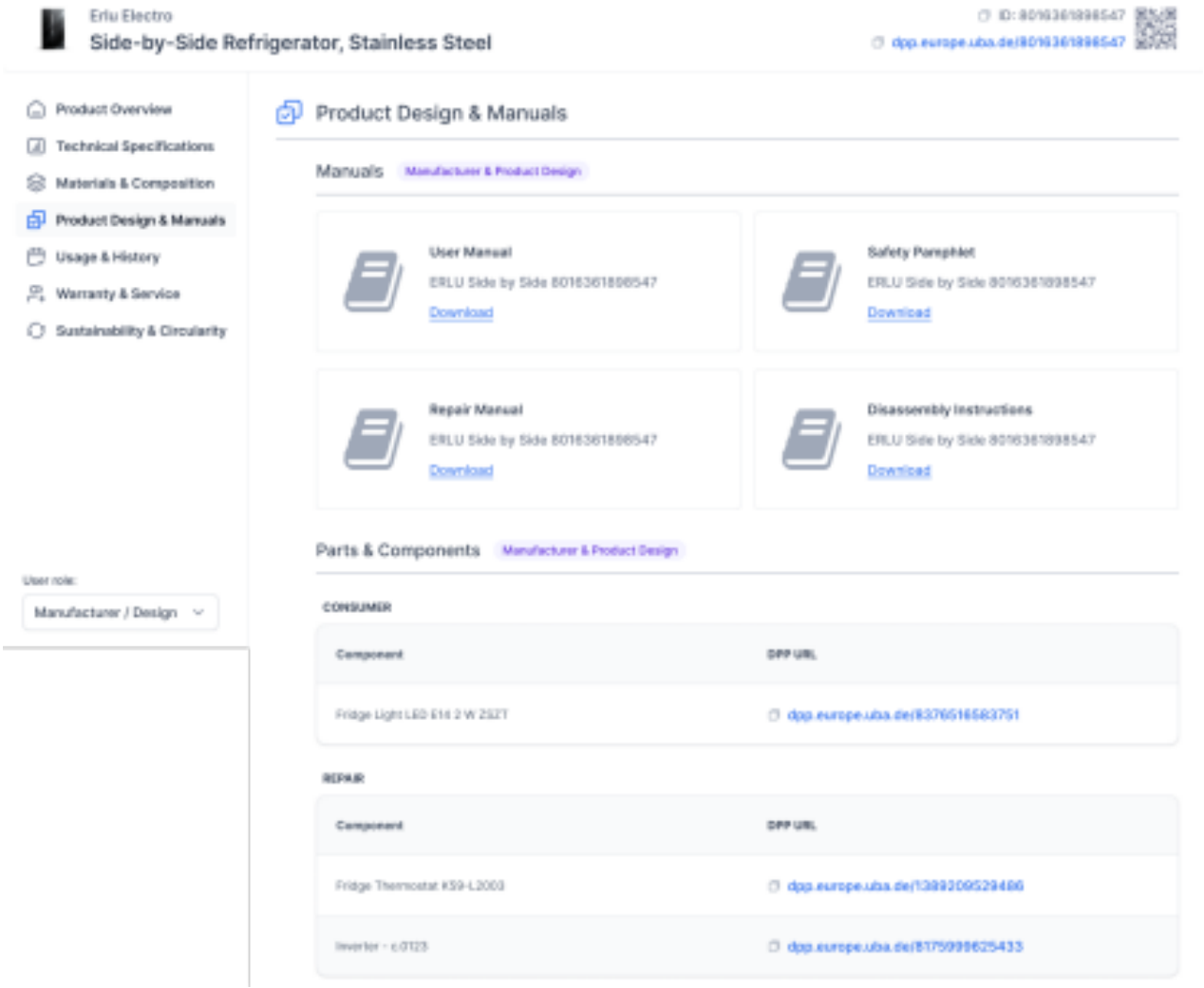

A table format made more sense for the numerous technical specifications associated with refrigerators (and other electronics). Sample Data was sourced from the EPREL Database.

### Materials and Composition

The Materials and Composition section features information related to the materials. For textiles, this includes the fabric type, recycled content information, material durability test results and safety information. For the electronic item, there is a list of components, information on recycled content, hazardous materials and a full material declaration.

### Product Design and Manuals

The Product Design page was intended to give details about how the product was designed and in particular how it was designed for circularity. Here users can find information regarding durability and disassembly as well as lists and links to spare parts and user manuals.




### Usage and History

Usage and History was only included in the electronic prototype and features information about the lifecycle of the product. With serialised identifiers, information like sale history and repairs could be added to a product's history.

#### Warranty and Service / Care and Service

The Service pages were mainly intended to give consumers information about how they could care for, repair and dispose of their product in the best way. It includes details from brands about potential takeback systems, WEEE information and a Service Finder where users can search for repair and recycling operators. The hierarchy of the page prioritises product reuse and repair over recycling and disposal.

#### Sustainability and Circularity

The Sustainability and Circularity page features information related to environmental impact and Sustainability Certificates. Detailed data from an LCA/PEF was included in order to evaluate whether this was understandable and/or valuable to users.

## Research

#### Goal

The goal of the research was to evaluate the DPP Demonstrator with representative users for usability and usefulness of the interface and assess the relevance and value of the information provided.

#### Methodology

A combination of applied UX research methods aimed at providing insights for future design decisions were undertaken. The approach included a remote prototype usability test combined with a survey to gather observational data and qualitative feedback from users. Heatmap analysis was used to identify patterns in user flows and assess navigation as well as identify potential areas for improvement. Qualitative data was collated and synthesised to uncover trends, insights and core themes.

#### Limitations

The research questions were not intended to yield quantitative results and as such, no statistical conclusions should be made. The survey sample size was too small and not representative of the overall industry to make definitive judgements based on the number of responses. The purpose was to gain insights from relevant users to evaluate the current state of the interface and inform future iterations. Nonetheless, in the future, decisions should be validated through both representative quantitative analysis and further qualitative research.

#### Results / Findings

Task Completion (All Participants/Workshops)

More than 90% of users stated that they could successfully use the interface and that it was easy or very easy to navigate. There were delays for some users in loading the Figma prototype/Useberry survey and these negatively affected the record metrics.

#### Key observations

- Users were able to navigate around the interface and find information easily
- Some information was too detailed or technical for consumers and was not well understood
- Some information needs comparison or more context

- Users wanted to have a quick understanding of how green a product was
- Users wanted to know how they could trust the information
- Users did not want to give up access to detailed info
- Detailed information helped users to trust
- Users (particularly consumers) wanted traceability through the supply chain sought more specificity on environmental impacts at each production
- More general information raised suspicion of greenwashing
- Users wanted knowledge about social and working conditions in addition to sustainability and circularity concerns

**Heatmap Analysis**

Heatmaps are a user research technique used to visually represent data collected from user interactions with a user interface (UI). They help to evaluate the effectiveness of a UI by tracking how users interact with it, such as which buttons or links they click on and how long they spend on certain pages. Heatmaps help to identify areas of the UI that are confusing or difficult for users to navigate, as well as areas that are particularly effective.

**Takeaways**

- The global navigation menu in the left sidebar was effective in allowing users to find the relevant page or screen of the Demonstrator.
- Overall, there were few clicks outside of the main navigation or interactive elements, suggesting that users were not surprised or confused as to which elements were interactive or how to navigate the interface.
- In some cases, specific data elements were clicked on. In general, this occurred on data points of a highly technical nature or on sustainability certificates. This suggests more information or context was sought by users on these subjects.


A typical pattern showing the use of the main navigation on the left. On the right, technical information has been clicked, which likely indicates a user desire for more information or context to the material properties listed there.

## User Insights

### Certifiers

#### Summary

The sustainability and circularity section was the most relevant for the Certifier and Market Surveillance user group. Participants generally had a positive assessment of the amount and detail of the information provided but there were some concerns regarding the clarity and presentation of the information provided. For certifiers, it was important that sources of data were also displayed and there should be a clear distinction between primary and secondary information. Participants sought more information on the traceability of the supply chain with specific information about resources and materials used at each stage. Information on durability and chemical use were also important to consumer organisations and market surveillance representatives.

#### Additional data requests

Participants suggested the following additional data: purchase date; allergenic material details; where to find spare parts (like zippers and buttons); transportation methods; a list of Substances of Very High Concern (SVHC); data source information; traceability information.

#### Takeaways

To ensure users understand the relevance of technical information, data should be presented with reference to the overall scale used for assessment and could be compared to other products or industry averages. Complex data should also be presented more visually to improve comprehension.

**Relevance**

- Overall, the most relevant attributes were those in the Sustainability and Circularity section, followed by those related to Repair/Return/Disposal, Materials and Composition and Product Durability results.
- Information Quality
- The participants generally had a positive assessment of the amount and detail of the information provided.
- There may be "sector-specific details" which would affect what information is expected. Data Clarity
- Some participants had difficulty understanding certain data points, such as the environmental impact values.
- It was not clear whether the data referred to the entire supply chain or just production.
- The data provided should specify what it refers to and its source
- Providing an overall or average value may lower trust in the value given
- A user stated that the more specific the data, the more it would allow for “interoperability” of that data for retailers, which would ease sustainability reporting and create overall trust in the quality of the data.
- It was not clear to users whether some was primary or secondary
- Some users were concerned that solely ‘text-based’ information could appear as greenwashing
- It was not clear whether the data had already been verified by a third-party Standardisation
- Standardisation of data and measurement methods were deemed important to ensure use of that data.

**Traceability**

Participants requested details of the supply chain and the traceability of the materials and product.

**Durability and Chemicals**

Consumer organisations and market surveillance representatives found the information on durability and chemicals used important. They advocated the use of overall scores or a points system to make it easier to understand complex data.

**Additional Data**

Participants suggested the following additional data: purchase date; allergenic material details; where to find spare parts (like zippers and buttons); transportation methods; a list of Substances of Very High Concern (SVHC).

#### Data Presentation

- Some data was difficult to understand because it was given without reference to the overall scale that was used to assess it. Including a value in addition to the scale on which it was scored would make it easier for users to understand each values significance.
- The product overview could be presented more visually in the same approach as the EU Energy Rating Label.
- Comparability of data would help users to put scores and data in context. Product attributes could be compared 1-on-1 to other products, to a category/industry average or according to an established scale (e.g. as outlined in an ISO standard).
- The presentation of data could affect how the user viewed that information's relevancy and their trust in it.

### Supply Chain / Manufacturers / Brands

#### Summary

Participants in the Supply Chain and Brands user group would benefit from the ability to compare product scores with others in the same category. The use of average comparison scores could help provide context to the data provided. Overall, the sustainability scores were viewed as lacking context. Participants appreciated the Life Cycle Assessment (LCA) values but sought more details about the method used and an indication of the significance of each value. The inclusion of repair information and manuals was highly rated. Some participants did not understand the difference between material and product durability. Some Brand representatives felt that too many details were shared with other stakeholder groups. In particular, the information made available to sorters and recyclers was more than brand representatives expected.

#### Additional Data

Information relating to laundry and wash cycles was seen as important for participants operating in the workwear and commercial laundry industry and a unique identifier for textiles was suggested to track wash cycles.

#### Takeaways

Similarly to the Certifier user group, Brands and Manufacturers sought further context to the data values given. Feedback on the duplication of durability information could have resulted from using similar dummy data and format for product and material durability in the prototype and this should be improved in future iterations.

#### *Product Comparison*

- Users would benefit from being able to assess how “good or bad” a score is compared to other products in the same category.
- Average comparison scores for a given product category could appear next to the score for a product.

#### *Life Cycle Assessment (LCA)*

- The LCA values were appreciated by users

- Should include more details

***Wash Cycles and Laundry Information***

- Information relating to laundry and wash cycles would help providers in the workwear and clothing rental markets as well as launderers.
- The use of a unique identifier would be required for recording wash cycles and is very important to this user segment.

***Stakeholder Information***

Some users stated that there were too many details for some stakeholder groups (unspecified).

***Maintenance Information***

- Maintenance information could include what kind of detergents can be used. Product Price
- One user stated that Price was irrelevant due to there being the potential for different prices across European markets.

***Material vs. Product Durability***

- Some users did not recognize a difference between material durability and product durability results.
- This could be because of the prototype using similar dummy data and format and should be improved in future iterations.

***Information for Sorters and Recyclers***

Information available to Sorters and Recyclers was more than expected for users of the Brand/Product Developer profile.

***Sustainability Scores***

Sustainability scores lacked context.

***Presentation of Data***

One user suggested that repair manuals could appear as video tutorials.

### Reverse Supply Chain / Sorters / Recyclers

#### Summary

Participants highly rated the relevance of the Sustainability and Circularity and Materials and Composition sections. Sorters and Recyclers expected more information about recycled content and stated that a percentage was not sufficient or helpful. Highlighting components, materials and substances which need to be separated according to waste legislation would help reverse supply chain operators make faster and more accurate decisions during sorting and disposal. The inclusion of aggregated data from disposed products would ensure that even products with missing DPPs or product information could be disposed of efficiently.

The placement of restricted substances information would be more useful for this user group if it were placed in the Material and Composition section.

#### Additional information

Participants suggested the following additional data:

- Dyes
- Additives on the fibre
- The type of recycling fibre used
- More detail on the composition and materials of trims, yarn, buttons, labels and zippers.
- Material details on multi-layered textiles (e.g. Jackets) should be divided and presented by layer.

#### Takeaways

Like other user groups, Sorters and Recyclers saw the value in using aggregated data from the overall product information system. However, the need was not only to better contextualise data but to identify specific parts in a product that were the most valuable or the most concerning during disassembly and disposal.

### User Insights

#### *Information Quality*

In the Materials and Composition section, users expected to see more information about recycled content. A percentage was not particularly helpful.

#### *Waste Separation Requirements*

Highlighting components, materials and substances which need to be separated according to waste legislation (see: Annex VII of Directive 2012/19/EU). Potential to link to the I4R-platform (https://i4r-platform.eu).

#### *Use of Aggregated Data*

Aggregated data from disposed products could be used to determine best practices for waste treatment when identification of a product is not possible.

#### *Information Architecture and Organisation*

- Placing the information on restricted substances in the Materials and Composition section could help sorters and recyclers.
- For multi-layered textile products like jackets, materials and composition should be provided for each layer.
- Repairers and recyclers would benefit from being able to sort the materials that were the most valuable or the most recyclable or filter by the hazardous materials that need to be separated.

#### *Additional Data*

Participants suggested the following additional data:

- Dyes
- Additives on the fibre

► The type of recycling fibre used

► More detail on the composition and materials of trims, yarn, buttons, labels and zippers

## Consumers

### Summary

Consumers found several sections highly relevant with information about how the product was made and the Care and Service sections rating the highest. Usage History was also rated highly. While Sustainability and Circularity were not as frequently rated as relevant, the items on that page were the subject of most of the subsequent feedback from consumers, suggesting that the level of interest in this area was very high. Several users found the data on sustainability and circularity overwhelming and sought more context to understand the sustainability of a product. Most users wanted to quickly identify how sustainable a product was and several suggestions on how to achieve this were proposed:

► Including a summary of the data and an explanation of what it means

► Giving the data a score with a comparison to a benchmark or average

► Using a traffic light system to easily identify good and bad indicators

Sustainability certificates were considered important but were not prominent enough in the Demonstrator. Warranty information was not clear to all users and they wanted to know if it was still valid and specific to their location.

### Additional information

Participants did not feel they had enough information to make decisions about recycling options and sought knowledge about work standards and social conditions of employees through the supply chain.

### Takeaways

While Consumers wanted to quickly and easily understand the overall sustainability score of a product, they also wanted to maintain access to more detailed information. Access to this data helped users to trust the information provided and more general information was treated with some suspicion. Sustainability Certificates should be featured more prominently than in the current iteration of the Demonstrator.

#### *Relevant to Consumers*

Two clear areas were found to be relevant to consumers: How the product was made and Care and Service. Usage History was also rated highly.

While Sustainability and Circularity were not as frequently rated as the highest relevance, the items on that page were the subject of most of the subsequent feedback from consumers, suggesting that the level of interest in this area was very high.

#### *Explanation of Care Symbols*

One user had a highly positive response to the inclusion of an explanation for care symbols in the t-shirt prototype, which suggests that the care icons commonly found on garments may not be widely

understood. This demonstrates the potential for the DPP to provide further context to information currently contained on product labels and provide ongoing value to consumers.

***Data Clarity***

- Several users found the data contained on the Sustainability and Circularity page overwhelming and difficult to understand. Most users found the data highly-technical and sought more context for entered data so that they could quickly identify how sustainable a product was. Several suggestions were posited:
  - Including a summary of the data and an explanation of what it means
  - Giving the data a score with a comparison to a benchmark or average
  - Using a traffic light system to easily identify good and bad indicators
- Users wanted to know if information had been verified by a trusted party.
- The "Product Design" information was too general and this reduced user trust in the provided information.

***Importance of Sustainability Certificates***

Sustainability Certificates were considered very important but were not prominent enough. One user stated that they should appear at the top of the page.

***Warranty Information***

Not all users could determine whether the Warranty was still valid from the information provided. One user mentioned that the warranty page is not clear and it would be helpful to know if the product is still under guarantee and if the information provided is specific to the user's location.

***Environmental Impact***

- The environmental impact information is complex and it would be helpful to have comparative data or a range of values.
- It would be helpful to have more information on recycling options and the social standards of the workers.

***Additional Information Needed***

- The LCA results need the method used for comparison
- Additional information is needed on the fridge and LED lamp such as color and bill of materials.

***Aggregation and comparison of data***

Several participants mentioned the need to access data based on aggregated values across industry and product categories. The use cases for this information differed by user profile. For market surveillance representatives and consumer associations, viewing averages, min-max ranges and trends across data would be useful. Waste operators and recyclers need to have the ability to calculate information across multiple items within a category, such as all t-shirts or items under the WEEE collection category. This information would allow for more informed decisions in regards to

recycling and waste management. Consumers sought context in order to understand the significance of individual product data.

The ability to both evaluate individual products in terms of sustainability and environmental impact and compare products and gather large-scale data was recognised as one of the key advantages of the DPP. And the requirement itself of requiring extensive information was seen as a way to encourage manufacturers to improve practices.

***Service finder***

The public-facing interface of the DPP presents an opportunity not only to present static information about physical products, but also the potential to be an enabler of circular services. A "Service Finder" was included in the Demonstrator as one possible implementation that would allow consumers to find repair and recycling operators in their area. In practice, such a service would require the use and creation of repair and recycling networks at regional and national levels. The network could include those repair and recycling suppliers who were licensed to be able to update and contribute information to the DPP system.

***Traceability, Supply Chain Transparency and Social Conditions***

Participants highlighted the importance of traceability and supply chain transparency. They expressed a desire for the inclusion of detailed information about production at each stage in the supply chain. A common concern across all user profiles was the absence of information on the social and working conditions of employees involved in the production of the product. To ensure the ethical and sustainable production of products, some users emphasised the need for visibility into supplier sourcing and suggested that this should include, at the very least, the basic data of suppliers, including addresses of factories.

***Verification of data and certifications***

Who should be responsible for adding certification details and files to the DPP system?

For the most part, participants contended that the addition of certificates would be more credible and trustworthy if certificates were added to the DPP system by certifying organisations rather than by brands. Supporting this argument were the sentiments that the certifying bodies were less likely to take part in "greenwashing", that there was more of a guarantee of accuracy and that it prevented brands from tampering with or falsifying data and that it was the only way to maintain the confidence of consumers in the product information presented. One problem raised with this approach was that leaving responsibility solely to the certifying body could leave certification information incomplete at the time the product becomes purchasable. As a solution, a hybrid approach was suggested where the brand provides the information related to certification and once the product becomes purchasable, the certifier is notified and prompted to quickly check the information provided.

***Entering data in the system***

There was a high preference for automation across participants and user profiles. Many participants were concerned about the potential of overly manual processes of entering data. On the other hand, the possibility of web portals and online standardised forms were presented as options and there was some concession that there may need to be some manual data entry in the early stages of a DPP before later automation solutions become possible.

Overall, participants saw the value of different stakeholders being responsible for inputting the data that they had access to and was closest to them. E.g. Manufacturers inputting data on parts at the point and time of manufacture; Certifiers verifying certificates just prior to purchasability. One suggested solution was a "hub and spoke" design, with the brand being ultimately responsible for the majority of product information and data input but allowing suppliers and certifiers to add data or certify data through verified links. This could exist in both an automated or manual format, depending on the particular stakeholders and providers.

***Balancing the needs of stakeholders***

One of the core challenges in a product information system with multiple stakeholders is the competing needs of each stakeholder. Some brand representatives were surprised at the amount of information available to sorters and recyclers and they also raised concerns about the display of supplier and shipping information being shown to consumers. Balancing the overall objective of providing system transparency with the need or desire of stakeholders to maintain confidentiality is a core challenge in the creation of a DPP system.

***Specific industry requirements and serialised identifiers***

The DPP must be adaptable to provide value both to industry as whole and the more targeted needs of specific sectors. A good example is evident in the case of serialised product identifiers. Unlike for electronics, serialised IDs are not currently common in the textile industry with non-serialised identifiers of product types being more prevalent. The design of the PI 4.0 Demonstrator took this into account – the refrigerator prototype included a serialised ID whereas the Tshirt prototype included only a product type ID. While the use of non-serialised IDs in textiles will likely remain the preferred option for most producers, workshop participants from the workwear, rental and commercial laundry sectors strongly advocated for the use of serialised IDs. This would allow for tracking usage, wash cycles and repairs for individual items. In a DPP system where textiles would not have serialised IDs as default, it would remain helpful to these and potentially other sectors to allow serialisation of individual products. By ensuring that information requirements of new not-yet-imagined services can adapt easily, there is potential to future-proof the DPP system either through the dynamic creation of new data points or through third-party integrations.

***Interoperability and integrations***

Interoperability of data is an important element of a product information system and was mentioned by several participants as a significant requirement of a successful and functional DPP.

***EPREL***

Participants were well aware of existing product information databases like EPREL and the value of aligning data between these systems. In addition to EPREL, two other systems were identified as potential integrations that could be taken into account during the next phases of DPP development.

***Extended Producer Responsibility (EPR) Systems***

Some of the information presented in the Demonstrator would align with those required for an EPR system with eco-modulation fees. The DPP could connect to national EPR systems that require the registration of textiles.

***I4R-platform (https://i4r-platform.eu)***

One participant highlighted the potential to link to the I4R-platform (https://i4r-platform.eu). I4R helps producers of electrical equipment (EEE) and recyclers of waste from EEE to identify

components, materials and substances which need to be separated for specific treatment according to waste legislation (see: Annex VII of Directive 2012/19/EU). Digital services like I4R could connect with the DPP to help providers disassemble and sort waste by displaying materials that need separate treatment alongside other information the DPP provides.

## A.3.8 Roles and Access Management

| | | supply chain | | | | | in-use | | | | end of life | | | | | market surveillance | certification | data storage providers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | producers and manufacturers of raw materials, trims, textiles, dyes etc. | manufacturers of products | brands/ designers | retail | workwear providers | rental services | repair services | laundry services | consumers | collectors | sorters | reuse parties | recyclers | waste management | market surveillance | certification bodies | data storage and information system providers |
| **general manufacturer and product information** | product category | | | Data source<br>Data owners | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | Data users | pot. Data users | Data users | | | pot. Data users | Data custodians |
| | product type | | | Data source<br>Data owners | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | Data users | pot. Data users | Data users | | | pot. Data users | Data custodians |
| **technical specifications** | product description | | | Data source<br>Data owners | Data users | pot. Data users | pot. Data users | | | pot. Data users | | pot. Data users | pot. Data users | | | | | Data custodians |
| | warranty information | | | Data source<br>Data owners | Data users | pot. Data users | pot. Data users | | | Data users | | | pot. Data users | | | | | Data custodians |
| | product attributes:<br>- size<br>- color<br>- weight<br>... | | Data source | Data owners | Data users | pot. Data users | pot. Data users | Data users | | | Data users | Data users | Data users | Data users | | | | Data custodians |
| **material & composition** | recycled content | Data source | Data users | Data owners,<br>pot. Data users | pot. Data users | pot. Data users | pot. Data users | | | Data users | | pot. Data users | pot. Data users | pot. Data users | | pot. Data users | pot. Data users | Data custodians |
| | material composition | Data source | Data source | Data owners,<br>pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | | pot. Data users | pot. Data users | |
| | material properties<br>- color<br>- water properties<br>- weight ... | Data source | Data source,<br>pot. Data users | Data owners,<br>pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | | pot. Data users | | Data users | pot. Data users | Data users | ? | | | Data custodians |
| | full material declaration (also of chemicals) | Data source | Data source | Data owners | | | | | | | | pot. Data users | | pot. Data users | | | pot. Data users | Data custodians |
| | staple fibre lenght | Data source | | Data owners | | | | | | | | pot. Data users | | pot. Data users | | | | Data custodians |
| | material quality information (durability) | Data owners | pot. Data users | pot. Data users | | | | pot. Data users | | | | | | | | | Data source | Data custodians |
| | material origin | Data source<br>Data owners ? | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data users | | pot. Data users | | Data users | pot. Data users | Data users | | pot. Data users | pot. Data users | Data custodians |
| **product design & service** | design for reuse/ refurbishment / repairability | pot. Data source | pot Data source | Data source<br>Data owners | pot. Data users | pot. Data users | pot. Data users | Data users | | Data users | | | Data users | | | | | Data custodians |
| | design for longevity | pot. Data source | pot Data source | Data source<br>Data owners | pot. Data users | pot. Data users | pot. Data users | Data users | | Data users | | | Data users | | | | | Data custodians |
| | durability test results | Data source;<br>Data owners;<br>Data users | Data source;<br>Data owners;<br>Data users | Data source<br>Data owners | pot. Data users | pot. Data users | pot. Data users | pot. Data users | | pot. Data users | | | pot. Data users | | | | Data source | Data custodians |
| | care instructions | | Data source? | Data source<br>Data owners | | | pot. Data users | pot. Data users | Data users | Data users | | | pot. Data users | | | | | Data custodians |
| | instructions for disposal and take-back | | | Data source?<br>Data owners | pot. Data sourc<br>pot. Data users | pot. Data users | pot. Data users | Data users | pot. Data users | Data users | Data source?<br>pot. Data users | pot. Data users | Data users | pot. Data users | pot. Data users | pot. Data users | pot. Data sourc | Data custodians |
| **Downstream data (usage, product history, ...)** | usage (washing cycles) | Data users | Data users | pot. Data users | | | pot. Data source,<br>pot. Data owners,<br>pot. Data users | | pot. Data sourc | Data source<br>Data owners | | pot. Data users | pot. Data users | | | | | Data custodians |
| | repair history | Data users | Data users | pot. Data users | | pot. Data sourc<br>pot. Data users | pot. Data sourc<br>pot. Data users | Data source | | Data source | | pot. Data users | pot. Data users | pot. Data users | | | | Data custodians |
| | purchase date | | | Data source<br>Data owners? | Data source<br>Data owners? | | | Data users | | Data owners? | | Data users | Data users | | | ? | | Data custodians |
| **circularity** | environmental footprint | | Data users | | pot. Data users | pot. Data users | pot. Data users | | | pot. Data users | | pot. Data users | pot. Data users | | | pot. Data users | Data source,<br>Data users | Data custodians |
| | LCA of goods/services | | pot. Data users | | pot. Data users | pot. Data users | pot. Data users | | | pot. Data users | | pot. Data users | pot. Data users | | | | Data source | Data custodians |
| | sustainability certificates | | pot. Data users | | pot. Data users | pot. Data users | pot. Data users | | | pot. Data users | | pot. Data users | pot. Data users | | | | Data source | Data custodians |
| | biodegradability | | pot. Data users | | pot. Data users | pot. Data users | pot. Data users | | | pot. Data users | | Data users | pot. Data users | Data users | pot. Data users | | Data source | Data custodians |
| | restricted substances list (e.g. AFIRM) | pot. Data users | pot. Data users | Data source?<br>pot. Data users | | | | | | | | pot. Data users | | pot. Data users | pot. Data users | pot. Data users | Data source? | Data custodians |

### A.3.9 Product Attributes per User Role

The following tables display a comparison of the initial proposal for role-based information access based on the results of Part A and B, the stakeholder survey and our experience and knowledge. Based on the initial suggestion, the first version of the front-end demonstrator was developed. The demonstrator was used as a basis for further workshops, stakeholder interviews and internal discussions, based on which the final version of the demonstrator as well as the role-based access profiles was developed.

**T-Shirt**

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Product Overview** | x | **x** | x | **x** | x | **x** | x | **x** | x | **x** | **Combined from Product Overview and Product Specification** |
| Brand Name | x | x | x | x | x | x | x | x | x | x | |
| Product Identifier | x | x | x | x | x | x | x | x | x | x | |
| Country of Manufacture | x | x | x | x | x | x | x | x | x | x | |
| Size | x | x | - | x | x | x | x | x | - | x | |
| Weight | x | x | - | x | x | x | x | x | - | x | |
| Fit | x | x | - | x | x | x | x | x | - | x | |
| Year of Sale | x | x | - | x | x | x | x | x | - | x | |
| Colour | x | x | - | x | x | x | x | x | - | x | |
| Category | x | x | x | x | x | x | x | x | x | x | |
| Price | x | x | x | x | x | x | x | x | x | x | |
| Type | x | x | x | x | x | x | x | x | x | x | |
| Material Composition | x | x | - | x | x | x | x | x | - | x | |
| Product Image | x | x | - | x | x | x | x | x | - | x | |
| Product Description | x | x | - | x | x | x | x | x | - | x | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Materials and Composition** | x | x | x | x | x | x | x | x | x | x | **Combined from Material & Composition and Product Design** |
| Category | - | x | - | x | - | x | - | x | - | x | |
| Composition | - | x | - | x | - | x | - | x | - | x | |
| Material Origin → Country of Production | - | x | o | x | o | x | o | x | o | x | |
| Recycled content | x | x | x | x | x | x | x | x | x | x | |
| Material Colour → Colour | o | x | o | x | o | x | o | x | o | x | |
| Water Properties | x | x | x | x | x | x | x | x | x | x | |
| Material Durability | - | x | x | x | x | x | x | x | x | x | |
| Colour Fastness to Rubbing | - | x | o | x | o | x | o | x | - | x | Extracted from product durability test results |
| Pilling Resistance | - | x | x | x | x | x | x | x | - | x | |
| Colour Fastness to Laundering | - | x | o | x | o | x | o | x | - | x | Extracted from product durability test results |
| Light Fastness | - | x | - | x | - | x | - | x | - | x | Extracted from product durability test results |
| Durability of Trims | - | x | - | x | - | x | - | x | - | x | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Safety Data Sheets (MSDS / SDS) | - | - | x | x | x | x | x | x | x | x | |
| Staple Fibre Length | x | - | x | - | x | - | x | - | x | - | |
| Circular Design Attributes | x | - | - | - | x | - | x | - | - | - | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Care and Service → Service** | x | x | - | - | x | x | x | x | - | - | renamed |
| Care instructions | x | x | - | - | x | x | x | x | - | - | |
| Take-back and Return | x | x | - | - | x | x | x | x | - | - | |
| Repair and Disposal | x | x | - | - | x | x | x | x | - | - | |
| Service Finder | x | x | - | - | x | x | x | x | - | - | |
| Contact | - | x | - | - | - | x | - | x | - | - | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Sustainability and Circularity** | x | **x** | x | **x** | x | **x** | x | **x** | x | **x** | |
| Sustainability Performance | - | x | - | x | - | x | - | x | - | x | |
| Sustainability Certificates | x | x | x | x | x | x | x | x | x | x | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Compliance with Restricted Substances List | x | x | x | x | x | x | x | x | x | x | |
| Product Durability Results | - | x | o | x | o | x | o | x | - | x | Moved from product design |
| Life Cycle Assessment (LCA) / Product Environmental Footprint (PEF) | x | x | x | x | x | x | x | x | x | x | |

**FRIDGE**

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Product Overview** | x | **x** | x | **x** | x | **x** | x | **x** | x | **x** | |
| Model Identifier | x | x | x | x | x | x | x | x | x | x | |
| Overall Dimensions | o | x | o | x | o | x | o | x | o | x | Moved from technical specification |
| Total Volume | o | x | o | x | o | x | o | x | o | x | |
| Annual energy consumption | o | x | o | x | o | x | o | x | o | x | |
| Energy efficiency class | o | x | o | x | o | x | o | x | o | x | |
| EAN/GTIN → Product Identifier | x | x | x | x | x | x | x | x | x | x | Renamed field |
| Price | - | x | - | x | - | x | - | x | - | x | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sustainability Performance | - | x | - | x | - | x | - | x | - | x | Duplicated from sustainability & circularity |
| Sustainability Certificates | o | x | o | x | o | x | o | x | o | x | |
| Product Image | x | x | x | x | x | x | x | x | x | x | |
| Category (EPREL), e.g. design type, low noise, wine storage, … | x | - | x | - | x | - | x | - | x | - | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Technical Specifications**<br><br>**→ Product Specifications** | x | **x** | x | **x** | x | **x** | x | **x** | x | **x** | |
| General Product Parameters *(EPREL)* | - | x | - | x | - | x | - | x | - | x | |
| Category → Type *(EPREL)* | o | x | o | x | o | x | o | x | o | x | renamed, moved from product overview |
| Compartment Parameters *(EPREL)* | x | x | x | x | x | x | x | x | x | x | |
| Light Source Parameters *(EPREL)* | x | x | x | x | x | x | x | x | x | x | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Additional Information *(EPREL)* | x | x | x | x | x | x | x | x | x | x | |
| Suppliers *(Name and Address)* | o | x | o | x | o | x | o | x | o | x | Moved from product overview |
| Product Image | x | x | x | x | x | x | x | x | x | x | |
| EPREL Information | x | x | x | x | x | x | x | x | x | x | |
| Energy efficiency index (EEI) | x | - | x | - | x | - | x | - | x | - | |
| Airborne acoustical noise (EPREL) | x | - | x | - | x | - | x | - | x | - | |
| Energy rating label | x | - | x | - | x | - | x | - | x | - | |
| **Materials and Composition** | x | **x** | x | **x** | x | **x** | x | **x** | x | **x** | |
| Hazardous Substances | - | x | x | x | x | x | x | x | x | x | |
| Recycled Content | x | x | x | x | x | x | x | x | x | x | |
| Material Declaration | - | - | x | x | x | x | x | x | x | x | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Usage & History** | x | **x** | x | **x** | x | **x** | x | **x** | - | **-** | |
| Product History | x | x | x | x | x | x | x | x | - | - | |
| Purchase receipt (download) | x | x | x | x | x | x | x | x | - | - | |

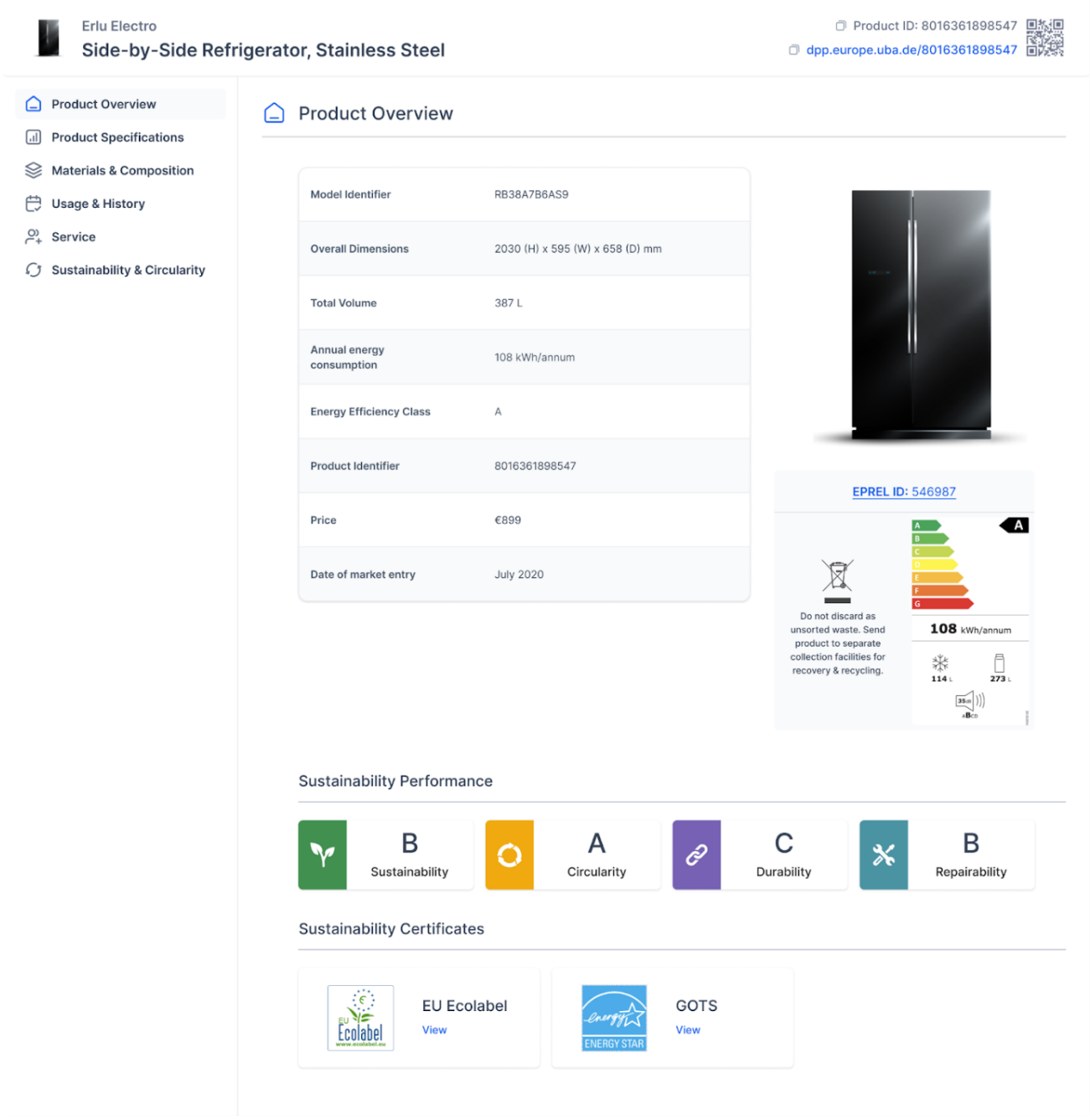
| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Repair details (download) | x | x | x | x | x | x | x | x | - | - | |
| **Warranty & Service → Service** | o | **x** | - | **-** | o | **x** | o | **x** | - | **-** | **Renamed to service for alignment** |
| Software Updates → Updates | o | x | - | - | o | x | o | x | - | - | |
| Warranty details: → Warranty | o | x | - | - | o | x | o | x | - | - | |
| Repair and Disposal | o | x | - | - | o | x | o | x | - | - | Summarised from “repair” and “general repair and disposal information” |
| WEEE-required take-back and disposal information → Take-back and Disposal | o | x | - | - | o | x | o | x | - | - | |
| Manuals | o | x | - | - | o | x | o | x | - | - | Moved from “product design and manuals” |
| Parts and Components | - | x | - | - | - | x | - | x | - | - | |
| Contact | - | x | - | - | - | x | - | x | - | - | |
| Service Finder | x | x | - | - | x | x | x | x | - | - | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | inital | final | inital | final | inital | final | inital | final | inital | final | |
| **Sustainability and Circularity** | x | **x** | x | **x** | x | **x** | x | **x** | x | **x** | |

| | Consumer | | Certifier | | Sorter/ Recycler | | Brand | | Supplier | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sustainability Performance | - | x | - | x | - | x | - | x | - | x | |
| Sustainability Certificates | x | x | x | x | x | x | x | x | x | x | |
| Life Cycle Assessment (LCA) / Product Environmental Footprint (PEF) | x | x | x | x | x | x | x | x | x | x | |
| Repairability Index | x | - | x | - | x | - | x | - | x | - | Summarised in "sustainability performance" |
| Recycling Performance | x | - | x | - | x | - | x | - | x | - | |
| Biodegradability | x | - | x | - | x | - | x | - | x | - | |

## A.3.10 Screenshots Demonstrator Frontend

A: Refrigerator Demonstrator



Erlu Electro

## Side-by-Side Refrigerator, Stainless Steel

Product ID: 8016361898547

dpp.europe.uba.de/8016361898547

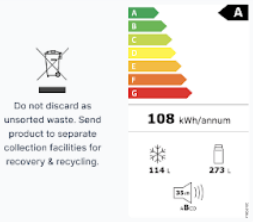
- Product Overview
- Product Specifications
- Materials & Composition
- Usage & History
- Service
- Sustainability & Circularity

## Product Specifications

### GENERAL PRODUCT PARAMETERS

| | |
|---|---|
| Energy Efficiency Index (EEI) | 41 |
| Airborne acoustical noise emissions | 35 dB (A) re 1 pW |
| Airborne acoustical noise emission class | B (A-D) |
| Climate class | SN (Extended temperate), N (temperate), ST (subtropical), T (tropical) |
| Minimum ambient temperature for which the refrigerating appliance is suitable | 10 °C |
| Maximum ambient temperature for which the refrigerating appliance is suitable | 43 °C |
| Winter setting | No |
| Fast freeze facility | Yes |
| Category | Electronics > Refrigerating Appliance |

EPREL ID: 546987




Do not discard as unsorted waste. Send product to separate collection facilities for recovery & recycling.

### TYPE

| | |
|---|---|
| Low-noise appliance | No |
| Wine storage appliance | No |
| Design type | Freestanding Appliance |
| Other refrigerating appliance | No |

### COMPARTMENT PARAMETERS

| Compartment Type | Volume (dm3 or L) | Recommended temperature setting for optimised foodstorage (°C) | Freezing capacity (kg/24h) | Defrosting type (auto-defrost=A, manual defrost=M) |
|---|---|---|---|---|
| Fresh Food | 273,0 | 3 | - | A |
| 4-star | 114,0 | -19 | 8,0 | A |

### LIGHT SOURCE PARAMETERS

| | |
|---|---|
| Type of Light Source | LED |
| Energy Efficiency Class | G |

### ADDITIONAL INFORMATION

Weblink to the manufacturer's website, where the information in point4(a) Annex of Commission Regulation(EU) 2019/2019 is found: https://www.erlu-electro.com/support

## Suppliers

| | |
|---|---|
| Supplier Name | Erlu Electro |
| Supplier Address | Suite 45,<br>6789 Beijing Rd<br>Shanghai<br>supply-chain@erlu-electro.cn |

Erlu Electro

## Side-by-Side Refrigerator, Stainless Steel

Product ID: 8016361898547

dpp.europe.uba.de/8016361898547

- Product Overview
- Product Specifications
- Materials & Composition
- Usage & History
- Service
- Sustainability & Circularity

## Materials and Composition

### Hazardous Substances

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

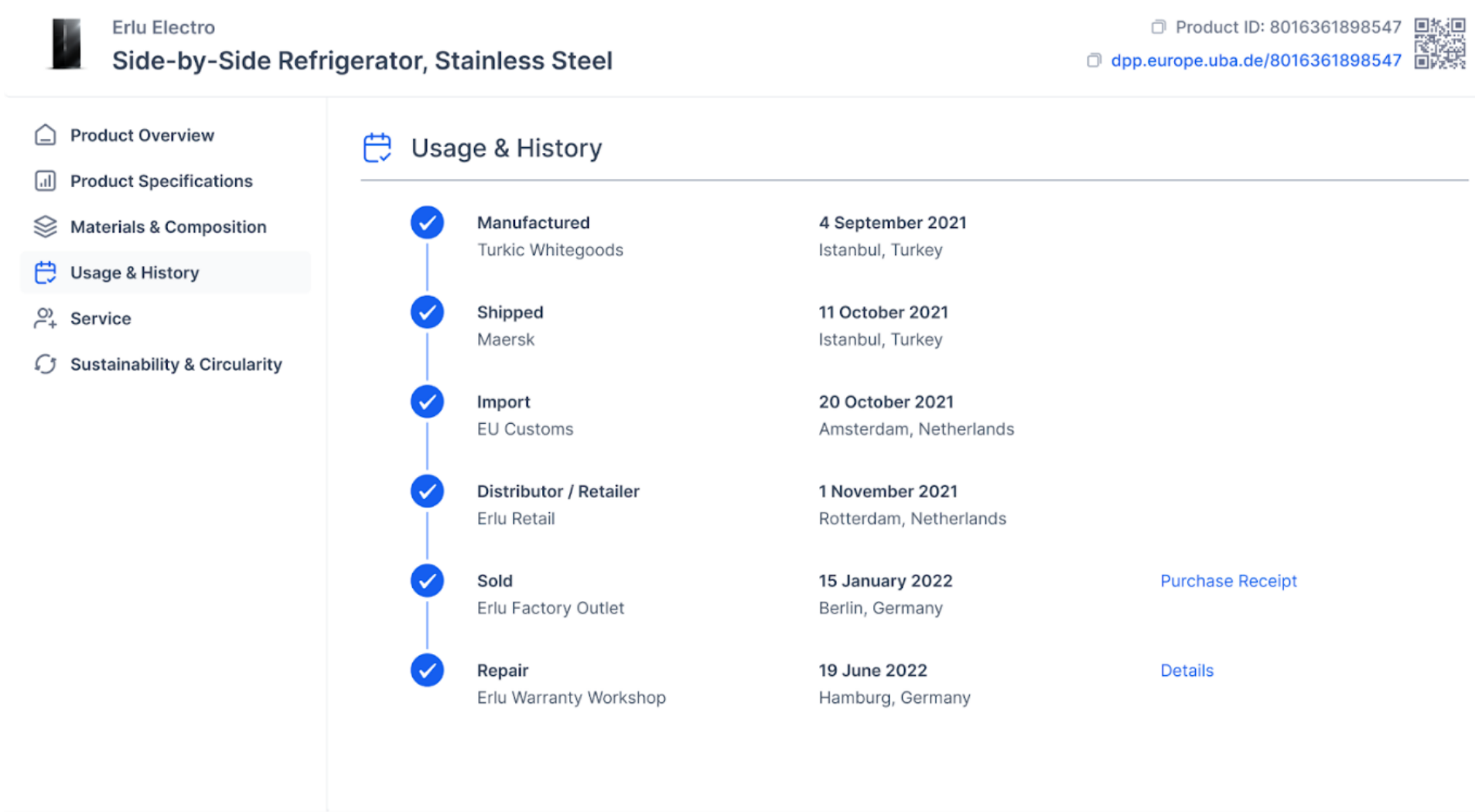
### Recycled Content

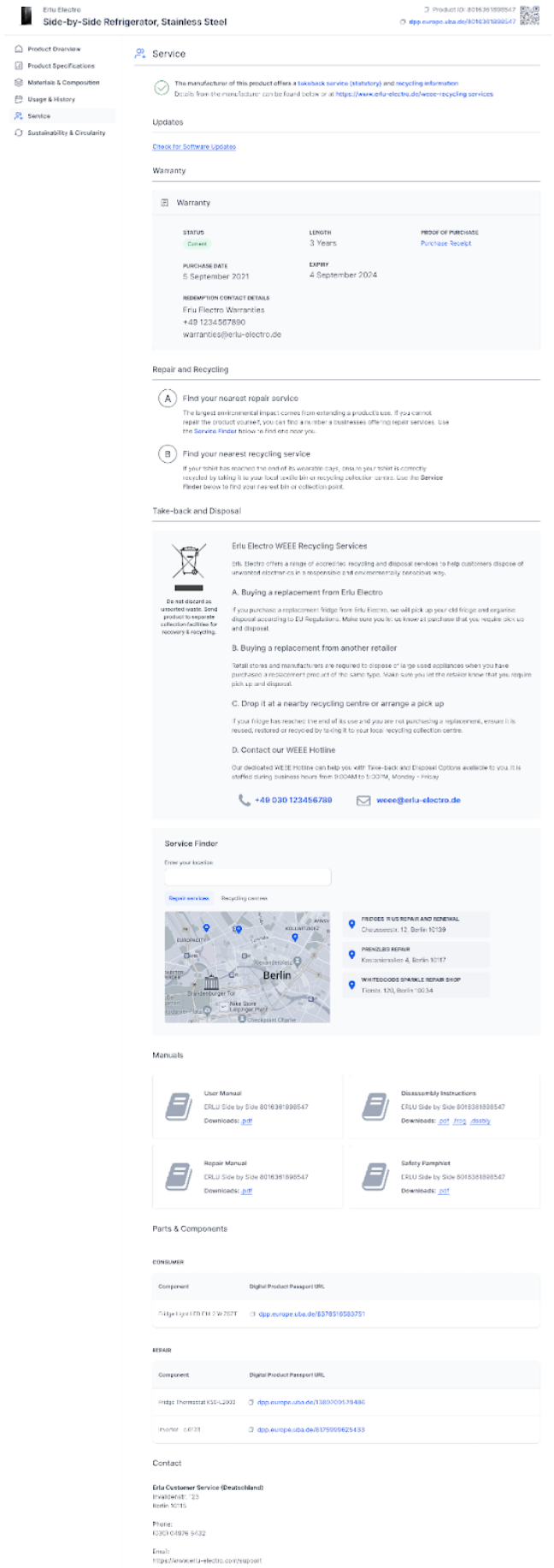
| Components | Weight (kg) | Materials | Composition (%) | Recycled Content (%) |
|---|---|---|---|---|
| Door | 25 | Stainless Steel | 100 | 15 |
| Interior Shelves | 1 | Polypropylene | 100 | 10 |
| Exterior Cabinet | - | Aluminium | 100 | 55 |
| Cooling System | - | Copper | 100 | 10 |
| Insulation | - | Polyurethane rigid foam | 100 | 20 |

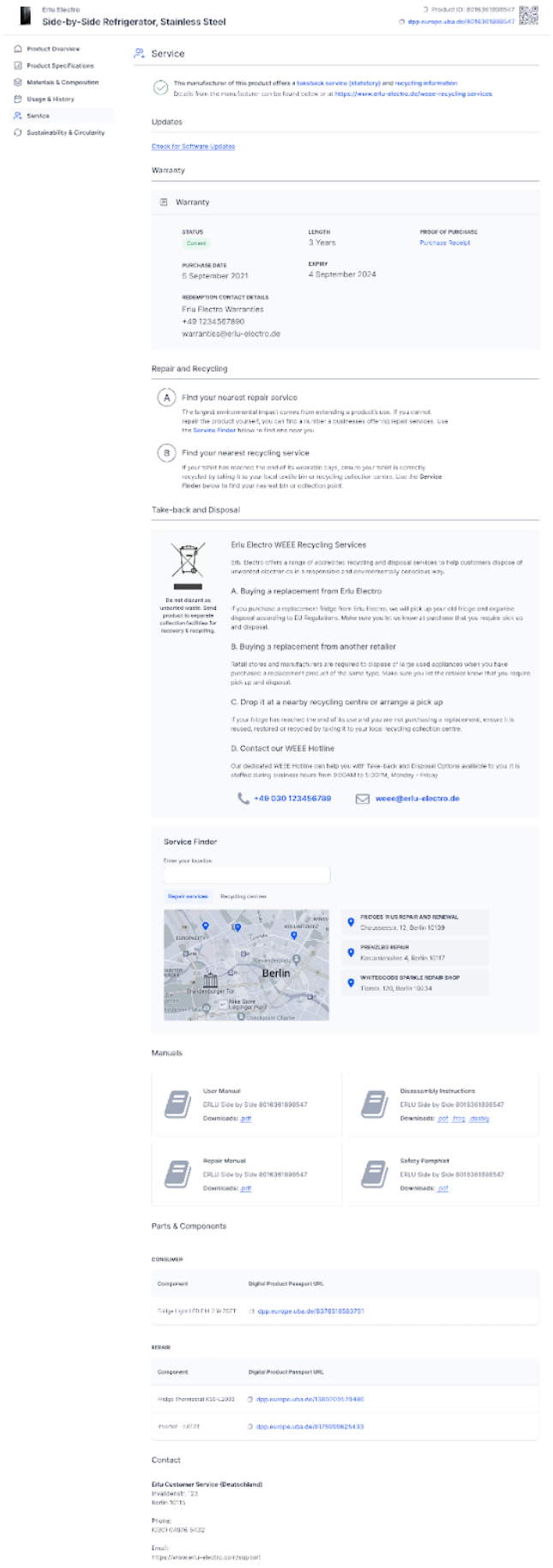
### Material Declaration

| Component | Material | Mass (kg) | Percentage of total (%) |
|---|---|---|---|
| Exterior cabinet | Aluminium, Acrylonitrile-Butadiene-Styrene | 6 | - |
| Door | Aluminium, Steel, Polystyrene, Acrylonitrile-Butadiene-Styrene | 4 | - |
| Inner cabinet | Polystyrene | 4 | - |
| Insulation | Polyurethane | 3 | - |
| Cooling system | Copper | 6 | - |
| Refrigerant | Isobutane | 1 | - |
| Drawers | Polypropylene | 1,5 | - |
| Shelves | Glass, Polypropylene | 3 | - |

Download Full Material Declaration (FMD)


Erlu Electro
Side-by-Side Refrigerator, Stainless Steel
Product ID: 8016361898547
dpp.europe.uba.de/8016361898547
Product Overview
Product Specifications
Materials & Composition
Usage & History
Service
Sustainability & Circularity
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


Erlu Electro
Side-by-Side Refrigerator, Stainless Steel
Product Overview
Product Specifications
Materials & Composition
Usage & History
Service
Sustainability & Circularity
Service
Updates
Check for Software Updates
Warranty
Warranty
STATUS
LENGTH
3 Years
PROOF OF PURCHASE
PURCHASE DATE
5 September 2021
EXPIRY
4 September 2024
REDEMPTION CONTACT DETAILS
Erlu Electro Warranties
+49 1234567890
warranties@erlu-electro.de
Repair and Recycling
Find your nearest repair service
Find your nearest recycling service
Take-back and Disposal
Erlu Electro WEEE Recycling Services
A. Buying a replacement from Erlu Electro
B. Buying a replacement from another retailer
C. Drop it at a nearby recycling centre or arrange a pick up
D. Contact our WEEE Hotline
+49 030 123456789
weee@erlu-electro.de
Service Finder
Berlin
Manuals
User Manual
Disassembly Instructions
Repair Manual
Safety Pamphlet
Parts & Components
CONSUMER
Component
Digital Product Passport URL
REPAIR
Component
Digital Product Passport URL
Contact
Erlu Customer Service (Deutschland)


Erlu Electro
Side-by-Side Refrigerator, Stainless Steel
Product Overview
Product Specifications
Materials & Composition
Usage & History
Service
Sustainability & Circularity
Service
Updates
Check for Software Updates
Warranty
Warranty
STATUS
LENGTH
3 Years
PROOF OF PURCHASE
Purchase Receipt
PURCHASE DATE
5 September 2021
EXPIRY
4 September 2024
REDEMPTION CONTACT DETAILS
Erlu Electro Warranties
+49 1234567890
warranties@erlu-electro.de
Repair and Recycling
A Find your nearest repair service
B Find your nearest recycling service
Take-back and Disposal
Erlu Electro WEEE Recycling Services
A. Buying a replacement from Erlu Electro
B. Buying a replacement from another retailer
C. Drop it at a nearby recycling centre or arrange a pick up
D. Contact our WEEE Hotline
+49 030 123456789
weee@erlu-electro.de
Service Finder
Berlin
Manuals
User Manual
Disassembly Instructions
Repair Manual
Safety Pamphlet
Parts & Components
CONSUMER
Component
Digital Product Passport URL
REPAIR
Component
Digital Product Passport URL
Contact
Erlu Customer Service (Deutschland)

Erlu Electro

Side-by-Side Refrigerator, Stainless Steel

Product ID: 8016361898547

dpp.europe.uba.de/8016361898547

- Product Overview
- Product Specifications
- Materials & Composition
- Usage & History
- Service
- Sustainability & Circularity

## Sustainability & Circularity

### Sustainability Performance

| B | A | C | B |
|---|---|---|---|
| Sustainability | Circularity | Durability | Repairability |

### Sustainability Certificates

EU Ecolabel — View

GOTS — View

### Life Cycle Assessment (LCA) / Product Environmental Footprint (PEF)

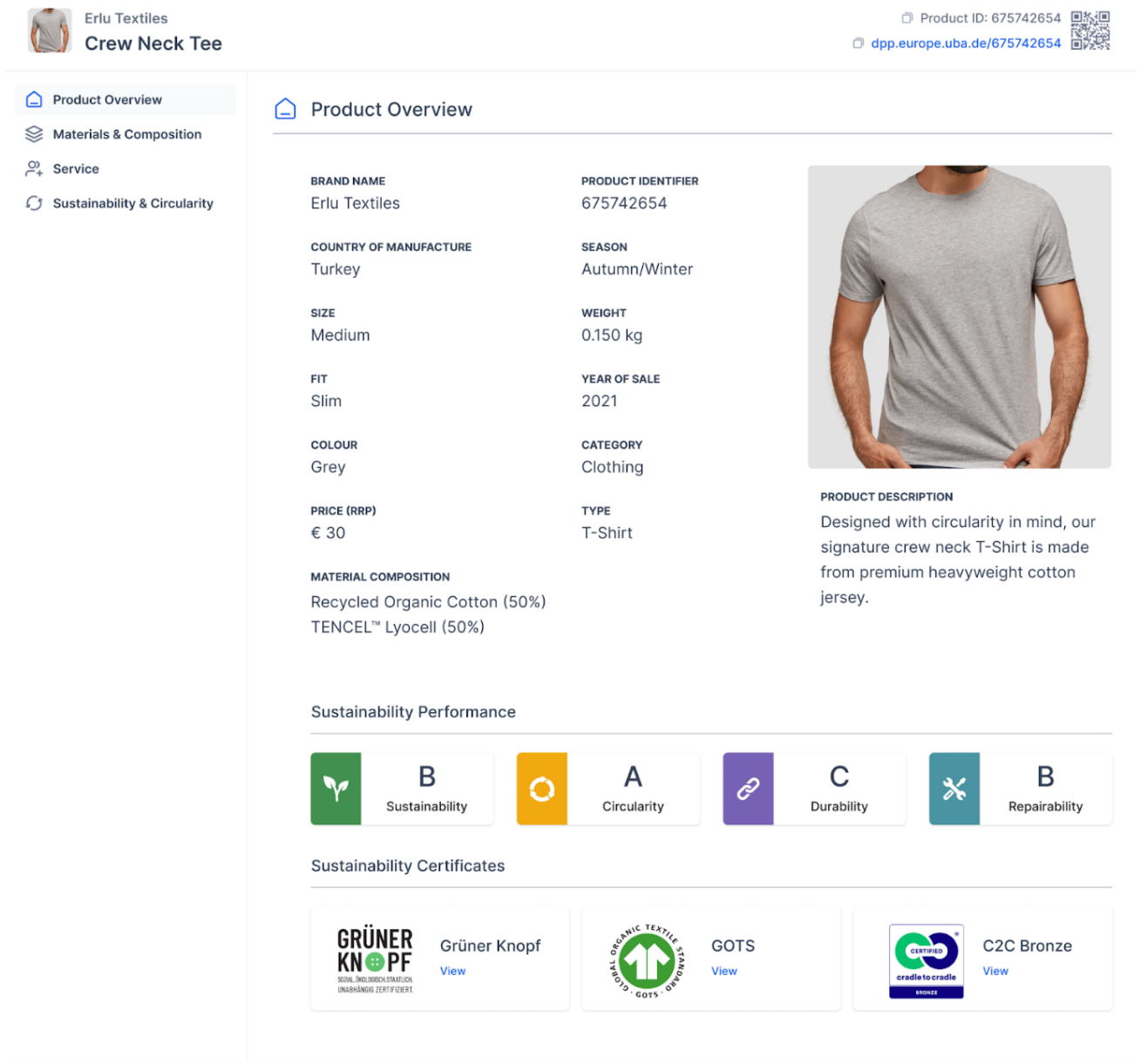
**ENVIRONMENTAL IMPACTS**

| EF Impact Category | Result | Industry Average (EU) | Unit |
|---|---|---|---|
| Climate Change, total (GWP100) | 3,9 | 4 | kg $CO_2$ eq. |
| Water use | 6 | 5 | m3 world eq. |
| Human Toxicity, cancer, non-cancer (CTUh) | 0,3 | 0,3 | CTUh |
| Particulate Matter | - | - | disease incidence |
| Ionising radiation, human health | 0,2 | 0,2 | kBq $U^{235}$ eq |
| Photochemical ozone formation, human health | 0,12 | 0,12 | kg NMVOC eq. |
| Acidification | 0,9 | 0,9 | mol H+ |
| Eutrophication, terrestrial | 0,9 | 0,9 | |
| Eutrophication, freshwater | 3 | 3 | kg P eq. |
| Eutrophication, marine | 2 | 2 | kg N eq. |
| Ecotoxicity, freshwater (CTUe) | 0,4 | 0,4 | CTUe |
| Land use:<br>- Soil Quality Index<br>- Biotic Production<br>- Erosion Resistance<br>- Mechanical Filtration<br>- Groundwater replenishment | 0.631<br>0,9<br>0.321<br>3<br>4 | 0.631<br>0,9<br>0.321<br>3<br>4 | Dimensionless (pt)<br>kg biotic production<br>kg soil<br>m3 water<br>m3 groundwater |
| Ozone Depletion (ODP) | 6 | 6 | kg CFC-11 eq. |
| Resource use, minerals and metals (ADP) | 3 | 3 | kg SB eq. |
| Resource use, fossils (ADP-fossil) | 2,1 | 2,1 | MJ |

**RESOURCE USE**

| Parameter | Result | Unit |
|---|---|---|
| Non-renewable Energy Use (Materials) | 3,9 | MJ |
| Non-renewable Energy Use (Energy) | 6 | MJ |

## B: T-Shirt Demonstrator



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 | COUNTRY OF PRODUCTION | COMPOSITION |
|---|---|---|
| Fabric | Portugal | Recycled Organic Cotton (50%)<br>TENCEL™ Lyocell (50%) |
| **RECYCLED CONTENT** | **COLOUR** | **WATER PROPERTIES** |
| 50% | Gray | No Water Properties |

#### MATERIAL DURABILITY

**COLOUR FASTNESS TO RUBBING**

3


Scale: 1-5

(according to ISO 105-A03)

**COLOUR FASTNESS TO LAUNDERING**

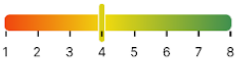
3


Scale: 1-5

(according to ISO 105-A03)

**LIGHT FASTNESS**

4

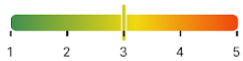



Scale: 1-8

(according to ISO 105-B01)

**PILLING RESISTANCE**

3




Scale: 1-5

(according to ISO 12945-1 procedure with the ICI Pilling Test Box)

**DURABILITY OF TRIMS**

**Proven**

(according to ISO 16732)

### Sewing Thread

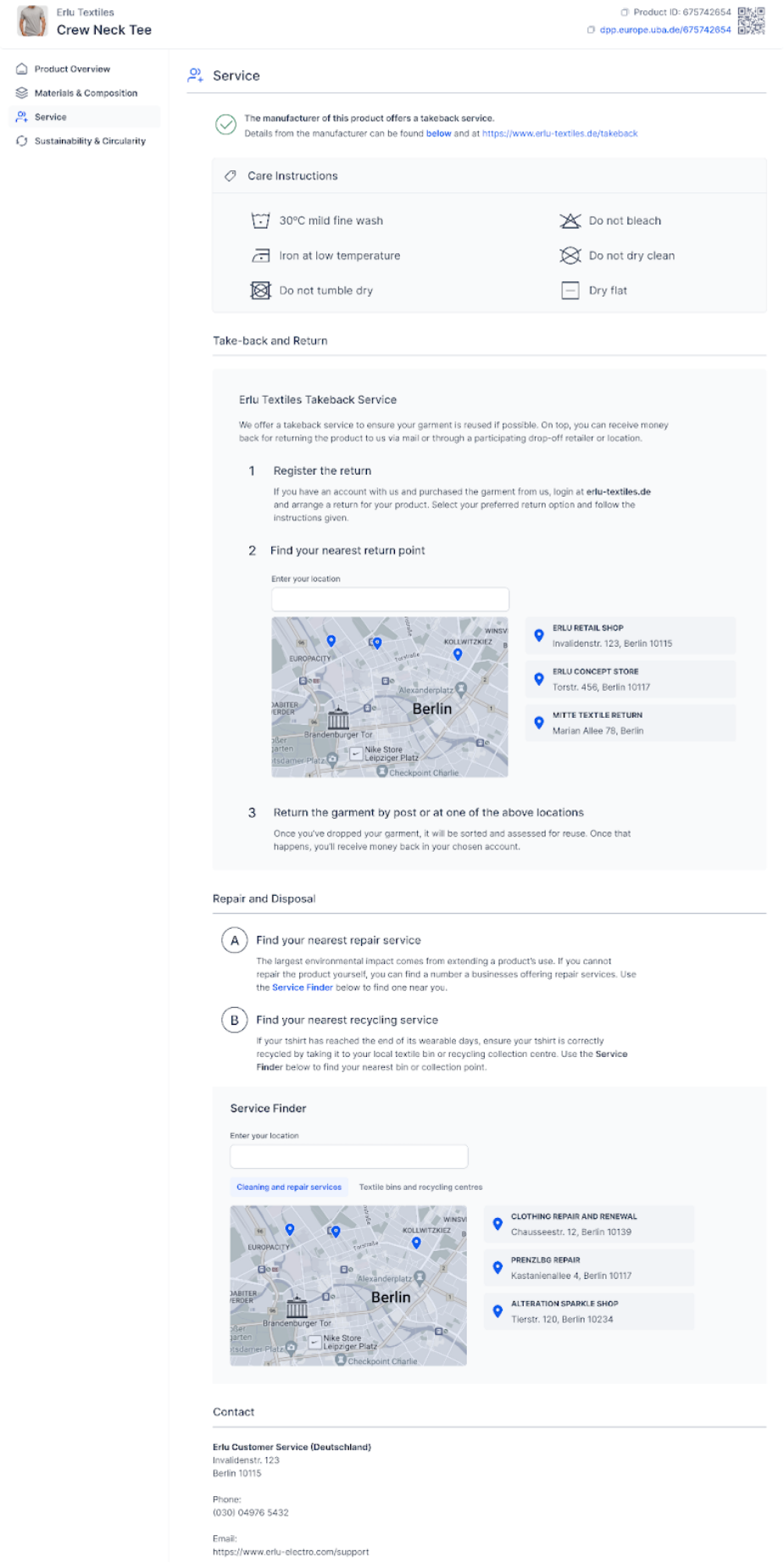
| CATEGORY | COUNTRY OF PRODUCTION | COMPOSITION |
|---|---|---|
| Yarn | Bangladesh | TENCEL™ Lyocell (100%) |
| **RECYCLED CONTENT** | **COLOUR** | **WATER PROPERTIES** |
| None | Gray | No Water Properties |

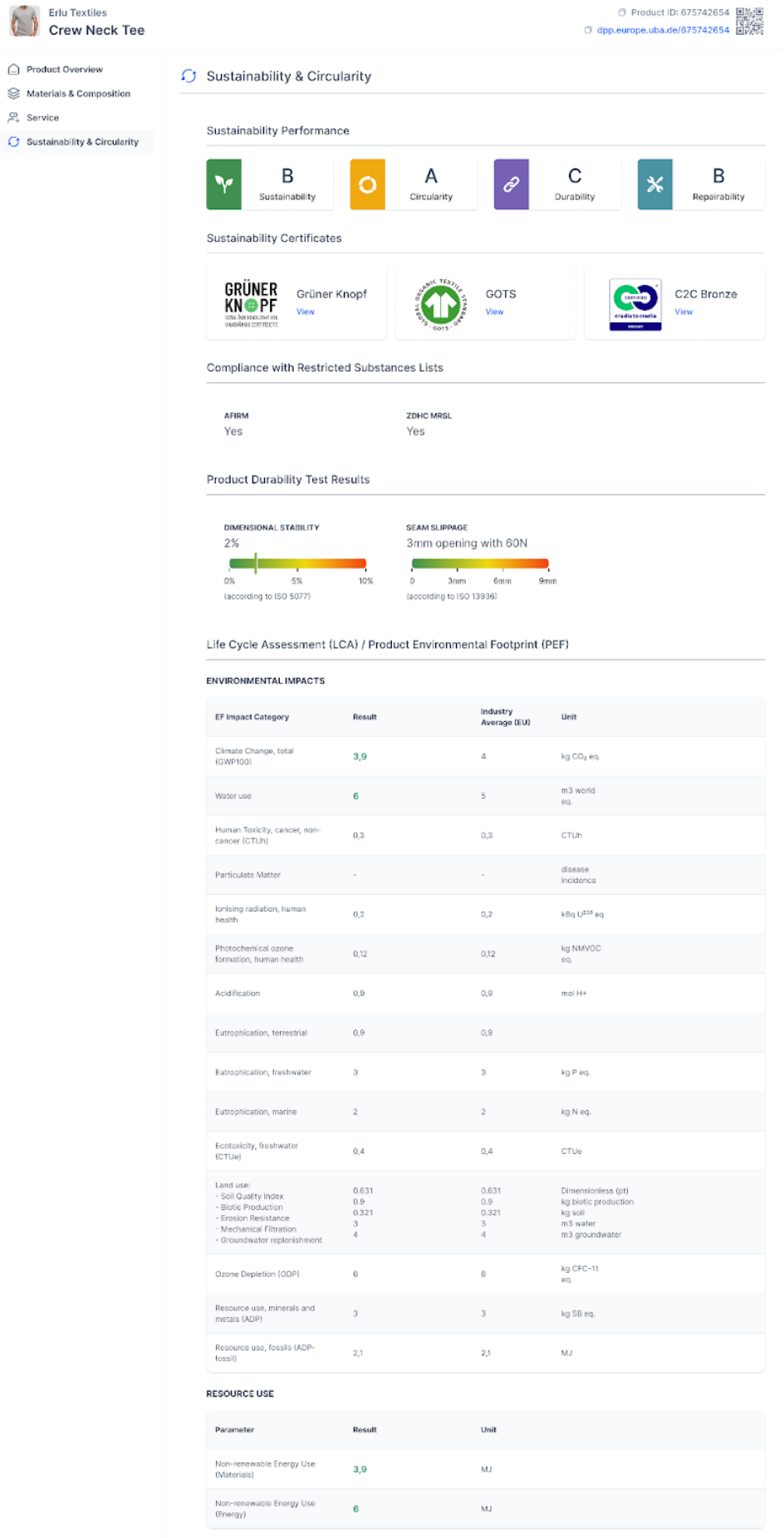
### Care Label

| CATEGORY | COUNTRY OF PRODUCTION | COMPOSITION |
|---|---|---|
| Trim | China | Organic Cotton (100%) |
| **RECYCLED CONTENT** | **COLOUR** | |
| None | Beige | |

Safety Data Sheets (MSDS / SDS)

MSDS_Crew_Neck_Tshirt_675742654.pdf


Erlu Textiles
Crew Neck Tee
Product ID: 675742654
dpp.europe.uba.de/675742654
Product Overview
Materials & Composition
Service
Sustainability & Circularity
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
Do not bleach
Iron at low temperature
Do not dry clean
Do not tumble dry
Dry flat
Take-back and Return
Erlu Textiles Takeback Service
We offer a takeback service to ensure your garment is reused if possible. On top, you can receive money back for returning the product to us via mail or through a participating drop-off retailer or location.
1 Register the return
If you have an account with us and purchased the garment from us, login at erlu-textiles.de and arrange a return for your product. Select your preferred return option and follow the instructions given.
2 Find your nearest return point
Enter your location
ERLU RETAIL SHOP
Invalidenstr. 123, Berlin 10115
ERLU CONCEPT STORE
Torstr. 456, Berlin 10117
MITTE TEXTILE RETURN
Marian Allee 78, Berlin
Berlin
3 Return the garment by post or at one of the above locations
Once you've dropped your garment, it will be sorted and assessed for reuse. Once that happens, you'll receive money back in your chosen account.
Repair and Disposal
A Find your nearest repair service
The largest environmental impact comes from extending a product's use. If you cannot repair the product yourself, you can find a number a businesses offering repair services. Use the Service Finder below to find one near you.
B Find your nearest recycling service
If your tshirt has reached the end of its wearable days, ensure your tshirt is correctly recycled by taking it to your local textile bin or recycling collection centre. Use the Service Finder below to find your nearest bin or collection point.
Service Finder
Enter your location
Cleaning and repair services
Textile bins and recycling centres
CLOTHING REPAIR AND RENEWAL
Chausseestr. 12, Berlin 10139
PRENZLBG REPAIR
Kastanienallee 4, Berlin 10117
ALTERATION SPARKLE SHOP
Tierstr. 120, Berlin 10234
Berlin
Contact
Erlu Customer Service (Deutschland)
Invalidenstr. 123
Berlin 10115
Phone:
(030) 04976 5432
Email:
https://www.erlu-electro.com/support



Erlu Textiles
Crew Neck Tee

Product ID: 675742654
dpp.europe.uba.de/675742654

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

## Sustainability & Circularity

### Sustainability Performance

| B | A | C | B |
|---|---|---|---|
| Sustainability | Circularity | Durability | Repairability |

### Sustainability Certificates

| Grüner Knopf | GOTS | C2C Bronze |
|---|---|---|
| View | View | View |

### Compliance with Restricted Substances Lists

| AFIRM | ZDHC MRSL |
|---|---|
| Yes | Yes |

### Product Durability Test Results

**DIMENSIONAL STABILITY**
2%
0% 5% 10%
(according to ISO 5077)

**SEAM SLIPPAGE**
3mm opening with 60N
0 3mm 6mm 9mm
(according to ISO 13936)

### Life Cycle Assessment (LCA) / Product Environmental Footprint (PEF)

**ENVIRONMENTAL IMPACTS**

| EF Impact Category | Result | Industry Average (EU) | Unit |
|---|---|---|---|
| Climate Change, total (GWP100) | 3,9 | 4 | kg $CO_2$ eq. |
| Water use | 6 | 5 | m3 world eq. |
| Human Toxicity, cancer, non-cancer (CTUh) | 0,3 | 0,3 | CTUh |
| Particulate Matter | - | - | disease incidence |
| Ionising radiation, human health | 0,2 | 0,2 | kBq $U^{235}$ eq |
| Photochemical ozone formation, human health | 0,12 | 0,12 | kg NMVOC eq. |
| Acidification | 0,9 | 0,9 | mol H+ |
| Eutrophication, terrestrial | 0,9 | 0,9 | |
| Eutrophication, freshwater | 3 | 3 | kg P eq. |
| Eutrophication, marine | 2 | 2 | kg N eq. |
| Ecotoxicity, freshwater (CTUe) | 0,4 | 0,4 | CTUe |
| Land use:<br>- Soil Quality Index<br>- Biotic Production<br>- Erosion Resistance<br>- Mechanical Filtration<br>- Groundwater replenishment | 0.631<br>0.9<br>0.321<br>3<br>4 | 0.631<br>0.9<br>0.321<br>3<br>4 | Dimensionless (pt)<br>kg biotic production<br>kg soil<br>m3 water<br>m3 groundwater |
| Ozone Depletion (ODP) | 6 | 6 | kg CFC-11 eq. |
| Resource use, minerals and metals (ADP) | 3 | 3 | kg SB eq. |
| Resource use, fossils (ADP-fossil) | 2,1 | 2,1 | MJ |

**RESOURCE USE**

| Parameter | Result | Unit |
|---|---|---|
| Non-renewable Energy Use (Materials) | 3,9 | MJ |
| Non-renewable Energy Use (Energy) | 6 | MJ |