



PCDS
PRODUCT CIRCULARITY
DATA SHEET
LUXEMBOURG



CONNECT UNIVERSITY

Creating a digital circular fingerprint for products

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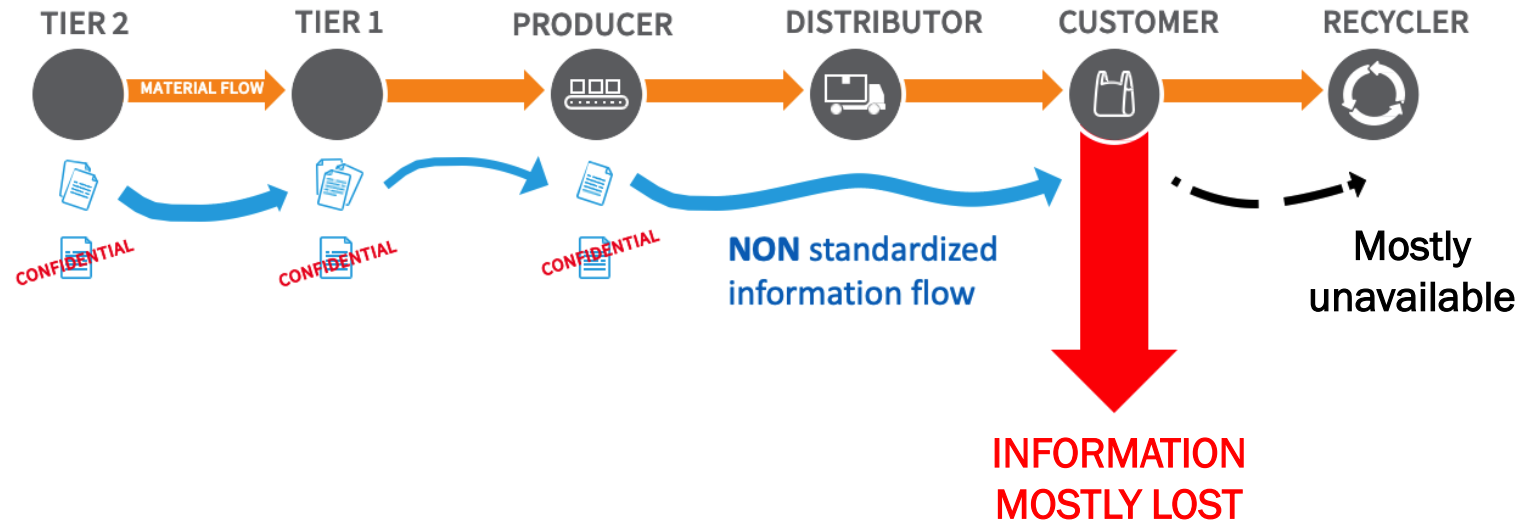


THE GOVERNMENT
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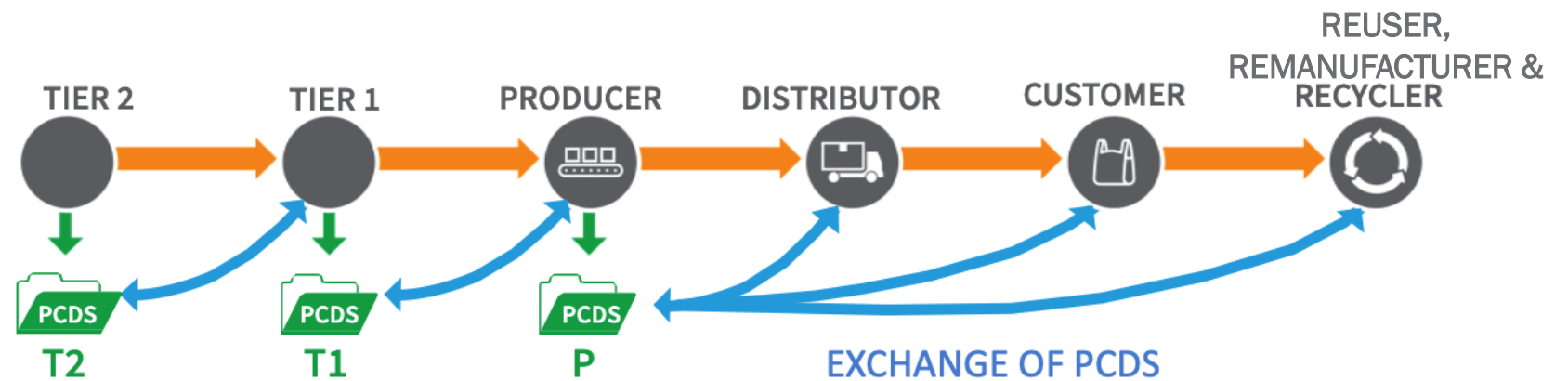
Problem statement

Collecting circularity data is expensive, difficult and non-standardized

Information flow in a linear economy



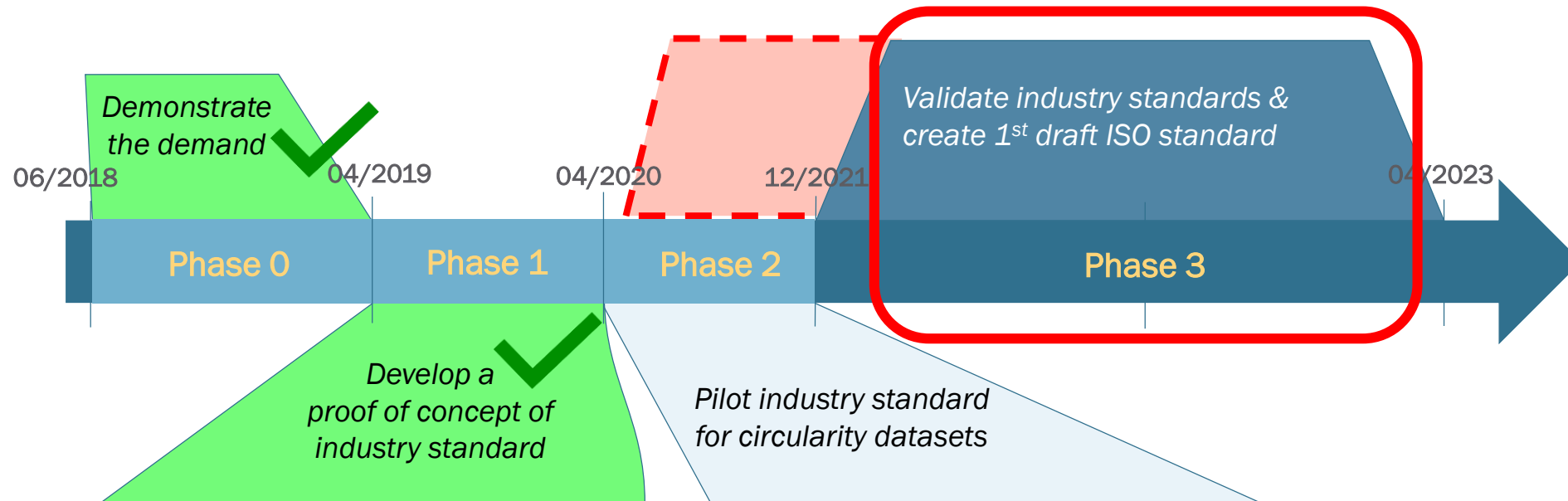
Information flow with PCDS



Circularity Dataset Standardization Initiative

Objectives and project governance

- Establish an international industry standard for communicating data on the circularity of products, to save significant costs to manufacturers and their suppliers by providing a standardized approach
- Support the design of circular products and the implementation of cost-effective circular business models
- +50 international companies working in a co-creation process
- Since 2018 managed by the Ministry of the Economy of Luxembourg
- Non-profit based governance under review



The solution






Standardized way to share circularity data at each step of the value chain

Product Circularity Data Sheet (PCDS) system:

- 1) a data template based on true/false statements which contains **standardized and trustworthy information** on the **circularity of a product** (including its **guidance document**)
- 2) a **third-party verification process** to validate the content of the **PCDS**
- 3) a **standardized data exchange protocol** based on a decentralized data storage approach

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17/02/2020

SECTION		STATEMENTS (Example)
1	 GENERAL INFORMATION	<ul style="list-style-type: none"> Company details Difference made between two production sites
2	 COMPOSITION	<ul style="list-style-type: none"> The product contains >75-95 % post-consumer recycled content by weight. The product does not contain Substances of Very High Concern from the REACH Candidate list in concentration above 0.1% by weight.
3	 DESIGNED FOR BETTER USE	<ul style="list-style-type: none"> The product can be maintained & repaired by untrained personnel at the location of the product use.
4	 DESIGNED FOR DISSASSEMBLY	<ul style="list-style-type: none"> The product is designed to be installed and demounted using reversible connectors.
5	 DESIGNED FOR REUSE	<ul style="list-style-type: none"> The product is designed for re-use as-is or with minimal modification. The product is designed for composting in a home composter.

Connection Types	Description
Type I	Direct chemical connection. Two materials are permanently fixed by chemical connection (no reuse or upcycling).
Type II	Indirect connection with irreversible chemical connection, which is stronger than the connected elements/materials/products.
Type III	Direct connection with reversible chemical connection. Two elements are connected with softer chemical substances, which can be removed or delaminated (reuse by refurbishment is possible).
Type IV	Direct insert connection. Two elements are connected by upland insertion of accessories into the element (element is weakened after disassembly).
Type V	Direct connection with mechanical fixing devices. Two elements are connected with mechanical connection, which can be removed without damaging the elements (reuse and reconfiguration/adaptability is possible).
Type VI	Indirect connection via dependent third component. Two elements are separated with third element/component, but they have dependence in assembly (reuse is partly possible).
Type VII	Interlock connection. Two elements are connected without being damaged by fixing devices (direct reuse and reconfiguration/adaptability possible).
Type VIII	Intermediary connection. Two elements are connected by third element using dry/ mechanical connections. Disassembly of one element does not affect the other (direct reuse and reconfiguration/adaptability possible).
Type XI	Gravity. Two elements are connected only by gravity force.

Table 4: Connection Types Typology developed by F. Durmisdorff-Twante | University B&MR Project

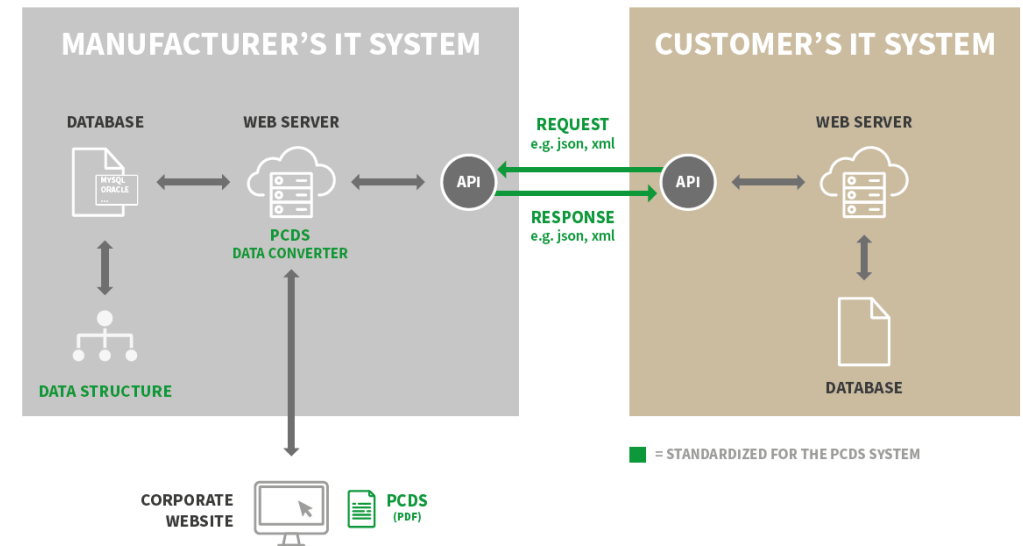
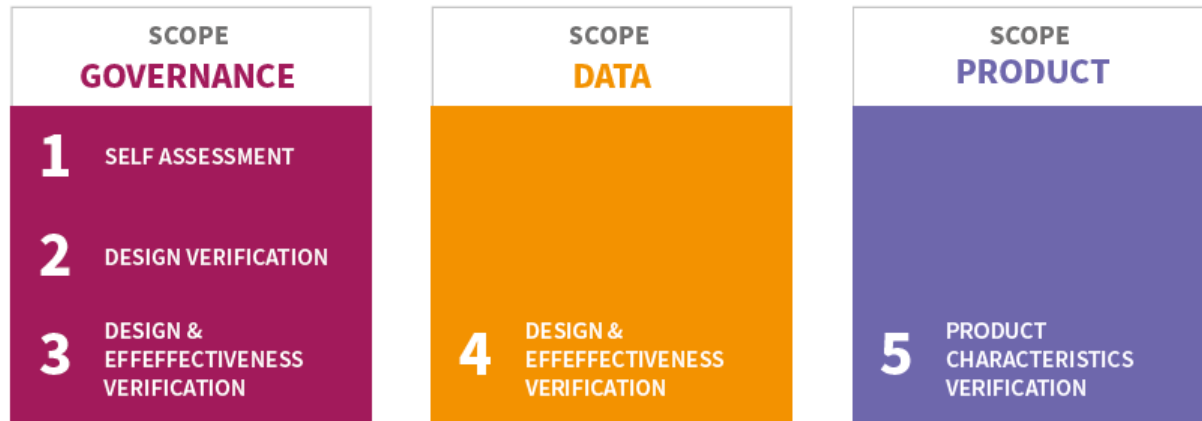
- 4.9. **disassembling**
ability of a **product** to be taken apart at the end of its useful life in such a way that the constituent sub-elements or components can be re-used or recycled. (ISO 6707-3:2017, Definition 3.7.31)
This is distinct from demounting where the product is being removed from another context like a structure or vehicle.

Example of disassembling: cell phone or computer that is easily separated into constituent components.

PCDS System

Third-party verification process and data exchange protocol

ASSURANCE MECHANISMS



- 3rd party auditable system with **multiple assurance mechanisms to balance credibility and cost-accessibility**
- **Affordable** audit structure inclusive for SME's
- Prerequisites facilitate audit

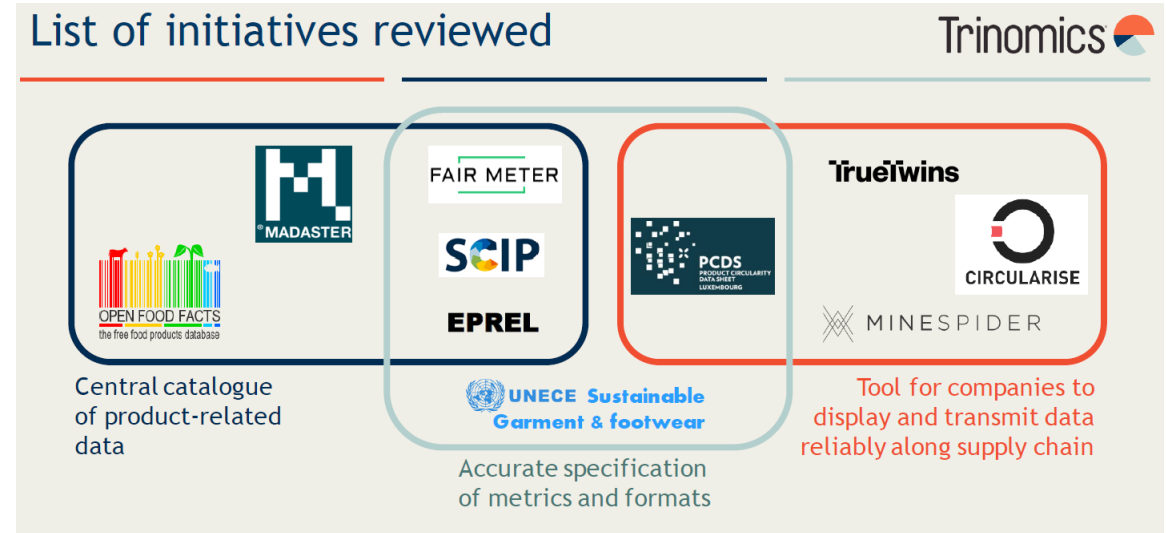
- **Decentralized** system based on the fact that data remains at producer's premises
- **No leakage** of proprietary information or trade secrets
- **Standardized exchange protocol** enabling efficient data exchange throughout the value chain

PCDS System

International awareness



- European Sustainable Product Initiative. Reviewed for the Digital Product Passport
- Notarisation proof of concept using the EBSI with ECA
- Included in the Cradle to Cradle certification v4.0
- Integration in building reporting systems including Madaster
- Strong support by Circular Economy leaders like EMF and WBCSD



EUROPEAN BLOCKCHAIN SERVICES INFRASTRUCTURE



International standardization

Product Circularity Data Sheet under ISO / TC323

- ISO Vote for NP-6572 positive on March 16th 2021 for the future **ISO 59040** on Product Circularity Data Sheet. Editor of the Norm is **ILNAS/Luxembourg**
- ISO Vote for the creation of WG5 on April 26th 2021 to convene the meetings to advance the norm. **Convenor:** Jérôme Petry, Min. Economy of Luxembourg. **Co-convenor:** Ding Shuang, CNIS/China
- Located under **ISO / TC323** with approx. 70 P-members and international support
- Alignment with existing undertakings and **CASCO** for conformity assessment

2021

Project kick-off and working draft

- Circulation of 1st working draft Nov 1, 2021

2022

Detail the content. Working draft -> committee ballot

- Committee Draft ballot April 4, 2022

2023

Deepen the work. Committee ballot to DIS

- Draft International Standard (DIS) February 13, 2023

2024

Finalize the standard

- Publication February 12, 2024