

# CIRPASS-2 project

Venice Training School 2025

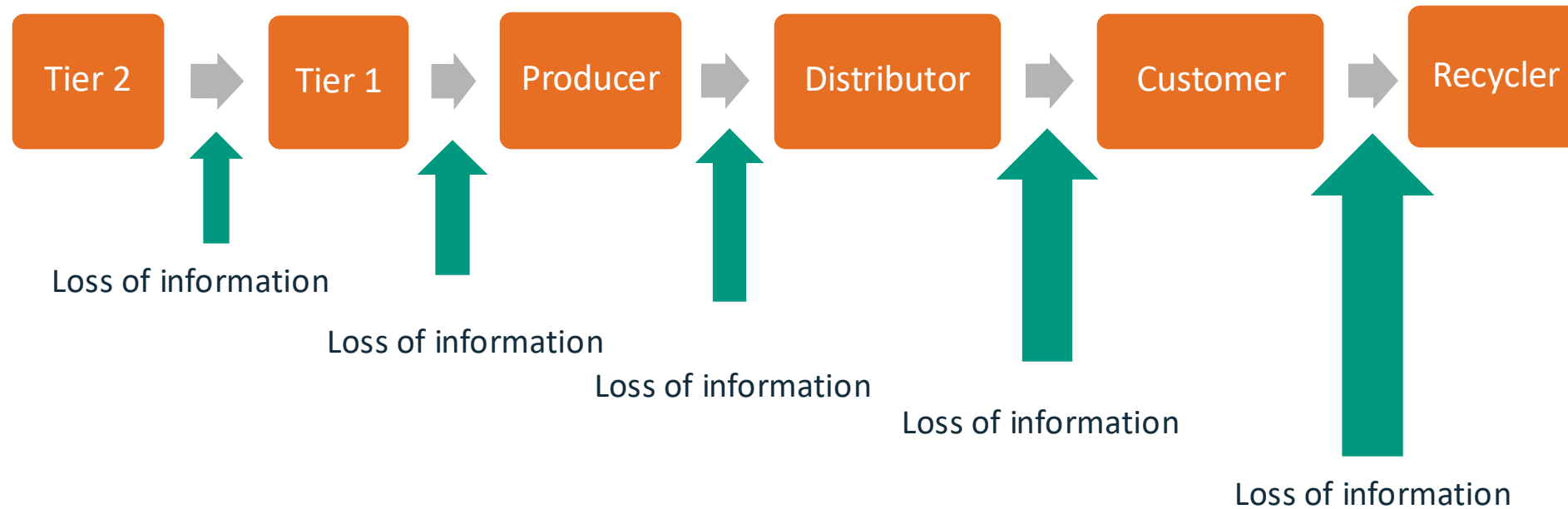
Anne-Christine Ayed, +ImpaKT / AOC Innovation  
CIRPASS<sup>2</sup> consortium member

June 13, 2025

*For the circular economy to work,  
not only resources are required to circulate...*

*...but also data on circularity of products along the value chain.*

**Collecting circularity data is expensive, difficult and non-standardized**



Linear economy : every sale leads to information loss about design and production details

# DPP in European regulations



2019



2020

Ecodesign for Sustainable Products Regulation



2022



2022

Battery Regulation



2027

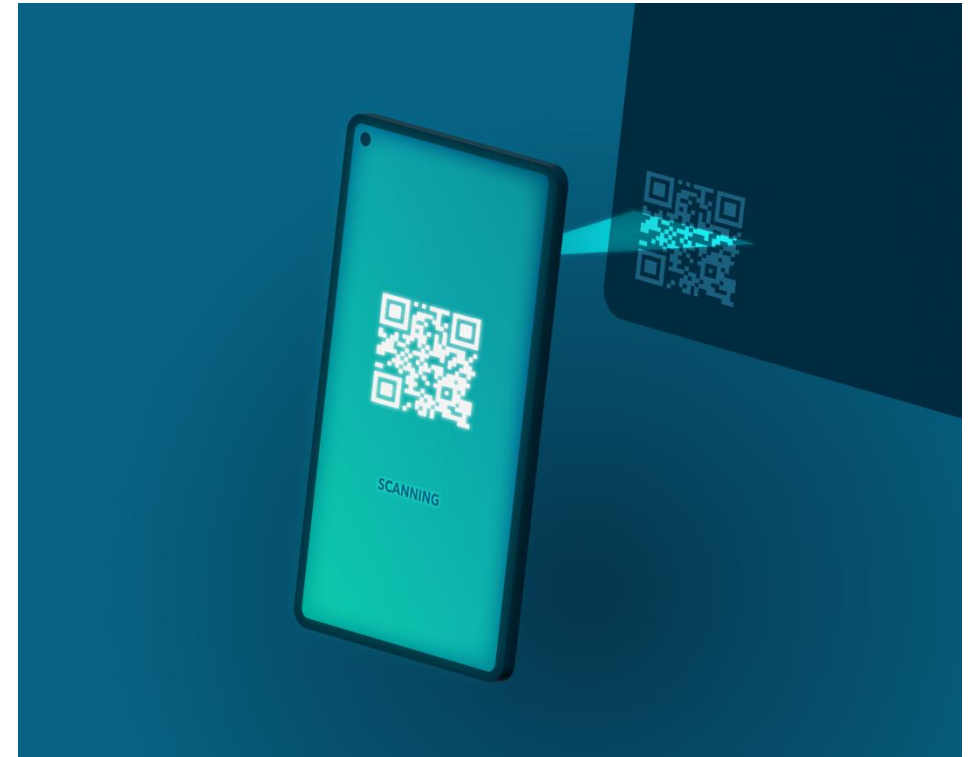


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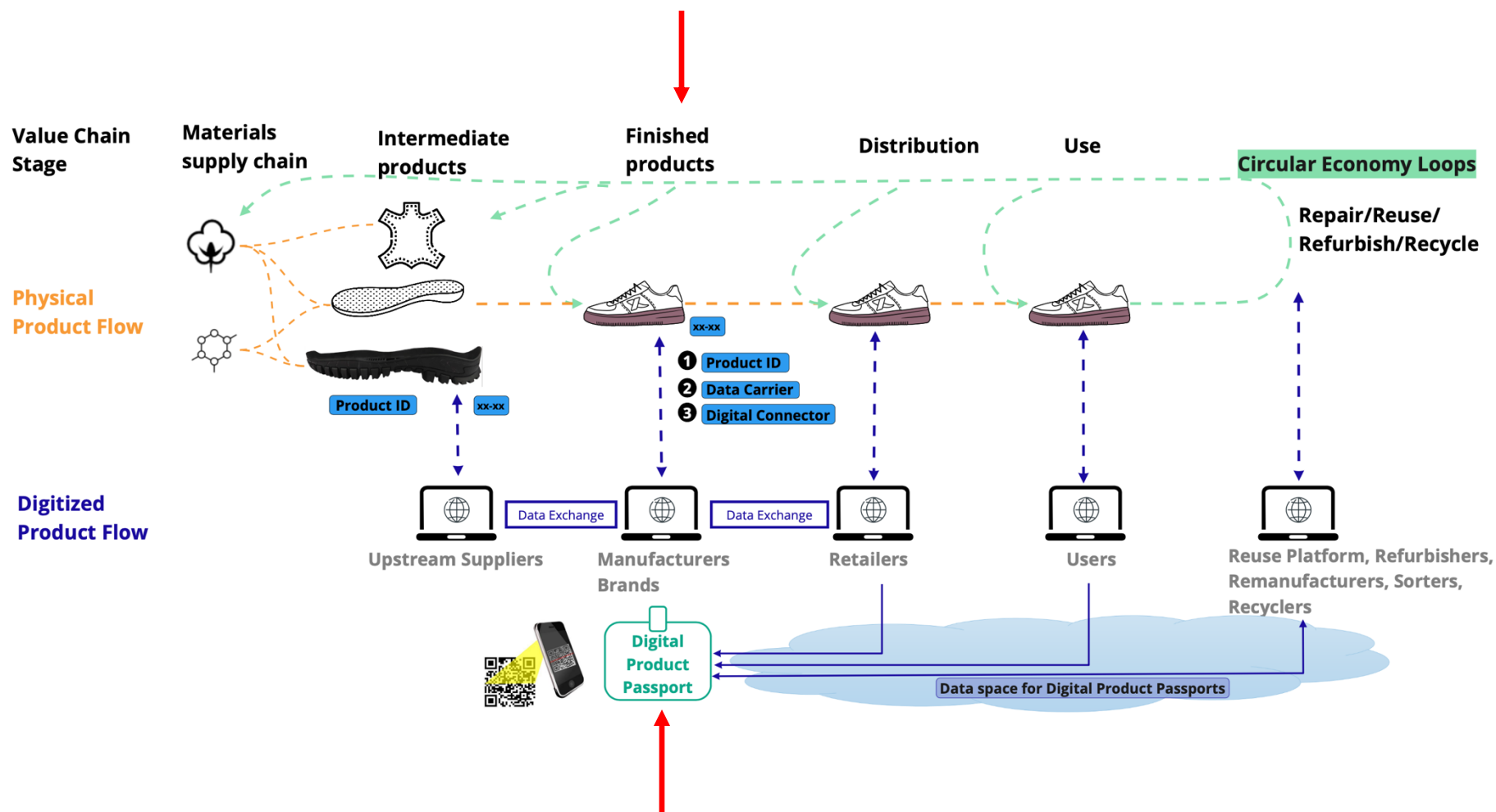
# Digital Product Passport in a nutshell

A **Digital Product Passport (DPP)** is a structured collection of product-related, **machine-readable** data with pre-defined scope and agreed data management and access rights conveyed through a **unique product identifier** and that is accessible via electronic means through a **data carrier**.

The DPP is an **information system for the circular economy**.



# EU vision for the Digital Product Passport



## DPP Information:

Collection of product data covering information related to sustainability and circularity (to be identified when developing product-group specific secondary legislation)

- Recycled content
- Substances of concern
- Environmental footprint profile
- Producer circularity indicators
- Use & maintenance instructions
- Dismantling & recycling instructions
- Track & trace identifiers

## DPP system:

Components of a data sharing system (to be developed before DPP deployment)

- 1 - unique persistent ID for the product
- 2- persistent data carrier (RFID, QR Code, digital watermark, Bluetooth tag, etc.)
- 3- digital connector between the physical product and the digital place of information on the product
- 6- IT architecture facilitating the data exchange and access (interoperability, data storage, data authentication, security and privacy...)

## DPP registry

# Digital Product Passport related initiatives

(only an extract of all initiatives)

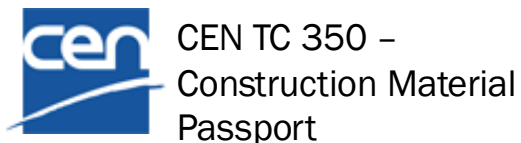
## Standardization initiatives



TECHNICAL COMMITTEES  
**ISO/TC 323**  
Circular economy



**ISO/TC 38**  
Textiles  
WG35 - Environmental aspects



IEC/ISO 62474 – Material Declaration

## EU Regulation



*Ecodesign for Sustainable Products Regulation (ESPR)*



*Revision of Construction Products Regulation (CPR)*

*Sustainable Battery Regulation*

## Platforms



cobuilder



THE INTERNATIONAL EPD® SYSTEM



EON



GTS  
GLOBAL TEXTILE  
SCHEME



*Auto Data Alliance*

(BMW, SAP, Siemens, Bosch, ZF Friedrichshafen)



# CIRPASS and CIRPASS-2



- Funded by the European Commission under the **Digital Europe Programme**
- **Duration:** 18 months (Oct 2022 - March 2024)
- **Coordination and Support Action (CSA)**
- **2M euros budget**
- **31 partners**



*Build consensus on a standards-based DPP system*

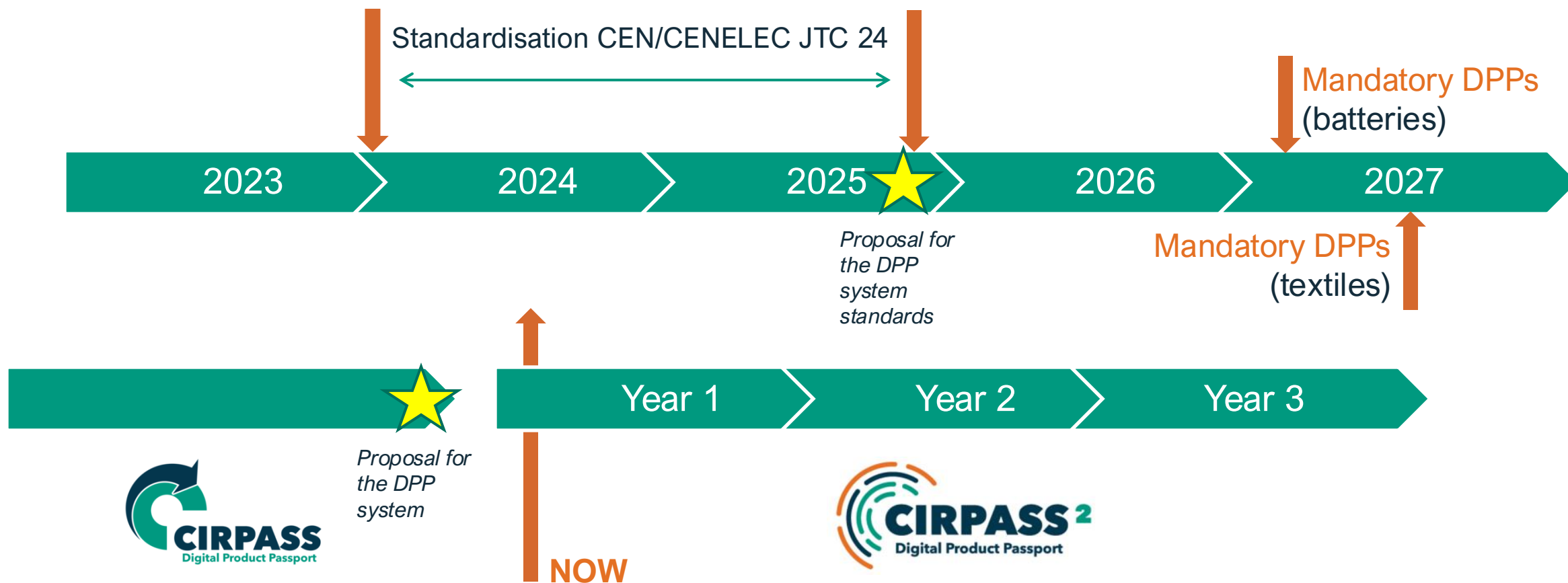
- Funded by the European Commission under the **Digital Europe Programme**
- **Duration:** May 2024 – April 2027
- **Innovation Action (IA)**
- **12,6M euros budget**
- **49 partners**



*Deploy at scale Digital Product Passports in four target value chains and demonstrate data-enabled B2B activities that promote circularity*



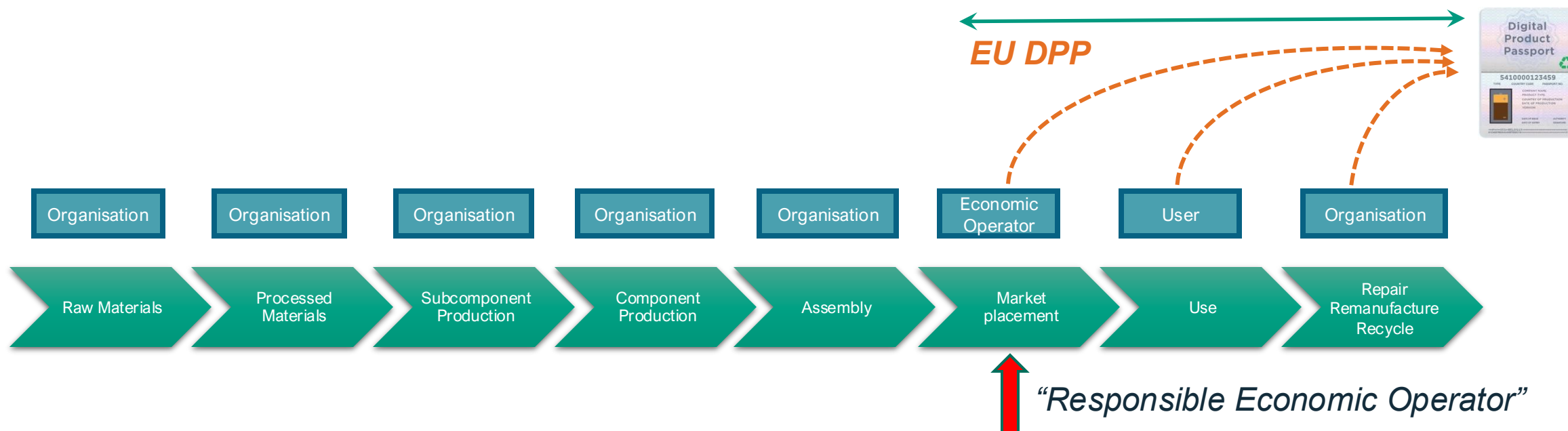
# Standardisation & CIRPASS-2 - Timelines



# The challenge we are we trying to solve

How can **all industries** agree on a common DPP system that is :

- **compliant** to the requirements of future regulations and that can support the massive issuing of DPPs in 2027 (Battery Regulation)?
- **extensible and flexible** to supporting **beyond-mandatory** data exchanges to enable new circular business models?"



# Regulatory and beyond-regulatory requirements for the DPP system

## Policy requirements

- No proprietary solutions
- Open standards and interoperable formats
- Decentralized data storage
- Both **static** and **dynamic** data
- **Public** and **private** access data

## Business requirements

- Acceptability: Maximum reuse of legacy systems and legacy data
- Accommodate both **regulatory** and **non-mandatory** (business-model-specific) and evolving information requirements.
- Future-proof and easy to deploy: A DPP system with built-in flexibility based on state-of-the-art technologies but sufficiently mature to support DPPs in 2027


**The DPP is an information system for the Circular Economy.**




The **Semantic Web** stack already comes with most of the necessary (and mature) access control, usage control, verification, data ingestion, data manipulation, data exploitation tools **to link data and meta data**.


- 1 - Deploy and **validate at scale** and in real-life setting Digital Product Passports in **four target value chains** (textile, electronics, tyres, construction products)
  - Focus on B2B activities that promote circularity
  - While supporting the ongoing CEN/CENELEC standardisation work
- 2 - **Demonstrate cross-pilot interoperability**
- 3 - **Provide support to SMEs** in their uptake of DPPs. Support the deployment of DPP-as-a-Service
- 4 - Support the deployment and adoption of DPPs by other sectors targeted by upcoming European regulations and beyond

# DPP solutions (demonstrators)






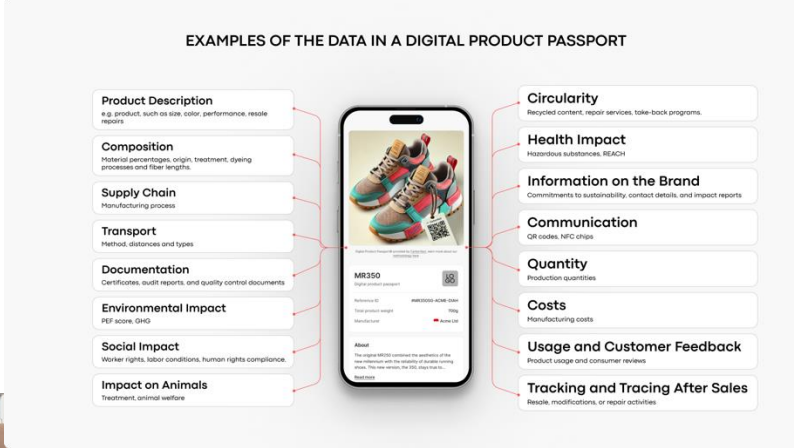
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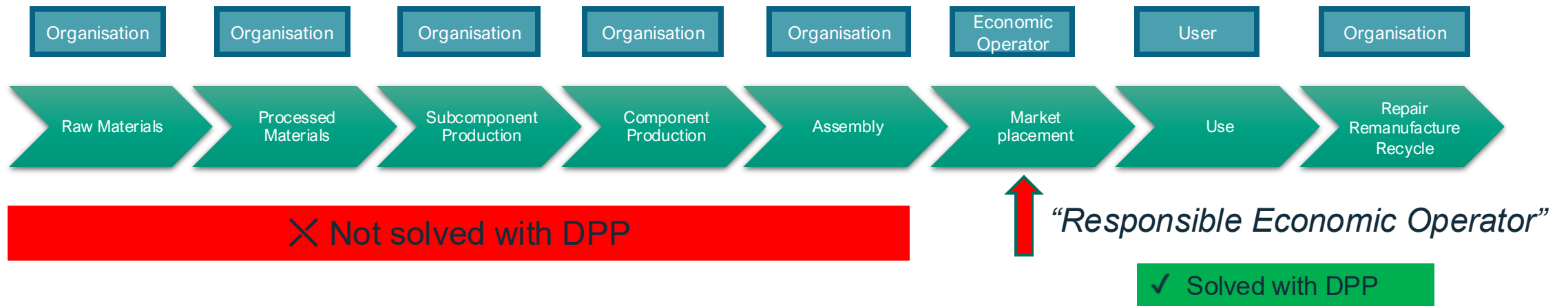
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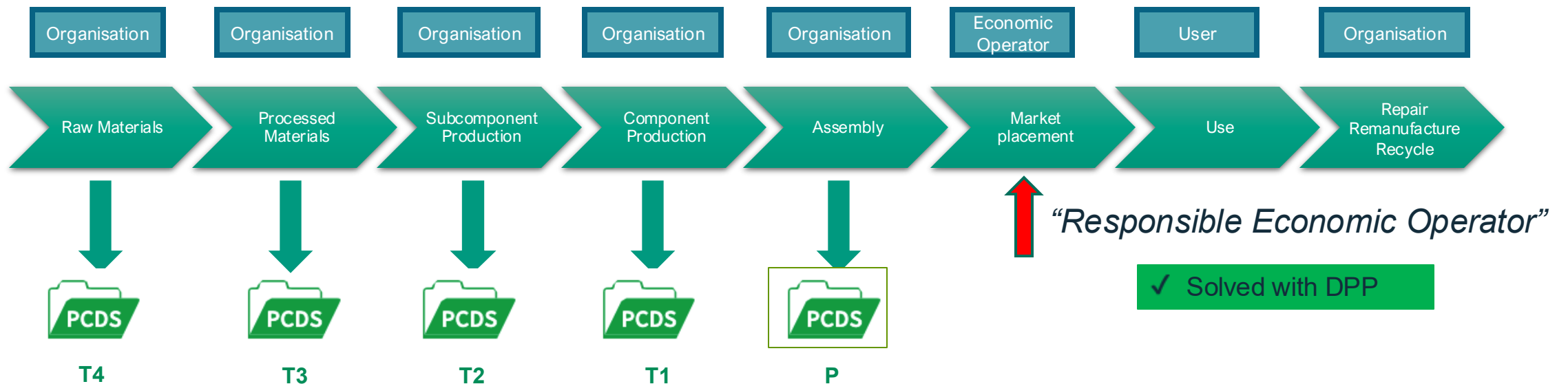
- 1: © Wordline
- 2: © projecthub 360
- 3: © carbonfact
- 4: © weloop.org

# Among remaining challenges... upstream data acquisition

Communicating circularity upstream data also requires a cross-sectorial approach



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



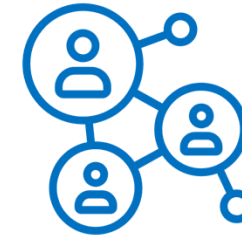
Standardized way to share circularity reliable data at  
each step of the value chain



A data template



A third-party verification process



A standardized IT exchange protocol & format

An ISO standard for communicating data on the circularity aspects of products **across supply chain**:

1. A **common language** to describe circularity features
2. Supports the **design of circular and healthier products**
3. Makes **product information more transparent** without infringing IP
4. Facilitates **collection of trustworthy data** from the supply chain
5. Saves costs with a standardized format published once for all your customers



# ISO 59040 : Structure of a PCDS template

Category number	Category	UID	Module	Obligation	Category number	Category	UID	Module	Obligation
1	PCDS template	1.1.0.00	PCDS template issuer	Mandatory	4	Circular production	4.1.0.00	Renewable energy	Optional
		1.2.0.00	PCDS template identifier	Mandatory			4.2.0.00	Water reuse or recirculation	Optional
		1.3.0.00	PCDS template version	Mandatory	5	Durability and extended lifetime	5.1.0.00	Reliability	Optional
		1.4.0.00	Persistent identifier page	Optional			5.2.0.00	Maintenance and repair	Optional
2	Company & Product information	2.1.0.00	Product identification	Mandatory			5.3.0.00	Upgradeability	Optional
		2.2.0.00	Supplier identification	Mandatory			5.4.0.00	Demounting	Optional
		2.3.0.00	Production site information	Optional			5.5.0.00	Disassembly	Optional
		2.4.0.00	PCDS issuance	Mandatory			5.6.0.00	Reuse	Optional
		2.5.0.00	PCDS revision	Mandatory			5.7.0.00	Refurbishing	Optional
3	Material inputs	3.1.0.00	Product composition	Mandatory	6	Circularity at end of product use period	6.1.0.00	Product portion released into the environment during its use	Mandatory
		3.2.0.00	Hazardous substances and substances of concern	Mandatory			6.2.0.00	Dismantling	Optional
		3.3.0.00	Reused content	Mandatory			6.3.0.00	Remanufacturing	Optional
		3.4.0.00	Recycled materials	Mandatory			6.4.0.00	Recycling	Mandatory
		3.5.0.00	Renewable materials	Mandatory			6.5.0.00	Composting and biodegradability	Mandatory

## Company and product information

- Product name: Eco Box
- Company name: Ornamin
- Production site: Minden, Germany

## Material inputs

- Does not contain Substances of Very High Concern from the REACH Candidate list above 0.1% by weight
- Contains > 0-10 % pre-consumer recycled content by weight



## Durability and extended lifetime

- Maintenance or repair of the product during its use period is not possible due to the design of the product.
- Spare parts are made available by the manufacturer during the functional use period of the product.
- The product is designed for re-use as-is or with minimal modification.

## Circularity at end of product use

- Less than 1% of the product content is anticipated to become leakage during the use phase
- 0% of the product is designed for recycling at the same level of quality. The remainder of the materials is foreseen by the manufacturer to be recycled at a lower quality than the original content.

## Company and product information

- Product name: Masterline 8 window
- Global Trade Item Number

## Material inputs

- Does not contain Substances of Very High Concern
- Contains > 0-10 % pre-consumer recycled content by weight.



## Durability and extended lifetime

- Can be maintained & repaired by trained personnel
- Designed to be installed and demounted with reversible connectors
- >25-50 % of the product (weight in kg) is designed to be cleanly removed from the product.

## Circularity at end of product use

- less than 1% of the product content is anticipated to become leakage during the use phase
- >75-95% of the product content is designed for recycling at the same level of quality

**Circularity design principles for aluminium window systems**

[https://www.reynaers.co.uk/sites/default/files/public/2022-09/241081\\_Wico-Brochure-A4\\_EN\\_FIN\\_digital\\_0.pdf](https://www.reynaers.co.uk/sites/default/files/public/2022-09/241081_Wico-Brochure-A4_EN_FIN_digital_0.pdf)

# Thank you!

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Contact us : [info@cirpass2.eu](mailto:info@cirpass2.eu)



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