

GO CIRCULAR

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# Digital Product Passport

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# Fraunhofer IZM (Institut für Zuverlässigkeit und Mikrointegration)

## Abteilung „Environmental and Reliability Engineering“

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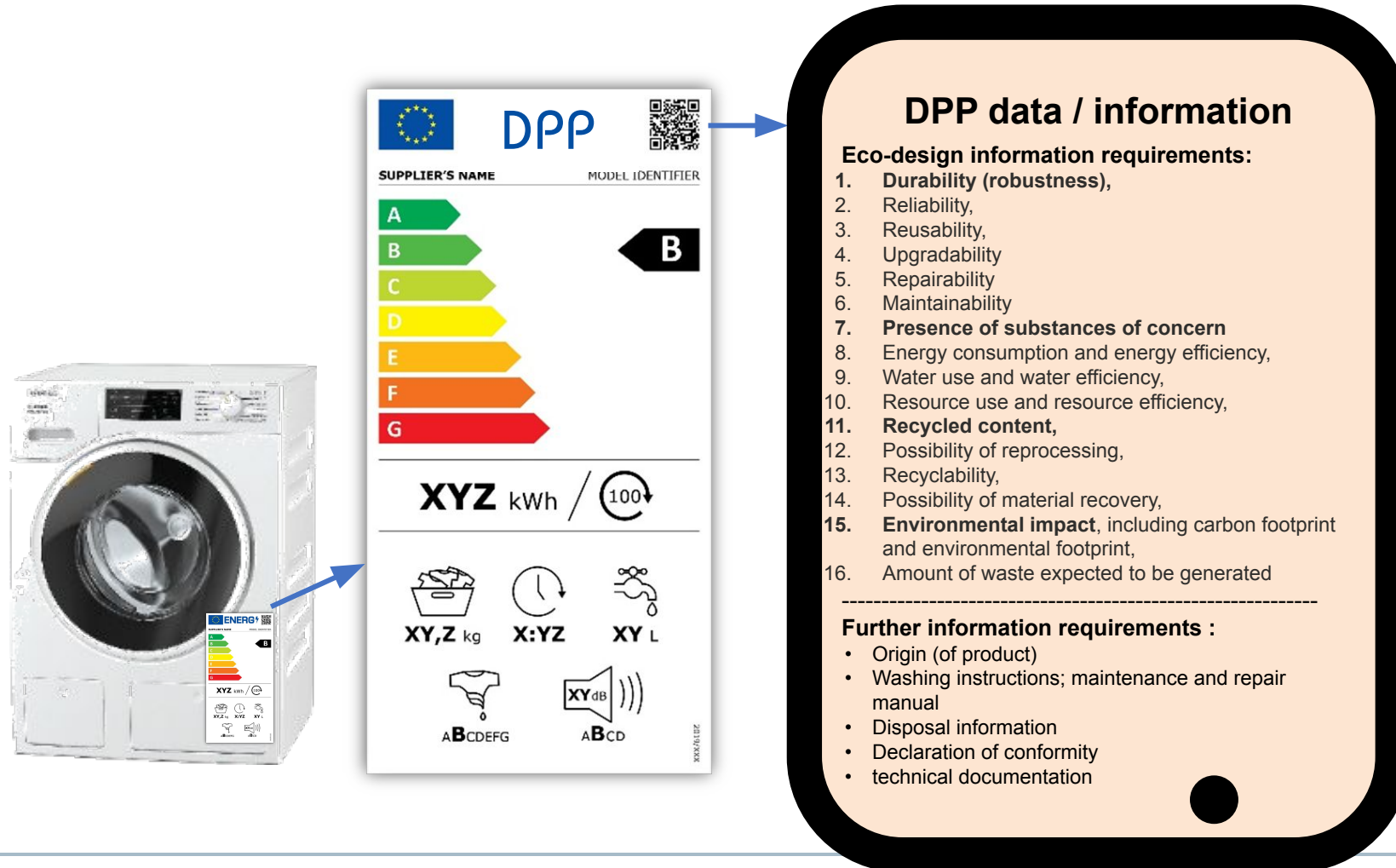
- **Industry-oriented research, since 1993**
- **Digital product passport activities**
  - **DPP concept & pilots:** „CIRPASS“ & „CIRPASS 2“
  - **DPP assessment studies for industry**
- **Ecodesign legislation & ESPR preparatory studies for the delegated acts:**
  - Textiles
  - Furniture
  - Repairability (horizontal)
  - Washing machines, dishwashers
  - Previous: smartphone & tablets, external power supply, printers, TVs, battery chargers, enterprise Server
- **Product-legislation updates (2x/year)**
- **Circular economy-ready technologies (Green ICT)**
- **WEEE (plastic) & Battery recycling**
- **LCA and product circularity assessment (repairability, durability, etc.)**



# Digital Product Passport Principle

# Digital Product Passport - principle

## Visualisation on the example of the energy efficiency label

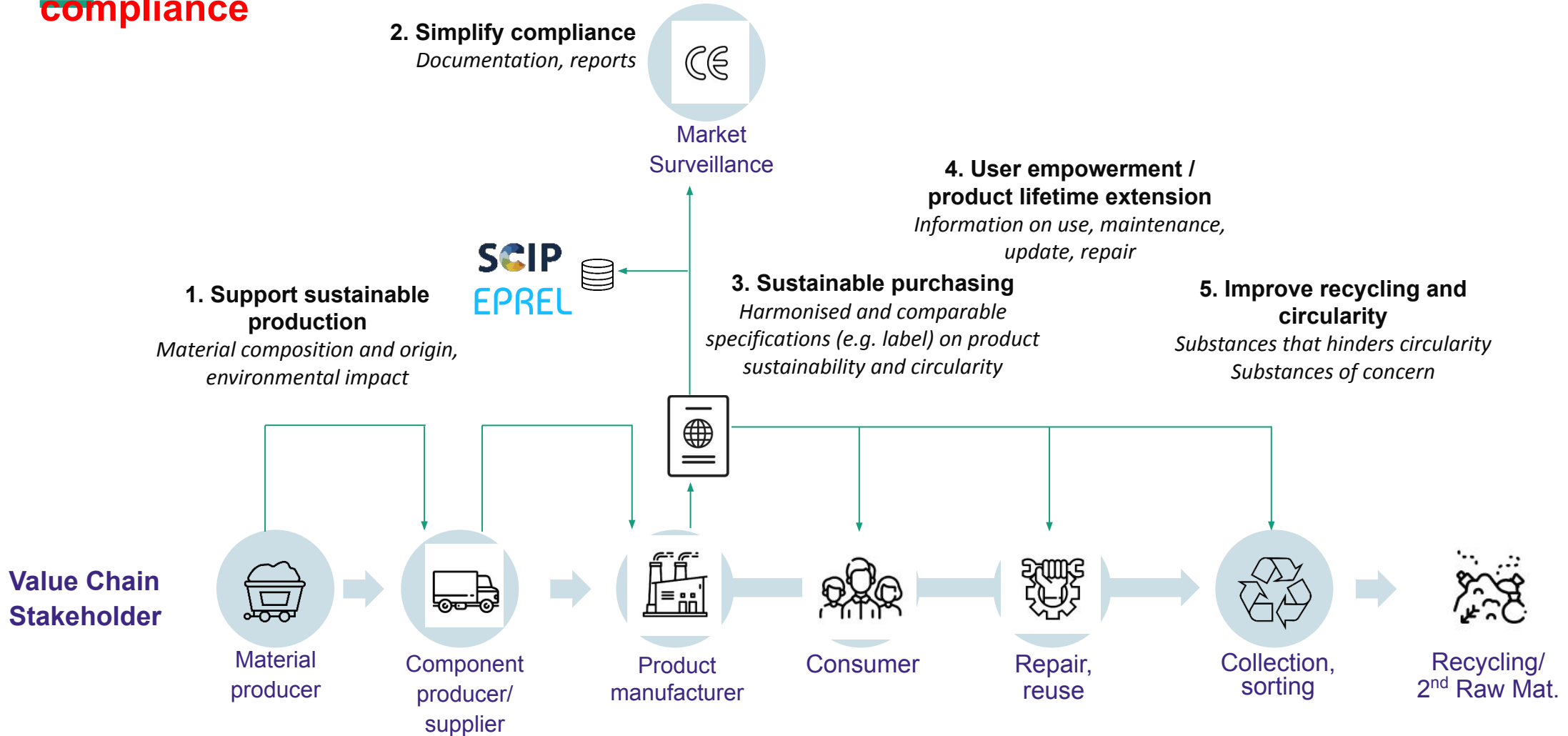


### DPP (in a nutshell)

- Every product becomes a **unique ID**
- Data is structured and **stored in standardised way**
- Access via „**data carrier**“ (QR, RFID or Web-Link)
- **Access management** for public / private access
- DPP data & **DPP system** are individual per product group

# Objective of the DPP

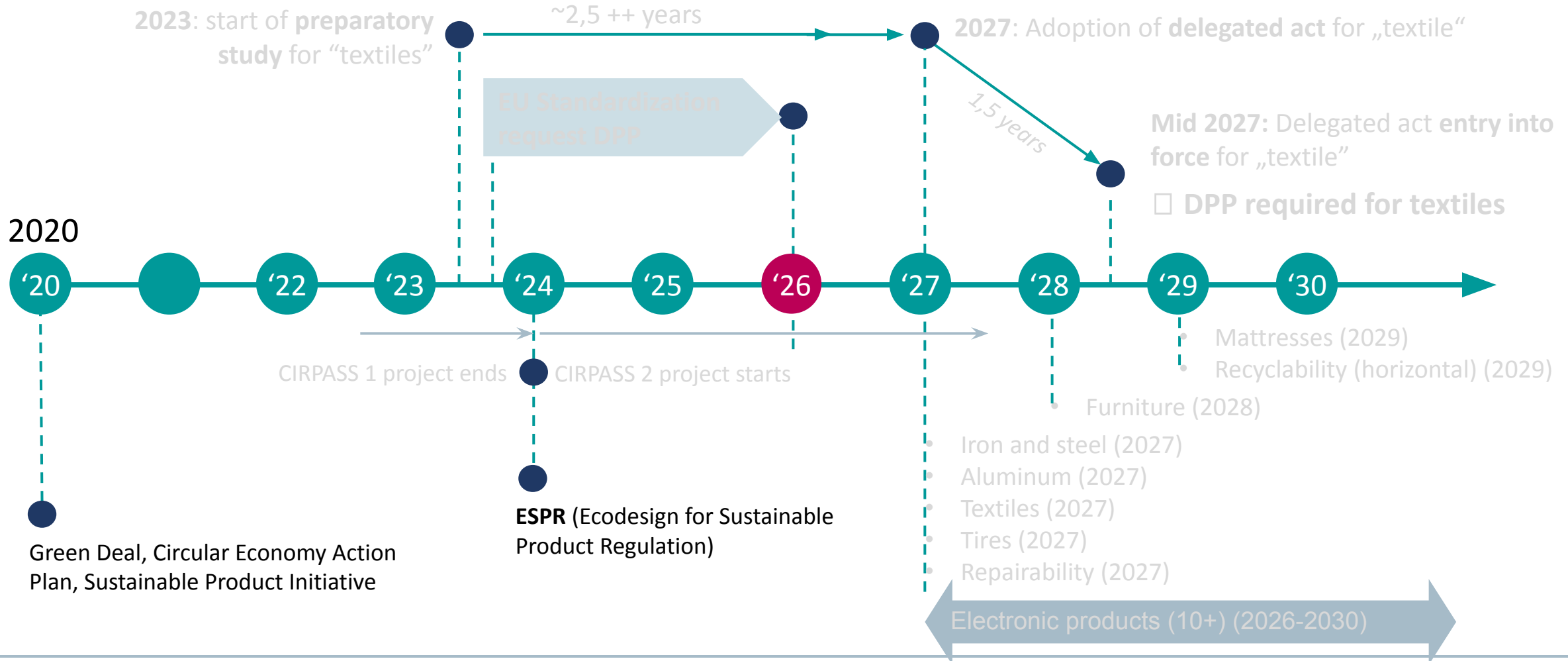
Simplify digital access to product-specific information of **sustainability**, **circularity**, and **compliance**



# Political background

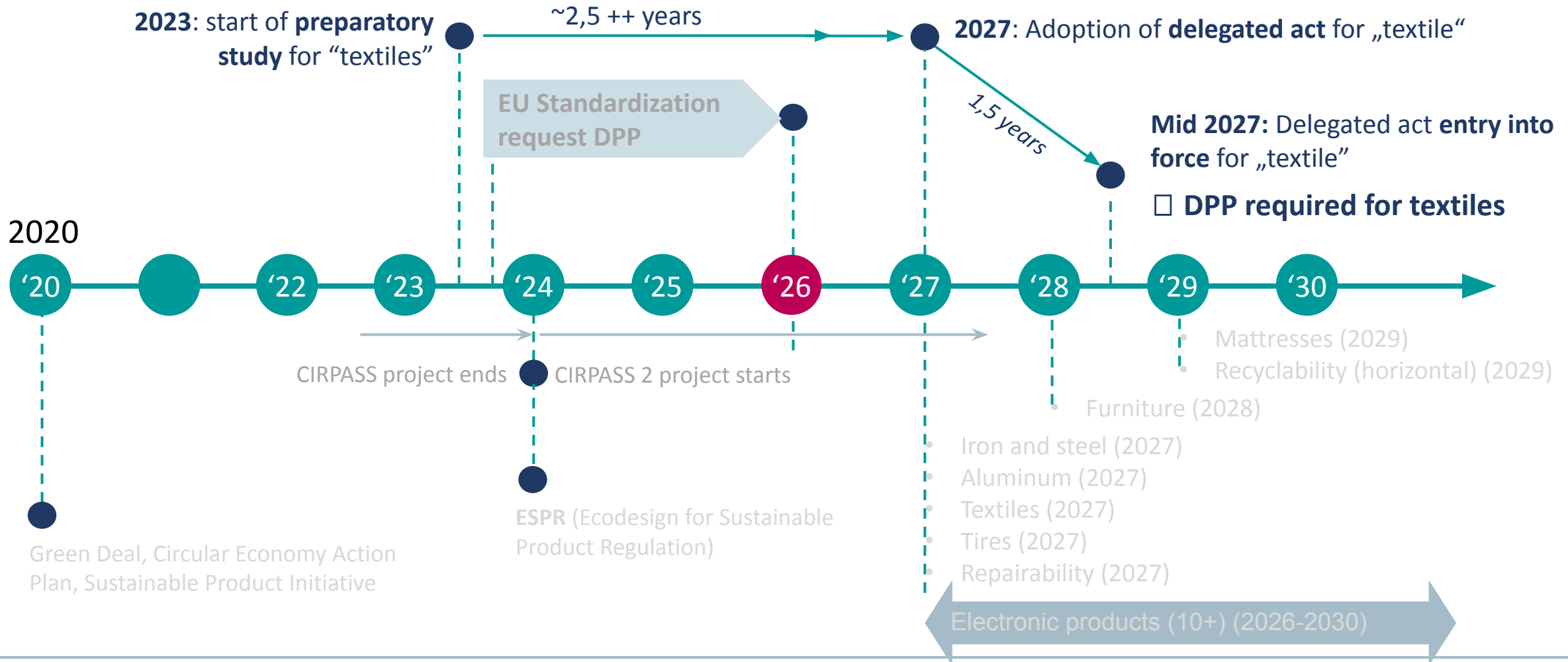
# ESPR & DPP timeline

## Implementation roadmap



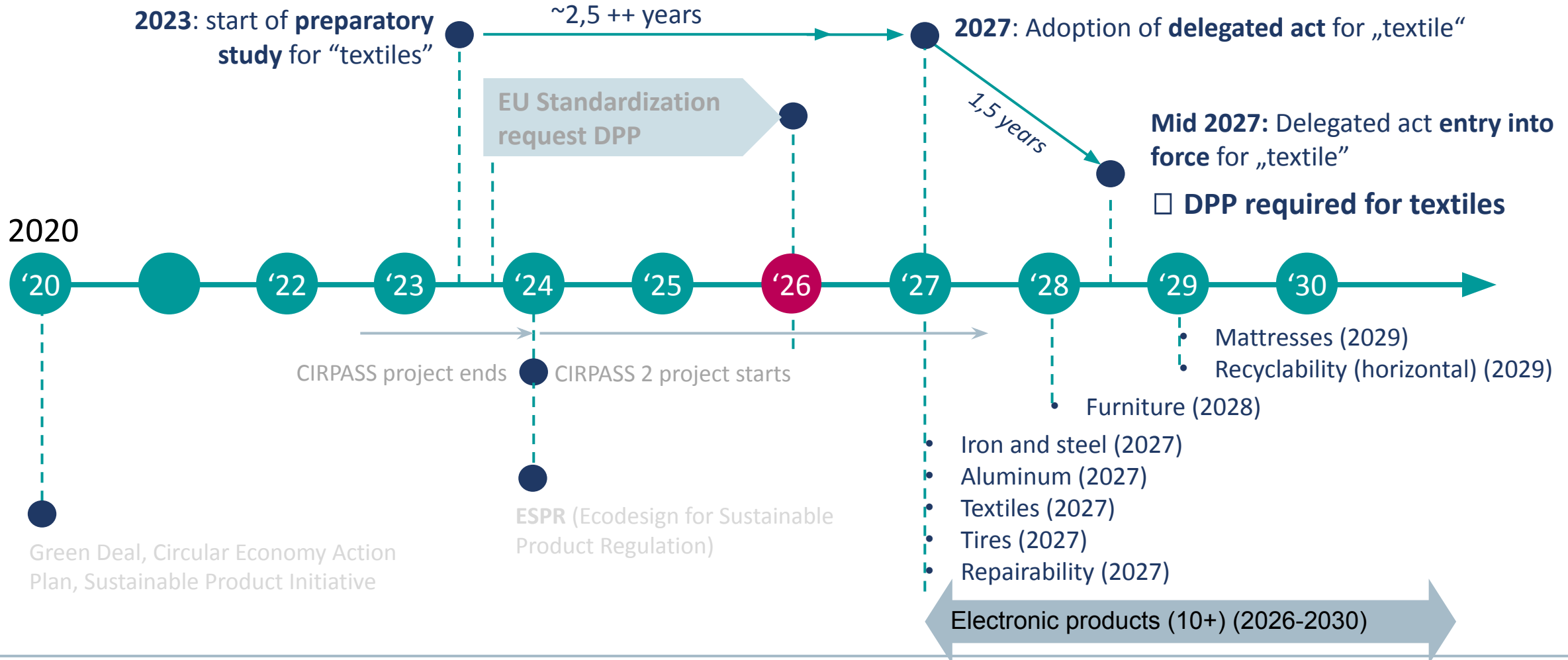
# ESPR & DPP timeline

## Implementation roadmap



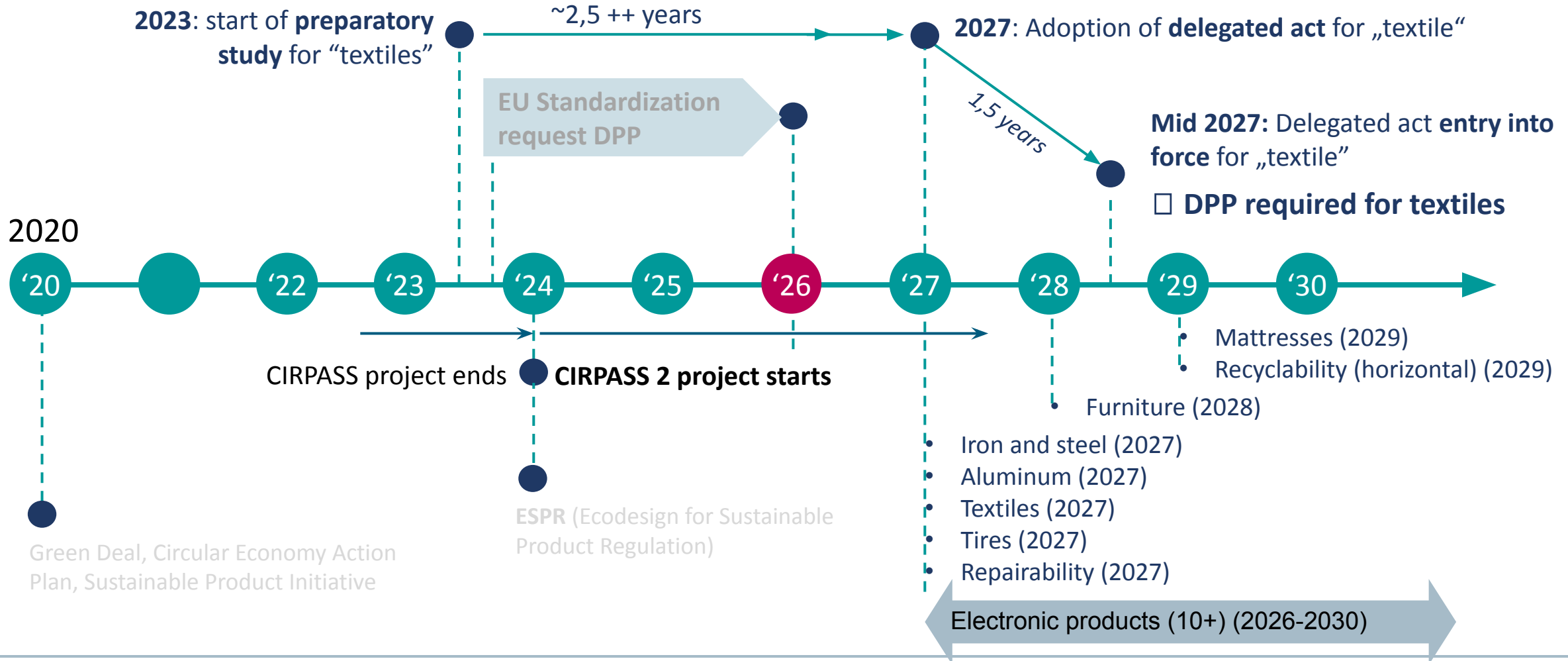
# ESPR & DPP timeline

## Implementation roadmap



# ESPR & DPP timeline

## Implementation roadmap



# CIRPASS 2 Project

# What is CIRPASS and CIRPASS-2 ?

## Lighthouse projects regarding the EU-DPP

- Coordination and Support Action (no R&D)
- Goal: **Concept** development for DPP system and key-information
- Product groups: textile, electronics, batteries
- Duration: 18 months (Oct 2022 - March 2024)
- 31 partners



*Build consensus on a standards-based DPP system*

- Innovation Action
- Goal: **Demonstration** of Digital Product Passports in target value chains
- Product groups: textile (6), electronics (5), tires (1), construction (1)
- Duration: **36 month** (May 2024 – April 2027)
- **50 partners**



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

# CIRPASS-2 Partners



## Cross-cutting expertise, Standards, Circular Economy

### Research institutes



CIRPASS-2 coordinator



Physikalisch-Technische Bundesanstalt  
National Metrology Institute



Expert Working Group partners:

EWG1, EWG2, EWG3, EWG4, EWG5, CoP

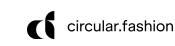


energy web



### Pilot participants

#### Textiles



#### Electronics



#### Construction



#### Tyres



# CIRPASS-2 Partners



## Research institutes

## Cross-cutting expertise, Standards, Circular Economy

## Pilot participants

Not shown: organisations participating in each pilot



CIRPASS-2 coordinator



Expert Working Group partners:  
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More than 800 experts from industry bringing know-how to support project activities.



maki consulting  
Life cycle expert services



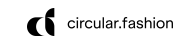
energy web



in Europe



### Textiles



### Electronics



### Construction



### Tyres



# Demonstrators

## DPP use-cases in CIRPASS 2

- Textile:
  - Workwear
  - Garments (2x),
  - Sports-wear,
  - Mattresses,
  - Bedding
- Electronic products:
  - Vacuum cleaners,
  - General EEE,
  - Audio & Lighting,
  - IT equipment,
  - Tumble dryers
- Tires (Reifen)
- Construction products



# Demonstrators

## DPP use-cases in CIRPASS 2

- Textile:

- Workwear
- Garments
- Sports
- Mattresses
- Bedding

- Electronic:

- Vacuum cleaners
- Generators
- Audio
- IT equipment
- Tumble dryers

- Tires (Re)

- Construction

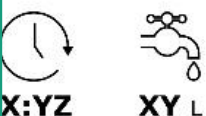
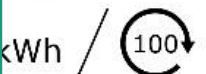
- Pilot diversity is the key to ensuring that what we propose is aligned with the current state of the industry.

- Sector diversity is the key to ensuring that the DPP system standards are both cross-sectoral and future-proof.

- Goal: Prove that the DPP can be **more** than just a regulatory burden for companies but it can effectively promote economic and environmental sustainability.



MODEL IDENTIFIER



2019/03/26

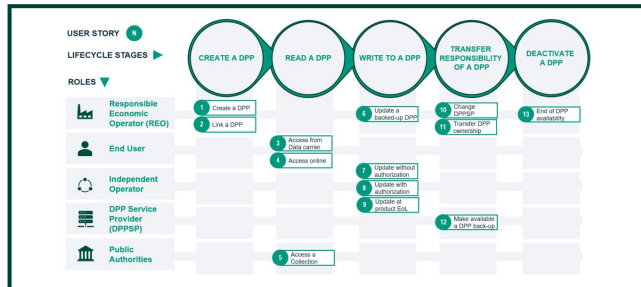
# DPP's for product usage and end-of-use: Tumble Dryer

Scenario and involved stakeholder :

1. **Gorenje:** 1000 units from Gorenje
2. **Ekodenge:** DPP will record detailed **lifecycle data, including usage, repairs, and replacements.**
3. **Hisense:** after-sales users will access DPP for **managing services, reporting appliance status, and maintenance.**
4. **Other:** ZEOS for **end-of-use collection**, and SUROVINA as **recycler**. Additionally, 100 **consumers** will test and provide feedback on the DPP service



# Published recommendations for DPP system implementation



## USER STORIES V3

Details all interactions between the DPP system and its users, based on the ESPR.



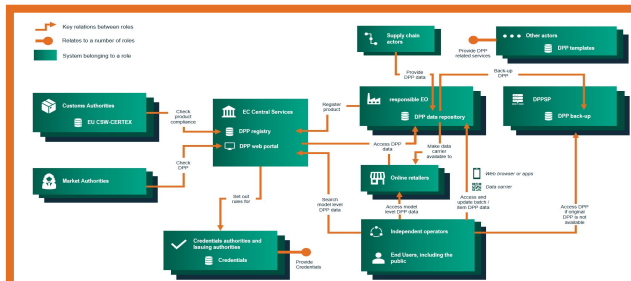
## Risks and mitigations

Analyzes technical and non-technical risks for the DPP system and proposes mitigations



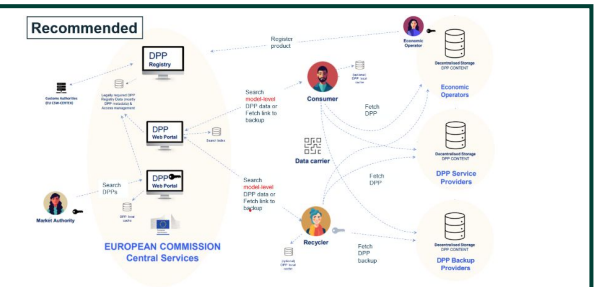
## Options for redirection to the backup

Considerations for ensuring access to mandatory DPP backup



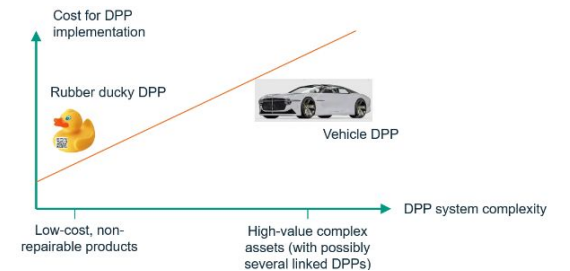
## Reference architecture proposal

Proposes building blocks and recommendations for a full-fledged DPP system



## Options for EU Web Portal search

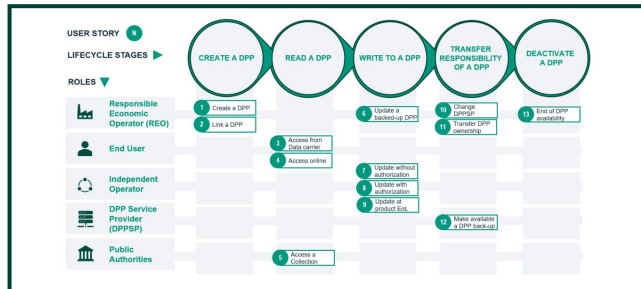
Provides considerations and recommendations for the search portal



## The simplest DPP system

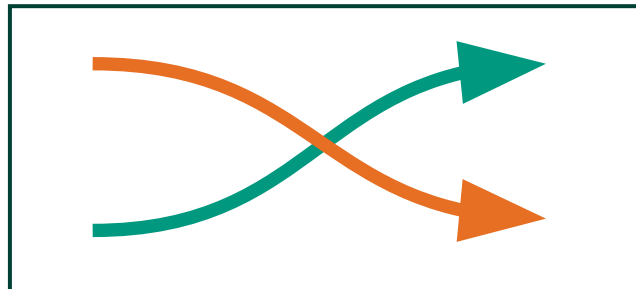
Describes a minimal DPP system, as inspiration and starting point for more complex systems

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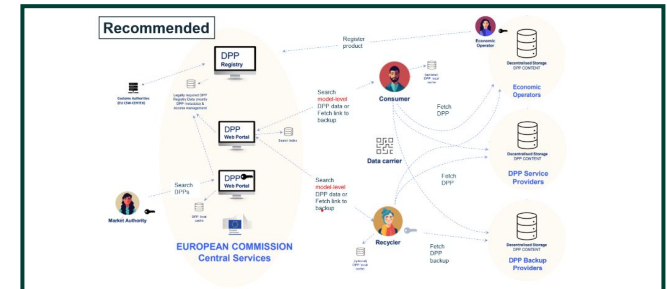
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## Options for redirection to the

Available on <https://cirpass2.eu/project-results/>



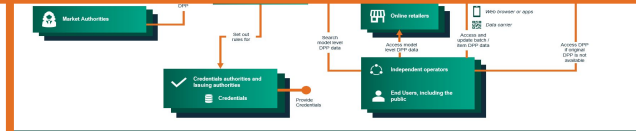
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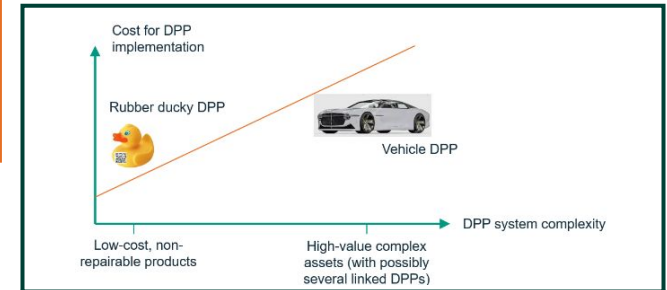
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Describes a minimal DPP system, as inspiration and starting point for more complex systems

# About CIRPASS-2 pilots



- They all employ **different DPP service providers**.
- They all focus on DPP-enabled value-chain use cases that **promote Circular Economy**.
- They all have **different business cases** based on 'voluntary' data.
- It is likely that they all will need to **convert pre-existing** 'voluntary' DPP use cases into 'mandatory' ones in the future.

# 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 data-enabled Circular Economy**.



# CIRPASS-2 Core Objectives



- Deploy and validate at scale and in real-life setting international and European standards-based Digital Product Passports for the textiles, electronics, tires and construction product sectors
- Demonstrate feasible circular business use cases using DPP data
- Empower SMEs in their uptake of DPPs
- Support the deployment and adoption of DPPs by other sectors targeted by upcoming European regulations and beyond

# Get involved in CIRPASS-2

LinkedIn & <https://cirpass2.eu/newsletters/>

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- Receive **updates** about the DPP and CIRPASS-2 project activities (**Newsletter**)
- Be invited to CIRPASS-2 **events and workshops**
- Participate in CIRPASS-2 **public consultations** and provide input to CIRPASS-2 activities (e.g. surveys, document feedback, etc.)

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<b>Dimension</b>	<b>practical</b>	<b>scalable</b>
<b>Data</b>	minimum required	standardised and extensible
<b>Processes</b>	clearly defined	automatable
<b>Systems</b>	easy to integrate	interoperable
<b>Organisation</b>	clear roles and responsibilities	globally deployable

# Contact

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