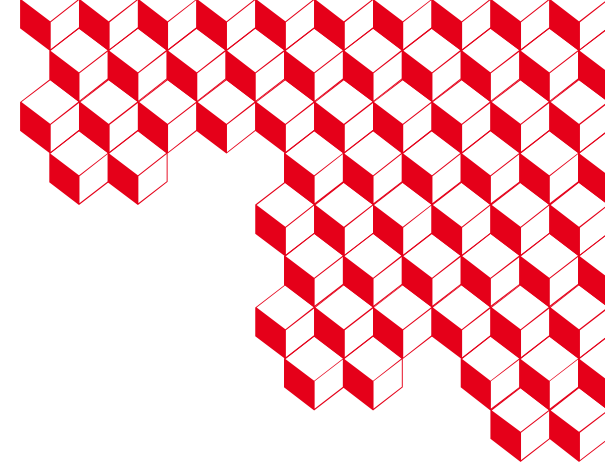# DIGITAL-2023-CLOUD-DATA-04 – DIGIPASS – Digital Product Passport

CIRPASS-2 Proposal

July 10, 2023

Agenda

- Who is present in this meeting?

- Brief intro to CIRPASS

- Presentation of call : DIGITAL-2023-CLOUD-DATA-04 -DIGIPASS
  - Additional funding opportunities beyond CIRPASS-2

- DPP System **standardisation timeline**

- What problem are we trying to solve?

- CIRPASS vision for the DPP System → federated network of solutions/platforms

- CIRPASS-2 proposal concept
  - Joining an CIRPASS-2 Expert Working Group

- CIRPASS-2 proposal timeline

- Resources

Who is present in this meeting?

Industries : textiles, electronics, tyres, sports equipment, cosmetics, detergents, construction, furniture,

Track & Trace solution providers

Invitation extended

-any spontaneous enquiries about the call

-to all respondents of our "DPP-related initiatives" benchmark survey (~150)

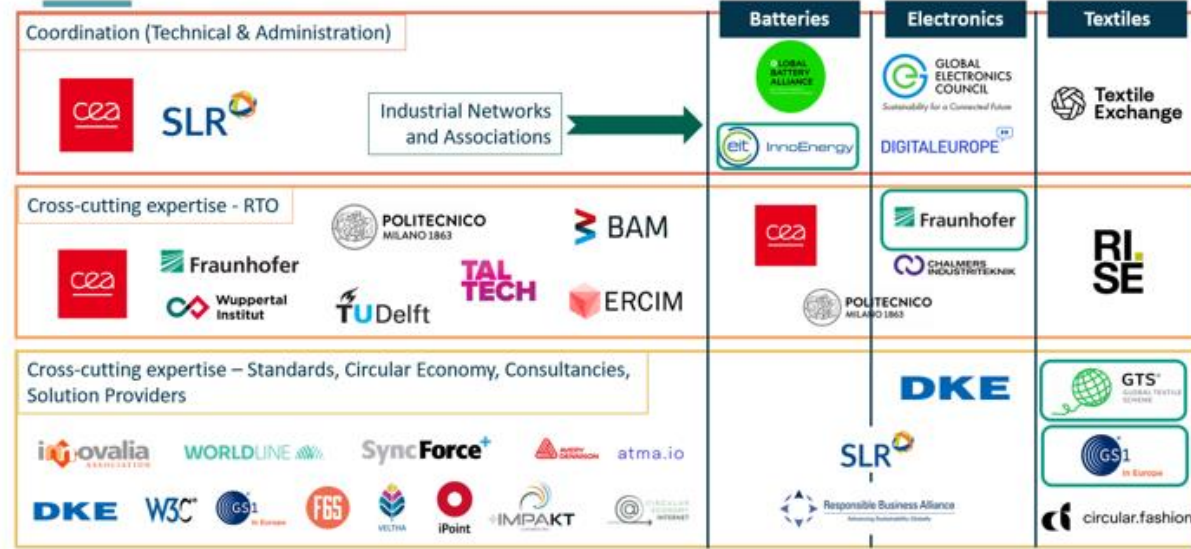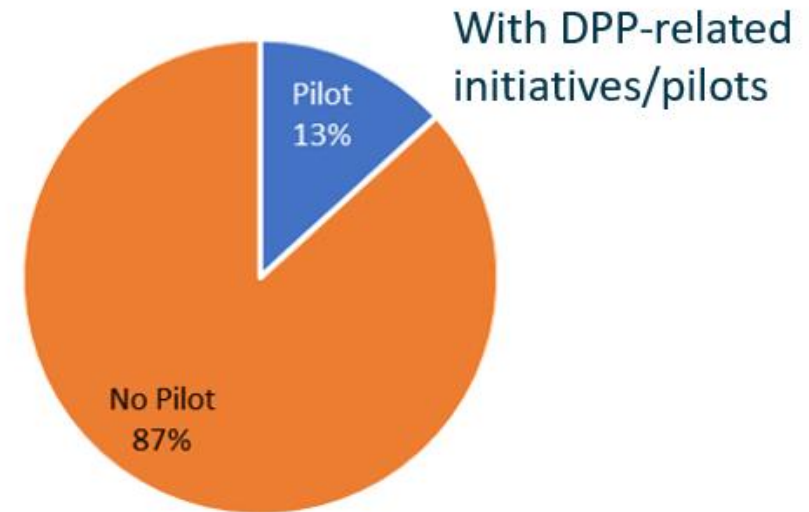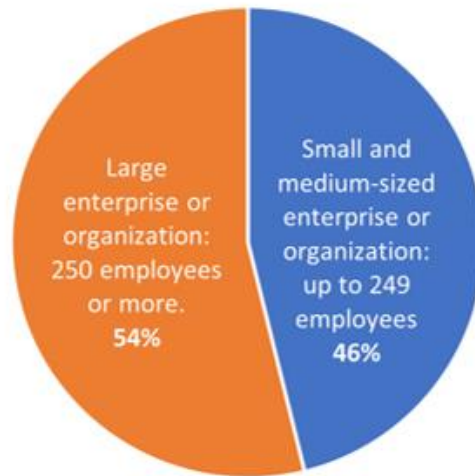-to supporting partners CIRPASS-1 proposal (~50)

-to CIRPASS-1 partners

What is CIRPASS?

- Funded by the European Commission under the **Digital Europe Programme**
- **Duration:** 18 months (from Oct 2022 to March 2024)
- **Coordination and Support Action (CSA)**

- Build a common understanding on a **cross-sectoral DPP**.

- Be an objective source of information for the **European Commission**
- Be an objective source of information for **all DPP stakeholders**

  - By gathering as much information as possible from as many sources as possible.
  - By listening attentively to all.
  - By listing the pros and cons of all approaches.
  - By gathering feedback on our analyses.
  - By helping put together the "DPP puzzle".

Funded by
the European Union

CIRPASS
Digital Product Passport

CIRPASS Stakeholder Community

May 2023: **>500 registered stakeholders**, 978 newsletter subscribers, 8000 website visitors/months

Batteries 6%

Other 7%

Textiles 20%

IT & Digital 21%

Electronics 15%

Cross-Sector 27%

Plastics & Composites 4%

Large enterprise or organization: 250 employees or more. **54%**

Small and medium-sized enterprise or organization: up to 249 employees **46%**

With DPP-related initiatives/pilots

Pilot 13%

No Pilot 87%

CIRPASS
Digital Product Passport
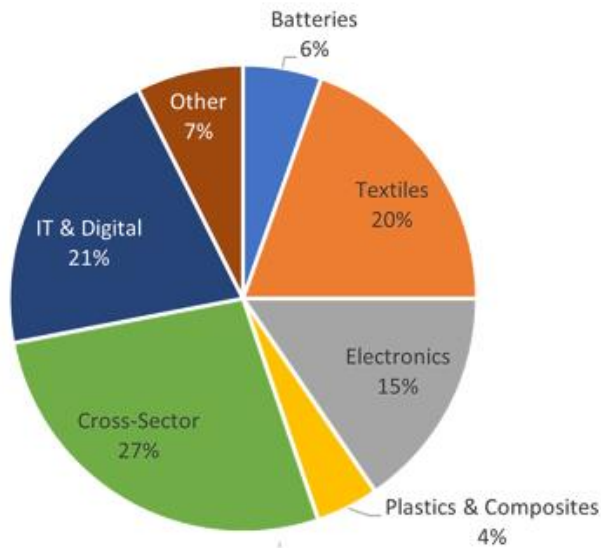
CIRPASS Resources

Extensive **FAQ**

- Short "**Fact sheets**" on related regulations
- **Benchmark of existing DPP-related initiatives** & Annex

DIGITAL-2023-CLOUD-DATA-04 – DIGIPASS – Digital Product Passport

Deadline	26/09/2023	Type	Simple Grant	Grant Max	6M€	Expected number of projects	1	End TRL	8/9
Duration	36 months	Funding rate		50% for all funded partners					
Topic CLOUD, DATA and ARTIFICIAL INTELLIGENCE (DIGITAL-2023-CLOUD-DATA-04)									

Additional funding opportunities beyond CIRPASS-2

HORIZON-CL4-2023-TWIN-TRANSITION-01-04	Factory-level and value chain approaches for remanufacturing (Made in Europe Partnership)
HORIZON-CL4-2024-TWIN-TRANSITION-01-05	Technologies/solutions to support circularity for manufacturing (Made in Europe Partnership)
HORIZON-CL4-2024-TWIN-TRANSITION-01-44:	Digital transformation and ensuring a better use of industrial data, which can optimise steel supply chains (Clean Steel Partnership)
HORIZON-CL6-2024-CircBio-01-3	Innovative circular solutions for furniture
HORIZON-CL6-2024-CircBio-01-2	Circular solutions for textile value chains based on extended producer responsibility
HORIZON-CL6-2024-CircBio-01-6	Digital information systems for bio-based products
HORIZON-CL6-2024-CircBio-02-1-two-stage	Circular solutions for textile value chains through innovative sorting, recycling, and design for recycling
HORIZON-CL6-2024-CircBio-02-2-two-stage	Increasing the circularity in plastics value chains
HORIZON-CL6-2024-CircBio-02-3-two-stage	Increasing the circularity in electronics value chains

DIGITAL-2023-CLOUD-DATA-04 –DIGIPASS

Scope

Support one **Pilot** action that will demonstrate functioning DPP in **real setting and at scale** in at least **two** value chains (product categories) with a preference to those with long and complex supply chain and/or challenging repair, refurbishment and recycling, such as **electronics**. [Means value chains with **B2B data exchanges for circular R strategies**.]

These two or more-product specific DPPs will be supported by a **common DPP Information System** that will build on international or European standards (referenced by StandICT) in the following areas: data carriers and unique identifiers, access rights management, Interoperability (technical, semantic, organisation) including data exchange protocols and formats, data storage, data processing (introduction, modification, update), data authentication, reliability, and integrity, data security and privacy.

Where possible and relevant, the work will consist in using the smart cloud-to-edge middleware platform Simpl. https://digital-strategy.ec.europa.eu/en/news/simpl-cloud-edge-federations-and-data-spaces-madesimple

The access to information included in the DPP, should be role-dependent (i.e., differentiated by stakeholder type). The full **interoperability** enabled by common DPP Information System **among different supply chains** should be one of the characteristics tested and demonstrated by the pilot.

DIGITAL-2023-CLOUD-DATA-04 –DIGIPASS

Scope

The pilot will build on the available results of the Coordination and Support Action (CIRPASS) as well as, other relevant initiatives.

It will also consider the appropriateness of the latest tracking and tracing technologies, internet of things systems, distributed ledger technologies, cybersecurity methods and cloud technologies and infrastructures.

A specific contribution is expected on **demonstrating at large scale** the feasibility of acquiring, managing and securely sharing the data held or generated by operators such as supply chain actors, **manufacturers, resellers, repairers, remanufacturers, and recyclers**, along these value chains for which an access by other relevant stakeholders would have a major beneficial impact on circularity and sustainability.

Special focus and should be given to the needs of the small and medium enterprises (**SMEs**).

The real-life deployment should validate and further improve protocols for secure and tailored access for the relevant stakeholders, including SMEs. It should test in real life setting open digital solutions for identification, tracking, mapping and sharing of product information along its life cycle, ensuring interoperability across borders and a well-functioning EU Internal Market.

DIGITAL-2023-CLOUD-DATA-04-DIGIPASS

Outcomes and deliverables

- Deployed and validated at scale and in real life setting Digital Product Passports in at least two value chains.

- Report on further needs for standardisation and specifications to ensure interoperability, security, and acceptance by all the stakeholders.

- Report on the benefits and challenges in using DPP for each of the stakeholders

- Recommendations based on the lessons learnt for the deployments of DPP in **other** value chains.

- Deliverable on dissemination and exploitation, to be submitted in the first six months of the project;

- Impact on the circularity of the product category considered by the proposal;

- List of benefits to all stakeholders (customers, recyclers, etc.) particularly to SMEs,

- The choice of the DPP system' s standards.

KPIs to measure outcomes and deliverables (Project-level KPIs)

- Number of value chain actors including the number of actors including consumers;

- Number of products targeted within each the value chains considered;

- Number of interactions, speed and usability of the system, in particular for SMEs, interoperability performance and cyber security tests;

- Rating of consumers' and market authorities understanding of information in the DPP and their **satisfaction**.

Other important aspects (DG CONNECT presentations)

- « Complex supply-chains » means **B2B** activity related to « R » strategies
  - So priority sectors for the project are not those where the DPP is just for information support.

- Ideally, pilots should demonstrate **economic benefits** to economic operators.

- Ideally, demonstrate how DPP-based business models can make sustainable products **less expensive than non-sustainable ones** ("Providing consumers with more sustainability information will not be sufficient", Ilias Iakovidis)

- Coordination with international organizations such as (UNEP/UNECE, WBCSD) to show involvement of the global community

- Needs of SMEs, a major concern of the European Council.

- Need for an internal **Observatory Board** to monitor:
  - **agility** needed towards an EU and globally evolving regulation and standardization landscape
  - **elasticity** with respect to current DPP system **uncertainties**: interoperability with public/governmental applications to access DPP, future DPP registry, future DPP archives

Priorities for the DPP

- Short-term priority for issuing of DPPs
  - The DPP is a regulatory tool for (mostly) static information on products, information extended to new Ecodesign requirements
    - Product durability and reliability
    - Possibilities for reuse
    - Possibilities for upgrade, repair, maintenance, refurbish
    - Presence of substances of concern
    - Energy efficiency and resource usage efficiency
    - Recycled elements
    - Product remanufacturing and recycling
    - Carbon footprint and environmental impact
    - Waste production potential
    - Micro-plastics emissions, etc.

- Other priorities for this call:
  - The DPP is a **flexible** tool to enable **new circular business models**, potentially with information that extends **beyond** the mandatory DPP requirements.

Standardisation & CIRPASS-2 - Timelines

Draft Standardisation Request issued for the DPP System standards

Standardisation Request published

Deadline for response by ESOs

Mandatory DPPs (batteries)

2023	2024	2025	2026	2027

Year 1	Year 2	Year 3

-Pilot interoperability gap analysis. Def. interoperability KPIs
-DPP system and sectoral ontology developments
-SW Tooling, training, consultancy towards pilots & development of DPP life-cycle tools

-Implementation of first generation pilots
-intra-pilot interoperability tests

-At scale deployment of third generation pilots
-Inter-pilot interoperability tests
-User satisfaction measurements

Project start (if successful)

CIRPASS-2 proposal submission

What problem are we trying to solve?

"How are upstream traceability schemes related to the DPP?"

Supply-chain traceability solutions focus on:
→*How to get quality data into the DPP?*
- *Track & Trace solutions*
- *Supply-chain data transfer automation solutions*
- *Supply-chain sustainability claims substantiation solutions*

Upstream traceability is not the primary focus of CIRPASS-2

| Organisation | Organisation | Organisation | Organisation | Organisation | Economic Operator | User | Organisation |

| Raw Materials | Processed Materials | Subcomponent Production | Component Production | Assembly | Market placement | Use | Repair Remanufacture Recycle |
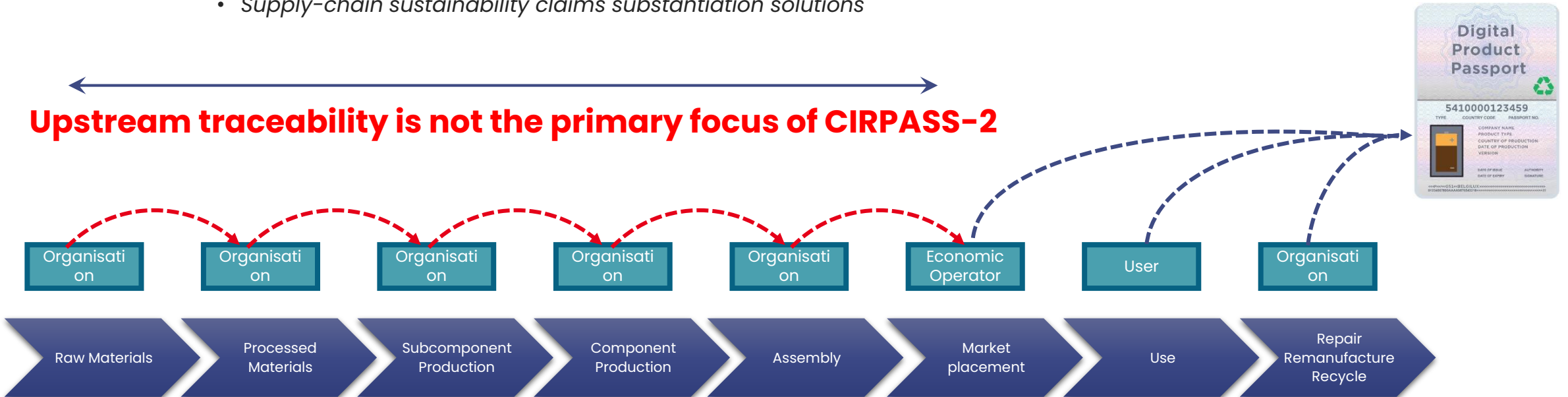
What problem are we trying to solve?

Problem #1:

*"How can **all industries** agree on a common DPP system that is **compliant** to the requirements of future regulations and that is capable of supporting the massive issuing of DPPs in 2027 (Battery Regulation) ?"*

DPP 1.0

The primary objective of this call is to support the at-scale issuing of DPPs in several sectors and demonstrating its use in downstream business models.

This is the primary focus of CIRPASS-2

| Organisation | Organisation | Organisation | Organisation | Organisation | Economic Operator | User | Organisation |

| Raw Materials | Processed Materials | Subcomponent Production | Component Production | Assembly | Market placement | Use | Repair Remanufacture Recycle |
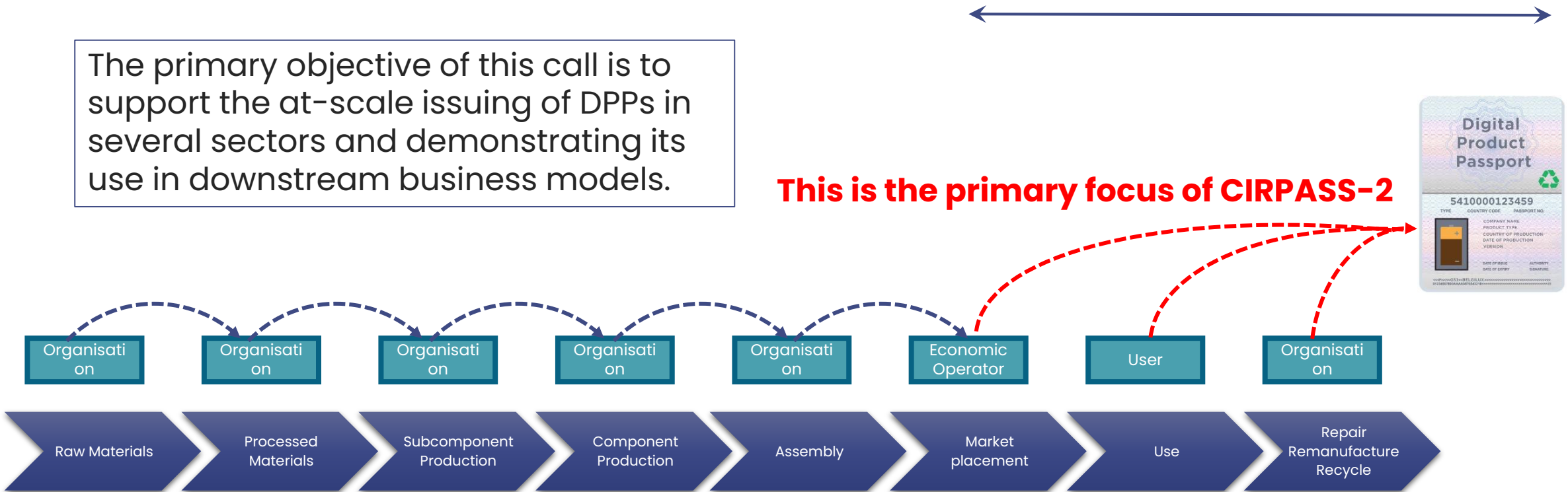
What problem are we trying to solve?

Problem #2:

*"How can **all industries** agree on an **extensible and flexible** DPP system capable of supporting **beyond-mandatory** data exchanges to enable new circular business models?"*

DPP 1.0

The primary objective of this call is to support the at-scale issuing of DPPs in several sectors and demonstrating its use in downstream business models.

This is the primary focus of CIRPASS-2

Organisation	Organisation	Organisation	Organisation	Organisation	Economic Operator	User	Organisation
Raw Materials	Processed Materials	Subcomponent Production	Component Production	Assembly	Market placement	Use	Repair Remanufacture Recycle
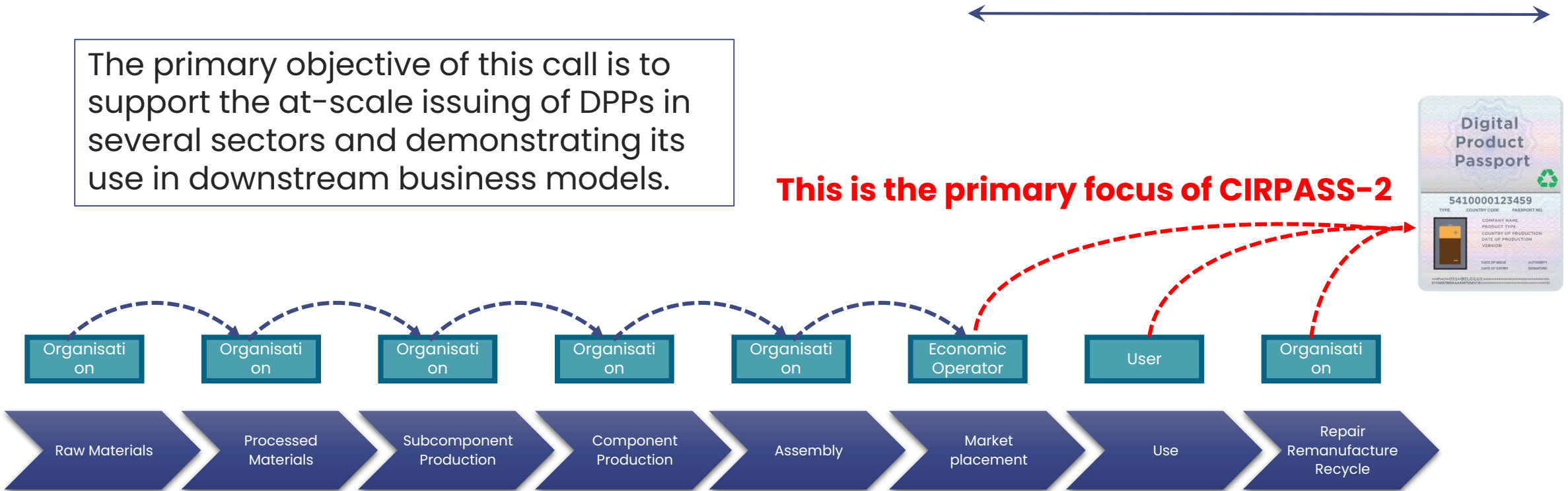
What problem are we trying to solve?

Problem #3:

*"How can **all industries** agree on an **extensible and flexible** DPP system capable of connecting upstream and downstream?"*
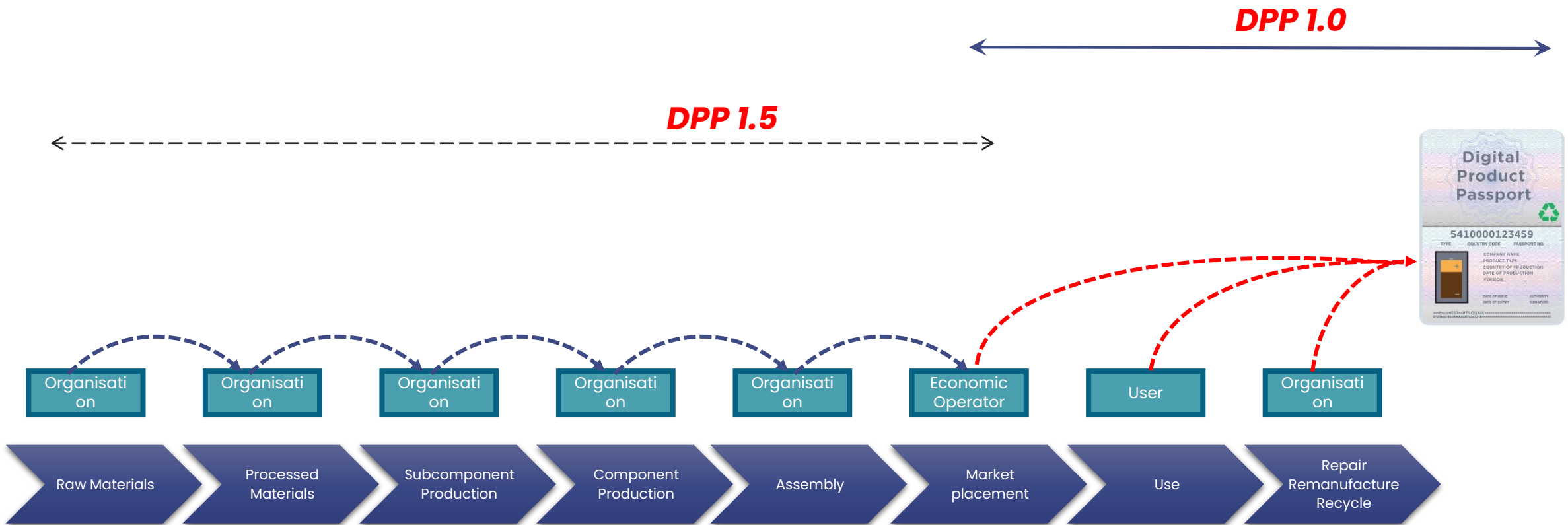
CIRPASS-2 also welcomes DPP 1.5 pilots.

What problem are we trying to solve?

"How can the DPP system support full product traceability from cradle to grave?"

DPP 2.0

DPP 2.0 is the vision where the DPP is seen as the **only tool** used to support traceability from cradle to grave.

Organisation	Organisation	Organisation	Organisation	Organisation	Economic Operator	User	Organisation
Raw Materials	Processed Materials	Subcomponent Production	Component Production	Assembly	Market placement	Use	Repair Remanufacture Recycle

CIRPASS-2 will not focus on DPP 2.0
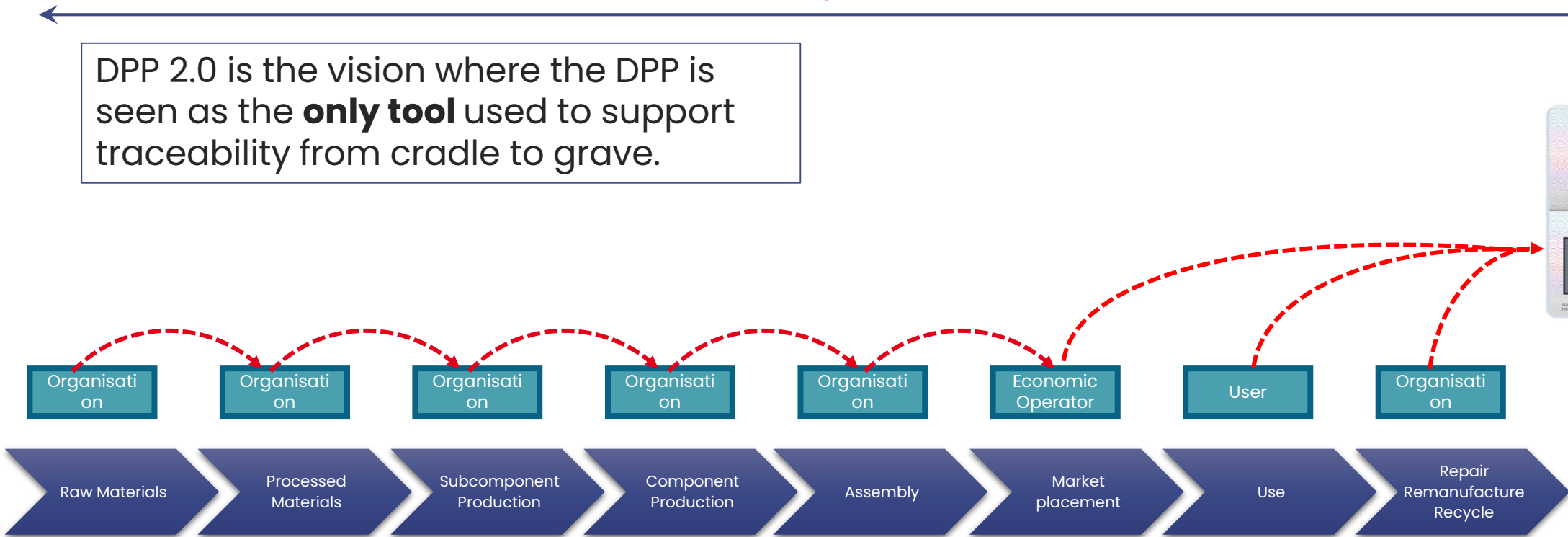
DPP and DLTs

"Decentralized" does not mean "DLTs" necessarily.

The "backbone" DPP system will not rely on DLTs. However, DLTs might be used in the future to offer DPP data related specific services.

Why?

-DLT interoperability standards are not widely accepted (still a research issue).

-The DPP will not be deployed in a trust-free environment requiring online auditability.

-To lower cost of issuing DPPs.

DPP System : A Federated Network of platforms

IDSA connectors are used to connect to **legacy company IT systems**
- they *expose* data and accompanying meta data (semantics)
- data access and usage rights are linked to the data (*sticky policies*)

Manufacturing company **A**, using legacy IT system **A**

IDSA **A**/RDF — Rights

AAS Company **B**, using IT system **B**

IDSA RDF — Rights

DPP-as-a-Service operator, using legacy IT system **C**

IDSA **C**/RDF — Rights

Traceability platform e.g., using DLTs

IDSA **A**/RDF — Rights

DPP DATASPACE / DATAFABRIC

IDSA RDF/**D** — Access control → Remanufacturing company **D** importing data into legacy IT system **D**

API (filter) — Access control → Repair company E reading/writing useful data

API (filter) — Access control → Webpage or App for consumers

Query — Access control → Statistics & Aggregation tools for market surveillance

DPP System : Example

GDSO
STANDARDIZE. SHARE. SIMPLIFY.
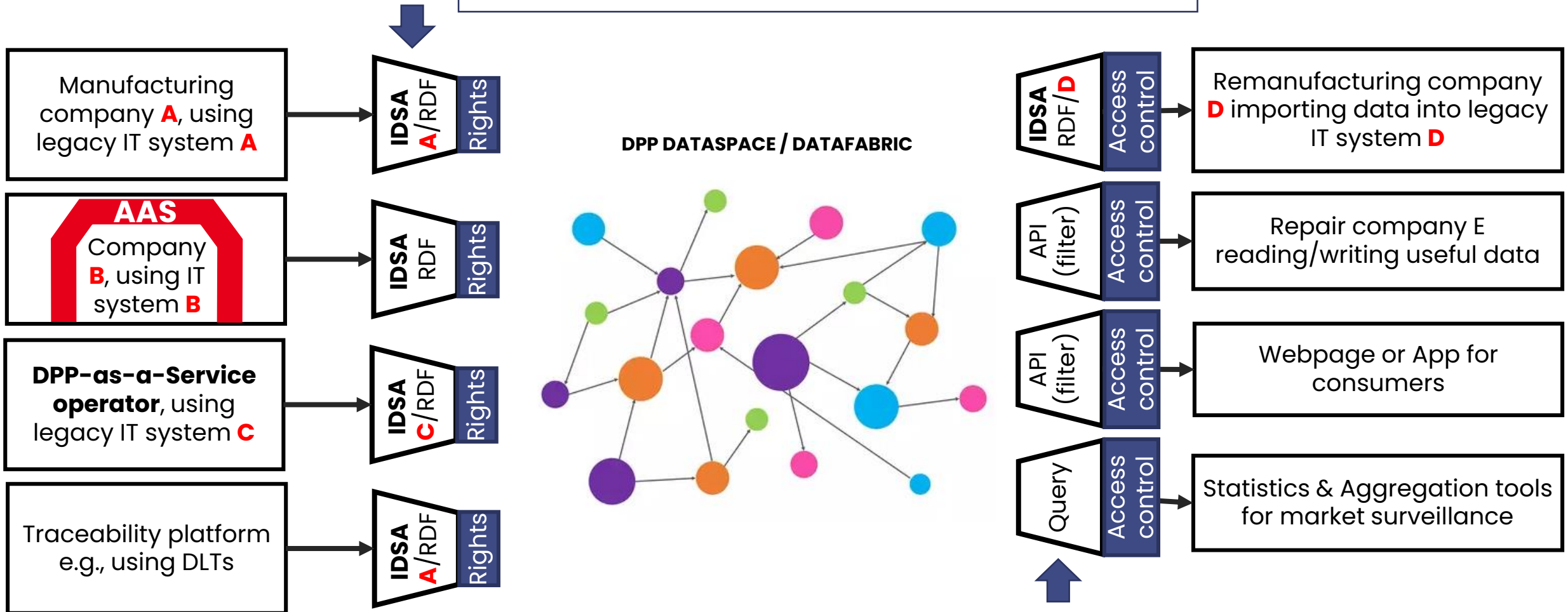
IDSA connectors are used to connect to **legacy company IT systems**
- they *expose* data and accompanying meta data (semantics)
- data access and usage rights are linked to the data (*sticky policies*)

- Sector-specific standardized data model for tyres
- Data access and exchange protocols
- Open to all tyre manufacturers and tyre data stakeholders (including remanufacturers)
- Enables the development of new services
- Enables the development of circular business models

IDSA **A**/RDF Rights

DPP DATASPACE / DATAFABRIC

IDSA RDF/**D** · Access control → Remanufacturing company **D** importing data into legacy IT system **D**

API (filter) · Access control → Repair company E reading/writing useful data

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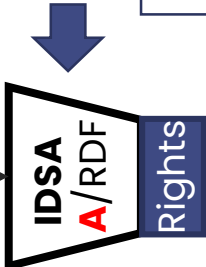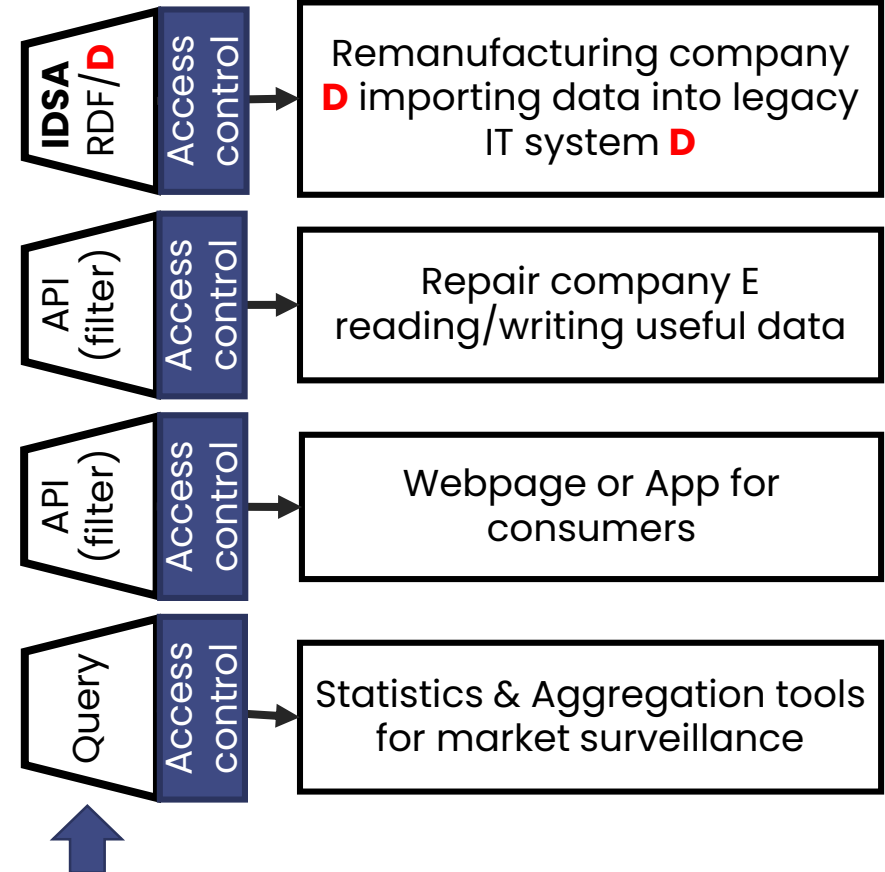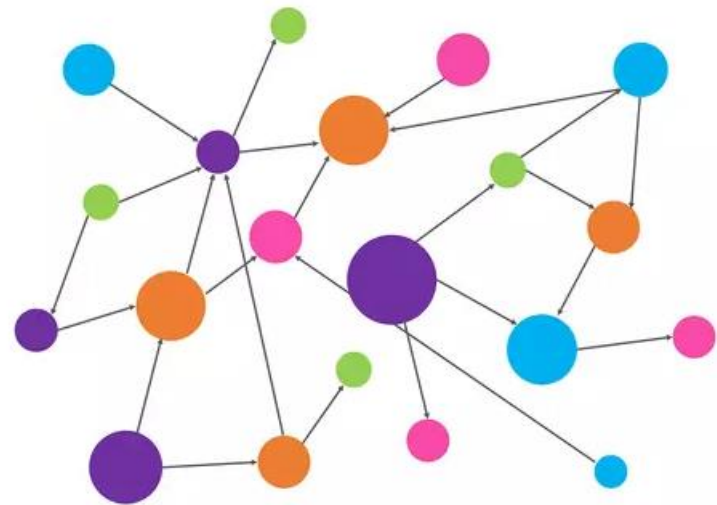
CIRPASS-2 Vision

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

  →Decentralized DPP service providers for maximum creativity (not a winner-takes-all approach)

  →Inclusive to accommodate ALL industry specificities (otherwise impossible to align on a single system.)

- Transitioning to a Circular Economy will require great **flexibility.**

- Need **mature**, **state-of-the-art** technologies with **built-in interoperability.**

- That can be deployed at **low-cost.**

- CIRPASS-2 is a deployment project with an objective of TRL8-9.

- Research & Technology Organizations (RTOs) are needed for neutrality and to facilitate the transfer of technology to industry.

CIRPASS-2 Vision → Architecture

- The DPP system is not yet another platform, but is a federated network of platforms, each platform being crafted to the needs of its community of users and sector.

- Data-level interoperability to minimize constraints and facilitate adoption
    - →Expose data using the semantic web standards for linked data
    - →Accommodates both **regulatory** and **non-mandatory** (business-model-specific) evolving information requirements.
    - →Linked data allows data flexibility for data models that can grow as needed, and is future-proof in case other governments want to reuse the European DPP System to issue THEIR DPPs.
    - →Enables data fusion for advanced querying capabilities.

- Aim for a maximum reuse of legacy systems.
    - →Use IDSA connectors

- Aim for a maximum reuse of legacy data.
    - →Use mapping tools and upper-level ontologies

- Attach access and usage control limitations to each data element
    - → E.g., using ODRL (Open Digital Rights Language)

CIRPASS-2 proposal timeline

WPs defined → WPs aligned → WPs finalised

Pilots defined → Pilots selected → Pilots finalised → Pilots aligned

Proposal writing

June   July   August   September

Summer holiday period…

Weekly public consortium building meetings

Final proposal submission
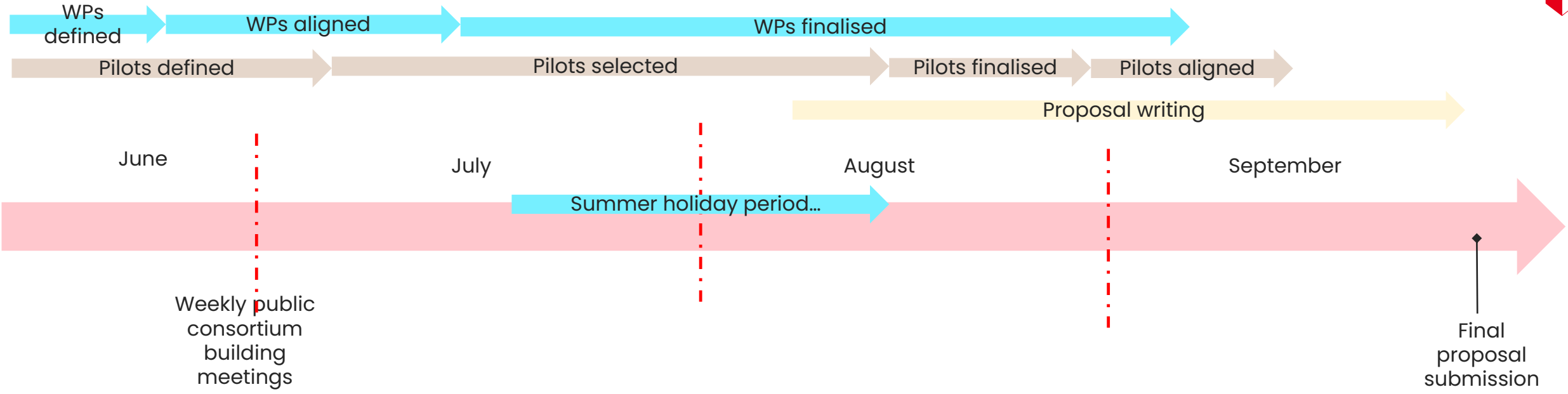
- **For all EWG participants:**
  - Written confirmation of engagement (by email)
  - Additional information to feed proposal: Area of expertise, What you can bring to the EWG, What are the benefits your expect, Current projects in link with CiRPASS-2
- **For Core beneficiaries:**
  - Person-month rate
  - Additional information to feed proposal:
    - Part A
    - Partner short description, domain of expertise and main role in CIRPASS-2
    - Key expected results, background and protection/exploitation
    - Barriers and requirements and how to overcome them
    - Data strategy

Data description	Type	Size	Findability	Accessibility	Interoperability	Reusability	Curation

Joining CIRPASS-2

- **Coordination CEA**
  - General coordination (Carolynn Bernier, Reda Naoucer)
  - Technical coordination (Sébastien Gérard)

  - **30 core partners**: Developments and demonstrations of a **small group (~12) of lighthouse pilots** focusing on textiles and electronics sectors
    (funded and in-kind partners)

  - <u>**Expert Working Groups**</u> :
    (in-kind partners)
    - o Two-way communication between the consortium and a larger community
    - o Follow and provide feedback on the project developments
    - o Disseminate results and feedback loop among a wider community
    - o Constitute ad hoc sub-groups to discuss matters of interest
    - o Commit to ~10-20 person-days over 3 years (& 2 optional in-person meetings)
    - o Participate in a 2-3 hour seminar every 2 months

    Five Expert Working Groups:
    - o **EWG1**: Observatory Board : European and Global Regulatory Context
    - o **EWG2**: Standardisation liaisons
    - o **EWG3**: Textile Stakeholders Group
    - o **EWG4**: Electronics Stakeholders Group
    - o **EWG5**: Cross-sectoral replication & training

Joining CIRPASS-2

- Be a **Core member**, meaning: *(funded and in-kind partners)*
  - Taking responsibilities in the WPs (e.g. Task/Pilot/Expert working group leader), preparing project deliverables (funded or in-kind) Remember that all partners only get **50% of their budget funded** by the EC, so you should seek management's approval before any engagement
  - Taking responsibilities in the proposal writing (e.g. WPs and Tasks, Excellence KPIs, SoA and methodology)
  - In-kind core members must agree to participate with at least 6 PMs.

There will be only ~30 partners in the core group.

All Core members will sign the **Consortium Agreement.**

- Be an **Expert Working Group member**, meaning: *(in-kind partners)*
  - Participating actively in the Expert Working Groups during the project (~10-20 days commitment over three years)
  - Being visible on CIRPASS-2 website and EWG communications
  - All Expert Working Group member will sign an NDA with CEA.

  - **To join an expert working group, please send a short email with your related exprience to carolynn.bernier@cea.fr**

CIRPASS-2 Intellectual Property

The DPP system will be built using harmonized standards.

All data structures developed in CIRPASS-2 will be software tool independent.

Priority will be given to the use of existing open source software solutions, in particular with respect to "Data connector" software tools (Data connectors are needed to issue and manage DPPs, including data ingestion and manipulation).

New software developed during the project for the DPP system management (excluding DPP application services) will use business friendly free software licences (e.g. EPL Eclipse Public Licence)

Software developed for the exploitation of DPP data (i.e., DPP application services) may be closed source.

Legal terms (this concerns all core members)
- **No NDA at proposal stage**, therefore no sharing of confidential information before start of project
- Agree to sign a **Consortium Agreement at start of project**. We will use the DESCA template available here:

https://www.desca-agreement.eu/desca-model-consortium-agreement/

CIRPASS-2 Objectives

- Objective 1: Deploy and validate at scale and in real-life setting Digital Product Passports in at least two target value chains
  - Focus on B2B activities which should come with economic benefits to economic operations and tend to make sustainable products less expensive for consumers.
  - Working together towards interoperability and compliance (will require agility and entail risk)

- Objective 2: Demonstrate cross-pilot interoperability
  - Deployment of a federated network of platforms
  - Development of sectoral upper-level ontologies aligned with the cross-sectoral DPP system ontologies

- Objective 3: Provide support to SMEs in their uptake of DPPs. Deployment of DPP-as-a-Service.
  - Challenge of keeping up with the regulatory context
  - Challenge of upstream data collection and provisioning
  - Challenge of DPP issuing for economic operators that are SMEs.
  - Challenge of interacting with DPPs

- Objective 4: Support the deployment and adoption of DPPs by other sectors targeted by upcoming European regulations and beyond;
  - Expert working groups to involve a greater community and support replication
  - Coordination with other ongoing initiatives, including at the global level
  - Open source software components, public deliverables, open science
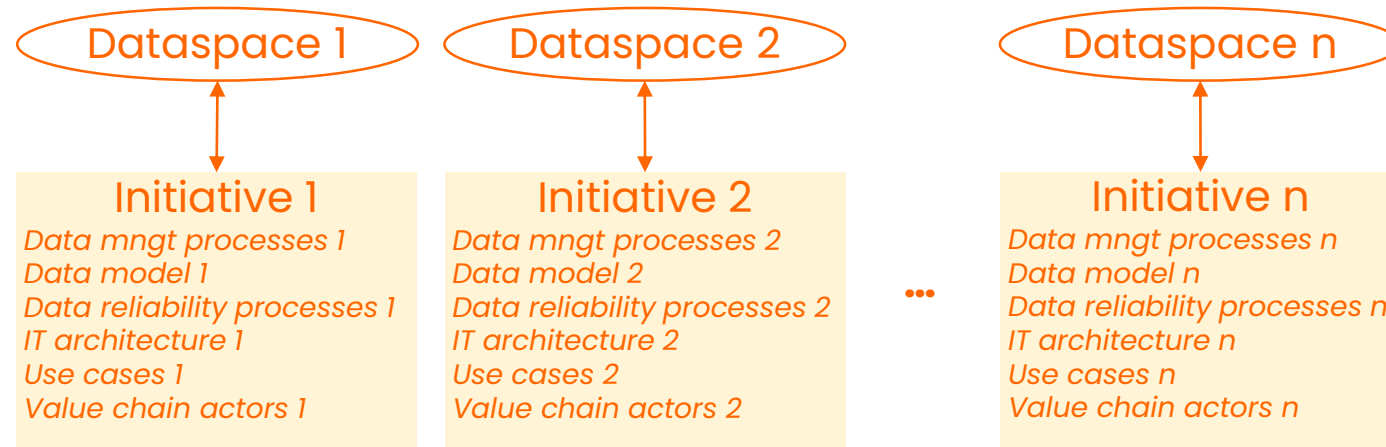 - Dedicated training/dissemination material

CIRPASS-2 Concept

Dataspace 1   Dataspace 2   Dataspace n

Today:
Different ongoing DPP initiatives, operating in dataspace silos.

No interoperability between silos.

Initiative 1	Initiative 2	...	Initiative n
Data mngt processes 1	*Data mngt processes 2*		*Data mngt processes n*
Data model 1	*Data model 2*		*Data model n*
Data reliability processes 1	*Data reliability processes 2*		*Data reliability processes n*
IT architecture 1	*IT architecture 2*		*IT architecture n*
Use cases 1	*Use cases 2*		*Use cases n*
Value chain actors 1	*Value chain actors 2*		*Value chain actors n*

☺ Variety
☹ Interoperability
? Compliance

Objective:
Cross-initiative demonstrations of interoperability **across initiatives of a given sector.**

Interoperable federated DPP Dataspace

Initiative 1	Initiative 2	...	Initiative n
Data mngt processes 1	*Data mngt processes 2*		*Data mngt processes n*
Data model 1	*Data model 2*		*Data model n*
Data reliability processes 1	*Data reliability processes 2*		*Data reliability processes n*
IT architecture 1	*IT architecture 2*		*IT architecture n*
Use cases 1	*Use cases 2*		*Use cases n*
Value chain actors 1	*Value chain actors 2*		*Value chain actors n*

☺ Variety
☺ Interoperability
☺ Compliance

Cross-initiative interoperability   Cross-initiative interoperability

What is a "lighthouse pilot"

We expect that each "pilot" will come with its own "eco-system" including

- a number of pilot partners/participants, but with a designated pilot leader,

- targeted circular economy business models (<u>necessarily</u> including B2B data exchanges), ideally demonstrating how DPP-enabled business models can <u>make sustainable products less expensive to consumers/end users,</u>

- a plan for demonstrating specific scenarios or use-cases, including the issuing of the DPP by the economic operator responsible for placing the product on the market and access (and potentially update) to the DPP content by B2B and B2C users,

- Funding for "pilots":
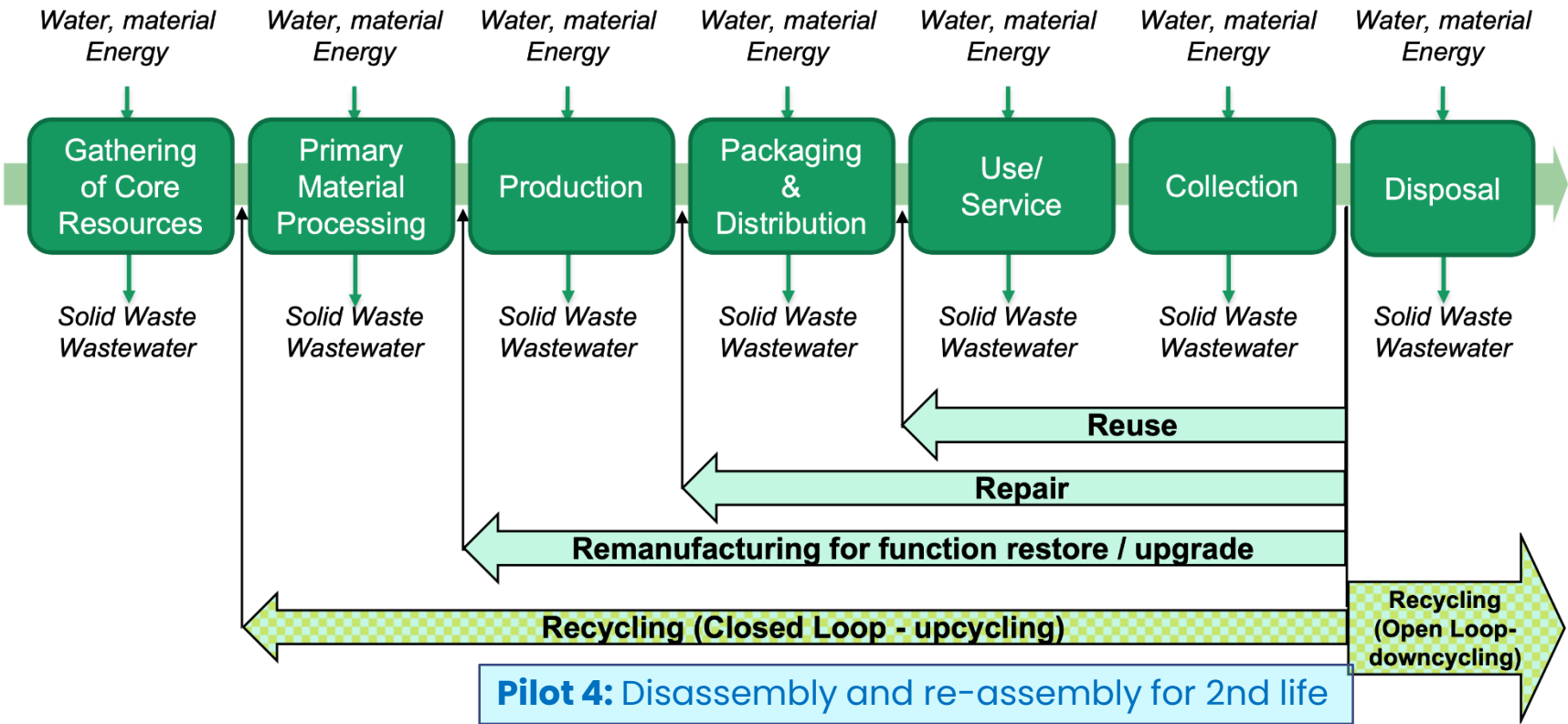 - Estimation of 400k-500k euros (funded 200k-250k euros) per pilot.

Example expected Pilot positioning (i.e. Many pilots for each target sector, each covering different phases of the value chain)

Inter-pilot Interoperability **KPIs**

Pilot 1: materials extraction and processing; production

Pilot 2: Logistics; Cross-border safe transport

Pilot 3: Lifetime extension (in-use monitoring, predictive maintenance and repair); Transfer to next economic operator

Water, material Energy

| Gathering of Core Resources | Primary Material Processing | Production | Packaging & Distribution | Use/ Service | Collection | Disposal |

Solid Waste Wastewater

Reuse

Repair

Remanufacturing for function restore / upgrade

Recycling (Closed Loop - upcycling)

Recycling (Open Loop- downcycling)

Pilot 4: Disassembly and re-assembly for 2nd life

Pilot 5: Closed-loop recycling

Lighthouse Pilot selection criteria

- Technical maturity and length of existing collaboration between pilot participants

- Prior existence of tagged products

- Potential for cross-pilot interoperability demonstrations

- Willingness to share information about the pilot

- Coverage of R-strategies (i.e., the consortium must show complimentary pilots)

- SME involvement

- Product categories considered

- Use case relevance for sustainability

- Capability of conducting consumer/end-user tests

- Potential for reducing costs for consumers (if possible)

Commitments from funded lighthouse pilots

- **Funded pilots will have to commit to**
  - Participating, along with the other sector partners, towards building a common sectoral upper-level ontology aligned with the DPP System ontologies
  - Communicate widely on their implementation effort, challenges & **lessons learned**
  - **Accept the risk** and required agility needed to adapt to fluctuating standards landscape
  - Respect the high variety of DPP solutions and not try to impose their solution

Lighthouse Pilots

(funded or in-kind) Textiles:

(funded or in-kind) Electronics:
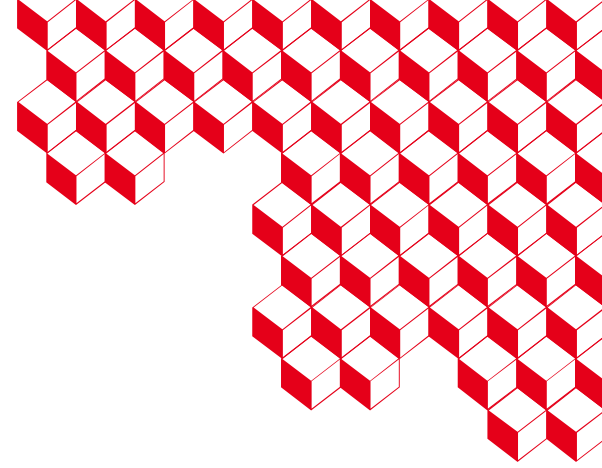
(funded or in-kind) Other value chains:

Resources & background

- Basic concepts on linked data and knowledge graphs
  - my short tutorial https://webcast.ec.europa.eu/digital-product-passport-initiative-2023-06-12 (go to 16:21:00)
  - Experiment with an existing knowledge graph : DBpedia.org (see my tutorial slide)

- Background on IDSA connectors and list of open and closed source connectors:
  - https://internationaldataspaces.org/wp-content/uploads/dlm_uploads/IDSA-Data-Connector-Report-6_April-2023-1.pdf

- Example of trusted, secure and semantically interoperable Data Spaces
  - https://www.trusts-data.eu/

- Example of successful federated architecture that exploits IDSA connectors (but not linked data) for supply-chain data sharing in the electronics sector (SCSN)
  - https://smart-connected.nl/en (~3000 participating companies, 8 "service providers" providing IT connectivity using the IDSA principles)

- Example of TRL 7 federated architecture exploiting both IDSA connectors and linked data
  - http://www.federatedplatforms.eu/
  - Harmonized data interoperability and data sharing for seamless and cross bordering multimodal freight transport and logisitics. https://www.youtube.com/watch?v=6BRaltYYPd4

cea list

Merci