Von Chem-X zum DPP – Wie Standards die Kunststoff-Industrie revolutionieren

21.11.2025

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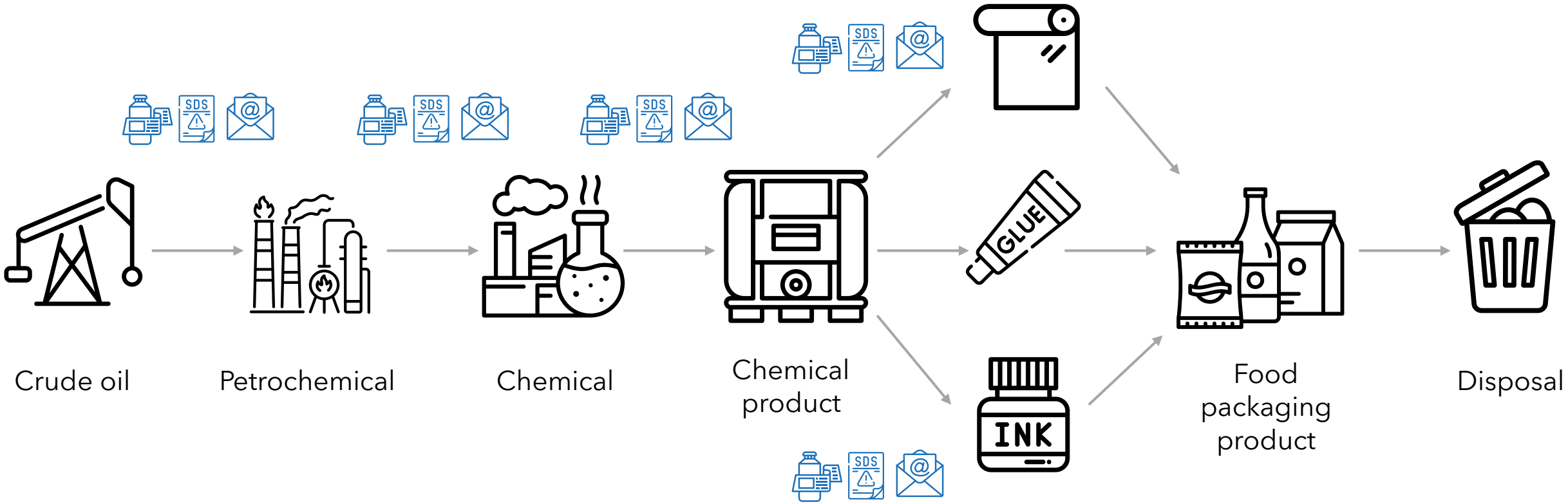
01
Initial situation & North Star

Chemical industry exchanges multiple different data formats along the value chain



Communication via

E-Mail Safety datasheet Label

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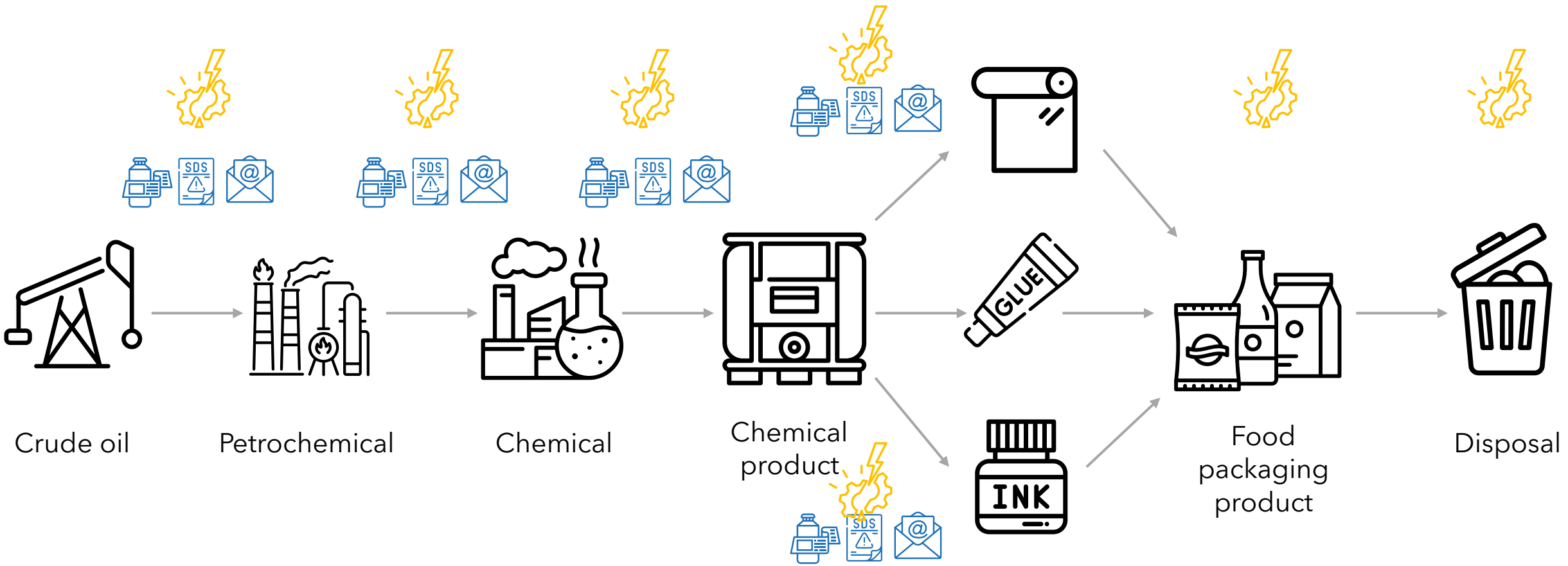
Different data formats lead to high information disruption along the value chain



Communication via

E-Mail + Safety datasheet + Label → **Information disruption**

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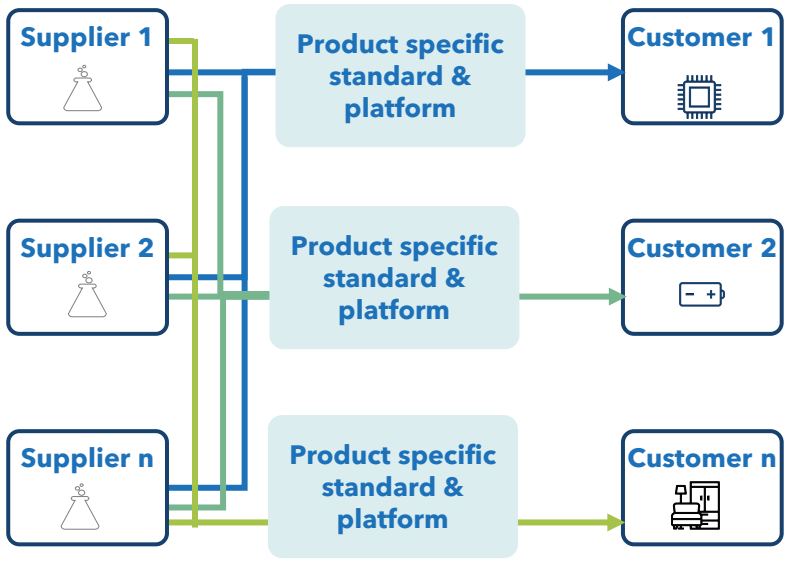
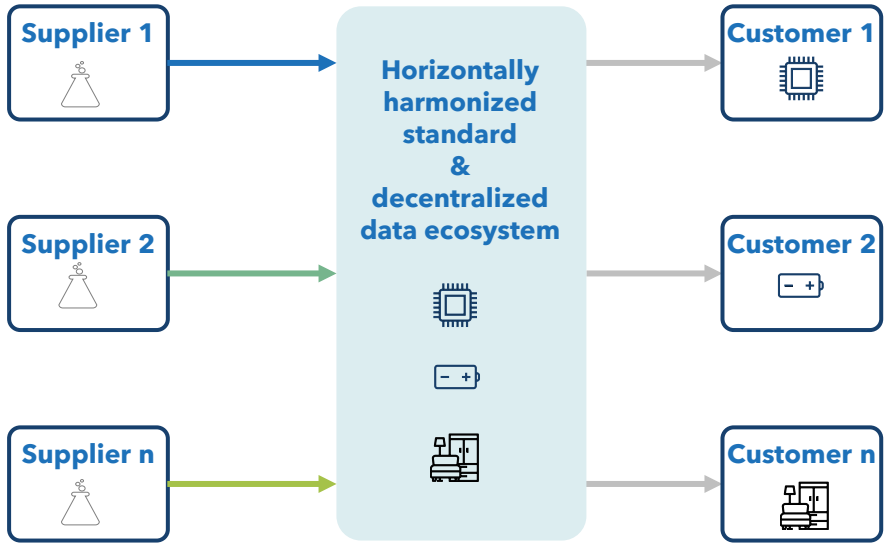
Steering clear from *siloed* & *manual* towards *harmonized* & *automated* data exchange

As is



Every customer/customer industry with own vocabularies, formats & standards

Target



Horizontally unified vocabularies, formats & standards for chemical materials

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With Chem-X, we want to address the need for seamless exchange of product information in the value chain across industries.

Increase cost competitiveness

Standardized, harmonized and automated data exchange can

a) significantly lower costs for data management processes
b) avoid cost resulting from increasing and diverging data requests.

Enable circularity

Transparency throughout the product lifecycle is key to implement and scale R-strategies (Recycle, Repair, etc.).

Via communication of standardized sustainability data (e.g. PCF), companies can differentiate themselves successfully.

Ensure compliance

The chemical industry will provide the required material data to enable their customers to deliver Digital Product Passports (DPPs).

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We are pursuing a long-term vision with Chem-X

Chem-X is the key to a competitive and circular chemical industry – by building the material data foundation for Digital Product Passports.

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EU regulatory frameworks mandate customer industries to create DPPs for their products

- The **EU's ESPR** (Ecodesign for Sustainable Products Regulation) and other Green Deal related regulations[1] require digitally available product information, for example in a DPP
- Such regulations should improve EU products' **circularity, energy performance** and other **environmental sustainability** aspects
- There will be **product group specific** delegated acts for the introduction of DPP
- First DPPs shall be **in force by 2027**

Since chemical products are part of end products requiring a DPP, the chemical industry has decided to actively shape the data requirements for DPPs

Products in scope for DPPs

According the ESPR working plan from April '25

Textile

Furniture

Mattresses

Tires

Steel

Aluminum

ICT

Energy Related Products

Exemplary standalone legislations referring to DPP

Construction

Detergents

Toys

Batteries

1) E.g. EU 2025/40 PPWR, EU 2024/3110 CPR

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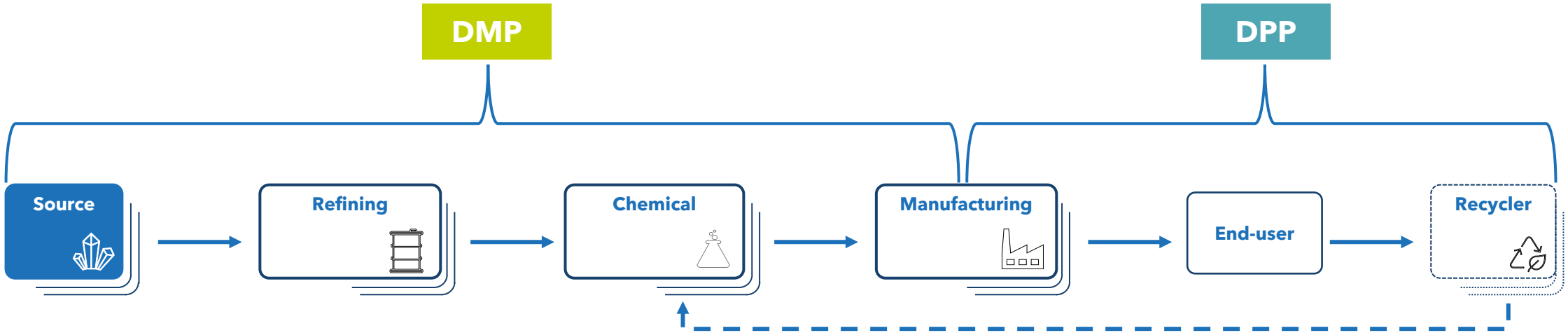
Within the chemical industry, we focus on a Digital Material Passport (DMP)



A Digital Material Passport (**DMP**) captures **information on chemicals or materials** which constitute a final product

The DMP **feeds into** several industry specific DPPs

A DMP can contain **attributes beyond** regulatory requirements

A Digital Product Passport **(DPP)** focuses on the **final product** of the value chain

DPPs **must adhere** to specific regulatory and technical **requirements**

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A DPP aggregates the DMPs of a final product

DMP "Cover"

DMP "Comfort layer"

DMP "Transitional layer"

DMP "Support Core"

DPP „Mattress"

DPP information can be scanned by customers

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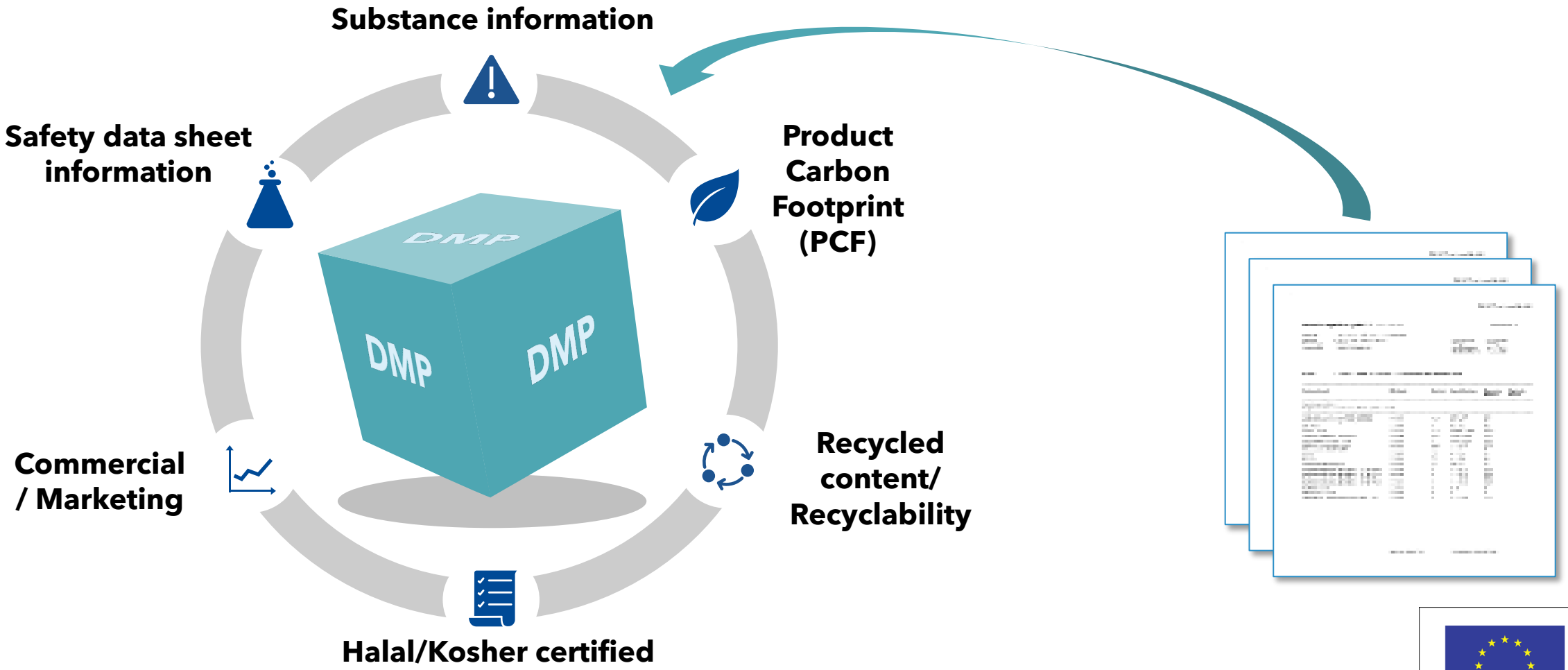
DMPs can include a wide range of product information from sustainability to compliance



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We create the foundations for a chemistry DMP according to the needs from different DPPs

Chemistry DMP

Business Partner Data Management

Business ID
Business Attributes

Guidelines for Technical Foundation

Material ID
Material Attributes

1. **Sustainability**
   1. ....
2. **Circularity**
   1. ....
3. **Material declaration**
   1. ....

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1. **Additional sector-specific information**
   1. ....

Guidelines for the DMP content

DMP information projection

Learnings from demon-strators

Exemplary downstream DPP

I. Identifier and product data
   1. Passport identifier
   2. Manufacturing date
   3. ...

II. Symbols, labels, documentation of conformity

III. Carbon footprint
   1. Carbon footprint per unit
   2. Contribution of raw material acquisition
   3. ...

IV. Supply chain due diligence

V. Material and composition
   1. Materials used
   2. Hazardous substances
   3. ...

VI. Circularity and resource efficiency
   1. Dismantling information
   2. Recycled & renewable content
   3. ...

VII. Sector specific information
   1. Product capabilities
   2. Product lifetime
   3. ...

... Deliverables from the project (also mentioned in GVB)

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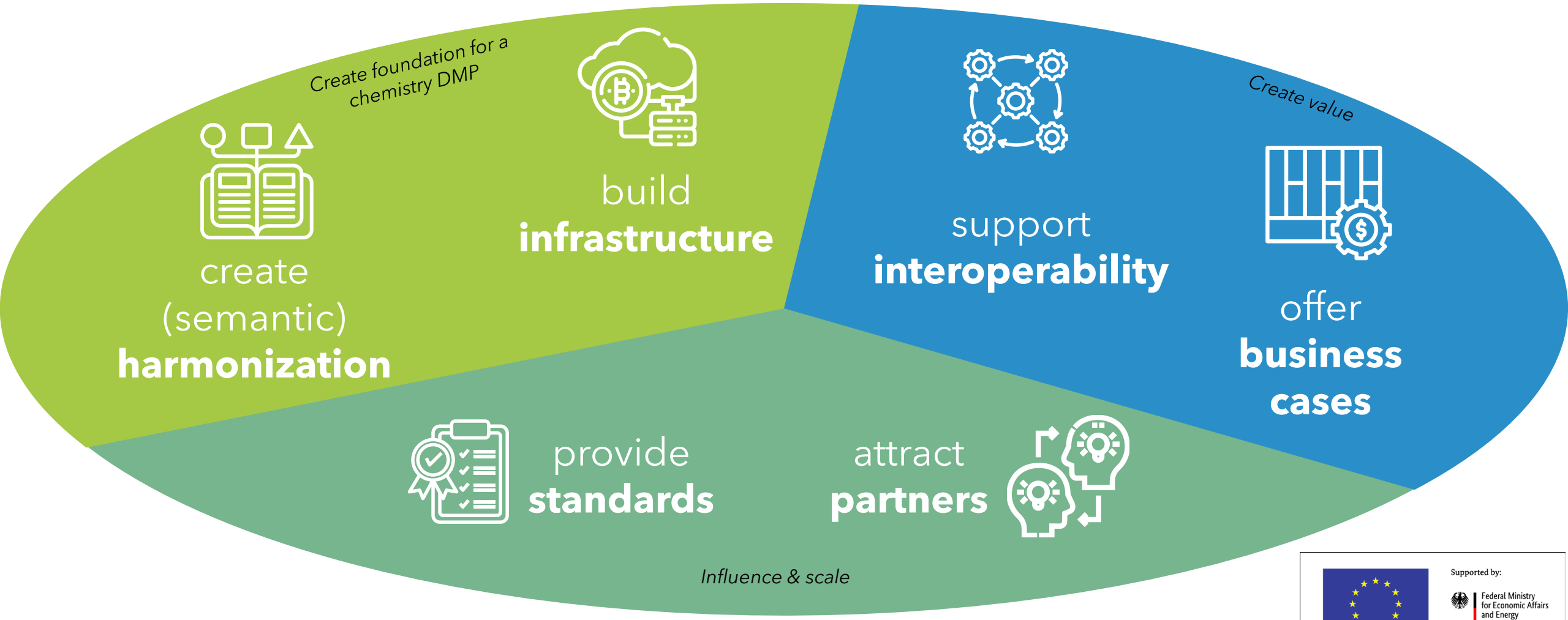
To make Chem-X as chemical data space successful, we must…



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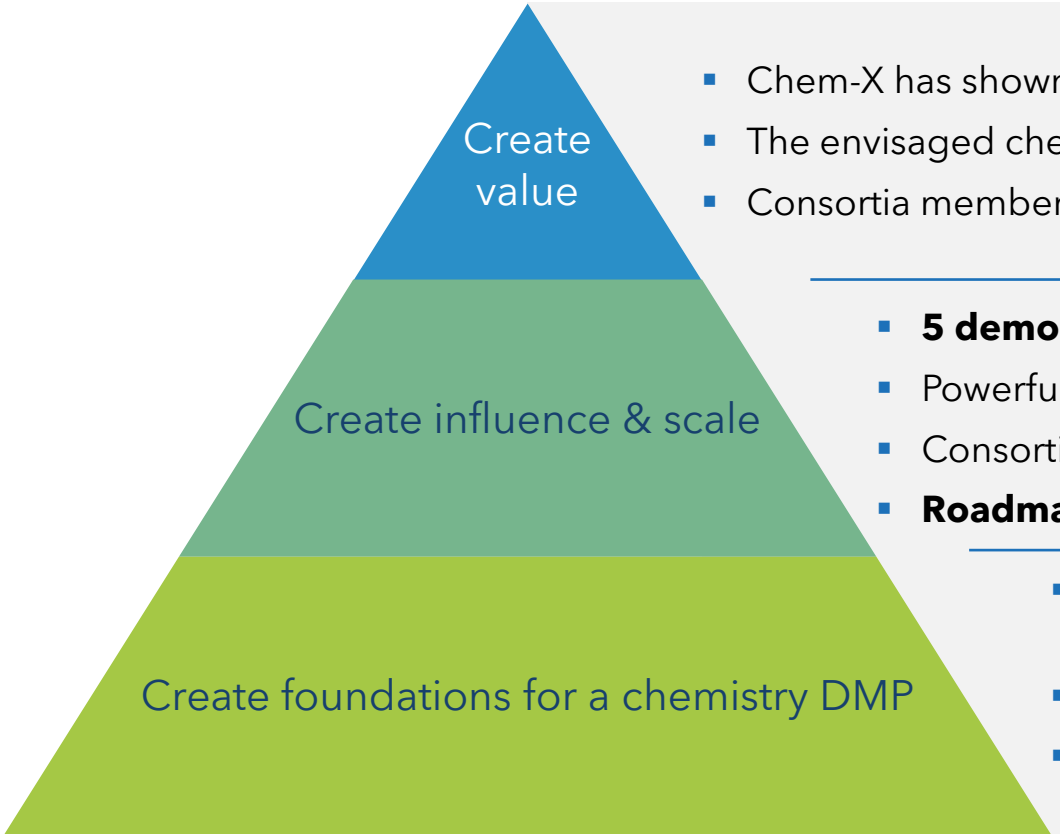
We have set ourselves clear strategic goals that we want to have achieved by the end of 2026



- Chem-X has shown evidence for **value cases of a chemical DMP**
- The envisaged chemical DMP is able to comprehensively **fulfill ESG compliance**
- Consortia members commit to **implement first use cases** as of 2027

- **5 demonstrators** for different industries and value chains developed
- Powerful **stakeholders support**/promote Chem-X (foundations)
- Consortia members **commit to adapt and to implement developed foundations**
- **Roadmap** of functions and institutions to be established for a scalable data space

- Guidelines for **business and material identity, verification, sustainability & circularity metrics, material declaration** developed and published
- **Information model** (chemical ontology) developed and published
- **Technical specifications** for a software implementation of data exchange between companies developed

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Next steps for 2026…

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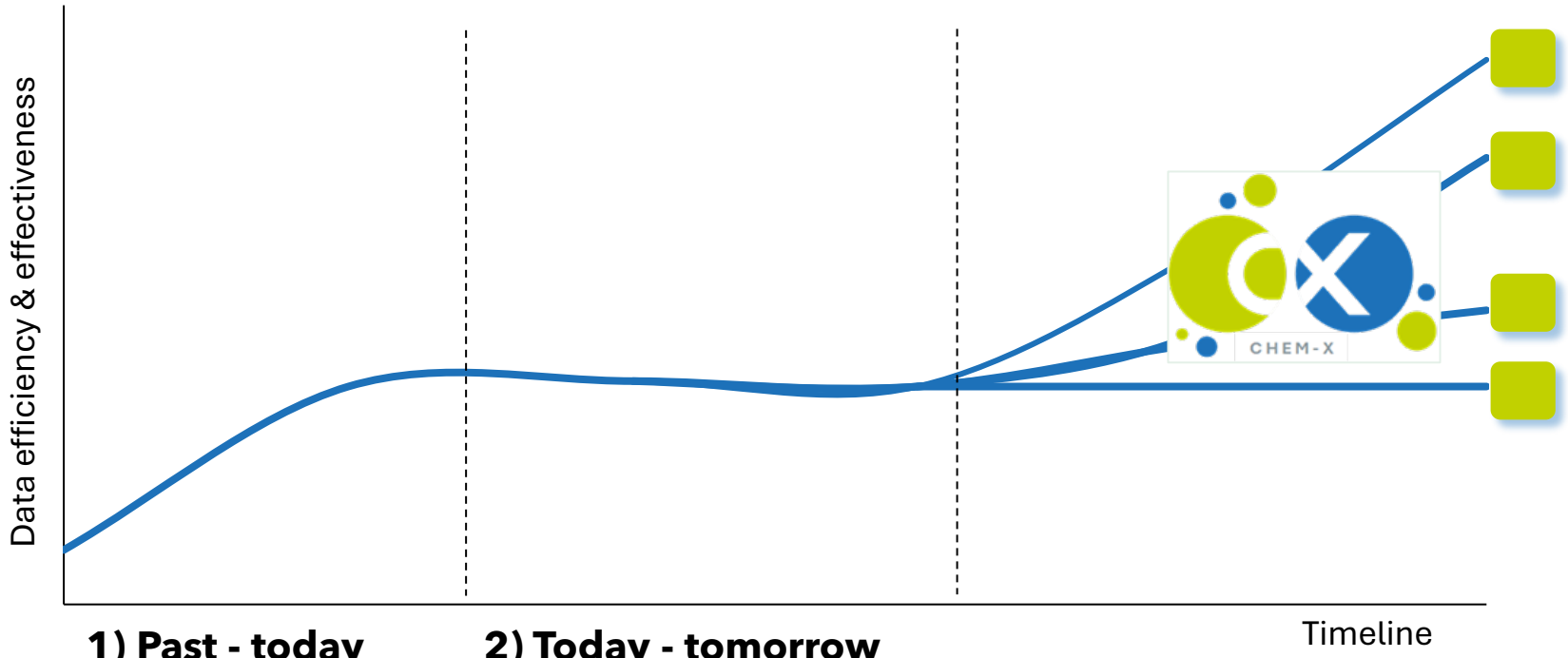
Chem-X at scale is able to significantly increase data efficiency & effectiveness



1) Past - today

Primary focus on improved internal processes, less on exchange of data between companies.

2) Today - tomorrow

Improvements in internal company processes are being eaten up by increasing data requests and the lack of seamless data exchange between companies.

3) Tomorrow - beyond

Global cross-industry and cross-value chain use of Chem-X

Chemical companies among themselves as well as their suppliers and customers will use Chem-X

Chemical companies will use Chem-X among themselves

No use of cross-industry standards or data ecosystems. Companies focus on improvement of their internal processes.

Continuation without Chem-X

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02
Chem-X project organization

Chem-X comes as a strong alliance

- **Project duration:** 01.12.2024 - 30.11.2026
- **Budget:** ~20 m€ (of which funding rate BMWE: 40%, rest consortia partners)
- Public funding approach goes hand in hand with the regulatory developments based on sovereign standards
- **Project Partners (Chemical & Tech Players):**

- **Associated Partners:**

Who is participating in the consortia?

Experts in

- Sustainability
- Digitalization
- Business requirements
- Standardization

Senior Leadership involvement for steering and guidance

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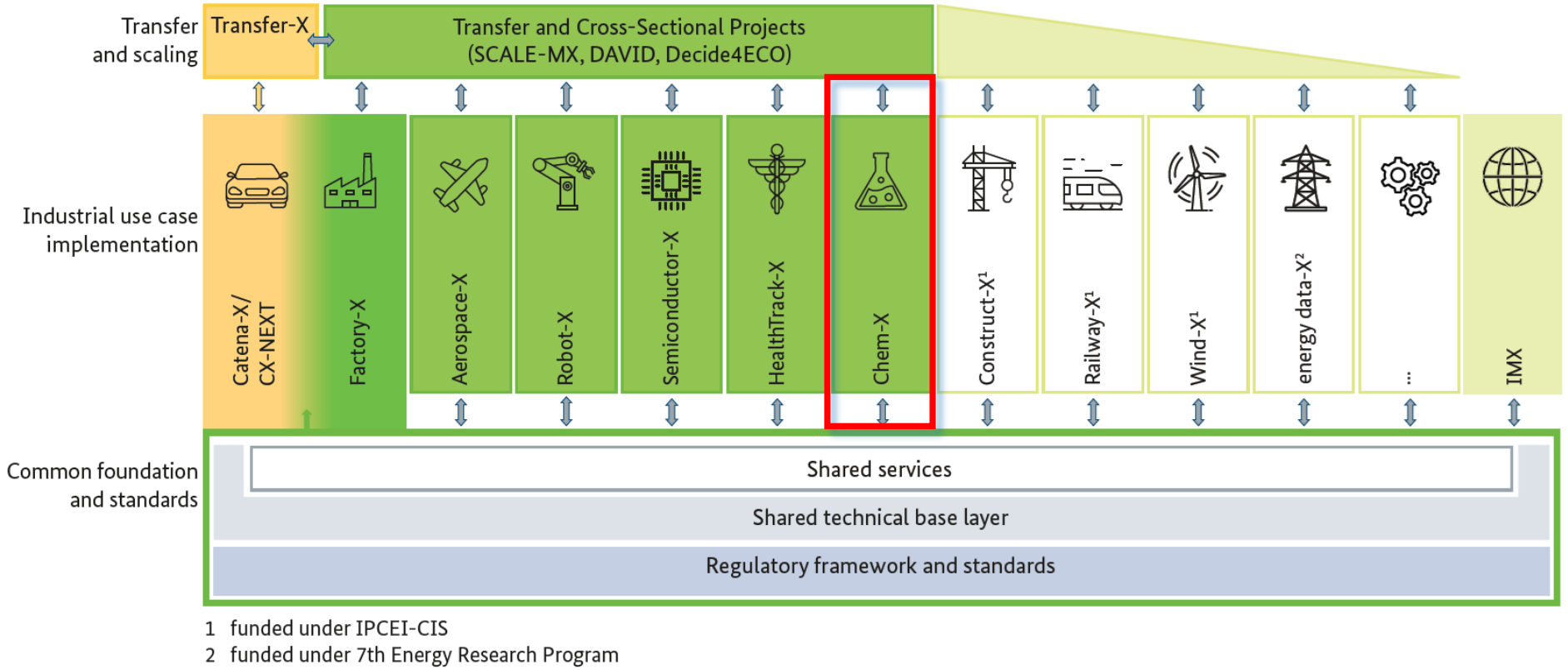
Chem-X is part of Manufacturing-X



1 funded under IPCEI-CIS
2 funded under 7th Energy Research Program

Goals of Manufacturing-X:

- To implement the DataSpace Industrie 4.0 and the transformation to a digitally networked industry across the board
- Manufacturing-X creates trustworthy data ecosystems based on open standards

Source: https://www.plattform-i40.de/IP/Navigation/EN/Manufacturing-X/Manufacturing-X.html

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To develop a sustainable data ecosystem Chem-X considers 3 layers: application, content, technical

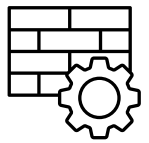
Chem-X working scope

Application layer – **Digital Product Passport**

Interoperability with EU and other DPPs

Content layer – **Digital Material Passport**

Sustainability, circularity and material declaration metrics



Technical layer – **Data space foundations**

Business & material ID, data verification

Standardization candidates

Speed & Focus – Build on lessons learnt from Battery Passport, TfS, and Catena-X

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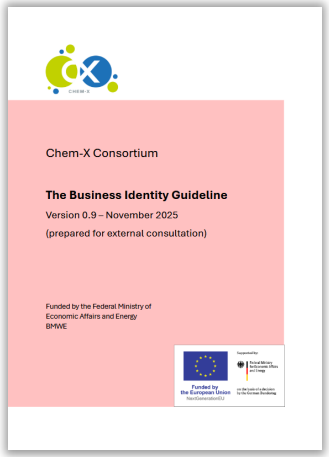
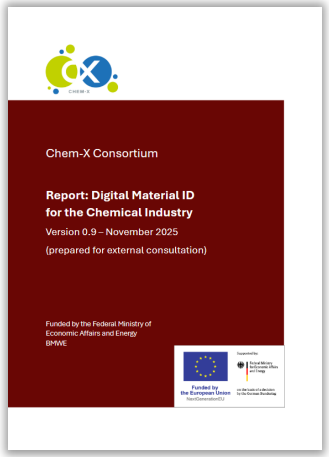
First deliverables: 6 seminal standardization candidate documents for public consultation

Technical Layer

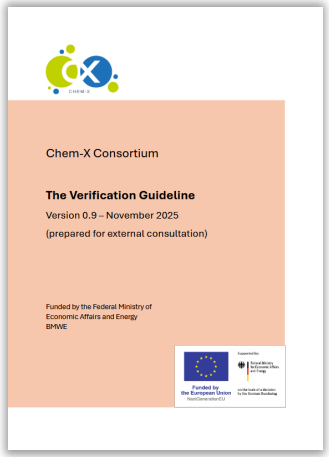
Business identity



Material identity and data chain

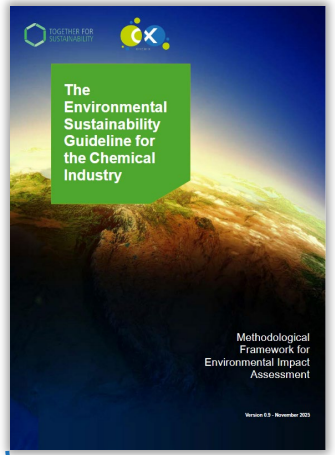


Verification

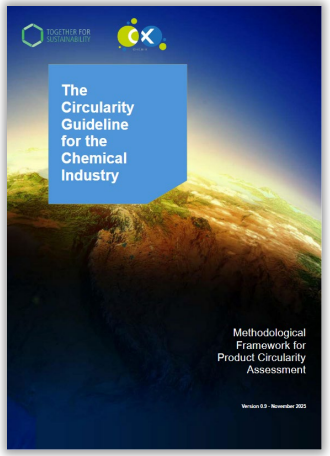


Content Layer

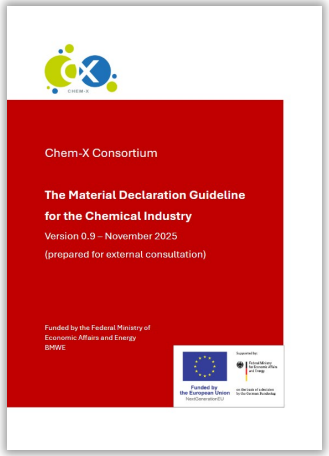
Sustainability



Circularity



Material declaration



Sectoral category rules for the chemical industry

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Many thanks for your attention!

For more information, follow us on LinkedIn and/or visit our homepage!

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Product Passport
CHEM-X