Chem-X
Content guidelines as foundation for a chemistry Digital Material Passport (DMP)

Webinar presenting the Chem-X guidelines

Things to know before we begin

Webinar will be **recorded** and **made available** on the Chem-X website

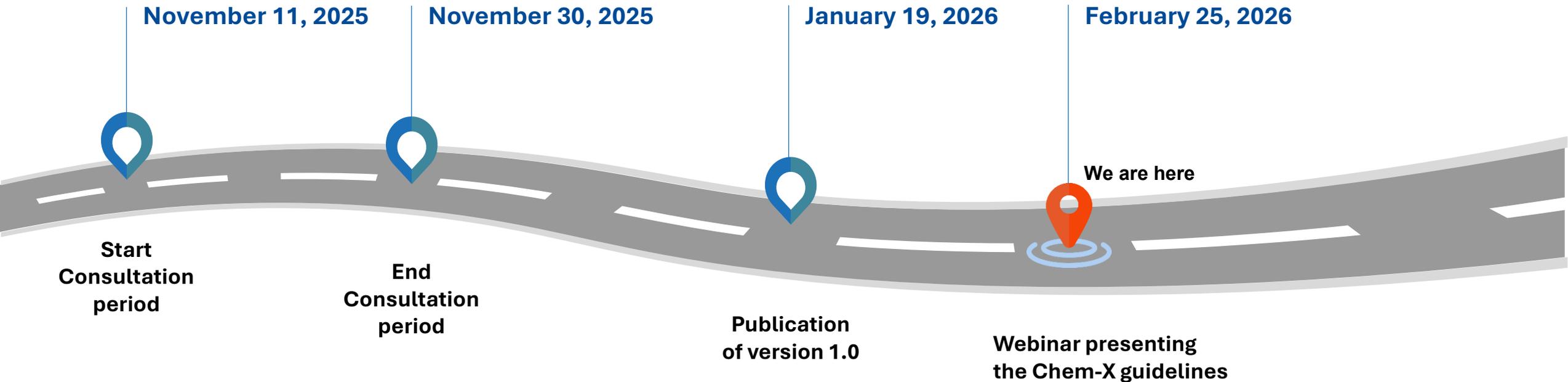You are **muted** and your **camera was disabled** upon entry

Chat is disabled

Use the **Q&A function** to raise and upvote questions

A journey from consultation to the launch of the Chem-X guidelines

CHEM-X

November 11, 2025

November 30, 2025

January 19, 2026

February 25, 2026

We are here

Start Consultation period

End Consultation period

Publication of version 1.0

Webinar presenting the Chem-X guidelines

The version 1.0 of the guidelines has been published on Chem-X.de on January 19, 2026

Find all information on our homepage!

HOME   PROJECT   PUBLICATION   PARTNERS   INTERVIEWS   NEWS   CONTACT

Chem-X Publication: Final version of Guidelines for a chemistry Digital Material Passport (DMP)

We're excited to share that the final version of the six Chem-X guidelines for a DMP is now published.
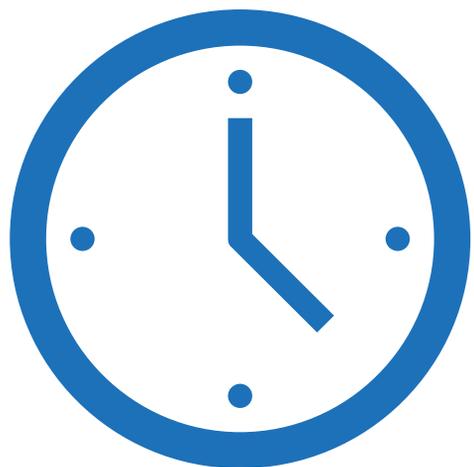
READ MORE

Agenda

Welcome & Intro Chem-X - Why, What, How

Project organization

Stakeholder feedback
and Chem-X technical framework enhancements

Outlook and Summary

Q&A

Your speakers today

Torsten Freund
Chem-X project lead

Vikas Mishrikoti
Chem-X data space foundations lead

Adrian von Mühlenen
Chem-X data space foundations lead

Doruk Sahinel
Chem-X data space foundations lead

Alessandro Pistillo
Chem-X & TfS sustainability lead

Achim Ilzhöfer
Chem-X material declaration lead

Katharina Ertskin & Daniel Mihalyi
Chem-X project management office

01
Intro Chem-X – Why, What, How

Starting with the facts

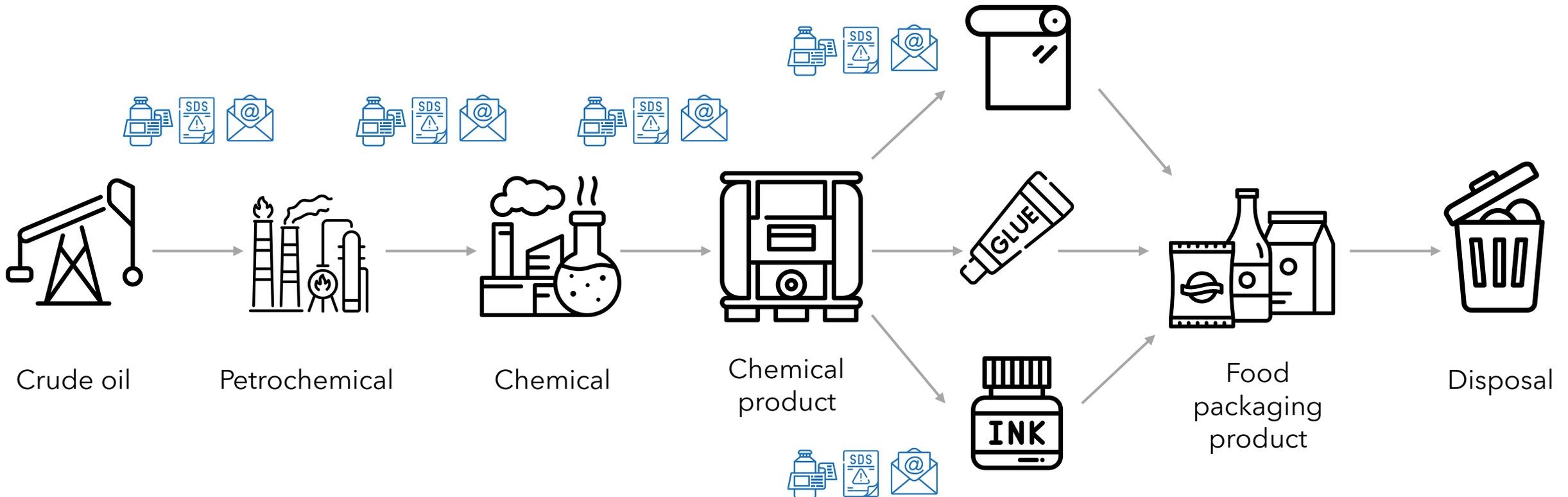**#1** Digital Product Passports (DPP) are coming

#2 ~95% of all products contain synthetic chemicals

#3 DPPs will require a material data foundation

Chemical industry exchanges multiple different data formats along the value chain

Crude oil → Petrochemical → Chemical → Chemical product → Food packaging product → Disposal

Communication via
- @ E-Mail
- SDS Safety datasheet
- Label

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

Crude oil → Petrochemical → Chemical → Chemical product

Chemical product → Food packaging product → Disposal

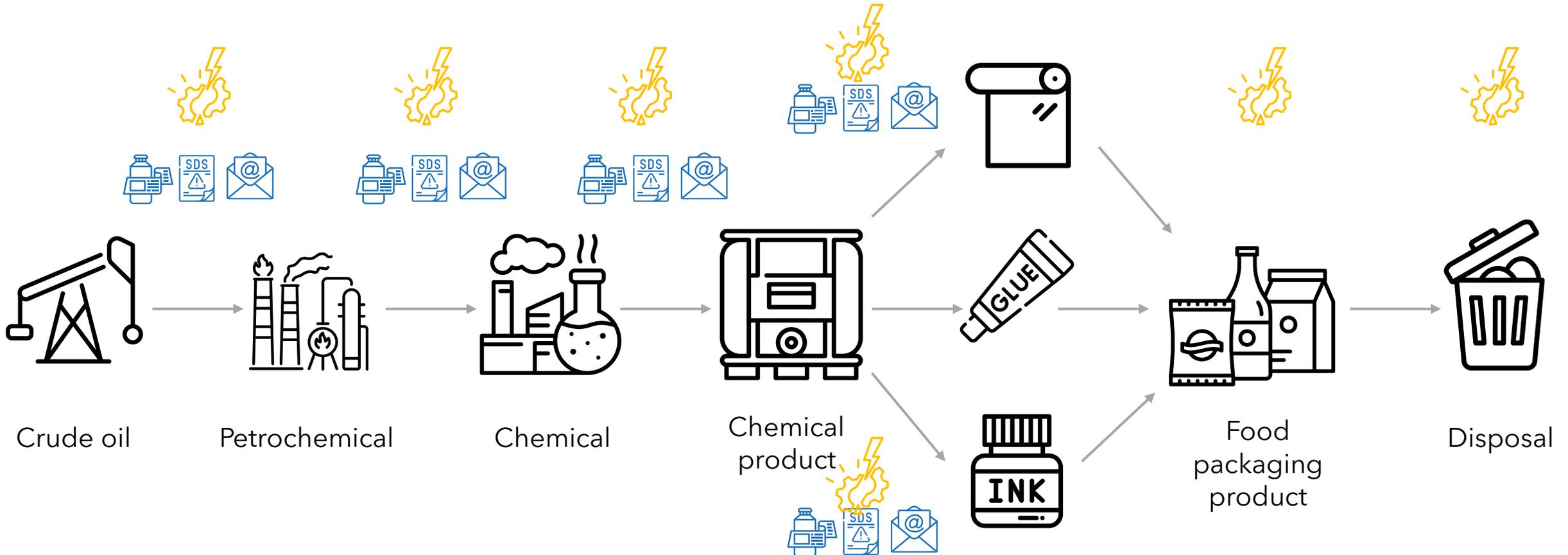**Communication via**

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

Gefördert durch:
Bundesministerium für Wirtschaft und Energie
aufgrund eines Beschlusses des Deutschen Bundestages

Finanziert von der Europäischen Union
NextGenerationEU

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

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

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

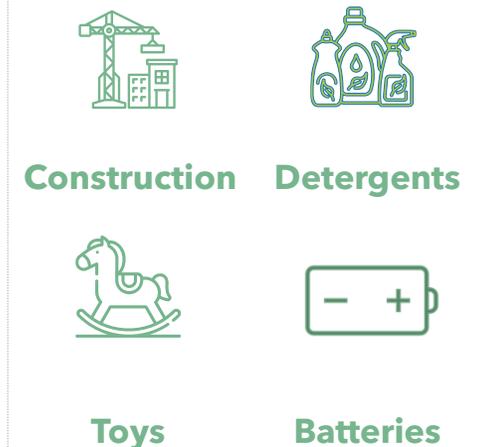- First DPPs shall be **in force by 2027**

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

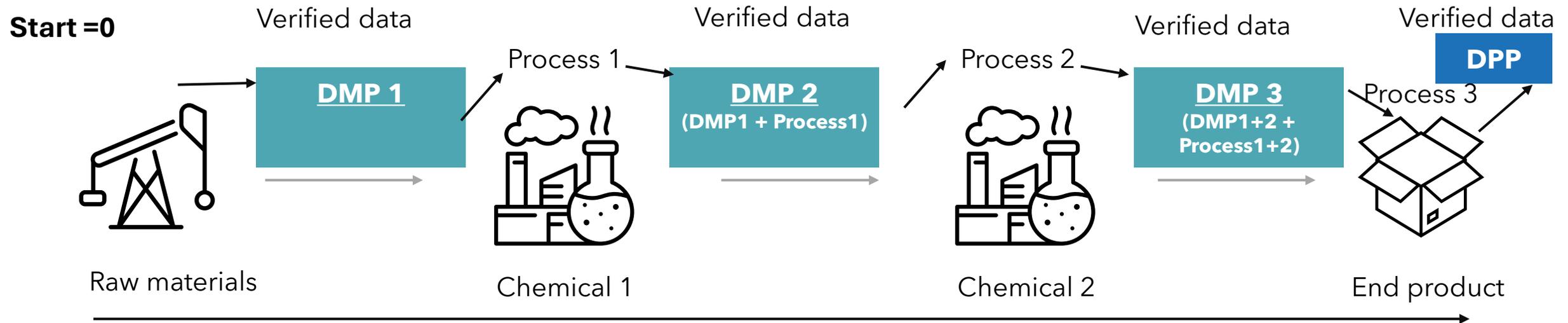| Construction	Detergents

Toys	Batteries

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

DMP system provides verified information along the value chain to deliver verified DPP

Primary data

Start =0

Verified data — Process 1 → **DMP 1** → **DMP 2** (DMP1 + Process1)

Verified data — Process 2 → **DMP 3** (DMP1+2 + Process1+2)

Verified data — **DPP** — Process 3
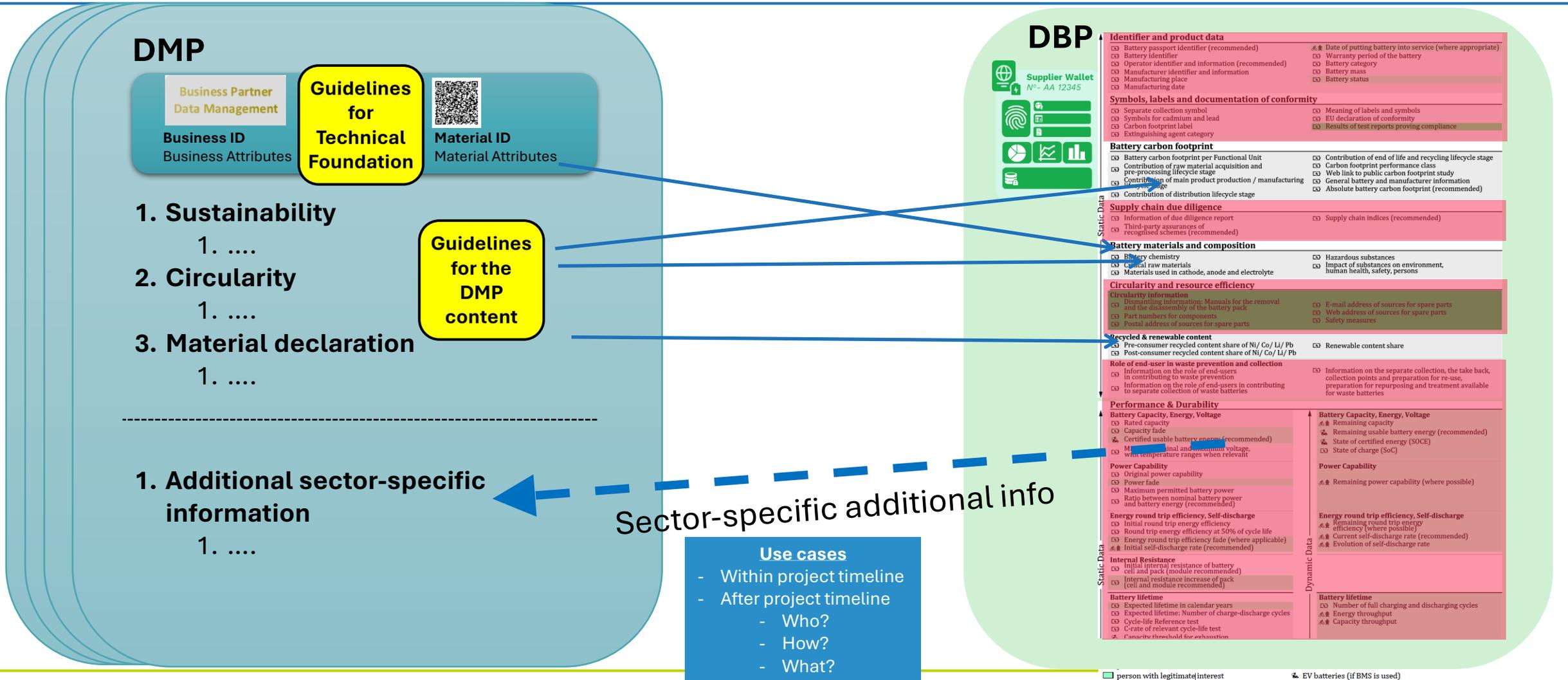
Raw materials

Chemical 1

Chemical 2

End product

Value chain
- **Beginning = 0**
- **All contributions accounted**
- **All data / processes validated & verified**
→ **Overall verified DMP**

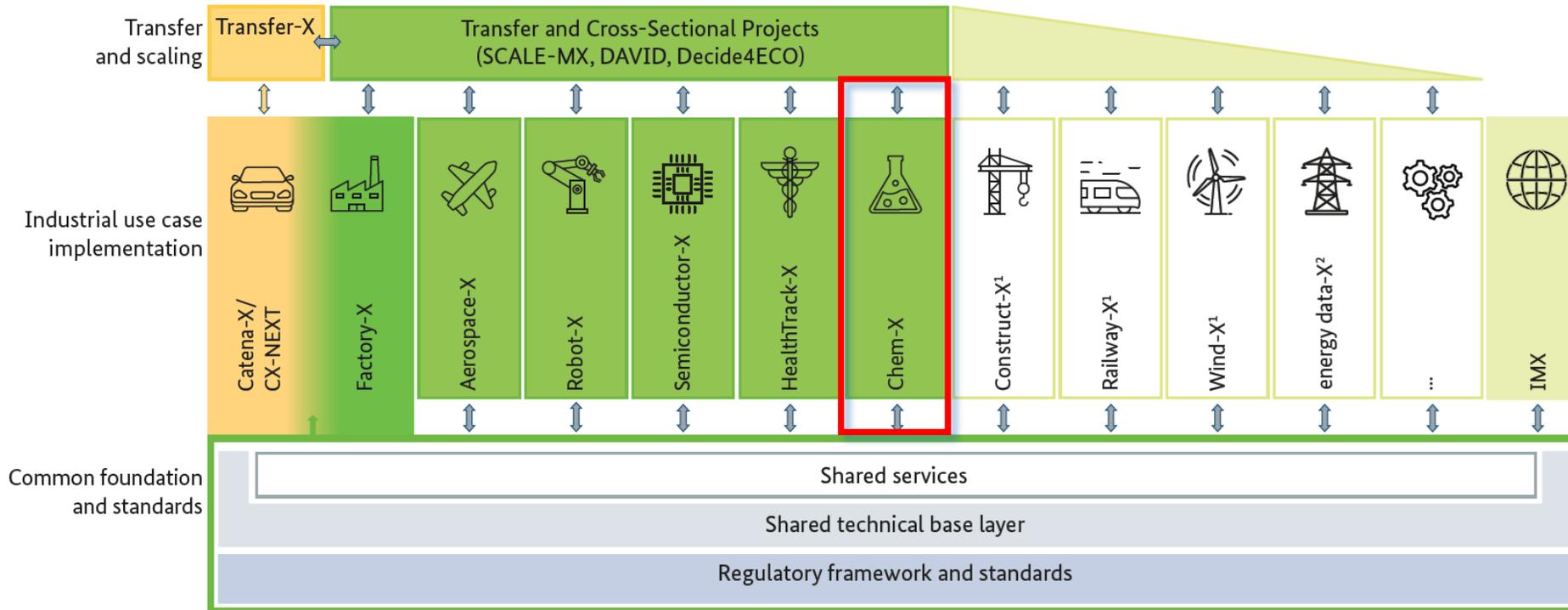# Example: DMP information projection to Battery Pass (DBP)

02
Chem-X project organization

Chem-X is part of Manufacturing-X

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

Transfer and scaling | Transfer-X | Transfer and Cross-Sectional Projects (SCALE-MX, DAVID, Decide4ECO)

Industrial use case implementation: Catena-X/CX-NEXT, Factory-X, Aerospace-X, Robot-X, Semiconductor-X, HealthTrack-X, Chem-X, Construct-X[1], Railway-X[1], Wind-X[1], energy data-X[2], ..., IMX

Common foundation and standards:
- Shared services
- Shared technical base layer
- Regulatory framework and standards

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

Chem-X comes as a strong alliance

- **Project duration:** 01.12.2024 - 30.11.2026

- **Project setup:** Public funding approach goes hand in hand with the regulatory developments based on sovereign standards

- **Project Partners (Chemical & Tech Players):**

- **Associated Partners:**

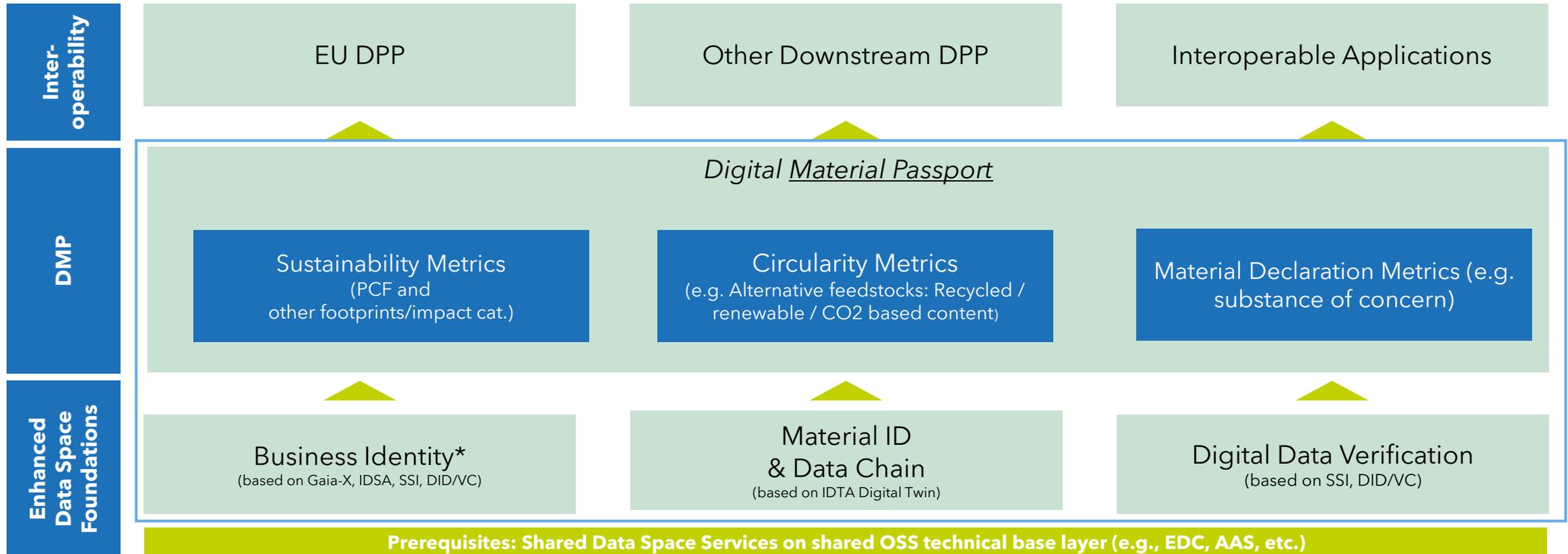**Who is participating in the consortia?**

Experts in

- Sustainability
- Digitalization
- Product Stewardship
- Standardization
- Business

Senior Leadership involvement for steering and guidance

Developing foundations for a digital material passport for chemicals is at heart of the project

| Inter-operability | EU DPP | Other Downstream DPP | Interoperable Applications |

Digital Material Passport

| DMP | Sustainability Metrics (PCF and other footprints/impact cat.) | Circularity Metrics (e.g. Alternative feedstocks: Recycled / renewable / CO2 based content) | Material Declaration Metrics (e.g. substance of concern) |

| Enhanced Data Space Foundations | Business Identity* (based on Gaia-X, IDSA, SSI, DID/VC) | Material ID & Data Chain (based on IDTA Digital Twin) | Digital Data Verification (based on SSI, DID/VC) |

Prerequisites: Shared Data Space Services on shared OSS technical base layer (e.g., EDC, AAS, etc.)

* Includes positive list of supply chain due diligence and legal entity specific certificates

03
Stakeholder feedback
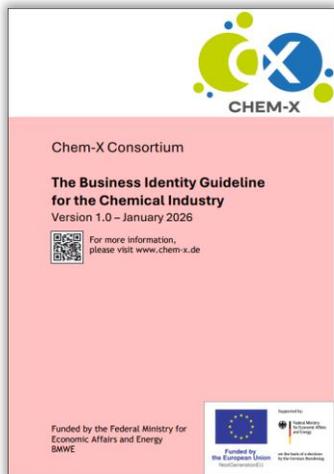# and Chem-X technical framework enhancements
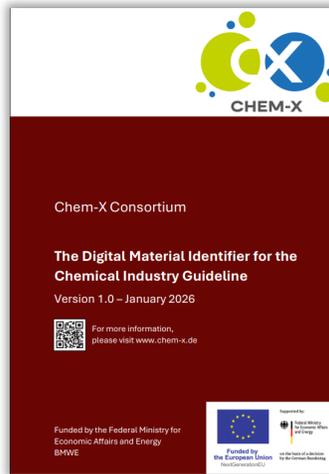
Overview of the six guidelines
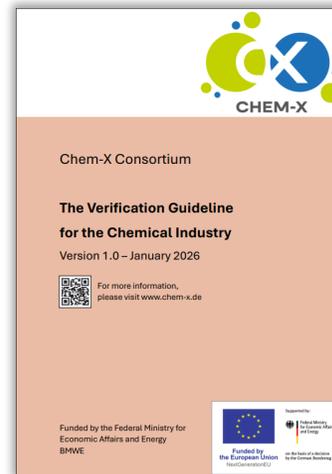

Technical Foundation

Digital Material Passport

| Business Identity | Material ID | Verification | Environmental Sustainability | Circularity | Material Declaration |
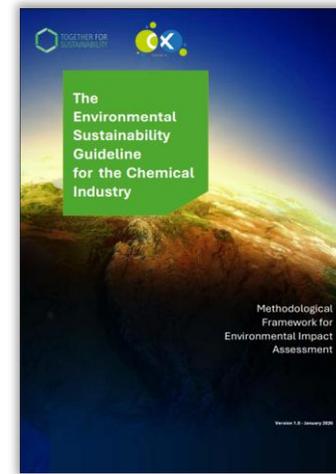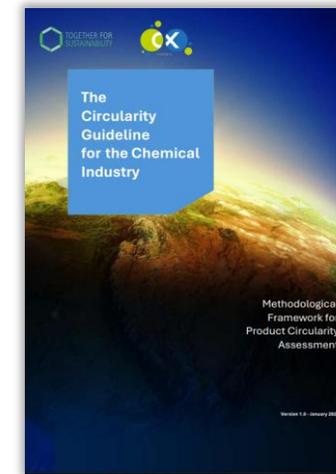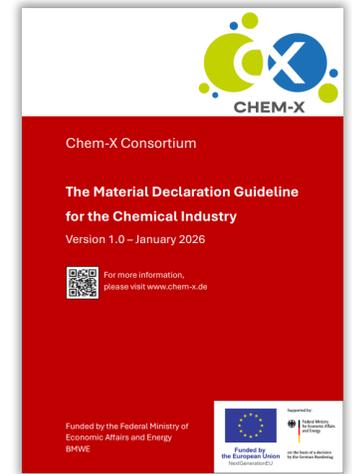
High industry engagement in the consultation and broad participation across all guidelines

Donut chart:
- Business Identity — 7%
- Material ID and Data Chain — 8%
- Verification — 7%
- Environmental Sustainability — 21%
- Circularity — 36%
- Material Declaration — 21%

>1000 Comments in total

>40 Organizations

6 Topics

Most feedback Circularity, Environmental Sustainability and Material Declaration
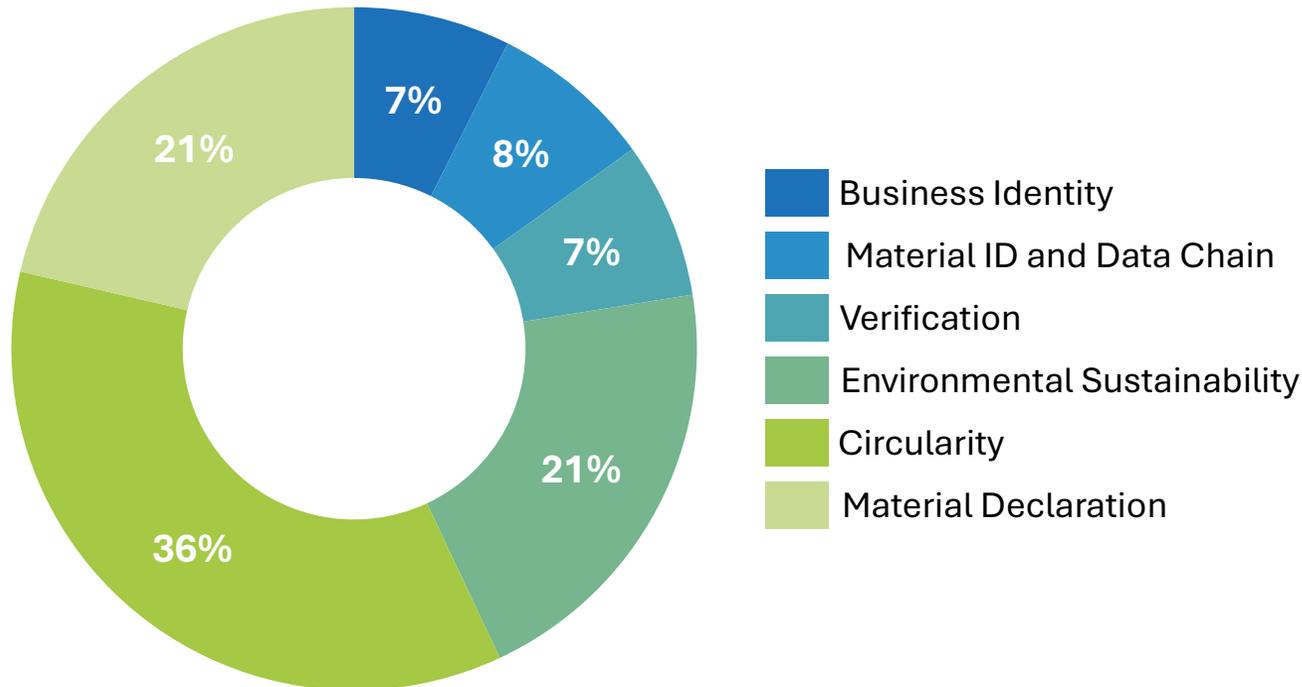
Business Identity Guideline Content and feedback

Chem-X Consortium

The Business Identity Guideline for the Chemical Industry
Version 1.0 – January 2026

For more information, please visit www.chem-x.de

Funded by the Federal Ministry for Economic Affairs and Energy BMWE

- **Strategically aligned but requires proportional simplification for SME participation.**
  - Concerns raised regarding **model complexity**, **clarity of responsibilities between operator and participants**, **high data quality expectations**, and **assumed level of IT maturity** - highlighting **need for proportional simplification** to enable effective SME participation
- The **framework** was refined to introduce a **proportionate participation model**, with a **clearly defined core dataset** and a **structured distinction between essential and advanced elements**
  - **Roles and responsibilities were clarified** to ensure transparency between operator and participant obligations
  - **Enablement mechanisms and automation** were added to reduce complexity and support SMEs.
- **Close alignment with related initiatives** is ensured to harmonize regulatory and data requirements and validate supply chain interoperability through consistent identity and data standards
- Initial guideline structure was **maintained**, while details were improved using external feedback
  - Work is ongoing to finalize the information model, with **publication planned for 2026**

Digital Material Identity Guideline Content and feedback

Chem-X Consortium

The Digital Material Identifier for the Chemical Industry Guideline

Version 1.0 – January 2026

For more information, please visit www.chem-x.de

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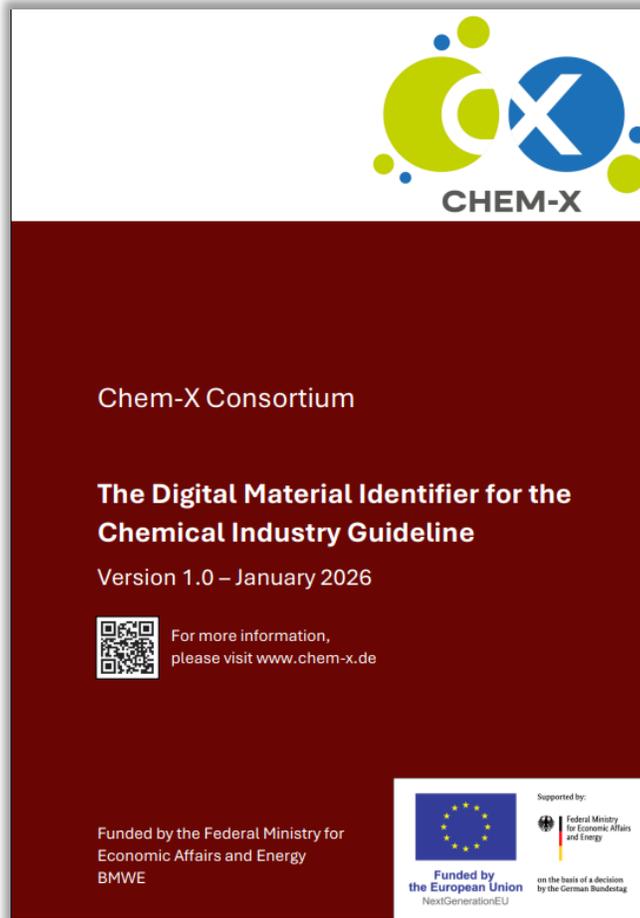
- **Comments** from **reviewers** addressing **technical** and **implementation**, **challenges** for SMEs, definitions from specific verticals and clarification on guidance for **addressing DMP endpoints**
- More than half of the comments were **deferred because they were out of scope of the MaterialID guideline** (e.g. it is not a material master data system, upcoming and yet unclear regulatory requirements and recommendations from the 3 content layer guidelines)
- MaterialID guideline provides an **overview of proposed ID schemas** published by **JTC 24 prEN 18219**, including a recommended use in the context of **chemical value chain communication**
- The structure of the report has been updated to **include the comparison of JTC 24 ID schemas**
    - The conclusion of the MaterialID guideline is the same as of the report

Verification Guideline Content and feedback

Chem-X Consortium

The Verification Guideline for the Chemical Industry

Version 1.0 – January 2026

For more information, please visit www.chem-x.de

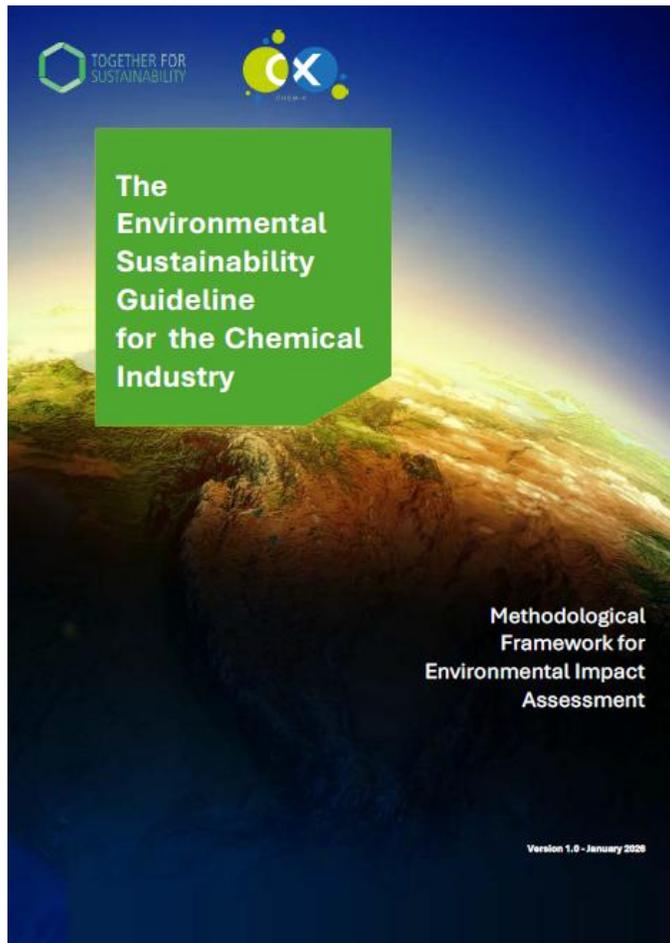Funded by the Federal Ministry for Economic Affairs and Energy BMWE
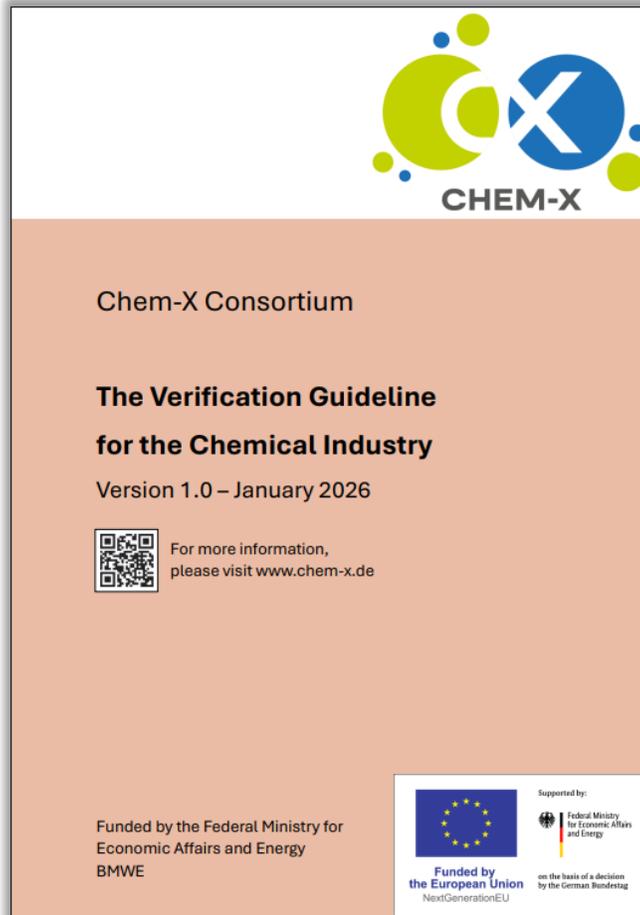
- It was emphasized that **technical product data** frequently originates from **third-party laboratories** rather than **manufacturers**
  - Additionally, stakeholders raised concerns about **high technical entry barriers for SMEs**, such as the **heavy dependency manual certification** in current supply chains
- The **Trusted Authority Registry** section includes **accredited laboratories as authorized credential issuers**
  - To accommodate **traditional workflows**, **Version 1.0** clarifies that **PDF-based verification** remains a **supported, complementary approach for SMEs**
- The **envision concept** is updated to a **multi-issuer model**, recognizing **National Accreditation Bodies** as additional **trust anchors**
  - The framework now explicitly includes **material conformity verification** that **links test results to specific material identities**
- Version 1.0 introduces **Component Overview** and **Verification Levels tables** to provide **immediate technical clarity** for **developers and auditors**

Environmental Sustainability Guideline Content and feedback

The Environmental Sustainability Guideline for the Chemical Industry

Methodological Framework for Environmental Impact Assessment

Version 1.0 - January 2026

- Guideline **Module 1** content includes:
  - Product Carbon Footprint (TfS PCF Guideline 3.0)
  - Resource Use Fossil
  - Acidification Potential
  - Water Use (water scarcity)
  - Ozone Depletion Potential
  - Photochemical Ozone Creation Potential

- Guideline **Module 2, 3** will include other EF impact categories

- Feedback **mostly** asking for **clarification** (e.g., methane leakage in other impact categories, declared vs functional unit) and leading to text additions or improvements

- While developing the methodology special care was taken in the Guideline not to impair **automation** of LCA calculations

- Acknowledgement of **data availability gaps** and related approach strategies

Circularity Guideline Content and feedback

The Circularity Guideline for the Chemical Industry

Methodological Framework for Product Circularity Assessment

Version 1.0 - January 2026
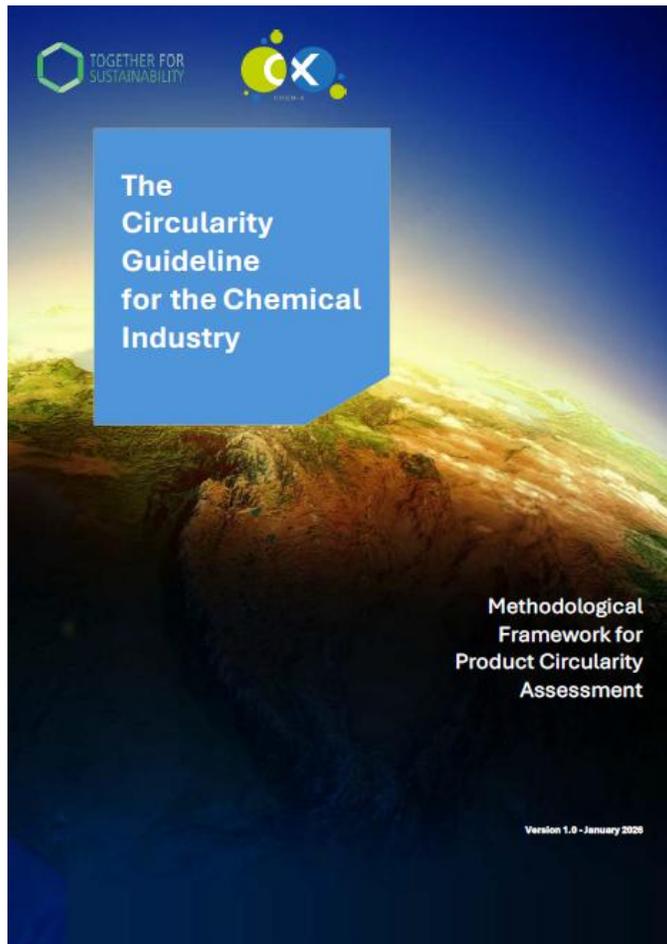
- Guideline **Module 1** content includes:
    - Overview of circular sources and technologies, including characterization of biogenic & waste origin
    - Biogenic carbon/Biogenic/Renewable/Renewable energy derived content metrics definitions and formulas
    - Recycled/Reused content metrics definitions and formulas
    - Chain of Custody definitions, examples and indicators

- Guideline **Module 2, 3** will include CO2-based content, Waste metrics (EPD) and Material accounting (closing the material loop)

- Feedback led to **improvement** of certain aspects of the Guideline (e.g., differentiation bio-based/bio-attributed, streamline of chemical re-use cases, classification of enzymatic recycling technology).

- **Additional examples** in circular framework (Annex) provided.

- Link to Env. Sustainability Guideline and **reference to** future ISO14077.

Material Declaration Guideline Content and feedback

Chem-X Consortium

The Material Declaration Guideline for the Chemical Industry

Version 1.0 – January 2026

For more information, please visit www.chem-x.de

Funded by the Federal Ministry of Economic Affairs and Energy BMWE

Supported by: Federal Ministry for Economic Affairs and Energy

Funded by the European Union NextGenerationEU on the basis of a decision by the German Bundestag
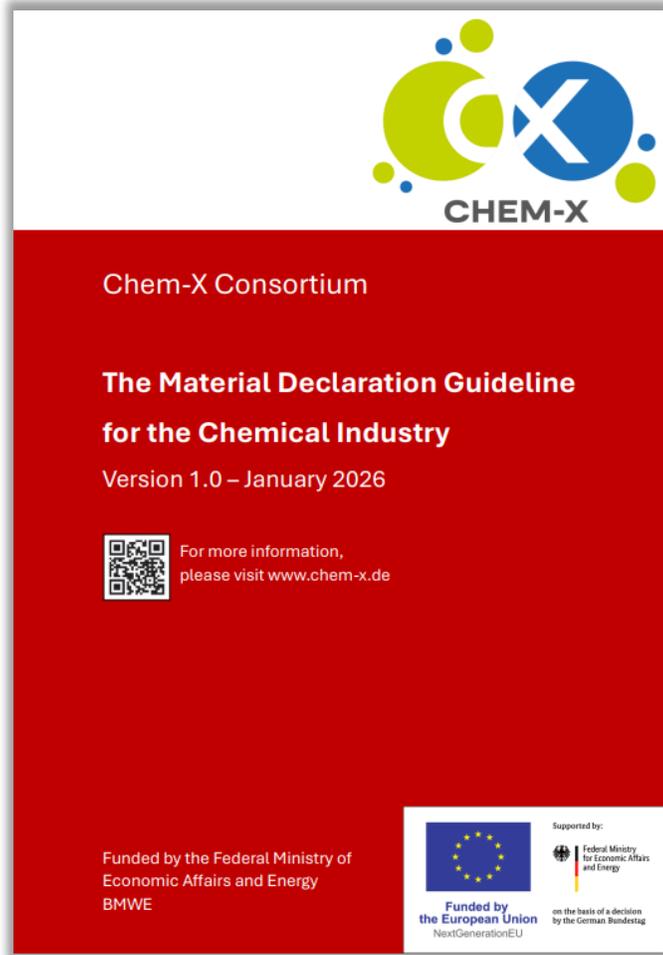
- **Comments from Companies, Consultancy, Federal Institutes and Research Institutes received**
  - Editorial comments all accepted and included into V1.0 of Guideline
  - General comments regarding Digital Material Passports (DMP) and optional Safety Data Sheet (SDS) noted while the Material Declaration Guideline defines the language (definitions and context) and not the combination in a DMP (including SDS information)
  - SME data-delivery readiness acknowledged (First examples integrated into DMP interoperability test cases partially presented at Hannover Fair)
  - Acknowledged request for more specific material data (process & microstructure level) while prioritizing regulation-aligned, value-chain-relevant data that is implementable in the coming years

- **Alignment request with other Manufacturing-X projects** to harmonize ESPR/CPR DMP requirements and test supply-chain interoperability understood

- **Guideline structure** retained, details refined through external feedback, information model under development for publication in this year (2026)

Gefördert durch: Bundesministerium für Wirtschaft und Energie

Finanziert von der Europäischen Union NextGenerationEU aufgrund eines Beschlusses des Deutschen Bundestages

Our roadmap towards project completion – and full industry adaptation

November 30, 2026

Chem-X project end – Enable industry adoption

Q4/2026

Guidelines publication Module 3

After the project

- Respond to upcoming regulations
- Maintain content
- Extend to further use cases
- Harmonize with up- and down-stream interfaces

March – November 2026

First demonstrator blue-prints for scale up showing interoperability with test data and DPP systems

Increasing the number of data points

April 20 – 24, 2026

HMI - First testing of minimum set of data to proof the interoperability concept on Cofinity-X (5 demonstrators)

Q2/2026

Guidelines publication Module 2

Gefördert durch:

Bundesministerium für Wirtschaft und Energie

Finanziert von der Europäischen Union
NextGenerationEU

aufgrund eines Beschlusses des Deutschen Bundestages

04
Q&A

CHEM-X

Many thanks for your attention!

CHEM-X

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

Chem-X Projekt: Übersicht | LinkedIn

Website: CHEM-X

Meet us at Hannover Messe 2026

April 20 – April 24

Halle 13, Booth C24

HANNOVER MESSE