

Catena-X - An Overview

Catena-X Automotive Network e.V.

April 2025



Catena-X is the first globally trusted and collaborative data ecosystem for the automotive industry

We are the first to offer multi-tier collaboration.

We reduce costs and create synergies for business and IT.

We are successful via radical collaboration.





From the industry, for the industry

The 1st trusted multi-tier business collaboration network is LIVE

Layer 1: Build & Govern Full industry re-representation

- OEM/ supplier/ recycler/ SME/ research
- Solution-/ service provider/ transfer org.



overall:
Global Industry Representation

Layer 2: Scale Global re-representation

- regional alliances (US, FR, ES, JP, CN, ...)
- local hubs



overall:
~ pot. 7,000 companies addressed

Layer 3: Transfer X-Industry re-representation

- comparability & interoperability
- re-use/ synergies

Selected industry Eco-Systems Partners



Temp. guidance-/ Collaboration Partner (when needed)

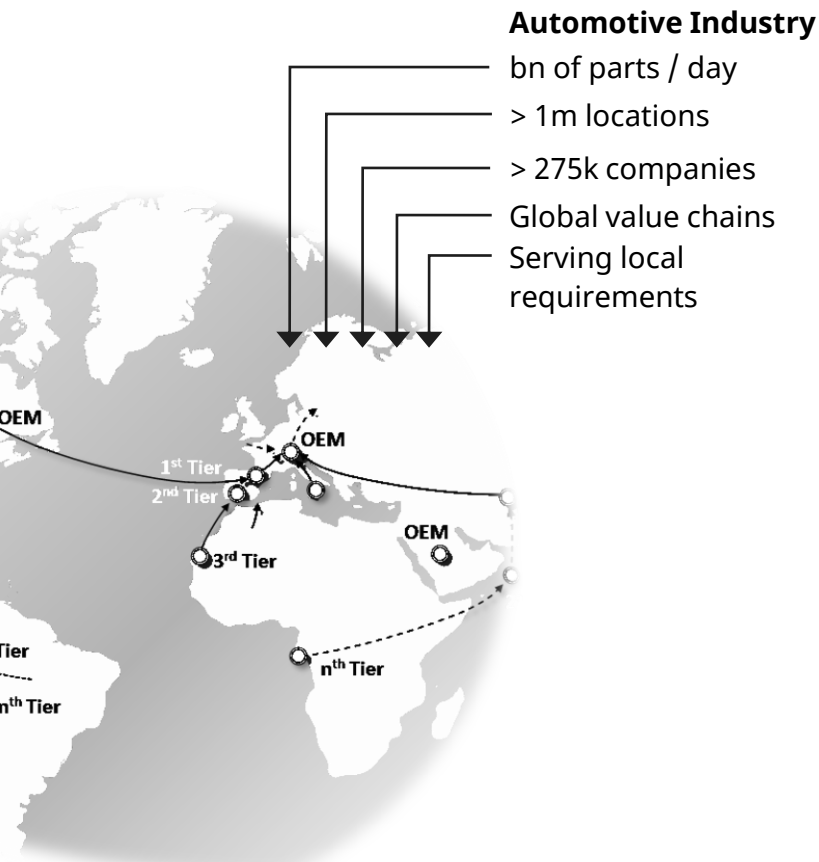


Trusted & interoperable data exchange: **Governed by the industry**



Our automotive business processes require an update of the industry operating model

Motivation: "License to operate and grow"



Resiliency
Resilient Supply Chains

- Business Partner Identification
- Location Certification
- Bolster supply performance
- Optimize inventory / logistics
- ...

Compliance
Trusted Sustainability

- Report validated CO₂e-Values
- Cover regional variance
- Release of Product Passports
- Supply Chain Due Diligence
- ...

Cost down
Effective Quality

- Trace parts / campaign mgt.
- Live quality loops
- Behavior Twins
- ...

require

» **multi-tier collaboration along the value chain** «

It is a digital challenge!

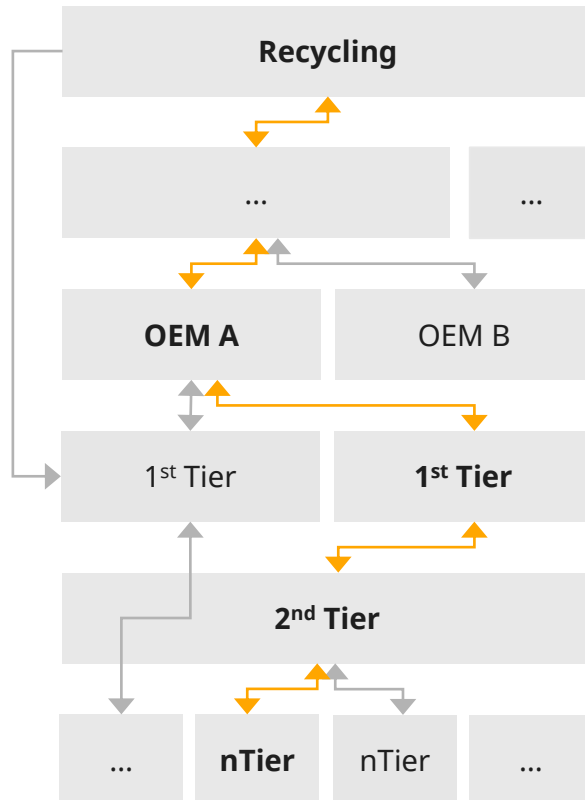


How to enable Multi-Tier Collaboration?

Four main alternatives

Automotive Value Chain

- Use Case X -



Alternative 1

1x central Data Base for all industry partners

- + No cost for supplier
- + Established / available
- Trust / Verification
- Data Protection / IP
- Cyber-Security
- Business Process Readiness

Alternative 2

One IT Provider for all partners of the same value chain

- + Trust / Verification
- + One solution provider
- Compliance / AntiTrust
- Scalability in Business
- Enforce Usage (nTier)
- Costs / Synergies

Alternative 3

Industry standards to create interoperability between providers

- + Freedom of Choice (vendors) → Anti Trust
- + Data Protection / Cyber Security
- + Trust / Verification
- + Scalability in Business
- Industry Transformation
- Initial Complexity

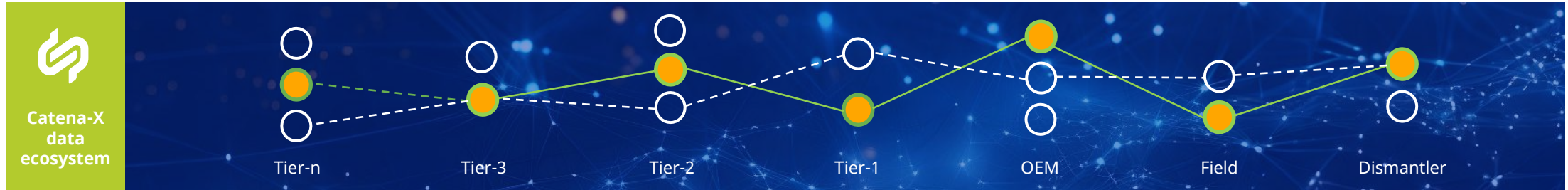
Alternative 4

Every Partner has its own solution

- + Data Protection / IP
- + Freedom of Choice
- Trust / Verification
- Business Compliance
- Compatibility / Logic
- Scalability in Business
- Overall Costs



Catena-X developed an open, collaborative ecosystem for data exchange along the value chain



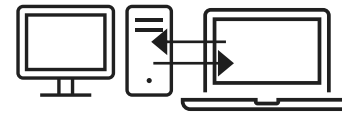
Trusted Identities

Verified and unique company identities



Self Sovereignty

Decentral Architecture with full control over your data



Interoperability

Unified open-source-based standards and KITs



Industry Governance

One global operating model and framework

Catena-X is **not a database** to store and collect data but an **open ecosystem** to share data in a better way – **standardized, secure and simple.**



Examples and Success Stories

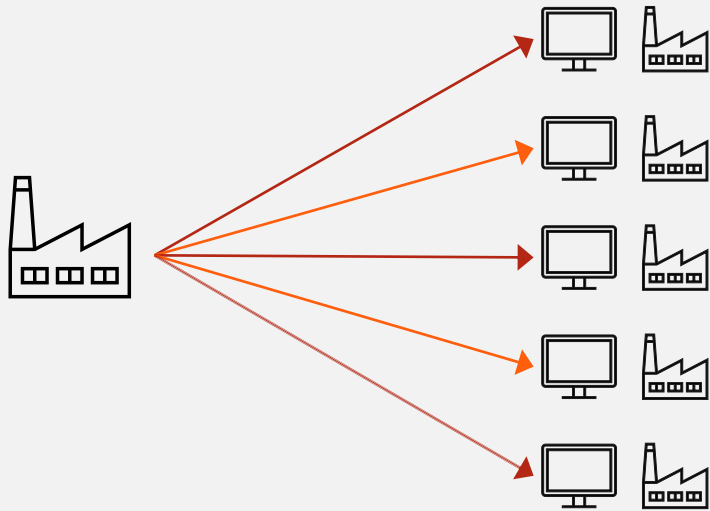
Next Level Master-Data-Management



Problem Statement & Catena-X Solution

Current Challenge

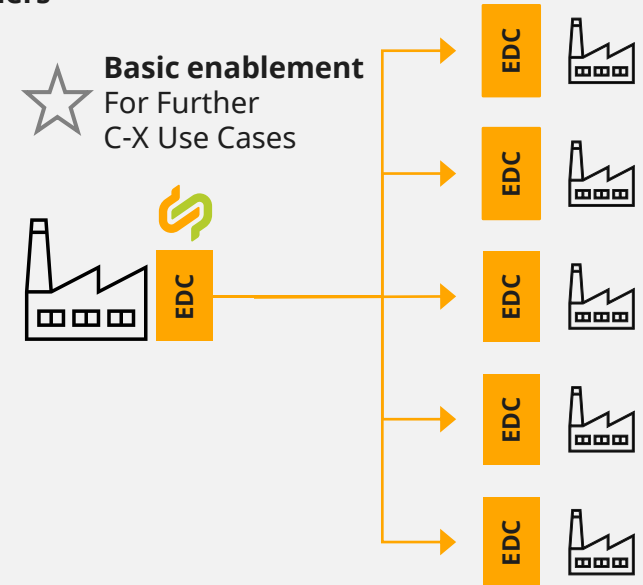
100 Customer = 100 Different Ways & Systems



- No Standards**
- Individual B2B portals**
- Outdated Certificates**
- Manual Validation**

Catena-X Solution

Standardized Data Models & Processes for ALL Partners

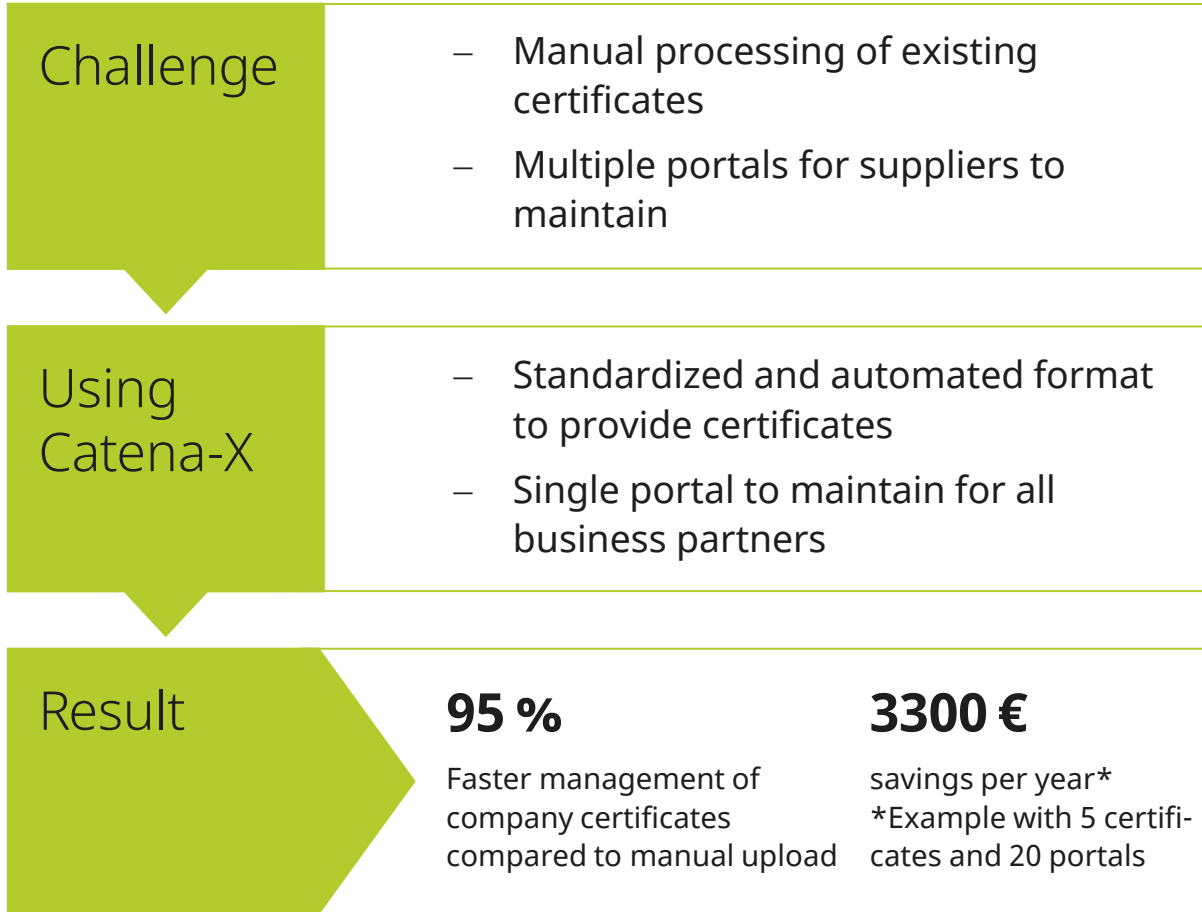


- Standardized Data models**
- Interoperable Data exchange**
- Harmonized Validation (tba.)**



Example

Certificate Management with Cofinity-X and BMW





Examples and Success Stories

Trusted Sustainability

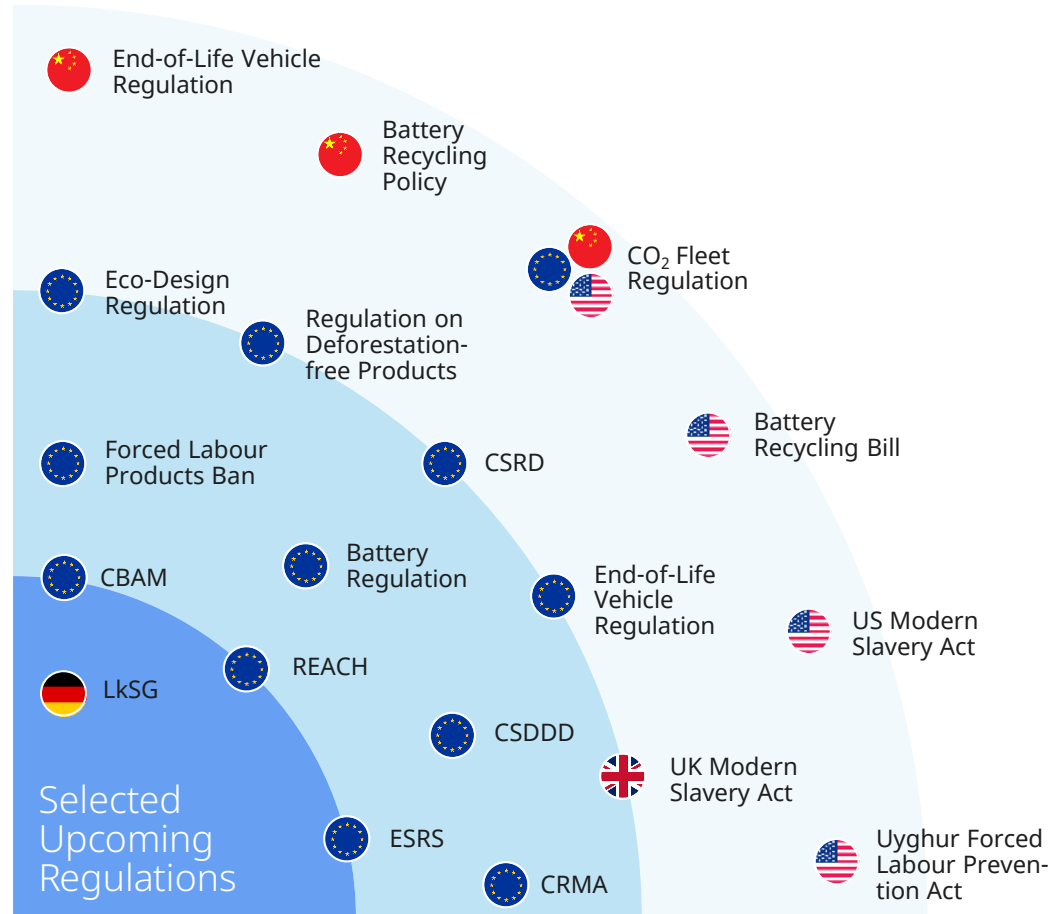


Challenge

Mastering the worldwide regulatory tsunami

New level of reporting incl. regional variances will hit our industry hard, if we are not prepared to scale.

- One-time reporting
- Average values
- Discreet data point
- Reporting on secondary data
- Choose your own calculation method



2030

- 1 Continuous Reporting of LCA
- 2 Third party Verification
- 3 Instance Level
- 4 Reasonable assurance
- 5 Different prescriptive methodologies
- 6 Sensitive data
- 7 Methodology depending on regulation and region

Example

Digital Product Passport (DPP)



Catena-X Battery Passport

Battery ID: H436595670581C11592587939283343

GENERAL #
Type: **NCA**
Li-Ion-S-Model Model

PERFORMANCE [Icon]
Rated Capacity: **120 kW**
305 Ah Original Power

HEALTH [Icon]
State of Health (SoH): **93%**
Charging Cycles: 675 / 1500

SUSTAINABILITY CO₂
Ni: 4% Co: 15%
Li: 5% Pb: 0%
CO₂ Total: **1,3 t**

General Information | Product Condition | Composition | Cell Chemistry | Electrochemical Properties | Additional Information

Battery ID: H436595670581C11592587939283343
Warranty: 60 months
Date of Manufacturing: 2022-01-24
Manufacturer Information: Company A, 81345 Munich, Germany | +49 89 1234567893 | www.oem-a.com | info@companyA.com

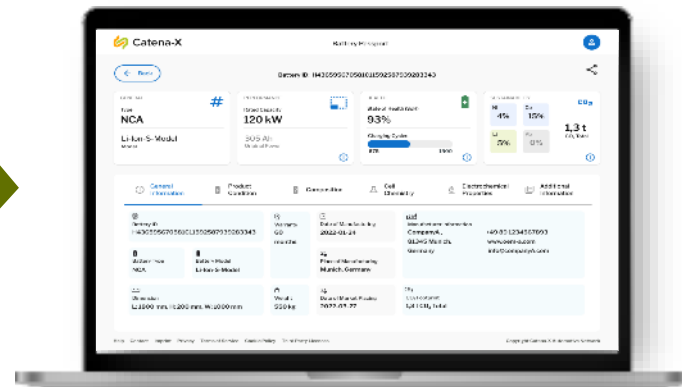
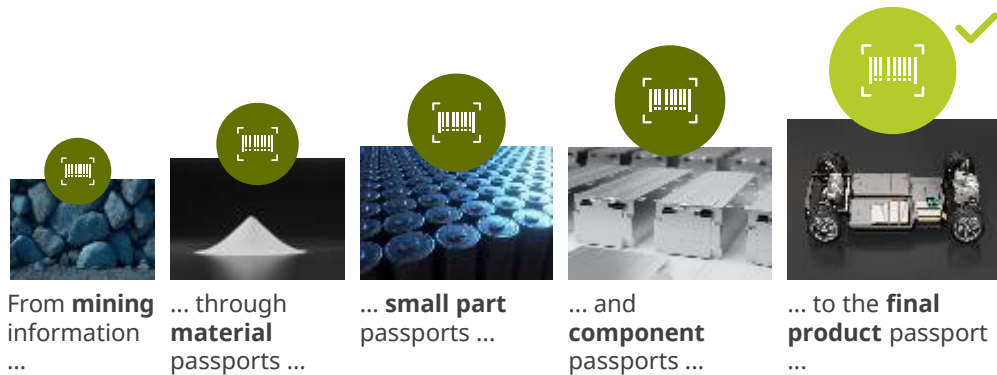
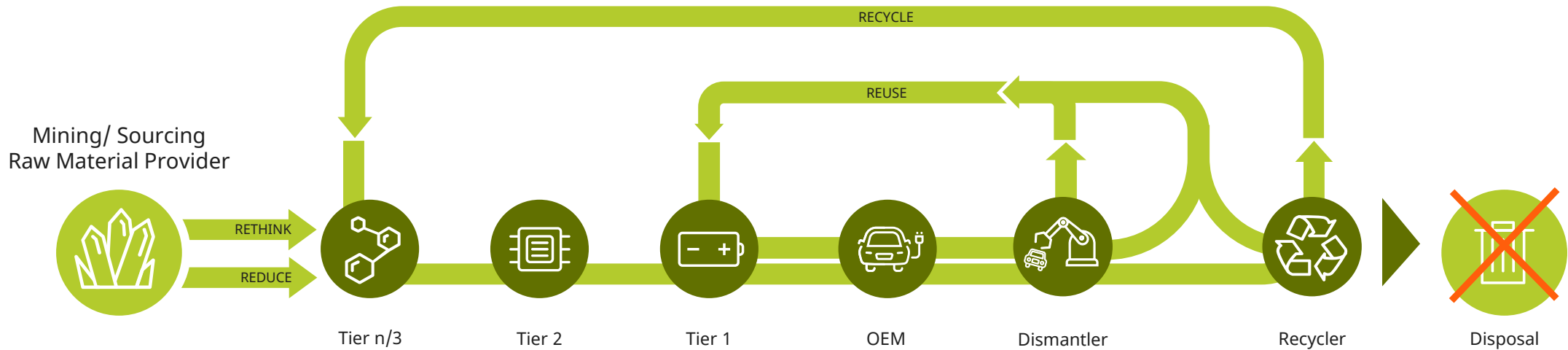
Battery Type: NCA
Battery Model: Li-Ion-S-Model
Place of Manufacturing: Munich, Germany

Dimension: L: 1800 mm, H: 200 mm, W: 1000 mm
Weight: 550 kg
Date of Market Placing: 2022-03-27
CO₂ Footprint: 1,3 t CO₂ Total

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Rethink, reduce, reuse, recycle

Sustainability



... which can then be provided by the OEM.

Example

PCF-Reporting at SAP and Supplier Witte

Challenge

- Isolated communication of Product Carbon Footprint values (PCF)
- No standardized way of calculating the PCF

Using Catena-X

- Automated data flow streamlines PCF assessment
- Standardized calculation of the PCF value along the value chain

Result

3-5x

higher efficiency in PCF calculation compared to manual approach

~10,000 €

savings per PCF calculation compared to audit-based process





Examples and Success Stories

Effective Quality Management



The reason

Why We Need the Quality Use Case in Catena-X

In today's automotive industry, quality issues don't just affect individual parts — they ripple across global supply chains. The lack of end-to-end transparency and standardized data exchange leads to inefficiencies, costly recalls, and missed innovation potential.

The Catena-X Quality Use Case addresses these challenges by enabling data-driven, collaborative quality management across company boundaries.



Key challenges it solves

1

Part Tourism

Without digital traceability, defective parts often travel through multiple hands before being identified, causing delays and increased costs in quality management.

2

Untargeted Recalls

A lack of precise, shared quality data leads to broad, unfocused recalls — impacting more products than necessary, harming brand reputation and causing avoidable expenses.

3

Missed Opportunities in Development

Inaccessible or siloed quality insights prevent feedback loops from reaching R&D teams, leading to repeated mistakes and slowing down innovation cycles.

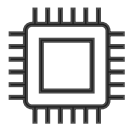


Improving Quality with Access to Production Data

Insights



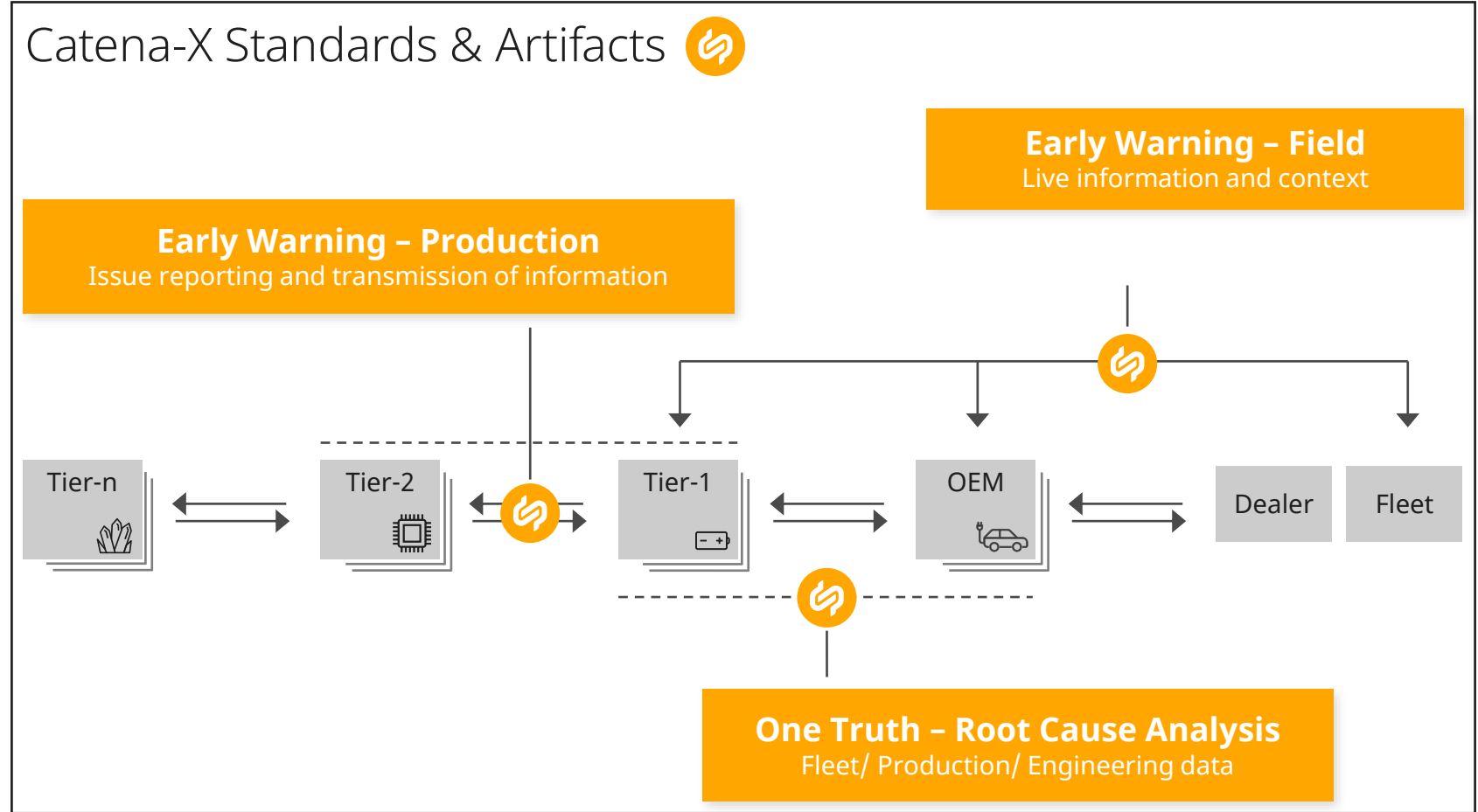
Early Warning - Field
Digital Trouble Codes (DTC) and Claim Data were permanently shared



Early Warning - Production
Production information from component assembly will be matched with vehicle field data



One Truth - Root Cause Analyse
Collaborative Root Cause Analysis between OEM-Tier-1/ Tier-1 - Tier 2/ etc.



Example

Quality Improvements at BMW and Bosch

Challenge

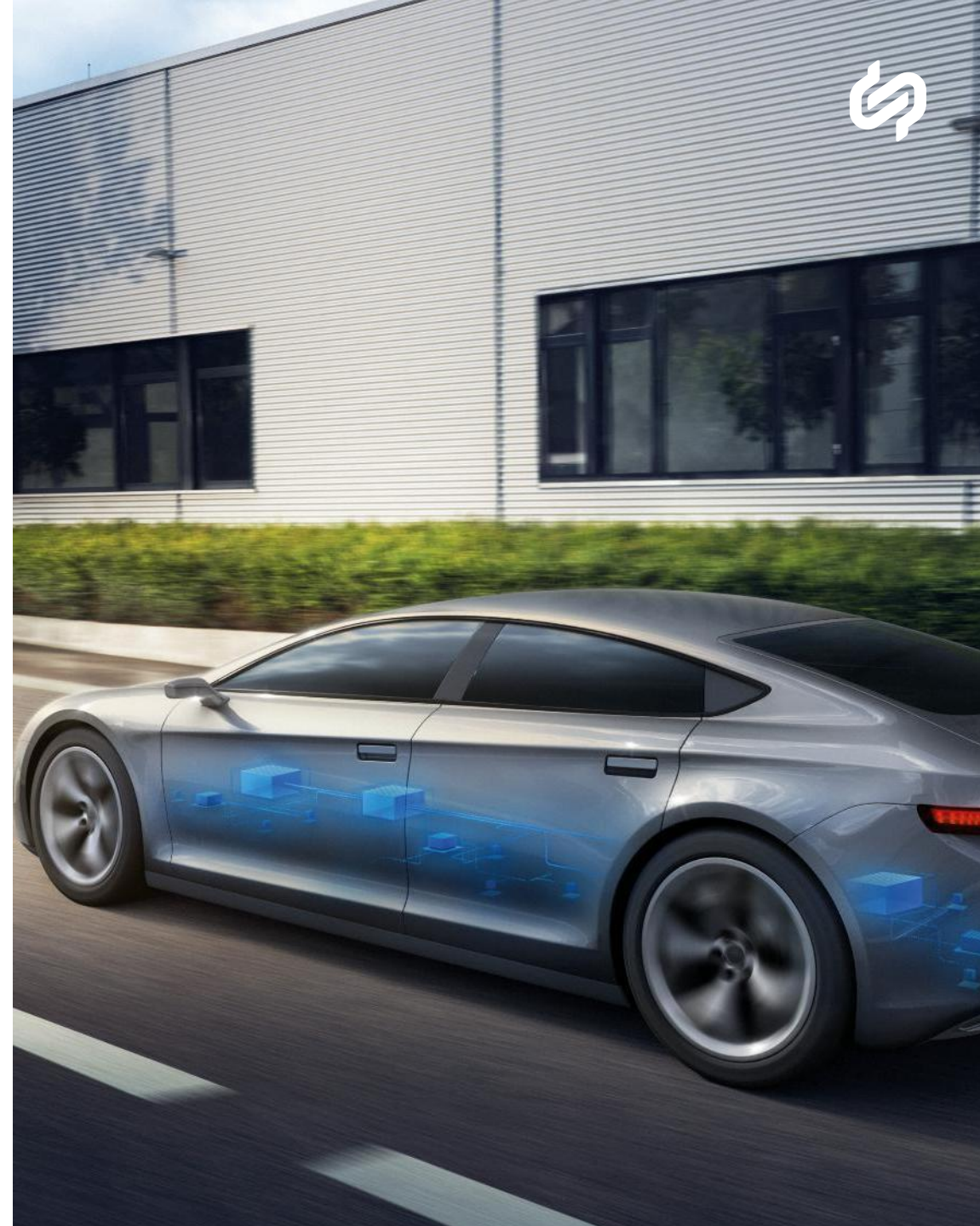
- Labor-intensive, parts-based inspections of components
- Detection of anomalies often only after the failure occurs

Using Catena-X

- Data-driven instead of a parts-based approach
- Early warning analyses based on standardized field data

Result

4 Months earlier detection of patterns and anomalies, often before a failure occurs



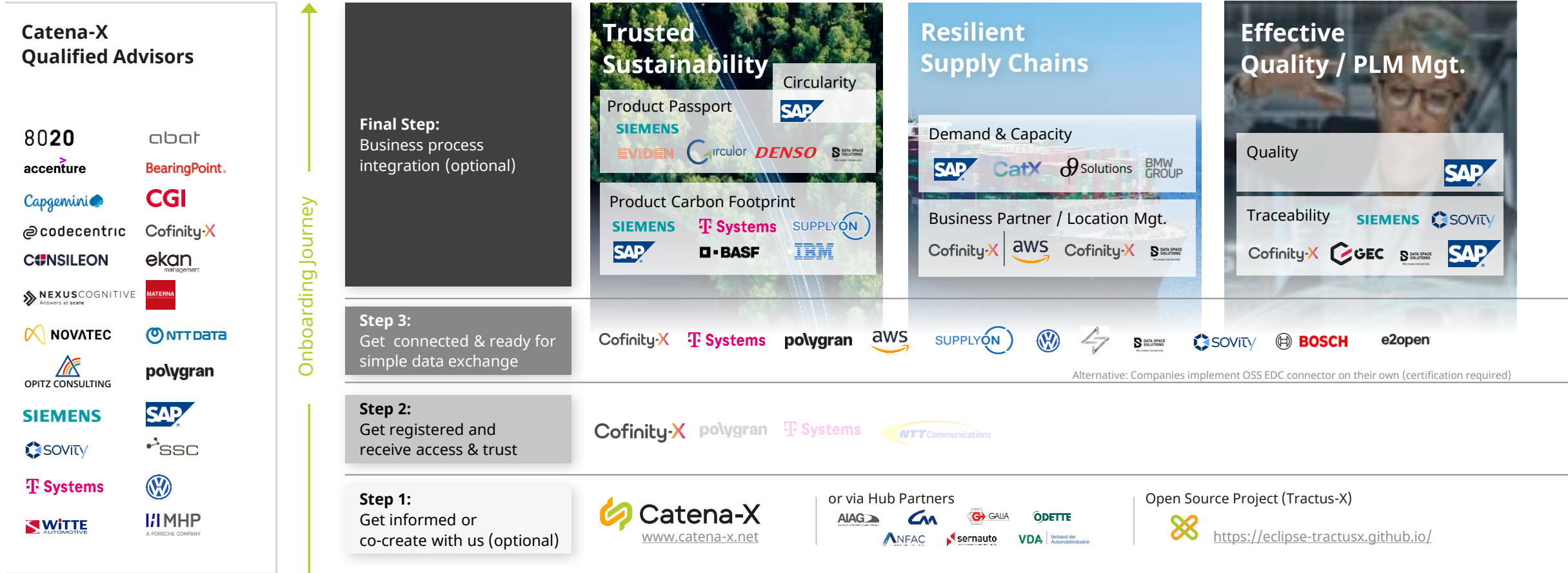


Catena-X
Certified Solutions



Catena-X certified partners portfolio

3 steps to value creation (04/2025)





Catena-X KIT Structure

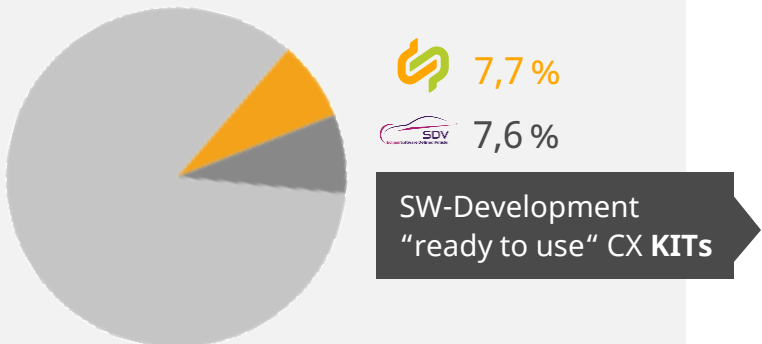
A Shared Technological Foundation



Catena-X results as of 12/2024:

- **Scalable / trusted standards for top industry problems** (21x KITs, >40 certified services)
- **Fully operational development** (Tractus-X) & **operating environment** (Cofinity-X)
- **Global and cross Industry Alignment** (US, EU, CN)
- **Conformity Assessment Body** (Deloitte / TÜV)

Catena-X Development Environment



Open Source Tractus-X [Eclipse Foundation]
Metric: # Commits Q4/2024

Standards for Top Industry Problems

Resiliency Resilient Supply Chains	Compliance Trusted Sustainability	Cost Down Effective Quality
<ul style="list-style-type: none"> Demand & Capacity Mgt. PURIS (Short term supply mgt.) Business Partner Mgt. Certificate Mgt. 	<ul style="list-style-type: none"> CO₂ Footprint (CSRD, IKB) EcoPass / BatteryPass Environmental and Social Services Circularity 	<ul style="list-style-type: none"> Quality Mgt. Traceability Remaining Useful Life Health Indicator

Network Foundation

Industry Core	Connector	Data Chain	Digital Twin	Operating Model	and many more
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Business Impact

Catena-X as foundation for Inter-Company Business Optimization (Example: Large, globally acting Corporation)

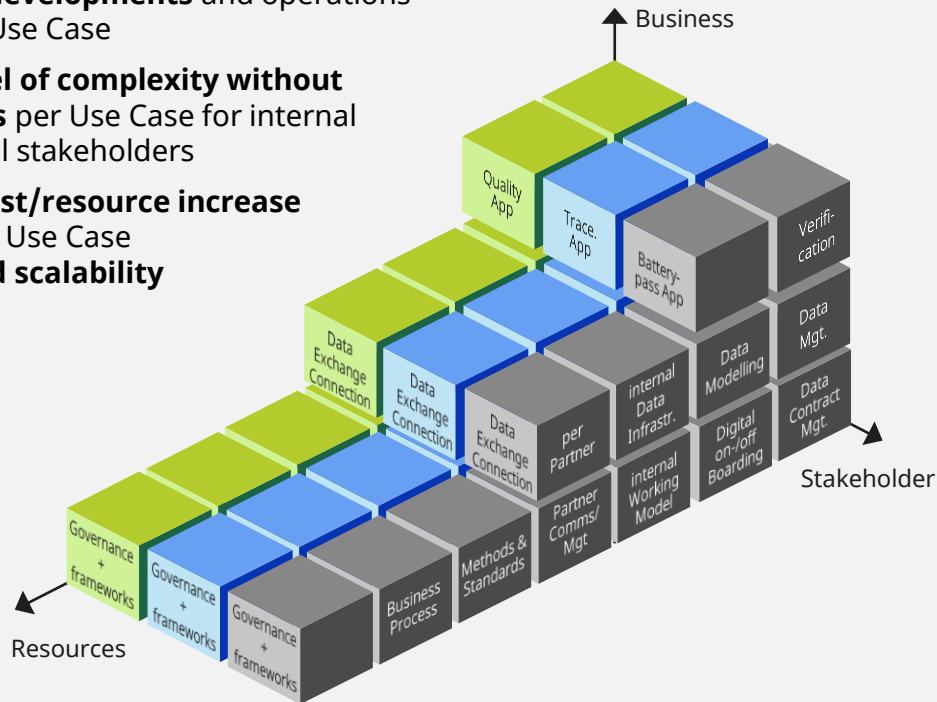
Savings and Synergies



Without Catena-X

... mostly individual Use Case enablement

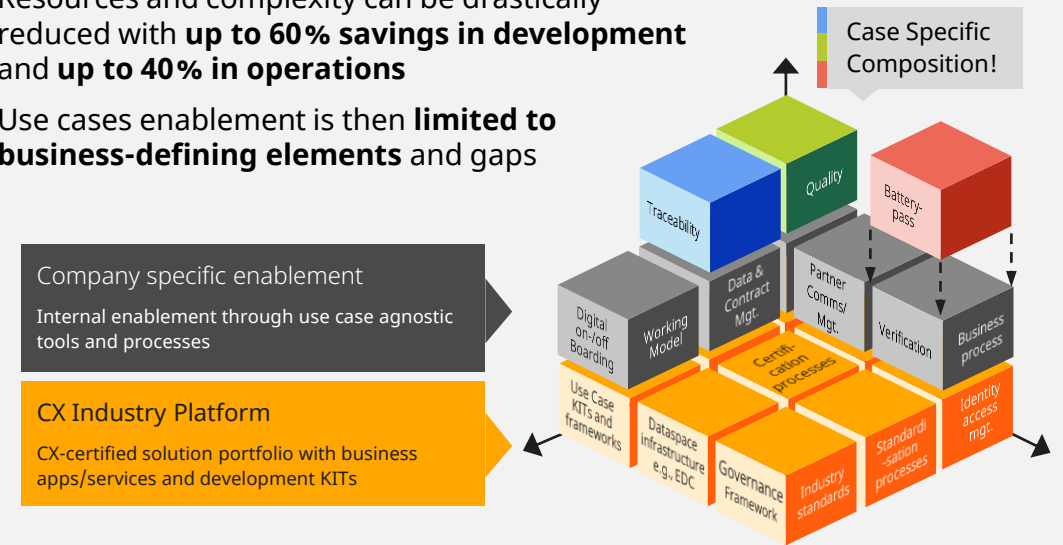
- **Parallel developments** and operations for each Use Case
- **High level of complexity without synergies** per Use Case for internal & external stakeholders
- **Linear cost/resource increase** with each Use Case → **limited scalability**



Same scope with Catena-X

... synergetic modules and scalable Infrastructure

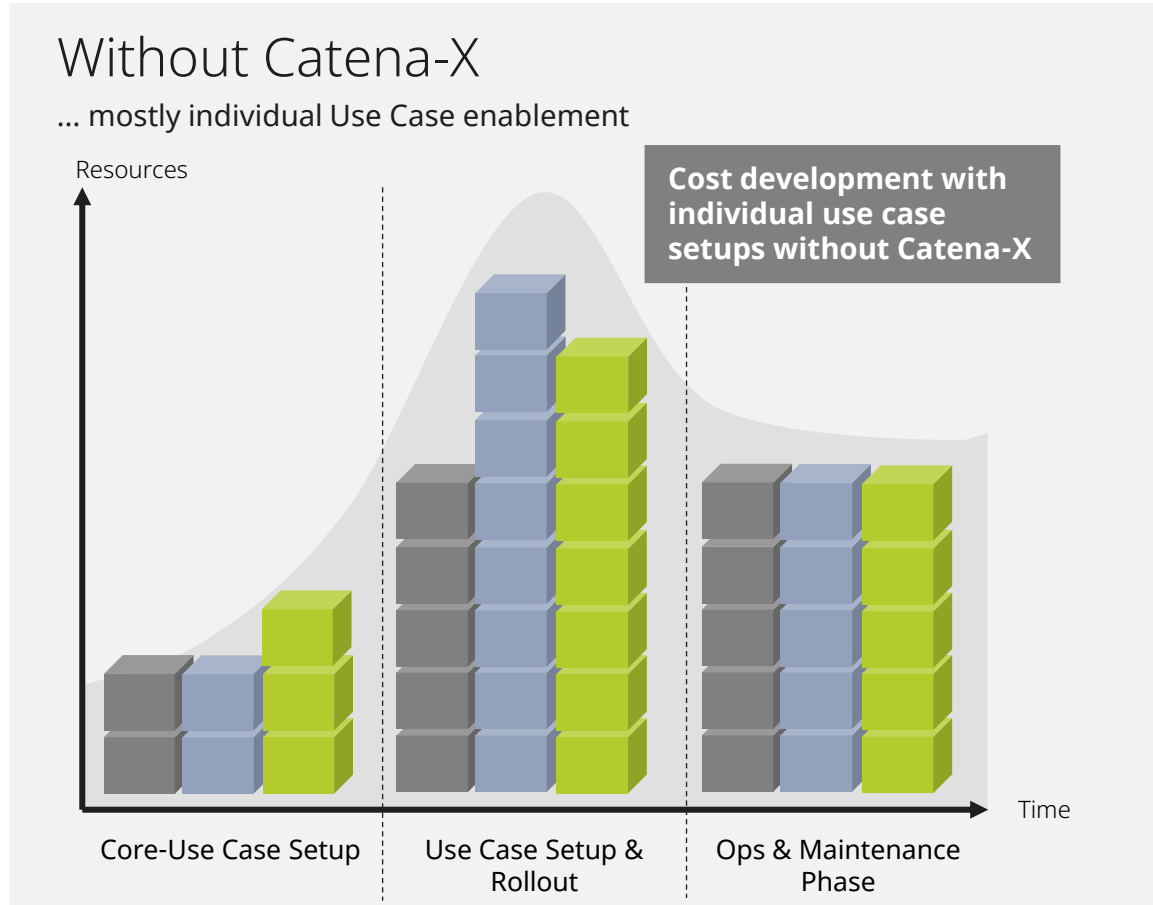
- Creation of **synergy effects** through the development/ composition of an **operational and technical foundation**
- Resources and complexity can be drastically reduced with **up to 60% savings in development** and **up to 40% in operations**
- Use cases enablement is then **limited to business-defining elements** and gaps



- ✓ >100 redundant Processes eliminated
- ✓ >1.000 individual Supplier/ Customer Interactions avoided
- ✓ >100.000 redundant datapoints no longer required to be stored

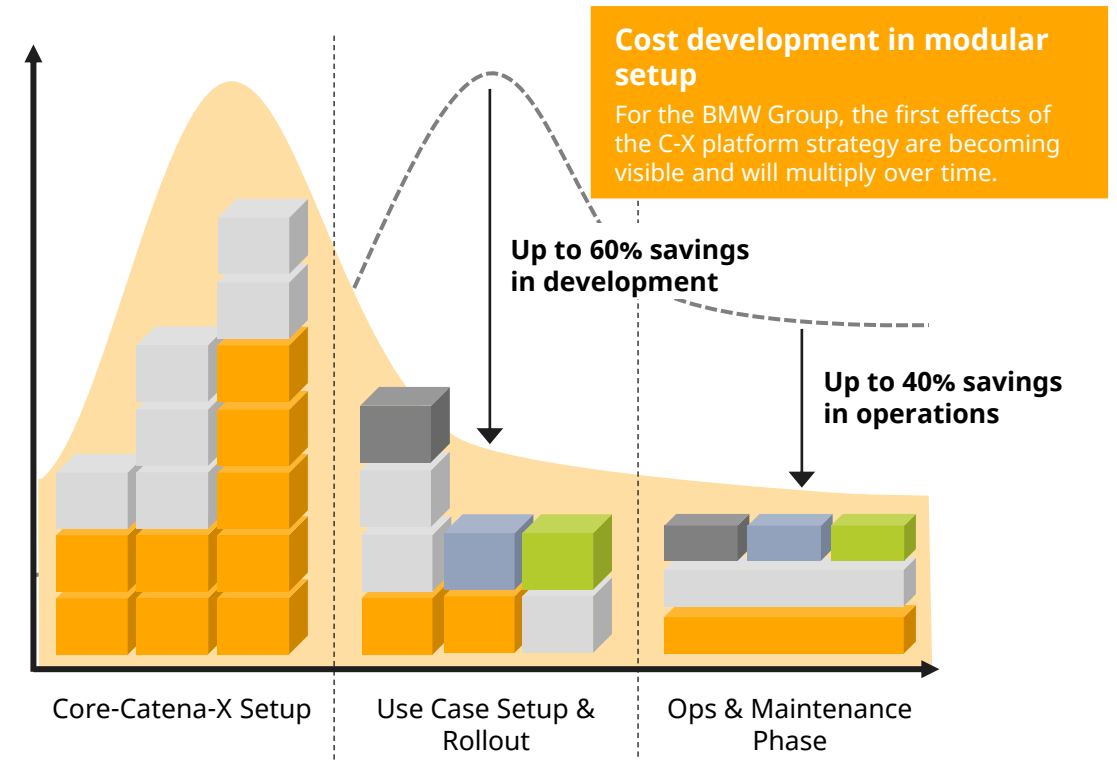
Catena-X as foundation for Inter-Company Business Optimization (Example: Large, globally acting Corporation)

Development of savings potential over time



Same scope with Catena-X

... synergetic modules and scalable Infrastructure



Questions? Get in touch with us!

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