BASF and Catena-X:

Creating a More Connected and Efficient Automotive Industry

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BASF
We create chemistry

Executive Summary/Abstract

The automotive industry is undergoing a pivotal transformation, driven by the dual imperatives of digitalisation and sustainability. As a top 30 global automotive supplier, BASF is at the forefront of this shift, leveraging its expertise in materials, sustainability and supply chain management to support groundbreaking initiatives like Catena-X—a collaborative, open data ecosystem designed to revolutionise the automotive supply chain.

By fostering transparency, traceability, and efficiency, Catena-X aligns with BASF's commitment to innovation and sustainability, enabling the automotive industry and BASF's customers to meet regulatory demands and achieve long-term environmental goals.

This whitepaper delves into the challenges facing today's automotive supply chains, the transformative potential of Catena-X, and BASF's unique contributions to this ecosystem. Through real-world examples and insights from BASF leaders, we demonstrate how Catena-X is reshaping the industry, paving the way for a more connected, efficient, and sustainable future.

Overview of Catena-X

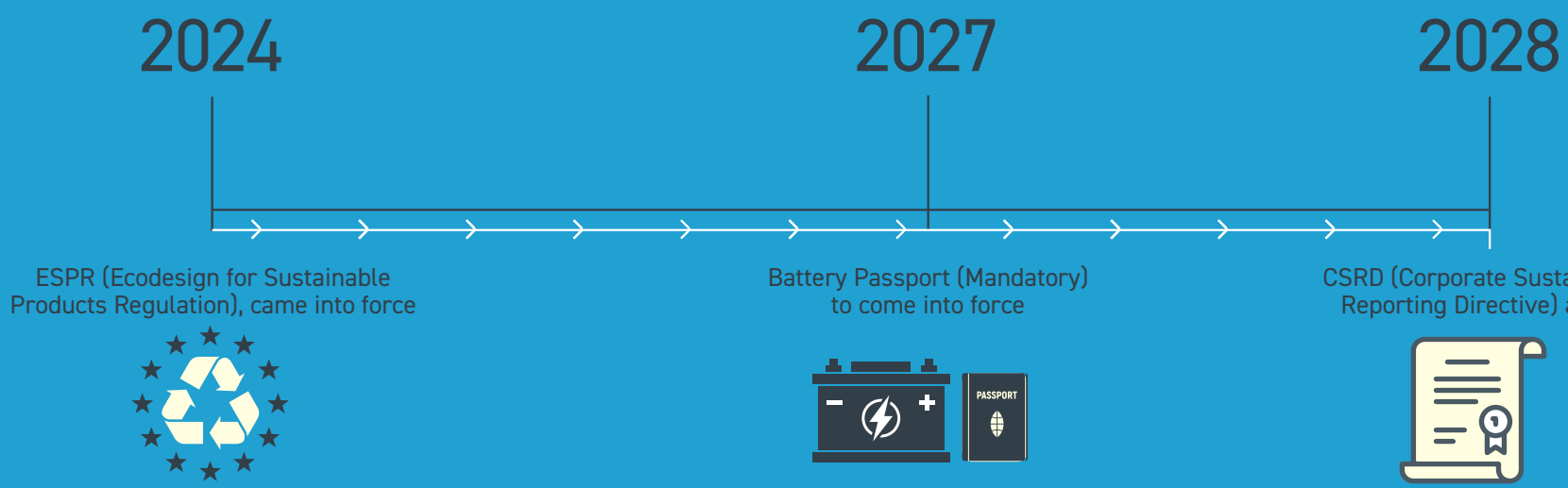
Catena-X is the first end-to-end, collaborative, and open data ecosystem for the automotive industry. It connects all players along the value chain, from raw material suppliers to original equipment manufacturers (OEMs), enabling seamless data exchange and fostering innovation. The initiative aims to standardise data formats, enhance transparency, and support compliance with evolving regulatory frameworks, such as the EU's Ecodesign for Sustainable Products Regulation (ESPR) and the Corporate Sustainability Reporting Directive (CSRD).

Catena-X's vision is to create a globally connected data ecosystem that improves efficiency, reduces costs, and accelerates the adoption of sustainable practices. By providing a standardised platform for data sharing, Catena-X addresses the automotive industry's most pressing challenges, including decarbonisation, supply chain resilience, and the transition to a circular economy.

"At Catena-X, we often refer to the 'regulatory tsunami,' as numerous regulations are forthcoming. One example is the battery passport, which will be a legal requirement by 2027. Additionally, the Ecodesign for Sustainable Products Regulation (ESPR) and the Corporate Sustainability Reporting Directive (CSRD) introduce increasing reporting obligations"

Dr. Andreas Wollny,
Project Lead for Catena-X at BASF

Increasing Reporting Obligations



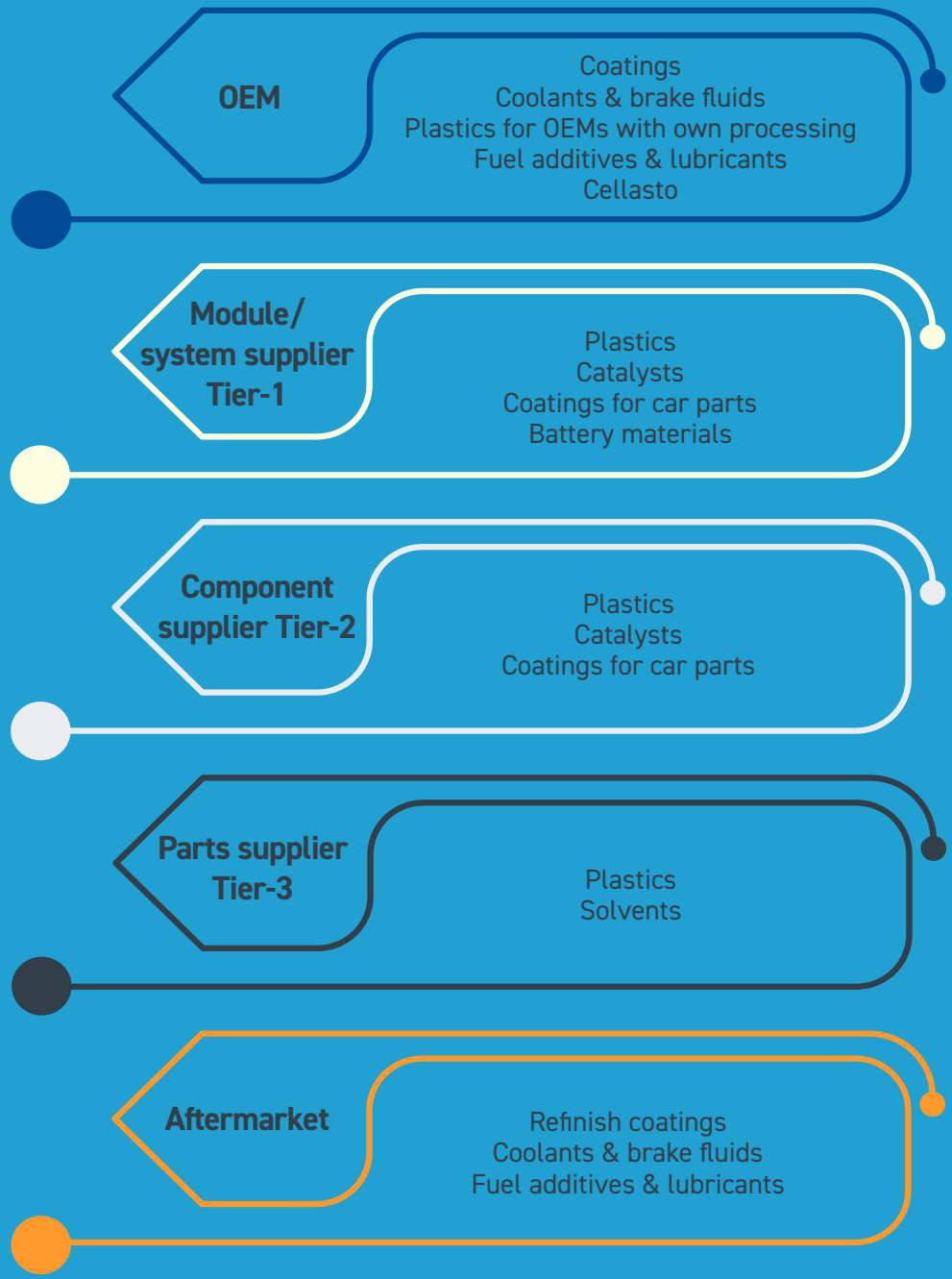
BASF's Position in the Automotive Industry

As one of the top 30 global automotive suppliers, BASF plays a pivotal role in the automotive value chain. The company supplies a diverse range of materials and solutions, including coatings and polyurethane raw materials for foams, to battery materials, automotive fluids and plastics. BASF's involvement spans multiple tiers of the supply chain, making it uniquely positioned to drive innovation and sustainability.

BASF's commitment to sustainability is deeply embedded in its corporate strategy. The company has set ambitious targets to achieve carbon neutrality by 2050, with interim goals for 2030. By participating in Catena-X, BASF is reinforcing its dedication to creating a more transparent, efficient, and sustainable automotive industry.

"An interesting aspect of BASF which may not be widely recognised, is that we are among the top 30 global automotive suppliers. Our distinctive position lies in the diverse roles we occupy across the value chain."

Dr. Andreas Wollny,
Project Lead for Catena-X at BASF



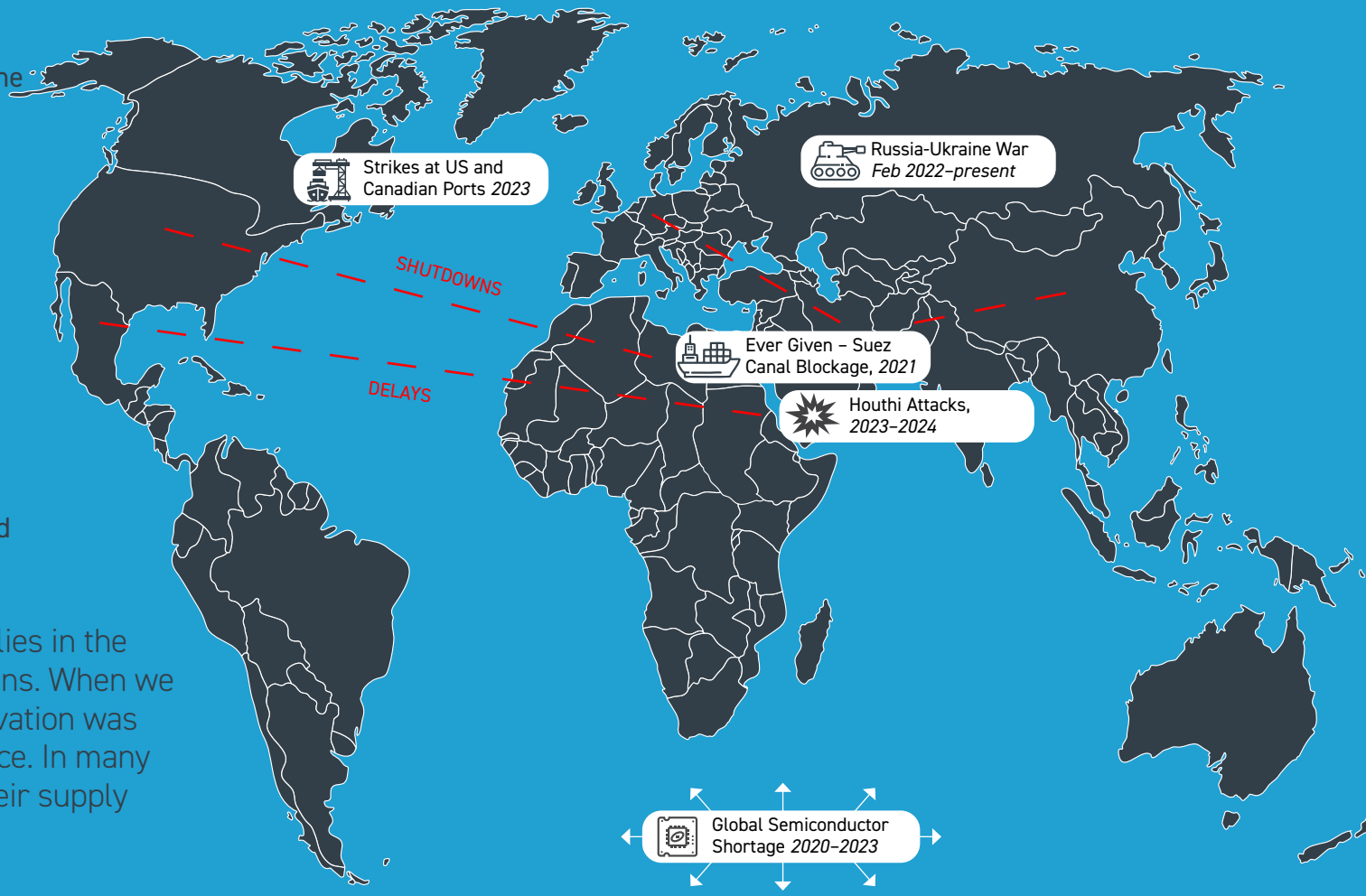
Complexity in Supply Chains

The modern automotive supply chain is a complex web of interconnected players, spanning multiple tiers and geographies. This complexity creates significant challenges in terms of transparency and traceability. One of the most pressing challenges stemming from this intricate network, is that without full visibility, companies leave themselves exposed to critical vulnerabilities that can disrupt operations.

Events such as the Ever-Given shipping vessel obstruction in the Suez Canal (2021) and disruptions caused by geopolitical tensions such as the Houthi Rebel attacks (2023-2024) highlight the risks associated with opaque supply chains. Without robust systems for data exchange, companies struggle to anticipate and mitigate these risks, leading to inefficiencies and increased costs.

"One of the primary challenges lies in the complexity of global supply chains. When we initiated Catena-X, a major motivation was enhancing supply chain resilience. In many cases, companies lack full visibility into their supply chains, which can lead to vulnerabilities."

Dr. Andreas Wollny,
Project Lead for Catena-X at BASF



Data Silos, Data Sovereignty and Communication Gaps

As a result of this complexity, the automotive industry is characterised by fragmented data systems, with each OEM and supplier maintaining its own proprietary platforms. This lack of interoperability creates data silos, hindering effective communication and collaboration.

Initially, the major driver behind the establishment of Catena-X came from automotive OEMs which needed better access to data from their supply chains, spanning from Tier 1 to Tier N. The challenge comes with almost every OEM—running its own supplier portal. This makes it therefore equally challenging for suppliers to manually enter data into 25 different OEM portals.

Such communication gaps slow down decision-making while impeding the industry's ability to respond to disruptions and meet regulatory requirements.

Data opacity in the automotive supply chain presents significant challenges, particularly during product recalls. When defects are identified, a lack of clear and accessible data often leads to widespread recalls affecting thousands of vehicles. This inefficiency stems from manufacturers' inability to accurately determine which units are impacted. Advancements in data tracking and management have transformed this landscape.

By employing robust data analytics, manufacturers can monitor vehicles throughout their lifecycle, allowing for precise identification of affected units. As a result, a potential recall involving thousands can be narrowed down to a manageable number, sometimes as few as 50 vehicles. This enhanced capability streamlines the recall process, reduces operational costs, and minimizes consumer inconvenience. Ultimately, improved data visibility fosters better quality management and strengthens consumer trust, highlighting the critical role of data transparency in the automotive supply chain.

Further, there were - and continue to be - major concerns about data ownership and sovereignty. When working with cloud providers, these companies often own the data, which European automakers are wary of. Automotive suppliers and OEMs prefer to retain control over their data and participate in the benefits of data-driven supply chain efficiencies.

"Originally, the issue was that every OEM operates its own supplier portal. As a supplier, it is inefficient to manually enter data into 25 different OEM portals. Catena-X provides a solution to this challenge"

Dr. Matthias Dohrn,
President of Global Procurement at BASF

Sustainability Requirements

The automotive industry is under increasing pressure to reduce its environmental footprint. Regulations such as the German Supply Chain Due Diligence Act (2023) and the incoming EU's battery passport mandate (2027) require companies to provide detailed data on their supply chains, including carbon emissions and material sourcing. Meeting these demands requires a fundamental shift in how data is collected, shared, and utilised.

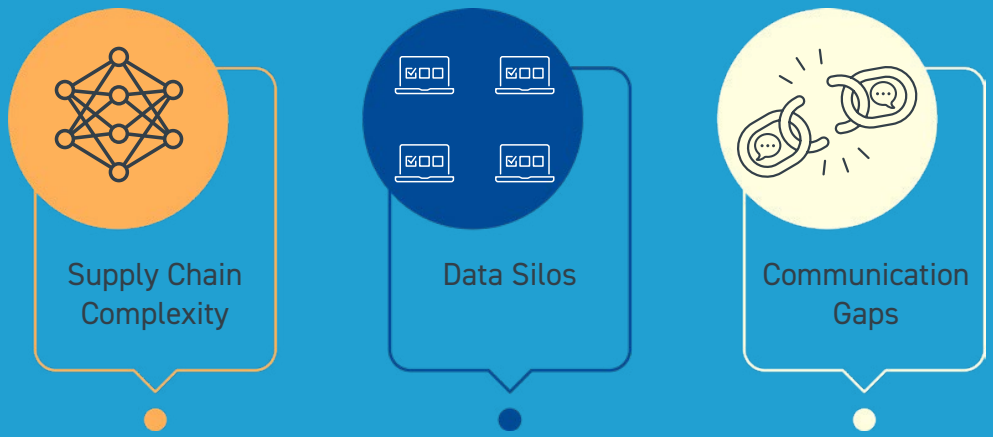
The objective of Catena-X is to standardise data formats and develop rulebooks or guidelines to ensure compliance with these evolving regulations. A key consideration is the update from the European Commission on February 27th, 2025, regarding the omnibus process. The working hypothesis remains that reporting obligations will continue to expand, necessitating efficient tools for data exchange. This is crucial for sharing data with customers and enabling OEMs to collect the required information to meet regulatory compliance requirements.

Additionally, the transition to a circular economy necessitates innovative approaches to recycling and resource recovery. As Dohrn explains, "If we think in a circular way, that end-of-life vehicle in ten years might be a new source of raw materials."

"Sustainability is central to BASF's strategy. We want to be the preferred chemical company to enable our customers' green transformation. Our objective is to become carbon neutral by 2050, with interim targets set already for 2030"

Dr. Matthias Dohrn,
President of Global Procurement at BASF

Problems in the Automotive Supply Chain



Solutions in the Automotive Supply Chain

Vision and Objectives

Catena-X aims to create a connected ecosystem that enables seamless data exchange across the automotive value chain. By standardising data formats and developing rulebooks for compliance, Catena-X provides a scalable solution for addressing the industry's most pressing challenges.

"One of Catena-X's core objectives is to provide a globally applicable data exchange system. The impact of regulatory developments demonstrates the importance of an internationally viable solution"

Dr. Andreas Wollny,
Project Lead for Catena-X at BASF

Enhancing supply chain transparency and traceability

Supporting compliance with regulatory requirements

Facilitating the transition to a circular economy

Driving innovation through collaborative data sharing

Key Features of BASF and Catena-X's Alignment of Vision

Catena-X leverages cutting-edge technologies and frameworks to achieve its goals.

Key features include:

1. **Standardised Interfaces:** Catena-X provides standardised data formats and interfaces (the Electrical Data Connector connector), enabling seamless data exchange between stakeholders. This standardisation ensures interoperability and reduces inefficiencies

2. **Data Sovereignty:** Built on Gaia-X principles, a European initiative aimed at creating a federated data infrastructure that promotes data sovereignty, Catena-X prioritises data sovereignty, allowing each company to retain control over its data. This peer-to-peer approach fosters trust and ensures data confidentiality.

3. **Sustainability Integration:** Catena-X integrates sustainability metrics, such as CO2 footprint tracking, into its framework. This enables OEMs to assess emissions across the entire vehicle production process and supports the development of circular economy practices.

"Blockchain is typically deployed in environments where multiple partners lack mutual trust, necessitating notarisation or an external trust layer. However, Catena-X is built on Gaia-X principles, which prioritise data sovereignty and mutual trust"

Dr. Matthias Dohrn,
President of Global Procurement at BASF

BASF's involvement in Catena-X aligns with its broader strategic objectives. As a supplier of raw materials and solutions across multiple tiers of the automotive value chain, BASF benefits from the standardised data model provided by Catena-X. This model simplifies data sharing, enhances efficiency, and supports compliance with regulatory demands.

"Catena-X will provide transparency into supply chains. The ability to track real-world data rather than relying on industry averages will enable more sustainable procurement decisions"

Dr. Matthias Dohrn,
President of Global Procurement at BASF

Digitalisation of Raw Material Supply, Procurement, Innovation and Collaboration

BASF's extensive footprint in the automotive sector, spanning Tier 1 to Tier 4 suppliers while also being active in end-of-life battery recycling, positions it uniquely within the Catena-X ecosystem. Unlike many suppliers that operate in specific niches, BASF's involvement across the entire material spectrum—from coatings and plastics to battery materials—enables it to drive innovation through collaborative data sharing and digital traceability.

The company is leveraging Catena-X to implement transparent, traceable, and sustainable sourcing practices. By integrating Catena-X's data exchange capabilities into its procurement processes, BASF is enhancing visibility into its supply chain and reducing risks associated with raw material sourcing.

BASF is also collaborating with OEMs, suppliers, and logistics partners to develop innovative solutions that support the digitalisation of the automotive supply chain. One example is the PACIFIC app, a scalable solution for managing product carbon footprints. Developed in alignment with Catena-X standards, the PACIFIC app simplifies data exchange and ensures data security.

Catena-X and BASF are strongly aligned on real-time data insights that enable proactive risk management. For instance, BASF employs early warning systems and multi-sourcing strategies to mitigate disruptions in raw material supply. Catena-X enhances these capabilities by allowing companies to share demand-capacity data, optimising inventory levels and reducing excess stock. BASF is already piloting such a system to improve inventory planning and capital efficiency.

Real-world Impact

BASF's contributions to Catena-X are already delivering tangible benefits.

For instance, the company's efforts to track and reduce CO2 emissions across its supply chain are helping OEMs meet their sustainability targets. Additionally, BASF's involvement in the development of the battery passport Path.Era is supporting the transition to a circular economy by enabling efficient recycling of end-of-life vehicle batteries.

BASF contributes to the development and implementation of digital product passports, such as the battery passport, through its active role in Catena-X. As a leading supplier of materials critical to automotive production—including cathode active materials, coatings, and plastics—BASF plays a central role in enabling traceability across the supply chain.

02

Facilitating Circular Economy Practices: BASF's involvement in battery recycling aligns with Catena-X's goal of digitalising supply chains. The battery passport acts as a digital twin, tracking the lifecycle of materials like nickel, cobalt, and manganese, ensuring responsible sourcing and supporting efficient end-of-life recycling.

04

Strengthening Supply Chain Resilience: BASF's broad role as a Tier 1–5 supplier across the automotive industry means that it requires robust digital tools to manage procurement risks. Through Catena-X, BASF leverages collaborative demand and capacity management and demand-capacity planning to mitigate disruptions, optimise inventory, and improve capital efficiency.

Ensuring Traceability and Compliance: BASF supports Catena-X to enhance data transparency, which is essential for meeting stringent regulatory requirements such as the EU Battery Passport (mandatory by 2027), the German Supply Chain Act, and broader ESG reporting frameworks. By standardising data exchange formats and ensuring accurate carbon footprint tracking, BASF helps its customers make informed procurement decisions.

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Enhancing Procurement and Sustainability Metrics: The ability to track product carbon footprints (PCFs) and sustainability attributes—such as renewable content and recyclability—through digital platforms allows BASF to justify premium pricing for sustainable materials. Catena-X provides the infrastructure to capture real-world data rather than relying on industry averages, reinforcing credibility in sustainability claims.

03

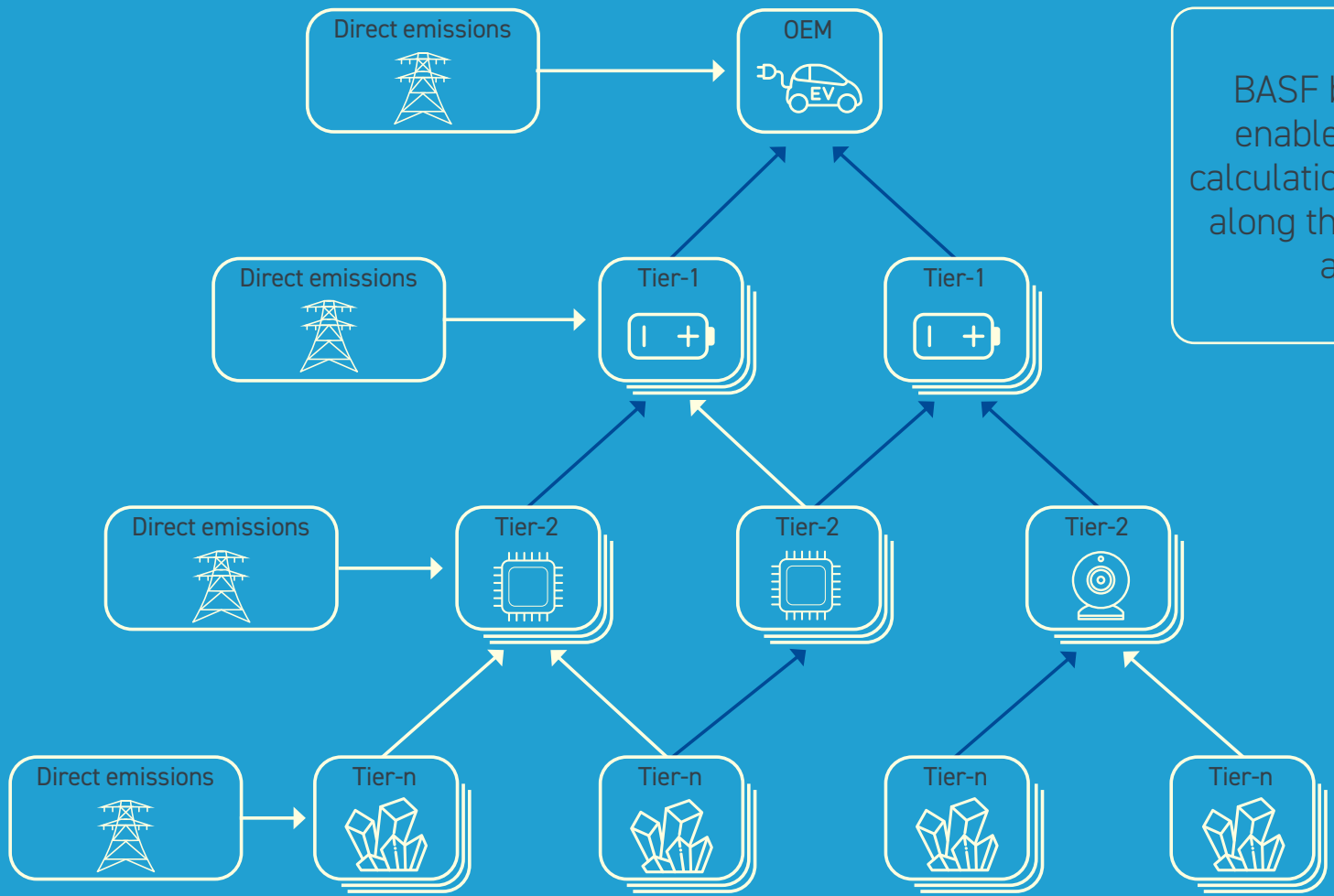
Driving Industry-Wide Collaboration: BASF's participation in Catena-X underscores the importance of ecosystem-based data sharing. The initiative enables collaboration among OEMs, tier suppliers, and raw material providers, fostering innovation, reducing costs, and ensuring competitiveness in the transition to sustainable mobility.

05

"The battery passport Path.Era extends this concept of emissions data capture by ensuring proper end-of-life recycling. In this context, sustainability metrics encompass both carbon footprint tracking and resource circularity. These two pillars—CO2 emissions monitoring and efficient material recycling—are fundamental to Catena-X's contribution to sustainability"

Dr. Matthias Dohrn,
President of Global Procurement at BASF

By integrating Catena-X principles into its procurement and sustainability strategies, BASF is helping shape a more connected and responsible automotive supply chain, positioning itself as a leader in digitalisation and circular economy transformation.



BASF believes that Catena-X enables the potential of PCF calculation based on primary data along the value chain, based on actual processes.

Ecosystem Benefits

Catena-X is positioned to deliver significant benefits to the automotive industry, including:

Enhanced Efficiency:
By enabling data-driven decision-making, Catena-X reduces inefficiencies and lowers costs across the value chain.

Accelerated Innovation:
The initiative fosters collaboration and innovation, supporting the development of new technologies and business models.

Sustainability Leadership:
Catena-X provides the tools and frameworks needed to achieve sustainability goals, from reducing carbon emissions to promoting circular economy practices.

BASF's Long-term Vision

We are witnessing the emergence of regional hubs across Europe, North America, and China, expanding the network beyond its origins in Germany. This global adoption highlights growing recognition of the benefits of standardised data ecosystems. Collaboration not only advances sustainability objectives but also enhances operational efficiency, ultimately creating a more resilient and interconnected supply chain. According to Andreas Wollny, "the most important takeaway is the value of ecosystems." While BASF, as a major corporation, could theoretically pursue such initiatives independently, the challenges posed by regulations and data exchange necessitate collaboration. Ecosystem-based data sharing unites OEMs, tier suppliers, raw material providers, IT firms, and SMEs, leveraging collective expertise to develop scalable solutions.

BASF is committed to leading the automotive industry's transition to a more connected and sustainable future. Through its participation in Catena-X, BASF is driving innovation, fostering collaboration, and supporting the development of a resilient and efficient supply chain.

Conclusion

The automotive industry is veritably facing unprecedented challenges and opportunities. BASF's involvement in Catena-X underscores its commitment to driving innovation and sustainability in the automotive supply chain. By fostering transparency, traceability, and efficiency, Catena-X is enabling the industry to meet regulatory demands, reduce its environmental footprint, and achieve long-term success.

Catena-X will provide transparency into supply chains. The ability to track real-world data rather than relying on industry averages will enable more sustainable procurement decisions. OEMs will be able to assess the true impact of their supply chains, from mine to end-of-life disposal.

Dohrn says, "ultimately, success will depend on trust. Data integrity must be maintained through rigorous auditing and verification. AI and digital tools will play a key role in identifying inconsistencies and ensuring compliance, and BASF is committed to onboarding suppliers onto Catena-X to facilitate widespread data exchange."

As the initiative gains momentum, BASF is poised to play a leading role in shaping the future of the automotive industry. Through collaboration, innovation, and a shared commitment to sustainability, BASF and Catena-X are driving a more connected, efficient, and sustainable future for the automotive industry.

Wollny concludes, "we are ready to welcome and support everybody in this exciting joint journey in establishing true circular economies, driving sustainability within the industry."