



AI FOR A SUSTAINABLE INDUSTRY

From Data Silos to Connected Intelligence

**Transforming compliance and sustainability into
new business models**

A whitepaper on how the chemical and lubricants industries can leverage AI to accelerate capability-building, ensure supply chain transparency, and drive sustainable growth.

Editorial Summary

Artificial intelligence is no longer an experimental add-on; it is fast becoming the foundation of industrial progress. In 2025, Boston Consulting Group identifies about 5% of companies worldwide as future-built organizations that have developed the critical capabilities to leverage AI. Not only for efficiency but for innovation and business reinvention. These 5% of companies are outperforming the competition and creating value by making better decisions with the support of AI (BCG, 2025). These frontrunners enjoy revenue growth up to five times greater than peers who remain in pilot or scaling phases. For most companies, closing this AI value gap swiftly is crucial. Engaging specialized AI partners is often the key to accelerating capability-building, ensuring AI initiatives move beyond pilots to deliver substantial, sustainable returns. For the chemical and lubricants industries, AI is also an opportunity to transform compliance and sustainability obligations into new business models and growth accelerators - if organizations identify circular economies and sustainable industry as an opportunity. What once were static data silos are now evolving into “connected intelligences,” enabling real-time collaboration and smart supply chain operations.

1 A New Intelligence Layer for the Chemical and Lubricants Industries

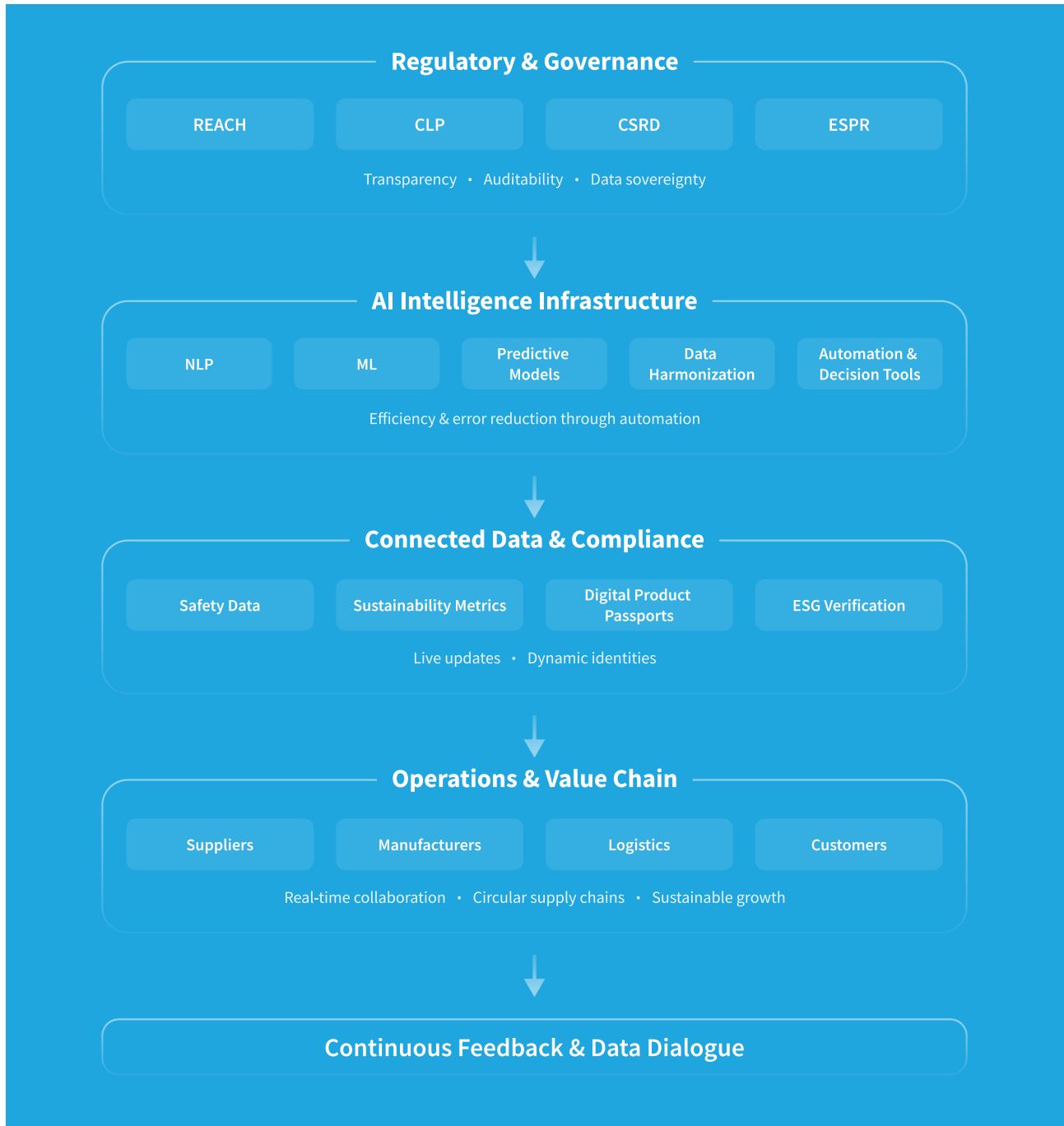
For decades, the sector’s information flows (formulation data, safety information, and regulatory files) remained trapped in isolated systems and PDF documents. Today, the best-performing organizations are integrating AI-driven software solutions that merge these fragments into smart business processes. Although many standards exist to help companies operate along the value chain, significant gaps remain, and regulation is a hurdle. Especially for the chemical industry. To address these challenges, companies are increasingly adopting AI approaches that not only enhance operational speed and compliance but also drive business growth. By leveraging digital solutions such as AI, digital twins, and blockchain, organizations can monitor low-carbon products more efficiently across the supply chain, uncover new value opportunities, and strengthen their competitive advantage in the transition to a sustainable economy (Deloitte, 2025). Future-oriented firms already plan a 26% rise in IT spending focused on automation, data quality, and model-based decision tools (BCG, 2025). These investments are laying the groundwork for scalable industrial intelligence.

2 From Regulatory Complexity to Digital Clarity

Europe’s regulatory landscape (spanning REACH, CLP, Taxonomy, CSRD, and ESPR) demands precision and adaptability. Here, AI provides ideal assistance to support functional experts and teams to establish speed and standardization. AI-driven compliance systems are helping European firms accelerating documentation and cross-referencing processes. The adoption of AI in sustainability reporting has raised from 11% to 28% within the last year. By combining centralized data architecture with networks of autonomous AI agents, companies could dramatically improve the efficiency, responsiveness, and scalability of their sustainability reporting (PwC, 2025). As a result, compliance evolves from a linear business process to a continuous feedback process: a “living system” of data integrity and traceability. AI-driven compliance systems are helping European firms to rethink their future business models quickly and substitute hazardous ingredients.

3 The Rise of Connected Compliance Ecosystems

The European Union’s Digital Product Passport initiative is accelerating this transformation. Early European Digital Product Passport pilots show significant reductions in documentation inconsistencies and cross-border traceability errors. DPPs promise substantial long-term benefits, including improved supply chain transparency, risk management, compliance facilitation, market efficiency, new digital business models, enhanced product quality communication, and support for sustainable consumption. The success of the DPP initiative depends on developing cross-sector, practicable implementation solutions based on global data standards to accommodate diverse company capacities and avoid fragmentation (Intereconomics, 2025). These passports enable every product, from a lubricant to a polymer, to carry an intelligent identity that updates dynamically as regulations or suppliers change. As data is the input for AI applications and smart data processing, the DPPs have gained an even more important role for future supply chains and intelligent data usage inside organizations and by consumers. The key challenge for a faster transformation is the ongoing process of regulation and the time-consuming execution. Today there are still no standards clearly defined and available. The global chemical market is expected to more than double, with a total increase of 112.0%, growing at a compound annual growth rate (CAGR) of 7.8% from 2025 to 2035. Over this time frame, the market size is projected to nearly double (about 2.1 times its current value), driven by stricter environmental regulations, increased demand for sustainable products, and heightened focus on reducing carbon emissions and embracing circular economy principles (FMI, 2025). The increasing prevalence of the European Digital Product Passport (DPP) is significantly driving the transformation of the chemical industry: Stricter transparency and sustainability requirements imposed by the DPP promote innovation and create new market opportunities, which account for a significant share of global growth in the chemical market. The DPP is thus not only increasing regulatory pressure but also becoming a key driver of sustainable market growth and the international shift toward circular products.



4 Towards a Transparent and Resilient Supply Chain

As transparency becomes a market differentiator, companies are reimagining operational trust. Around 80% of manufacturers now report improved traceability through AI-enabled data sharing and predictive tools (McKinsey, 2025). Investors' expectations reinforce this urgency, over half of global consumers prefer environmentally responsible products, and 70% actively choose options built on recyclable materials (PwC, 2025). Industrial data spaces such as Chem-X and Catena-X serve as the backbone of this shift, giving supply chains a common, auditable language for sustainability data (KPMG, 2025). Safety is one of AI's most compelling industrial applications. Predictive analytics in plant operations has reduced incident rates up to 20% in high-risk chemical production (Deloitte, 2025). Machine learning now assists in reviewing thousands of Safety Data Sheets (SDS), cross-checking classifications, and inferring missing hazard labels. Integrated into dynamic systems, such intelligence turns safety management into a proactive discipline rooted in continuous improvement.

5 A European Model for Industrial AI

Europe is leading the way in responsible industrial AI on a global scale. The phased enforcement of the EU Artificial Intelligence Act between 2025 and 2027 is prompting manufacturers to place importance on transparency, auditability, and data sovereignty in the development and implementation of AI technologies (McKinsey, 2025). Future-built companies allocate 64% more IT resources to AI compared to late adopters, developing explainable and traceable models that strengthen regulatory trust (BCG, 2025). This framework ensures that innovation remains anchored in European ethical and legal standards, AI that act transparently.

6 From Documentation to Dialogue

Regulatory data is becoming conversational. Instead of one-way submissions, AI-enabled systems now verify supplier declarations, check sustainability metrics, and trigger live updates downstream. In this connected environment, compliance becomes communication, an active dialogue across organizations - from upstream to midstream to downstream. This cross-functionality accelerates innovation cycles and fosters systemic trust across industrial ecosystems (Oliver Wyman, 2025).

7 Challenges on the Road Ahead

AI's impact is clear, but execution is uneven. Around 70% of executives identify data integration and trust as the top barriers to adoption (Deloitte, 2025). The chemical sector still ranks among the least digitally mature industries worldwide, leaving potential unexploited in both AI and process automation (Roland Berger, 2025). Bridging these gaps requires more than algorithms: It demands cross-disciplinary expertise combining data science, regulatory knowledge, and chemical engineering.

8 The Opportunity: Compliance as a Catalyst for Innovation

Forward-looking leaders now view compliance as a catalyst for strategic innovation. Over half of European chemical CEOs identify AI-driven transparency as their top growth enabler for 2025 (McKinsey, 2025). When compliance, sustainability, and performance data converge, they form the basis for faster innovation cycles, greener formulations, stronger market trust, and higher growth rates. It is a fundamental redefinition of regulatory value.

9 Conclusion: Intelligent Transparency for a Sustainable Industry

The global chemical AI market is projected to grow at nearly 19% CAGR through 2030 as companies converge on digital, sustainable transformation strategies (McKinsey, 2025). Organizations adopting responsible AI, anchored in explainability and governed data, will not only ensure compliance but define industrial leadership for the next decade. Intelligent transparency is the bridge: linking safety, sustainability, and profitability in one connected, adaptive future (Oliver Wyman, 2025). Software tools, like the ones from coac GmbH, offer the industry the tools they need to transform and build a better future for their organization, our environment and our societies.

Sources & References

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Build connected intelligence and sustainable supply chains.

COAC helps chemical and lubricants companies transform regulatory complexity into a strategic advantage. We specialize in bridging the gap between data science, regulatory knowledge, and B2B enterprise solutions. Our tailored AI-driven software empowers you to build transparent, resilient, and sustainable supply chains.

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