THE FUTURE OF SUSTAINABLE

CHEMISTRY:

ENHANCE YOUR SUSTAINABLE PRODUCTION BY DIGITALLY TRACING CHEMICALS





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The chemicals sector - like many other sectors - is going through a significant phase of disruption as Covid-19 is causing significant swings in the demand and supply of goods.

There are megatrends which were already swirling around the sector, ranging from supply chain to sustainability, and from digitalisation to the changing nature of the expectations of the end consumer. Added to this the layer of the growing importance of ESG - Environmental, Social and Governance - in the approach of both corporates and the way investors deploy capital.

A recent report into the sector from KPMG, pointed to there

already being significant evidence that companies in chemicals " are doubling down on ESG and embedding relevant themes as the heart of their post Covid-19 strategy".

So companies have been facing a period of near unprecedented change. But there are also opportunities in the disruption, for those companies who are looking to evolve how they "present-proof" and future proof their operations. This includes adopting technology such as blockchain to accelerate digital transformation, realise greater value and build trust across all stakeholders through blockchain.



THE ROLE OF ESG

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Over the past few years ESG has become a **key business imperative in the chemical industry.** Central to progress towards ESG standards is ensuring companies can measure progress efficiently, accurately and securely, as this will help companies prove that they have achieved what they set out to do, while holding them accountable for meeting their sustainability goals from a range of stakeholders, from investors to consumers.

VALIDATING ESG PROGRESS

VALIDATING

ESG PROGRESS

When communicating ESG achievements, companies need quantitative metrics that verify their credentials. Against a backdrop where corporate ESG activity is increasingly scrutinized by both regulators and ever more socially and environmentally conscious consumers, simply setting goals isn't enough.

This means defining targets and identifying key performance indicators (KPIs), then measuring them and developing a plan is essential to achieving successful outcomes. As the plan is implemented, organizations must regularly report on their KPIs by means of an auditable record that tells the story of how they have reached their goals.



DIGITAL PRODUCT PASSPORT

The European Resource Efficiency Platform (EREP) introduced the concept of a "product passport" a few years' back. The passport was meant to include information about the components and materials contained in a product, and how they can be disassembled and recycled at the end of the product's useful life. In addition to encompassing all forms of product information and labelling, it offers high-level scalability and develops holistic long-term control of resources.

GENERAL PROPERTIES

For several decades, thanks to the work of its scientific bodies as well as risk management entities, the EU developed world-class knowledge on chemicals' properties, and this knowledge base has been widely shared. Yet, there is still room for more knowledge to be acquired by authorities on the properties of a vast majority of chemicals, even for polymers and chemicals that are not manufactured in high volumes. At the same time, while the industry relies on providing exact and accurate information, there is not enough knowledge on uses and exposure. **The expected future rise and use of chemical products is expected to represent a significant challenge in terms of filling this knowledge gap.**

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The EU market still has a lack of an information base on all substances and on their environmental footprint, including their impact on climate. As a consequence, this can result in poor performance management of chemicals and products, not allowing



for a full sustainability assessment. Polymers, as the fundamental building blocks of plastics, are not subject to registration under REACH, which aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. Furthermore, information required for substances in the low and medium tonnages under REACH does not fully allow the identification of substances with critical hazard properties.

SUSTAINABILITY CREDENTIALS

Transparency and trust are not just crucial for end consumers. In the B2B sector, certifications are essential for the sustainable sourcing of chemicals and environmentally-friendly and socially responsible production conditions. Companies must be sure that, when communicating their sustainability success stories, they have an indisputable record that authenticates their message.

Through the adoption of a transparent digital agenda, such as deploying blockchain technology to prove transparency in a way that no other digital technology can, businesses will improve their sustainability credentials and make reporting more efficient and more effective.

Chemicals are the building blocks of low-carbon, zero pollution, energy and resource-efficient technologies, materials and products. The increased investment and innovative capacity of the chemicals industry to provide safe and sustainable chemicals will be vital to offer new solutions and support both the green and the digital transitions of our economy and society.

The expected future rise and use of chemical products is expected to represent a significant challenge in terms of filling this knowledge gap.

TRACK & TRACE CHEMICAL PRODUCTS IN THE SUPPLY CHAIN

Studies show that the global chemical industry spends around €9.5 billion a year on information about the 150,000 chemical substances marketed worldwide.

Yet the existing system remains plagued by complexity, information gaps as well as confidentiality and trust issues. In order to eliminate the gap, new emerging technologies such as blockchain can enable a trusted and decentralized environment to store, exchange, build and track chemical-related information along the supply chain – from feedstock producer to end consumer.

Some businesses have become lax when it comes to maintaining chemical quality records, which ensure their customers' specifications are successfully being met. They run the risk of becoming uncompetitive as they don't take into account "outbound traceability", that is tracing from raw material to finished goods. In fact, with an ever-changing competitive market, where consumers and regulators are demanding more transparency over product provenance and sustainability practices, corporations are becoming more aware that providing full visibility over their supply chain is key to consumer loyalty.

According to <u>Deloitte</u>'s report, end-to-end supply chain visibility can bring chemical companies the following benefits:



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- Collaboration: Multiple actors in the chemical supply chain can add information on raw materials and chemicals and view life cycle data
- Trust: Blockchain data (such as delivery date, expiry date, date of production) is immutable; the QR code only carries the unique ID/ transaction number
- Traceability: Raw materials and chemicals with a unique ID can be traced from sourcing to distribution (end-to-end supply chain visibility)
- Auditability: Product recalls can be traced and executed more efficiently

As of now, introducing traceability into ESG policies improves a company's credibility, enables it to meet or exceed compliance, and provides a competitive advantage in a growing market. The only truly effective way to do this is by embracing the power of technology, which is the key to achieving global goals.



SHARING PRODUCT PASSPORTS WITH CUSTOMERS AND REGULATORS

There is a demand coming from many stakeholders ranging from investors, end consumers and regulators to increase the level of responsibility in the production and consumption of chemicals.

This refers to the transfer of data between participants in the chemical supply chain and how the reporting is executed for all stakeholders.

CUSTOMERS

There is a demand coming from end consumers to understand what they are buying, where and how products are sourced and the impact on the environment.

This has translated into many regulations and initiatives for the control and transparency of production for final products. One of the critical points in this process is the usage and the impact of chemical products and their source.

Even though consumers may not be explicitly aware of the usage of chemical products, the brands - which are consumer facing - are. These brands tend to be the customers of chemical companies and need to trace and share the data when the products are purchased. The sharing of data is one of the key challenges this ebook explores. Even though there have been advances in the collection and treatment of data inside the companies, the interface with others in the supply chain is less sophisticated in terms of sharing that data automatically and transparently with other stakeholders, including end customers.



One of the main concerns is how to share trusted and verifiable data across the supply chain with enough agility that this can be transmitted to the end customer in a near future.

REGULATORS

Not understanding internal product definitions and external supply chain usage of substances can cause supply disruption, in the event of additional controls or restrictions on substances.

Chemical regulators require the industry to record the use of hazardous chemicals. They need to ensure chemical substances are identified, tracked and, where applicable, controlled or restricted. Supply chain chemical substance reporting is a lengthy process as data needs to be requested, collected, checked, and verified to assess potential business risks, as well as providing different levels of activity reporting to employees, consumers and chemical regulators.

There are different chemical regulations that exist globally, wherever a product is manufactured, distributed, purchased or even recycled, and the industry needs to adhere to regional chemical regulations. In the EU, chemicals legislation is led by <u>REACH</u> and <u>CLP</u>, the main objective of which is to ensure a high level of protection of human health and the environment. Specific groups of chemicals, such as biocides, pesticides, pharmaceuticals or cosmetics, are covered by separate legislation. Declarable substance lists define the substances that need to meet compliance in a supply chain, and determine specific actions to be tackled, ranging from notifications to regulators, material declarations from the supply chain, declarations to consumers, safe use guidance for anyone using supplied products, request authorized use of a substance request, or even prohibit the use of a substance.

Requesting all the above information is a highly-intensive manual process to transmit, receive and verify data. **Blockchain provides the ability to automate the requesting process, basic validation checks ahead of any possible manual data checking and allowing data to be ingested efficiently into higher level internal systems.**

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HARNESSING THE POWER OF BLOCKCHAIN

Introducing traceability into ESG policies is easier said than done because they often involve complicated supply chains spanning different geographies. In the face of this significant challenge, embracing technology is crucial if businesses are to prove they've delivered on their initiatives.

Which of the many digital technologies available should be considered when it comes to measuring sustainability goals? Blockchain.

Transparency and trust are the founding principles of blockchain, which, along with its immutability and ability to digitally represent assets moving along value and supply chains, makes it the standout technology to introduce traceability into industrial processes. By using blockchain to verify transparency, in a way that no other digital technology can, businesses will dramatically improve their sustainability credentials and reporting procedures.

BLOCKCHAIN IN ACTION

By deploying blockchain, companies can track their carbon footprint or how muchrecycled material is used in the manufacturing process.

Global energy company Repsol is leading the charge and is already adopting blockchain to digitize some of its chemical tracking process which means any resource which begins its journey at a refinery or industrial complex - before being processed into a product in subsequent supply chains - can be



By deploying blockchain, companies can track their carbon footprint or how much-recycled material is used in the manufacturing process. tracked and traced. Here, blockchain is used to create a digital asset that mirrors the physical resource that moves along a supply chain, with that asset registering all of the characteristics that define the quality and regulatory compliance of its physical counterpart.

For example, in the case of a product like polyethylene, the asset goes all the way up to the plastic container that is ultimately manufactured. Having traced this, the container can be recovered and, through mechanical recycling, use it to produce new raw materials for a new batch of plastics, which can then also be traced . This certifies how much primary and secondary raw material was used in production.

There are numerous other opportunities when it comes to blockchain and sustainability in the broader petrochemicals sector, with sustainable fashion being one example. Chemical dyes and plastics (petrochemical products) play a large role in the fashion industry and, by deploying blockchain, their carbon footprint can be tracked or how much recycled material is used in the manufacturing process can be identified.



SHARING INFORMATION & CREATING COLLABORATION ACROSS CUSTOMERS, SUPPLIERS AND REGULATORS

LOOKING AHEAD

There are many other areas where traceability helps measure the environmental and social impact of value chains as, ultimately, any asset that can be measured and traced can provide evidence of achieving ESG objectives. **What has been covered here is only the beginning of how blockchain can support sustainability.** As ESG requirements mature over the next few years, it can be expected that we will see many more blockchain applications.

DISCOVER MARCO

MARCO is an ecosystem bringing blockchain technology under one roof; connecting multiple ledgers simultaneously. Our solutions bring traceability, transparency and compliance to supply chains, bringing operational efficiency and cost savings by automating and streamlining processes. The compatibility gives competitive edge and de-risks adoption of blockchain as it builds a bridge between different blockchain solutions in the same supply chain.

MARCO provides companies with the power to rapidly experiment and validate the immediate benefits of using blockchain in their operations and business cases so that they can efficiently move blockchain into live production environments. Examples include:

- Traceability and quality control in downstream outputs from the chemical industry
- Certified environmental sustainability of products



Our ready to use application TRACK & TRACE optimizes supply chain processes with blockchain core functions. We make supply chains smarter, safer and more sustainable. TRACK & TRACE can digitize a product's history, from the raw materials used to the processes and custody chain throughout the product manufacturing or processing. This links the physical product to the digital documentation trail that proves its provenance, quality and environmental and social sustainability.





SUCCESS STORY

STAHL

HOW STAHL USES FINBOOT'S BLOCKCHAIN SOLUTION MARCOTO SHARE VERIFIED SUSTAINABILITY CREDENTIALS WITH CONSUMER BRANDS THAT USE ITS PRODUCTS

Consumers are becoming ever more sustainability conscious and regulators are taking stronger actions on the detrimental effect that the fashion industry is having on our environment. As a result, consumerfacing brands are demanding more details about product provenance and manufacturing processes. As a supplier, Stahl is rising to this challenge in line with its strategy to create responsible chemistry for a better future.

By implementing MARCO, the company was able to significantly improve the way it shares and verifies the sustainability credentials of their products with consumerfacing brands.

If you want to know more about how we helped Stahl implement their product passport take a look at our case study:

DOWNLOAD STAHL'S CASE STUDY



Do you want to improve transparency, traceability and data sharing across your supply chain?

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