



## Unravelling material traceability with Deloitte and SAP Green Token

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# Introduction

In today's interconnected and fast-paced world, the significance of material traceability cannot be overstated. From the clothes we wear to the food we consume, understanding the journey and origin of the materials used in products has become paramount for individuals, businesses, and regulators alike. Material traceability offers transparency, accountability, and the ability to address critical concerns such as sustainability, ethical sourcing, and product safety. This article discusses what material traceability entails, the challenges it presents, and a solution proposed by Deloitte and SAP, which will be detailed in relevant use-cases



# What is material traceability?

At its core, material traceability refers to the ability to track and trace raw materials, components, and finished products throughout the supply chain.


It involves capturing, documenting and communicating information about each relevant steps the material goes through, including the sourcing, production, transportation, and handling of materials. This information is processed so that each step can

be validated and verified by the respective parties. With the increasing complexity and global nature of supply chains, achieving comprehensive material traceability has become a complex task with its own unique set of challenges.





# Why is material traceability important?



The global marketplace is increasingly demanding greater transparency and accountability. Consumers are seeking reassurance about the sustainability, ethical sourcing, and safety of the products they purchase. They want to know if the materials used are responsibly sourced, if environmental regulations were adhered to, and if workers were treated fairly throughout the supply chain. These growing expectations, coupled with the rise of social media and online activism, have made it more urgent for companies to show strong material traceability practices.

To add to the complexity, regulatory bodies worldwide are responding to these demands by implementing stricter requirements for material traceability. Governments and industry watchdogs are enacting regulations aimed at enhancing product safety, reducing environmental impact, and preventing the use of unethical or illegal materials, as can be read in [Deloitte's article](#).<sup>1</sup> Non-compliance with these regulations can result in severe financial and reputational consequences for businesses. Therefore, companies should stay ahead of the regulatory curve and proactively adopt traceability measures to help ensure compliance and maintain public trust.

Beyond compliance and risk mitigation, material traceability is vital to driving long-term profitable growth. Deloitte's industry-leading expertise, combined

with cutting-edge technologies, enables companies to increase revenue, enhance customer loyalty, and optimise costs through supply chain transparency. As highlighted in [Deloitte's perspective](#)<sup>2</sup>, integrating sustainability into operations and supply chains not only ensures compliance but also accelerates business growth and strengthens market leadership.

One of the significant challenges surrounding material traceability lies in the sheer scale and intricacy of modern supply chains. From multinational corporations to small-scale producers, the supply chains often span multiple countries and involve numerous intermediaries. Keeping track of each material's journey, ensuring its authenticity, and monitoring compliance with environmental, social, and quality standards can be a daunting task. Inconsistent record-keeping, information gaps, and lack of standardized data formats further compound the challenge.

Manually compiling data from various sources is generally an impractical approach to business operations. These traditional methods relying on manual record-keeping and documentation not only consume valuable time and resources but also introduce a high risk of errors, inaccuracies and data inconsistencies. In the current era, real-time insights into material origins and supply chain performance are essential.

This article proposes a solution that enables organizations to unravel these challenges and thrive in an era where material traceability has become a crucial pillar of responsible and sustainable business practices. By going into detail about the solution and its applications for selected industries, it aims to provide a direction regarding overcoming challenges in managing material traceability.

## Solution: SAP Green Token

SAP Green Token is an industry-agnostic cutting-edge platform that brings supply chain transparency to raw material supply chains, regardless of the complexity involved in processing the commodities or the number of supply chain actors.

The transparency aids companies in their efforts to produce sustainable products by establishing a basis for certification (e.g., ISCC, REDcert<sup>3</sup>), enabling them to credibly claim their products as sustainable. Green Token is applicable to businesses that source or

consume raw materials and has already been utilized across diverse sets of industries, such as agriculture, chemicals and energy. For instance, it can prove the circularity of plastic or the reuse of cooking oils in producing sustainable aviation fuel blends.



Source: SAP



# How does SAP Green Token work?

SAP Green Token uses four innovations:



## Digital Twin Tokens with ESG Attributes

The use of **tokens**, which represent a unit of measurement (kg, L etc.) of an underlying raw material as a '**digital twin**' with any ESG fact(s) attached as attributes on the token. By associating ESG data directly with the tokens, Green Token enables comprehensive traceability and transparency of sustainability claims.



## Flexible Chain of Custody Models

The platform supports **chain of custody model (CoC)** that align with sustainability certification requirements and industry needs. The mass balance CoC is used for bulk commodities like palm oil or cocoa to determine the percentage of certified material versus conventional, while the fully segregated CoC is preferred when complete separation is feasible (e.g. coffee or tea).



## Blockchain-Powered Traceability

The use of a **decentralized blockchain ledger** to record material movements. When the material is first sourced, a digital twin token is minted to represent the material and its ESG fact(s). With the transformation of the material, for instance crushing palm fruit to get palm oil, the tokens are transformed from raw material tokens to the new material tokens at the correct ratio. A new entry is written to the ledger showing this token transformation, which also links back to the first sourcing step. This approach creates an **immutable chain of custody**, providing a comprehensive audit trail from origin to end customer.



## Rapid Adoption Through Cloud-Based Deployment

To drive rapid adoption across supply chain partner networks, Green Token is available as a **cloud-based** product. This approach eliminates the need for complex on-premises installations, requiring only an internet connection and a web browser. Furthermore, SAP Green Token will feature **built-in integration with S/4HANA** by the end of this year and has already published an **open API** for integration with other information systems. Leveraging SAP's presence in 77% of global transactions, SAP Green Token can capture and process vast amounts of supply chain data, accelerating companies' transition towards sustainable practices.

## Is blockchain secure and energy efficient?

SAP Green Token employs a private, permissioned blockchain network built on Quorum, an enterprise-grade Ethereum platform, to safeguard sensitive data and ensure trustworthiness throughout the supply chain.

Furthermore, the solution adheres to industry leading data privacy standards and regulations, such as GDPR, to protect stakeholders' information and uphold compliance. The blockchain solution uses no more power than any other conventional

Software as a Service, additionally, GreenToken specifically partners with hyperscale cloud providers that run on at least 80% renewable energy sources like solar, wind, or hydroelectric power, reinforcing its commitment to sustainability.





# Industry applications



## Chemical sector

The chemical sector faces increasing demands for rigorous carbon reporting and the **circularity of materials**. SAP Green Token is helping to address this need by enabling the traceability of raw and processed materials throughout the supply chain.

Green Token allows clients in chemical industries to verify the origin of materials and helps to ensure compliance with certification standards such as **ISCC and REDcert**. For example, a leading packaging manufacturer uses Green Token to demonstrate that their products meet ISCC standards regarding biological and circular content.

Deloitte supports [sustainable transformation](#) by guiding companies through an evolving landscape of regulations that now demand more than just compliance but require actionable strategies for sustainability.<sup>2</sup>



## Agrifood sector

Consumers demand **supply chain transparency** to help make informed decisions. By collaborating with accreditation bodies and refining efforts, claims, and endorsements, businesses can build consumer trust.

Deloitte identifies **conscious supply chains** as one of the key focus area for responsible production in the [Future of Food](#), where reliability, quality and sustainability of raw materials are paramount.<sup>4</sup>

SAP Green Token can capture and carry material attributes like country of origin and deforestation status, along with certificates like **Rainforest Alliance or RSPO certificates** in an automated and auditable way. These capabilities align with **EUDR's standards** for sustainability reporting. One of the [use cases](#) is with Unilever, where Green Token verified that palm oil was sourced in a **deforestation-free way**, demonstrating compliance with RSPO requirements.<sup>5</sup>

A consumer-facing application shows the journey the raw material has taken is accessible via a QR-code on the product packaging.



## New Energy sector

The New Energy sector is crucial in the global drive towards sustainability, with **green hydrogen** at the forefront of this transformation.

SAP Green Token provides a solution for tracking and verifying the green hydrogen production. This supports compliance with environmental standards and helps to build investor and consumer trust by providing a clear view of the hydrogen's sustainable credentials. One case is [SAP's collaboration with the German Agency for International Cooperation \(GIZ\) and the governments of Brazil and Germany](#) to develop digital solutions for green hydrogen certification.<sup>6</sup>

Deloitte's [Global Hydrogen Center of Excellence](#) streamlines the adoption of green hydrogen by providing strategic guidance and supporting collaboration across the industry. Efforts are focused on accelerating project implementation and scaling up sustainable practices in the New Energy sector.<sup>7</sup>



## Leveraging Deloitte's knowledge

Deloitte, a Global Platinum Partner of SAP with a strategic alliance dating back to 1989, has recently become the first and preferred enabled partner for SAP Green Token.

This collaboration leverages Deloitte's extensive knowledge and multidisciplinary capabilities in the following domains:

- **Consulting Prowess:** Deloitte brings industry knowledge and business transformation experience to reimagine sustainable supply chains
- **Regulatory Risk Advisory:** Helps clients navigate regulations like ISCC, REDcert, EUDR, help enable adherence to standards while unlocking opportunities for operational excellence
- **SAP Technology Leadership:** With 12,530 SAP practitioners in more than 135 countries (as of July 2024), Deloitte has extensive experience with implementing and integrating SAP solutions



By combining these strengths, Deloitte empowers clients to maximise the value derived from SAP Green Token's innovative supply chain traceability platform.



# Acronyms

**ISCC:** International Sustainability and Carbon Certification

**REDcert<sup>2</sup>:** Renewable Energy Directive Certification

**ESG:** Environmental, Social, and Governance

**CoC:** Chain of Custody

**API:** Application Programming Interface

**GDPR:** General Data Protection Regulation

**SaaS:** Software as a Service

**EUDR:** European Union Deforestation Regulation



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