Traceability Solution with GenoChain

Business Background

As the issue of global climate change becomes increasingly severe, new energy vehicles, as a green and low-carbon mode of transportation, are gradually becoming a key focus for the transformation and upgrading of the automotive industry. With the increasing penetration of new energy vehicles, countries like the United States, the European Union, and its member states have been enacting laws and policy documents related to the automotive supply chain and key raw materials. The EU imposes restrictions on new energy vehicles imported into Europe through multiple legal regulatory frameworks, including customs market access, supply chain and key raw materials, internal corporate governance, ESG requirements, and user privacy and data protection. As the scope of regulation continues to expand, the traceability of key raw materials in the supply chain and compliance with conflict minerals regulations are becoming important aspects of ESG assessments.

EU countries have begun to strengthen and improve the legal framework required for supervision. For example, the "EU Conflict Minerals Regulation," passed in 2017, mandates due diligence for conflict minerals such as tungsten, tin, tantalum, and gold (3TG). It requires the traceability of these minerals, demanding physical tracking from the source to the export location throughout the entire transaction chain, encompassing every step from mineral extraction, processing, and sales to transformation.

In addition, the "New Battery Regulation," officially announced in July 2023, requires traceability and due diligence for key raw materials such as cobalt, lithium, nickel, and graphite in the supply chain. This regulation covers all stages of the battery's life cycle, including raw material mining, battery manufacturing, and recycling and reuse. It mandates the disclosure of material sources, carbon emissions, and the proportion of recycled materials used.

Therefore, when targeting the European and American markets, new energy vehicle companies must ensure supply chain traceability by dynamically controlling and recording each level of the chain efficiently and credibly. They need to generate evidence that meets regulatory requirements, thereby reducing additional costs and expenses associated with compliance.

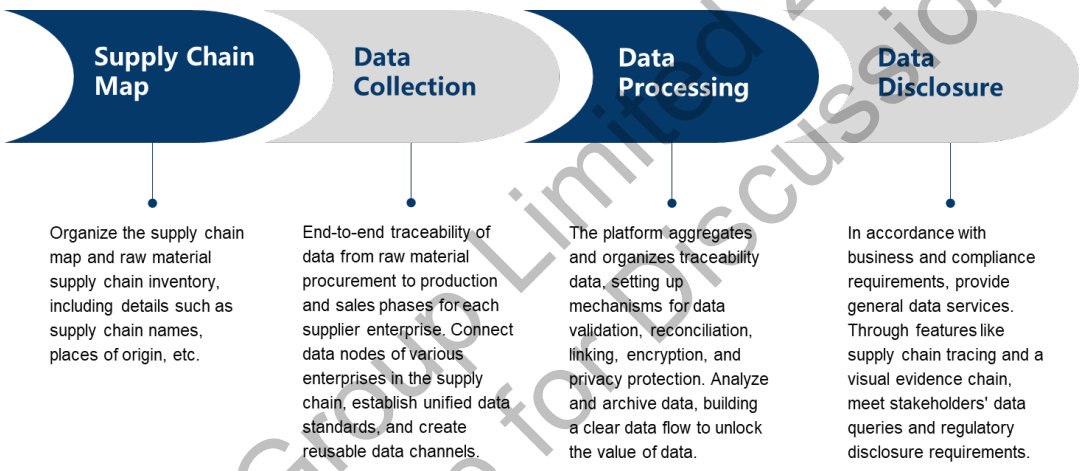
Going overseas, automotive companies aligning with international compliance certification and standards is a systematic and continuous process. It requires continuous adjustment and optimization of business models and management systems in a globalized business environment to adapt to and comply with international standards and regulations. Companies can consider implementing projects using digital traceability platforms to fully leverage the technical advantages of digital traceability, which are efficient, transparent, and credible. These platforms can collect relevant data in real-time throughout the entire supply chain, automatically verify and reconcile upstream and downstream data, and quickly generate an immutable product evidence chain. This approach ensures credibility and quality while reducing costs associated with time and labor, thereby creating a new mechanism for low-cost, high-efficiency cross-border trade compliance.

At the same time, regulatory authorities tend to favor and encourage companies to establish supply chain traceability systems and IT technologies to support the documentation of due diligence in the supply chain. Therefore, digital supply chain traceability is a necessary condition.

Solution

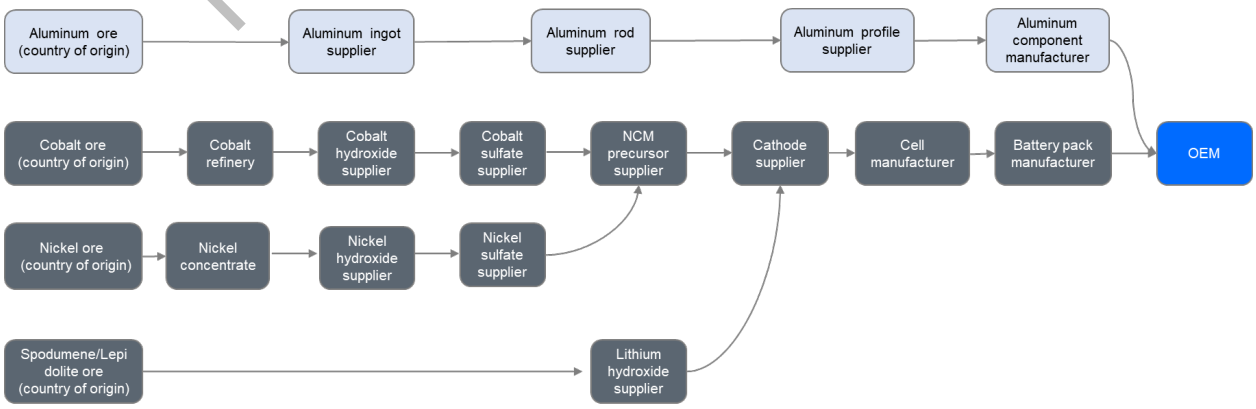
Business Solution

The supply chain for complete vehicle manufacturing is complex and lengthy, with a multitude of brands and models from various automakers, and there may be data overlaps between them, making it very difficult to fully understand the "family background." Taking the production of a complete vehicle as an example, to trace the entire industrial chain of a particular vehicle model, it is necessary to trace up to 8 levels and at least 200 suppliers, resulting in as many as 1 billion traceability data entries, in order to achieve a rigorous traceability from ore to the final complete vehicle for all products of that model. Specifically, in the supply chain related to aluminum, the leading enterprise needs to complete the full process traceability from the original ore mines, suppliers of aluminum ingots, aluminum bars, and aluminum component manufacturers, involving the entire country and even all over the world, and will generate a large amount of data. Therefore, it is necessary to build a digital supply chain traceability management platform to achieve traceability throughout the entire industrial chain.



End-to-End Traceability

To achieve sustainability and visibility in supply chain management, key traceability data from processes such as mineral extraction, component processing, and complete vehicle manufacturing in the industrial chain are uploaded onto a traceability platform for record-keeping (e.g., specific batches of products/materials and carbon footprint labels). This allows for a step-by-step traceability from the complete vehicle manufacturers back to the original material source miners, forming an end-to-end visible supply chain map.



Traceability Visualization and Reusable Data Channels

In compliance with regulatory requirements, the data nodes of various enterprises in the supply chain are interconnected to establish a unified data standard, thereby creating reusable data channels. The reuse of trustworthy data for compliance, carbon management, ESG, and risk management across multiple business scenarios reduces the cost of data management, enhances transparency, and ultimately effectively supports the digital analytical decision-making of enterprises.

Data Verification and Data Credibility

Data verification ensures the standardization and quality of traceability data, as well as the smooth flow of the entire chain, which is necessary for:

- Data legality verification: Upgrade data collection standards and establish complete and clear verification rules, including data format/range size, required fields, prerequisite dependencies, attachment format/size, and other aspects of verification rules to ensure the legality and completeness of data.
- Internal enterprise logic verification: Based on the internal data collection fields and key connection points of the enterprise, improve the internal logic verification rules, including quantity, amount, various participants, product material verification, and other logical verification rules to prevent data fraud or omission in enterprise data.
- External enterprise logic verification: Based on the key connection points of upstream and downstream enterprises, optimize and improve the external data verification rules of the enterprise, including contracts, orders, invoices, supplier sales shipments, and enterprise procurement inbounds, to help enterprises identify data linkage anomalies.

Regarding the issue of data credibility throughout the entire chain, blockchain technology can effectively address the pain points of distrust, difficulty, and low information sharing efficiency in traceability, thereby efficiently and accurately completing the traceability of the automotive supply chain.

- Dynamically configure rules based on business requirements and regulations
    - Risk areas — Sanctioned countries / Conflict zones
    - Labor force — Whether child labor is employed
    - GPS tracking — Whether there is deviation from the predetermined route
    - Quality balance — Whether ASI aluminum is used
- Anomaly detection
    - Alert notifications — Risk warnings
    - Third-party certification assessment — Performance scoring
    - Export destination country regulation — Proof of responsible sourcing

Product Solution

GENO, leveraging its technological edge and accumulated industry experience, has developed a blockchain traceability platform that can track the movement of materials throughout the entire industry chain, including mining, manufacturing, and transportation. By verifying the

data relationship between upstream and downstream of the supply chain through smart contracts, it not only prevents data falsification but also creates end-to-end supply chain visibility. This helps users build a transparent and sustainable supply chain system that meets the regulatory requirements for supply chain traceability and supports the sustainable development strategy of enterprises.

The traceability platform can achieve the following functions:

- KYC Identity Verification: The platform creates a trustworthy digital identity on the chain for enterprises that have completed the verification, ensuring the right to user data from the source.
- Reliable Data Collection: Supports a variety of data collection and system integration methods, including standard API interfaces, Excel template imports, and platform entry.
- Visual Traceability Inquiry: View the enterprise supply chain relationship map and product traceability map in a visual form.
- One-click Coding Operation: The traceability code is uniquely authorized, truly achieving "one product, one code," supporting multiple identification management, including rule configuration, identification generation, and identification download.
- Abnormality Early Warning Notification: Utilizing big data technology, early warning of problematic products is provided through cross-validation, historical data comparison, and alarm rule settings.
- On-chain Query Verification: Provides blockchain browser functionality, supporting real-time on-chain data queries and verification by enterprises, regulatory agencies, and the public.

Currently, the platform has far exceeded the industry in terms of traceability scenarios, traceability levels, and the volume of traceability data, and has served the entire supply chain traceability of many well-known automotive companies, providing "escort and protection" for the overseas expansion of new energy vehicles.

Scenario Case

Supply Chain Traceability

The GENO blockchain traceability platform has been implemented in cooperation with several internationally renowned automotive OEM to provide supply chain traceability services for complete vehicles. In the key traceability projects for the power battery supply chain of two international automotive brands, it traced multiple key raw materials, with up to eight levels of supply chain tiers, covering more than 70 supply chain enterprises. GENO has used the

traceability platform to help these two OEMs pass the EU regulatory compliance review and successfully enter the European market.

Battery Passport

Relying on its independently developed blockchain traceability platform, by constructing an ecological alliance chain, it connects all the participants in the battery value chain, creating a "digital passport" with a digital identity for each battery. This is minted on the blockchain as a digital asset, recording key information such as manufacturer, material composition, material source, model capacity, charge-discharge cycle count, health status, carbon footprint, and due diligence audit. The information included is developed in an open standard and an interoperable format, and supports the circulation of the battery passport through different stages of the battery's life cycle in the industry chain, as well as the change of ownership and the confirmation of data sovereignty.

Brand owners can use the digital asset of the battery passport to ensure the sustainable transparency and traceability of the supply chain to related parties, and to monitor carbon emissions and supply chain risks in the battery manufacturing process. The battery passport meets the market's demand for sustainable and ethically sourced products, highlighting the brand owner's commitment to sustainable development and compliance.

Component Recycling Traceability

For the scenario of recycling and reuse of automotive components, a component recycling traceability management platform has been developed. This platform can record key data from various stages such as production, use, scrapping, evaluation, dismantling, and recycling of components. Through the immutable and distributed storage characteristics of blockchain, it ensures the security, credibility, and confidentiality of data storage, transfer, and sharing, realizing the traceability of the component recycling chain, making the entire process transparent and visible, and solving trust issues in the collaborative process of the component industry chain.

Carbon Footprint Management

The common practice for carbon accounting is to estimate the carbon emissions of the processing stage, manufacturing stage, transportation stage, use stage, and end-of-life stage of the product's life cycle. This calculation method mostly uses the carbon factor library estimation method for the carbon emissions data of raw materials and components. Due to the lack of credible supply chain traceability data as a support, it is impossible to truly and accurately reflect the actual carbon emissions of various suppliers upstream, let alone achieve dynamic monitoring of corporate and product carbon footprint management.

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GENO has created a blockchain-based automotive lifecycle traceability and carbon footprint management platform for a well-known automotive company, which can record the traceability data and carbon footprint data of the entire supply chain of the automotive industry from ore

mining, component manufacturing, complete vehicle manufacturing, warehousing logistics, automotive traders, after-sales service providers, and recycling companies. By establishing traceability applications covering the entire automotive supply chain, it fully assesses the carbon footprint of suppliers, helping automotive companies determine whether they can include them in their own supply chain system. Enterprises in the supply chain can also collect credible traceability data, analyze the carbon emissions of enterprises and products, improve energy utilization efficiency, and help enterprises achieve "carbon neutrality".