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Why is traceability critical? Looking ahead to the future of minerals

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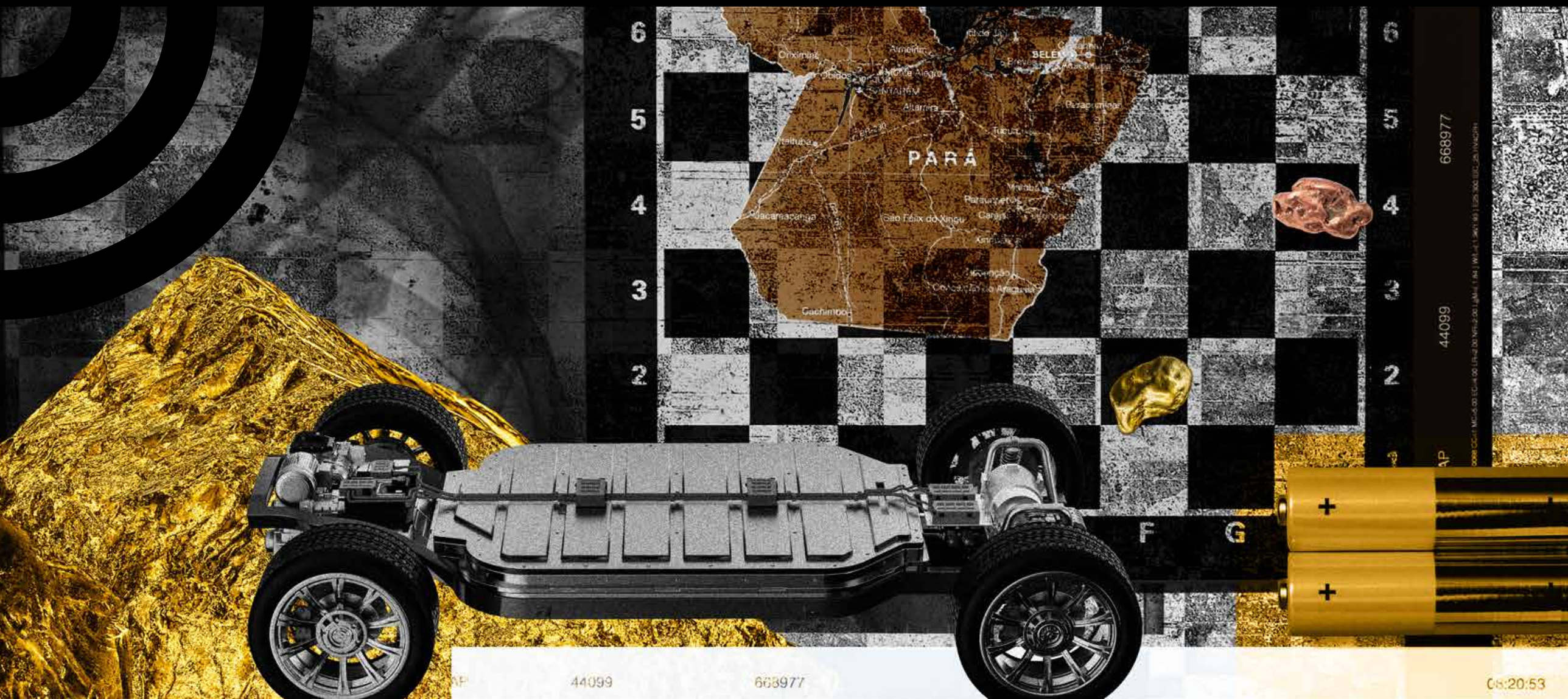

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The time when we didn't know the origins of what we consume is long gone. Nowadays, companies and consumers are increasingly keen to make conscious choices, as the world has come to realize the urgent need for responsible social and environmental practices to ensure our survival as a species.

Minerals are present in almost every aspect of daily life: from our houses to transportation means to crops. As climate change advances rapidly, governments and societies are pursuing an energy transition movement to phase out fossil fuels and phase in renewable energy sources and appliances, as the energy sector is the primary driver worldwide for greenhouse gas emissions, about 80% of the total[1].

Although in Brazil the picture is much different – as agriculture, pasture, and deforestation all together account for 70% of emissions while the energy sector contributes to another 20%[2] – the country is embedded in a global economy. Its mineral deposits are key to source materials for the worldwide energy transition. Demand for minerals is estimated to triple by 2030[3], and Brazil is part of the game, with its current operations and future projects of iron ore, copper, gold, lithium, and others.

With that in mind – and considering the Brazilian mineral industry is already preparing its moves in this geopolitical and natural resources chess game – it is due that we organize the house. Environmental damage and social conflicts remain among the main challenges the mineral industry faces. Due to past relaxed oversight and attention, the industry now needs to rebuild its trust with society and demonstrate responsibility. This comes with transparency and dialogue.

That is precisely where the term traceability comes into play. Traceable materials mean that companies and consumers know exactly where they come from. Knowing its origins makes it much easier to attest whether they are being produced responsibly, following the law and best environmental and social practices. This information is powerful because it orients choices and can mold the market.

1
Ministry of Mines and Energy – MME & Energy Research Office – EPE (2025), Brazilian Energy Balance 2025, Summary Report, Reference year 2025. Available at: <https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-885/topico-767/BEN_S%C3%ADntese_2025_EN.pdf>.

2
Ibid., note 1.

3
OECD/IEA (2025), The role of traceability in critical mineral supply chains, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/edb0a451-en>.

Traceable, not complicated

Traceability should not be complicated. Governments and companies can create their own digital systems of registers to follow the path of a mineral, from the mining site to the consumer. Every time a mineral is produced, processed, handled, and sold, it is registered. The collection of records can then be monitored by the authorities and informed to interested parties such as consumers.

More than available technologies, which more often than not overtake the debate, the crucial aspect of a traceability system is that it provides information of origin – we need to know exactly where the mineral comes from – and that this information is trustworthy – we need to feel confident that what we read in digital records is the reality. If we have these two aspects – origin and trust – we can say the traceability system is a successful one. If one of these two aspects is missing, we won't have a reliable or sound system, even with the most advanced technology.

Therefore, a traceability system for minerals must be mandatory and regulated by the government through its competent agencies. It ensures trust. Also, a compulsory system means all players must participate, which avoids market unfairness and ensures all play by the same rules.

Brazil already has the expertise to implement such a system. Its agencies already control the flows of forest products and cattle, for instance. The National Mining Agency manages several digital systems, with granular information for mineral production, royalties' collection, tailing dams, and others. It would be one more step to integrate and organize mineral flows and other social and environmental information. That is another key aspect and value of a traceability system: it can monitor not only the minerals' origin and volumes but also environmental and social information.

More and more, the world is moving towards transparency, with traceability serving as the tool. The OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas – the leading international standard – calls for the implementation of traceability as the first step to identifying and addressing adverse impacts in mineral supply chains[4].

Key mineral-importing and processing countries, such as the European Union[5,6] and Switzerland[7], have integrated the OECD Guidance into their domestic laws, covering minerals like tin, tungsten, tantalum, gold, cobalt, lithium, nickel, and natural graphite. Key mineral-producing countries, such as Indonesia and the Democratic Republic of Congo, have also put in place traceability systems. In the private sector, the London Metals Exchange – the world's largest market in standardized forward contracts, futures contracts, and options on base metals – and the London Bullion Market Association – the world's leading authority on gold and silver markets – require the application of the OECD Due Diligence Guidance as a condition for market access.

In Brazil, research has already shown the need for traceability – see, for instance, the report *Blockchain, Traceability, and Monitoring for Brazilian Gold*[8] –, and legislation proposals have popped up over the years, especially as a tool to help enforcement deal with illegal gold mining in the Amazon region. Although gold remains a challenge, more is now under the radar, and we need to broaden our perspective.

It is past time for Brazil to follow suit and not be left behind. If traceability ensures the protection of our environment and communities, it also ensures that companies are aligned with international standards and well-positioned in the global minerals market to benefit from it.

What does it look like? Transparent

Transparency, rather than being viewed as a glass ceiling, should be seen as a window to showcase exemplary practices and demonstrate that the industry is capable of and committed to doing more.

Who?

The National Mining Agency must be involved: it is the competent authority to regulate and oversee the mineral industry and already manages mineral production systems and related activities.

Nonetheless, other government bodies should participate to ensure data sharing and enforcement, such as the Fiscal Revenue Service (responsible for customs and tax-related transactions), the Federal Police, and environmental agencies, among others.

4
OECD (2016), OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Third Edition, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/9789264252479-en>.

5
Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2017:130:TOC>.

6
Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32023R1542>.

7
Swiss Federal Council. Ordinance on Due Diligence and Transparency in relation to Minerals and Metals from Conflict-Affected Areas and Child Labour (DDTrO) of 3 December 2021. Available at: <https://www.fedlex.admin.ch/eli/cc/2021/847/en>.

8
Instituto Escolhas (2021), Blockchain, Traceability, and Monitoring for Brazilian Gold. Available at: <https://escolhas.org/wp-content/uploads/Blockchain-traceability-and-monitoring-for-Brazilian-gold.pdf>.

What?

Traceability must ensure records of mineral production, process, refining, handling, custody, and transport from mines of origin to domestic consumers and exports. Recycling, scrap, and concentrates should also be covered. This means all mineral flows will be traceable.

Flows must also be documented so that players, when required, can attest to the regularity of a mineral throughout its entire supply chain.

Aside from that, information on social and environmental compliance must be available, such as licenses, reclamation execution, water management, tailing management, and other relevant details.

Information should be made public for the sake of transparency[9].

How?

The National Mining Agency might establish a mandatory traceability system as the competent authority to regulate such issues.

However, implementation could also be pursued through legislation by the National Congress, via a bill to turn it into law.

How much?

The costs of the system must be paid by its users, such as mining companies, cooperatives, and miners, through dedicated funding.

Otherwise, society as a whole will bear the costs of doing business in a specific economic sector (“socialization of costs” should be avoided).

9
Only sensible information should be protected. It is important to encourage disclosure.

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