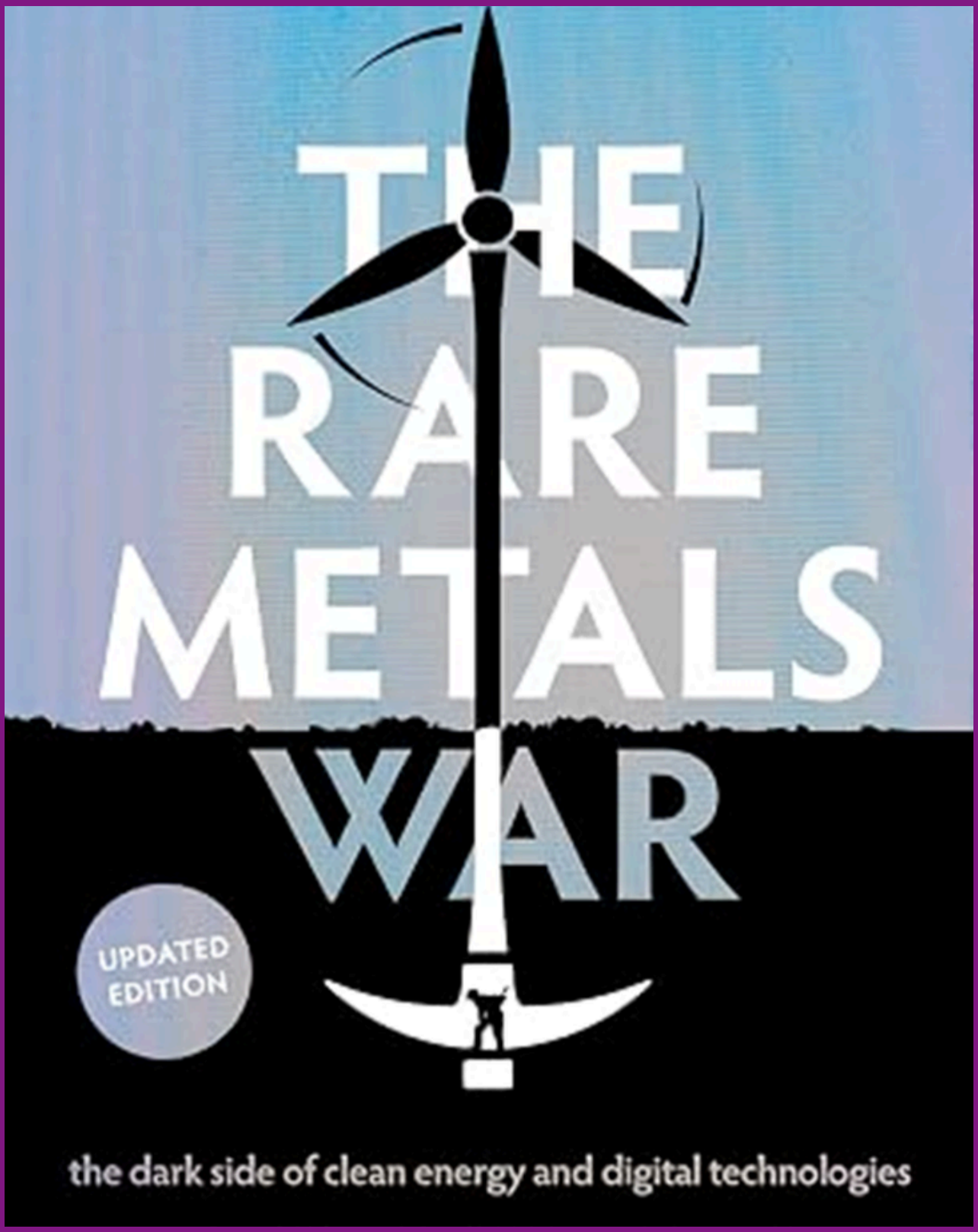
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BOOK REVIEW

The Rare Metals War: The Dark Side of Clean Energy and Digital Technologies

Authored by Guillaume Pitron



About the Author

Guillaume Pitron, born in 1980, is a French journalist, author, and director living in Paris. He holds a postgraduate diploma (DEA) from the universities of Paris and a master's degree in law from Georgetown University (United States). He is also a research associate at the Institute for International and Strategic Relations (IRIS) in Paris, an Executive in Residence at INSEAD's Sustainability Business Initiative, and was awarded a residency at the Villa Medici in Rome in 2025.

His work focuses on commodities and on the economic, political, and environmental issues associated with their use, and he is a regular contributor to media outlets including Le Monde, the BBC, Bloomberg TV, The Guardian, The Financial Times, and National Geographic. He is the author of two essays, The Rare Metals War (2018) and Digital Hell: Journey to the End of a Like (2021). His work has been recognised with some thirty French and international awards, including the Erik Izraelewicz Prize for Economic Research, the 2018 Economics Book Prize for The Rare Metals War, and the 2022 Environment Book Prize for Digital Hell.

About the Book

The Rare Metals War was first published in French in 2018 as La Guerre des Métaux Rares and has since been translated into multiple languages. This review is based on the updated 2024 version, translated by Bianca Jacobsohn. This book is a work of investigative journalism and is based on years of reporting from mines and refineries in China, Mongolia, and elsewhere, and on interviews with industry insiders, officials, and researchers. The book is written for the general reader, It requires no technical background. It gives the reader an overview of the environmental costs of extracting and refining rare materials, how Beijing turned mining into a monopoly, the military stakes of mineral dependence, and the author's own recommendations.

Introduction

As the world weaves dreams of green technology and digital revolution, Pitron silently awakens the world through his book, which exposes readers to the reality of green technology. Pitron starts with an introduction to when critical minerals came into the picture in the 1970s and goes on to explain the amount of effort and investment it takes to produce these metals. The figures are striking, 8.5 tons of rock need to be purified to produce 1 kg of vanadium, 16 tons for 1 kg of cerium, 50 tons for the equivalent in gallium and a staggering 1,200 tons for 1 kg of lutetium.

He establishes the paradox of the modern energy transition, arguing that shifting away from fossil fuels is not reducing overall material dependence, it is simply shifting from coal to metals, and these are not weightless technologies, they depend on intense resource extraction. He also argues that rare metals could have an environmental impact far more severe than that of oil extraction. As the figures above show, while an electric car battery or a wind turbine may sound like clean technology, they rely on these dirty raw materials and require hundreds of tons of rare earth material

Summary

Pitron also addresses how the pollution created by this extraction is highly localised. Western nations can talk about clean technology, but the impact is borne by the countries where the raw metal extraction is happening, such as China and Congo.
Initially, Western Nations like the United States dominated mining, but later, due to the environmental damage caused, they moved away from it and pushed production and its accompanying pollution to poorer countries. The stopping of mining operations in Mountain Pass Mine of the United States is a great example.

From the environmental impact, the book moves into the geopolitics and strategy of critical raw materials. Pitron argues that the world has placed the fate of its green and digital technology, the cream of its industries of the future, in the hands of a single nation: China. While China nurtures its own technologies and plays hardball with the rest of the world by capping the export of these resources, this has serious economic and social consequences for the rest of the world.

The book also covers how China has used this supremacy in rare earth metals and minerals at different points. One such case is the 2010 diplomatic dispute between Japan and China, in which China restricted rare earth exports to Japan. Similarly, it discusses how China required foreign companies to relocate their factories and technology to China in order to gain access to these minerals, and how the Chinese government strategised to build this monopoly. While the world plans to adopt green technology, Pitron asks: where and how will we procure these rare materials? Will there be winners and losers on the new chessboard of rare materials, as there were for coal and oil? What will be the economic, social, and environmental cost of securing their supply?

The book also discusses the military and defence implications of critical minerals, arguing that defence infrastructure could become a national security nightmare where it relies on adversarial nations for equipment components.

He goes on to suggest possible solutions, such as deep-sea mining and Arctic exploration, through which Western nations are trying to secure alternative sources outside of China’s control. He then suggests that Western nations should also return to mining in their own localities, to understand the true cost of their choices.

The book concludes with a call for intellectual honesty, arguing that rather than abandoning clean energy, we must abandon the idea that technology alone can provide a consequence-free transition. Exploration should continue, and the search for the right technology must go on.

Critical Assessment

The key takeaway from the book is that rare metals, which are changing the world today and are not only polluting the environment, but also jeopardising economic stability and global security. In the twenty-first century, their use has consolidated China’s supremacy and accelerated a weakening of the West. True sustainability, Pitron argues, requires consuming less, recycling aggressively, and accepting the real impact of this extraction.

The book's central strength is that Pitron is outspoken, calling out the hypocrisy surrounding critical minerals and green energy while educating the reader on the various dimensions of the issue. The examples and flow of the book keep the reader engaged and leave a lasting impression.

The book however also has some limitations. Some of its thinking is rooted in the early 2020s, and the global picture has since evolved. Recent events have largely proved Pitron right, China imposed export controls on gallium and germanium in 2023 and, in April 2025, on several rare earths and magnets, which disrupted car makers worldwide. The European Commission's measures against China's monopoly and the United States' own strategy, for instance, needs to be considered by the readers. While Pitron's claims are largely true, the book would benefit from a broader discussion of the actual impact of these minerals. It focuses heavily on the negatives; giving more equal weight to the positives would let readers weigh the trade-offs for themselves.

The book also gives China a great deal of credit for its planning, but the picture is arguably more complicated. While China has executed its strategy well, Western negligence also contributed to the outcome. The writing style, too, could have been somewhat less dramatic.

Relevance to India

While the book focuses primarily on Western countries and their relationship with China, it has considerable relevance to India as well. India's own energy transition, green technology goals, defence modernisation, and digital economy will all demand critical minerals.

The underlying question remains the same for India: a heavy dependence on imported minerals, limited domestic processing capacity, and comparatively little being done on recycling or mining. The biggest complicating factor is that China is a neighbour with which India shares disputed borders. As the book shows, China has previously used its dominance over mineral processing to its diplomatic advantage.

India will therefore need to think carefully about its own strategy, even as considerable movement has already been made toward a critical-minerals policy. Indian diplomacy, in particular, needs to become critical mineral aware, building long-term partnerships with mineral-rich countries such as Australia and those in Africa. India also needs to ensure it does not remain extraction-heavy alone, and should invest equal effort in recycling and processing. Finally, India should plan to build larger strategic reserves of these resources, which would strengthen national security planning.

Conclusion

As Pitron writes, changing the way we produce and consume energy is humanity's next great adventure, one that will continue to test us as we search for our best path forward.

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