

Alexander Freier

Blockchain in the Energy Sector

An Advancing Technology to Tackle Global Climate Change?

With a foreword by Reimund Schwarze and Alejandro Bernhardt

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TOMORROW'S ENERGY.

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For Laura & Gianluca –

The two most important people in my life.

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Foreword

The intersection of blockchain and energy is a topic that has attracted growing interest in recent years as the potential of this distributed ledger technology (DLT) to transform the energy sector becomes increasingly apparent.

However, despite its potential, the issue is relatively new to the academic debate, and there is still a significant gap in our understanding of how blockchain can be applied in the energy sector and the broader implication of this much-discussed innovation for global energy systems and society.

This book, *Blockchain in the Energy Sector*, and the Master's thesis I had the privilege of directing at the European University Viadrina Frankfurt/Oder in 2020 thus represents an important contribution to the literature on this topic. It combines international relations theory with management studies by using an innovative approach to address climate change as the most fundamental threat to the world's population and our ecosystems today. It provides a comprehensive overview of the potential implications of blockchain for the energy sector, its challenges, and how it could be applied to support the transition to a more sustainable energy system.

One of the key strengths of this book is its focus on international norms and how international technology transfer in the field of blockchain technology from a legal standpoint can be supported. This is a critical issue for the study of climate change, given the large unknowns about the potential of emerging technologies in general and those of blockchain, in particular, to drive down GHG emissions on a global basis.

So, while the book gives an interesting overview of how blockchain technology works, it also analyses two important use cases in the energy sector: The Brooklyn Microgrid and the WindNODE research project testing the viability of a renewable energy-based system in northeastern Germany. These use cases demonstrate blockchain technology's potential benefits and challenges in supporting the development of a more decentralized and efficient energy

system. The lessons learned can and should be used to apply the technology to energy sectors in other parts of the world.

Overall, this book is an important first step in a research field that requires further exploration. It will interest scholars, practitioners, and policymakers concerning the potential of blockchain technology to 'green' our energy systems and support the transition to a more sustainable future.

Prof. Dr. Reimund Schwarze
Frankfurt/Oder, Germany May 2023

In our modern world, where complexity abounds and various fields intersect, we are witnessing a profound redefinition of disciplines. Notably, economics and management have expanded their horizons, embracing new dimensions of significance.

Gone are the days when policymakers and business leaders focused solely on maximizing macroeconomic gains, shareholder profitability, and customer satisfaction. A transformative trend has emerged on a global scale, gaining momentum, as both public and private sectors recognize the need for a different impact: acknowledging that economic optimization alone is insufficient and must be accompanied by social and environmental considerations. Consequently, sustainability has rightfully found its place and is reshaping the behavior of political and economic actors.

Such an approach, particularly in economics, calls for an interdisciplinary methodology integrating diverse knowledge strands. We can strive to maximize all the factors at play through seamless coordination simultaneously.

Scholarly work is of significant value within this complex landscape for several compelling reasons. At its core is the author, Alexander Freier, whose research presents a testament to his extensive and diverse academic background. Additionally, his extensive professional experience enhances this contribution, enabling him to adopt a multifaceted approach from various angles. Furthermore, his global experiences, studying and working in different cultural contexts, provide him with a comprehensive lens to understand the multiple layers inherent in our subject matter.

Through the chosen approach, the author aptly underscores the paramount significance of fostering renewable energy resources to bolster global sustainability efforts. Furthermore, introducing blockchain as a nascent technology broadens the reader's understanding of potential avenues for innovation. The convergence of these two critical subjects lays the foundation for a compelling case, necessitating a reevaluation of business models that prioritize environmental responsibility and foster social inclusivity. This intersection promises to yield transformative possibilities whereby greener and more socially conscious frameworks can be envisioned and actualized. For these reasons, I wholeheartedly

declare this book invaluable to addressing complex and consequential issues. Its ultimate goal is to advance the collective well-being of humanity, both in the present and future.

Finally, personally, I derive immense satisfaction from witnessing my former student and esteemed friend, Alexander, dedicating himself wholeheartedly to these pressing concerns. I firmly believe that he possesses the essential qualities and professional values necessary to tackle these challenges with the utmost effectiveness.

Alejandro Bernhardt, PhD.
Córdoba, Argentina May 2023