Call for Contributions

Hydrogen in Hard-to-Abate Industries: Technical, Financial, and Policy Pathways for Industrial Decarbonization

An edited collection to be published by Palgrave Macmillan

Co-edited by:
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The John Molson School of Business and the Jacques Ménard - BMO Centre for Capital Markets at Concordia University and the Institute for Sustainable Finance kindly invite contributions to the edited book collection, entitled *Hydrogen in Hard-to-Abate Industries: Technical, Financial, and Policy Pathways for Industrial Decarbonization*, to be published by **Palgrave Macmillan**.

ABOUT THE BOOK:

Hydrogen in Hard-to-Abate Industries offers an interdisciplinary exploration of how low-carbon and green hydrogen can serve as both a pragmatic supplement to fossil fuels and a long-term clean energy carrier in carbon-intensive sectors such as mining, steelmaking, cement production, chemical refining, and heavy transport. While direct battery electrification works well for passenger vehicles and light urban grids, it faces severe physical limits in remote, cold-climate, or continuous industrial operations that rely heavily on diesel and natural gas. This edited volume continues the research trajectory of our recent book *Wiring the Future: Financial Strategies, Challenges, and Opportunities in the Sustainable Energy Transition* (Palgrave Macmillan, 2026). What makes this book distinctive is that we bring engineering realities, corporate finance, digital governance, and public policy together under one roof. In particular, we explore how transitional fuel blending and decentralized, on-site green hydrogen installations located directly next to factories and mines can bypass costly long-distance transport bottlenecks and meaningfully cut industrial greenhouse gas (GHG) emissions.

We structure the book to guide readers through a logical progression of topics. We begin with the fundamentals of hydrogen as a transitional complement to fossil fuels — such as hydrogen-diesel dual-fuel retrofits and hydrogen-natural gas blending — before examining the engineering, Green Information Systems (Green IS), and artificial intelligence (AI)–enabled governance of behind-the-meter green hydrogen hubs in high-reliability industrial environments. From there, we move into the financial hurdles and valuation frameworks needed to de-risk capital-intensive installations, the policy instruments and safety codes shaping deployment, and real-world case studies from across the globe. Each chapter will provide clear explanations, empirical analyses, illustrative case studies, and practical recommendations, making the book accessible to students, educators, researchers, industrial engineers, financial practitioners, and policymakers.

The book satisfies a pressing need for realistic, cross-disciplinary guidance on industrial decarbonization. In our own work across engineering labs and business schools, we repeatedly see promising clean-energy projects stall because engineers, information systems specialists, and financial decision-makers evaluate risks in separate silos. By connecting physical performance and human-in-the-loop digital safety governance with capital budgeting, blended finance, and regulatory design, *Hydrogen in Hard-to-Abate*

Industries serves as an essential resource for anyone working to decarbonize heavy industry without sacrificing economic competitiveness.

CALL FOR CONTRIBUTIONS:

Given the global urgency of decarbonizing heavy industry, the co-editors welcome contributions from scholars and industry practitioners around the world who work at the intersection of industrial and mining engineering, sustainable finance, information systems, and energy policy. The contributions will provide a critical analysis of both the technical and financial hurdles facing industrial hydrogen adoption and the opportunities created by co-located green hydrogen production near mines, factories, and processing plants.

Due to the interconnected and intricate nature of the topic, the editors encourage contributors to take a multidisciplinary approach and particularly welcome comparative and sector-specific case studies. Furthermore, we seek chapters that incorporate case studies or comparative studies to illustrate the evolving nature of hydrogen use in sustainability. We encourage authors to critically analyze the relevance of their contributions at different levels – temporal, geographic, and sectoral. By doing so, authors will be able to reflect upon the possible hydrogen-related solutions to climate change across different contexts and scales.

Submitted chapters must be original and exclusively prepared for the book, with no part of the article having been published elsewhere. Finally, although the book can be used as a reference book in academic courses, it is not explicitly organized as a textbook.

POTENTIAL TOPICS FOR CHAPTERS:

1. **Understanding hydrogen in hard-to-abate industries**
    - Hydrogen as a transitional supplement versus a full replacement for fossil fuels
    - Limits of direct electrification in heavy industry and remote operations
    - Lifecycle emissions across hydrogen production pathways
    - Current market trends and industrial demand projections
2. **Engineering realities, on-site green hydrogen hubs, and digital governance**
    - Hydrogen-diesel dual-fuel retrofits and dedicated hydrogen internal combustion engines
    - Hydrogen-natural gas blending for industrial and mine ventilation heating
    - Hydrogen fuel-cell systems for mobile and stationary industrial applications
    - Co-locating green hydrogen production near factories, mines, and industrial plants
    - On-site hydrogen storage, refueling, and local distribution challenges
    - Cold-climate performance and operational reliability of hydrogen systems

- Hydrogen leakage, gas dispersion, combustion emissions, ventilation, and occupational safety risks
- Green Information Systems (Green IS), digital twins, and AI-enabled decision support for industrial microgrids
- Human-in-the-loop governance and autonomous safety monitoring in high-reliability industrial operations
- Alarm management, sensor reliability, and operator workload in hydrogen-enabled control rooms

3. **Financial hurdles, valuation, and capital mobilization**
    - Capital and operating cost trade-offs of staged retrofits versus full conversion
    - Real-options valuation under technical and price uncertainty
    - Stranded-asset risks, corporate borrowing costs, and debt covenants
    - Blended finance, green bonds, and project securitization for industrial hubs
    - Machine learning and predictive analytics for emissions measurement, reporting, and verification
4. **Policy, regulation, and community co-ownership**
    - Investment tax credits, subsidies, and Carbon Contracts for Difference (CfDs)
    - Updating industrial safety codes, permitting, and technical standards
    - Transition finance taxonomies, disclosure mandates, and greenwashing risks
    - Indigenous equity co-ownership, workforce retraining, and community benefit sharing
5. **Hydrogen at work: Sectoral and regional case studies**
    - Remote mining operations
        i. Surface mining
        ii. Underground mining
    - Green steelmaking, cement kilns, and chemical manufacturing
    - Heavy freight, maritime shipping, and industrial port clusters
    - Comparative regional experiences across North America, Europe, Asia, and Latin America

IMPORTANT DATES:

We currently anticipate the following timeline for the project:

- Abstract and CV submission deadline – **January 31, 2027**
- Selection of abstracts and notification to successful contributors – **February 28, 2027**
- After February 2027, the publisher's release forms will be forwarded to successful contributors
- Full chapter submission – **May 31, 2027**
- Revised chapter submission – **August 31, 2027**
- Manuscript delivery – **November 30, 2027**
- Publication (tentative date) – **Summer 2028** (tentative)

GUIDELINES FOR CONTRIBUTORS:

Submissions should be written in English using a non-technical writing style. The contributions may include diagrams/illustrations in order to present data, or photographs/figures (preferably in black & white) to better illustrate the topic of discussion. Submitted chapters should be original and exclusively prepared for the present book. No part of the article should be published elsewhere. Chapters must not exceed 8,000 words (including all references, appendices, biographies, etc.) and must use the APA 7th edition reference style.

To conform to the policies of Palgrave Macmillan on AI use (which you can read in full here: https://www.springernature.com/it/authors/publish-a-book/manuscript-guidelines) we do not accept AI models as authors of content, we require any use of large language models (LLMs) to be documented in an acknowledgement section, and we do not accept figures created by generative AI. Please note that all chapters will be checked for plagiarism and AI use.

Researchers and practitioners are invited to submit abstracts of no more than 500 words and a CV for each author. Abstract submissions are expected by **January 31, 2027.** Submissions should be sent via email to: hydrogen.book@concordia.ca

Authors will be notified about the status of their proposals and will be sent complete chapter guidelines by **February 28, 2027**. Full chapters are expected to be submitted by **May 31, 2027.**

Please note that there are **no submission or acceptance fees** for the chapters.

ABOUT THE EDITORS:

Thomas Walker[1]

Thomas Walker is a full professor in the Department of Finance at Concordia University in Montreal, Canada, and serves as Director for Special Projects at the Institute for Sustainable Finance (ISF) at Queen's University. Prior to his academic career, he worked for several years in the German consulting and industrial sector at such firms as Mercedes-Benz, Utility Consultants International, Lahmeyer International, Telenet, and KPMG. His research interests are in sustainable finance, banking, emerging risk management, and energy transition economics, and he has published over ninety journal articles and more than twenty-five books in these areas. Since 2021, he is the director of the Jacques Ménard - BMO Centre for Capital Markets at Concordia University and the Concordia University Research Chair in Emerging Risk Management (Tier 1).

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Mahmoud Alzoubi[2]

Mahmoud Alzoubi is an assistant professor cross-appointed in the Robert M. Buchan Department of Mining and the Department of Mechanical and Materials Engineering at Queen's University in Kingston, Canada, where he directs the Energy Efficiency Engineering Laboratory. He holds a PhD from McGill University and an MSc from the Masdar Institute in collaboration with MIT. Prior to joining Queen's, he served as a Physical Scientist at Natural Resources Canada (CanmetMINING) and worked in industrial engineering roles in the UAE and Jordan. His research addresses energy efficiency and mine decarbonization, with particular emphasis on hydrogen utilization and risk assessment in underground ventilation, gas-mixing dynamics, subsurface hydrogen leakage, and industrial thermal energy systems.

Shamel Addas[3]

Shamel Addas is Associate Dean (Research), Associate Professor, and Distinguished Research Fellow of Digital Technology at the Smith School of Business, Queen's University, in Kingston, Canada. He holds a PhD in Management (Information Systems) from McGill University, an MBA from Concordia University, and a BSc in Mechanical Engineering from the American University in Cairo, where his engineering thesis focused on the analysis and design of an automotive compressed natural gas (CNG) engine. Prior to his academic career, he worked in industrial manufacturing and operations engineering as Co-Founder and Director of Production at Altex Fibres Canada, Operations Engineer at Brello Manufacturing, and Process Analyst for the United Nations Development Programme (UNDP). Recognized as an Association for Information Systems (AIS) Distinguished Member, his research examines artificial intelligence (AI)–enabled decision-making, human-AI interactions, the behavioural impacts of information systems, real-time feedback ecosystems, and the governance of agentic technologies in high-reliability organizations. His work has been published in leading outlets such as *MIS Quarterly*, *Journal of Management Information Systems*, *Information Systems Journal*, *IEEE Transactions on Biomedical Engineering*, and *MIT Sloan Management Review*.

Simone Donders[4]

Simone Donders holds an MA in History from Concordia University, Montreal. Her research interests range from Irish country house architecture to biodiversity and transition finance. She has a passion for sustainability studies and supports the team at the Emerging Risks Information Centre (ERIC) as both an editor and research associate. Her work on biodiversity finance has been published by the Institute for Sustainable Finance (ISF) and Palgrave Macmillan.

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