Brazil Steel Research and Industrial Policy: Green Superpower Potential and the Charcoal Paradox

Prof. Fabio Miani
DPIA Department of Polytechnic Engineering and Architecture
University of Udine, Italy

November 2025

Abstract

This document examines Brazil's steel research and industrial policy from the perspective of a country with unique natural resource advantages for green steel production but facing significant policy development and implementation challenges. With 33.8 million tonnes of annual crude steel production, abundant renewable energy, high-quality iron ore, and charcoal production capability, Brazil possesses conditions other nations can only aspire to create artificially. However, this analysis reveals a concerning gap between potential and actualization: despite hosting COP30 in 2025 and announcing various decarbonization initiatives, Brazil lacks coherent sectoral policies, specific steel industry targets in its NDC, and coordinated implementation mechanisms. This document explores Brazil's technology mix combining charcoal-based blast furnaces (unique globally) with conventional coal-based production and growing EAF capacity, innovative projects like Boston Metal's molten oxide electrolysis commercialization and CSN's Selene hydrogen initiative, the Industrial Deep Decarbonization Initiative participation, and the structural weaknesses in university-industry collaboration despite abundant research capacity. The analysis highlights how Brazil exemplifies the challenge of translating natural advantages into industrial leadership without policy coherence and institutional capacity.

Contents

Acknowledgments

This analysis synthesizes publicly available research and policy documents with analytical support from AI systems including Anthropic Claude. All interpretations remain the author's responsibility.

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