



Regulation of Green Hydrogen: Analysis of Bills and Their Scope

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ABSTRACT

The present work aims to analyze the Bills presented regarding the topic of the Implementation of Green Hydrogen as a new sustainable and renewable energy source. Throughout the text, topics such as the quality of hydrogen to be used, incentives for research, development of production, regulation, inspection, and production of green hydrogen are addressed. In addition, it analyzes and gathers the ideas present in existing Bills s to unify clear guidelines on the production, use, transport, storage, and trade of this resource.

Keywords: Green hydrogen, Regulation

INTRODUCTION

The growing concern about climate change and the need for a low-carbon economy are driving the search for cleaner energy sources. Decarbonized hydrogen emerges as a promising solution, especially in Brazil, which has great potential to become a leader in green hydrogen production. Regulation of low-carbon hydrogen production is crucial to ensure legal certainty and attract investments. Recently, the Brazilian government approved a legal framework to encourage the production of low-emission hydrogen, including renewable technologies such as electrolysis and biomass, and established guidelines for certification and tax incentives for companies in the sector. Regulation is crucial not only for the economy but also to define sustainability standards and reduce greenhouse gas emissions. Clear public policies can develop a robust hydrogen industry, meet domestic demand, and position Brazil as a competitive exporter. Additionally, it can boost innovation and research, improving efficiency and reducing costs, which are essential for the economic viability of the new energy matrix.



MATERIALS AND METHODS

The study is exploratory, using the understanding of low-carbon green hydrogen production and the Bills and laws related to the production of decarbonized hydrogen.

WHAT IS DECARBONIZED HYDROGEN

Decarbonized hydrogen, also known as clean hydrogen, is produced with little or no CO₂ emissions. It includes green hydrogen, obtained through the electrolysis of water using renewable energy (solar, wind, hydro), and blue hydrogen, generated by steam reforming of natural gas with carbon capture and storage (CCUS). Pink hydrogen is produced by electrolysis of water using nuclear energy, serving as a low emission but non-renewable alternative. Other emerging routes, such as those from biomass and waste, can also be decarbonized. The adoption of decarbonized hydrogen is crucial for the energy transition and climate change mitigation, especially for sectors that are difficult to electrify, despite challenges related to cost and infrastructure. In this context, this article aims to discuss the need and importance of regulating the production of decarbonized hydrogen in Brazil, analyzing the public policies already approved and their implications for the future of the national energy sector.

ASPECTS ANALYZED

Several important aspects need to be analyzed regarding the approved and pending Bills that will be presented below:

A. Investments in Research

The approved Bill 2308/2023 outlines the investments that will be made for economic subsidies in the commercialization of low-carbon hydrogen, specifically in Articles 27, 28, 29, 32, and 33. Additionally, Bill 1878/2022, which is still under consideration, presents an interesting idea regarding incentives for the development of the green hydrogen sector, specifically in Articles 12 and 13.

B. Tax Incentives Through Credits

The Bill 2308/2023 approved the idea of granting a tax credit for the Social Contribution on Net Profit (CSLL) applicable to the purchase and sale operations of low-carbon hydrogen and its derivatives produced in the country, provided that the projects promote technological development and contribute to regional development, industrial diversification, and damage reduction and adaptation to climate change. The credit will be granted within 60 days of the issuance of the sales



invoice and can be used to pay any federal tax. However, if there is insufficient debt for compensation, the credit will be refunded in cash. Nonetheless, the benefit cannot exceed R\$1.7 billions in 2028, R\$2.9 billion in 2029, R\$4.2 billion in 2030, R\$4.5 billion in 2031, and R\$5 billion in 2032, and it must be included in the Union Budget.

C. Incentives Present in Bills

The Bill 1880/2022, which is still under consideration, also presented ideas for creating incentive programs for the large-scale production of fuel cells, aiming to leverage the potential of hydrogen, ethanol, and biogas value chains to promote the development of this energy source, specifically in Articles 3 and 4.

D. Development for Production

The Bill 2.308/2023 establishes the National Low-Carbon Hydrogen Policy, which includes the National Hydrogen Program, the Low-Carbon Hydrogen Development Program (PHBC), the Brazilian Hydrogen Certification System, and the Special Incentives Regime (Rehidro). The guidelines will be defined by the Management Committee of the National Hydrogen Program (Coges-PNH2), which will include representatives from federal agencies, states, the scientific community, and the productive sector. The ANP – National Oil Agency will be responsible for authorizing the production, import, transport, export, and storage of hydrogen, which can only be produced by Brazilian companies.

The Bill 3173/2023, still under consideration, also proposed the development of production through the creation of a new program called Prohidroverde, which effectively serves the same purpose as the already approved Low-Carbon Hydrogen Development Program (PHBC). The text is presented in:

Article 1: The Prohidroverde – National Green Hydrogen Program is established to promote the production, distribution, and use of hydrogen generated from solar, wind, biomass, biofuels, gases produced in landfills, and other renewable sources that may be created.

Article 2: The Prohidroverde aims to:

I – promote the production of clean energy, including, when applicable, through tax incentives and public financing with differentiated rates;



II – encourage research related to the development of clean energy;

III – create and structure clean energy study centers throughout the national territory;

IV – widely disseminate the advantages of using clean energy.

E. Hydrogen Certification

The Bill 2.308/2023 also establishes the Brazilian certification system, which will be carried out by a competent authority that certifies the characteristics of the production process, the inputs used, the location of production, information about the hydrogen life cycle, and the amount of carbon dioxide emitted (Articles 15, 22, 23, 24, 25).

F. Monitoring Green Hydrogen

The monitoring and production of Green Hydrogen is a topic addressed in detail in Bill No. 2308/2023, which has already been approved, and in Bill No. 1878/2022. Both bills are based on amending Law No. 9,478/1997, which is the current law governing national energy policy, the activities related to the oil monopoly, the establishment of the National Energy Policy Council, and the National Petroleum Agency, among other provisions. Thus, the main changes proposed in Bill 2.308/2023 are in Articles 34 and 35.

On the other hand, Bill 1878/2022 also aims to modify Law No. 9,478/1997; however, in different articles and sections from the already approved bill, the proposed changes are in Articles 7 and 8.

G. Green Hydrogen Production In The Vision of Bill 1878/2022

The highlight of Bill 1878/2022 is found in Chapter V regarding the production of Green Hydrogen, which, unlike the other Bill, focuses on the companies or consortia of companies interested in engaging in the economic activities of Green Hydrogen production.

CONCLUSION

This article analyzes the Bills regarding the implementation of green hydrogen as a sustainable energy source in Brazil, addressing quality, incentives, regulation, monitoring, and production. The study seeks to unify guidelines for the production, use, transport, storage, and commercialization of green hydrogen, highlighting Bill 2.308/2023 as the



main regulatory framework for the production of low-emission hydrogen, including that obtained from biomass and water electrolysis using renewable energies. Although the other analyzed bills have not been approved, their contributions could complement Bill 2308/2023, particularly concerning tax incentives and support for companies wishing to economically produce green hydrogen. In summary, this work emphasizes the importance of ecological transition and the sustainable use of Brazil's natural resources, highlighting the need for clear regulation regarding green hydrogen. The absence of specific regulatory frameworks may hinder investments and innovations, making government support essential to create a favorable environment for the development and adoption of green hydrogen.

ACKNOWLEDGMENT

Authors 2 and 3 would like to thank CNPq - National Council for Scientific and Technological Development for their financial support.

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