Policy Brief

02/12/2024

Tomas de Coninck

Verde Para Todos ("Green for Everyone")

Working towards a Fair Green Hydrogen Partnership between the Port of Pecém and the Port of Rotterdam

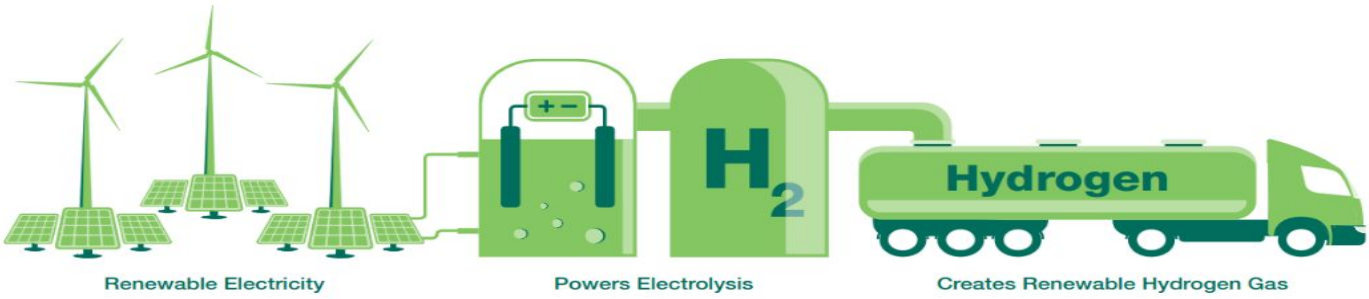
Introduction

On May 10, 2023, the Port of Pecém in Ceará, a northeastern state of Brazil, and the Port of Rotterdam signed an agreement to establish a Brazilian-Dutch 'Green Hydrogen Corridor' (Port of Rotterdam, 2023). This partnership brings together both ports and several prospective green hydrogen (GH2) producers—AES Brasil, Casa dos Ventos, Nexway, and Fortescue—to develop an end-to-end GH2 supply chain. The supply chain will include hydrogen production at Pecém and its receipt and distribution at Rotterdam. Through the corridor the partnership aims to accelerate Europe's energy transition by supporting decarbonization goals while fostering sustainable development in Ceará. This collaborative initiative aspires to create mutual benefits, presenting a win-win scenario for both regions (Port of Rotterdam, 2023).

Port of Rotterdam (2023)

Significant developments are currently taking place within Ceará to establish the infrastructures necessary for GH2 production and its export to Rotterdam. These projects require a lot of land, water and energy. Among these new infrastructures are hydrogen pipelines, renewable energy generation projects (such as wind parks and solar farms), and port expansions. However, such large scale infrastructure projects have historically been linked to negative impacts on local populations and the environment in which they are sited. The rapid expansion of GH2-related infrastructure in Ceará raises concerns about potential social and environmental consequences for the region (de Andrade Meireles et al., 2013; Freitas, 2006; Gorayeb et al., 2016 Meireles et al., 2018).

How is the Pecém-Rotterdam partnership addressing these impacts and risks? To contribute meaningfully to sustainable development in Ceará, the partnership must prioritize ensuring that the benefits and risks of GH2 production and export are equitably distributed among all segments of the Cearense population. By integrating principles of inclusivity and ensuring the equal recognition of all societal groups in the development plans for the 'GH2 Corridor,' the partnership can lay the groundwork for an energy transition that is not only green but also just. Under these premises, the Pecém-Rotterdam partnership has the potential to serve as a model for equitable and sustainable energy transitions, creating a true win-win scenario that benefits both regions and fosters long-term success.



Flowserve (2022)

About the Study

This document provides an evaluation of the Pecém-Rotterdam partnership in their development of a Brazilian-Dutch 'GH2 Corridor'. It seeks to examine how the partnership contributes to fair and inclusive sustainable development for the region of Ceará. It will provide limitations and recommendations for the partnership's practices. The document draws from the MSc thesis on Energy Justice within the Pecém-Rotterdam GH2 partnership by de Coninck (2024), provided in the annex. In this study qualitative analysis was done by conducting stakeholder/expert interviews, observations at GH2 events, a field visit to the Port of Pecém, and an extensive document analysis.

Green Hydrogen

Hydrogen is an energy carrier that can be used to store, move and deliver energy produced from other sources. It is a low-carbon energy fuel, which in opposition to other energy fuel processes, such as burning natural gas, does not release high amounts of carbon dioxide in its production process (IEA, 2023).

Hydrogen can be produced from a variety of resources, such as natural gas, nuclear power, biogas and renewable power (e.i. wind or solar). When renewable energy resources are used to produce hydrogen it is called green hydrogen (GH2). In this process hydrogen is created by utilizing electricity to operate an electrolyzer, which separates hydrogen from water molecules. The low amount of carbon dioxide that is released throughout the production process makes GH2 a useful energy source for the energy transition (IEA, 2023).

Pecem (2020)

Main Findings

Economic over Social Priorities

The Pecém-Rotterdam GH2 partnership is mainly seen by actors as a business opportunity. For this reason, economic considerations are found to be prioritized by its actors over social considerations. A Port of Rotterdam manager indicated, for instance, that it is too early to integrate energy justice, which looks at the ways in which energy transitions can create or exacerbate existing inequalities between social groups, in the plans and decision-making in the Pecém-Rotterdam GH2 corridor. Although the manager indicated that energy justice is definitely something they want to integrate in the future, they did not think that it was feasible yet.

> ***"There are too many other problems in the field of economic feasibility to worry about that right now."***
>
> - Port of Rotterdam Manager

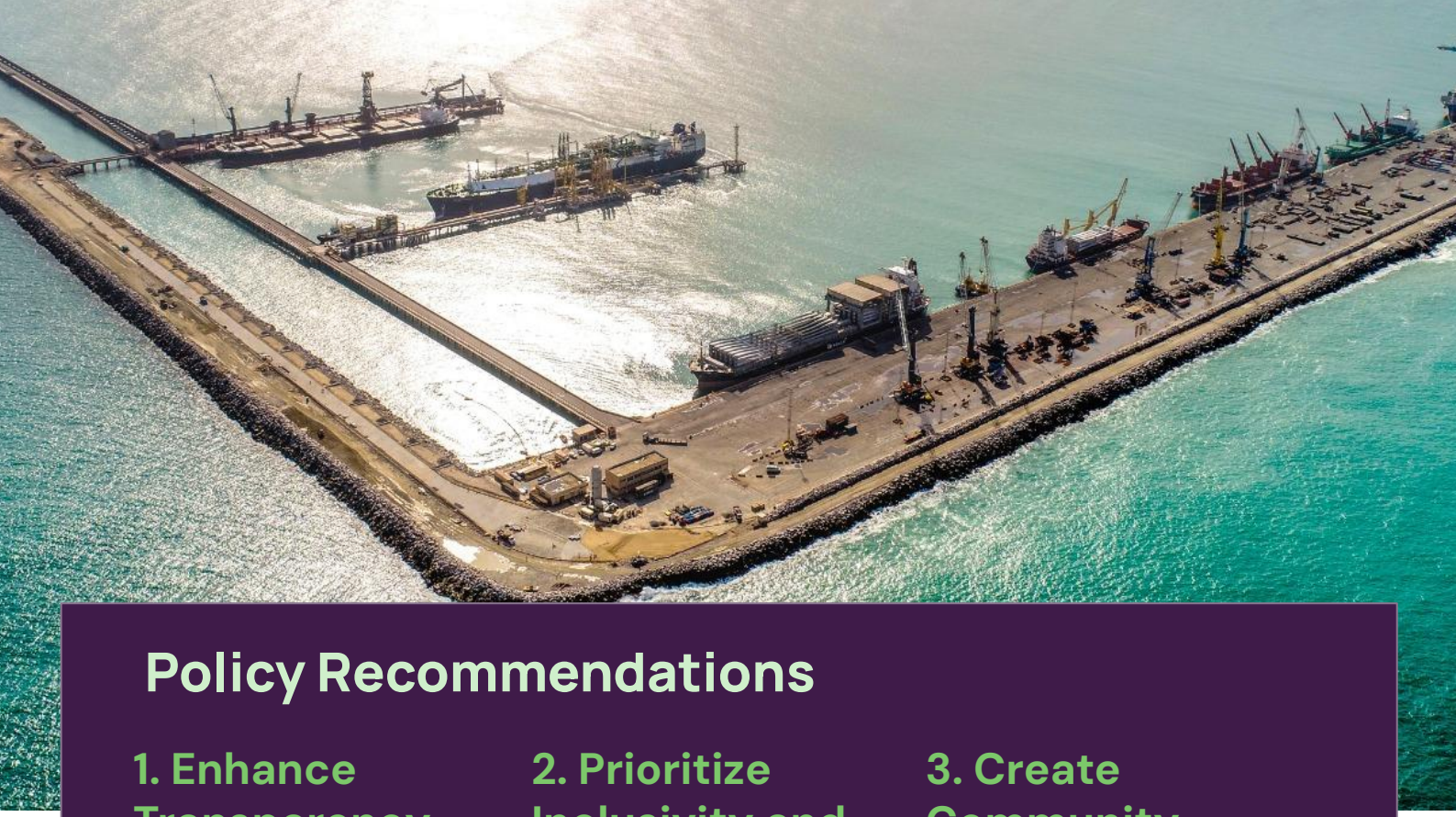
Failing to integrate social and justice concerns during the early development of the GH2 corridor could have harmful consequences. The prospects of the Pecém-Rotterdam GH2 corridor have spurred significant demand for renewable energy, leading to the planning and construction of numerous on- and offshore wind farms in Ceará. These projects have sparked conflicts with indigenous, maroon and fishing communities that live near these proposed sites, who have raised concerns about the considerable impacts on the livelihoods of these communities. Reported impacts include increased violence and drug trafficking, diminished fishing opportunities, and rising living costs, such as higher energy expenses. State authorities have faced criticism for inadequately addressing these issues during the wind farm licensing process (Gorayeb et al., 2024).

As a result, doubt remains whether the partnership can genuinely contribute to inclusive sustainable development if it fails to address the unequal distribution of the negative impacts associated with the GH2 industry's expansion in Ceará.

Development for Whom?

In addition, the Pecém-Rotterdam GH2 partnership states that it will bring considerable development to the state of Ceará through job opportunities, income opportunities, and private investments. They, for instance, say that 80.000 jobs will be created by the future Pecém-Rotterdam 'Green Hydrogen Corridor'. These protections have questionable prospects, as most of the jobs that will be created are only temporary (Caiafa et al., 2023). After the construction phase of green hydrogen (GH2) industries there will be only a limited amount of jobs available in the sector, as they will only need a small number of mostly high-skilled employees to operate them. This may leave lower-educated segments of the population without long-term employment opportunities in the sector, leaving most of the benefits with higher-educated segments of the population. Consequently, the Pecém-Rotterdam GH2 corridor could increase the already existing inequalities in the state of Ceará, increasing inequality in income opportunities between lower- and higher-educated segments of the population.

Despite these concerns, the partnership itself does not yet provide clear plans to ensure that more disadvantaged groups within Cearense society benefit from the Pecém-Rotterdam GH2 corridor. While the Cearense government has taken some steps to promote inclusivity, greater transparency from the partnership would help clarify its specific contributions and commitments. Developing accessible documentation that outlines the partnership's role in the GH2 corridor could enhance understanding and confidence in how the benefits and risks are being managed and distributed.



Policy Recommendations

1. Enhance Transparency and Accountability

The partnership should develop a detailed and publicly accessible document outlining the processes for future GH2 corridor developments. This document should explicitly address how social and justice concerns will be integrated into planning and implementation to ensure inclusive and equitable outcomes.

2. Prioritize Inclusivity and Energy Justice Principles

Together with Dutch and Brazilian public actors the partnership should engage with social and justice considerations in early development stages of the GH2 corridor. This approach will help ensure a fair partnership, with clear strategies for equitable distribution of benefits and fair compensation for any negative impacts. Addressing social and justice issues from the beginning will be key to fostering an inclusive and sustainable energy transition

3. Create Community Benefit Initiatives

Programs like *Renda do Sol*, which involve low-income families in community solar microgeneration projects, demonstrate how benefits can be more equitably distributed across different groups within Cearense society (Governadora do Estado do Ceará, 2020). Building on such initiatives and establishing similar programs through public-private collaboration between the partnership and local government can enhance inclusivity and ensure a fairer distribution of the benefits derived from GH2 developments in Ceará.

Author:
Tomas de Coninck

Disclaimer:
This brief was developed as part of the partial fulfilment of the Master's program International Development Studies at Utrecht University. The Author conducted 6 in-depth interviews, in combination with events' observations, and a document review from February till June. The author reports no conflict of interest.

Universiteit Utrecht

References

de Andrade Meireles, A. J., Gorayeb, A., da Silva, D. R. F., & de Lima, G. S. (2013). Socio-environmental impacts of wind farms on the traditional communities of the western coast of Ceará, in the Brazilian Northeast. *Journal of Coastal Research*, (65), 81-86.

Caiafa, C. R., Pereira, A. O., Romijn, H., & de Coninck, H. (2023). Can green hydrogen exports contribute to regional economic development? Exploring scenarios from the Dutch-Brazilian green hydrogen corridor for the state of Ceará (No. 667). WIFO Working Papers.

de Coninck, T. (2024). Energy Justice in Green Hydrogen Partnerships: a Case Study of the Pecém-Rotterdam Green Hydrogen Corridor. [Master's thesis]. Utrecht University. [not available online yet]

Freitas, K. S. (2006). Impactos socioeconômicos do complexo industrial e portuário do Pecém (CIPP) sobre os pescadores artesanais do Pecém, São Gonçalo do Amarante, Ceará [Master's thesis]. Federal University of Ceará. https:// repositorio.ufc.br/handle/riufc/43519

Gorayeb, A., Mendes, J. D. S., Meireles, A. J. D. A., Brannstrom, C., da Silva, E. V., & de Freitas, A. L. R. (2016). Wind-energy development causes social impacts in Coastal Ceará state, Brazil: the case of the Xavier Community. *Journal of Coastal Research*, (75), 383-387.

Governadora do Estado do Ceará. (2020). *Plataforma Ceará 2050. Programa Estratégico: Renda do Sol.* Governo do Estado do Ceará.

IEA. (2023). *Global Hydrogen Review 2023*. International Energy Agency. https://www.iea.org/reports/global-hydrogen-review-2023

Meireles, A. J. D. A., Melo, J. A. T., & Said, M. A. (2018). Environmental injustice in Northeast Brazil: the Pecém industrial and shipping complex. In *Environmental Impacts of Transnational Corporations in the Global South* (pp. 171-187). Emerald Publishing Limited.

Port of Rotterdam. (2023, May 11). #WHS2023: Havens Rotterdam en Pecém (Brazilië) sluiten aan bij Braziliaans-Nederlandse samenwerking. *Port of Rotterdam*. Retrieved on the 28th of January.

Figures

Flowserve (2022, March 29). Pumping up Green Hydrogen Production for the Energy Transition. *Empowering Pumps*. Retrieved on the 3th of July.

PECEM, Complexo Industrial e Portuário, Port of Rotterdam e Governo de Estado Pará (2020).

Port of Rotterdam. (2023, May 11). #WHS2023: Havens Rotterdam en Pecém (Brazilië) sluiten aan bij Braziliaans-Nederlandse samenwerking. *Port of Rotterdam*. Retrieved on the 28th of January.