Science Diplomacy’s role in promoting Energy Transition: The RCGI’s case

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# Overview

 Energy transition, as understood currently as a period where the world's energy production and consumption will transition from fossil fuels to renewables, has become one of the main topics of discussion regarding combating climate change. This process, deemed irreversible to some if immediate action does not take place, has been fueled by carbon emissions in the past 150 years, notably from the energy sector. Therefore, energy transition is a necessity to reduce, neutralize and offset those emissions. Although the world suffers from a myriad of socioeconomic and geopolitical problems, climate change still looms large as the biggest threat. Meanwhile, science diplomacy is a practice in which governments and scientific institutions either make alliances and connections through scientific innovations or promote scientific breakthroughs in order to form diplomatic ties. Also, science diplomacy could be described as a bridge to unify human knowledge towards fighting global problems. Such was the case with the Covid pandemic.

However, climate change is the main global issue. Science diplomacy initiatives might be the key to unlock effectives ways to mitigate this problem, as it can help promote and spread new technologies and policies that accelerate energy transition. Doing so, could result in the achievement of multilateral environmental goals like the National Determined Contributions (NDCs). Taking that into consideration, this present work aims to illustrate an example case from the Research Center for Greenhouse Gas Innovation (RCGI), an organization from the University of São Paulo (financed by local government sponsors and Shell). With over 70 projects regarding innovations in the energy sector, RCGI has been fulfilling its purpose to develop, promote and disseminate new technologies that can contribute to energy transition. Our main goal is to demonstrate how RCGI’s strategy in science diplomacy is bearing fruits in the center’s expansion and integration with other Brazilian centers and also foreign ones.

**Methods**

RCGI’s projects have the stated mission to help and improve energy transition technologies in terms of usage and efficiency, specifically to help these developments in its state in Brazil, São Paulo, but also the rest of the country. For that purpose, this work will aim to evaluate how RCGI’s projects help Brazil’s diplomacy and energy sector to achieve its NDCs goals. As a multilateral target set by the Paris Agreement, which makes it mandatory and legally binding, the NDCs are also an index that can measure a country's commitment and success in dealing with climate change. RCGI’s projects deal with energy innovations that should aid mitigation of greenhouse gas emissions, evaluate how they can contribute to achieve the NDCs targets are an invaluable tool to verify this importance.

 The first step of this work is describing what are Brazil’s NDCs’ targets and how they have changed in the past decade, as governments passed, and priorities switched. Next, we focused on RCGI’s main projects, focusing on those whose priorities are the development of techniques and practices that can be used to forward energy transition. These include Nature Based-Solutions (NBS); Bioenergy, Greenhouse Gas and Decarbonization. The third step, based on the previous findings, is to determine how these projects can be used through science diplomacy initiatives, particularly in two aspects: Science Promotion and Divulgation, then, RCGI’s potential to influence public policies in the energy sector, as the center gains more leverage and value amongst public and private sectors.

# Results

After just eight years since its foundation, RCGI’s achievements prove the center’s success. Besides its numerous publications and patents, RCGI has formalized almost one-hundred partnerships among other Brazilians and foreigners’ institutions and enterprises, totaling 57 partners in Brazil and 40 international partners. Recently, at the beginning of 2024, RCGI also inaugurated an outpost in Amsterdam, a city that has become synonymous with energy transition, solidifying its international network. Meanwhile, Brazil’s NDCs targets are currently set at 37% reduction from 2005 until 2025. The next target is 50% from 2005 until 2030. Currently, it is not expected that Brazil will fulfill these goals at those specific dates. Therefore, a window of opportunity presents itself for RCGI’s to expand its influence, which may happen if RCGI projects underline their usage for Brazil’s NDCs goals. The most crucial step for this is to reinforce its advocacy sector, which can illustrate both the importance of energy transition and the RCGI’s ability to promote it.

**Conclusions**

 As the main driver for climate change mitigation, energy transition as a whole needs to be promoted and incentivized before it becomes just another term devoid of true meaning, which happened to other concepts. Ever Ideas need to be planned with previous goals already defined. RCGI has the tools and expertise to contribute to this environment, but more studies regarding their effectiveness in contributing to Brazil’s NDC’s targets are necessary. Ventures like biofuels usage in heavy trucks, an automobile fleet fueled by both flex engines and hydrogen power cells and development of a CCSU infrastructure are decisive for Brazil’s accomplishments on global agendas like not only NDCs, but also Net-Zero and Sustainable Development Goals (SDG). Investments in research centers such as RCGI and others are one fundamental step, but more is needed. That’s where science diplomacy will play a critical function to attain positive public perception of those new technologies. Only then, true energy transition towards decarbonization can truly be possible.

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