RENEWABLE ENERGY AND GREEN EXTRACTIVISM: TRANSITIONS OR RECONFIGURATIONS?

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Abstract

This article discusses the implications of projects implemented by corporations in the energy sector based on their use of the notions of energy transition, decarbonization and renewable energy. We analyzed documents from business organizations, civil society, the Brazilian government and the United Nations containing data and representations regarding wind power projects and the production of green hydrogen. Interviews were also conducted with women from the quilombola community in Cumbe, located in the municipality of Aracati, in the Brazilian Northeastern state of Ceará, who have been affected by a wind power project. We have sought to develop an analysis that contrasts, on the one hand, the discourse of multilateral institutions and corporations that justify so-called clean energies as a means of combating climate change and, on the other, the perceptions of populations affected by a wind energy project in terms of the impacts and meaning they attribute to such projects.

Keywords

Energy Transition; Renewable Energy; Wind Power; Green Hydrogen; Climate Change; Green Extractivism; Environmental Conflict.

ENERGIA RENOVÁVEL E EXTRATIVISMO VERDE: TRANSIÇÃO OU RECONFIGURAÇÃO?

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Resumo

O artigo discute as implicações de projetos implementados por corporações do setor energético a partir do uso que fazem das noções de transição energética, descarbonização e energia renovável. Procedemos à análise de documentos de organizações empresariais, da sociedade civil, do governo brasileiro e das Nações Unidas com dados e representações sobre projetos de eólicas e de produção de hidrogênio verde, assim como entrevistas realizadas com mulheres da Comunidade Quilombola do Cumbe, localizada no município de Aracati/Ceará, atingida por um projeto de energia eólica. Procuramos desenvolver uma análise que coloque em relação contrastiva o discurso de instituições multilaterais e empresariais que justificam as energias ditas limpas como meio de combate às mudanças climáticas e, por outro lado, a percepção de populações atingidas por um projeto de energia eólica quanto aos impactos e ao sentido que atribuem a tais projetos.

Palavras-chave

Transição Energética; Energia Renovável; Eólicas; Hidrogênio Verde; Mudança Climática; Extrativismo Verde; Conflito Ambiental.

RENEWABLE ENERGY AND GREEN EXTRACTIVISM: TRANSITIONS OR RECONFIGURATIONS?[1]

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If this is clean energy, I can't imagine what dirty energy would be like

Cleomar Ribeiro da Rocha, Quilombola Member and Fisherwoman in the Territory of the Quilombola in Cumbe[2]

1. Introduction

The environmental debate on an interactional level has increasingly focused on the topic of climate change and political and technological strategies, justified by the need to reduce greenhouse gas (GHG) emissions. Multilateral and business institutions have proposed to adopt energy transition processes, either using or encouraging the use of so-called renewable energies through financial instruments and the logic of compensation. Among their investment strategies and the environmental self-legitimization of their practices, large corporations have become involved in production projects of green hydrogen obtained from the construction of wind farms, characterized as a renewable and clean energy source.

Within the scenario of the corporate appropriation of the climate debate, investments in solar and wind energy have soared, following what has been called "the new promise of green hydrogen", the "fuel of the future" allegedly intended to reduce carbon emissions and to put a halt to climate change (Faber, 2023). Brazil, in particular, ranks as the 6th largest wind energy producer worldwide (Abeeólica, 2022), with 85% of these projects concentrated in the Northeast Region (Agência

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2. This and all non-English citations hereafter have been translated by the authors.

Brasil, 2023). A study published by the German consultancy Roland Berger, in January 2023, projected that green hydrogen is to become the main source of energy on the planet, with the Brazilian market potentially generating 150 billion BRL per year, of which, more than 60% will come from exports (Soares, 2023). This fuel has increasingly been presented as a viable alternative to replace fossil fuels and, based on which, Brazil could adopt a leading position in the energy transition. These estimates and projections surrounding hydrogen have often been used to characterize a process called the "new green revolution" (Faber, 2023).

Thus, with the advancement of climate agreements, and particularly after the geopolitical consequences of the war between Russia and Ukraine, alongside the expansion of the conventional energy frontier of oil, gas and coal, the notion of renewable energy has been appropriated by corporations to legitimize and expand control over the energy market, imposing so-called energy transition policies and projects, presented as instruments to combat climate change. With a focus on proposals for technical changes, the energy transition discourse seems to be part of the logic of the socio-ecological modernization of capitalism (Acselrad, 2022), which seeks to present itself as being committed to defending the environment, confronting climate change and combating poverty. Hence, the strategy would no longer be to deny the harmful effects of extractive capitalism, but rather to affirm the complementarity between forms of energy and the ability of wind farms to offset the negative impacts of industrial activities based on conventional energy.

Within the specific territories where energy infrastructure has been installed, projects such as large onshore and offshore wind farms, from which the so-called "green hydrogen" may be produced, have, in turn, been brought into question by the affected communities, movements and social organizations. Due to the negative socio-environmental implications they cause, their dimensions, the impacts caused by their installation processes, the privatization of territories, among other forms of damage, these groups have been forced to call into question the very notion of renewability (Furtado; Paim, 2020; Instituto Terramar, 2021). The critical perspective of the affected groups thereby questions the understanding of energy as an exploitable natural resource, dissociated from the social relations involved in its production, use, distribution and management of its effects. This questioning has certain implications for how the notions of renewable energy and energy transition are used.

Hence, this text discusses the implications of projects implemented by corporations in the energy sector based on their use of the notions of energy transition, decarbonization and renewable energy. We have sought to develop an analysis that contrasts the discourse of multilateral and business institutions, which justify so-called clean energy as a means of combating climate change, and,

on the other hand, the perception of populations affected by a wind energy project in terms of the impacts and the meaning they attribute to such projects.

To this end, we have analyzed documents from business organizations, civil society, the Brazilian government and the United Nations, containing data and representations on wind farm and green hydrogen production projects, as well as interviews conducted with women from the quilombola community in Cumbe, located in the municipality of Aracati in the Northeastern Brazilian state of Ceará, affected by a wind energy project. The empirical material used for our investigation has been taken from the activities of the *Intercâmbio entre Mulheres em Defesa do Território-Corpo-Terra-Águas* [Exchange between Women in Defense of the Territory-Body-Land-Water] in Chapada do Apodi and Foz do Jaguaribe in the state of Ceará, carried out during the extension courses "Feminist Rights and Knowledge in Times of Pandemic", held in 2021, and "Women in Defense of the Territory-Body-Earth", in 2022[3]. Based on statements collected at that time, we seek to demonstrate how the so-called "energy transitions", as in the case under study, instead of favoring a rupture, may actually bring about a continuity of the activities of extracting and exporting resources from territories, as well as the generation of environmental conflicts. This, together with readings on other wind farm projects in Ceará (Faustino, Tupinambá; Meirelles, 2023), has also helped us to reflect on how the energy transition may favor a possible intensification of the race for land and territory.

2. Energy transition and green extractivism: complementation and compensation

The article is structured as follows: a brief introduction presents the topic, objectives and methodology; in part 2 we bring together data on the evolution of energy production and green hydrogen projects as part of the discourse on energy transition, evoked by intergovernmental and business institutions in order to justify, in Global South territories, the adoption of technologies presented as a solution for the global climate crisis; in part 3 we address the territorial implications of a wind farm belonging to the company CPFL Renováveis on the community in the Cumbe quilombola, taking into account the notion of climate eco-governmentality; in the final considerations, we problematize the environmental justifications of the energy transition in light of the spatial practices of companies producing so-called clean energy.

3. These courses were promoted by the Postgraduate Program in Social Sciences in Development, Agriculture and Society (CPDA) at the Universidade Federal Rural do Rio de Janeiro (UFFRJ), with the support of the Rosa Luxemburg Foundation.

The debate on the energy transition has taken place, with particular force, within the context of climate agreements and policies, particularly the United Nations Framework Convention on Climate Change (UNFCCC), based on the consensus established and disseminated by the Intergovernmental Panel on Climate Change (IPCC) that dependence on fossil fuels is the main cause of climate change (IPCC, 2023). First, it should be highlighted that despite isolated initiatives taken with the allegation of seeking to reduce investments in fossil energy and to diversify energy production, hydrocarbons and coal continue to predominate in the discourses and practices of the dominant agents. The percentage of fossil fuels in the global energy matrix has remained at around 80% for decades (International Energy Agency, 2022b). According to the IPCC Sixth Assessment Report, released in March 2023, the contribution of fossil fuels in 2019, in terms of all CO2 emissions in the economy, was: coal 33%, oil 29% and gas 18%. Furthermore, public and private financing for fossil fuels in the world continues to rise, reaching an average of USD120 billion per year in the energy sector, surpassing investments in so-called climate adaptation and mitigation policies between 2019 and 2020. For comparison, actual global public funding for adaptation was USD 46 billion (IPCC, 2023). Studies reveal that plans to extract fossil fuels in the world, if implemented, would lead to exceeding the set target of 1.5 ºC of warming. By 2030, corporations in the sector will have extracted 120% more fossil fuels than they should have done (UNEP, 2019). In the case of Brazil, it is important to mention the meeting promoted by the National Bank for Economic and Social Development (BNDES) in October 2023, "Pathways for Fair Energy Transition in Brazil", which, based on speeches by the president of the bank, Aloizio Mercadante, the governor of the state of Amapá, Clécio Luiz and the president of Petrobras, Jean Paul Prates, revealed the need to open a new oil exploration frontier on Brazil's northern coast (Climainfo, 2023).

At the same time, according to the IPCC Report (2023), it would be necessary to drastically reduce dependence on fossil fuels in energy production and switch to widespread electrification using renewable energy. Among the energy sources mentioned, including in terms of reducing costs, which could now compete with fossil fuels, were solar energy, onshore and offshore wind energy and lithium-ion batteries. A previous IPCC report had stated that "[E]nergy transitions can provide solutions to many global issues, including efforts against climate change, the achievement of sustainable development, and improvement of human wellbeing, [...] creating a dynamic and inevitable path" (UN, 2021, p. 12).

Thus, two weeks before the 26th Conference of the Parties (COP26) of the UNFCCC, held in 2021, the Global Wind Energy Council and more than 90 other parties – what the Council called "global leaders" – launched an alert that: "Annual wind installations need to scale up by four times current levels to reach net zero

by 2050"[4] (Abeeólica, 2022, p. 2). Zeroing net emissions, a central concept today in meeting CO_2 emission reduction targets in climate agreements, signifies reaching the point where all greenhouse gas emissions caused by human activity are "balanced" by removing or capturing carbon from the atmosphere. In other words, according to this logic, it will not be necessary to reduce all emissions caused by "human" activities, such as those resulting from the burning of fossil fuels or vehicles. Emissions that continue to be generated may be "balanced" or "compensated" with the equivalent amount of carbon removal or capture (Furtado, 2021b).

Although the Brazilian Wind Energy Association (Abeeólica) stated that "the energy transition needs to be much faster", by the end of 2021, wind energy in Brazil had 795 plants and 21.57 GW of installed power; an increase of 21.53% compared to December 2020. In 2021, 110 new wind farms were installed and 1 was revoked, for a total of 3.83 GW of new capacity, representing a record in terms of wind power installation in Brazil. Wind energy was the source of electrical energy that grew the most in 2021; the second was solar photovoltaics, with 17.95%. The new wind capacity installed in 2021 brought the source to a share of 11.8% of the Brazilian electricity matrix by the end of 2021 (Abeeólica, 2022), behind hydroelectric energy (56.8%) and natural gas (12.8%). The Brazilian government is proud to state that "the Brazilian electrical matrix is based on renewable energy sources, unlike the global electrical matrix" (EPE, 2022).

According to the Global Wind Energy Council (GWEC), Brazil ended 2021 as the third country worldwide to install the most wind farms, thereby ranking sixth in terms of installed capacity. It received USD 5.15 billion (BRL 27.81 billion) in investments for the wind sector, representing 44% of investments made in renewables (solar, wind, agrofuels, biomass and waste, PCH and others) (BNEF, 2023).

Many of these wind farm projects are directly related to the possible export of green hydrogen, especially to the European Union. Concisely, without entering into technical details and chemical specificities, hydrogen production may be cataloged into two large groups: a) as part of the industrial hydrocarbon processes (including the petrochemical industry) through the processing of natural gas, oil or coal and, b) through electrolysis, using electricity to separate hydrogen from oxygen in water, which is the raw material for the process (Pérez Macías, 2021). Hydrogen is a colorless gas, although there are around nine color codes to identify it, according to Table 1 (H_2 Bulletin, 2023).

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4. NB For direct citations, the English version was used of the GLOBAL WIND ENERGY COUNCIL – Global Wind Energy Manifesto – October 2021. Available at: https://gwec.net/global-wind-industry-manifesto-calls-on-governments-to-get-serious-ahead-of-cop26/. Accessed on: March 2,2024.

Type of Hydrogen	Production method
Green Hydrogen	From the electrolysis of water, using renewable electricity, to separate it into hydrogen and oxygen gas.
Blue Hydrogen	From fossil fuel, with CO_2 capture and storage.
Grey Hydrogen	From fossil fuel, it uses the steam methane reforming method. CO_2 produced is released into the atmosphere.
Black Hydrogen	From coal, a highly polluting process. CO_2 and carbon monoxide produced are released into the atmosphere.
Turquoise Hydrogen	From the pyrolysis of methane. Process in experimental phase, removes carbon in solid form instead of gas.
Purple Hydrogen	From nuclear energy and heat, through the combined chemical-thermal decomposition of water by electrolysis.
Pink Hydrogen	From nuclear energy, through the electrolysis of water.
Red Hydrogen	From nuclear energy, through the catalytic division at high temperature of water.
White Hydrogen	Refers to naturally occurring hydrogen.

Table 1. Hydrogen color codes

Source: Own elaboration based on information from the H_2 Bulletin (2023).

Currently, hydrogen production is based on fossil fuel technologies, with more than a sixth of global supply being derived from the facilities and processes of the petrochemical industry. According to the International Energy Agency (IEA), the production of hydrogen with low carbon dioxide emissions represented less than 1% of total hydrogen production during the years 2021, 2022 and 2023. In the Net Zero Scenario, the planned production of low-emission hydrogen by 2030 will be 95 million tons, more than half of the global production of the gas. In this projection, around two-thirds will be through electrolysis, while the other third will be produced from fossil fuels and with carbon capture and storage (IEA, 2022a).

According to data from the consultancy group Wood Mackenzie, Brazil was the leader in the volume of announcements of low-carbon production projects in the first quarter of 2021, presenting 0.6 million tons/year out of a total of 2.4 million tons/year, through the record of 55 announcements worldwide. Projects for the production of "green" hydrogen in the Northeast of Brazil have grown over recent years, and the region has emerged as one of the hubs for producing and exporting hydrogen, mainly to the European Union (Casarin, 2021). Many of these portfolios preceded the establishment of the National Hydrogen Program (PNH2), which only took place in August 2022, through the approval of Resolution No. 6, of June 23, 2022, by the National Energy Policy Council (CNPE). It should be highlighted that, based on the narrative of the importance of green hydrogen for promoting a low-carbon economy and net-zero emission targets by 2025, in July 2022, combining funds from the BNDES FINEM-Environment and the Climate Fund, BNDES launched the BNDES Green Hydrogen Program with the aim of encouraging pilot projects of the fuel.

In January 2023, the Ministry of Mines and Energy launched the three-year work plan (2023-2025) of the PNH2 (National Hydrogen Plan) with the aim of creating the foundations for the hydrogen market in Brazil. More recently, in March 2023, the Senate created a special commission to debate public policies on green hydrogen, and is also processing Bill 725, from 2022, which establishes the parameters for the country's use of sustainable hydrogen, authored by former senator Jean Paul Prates, the current president of Petrobras.

The corporate sector, mainly oil companies, interested in hydrogen production, has been promoting the generation of offshore wind energy. In December 2022, there were 70 projects registered for environmental licensing with the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) (Vasconcelos, 2023). Even in the absence of regulatory measures for the sector, in March 2023, Petrobras announced that it was to assess seven offshore projects with Equinor, a Norwegian oil company (Teixeira Jr., 2023).

The absence of regulatory definitions has not prevented the signing of several memorandums between foreign companies and state governments for the production of renewable energy and green hydrogen. By the end of October 2022, the state of Ceará had signed 24 documents related to the government's project for the state to become the main producer of renewable energy in the country and to build a complex of industrial facilities related to the production of green hydrogen in the Port of Pecém (Ceará, 2022). Companies such as AES Brasil, Fortescue, Linde, Qair, Engie, EDP Renováveis are some of those that signed memoranda with the state government of Ceará, adding 8 GW in electrolysis capacity to produce 1.3 million tons of green hydrogen per year (Machado, 2022).

At a federal level, in March 2023, a collaboration agreement in the energy area between Brazil and Germany was reaffirmed. The Ministers of Mines and Energy of Brazil and the Federal Ministry of Economy and Climate Protection of Germany will lead the "German-Brazilian Energy Partnership" which became part of the Cooperation Agreement in the energy sector, signed in 2008. According to the joint statement, the Green Hydrogen Energy Partnership Working Group will provide support to strengthen the energy cooperation between the two countries and the implementation of public policies and private investments. In the document there is no mention of technology transfer, but rather "the interest in counting on the engagement of Brazilian actors in promoting the export of green hydrogen and derived products to Germany" (Brasil-Alemanha, 2023).

Since the beginning of President Luiz Inácio Lula da Silva's third term (January 1, 2023), Brazil has received at least three visits from high-level authorities and businesspeople from Germany, highlighting the topic of energy transition.

Directly related to this subject, there was also a visit by the vice-president of the European Commission, Margrethe Vestager, in March, when she demonstrated her interest in expanding European Union partnerships for the exploration of strategic raw materials for green industry, such as critical minerals (rare earths, lithium, cobalt and niobium). Faced with instability in energy supplies related to the war between Russia and Ukraine, Germany and the European Union are looking for alternatives.

In this context, Latin American countries that have the potential to generate solar and wind energy, key to the production and export of green hydrogen and other strategic resources, are facing criticism of what activists and scholars are categorizing as "green extractivism". In other words, a logic that does not differ from neoextractivism except for the discourses used to guarantee its legitimation. Rhetoric originating in the Global North seeks to relate certain technologies, to be implemented in territories of the Global South, with the perspective of solving the climate crisis (Ulloa, 2021; Dietz, 2022). The energy transition, driven mainly by countries in the Global North, such as the United States and those in Europe with their New Green Deal, but also "emerging" countries, such as China, as will be seen later, and its corporations, brings serious implications for the people and territories of countries in the Global South (Bringel; Svampa, 2023). The geopolitics of energy transition reinforces the subordinate and dependent role of the economies of the countries of the Global South in relation to global capitalism, enabling the appropriation of extraordinary income by large extractive and financial corporations (Delgado, 2012; Paulani, 2013). This is a dependence that, within this context, is not only political, economic and financial, but also ecological (Acselrad, 2023). By evoking the need to combat climate change, mechanisms of domination and coloniality have been reproduced (Hazlewood, 2010).

Indeed, in the Brazilian case, the narrative that has sought to justify the inclusion of hydrogen in the energy matrix has revolved around supposed financial investments, job creation and exports to countries in the Global North (Dietz, 2022; Sander, 2023; UE Signaliza..., 2023). Along with other countries in Latin America and Africa, in the aforementioned energy transition, Brazil would play the role of the provider of "natural resources" and cheap labor for the objectives of the alleged global green energy transition. This is because there are different paths and strategies for energy transitions. Ulloa (2021) highlights the distinction between social energy transitions and institutionalized transitions. In the case of social transitions, the proposals come from organizations and social movements that seek to address the issue of climate change by questioning extractive capitalism. In their diversity, in addition to territorial dynamics, they tend to take into account

systemic economic and political dynamics, particularly those that affect peoples and communities. They present specific proposals on how to leave fossil fuels underground, decentralize energy production and guarantee energy autonomy in a post-extractive world. There we come across notions such as environmental and territorial justice, but also "fair, inclusive and supportive energy transition"; "energy transition for life"; and, "fair and popular energy transition". In addition to demanding new sources of energy, these proposals focus on the need to rethink life from the perspective of justice and changes in the economic model.

Institutionalized transitions, on the other hand, involve governments and corporations, in addition to large conservation organizations, which respond to global environmental agreements, especially climate agreements, based on the logic of environmentalization, i.e., incorporating so-called environmental justifications into their actions and procedures, making criticism of climate change an opportunity for accumulation and legitimization. Decarbonization, which defines the proposals in this field, is centered on the production of renewable energy through profitable economic models. Thus, wind and solar energy projects, in addition to green hydrogen, are supported by new socio-technical and socio-political processes, adding environmental and climate reasons to the discourse of development and progress. In other words, industrial extractivism goes unquestioned, but ways of complementing and compensating it are proposed (Ulloa, 2021). The Secretary of Geology, Mining and Transformation from the Ministry of Mines and Energy (MME) during the government of Jair Bolsonaro, Alexandre Vidigal, for example, explained how so-called clean energy will demand more mineral production, valorizing the notion of sustainability for this, supposedly, to stimulate mineral production:

> When we talk about clean energy, green energy, when we are looking for new energy generation resources, energy storage [...], when we talk about photovoltaic energy [...], we are talking precisely about what mineral assets are able to offer. So today, we have a very clear logic - the more we expand the discourse on sustainability, the more we will also be expanding the discourse on the need for mineral resources, mineral goods. There is no way of dissociating one thing from the other [...]. The more sustainability, the more mineral resources we will need (*apud* Política Mineral..., 2020).

In addition to this type of interested association between clean energy and industrial extractivism, when the focus of the energy transition is placed on measuring, capturing, storing and compensating carbon, the debate becomes depoliticized, hiding the causes of the climate crisis structurally associated with consumerism and planned obsolescence, legitimizing extractive capitalism and, a fortiori, not taking into account the social, racial and gender inequalities

embedded in energy production and consumption (Moreno; Chassè; Fuhr, 2016). What is created is "a fetishist invocation of CO_2 as the 'thing' around which our environmental dreams, aspirations, contestations as well as policies crystallize", with a perspective whereby "[S]tabilizing the climate seems to be a condition for capitalist life as we know it to continue" (Swyngedouw, 2010, p. 219 and 222). As the enemy is external to society, the cure for the problem could, in turn, be within the system itself, thus legitimizing market and compensation mechanisms.

At the same time, in some cases, the line that separates social energy transitions, sometimes given new meanings by dominant agents, and institutionalized transitions, becomes increasingly blurred. The terms used, such as the very idea of transition and renewable and clean energy; the methodologies and technologies often proposed as an end, taking solar energy and wind energy as an example – in some cases with arguments that offshore may have less impact and that in the face of the climate emergency some cost is necessary –, are increasingly contradictory and ambiguous, appearing, with regard to their political, environmental and territorial implications, similar to one another (Ulloa, 2021). Environmental justifications are attributed to the technical reconfigurations of a capitalism that continues to concentrate power over territorial resources, instead of adopting

> […] radical socio-environmental transformations that […] seek a radical change in capitalist structural relations around control, access, and territorial and environmental appropriation as "resources", to position other possible forms of life and relational environmental justice. (Ulloa, 2021)

3. Territorial implications of energy transition and CPFL Renováveis

Carcinoculture took away our lakes and
wind power took our dunes

Cleomar Ribeiro da Rocha, Quilombolamember
and Fisherwoman in Cumbe

As mentioned above, a significant portion of green hydrogen production will result from the installation of wind farms. Thus, an analysis of the effects of this "new", "revolutionary" fuel needs to investigate the territorial implications of the wind farms. Various investigations have taken place into the effects of wind farms, such as the work of Araújo (2015) and Gorayeb, Brannstrom and Meireles (2019). Here, we examine the relationships between the discourse of renewable energy and energy transition and the experience of the quilombola community in Cumbe, made up of approximately 170 families and 800 people, who live by the sea,

the dunes and the mangroves, located in the municipality of Aracati, on the east coast of Ceará, around 160 kilometers from the state capital, Fortaleza, and have been affected by the activities of CPFL Renováveis. In addition to the wind farm, the community has also been affected by carcinoculture, tourism ventures and the oil spill that affected the Northeastern coast in 2020 (Brazil, 2022). Thus, in the terms of Cleomar Ribeiro da Rocha (2022a), quilombola member and Cumbe fisherwoman, her community may be understood as "a distributor of water and energy." In 2008, one of the largest wind farms in Ceará was installed inside this community. With 67 wind turbines, initially implemented by the company Bons Ventos, but today managed by CPFL Renováveis, the farm has now expanded across an area of approximately 1,546ha, surrounding the quilombola community in Cumbe, which has now been forced to seek permission in order to circulate within its own territory (Jucà; Betim, 2021).

CPFL Renováveis, the largest generator of wind energy in the country, is "a company that generates clean energy from renewable sources" and "presents the four main types of sustainable production: wind, small hydroelectric plants, thermoelectric plants powered by sugarcane and solar" (CPFL, 2023). The company, created in 2011, has 94 assets, distributed around 58 municipalities throughout Brazil, totaling 2.1 GW of installed capacity. It belongs to the CPFL Energia group, the largest private group in the Brazilian electricity sector. CPFL Energia is a holding company, i.e., a company with a central structure that manages different companies of the same group. Currently, it is controlled by the State Grid Corporation of China (SGCC) which acquired the control of CPFL Energia in January 2017 from Camargo Corrêa and from the Previ pension funds, Fundação Cesp, Sabeprev, Sistel and Petros (CPFL, 2017). CPFL Renováveis is controlled by CPFL Energia (49.1502%) and CPFL Geração (50.8498%) (CPFL, 2023).

It is important to highlight the role of Chinese companies in this endeavor, because, with the accelerated industrialization of the country since the 2000s, there has been an increase in energy consumption accompanied by modification plans of the energy matrix for the production of energy from "renewable" sources". Thus, China's role in the construction of wind farms around the world has been achieving records annually.

The advance of Chinese corporations in Latin America is not something new. For some years now, various authors have indicated a transition from the dynamic vertex of the global economy of the Atlantic to the Asia-Pacific region, which gained particular force with the emergence of the Chinese economy during the 2000s. Part of China's development strategy has been to advance into new markets, in addition to transforming the destiny of most of the world's mining, energy and agricultural commodities. South-South cooperation mechanisms also make China an important

partner for Asia, Africa and Latin America. Brazil is no exception, and there has been a growing presence of Chinese capital controlling important assets in the construction, automobile and banking sectors, but fundamentally in the energy (oil, gas and hydroelectricity) and mining sectors. China is the largest destination for Brazilian exports and one of Brazil's largest investors and creditors (Aguiar, 2017).

In turn, China is the leading country in the global ranking of GEE and methane emissions currently observed, mainly, in the energy and industrial sectors. Its biggest challenge is dependence on coal. Thus, by ratifying the Paris agreement of the UNFCCC and an agreement with the United States, China has committed itself, among other things, to achieving carbon neutrality by 2060 through, for example, investments in renewable energies (Mattos et al., 2023). Seeking to guarantee "energy security" and disseminate technology for solar and wind energy, China is a world leader in investments in renewable energy, with companies such as State Grid and China Three Gorges (CTG) that have 48% and 60% of its assets invested in Brazil, respectively.

One third of China's investments in wind and solar energy are destined for Latin America and the Caribbean. Brazil, considered a country with openings and opportunities in the fields of renewable energies, is a strategic partner (Nunes, 2023). In terms of wind power, Chinese companies control approximately 17% of the country's total capacity, in at least 7 states, throughout the Northeast and South regions. In addition to State Grid and CGN, it also includes CTG and SPIC. State Grid is the leader in wind generation capacity, with approximately 1,500 MW, with the largest number of wind farms, primarily distributed across the states of Rio Grande do Norte (RN), Ceará (CE) and Rio Grande do Sul (RS) (Nascimento, 2023).

Highlighting the growing importance of China in Brazil's energy sector, in May 2023, the vice-president of State Grid Brazil Holding was appointed vice-president of the Administrative Council of the National Electrical System Operator (ONS). The ONS is responsible for the operational coordination and control of the generation and transmission installations of electrical energy in the National Interlinked System (SIN), and for the operational planning of the isolated systems in the country, under the supervision and regulation of the National Electrical Energy Agency (Aneel) (Pinto, 2023). This is part of a strategy to promote the expansion of Chinese corporations around the world. This role played by China has also resulted in the destruction of forests, exploration of labor and conflicts with communities in countries such as Ecuador, Colombia and Peru, which have guaranteed the supply of balsa trees, an important production factor for wind generator turbines for China (WRM, 2021). In the case of Brazil, investigations carried out by the Dataluta Network – the Database for Territorial Struggles, for example, revealed that between the years 2020 to 2022, foreign investment has undergone a substantial

change in the energy sector, especially in wind and solar energy, with China as the main actor. Such investment has fueled the expansion of Brazilian lands, thereby reinforcing the land rush (Rede Dataluta, 2023). A study carried out by the Instituto Terramar on wind farms in Ceará, identified that, as a result of the institutionalized energy transition, "the demand for land and territory has increased the historical land conflicts and the speculation of real estate in the region, and has deferred the regularization of traditional territories" (Faustino; Tupinambá; Meirelles, 2023, p. 6).

Below we present Tables 2 and 3 containing information on the CPFL projects in the Northeast and in the state of Ceará, highlighting the extent of their work.

State	Energy	Quantity	Power (kw)
Bahia	Central Photovoltaic Generator (UFV)	1	30,000.00
Ceará	Wind farm	12	427,030.00
Paraíba	Thermoelectric Power Plant	2	182,264.91
Rio Grande do Norte	Thermoelectric Power Plant	133	40,000.00
	Wind farm		843,210.00
Total		**49**	**1,522,504.91**

Table 2. CPFL Generation projects in the Northeastern Region
Source: Own elaboration based on data from the CPFL Renováveis site, 2023.

Project	Power (Kw)	Owner/Exploitation regime
Foz do rio Choró	25,200.00	100% for SIIF Cinco Geração e Comercialização de Energia S.A. (PIE)
Praia Formosa	105,000.00	100% for CPFL Energias Renováveis S.A. (PIE)
Canoa Quebrada	10,500.00	100% for Rosa dos Ventos Geração e Comercialização de Energia S.A. (PIE)
Lagoa do Mato	3,230.00	100% for Rosa dos Ventos Geração e Comercialização de Energia S.A. (PIE)
Icaraizinho	54,600.00	100% for CPFL Energias Renováveis S.A. (PIE)
Paracuru	25,200.00	100% for Eólica Paracuru Geração e Comercialização de Energia S.A. (PIE)
Enacel	31,500.00	100% for CPFL Energias Renováveis S.A. (PIE)
Canoa Quebrada	57,000.00	100% for CPFL Energias Renováveis S.A. (PIE)
Taíba Albatroz	16,500.00	100% for CPFL Energias Renováveis S.A. (PIE)
Bons Ventos	50,00000	100% for CPFL Energias Renováveis S.A. (PIE)
Pedra Cheirosa II	23,100.00	100% for Pedra Cheirosa II Energia S.A. (PIE)
Pedra Cheirosa I	25,200.00	100% for Pedra Cheirosa II Energia S.A. (PIE)

Table 3. CPFL Generation projects in the state of Ceará
Source: Own elaboration based on data from the CPFL Renováveis site, 2023.

Besides affecting the quilombola territory of Cumbe, CPFL is also in conflict with the fishing community on Xavier beach, due to the Formosa Beach Wind Farm. The complaints involve: (a) the privatization of common-use areas, affecting the right to come and go on the territories; (b) the suppression of fresh-water lakes

used for artisanal fishing; (c) the constant fear that some kind of accident will occur; and (d) noise pollution resulting from the wind turbines (Gadelha et. al., 2018). In the case of the Canoa Quebrada Wind Farm and its substation, to which it is interlinked (Itaiçaba), which together occupy an area of 24 km, conflicts have been recorded with the communities in Vila do Estevão and Vila Canoa Quebrada, due to it being located in an Environmental Protection Area (EPA) and Permanent Preservation Area (PPA) (Alcântara; Caúla; Urtiaga, 2015).

The Bons Ventos Wind Farm, part of CPFL, has also invaded the dune fields of the Cumbe community, which, in addition to being a water repository, is a location where 41 archaeological pieces have been found (Jucá; Betim, 2021). In her testimony, Rocha (2022a) confirmed: "I state that we have an open-air museum. There are more than 60 archaeological sites in these dunes from the first occupations of indigenous people." Other impacts would include sound and visual pollution, cracks appearing in houses due to the passing trucks, birds flying into the turbine propellers, the endangering of turtle reproduction because of the light emitted by towers, the privatization of space, improper waste management and dividing the community with a narrative of progress and of generating employment. "It's inhumane," said Rocha (2022b).

> And so you realized that wind energy had arrived inside the territory. And it was very scary, everything was so very big, it impacted everything, in a hugely gigantic manner. We didn't understand. It was like being in a film where there were so many giant robots destroying a community that didn't even know how to defend itself, or how it could take care of itself with what was happening there. And so we saw we were being pushed back, that our community was being squeezed out. Because my relationship with the area of the mangrove was to take great care of it, as I did with what was over there on the other side, which was area of dunes, lakes and beach (Rocha, 2022b).

> It's all so huge. A beast, something so scary that caused a traffic accident. The children don't go to school alone anymore. This all attracted bars and alcohol, vulnerable women and children, exposed to sexual exploitation. So much dust causing respiratory problems; psychological problems. It is invasive, it causes the destruction of the dunes, because it tears everything apart from outside to inside, burying our lagoons, our archaeological centers (Rocha, 2022a).

Given the sociodemographic and cultural formation of the affected populations, the case of the quilombo in Cumbe evokes situations of environmental racism, in which the harmful effects of investment projects fall

more proportionally onto non-white populations, located on the expansion frontier of extractivism (Passos, 2021). This is to say, in the context of wind energy development, the case of Cumbe exemplifies the territorial transformations that occur in large-scale conventional projects. These transformations can result in the displacement of entire populations from their traditional production and reproduction sites, rendering their ways of life unsustainable. Although its fruits are consumed in other places, these projects are not neutral in relation to the space they occupy; they are active instruments of territorial reorganization. The Northeast and Amazon, home to many such projects, are continuously locked into a subordinate role within the national and global hegemonic project (Vainer; Araujo, 1992; Almeida, 2010).

Despite the effects that they produce, within the context of energy transition, companies still benefit from compensation projects. In the case of the energy sector, Renewable Energy Certificates (RECs), referred to as the International REC Standard (I-REC), have increasingly gained traction as a method for offsetting emissions. Through RECs, companies receive energy in the traditional way and acquire the equivalent volume of renewable energy to their consumption through certificates. The investment is then accounted for in the emission reduction goals or "sustainability goals" enabling indirect GEE emissions to be offset, in the case of Brazilian companies, within the scope of the Brazilian GHG Protocol Program. A survey by the Instituto Totum (2021), responsible for certifying power plants in Brazil, revealed that the total number of I-RECs issued in Brazil more than doubled from 2020 to 2021, from 4 million certificates to more than 9 million. In 2021, the main source of certificates in Brazil was wind, followed by water and biomass. During the same year, on a global level, Brazil had more power plants registered for the issuance of certificates than any other country, with 266 projects and more than 33 thousand megawatts of installed capacity of certified clean, renewable energy. CPFL Soluções, a CPFL Energia company, acquired more than 98 thousand RECs. According to the Vice-President of Legal and Institutional Relations at CPFL, "the green certificate enable companies to commit to concrete actions to reduce emissions. It is a way to demonstrate how the organization is aligned with a more responsible form of management, which ultimately impacts the value of the brand. The company is also involved in the carbon market with registered projects in the regulated and voluntary market." (CPFL Energia, 2021).

This signifies that, despite the conflicts with communities, as well as the profits from wind farms, CPFL still earns carbon credits and reputational capital for claiming to be "carbon neutral." At the same time, a credit purchasing corporation, which could be an oil company, also purchases the right to continue

emitting and polluting, using the credits to meet its emission reduction goals. In July 2023, Petrobras purchased CPFL credits contributing to its Decarbonization Fund (Gandra, 2023). Certificates tend to be acquired from projects implemented in the Global South, to compensate for the emissions of corporations in the North, but also in the South.

In addition to the involvement of the carbon market, in the context of decarbonization goals, CPFL (2022), in its new ESG Plan for 2030, foresees investments of approximately 40 million BRL for green hydrogen. According to the company, "since green hydrogen does not emit polluting gases during the combustion and production processes, in addition to being non-exhaustible, it may be considered one of the fuels of the future" (CPFL, 2023).

As a resident of Cumbe asked (Rocha, 2022a), "so to whom and where does this energy go?"

> They say that wind energy is renewable energy, clean energy. The speeches on this renewable energy all sound very nice. And when I come face-to-face with this energy, I get really scared by the way that this energy arrives, and so, because I know very little about other forms of energy, I think to myself: if clean energy has caused all of this to our lives, imagine what the dirty ones are like, eh? Because they come along with this discourse, about this clean energy, this renewable energy and how our lives are of no importance to them, as if we have not been impacted. To be honest, many of them don't even consider that our community lives on that territory and they ride over us like a tractor (Rocha, 2022a).

Various authors (Pirani, 2021; Bertinat; Chemes; Arelovich, 2014) have contended that the source of the problem of energy production and distribution lies in the way it has been commodified. Without doubt, the commodification process has transformed the way we think about energy. We refer to energy as a product that can be bought and sold, concealing its commodification process and the socio-ecological relations that underlie its production, appropriation, distribution and use. The questions surrounding the unequal distribution of the production, distribution and utilization structures of energy, in turn, have been insufficient to avoid the ambiguities of the way in which companies have appropriated the debate on energy transition (Lohmann, 2021). This lack of a more in-depth questioning, as has occurred with the idea of development and extractivism, or in the words of Grosfoguel (2016), of the epistemic and ontologic extractivism that establishes the bases for economic extractivism, enables "an energy transition to continue as a threat and an alienating force, a principle of colonial domination for millions of people" (Lohmann, 2023, p. 3).

Much of the debate on a "just transition" has indicated the configuration of what critical thinking associates with the paradox of a "just colonialism" (Lohmann, 2023), which seeks to subordinate energy transition to the logic of plantations and extractivist capitalism, based on the colonial devices of a certain governmentality. In other words, devices of power such as regulatory decisions, laws, administrative measures or scientific statements that are mobilized by an "art of governing" conducts. The geopolitics of knowledge, specific to what Ulloa (2014) calls climate eco-governmentality, carry a certain rationality inscribed in a dominant knowledge, determined by specialists from universities, institutions and programs from Northern countries that would establish the problem and the way to solve it. Through this rationality, "climatized" nature has justified policies based on economic processes, such as the creation of markets, environmental services and new technologies. This articulation between climate science and policies has naturalized inequalities, whether they are North-South, of gender, race or ethnicity, while ignoring other ways of producing knowledge. The critical perception of the hierarchization of knowledge is shared by the women of Cumbe, who indicate the disregard demonstrated toward the knowledge of traditional people, and their conceptions on nature and the climate. For these women, for example, CPFL is not only unconcerned about the vision of nature and of energy that the women of the quilombo in Cumbe hold, but it also obscures their existence and their perspective according to which they "take care of the territory because it takes care of us." (Rocha, 2022a).

4. Final considerations

In this article we have critically examined the prevalent uses of the notion of energy transition from the perspective of extractive corporations, governments and international agencies. The discourse on reducing emissions through new technologies has been contrasted with the empirical observations of a wind farm, whose activity is presented as part of the future production of green hydrogen in Brazil. Based on a global climate eco-governance, the climate debate has implied an intensification of projects so-called renewable, green and/or clean energies, such as the production of green hydrogen. The technical profile of these strategies is sustained by a production of specialized knowledge, the articulation of which naturalizes and reinforces dominant cultural values, corporate and government narratives based on neutral and global languages "empty of content, but with concrete functions" (Ulloa, 2021). In the case of conflict involving the Cumbe quilombola community in the state of Ceará and the company CPFL Renováveis, the corporate use of the notion of energy transition has led to the privatization

of territories and environmental degradation, reaffirming racial and gender inequalities. The territorial and sociocultural effects of this project do not differ, therefore, from those of "conventional" extractivism, in that they harmfully affect, above all, traditional communities and peoples, indigenous people, quilombolas and peasants.

The conflicts caused by the construction of wind farms and the speculation surrounding the production of green hydrogen demonstrate the need not only to question the source or the technology used in the production of energy, but also the social processes of production, appropriation and use of energy. Representatives of rural communities and coastal regions affected by wind energy projects have argued that, for energy to be renewable, it is not enough for its source to be renewable, if, at the same time, the construction and implementation of its infrastructure fragments and/or destroys territories (Furtado; Paim, 2020; Furtado, 2021a; Faustino; Tupinambá; Meirelles, 2023). They also argue that it is necessary to redefine the way we perceive energy and to make explicit who benefits from the policies developed for its generation.

Technologies, policies, and projects that have been justified by multilateral institutions and large corporations as means of addressing climate change can be understood as moments in implementing the logic of ecological modernization. This is a political-administrative response that is based on the assumption that the ecological crisis may be overcome through technological and procedural innovation, market instruments, collaboration and consensus building; a techno-managerial eco-consensus, which "maintains, we have to change radically, but within the contours of the existing state of the situation [...] so that nothing really has to change!" (Swyngedouw, 2013, p. 3).

The focus of climate policies on notions such as "low carbon", "carbon neutral" and "net zero emissions" is part of a process of transition between the established commodity consensus and what has been called the "decarbonization consensus", which seeks to strategically ensure the continuity of the extractive logic (Bringel; Svampa, 2023). The conflicts, environmental and social disasters, and responsibilities associated with the activities of oil, mining and agribusiness corporations are obscured, affirming the possibility of compensating for their historical damages or purchasing pollution rights through the carbon market. On the other hand, these compensations often imply the expansion of the private appropriation of territories, as shown by the reactions and resistance of the fisherwomen from the quilombola territory of Cumbe.

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