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ENERGY TRANSITION AND SOCIO-ENVIRONMENTAL INJUSTICES: AN EMERGENCY DEBATE IN THE BRAZILIAN CONTEXT

TRANSIÇÃO ENERGÉTICA E INJUSTIÇAS SOCIOAMBIENTAIS: UM DEBATE EMERGENCIAL NO CONTEXTO BRASILEIRO

TRANSICIÓN ENERGÉTICA E INJUSTICIAS SOCIAMBIENTALES: UN DEBATE DE EMERGENCIA EN EL CONTEXTO BRASILEÑO

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ABSTRACT: This article critically analyzes the implementation of energy transition models based solely on decarbonization and renewable sources. Through interviews, document analysis, and bibliographic research, it investigates the impacts of wind energy and green hydrogen projects in Northeast Brazil, particularly in Ceará. The study highlights the limitations of corporate energy transition, which, by merely "greening" capitalism, leaves socio-environmental inequalities intact and deepens geopolitical exploitation relationships between the Global North and South. It demonstrates how these projects disproportionately affect traditional communities and Indigenous territories, with a particular impact on women. As an alternative, the study draws from experiences of Indigenous women and women from traditional communities to propose new paradigms that center life and acknowledge the interdependent relationships that sustain diverse existence on the planet.

KEYWORDS: Climate and ecological crisis. Energy transition. Socio-environmental injustices. Socio-ecological transition. Indigenous women and traditional community women.

***RESUMO**: O artigo analisa criticamente a implementação de modelos de transição energética baseados exclusivamente na descarbonização e em fontes renováveis. Por meio de entrevistas, análise documental e pesquisa bibliográfica, investiga-se os impactos no Nordeste brasileiro, especialmente no Ceará, de empreendimentos de energia eólica e de hidrogênio verde. A pesquisa evidencia os limites da transição energética corporativa que, ao promover um simples esverdeamento do capitalismo, mantém inalteradas as bases das desigualdades socioambientais e aprofunda relações geopolíticas de exploração entre Norte e Sul Global. O estudo demonstra como esses projetos afetam comunidades tradicionais e territórios indígenas, gerando impactos desproporcionais sobre mulheres. Como alternativa, propõe-se, a partir das experiências das mulheres indígenas e de comunidades tradicionais, outros paradigmas que coloquem a vida no centro e reconheçam as relações interdependentes que sustentam as diversas existências no planeta.*

***PALAVRAS-CHAVE**: Crise climática e ecológica. Transição energética. Injustiças socioambientais. Transição socioecológica. Mulheres indígenas e de comunidades tradicionais.*

***RESUMEN**: El artículo analiza críticamente la implantación de modelos de transición energética basados exclusivamente en la descarbonización y las fuentes renovables. A través de entrevistas, análisis documental e investigación bibliográfica, se investigan los impactos de los proyectos de energía eólica e hidrógeno verde en el Nordeste brasileño, especialmente en Ceará. La investigación destaca los límites de la transición energética empresarial que, al promover un simple reverdecimiento del capitalismo, mantiene inalteradas las bases de las desigualdades socioambientales y profundiza las relaciones geopolíticas de explotación entre el Norte y el Sur Globales. El estudio muestra cómo estos proyectos afectan a las comunidades tradicionales y a los territorios indígenas, generando impactos desproporcionados sobre las mujeres. Como alternativa, propone, a partir de las experiencias de mujeres indígenas y comunidades tradicionales, otros paradigmas que pongan la vida en el centro y reconozcan las relaciones de interdependencia que sustentan las diversas existencias en el planeta.*

***PALABRAS CLAVE**: Crisis climática y ecológica. Transición energética. Injusticias socioambientales. Transición socioecológica. Mujeres indígenas y de comunidades tradicionales.*

Introduction

In the context of infinite growth at the expense of the planet's own capacity to renew its cycles, the Anthropocene (Crutzen, 2002) or Capitalocene (Acosta, 2018; Haraway, 2016)[4] are established as geological eras in which the planet's self-regeneration[5] barriers are being surpassed.

With the aim of reducing production costs—expanding the profit margins of a few—the current version of financialized capitalism demands the cheapening of everything, which implies the incessant search for new frontiers of raw materials, markets, and cheap energy (Moore, 2022). This process articulates the race for the domination of territory and technology as an essential condition in the struggle for hegemony on a global scale (Ceceña, 2001). This means the establishment of a new territoriality of domination, which represents a substantial change in content and dynamics in all dimensions of social life, since the expropriation of territories and natural resources modifies, along with it, the meanings of life historically constructed. In this direction, the territoriality of domination requires the possession or monopolistic control of biodiversity within the framework of inter-capitalist competition.

Thus, these projects are being located in different territories around the globe, but following the same pattern: they are territories already occupied by indigenous and traditional peoples and communities, who end up being expelled from their places or have their ways of life completely altered with the arrival of these projects.

Faced with the environmental crisis—which is also social, economic, civilizational, climatic, and multifaceted, pointing to the finiteness of human life on the planet—many solutions have been presented within the context of ecological modernization (Milanez, 2009). These solutions are presented, at least discursively, in the sense of reducing greenhouse gas emissions and altering the energy matrix of different countries with a preference for renewable sources over fossil fuels, which has commonly been called the energy transition.

In this context, "clean" and "smart" ways of consuming are presented to citizens-consumers, reducing the ecological footprint of a consumption pattern that remains unchanged. Buying, but buying well and thinking about the environment, is the keynote of advertisements

[4]Haraway (2016), despite conceptualizing the Capitalocene, proposes the term Chthulucene, in a provocation for us to remain with the problem and seek to establish interspecies kinship relationships in order to recompose the web of life.

[5]We refer to planetary boundaries, identified with climate change: the destruction of the ozone layer, the loss of biodiversity, the dispersion of chemicals and new substances, ocean acidification, disturbances in the global hydrological cycle, changes in land use, alterations in nitrogen and phosphorus cycles, and anthropogenic aerosols. Available at: https://www.anthropocene.info/. Accessed on: Nov. 28, 2025.

that proclaim that "agribusiness and mining are *tech*, are *pop*, are everything." In order to maintain this consumption pattern, new incursions are observed in the territories of indigenous peoples, artisanal fishermen, *Quilombola* communities, family farmers and peasants, among other traditional peoples and communities, opening the market to new products.

With the aim of taking a closer and deeper look at the issue of energy transition, this article critically analyzes proposals for green hydrogen production on the coast of Ceará and the installation of *offshore wind farms* on the northeastern coast. This analysis is based on field research involving interviews and experiences with the impacted traditional peoples and communities[6], combining this data with bibliographic and documentary research, environmental licensing processes, and legislation approved and under consideration in the National Congress. All this material was also compared with various reports published in regional and national newspapers. The guiding questions of our reflection were: What is the objective of these proposals to "green" the Brazilian energy matrix? Who will benefit from the installation of these projects? Who will be affected by their impacts? And what is behind this choice?

Detailing the data collection process from interviews, we inform that the research and data collection process was preceded by: i) consultation with the interviewed Quilombola leader; ii) presentation of a Free and Informed Consent Form; and iii) information about the research objectives, scope of the interview granted and purposes, as well as the ethical, political and legal implications of the research, in accordance with Article 2 of the Code of Ethics of the Brazilian Anthropological Association (ABA)—which details the rights and duties of professionals who conduct ethnographic and field research with individuals and groups. Finally, we mention that the final version of the article was submitted to the analysis of the Quilombola leaders of Cumbe in an exercise of non-tutelar science, committed and dedicated to the popular cause (Bonilla *et al.*, 1972) or an anthropology on demand (Segato, 2021)[7].

[6]The field data collection was based on the norms included in the Code of Ethics of the Brazilian Anthropological Association (ABA). Available at: https://portal.abant.org.br/codigo-de-etica/ . The authors understand the importance of scientific production committed to the struggle of traditional peoples and communities. The people interviewed directly authorized the reproduction of their statements, provided that their identities were kept confidential in order to protect them.

[7]According to Rita Segato, anthropology "on demand" is anthropology "subject to the demands of those who were previously the object of our observation; an anthropology attentive to and challenged by what these subjects request from us as valid knowledge, which could serve them to access greater well-being, resources and, above all, an understanding of their own problems" (Segato, 2021, p. 15, our translation).

In the context of the Capitalocene: the discourse of transition, false solutions, and new markets

Despite the intense volatility of highly financialized capital —corresponding to a general pattern of reorganization of a supranational capitalist project (Calveiro, 2021)—we observe a growing territorialization of multinational groups[8] that, allied with nation-states, establish themselves on the fringes of capitalism, phagocytizing spaces, people, and relationships not governed by market logic into the socio-metabolic system of capital (Mészaròs, 2011). This increasing territorialization and demand for spaces rich in water, minerals, fertile soils, biodiversity, etc., has generated, according to Rodrigues (2021), the intensification of conflicts, urban violence, and the dispossession of territories and cultures. Forms of organization, reproduction, and tradition; the loss of access to and use of natural resources; and the widening of environmental and social inequality.

At this point, theories of social and environmental justice intersect with anti-racist, decolonial, and anti-colonial debates and struggles, demonstrating how much the economic and political decisions to exploit certain territories or to dispose of the waste from highly degrading economic activities there are related to colonialism and racism, since such territories—of dispossession, exploitation, and toxic disposal—are, in their vast majority, occupied by indigenous, black, and traditional communities.

Linked to the coloniality of knowledge (Lander, 2005), power (Quijano, 2005), and gender (Lugones, 2008), neoliberalism treats bodies and territories as subsumable to the force of capital, but not only that: territory is disputed based on ontological logics between the ontology of capital and the ontology of the different peoples who inhabit and coexist in these territories (Barbosa, 2024); therefore, exhaustion is characteristic of our times. When there are no more territories to be subjected to the incessant accumulation of capital, we move to another planet. In the same vein, Ailton Krenak (2020, p. 66, our translation) concludes:

> Capitalism wants to sell us the idea that we can reproduce life. That you can even reproduce nature. We destroy everything and then create something else, we deplete fresh water and then make a fortune desalinating the sea, and if that's not enough for everyone, we eliminate a portion of humanity and leave only the consumers.

[8]By territorialization of multinational groups, we mean the process observed in different areas of the Global South of establishing enterprises originating, to a large extent, from consortia between companies from the Global North, with the aim of transforming these spaces—territories constituted by traditional peoples and communities—into territories of capital, destined for the exploitation of resources and the dispossession of ways of life.

Accumulation by dispossession (Harvey, 2018) is part of a predatory capitalism that operates through the privatization of public resources, the financialization of the economy, and indebtedness that reduces entire populations and nations to servitude (Calvairo, 2021). Thus, the forced removal of populations and the appropriation of their territories and common goods—including through megaprojects and massive extraction—would be nothing more than a deepening and updating of the colonial logics and practices that guaranteed and still guarantee a direct transfer of wealth from these territories to the centers of world power.

Although softened in discourse by the ideals of income redistribution and job security, reality has shown that such projects deepen inequalities and impoverish the population. Thus, the "ecological wealth [de los territorios] ends up being turned into a curse" (Gudynas, 2016, p. 21, our translation), that is, the social groups that have managed to maintain, through their traditional practices, conserved spaces on the planet, ensuring a wide and rich biodiversity, are precisely those that face the fury of capital in its current phase.

On the other hand, indigenous peoples, in their various struggles observed in Latin America from the late 1990s and into the 2000s—for example, the armed insurgency of the Zapatistas against NAFTA and the exploitation of indigenous and peasant territories in Mexico, the fight for the right to water in Cochabamba and against the privatization of gas, as well as the defense of the Isidoro Sécure Indigenous Territory and National Park (TIPNIS) in Bolivia and the Mapuche struggle for territorial autonomy, among others—bring to the public debate other possibilities of existence not bewitched by the logic of capitalism in its multiple facets.

It is interesting to note that these indigenous struggles in Latin America coincided with the arrival of progressive governments in the region, which succeeded a political-economic cycle of more than a decade and the adoption of neoliberal policies dictated by the Washington Consensus. The arrival of these progressive governments coincides with a new context of capitalism in Latin America, characterized by a greater global demand for *commodities* from central and emerging countries—such as China—increasing the need for new territories for the extraction and production of goods with little added value, which Svampa (2013) calls the "Commodity Consensus."

The Commodities Consensus is a type of neo-extractive development that, despite generating some economic returns—such as GDP growth—which enables the adoption of certain job creation and income transfer policies, produces new asymmetries and social, economic, environmental, and political-cultural conflicts (Svampa, 2013). It is a type of conflict

that, in motley societies, like Latin American ones (Zavaleta, 2009), generates a cycle of struggles founded not only on the defense of land, territory, development models, and the boundaries of democracy (Svampa, 2013); but also on distinct onto-epistemic paradigms (Barbosa, 2019), which, in turn, translate into distinct ways of reproducing life, *i.e.*, existence.

What is happening in Brazil and other countries in Latin America and the Global South is linked to a development model that prioritizes infinite growth at the expense of, among other things, the planet's own capacity to renew its cycles of water, carbon, nitrogen, etc. The trail of destruction and violence caused by this development model is enormous. Acosta (2011, our translation) highlights the multiple forms of violence linked to extractivism:

> Violence appears to be an inherent element of extractivism, a bio-predatory model par excellence. There is violence perpetrated by the State in favor of the interests of extractive companies, especially transnational ones. Violence disguised as indispensable acts of sacrifice by a select few to guarantee the well-being of the community, regardless of the ideological orientation of governments.

In this knot between lives that deserve to be lived and those that can be abandoned to domination, colonization, and death, capitalism and colonialism converge, generating an extremely powerful articulation—which is established in all fields of existence—and reducing the imaginaries and possibilities of escape.

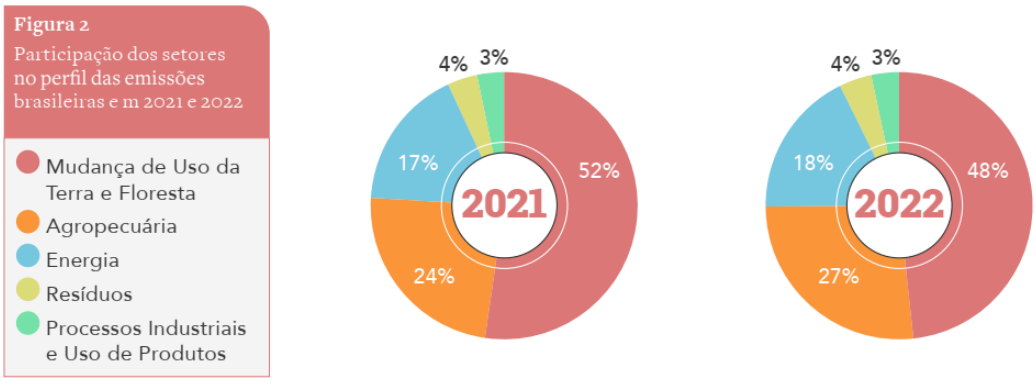
In the context of diminishing imagination and possibilities for overcoming the ecological, environmental, and multi-source crisis, we cite the call for the decarbonization of the energy matrix. The model of energy generation from fossil fuels — Power plants derived from oil and natural gas, such as thermal power plants, have been identified as one of the main causes of greenhouse gas emissions in the world, making a significant contribution to global warming and climate change.

As stipulated in the Paris Agreement, in force since November 2016, global greenhouse gas emissions must reach zero, that is, a balance between emissions and removals, by the second half of the 21st century — if the different countries of the world want to fulfill the commitment to keep the increase in the average global temperature below 2 C and above pre-industrial levels, and pursue efforts to limit the temperature increase to 1.5 C above pre-industrial levels (Organização das Nações Unidas, 2015).

In the context of the National Policy on Climate Change, established by Law No. 12,187/2009 and in accordance with the Paris Agreement, Brazil proposed to reduce greenhouse

gas emissions by 37% below 2005 levels by 2025, with subsequent reductions until achieving climate neutrality by 2050. However, unlike many countries in the world—in the case of Brazil—the main causes of greenhouse gas emissions are not related to emissions from the electricity grid or industrial processes, but rather to changes in land and forest use and agriculture, according to data from the Greenhouse Gas Emissions and Removals Estimation System (SEEG)[9].

Figure 1 – Participation of sectors in Brazilian greenhouse gas emissions in 2021 and 2022



Source: SEEG (2023).

In Ceará—unlike the general Brazilian scenario—the energy sector is the main contributor to greenhouse gas emissions, followed by agriculture and waste. The state's energy matrix—where there is great potential for renewable energy—is mainly composed of wind power (48.53%), followed by thermal power plants (41.80%) and solar power plants (9.68%). Thus, contrary to the commitments made in the Paris Agreement, the influence of thermal power plants on emissions can be exemplified by the municipality of São Gonçalo do Amarante, where the commissioning of the Pecém I Thermal Power Plant in 2012 caused local emissions to increase significantly, placing it among the Brazilian municipalities with the highest emission rates in 2017 (SEEG, 2019 *apud* Lima; Galbiatti, 2023). We emphasize that this municipality is home to most of the large industries that make up the Pecém Industrial and Port Complex (CIPP)—including steel mills, cement plants, production facilities, wind turbine blade manufacturers, among others. Within the CIPP, industries focused on wind and solar energy production coexist with thermoelectric plants, implying an expansion of energy sources that

[9]system for estimating emissions and removals of greenhouse gases (SEEG). 2025. Available at https://seeg.eco.br/. Accessed on: February 10, 2025.

indicates not the end of fossil fuels in the energy transition, but merely an energy addition where fossil fuels continue to operate alongside renewable sources.

The CIPP contribute to the greenhouse gas emissions in Ceará. Regarding thermoelectric plants, not only is the issue of greenhouse gas emissions problematic, but especially the intensive use of water—particularly in a state that is almost entirely semi-arid and where rainfall is scarce.

Although Brazil already has an energy matrix primarily derived from renewable sources—mainly hydroelectric (almost 50%), followed by wind and solar—several *onshore and offshore* wind, solar, and green hydrogen projects are being proposed in the name of climate and energy transition. These projects do not seem to consider that the main greenhouse gas emissions in the country originate from changes in land use and agriculture, nor do they adequately consider the possibility of intensifying emissions—such as the deforestation of the Caatinga biome for the installation of solar power plants. Thus—far from complying with the Paris Agreement and recognizing and respecting other understandings of the world and of relationships with the planet, and with what Western Euro-American thought calls nature—these projects represent new market and investment opportunities. Despite presenting themselves as promoters of the energy transition, they end up practicing greenwashing *in* their marketing practices and advertising.

The energy transition in Northeast Brazil, especially in Ceará, and the socio-environmental injustices

According to the Brazilian National Electric Energy Agency (ANEEL), in 2023, Brazil had a total of 194,387.49 MW of inspected power. Of this total in operation, 83.69% of the plants are considered renewable[10]. In that year, there was an expansion of the Brazilian electricity matrix of 5,673.9 MW, with 176 plants entering commercial operation, including 79 wind farms (2,713.8 MW), 61 photovoltaic solar plants (2,295.1 MW), 25 thermal power plants (531.4 MW), eight small hydroelectric plants (122.2 MW), and three hydroelectric generating

[10]BRAZIL. National Agency of Electric Energy. Wind farms dominate expansion of electricity supply in July. **Gov.br.,** 2023. Available at https://www.gov.br/aneel/pt-br/assuntos/noticias/2023/usinas-eolicas-dominam-expansao-da-oferta-de-energia-eletrica-em-julho . Accessed on: February 10, 2025.

plants (11.4 MW). Solar and wind plants together represented 88.3% of the installed capacity that year[11].

The debate about the energy transition and the adoption of renewable sources for energy production is not new in Brazil, and especially in the Brazilian Northeast, where, since the mid-2000s, wind and solar power plants have been installed in different municipalities in the Northeast. As a rule, these plants are located in the coastal zone or in the interior, in considerable proximity to, or even within, the territories of traditional peoples and communities.

In the case of Ceará, one of the first communities impacted by the installation of a wind power plant was the Quilombola community of Cumbe – located in Aracati, on the east coast, composed of approximately 170 families. Since the 1990s, Cumbe had been resisting the installation of shrimp farming enterprises, which had a significant impact on the mangrove ecosystem. According to a leader of this community, interviewed on July 21, 2022:

> Because we are a quilombola community of artisanal fishermen, where we have a very strong relationship with the mangrove ecosystem, the destruction of the mangrove by shrimp farming, by shrimp farming enterprises, was what motivated the creation of, I would say, a resistance group within the community to denounce and defend the mangrove ecosystem. So, it is during this period of activity, from 1996, that a whole process of community organization in Cumbe begins in the face of the economic enterprises of shrimp farming (Leader A. Interview given on July 21, 2022, our translation)[12].

In the early 2000s, the community began fighting against another major undertaking: the wind farm project with over 60 wind turbines from Companhia Paulista de Força e Luz Energia (CPFL), located in the dunes, lagoons, and near the community's houses and cemetery. At that time, the debate about a more sustainable energy production model that included solar, and wind sources did not yet encompass the violence occurring in Cumbe, but community leaders were already strongly feeling the effects of the installation of these not-so-sustainable projects.

> I joined the [human rights defenders] protection program in 2009, when the program didn't even exist at the state level yet, right? And this happened in a

[11]To follow the growth and expansion in electricity generation in the country, see more at: https://sigel.aneel.gov.br/portal/home/item.html?id=45374c61bd3e40e3a484878003fae937 . Accessed on: February 10, 2025.

[12]The leadership will be indicated by only one letter, due to the fact that it is threatened and is part of the Human Rights Defenders Protection Program.

> fight against the installation of the wind energy park that was being built within our territory, on top of our aquifer in the dunes, you understand, which supplies the municipality of Aracati, and which destroyed dozens of historical and prehistoric archaeological sites. […] However, it was a very difficult context, because we were coming from that issue of blackouts, you understand? And in this story of the need to produce clean, renewable energy, which I always say is a demand of ours from social movements. And capitalism has a very great capacity to appropriate what is ours and do it in its own way. And so, it was very difficult for us to bring this debate because of the need and urgency to change Brazil's energy matrix. I remember that during that period, in 2009, if my memory serves me right, whether it was after or before 2008, the World Social Forum took place in Belém do Pará, and I went. And I dared to denounce wind power there in a space that was available, you understand? And I was almost stoned because I was bringing up this problem, you know, that we said it was clean energy, but its installation wasn't. You understand? So what happened in Cumbe served as an example, I even think we were one of the first, the first community to denounce what was behind this fallacy of clean energy, right? How it was arriving in the territories and the problems it was causing. […] Today, currently, in the Quilombo do Cumbe, besides me, there are three more people who are included in the Protection Program. So, this happened precisely because we positioned ourselves against these death projects that interfere, dismantle, that is, cause a series of human rights violations within traditional territories, right? (Leadership A. Interview on July 21, 2022, our translation).

The account above is also shared by another Quilombola leader from Cumbe, Cleomar Ribeiro da Rocha[13]:

> We're talking about a community where many houses were made of wattle and daub. And, with the project, many houses collapsed. The church almost collapsed, the school almost collapsed. There's the impact of heavy vehicles coming and going, the impact of heavy wind turbines within the quilombo, within a community that has no infrastructure. There was no way to prepare for such a structure. First, a company came in to work on the dunes. The most painful thing during this construction period was seeing the devastation of the territory, the devastation of our lagoons being buried. They demarcated the entire area, from the road where the trucks passed to the installation site of all those propellers, those towers. And many of these towers are in traditional lagoons. We have several traditional lagoons in the community in dune areas, and it was in these lagoons where the roads would pass. They buried many lagoons. It was unbelievable the extent of the destruction, the tearing of the territory caused by the wind farm. How could anyone endure so much destruction from a "clean energy"? So, look at the role of this "clean energy": destroying communities, destroying our lives, destroying our practices, and devastating our territory (Rocha, 2024, p. 115, our translation).

In another passage, it adds:

[13]The leadership of Cleomar Ribeiro da Rocha is explicitly referenced since these excerpts are available in an open-access work, cited in the references.

> Because of this destruction, because of the wind farm, we lost our autonomy, our identity. We are lost in the territory. So, despite the discourse being about producing good energy, clean energy, energy that doesn't produce pollution, in practice it is destroying communities, it is destroying ancestral traditions. Let this be explicit, because the idea is that this energy is "clean," but we contextualize: "Look, the energy doesn't let me pass through my territory, the energy doesn't let me do my practices anymore, the energy doesn't let me enjoy the lagoons, fish in the lagoons, go to the beach!" Look at the role of this "clean energy"! Is it sustainable? Is it renewable? Destroying women, their bodies, not only mine, but those of everyone who lives in the community. And then, when we reach this level of illness, it's because we are fragmented, just like the territory! (Rocha, 2024, p. 116, our translation).

As we can see in the aforementioned statements, the implementation of neo-extractive enterprises imposes a rupture with the Quilombola communities' ways of life in a violent and permanent attempt to destroy the ontological and epistemic links with the territory. This reveals a socio-territorial conflict that is expressed through the dispute of *antagonistic ontological paradigms* (Barbosa, 2024) and the intensification of the dispute over conceptions and uses of the territory: transnational and financial capital defends a conception of development linked to territorial exploitation for the extraction of *commodities,* including the sun, wind, and water. For the communities affected by these projects, the territory is understood as the cradle of their identities and social interactions, permeated by the memory of their ancestors. and through their presence, through spirituality, through sounds and smells, and a way of cohabiting, which delineates their community subjectivities and their connection with the territory itself.

This reality of the implementation of wind and solar projects in the Northeast is no different from the installation of other projects that impact the ways of life of traditional peoples and communities, as clearly demonstrated, for example, in the Map of Conflicts – Environmental Injustice and Health in Brazil, by Fiocruz (2025).

However, in the proposed energy transition model, socio-environmental injustices are considered mere externalities of the projects, despite a "green" discourse and a renewed commitment to life on the planet. The disregard for the people who live in the territories targeted by these projects is a significant indication that we are talking much more about a deepening of the extractive model than necessarily about a transition from the capitalist way of life.

In this sense, based on discourses that state the objective of guaranteeing the reduction of greenhouse gas emissions and the fulfillment of goals established in international treaties, there is a race to expand wind, solar, and new forms of energy production—such as green

hydrogen. In the case of Northeast Brazil, these ventures also have an export-oriented aspect, aiming to enable the decarbonization of Europe and the Global North.

In the race to expand renewables, there is also an alarming speed regarding new regulatory frameworks for the production of green hydrogen and *offshore wind power*. Regarding green hydrogen, we should mention that, as it is a new technology, until 2022 there was no specific regulation to address the environmental licensing of these projects[14]– which is why the Ceará State Environmental Council (COEMA), linked to the State Secretariat for the Environment (SEMA), began discussing the proposal of a specific resolution to address green hydrogen production projects for energy generation within the state. In this sense, on February 10, 2022, the Council approved Resolution No. 03/2022, which establishes the procedures, criteria, and parameters applicable to environmental licensing and authorization within the scope of the State Superintendence for the Environment (SEMACE) for green hydrogen projects; this is a resolution that was unprecedented in the country on this subject.

Thus, the State of Ceará, through its environmental policy bodies, preferred to establish specific and *ad hoc legislation* for concrete and individualizable cases, that is, establishing an exception in environmental legislation specifically for the production of green hydrogen, instead of following the existing general and national regulations on environmental licensing of projects—such as Resolution No. 237 of the National Environment Council and Interministerial Ordinance No. 60/2015.

In February 2022, the State of Ceará had already signed approximately 14 memoranda of understanding with different multinational companies for the implementation of green hydrogen production projects in the Pecém Industrial and Port Complex region. This indicates that, more than guaranteeing the constitutionally established right to an ecologically balanced environment and the rights of the populations affected by the projects, the Resolution approved by the State Environmental Council had as its primary purpose to guarantee legal security for investors. First, memoranda of understanding are signed with investors; then, efforts are made to approve a resolution that legally guarantees these investments, avoiding future challenges.

Similarly, Bruna Damasceno (2022) highlights that the first resolution on environmental licensing for green hydrogen plants in Brazil—approved in Ceará—sought to consolidate the

[14]National regulations on green hydrogen were only approved by the National Congress and sanctioned by the Presidency of the Republic on August 2, 2024, through Law No. 14,948/2024. This law established the legal framework for low-carbon hydrogen; provided for the National Policy on Low-Carbon Hydrogen; and provided for various incentives for the low-carbon hydrogen industry, such as the Special Incentive Regime for the Production of Low-Carbon Hydrogen (Rehidro) and the Low-Carbon Hydrogen Development Program (PHBC).

state as a *hub* for this sector. Citing the words of Carlos Alberto Mendes Junior—then head of Semace—Damasceno (2022) reports that the measure sought to guarantee legal security for the projects, establishing clear criteria for licensing and providing predictability to companies—which had already signed more than 16 memoranda of understanding with the state government. The aforementioned report (Damasceno, 2022) also listed a group of companies that had already signed memoranda of understanding with the State of Ceará, indicating an interest in exploring this new green hydrogen market in the CIPP. Among these companies, he mentions: Enegix Energy, White Martins, Qair, Fortescue, Eneva, Diferencial, Hytron, H2helium, Neoenergia, Engie, Transhydrogen Alliance, Linde, Total Eren, and AES Brasil.

Offshore wind turbines

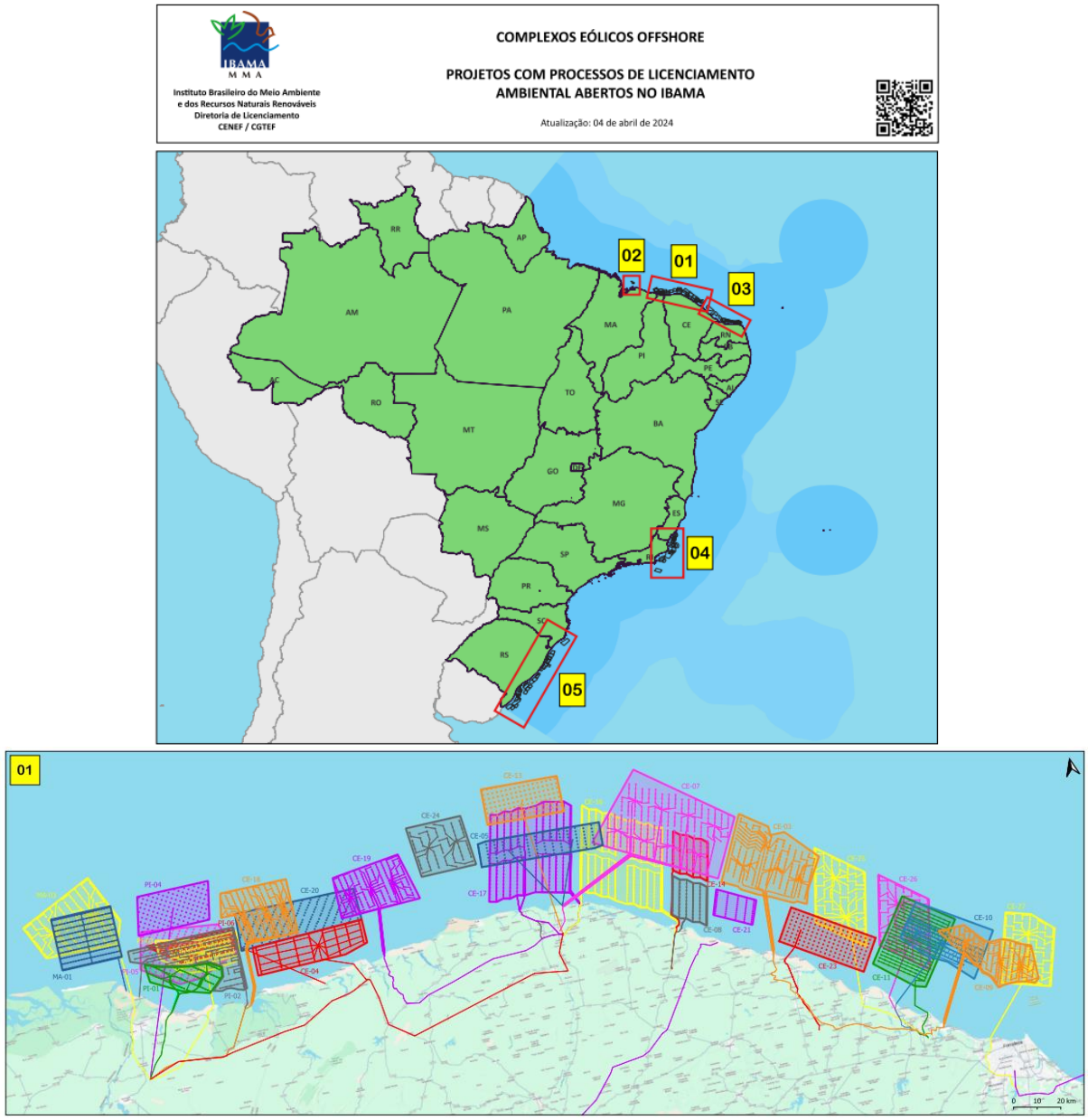
In the case of *offshore wind farms*, regulation in Brazil was established by Federal Law No. 15,097, of January 10, 2025, which governs the exploitation of energy potential in the high seas. Although the law provides in Article 4, item X, for free, prior, and informed consultation with the peoples and communities affected by the *offshore project*, the law itself was approved and enacted without any mechanism for listening to and consulting potentially impacted communities. To date, the Brazilian Marine Spatial Planning (MSP)—which aims to establish an ordering of the various human activities at sea, promoting a sustainable use of the ocean—has not yet been completed[15], nor does it include popular participation in its development.

Therefore, the existence of coastal peoples and their relationship with the sea-territory is disconsidered. There is a legal, social, and often scientific production of the non-existence of these peoples and communities (Nóbrega, 2023), in an attempt to legitimize socially, economically, and politically the different ventures in territories already occupied by these same peoples and communities. This is an important technology of erasure, updated since colonial times.

Regarding the coast of Ceará state, *offshore* wind energy projects with open environmental licenses at Ibama and more than 4,300 wind turbines planned, many of them overlapping, according to data from April 4, 2024[16]. The main developers include Petrobras, Qair, Cemig, Shizen Energy, Shell, H2 Green Power, among others.

[15]We suggest reading the page of the Interministerial Commission for Marine Resources at: https://www.marinha.mil.br/secirm/pt-br/psrm/pem . Accessed on: February 15, 2025.
[16]BRAZIL. IBAMA. Offshore wind farms. **Gov.br,** 2024. Available at https://www.gov.br/ibama/pt-br/assuntos/laf/consultas/arquivos/20240507_Usinas_Eolicas_Offshore.pdf . Accessed on: February 15, 2025.

Figures 2 and 3 – Location of *Offshore* Wind Farm Projects with environmental licensing from IBAMA, highlighting the coast of Ceará



Source: Ibama (2024).

Silva (2024) developed an important social cartography of the sea, from the perspective of artisanal fishermen and coastal communities, noting the existence of practices, knowledge, and technologies associated with artisanal fishing on the coast of Ceará. The following were identified: boat mooring locations; the existence of fishing weirs in the open sea; boat routes; marine biodiversity resulting from artisanal fishing; the location of artisanal fishing grounds and shellfish harvesting sites; different fishing gear; religious and leisure activities linked to

artisanal fishing, among other elements that characterize the marine environment as the sea habitat of various peoples and communities on the coast of Ceará. There is a recognition of complex and multifaceted links between different coastal communities and the marine environment.

> The social mapping of the sea, carried out in 21 of the 23 coastal municipalities of Ceará, revealed 216 fishing areas along the continental shelf, along with 600 identified fishing grounds, indicating a diversity and complexity in artisanal fishing practices. The sectorization of these areas based on bathymetric criteria, seabed types and species present demonstrates the variety of marine ecosystems along the Ceará coast (Silva, 2024, p. 79, our translation).

Regarding offshore wind farms, Silva (2024, p. 154) highlights the potential negative impact of their deployment on traditional communities that depend on fishing resources for their livelihood. This is because artisanal fishing is not confined to a single specific location in the coastal and marine environment, but encompasses vast areas, depending on wind and tidal conditions. Furthermore, such offshore projects can exacerbate existing inequalities and socio-environmental and territorial conflicts in these areas. Thousands of families depend on artisanal fishing, and the fishing industry ensures food security and sovereignty with very little or almost no public investment. However, offshore and onshore projects require government funding, in the form of tax incentives or reduced financing costs, in a way that is unthinkable for these coastal communities.

Green hydrogen

But the energy transition isn't solely driven by wind power. In the relentless pursuit of new markets and ways to commercialize this type of energy produced from renewable sources, Brazil has invested in green hydrogen, which is a form of energy production through water electrolysis, as previously mentioned. According to Wyczykier (2023), being an energy vector and not a raw material in itself, green hydrogen is not found naturally in its pure state; it is obtained from the breakdown of the water molecule (H2O) into oxygen and hydrogen through a process that uses energy from renewable sources such as wind and solar. Because it is still an experimental technology, its production cost is quite high, requiring large quantities of water and energy.

In the case of Ceará, over the last 30 years, the State has invested large sums of resources in the implementation of the Pecém Industrial and Port Complex (CIPP), as already mentioned. This movement has intensified with projects related to the production of green hydrogen, whose main consumer market is the European market—due to the need to decarbonize the energy matrix—to meet the goals of the Paris Agreement and the impacts resulting from the war in Ukraine (Wyczykier, 2023). However, different traditional communities and the Anacé indigenous people are located in the territory disputed by the CIPP.

In a news article with the headline "Green Hydrogen: with the 14th memorandum signed, Ceará expands its fuel production capacity," published on December 14, 2021, Falcão (2021) highlighted the interest of numerous multinational companies in establishing a green hydrogen *hub* at the Pecém Industrial and Port Complex. That week, the 14th memorandum of understanding was signed between the State of Ceará and AES Brasil, a subsidiary of AES Corporation—one of the largest energy companies in the United States—for the implementation of a green hydrogen plant at CIPP, referred to in news article as "clean fuel." By 2025, the State of Ceará had already signed more than forty memoranda of understanding for the construction of green hydrogen plants at CIPP, with the Australian multinational company Fortescue having obtained, in November 2023, the Preliminary License (LP) from the state environmental agency Semace[17].

Ceará, therefore, has been announced as a location of great interest for the installation of industries for the production of energy from green hydrogen. But as we mentioned, the production of this "fuel of the future" requires large quantities of water and energy from renewable sources; hence the adjective "green." According to Domingos Zaparolli, in a news article published in Fapesp's Pesquisa Magazine,

> The study of productive hydrogen routes that do not depend on pure water in their processes is of great relevance and is closely followed by professionals in the sector. According to IRENA, to produce 409 million tons of green hydrogen annually and supply 12% of the world's energy demand in 2050, it will be necessary to consume between 7 billion and 9 billion cubic meters of water per year. This totals less than 0.25% of current freshwater consumption. It may seem small, but it is a significant volume in a world where this resource is becoming scarce (Zaparolli, 2022, online, our translation).

[17]CEARÁ. Secretariat of the Environment and Climate Change. Semace participates in the delivery of the preliminary license for the production of Green Hydrogen in Ceará. **SEMACE,** 2023. Available at https://www.semace.ce.gov.br/2023/11/10/semace-participa-da-entrega-de-licenca-previa-para-producao-do-hidrogenio-verde-no-ceara . Accessed on: November 28, 2024.

All this public and private investment has an interest, including overseas. Recent news indicates that Ceará has attracted large investments in green hydrogen, including international ones. In 2023, German businessmen visited the state to assess future purchase opportunities. In 2024, a study indicated that Ceará could receive R$ 168.9 billion in investments by 2031. In the same year, the state government signed a pre-contract worth R$ 9 billion with a Norwegian company for the installation of a new plant in Pecém[18].

What these news reports fail to highlight is that the state is almost entirely located within a semi-arid zone, with scarce rainfall. How, therefore, can the *sale* of CIPP be justified as a future green hydrogen *hub* with such a high demand for fresh water, considering all the water stress to which the population of Ceará has historically been subjected?

Referring to Carlos Walter Porto-Gonçalves (2004, p. 152, our translation), the environmental crisis related to hydrological imbalance is linked to unequal access to water, which "[...] reveals the crisis character of society, as well as its forms of knowledge," which continue to classify people, their territories, and ways of life as sacrifice zones (Viegas, 2006) to enable the living standards of a few. We are therefore not detached from the colonial matrix that prevailed in Latin American territories during European occupation. This matrix remains in effect and is potentiated by neo-extractive and financialized capitalism. Thus, living in territories of interest to globalized capitalism are entire populations that are expelled from these places, having to redefine their lives in territories with conditions different from those they knew.

To meet the raw water needs, in terms of quality and quantity, of the projects currently existing in the CIPP (Industrial Complex of Pecém), a specific water supply system was built by the state of Ceará: the Canal Sítios Novos/Pecém water supply system. This system is the main source of water supply for the Complex, consisting of a reservoir with a maximum volume of 123 million m^3, capable of supplying a flow rate of 1.1 m^3/s.

Complementing this system, due to the increased water demand from the developments, it became necessary to capture water via the Eixão das Águas or "Gavião Pecém Water Supply

[18]In this regard, see more at: LEMOS, M. German entrepreneurs arrive in Ceará to learn about opportunities for future purchase of green hydrogen. **Diário do Nordeste,** 2023. Available at: https://diariodonordeste.verdesmares.com.br/negocios/empresarios-alemaes-chegam-ao-ceara-para-conhecer-oportunidades-de-compra-futura-de-hidrogenio-verde-1.3429741 . Accessed on: November 28, 2025. To complement this, see: CAMPOS, I.; GIBAJA, C. Government of Ceará signs R$ 9 billion pre-contract with Norwegian company for installation of green hydrogen plant in Pecém. **Government of the State of Ceará,** 2024. Available at: https://www.ceara.gov.br/2024/10/28/governo-do-ceara-assina-pre-contrato-de-r-9-bilhoes-com-a-empresa-norueguesa-para-instalacao-de-planta-de-hidrogenio-verde-no-pecem/ . Accessed on: November 28, 2025.

System", which will be supplemented with water from the São Francisco River Transposition project, via the Ceará Water Belt project, "which basically consists of a system for distributing water transferred from the São Francisco River to all the hydrographic basins of the State of Ceará" (Santana *et al.*, 2013, p. 53, our translation).

During the drought period, starting in 2016, when the Sítios Novos reservoir reached its dead volume, the Government of the state of Ceará implemented a series of wells, pipelines, and a pumping station from the Dunas Aquifer, located underground and in areas of lagoon outcrops, such as the Cauípe Lagoon, guaranteeing the water-intensive consumption of the industries in the CIPP (Centro Integrado de Poupança e Pesquisas Pecuários). This extraction of water from the water sources, used even by the Anacé indigenous people, generated numerous conflicts (Melo, 2021). Meireles (2023) warns that the continuous extraction of water from the Cauípe Lagoon for water-intensive industries can impact the local ecodynamics, reduce aquifer recharge, and compromise the food sovereignty of traditional and indigenous communities.

Melo (2021) points out that the reality of water insecurity experienced by thousands of people in Ceará—due to the state being almost entirely located in a semi-arid area[19] (Zanella, 2005) and therefore highly vulnerable to the effects of drought (Folhes and Donald, 2017)—is not felt by industries located in the CIPP, characterized by such water-intensive activities. According to Melo (2021), the Pecém Thermoelectric Unit and its associate have a water use rights permit of 750 liters per second, and the Companhia Siderúrgica do Pecém – CSP, 1,000 liters per second, in a region marked by droughts. According to the author, "considering that the average consumption of a person from the Northeast is around 116 liters per day, CSP alone—if it effectively uses all of its granted water use rights—has a consumption equivalent to 744,186 people!" (Melo, 2021, p. 22-23, our translation).

Thus, the State of Ceará has allocated much larger volumes of water to the industries of CIPP compared to the local population. According to Aguiar (2019), the thermoelectric plant receives 800 liters of water per second, while the steel mill initially had the right to 1500 liters per second, later reduced to 1000. Together, these industries can consume up to 154.7 million liters of water per day, 31 times more than the minimum consumption recommended for the population of São Gonçalo do Amarante.

[19]According to Resolution No. 150 of the Deliberative Council of Sudene, dated December 13, 2021, published in the Official Gazette of the Union on December 30, 2021. Available at: https://www.in.gov.br/web/dou/-/resolucao-condel/sudene-n-150-de-13-de-dezembro-de-2021-370970623 . Accessed on: January 7, 2025.

This dimension of water injustice (Melo, 2021) is even more serious if we consider the context of climate change and the already fragile and vulnerable situation regarding desertification in the Brazilian semi-arid region. According to the report published in 2022 by the Intergovernmental Panel on Climate Change—According to the IPCC (International Research Council), linked to the United Nations, the Brazilian Northeast is one of three regions on the planet—along with southern Australia and the Mediterranean—that are experiencing river drying up.

In this frantic race for new markets, there is a profound lack of control over the proposed and actually installed projects, generating an overload, for example, in the electrical system. The overproduction of energy in the Northeast—especially from renewable sources—was the main cause of a blackout that occurred in 2023[20].

Aiming to reduce the possibility of further overloads on the national electrical system, the National System Operator (ONS) and ANEEL have reinforced the need to adopt power generation cuts in order to preserve the integrity of the national interconnected system. This operation—known by the jargon term *curtailment*—a power outage is the reduction or interruption of renewable energy generation—such as wind and solar—caused by grid limitations or economic considerations. According to a report in the newspaper *O Globo*[21], most of the outages occurred in Ceará, with power generation interruption rates of almost 15%. However, new risks of blackouts due to overload of the electrical system are not ruled out, according to data from the ONS (National System Operator)[22].

Despite this, the focus remains on expanding this neocolonial model between the Global North and South, and on internal colonialism within Brazil. With the Northeast supplying clean and cheap energy to the Southeast, based on the need to appropriate energy resources without a fair division of the socio-environmental risks and impacts associated with this energy transition model, this model intensifies mega-mining and fossil fuel extraction, maintaining the logic of profit and exacerbating socio-environmental conflicts. Thus, green hydrogen decarbonizes energy matrices without breaking with the current mercantilist model

[20]PIMENTEL, C. Failure in wind and solar farms in Ceará caused August blackout. **Agência Brasil,** 2023. Available at: https://agenciabrasil.ebc.com.br/geral/noticia/2023-09/falha-em-parques-eolicos-e-solares-no-ce-causou-apagao-de-agosto. Accessed on: November 28, 2025.

[21]LIMA, B. Cuts in wind and solar power generation increase and lead sectors to demand compensation that could weigh on electricity bills. **O Globo,** 2025. Available at: https://oglobo.globo.com/economia/negocios/noticia/2025/02/23/cortes-de-geracao-eolica-e-solar-aumentam-e-levam-setores-a-cobrar-ressarcimento-que-pode-pesar-na-conta-de-luz.ghtml. Accessed on: November 28, 2025.

[22]CORRIERI, R. 11 States at risk of blackout due to overload, says report. **Poder 360,** 2024. Available at: https://www.poder360.com.br/poder-energia/11-estados-correm-risco-de-apagao-por-sobrecarga-diz-relatorio/. Accessed on: November 28, 2025.

(Wyczykier, 2023). Therefore, there has not been a true transition, but rather an addition to the energy matrix: of "green" sources to carbon-emitting energies.

Therefore, we question this energy transition model, which deepens socio-environmental injustices, maintains capitalist lifestyles unchanged, and deepens geopolitical relations of exploitation between the Global North and South. This is a corporate-type energy transition that aims more at market exploitation and profit maintenance than at structural change (Bertinat; Agento, 2021). Thus, companies and governments seek to reduce emissions, not out of recognition of planetary limits, but to adjust to the constraints of the global crisis and minimize losses (Aedo, 2023), prospecting new markets.

Is there a way out in the energy transition? Proposals towards socio-ecological transitions.

The energy transition, as implemented, has impacted Indigenous and traditional peoples and communities whose existence has been ignored in the debate—despite their interdependent relationships with the environment offering valuable alternatives to the multidimensional crisis we face. Under the pretext of climate, the territories of these peoples and communities remain sacrifice zones, perpetuating socio-environmental injustices. In this sense, this transition represents a false solution that, in seeking decarbonization, implements technocratic approaches based solely on natural sciences, ignoring the socio-political and economic factors of climate change (Ravera; Arandia, 2017). In practice, it becomes merely a market opportunity that attempts to "green" capitalism without transforming it.

This model is exemplified by the maintenance of the Global North's consumption pattern through new incursions into the territories of indigenous peoples, artisanal fishermen, Quilombola communities, and traditional communities to implement "clean" energy projects. Wind, solar, and green hydrogen—mining exploration and logistics corridors. The corporate world and global ecological governance avoid crucial questions: where does the lithium for batteries and electric cars come from? What is the origin of the metals for wind turbines? Where are green hydrogen plants and large onshore and offshore wind farms located?

In these projects, justified by the need for adaptation and decarbonization, the socio-environmental impacts are transferred to the Brazilian Northeast, while the energy generated benefits markets in the Global North. This dynamic represents a capitalist update of the colonial model under the guise of climate urgency, maintaining the geopolitical configuration that

reduces Latin America to a supplier of *commodities*—now with sun, water, wind, and rare metals as new products of the global extractive market.

Indigenous peoples and traditional communities in the Global South have denounced the injustices of an energy transition model that deepens inequalities. La Via Campesina International—the largest transnational agrarian movement—has, in the same vein, pointed to the proposed energy transition as a false transition, with negative impacts on different territories (La Via Campesina, 2024)[23]. In the name of climate, communities that have contributed little to the climate crisis suffer: i) impoverishment, ii) displacement, iii) increased burden of care work for women, and iv) destabilization of their ways of life—impacts often more severe than those of climate change itself (Paim; Furtado, 2024)[24]. Parallel to the discourse of energy transition, there is increasing violence against traditional peoples (Ojeda, 2014), particularly affecting women.

In the case of the Quilombola Community of Cumbe, as reported in the statements of the leaders reproduced in section 2 of this article, the impacts resulting from the installation of *onshore wind farms* include, among others: a) the filling in of lagoons; b) destruction of archaeological sites; c) prohibition of the circulation of people and access to places of profound cultural, economic, ritualistic and symbolic relevance; d) fostering the breakdown of social ties and community divisions; e) harassment and threats to leaders; f) fencing and confinement of communities; g) disruption of ways of life; h) physical and mental illnesses; i) destruction of community heritage by the transit of heavy vehicles; j) deforestation; and k) fragmentation of territories. Many of these impacts are permanent and borne exclusively by the communities where these projects are installed.

Cumbe gives us important clues about the deepening of this scenario in the case of offshore wind farms, which, it is worth noting, also require *onshore infrastructure*, including substations, storage facilities, and transmission lines. The corporate energy transition model, therefore, tends to generate greater disruption among peoples and communities whose ways of life did not contribute to the scenario of multiple crises in which we find ourselves.

It is crucial to make gender dimensions visible in the debate on climate change and energy transition. Latin American political ecology, with its critique of extractivism and defense

[23]LA VIA CAMPESINA. La Vía Campesina: Climate catastrophes require urgent attention and global response! Enough of false solutions! **La Via Campesina,** 2024. Available at https://viacampesina.org/es/la-via-campesina-las-catastrofes-climaticas-requieren-atencion-y-respuesta-global-urgente-basta-de-falsas-soluciones/ . Accessed on: 28 Nov. 2025.

[24]To illustrate, we suggest the video "Wind turbines in Ceará - Clean energy for whom?", available at: https://www.youtube.com/watch?v=ZhnbovAAOhA . Accessed on: November 28, 2025.

of the commons, highlights the relationships between gender, environment, and social reproduction. This ecological perspective—rooted in struggles for access to land—connects directly to the resistance of Indigenous, Black, and peasant women and to Latin American feminisms (Arriagada Oyarzún; Zambra Álvarez, 2019).

In response to these new extractivist approaches, initiatives are emerging that rethink the energy transition from alternative ontologies. Proposals for just, democratic, feminist, and decolonial transitions are gaining strength, as exemplified by the Latin American Just Transition movement, which brings together organizations from Chile, Argentina, Colombia, and Peru (Aedo, 2023). In Northeast Brazil, the Movement of People Affected by Renewables (MAR) developed "Socio-environmental Safeguards for Renewable Energy" (2024) to protect territories and traditional ways of life. These movements do not reject sustainability, but question the polysemy of this concept based on how projects have been implemented in the territories. They also contest the ecological modernization that merely "greens" capitalism without transforming the consumption patterns of the Global North.

Facing the corporate transition, the struggle of women in social movements and academia denounces the false solutions of renewable energy megaprojects, offering fundamental concepts and reflections for overcoming the current crisis. Different theorists—such as Silvia Cusicanqui, Maristela Svampa, and Lorena Cabnal—have constructed a counter-colonial, feminist, and anti-extractive perspective that prioritizes life. They argue that overcoming the multiple crises requires a profound transformation of the socioeconomic relations that sustain racist patriarchal capitalism. The concept of body-territory emerges as an analytical key to transforming economic, environmental, and gender power relations.

Women have been leading mobilizations against daily precarity and water scarcity, and for food sovereignty, proposing situated socio-ecological transitions (Aedo, 2023) based on concrete collective practices. In Brazil, marches by indigenous women have denounced the disproportionate impacts of capitalism and extractivism, pointing to the "healing of the land." Their mobilizations show how ancestral knowledge about care, seeds, and territories is essential to rethinking the patterns of accumulation that have brought us to the brink of barbarism (Barbosa; Nóbrega, 2023).

"*Not fighting with the same weapon as the enemy does not mean we are unarmed*," stated Brazilian Indigenous women during the 2nd March held in Brasília in 2021. These new weapons of Indigenous women inaugurate new ways of fighting within the Indigenous movement, further contributing to deepening the debates on a feminist political ecology. The

1st Indigenous Women's March in Brazil (2019) presented the vision of territory as body and spirit, highlighting the connection between humans and nature. In the 2nd March (2021), they reaffirmed the importance of ancestral cosmologies, emphasizing that caring for the Earth is caring for one's own body and mind, promoting the idea of "reforesting minds" to protect the body-earth. The 3rd Indigenous Women's March (2023), with the theme "Women Biomes in Defense of Biodiversity through Ancestral Roots," reinforced the connection with ancestral traditions, highlighting the importance of strengthening women's participation and debates on indigenous policy in Brazil[25].

In the constellation of struggles and resistance against separations—body and spirit; reason and emotion; modern and ancestral; nature and culture; and personal and political—Indigenous women point to understandings of body-territory and life as something far more complex and interrelated. Where patriarchal capitalism sees separations, Indigenous women see the power of interdependent relationships and encounters. The struggle of Indigenous women allows us to make visible the abundant generative capacity of life as a whole, as well as the centrality of affections, care, and mythical meanings inherent in the dynamics of social production and reproduction (Aguilar; Gaona, 2020).

In confronting capitalist proposals for false solutions to the climate and environmental crisis, we also highlight the care crisis, which amplifies the concrete impacts of these crises on women's lives, directly and immediately reflecting the intersectionalities related to economic, gender, and ethnic-racial inequalities, among others. In many parts of the world, women are socialized to be responsible for the care of children, the sick, and the elderly, being responsible—within the context of the sexual division of (re)productive labor—for the tasks of maintaining life. This does not stem from any innate aspect or one naturally resulting from being a woman or having feminized bodies, but rather from power relations embedded in gender within socially constructed roles.

In this context, women are the most affected, or disproportionately affected, by climate change, since such changes have implied more work to find water, to care for increasingly sick children and elderly people; to guarantee food—even if it is not adequate or healthy. This means less time for themselves, for the political and social organization of women, and for the necessary confrontations not only with patriarchy, but also with racism, capitalism, and climate change.

[25]Available at: https://anmiga.org/marcha-das-mulheres/ . Accessed on: October 10, 2024.

Despite all this, women are often the first to stand up against developments in their territories, being indispensable agents in the context of climate mitigation and adaptation. While it is necessary to decarbonize our energy matrix and reduce greenhouse gas emissions, it is also necessary to safeguard the lives of those who did not cause the barbarity in which we find ourselves. We need to look at women and the care crisis.

In the context of a time of crisis, in which everyone on the planet has their lives put to the test—including non-humans—Donna Haraway proposes that we not allow the fatalistic and anthropocentric perspective to contaminate our thinking and our imaginative capacity to see and act for new presents and futures. The Chthulucene and Tentacular Thinking (Haraway, 2017) are invitations to "remain in the problem," through generative joy and collective thought. In other words, Donna Haraway invites us to feel, intend, and pulsate from the creation of bonds and ruptures that weave non-deterministic paths. It is about the need to continue thinking and not resort to and accept the capitalist fatalism that pushes us towards the logic of the end of the world.

In this sense, when reflecting on other worldviews and cosmologies, it is essential to value the knowledge of Indigenous, Quilombola, peasant, and fishing women, ensuring their real and effective participation in decision-making regarding the fight against climate change. This includes the necessary mitigation and adaptation to the geobiological transformations already underway—caused by so-called global warming—without implying an increase in the workload of these women. Feminist power and the valuing of knowledge that integrates the recognition of the interdependence of life into its ontologies (Navarro; Linsalata, 2021; Navarro; Gutiérrez, 2018) are essential to confront the multiple crises.

Finally, we understand that a socio-ecological transition to such crises necessarily requires that elites and countries of the Global North assume their responsibility and rethink their ways of life to reduce their contributions to the problem. As Isla Vargas (2020) warns, delegating adaptation solely to vulnerable communities reinforces inequalities and dilutes the historical responsibilities of the dominant classes. Without structural changes, the scenario of vulnerability of these populations will persist, making the articulation between mitigation, adaptation, and transformation of the capitalist model essential. Let us learn, therefore, to listen, dialogue, and walk with other women, devising strategies of interdependence that help us recover the web that sustains life on the planet.

Final considerations

The way the energy transition debate has been structured and consolidated in the world, and especially in Northeast Brazil, has led to a deepening of the relationship between states and companies that intensifies inequalities, expands extractivism and the exploitation of territories, minerals and water, subordinating ways of life to the maintenance of the standards of the Global North.

In this context, the technocratic solutions proposed for the multiple crises in which we find ourselves are limited and based only on one part of the problem. It is necessary, however, *to change the whole thing*, as Gago (2019) teaches us.

Indigenous, Quilombola, peasant, and women from traditional communities, therefore, from their organized and situated perspective, have pointed to the need to address the problem in a socio-political and ecological dimension, placing life at the center of the debate, that is, life in all its forms. The women's movements that directly confront the impacts of the corporate energy transition, as evidenced in the Indigenous Women's Marches and the resistance of fishing and Quilombola communities in the Northeast, offer fundamental perspectives that challenge the dominant extractivist paradigm.

Thus, by valuing the network of relationships between knowledge, practices, and care built from the experiences and struggles of these women, we can find situated paths that lead us to rethink and redefine the solutions to face the multiple environmental, economic, climatic, and social crises in which we find ourselves. It is this knowledge and these practices that point towards a true socio-ecological transition, in which the interdependence between all beings is recognized and respected.

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