Energy colonialism: Wind farms in the Isthmus of Tehuantepec, Mexico

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Abstract

The deployment of 29 wind farms in the indigenous territories of Ikoots and Zapotecs in the Isthmus of Tetuantepec, Oaxaca, Mexico is analyzed based on six dimensions: geopolitical; economic and financial inequalities; power, violence, and decision making; land grabbing and dispossession; impacts on territories and commons; resistance and socio-territorial conflicts. In the context of the energy crisis and climate emergency, this paradigmatic case contributes to the debate about whether the deployment of large-scale wind energy infrastructure is part of the energy transition or represents a case of energy colonialism. The results of this study allow us to conclude that energy colonialism is a useful concept for understanding and critiquing the effects of the deployment of large-scale wind energy megaprojects. At the same time, it suggests elements to consider for the decolonization of the energy transition.

Keywords: Colonialism, renewable megaprojects, indigenous people, wind farm, territory

Résumé

Le déploiement de 29 parcs éoliens sur les territoires autochtones des Ikoots et des Zapotèques, dans l'isthme de Tetuantepec, à Oaxaca, au Mexique, est analysé selon six dimensions: géopolitique; inégalités économiques et financières; pouvoir, violence et prise de décision; accaparement et dépossession des terres; impacts sur les territoires et les biens communs;

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résistance et conflits socioterritoriaux. Dans le contexte de la crise énergétique et de l'urgence climatique, ce cas paradigmatique contribue au débat sur la question de savoir si le déploiement d'infrastructures éoliennes à grande échelle s'inscrit dans la transition énergétique ou s'il s'agit d'un cas de colonialisme énergétique. Les résultats de cette étude nous permettent de conclure que le colonialisme énergétique est un concept utile pour comprendre et critiquer les effets du déploiement de mégaprojets éoliens à grande échelle. Parallèlement, il suggère des éléments à prendre en compte pour la décolonisation de la transition énergétique.
Mots-clés: Colonialisme, mégaprojets renouvelables, peuples autochtones, parc éolien, territoire

Resumen

Se analiza el despliegue de 29 parques eólicos en los territorios indígenas ikoots y zapotecas del Istmo de Tetuantepec, Oaxaca, México, desde seis dimensiones: geopolítica; desigualdades económicas y financieras; poder, violencia y toma de decisiones; acaparamiento y despojo de tierras; impactos en territorios y bienes comunes; resistencia y conflictos socioterritoriales. En el contexto de la crisis energética y la emergencia climática, este caso paradigmático contribuye al debate sobre si el despliegue de infraestructura eólica a gran escala forma parte de la transición energética o representa un caso de colonialismo energético. Los resultados de este estudio permiten concluir que el colonialismo energético es un concepto útil para comprender y analizar los efectos del despliegue de megaproyectos eólicos a gran escala. Al mismo tiempo, sugiere elementos a considerar para la descolonización de la transición energética.
Palabras clave: Colonialismo, megaproyectos renovables, pueblos indígenas, parque eólico, territorio

1. Introduction

The 21st Century is marked by the need for an energy transition that overcomes the fossil-fuel regime, mostly because of the problem of oil peak and the climate emergency that demands the reduction of carbon emissions (Turiel, 2020; Kazimierski & Argento, 2021). However, this becomes a difficult aim to fulfil when we note that 85% of global energy consumption depends on fossil fuels: oil, coal and natural gas (Valero, 2021). Additional studies have argued that the development of renewable megaprojects, such as wind and photovoltaics, continue fossil fuel dependence and are not fully geared toward transitioning from fossil fuels to renewables (Fressoz, 2024; Jarrige & Vrignon, 2020). In Mexico, the maximum peak of oil production was in 2004, and the maximum peak of natural gas production was in 2009. Since then oil production has decreased by half and gas by two thirds (Ferrari *et al*., 2023). Within this framework of fossil fuel decline, installing wind energy infrastructures has begun, and in 2022 wind farms were registered in 15 Mexican states (Asociación Mexicana de Energía Eólica, 2025). By 2023 in Mexico, wind energy sources generated 6.5% of electricity, compared to combined-cycle power plants (57%) and hydroelectric power plants (10.7%) (Energía y cambio climático, 2023). The installation of large-scale wind farms requires large stretches of land, which is generating a series of social and political conflicts in indigenous communities. The Isthmus of Tehuantepec is the region where most wind turbines have been installed.

In order to understand the conflict generated by the installation of wind farms in local territories, this article analyzes the deployment of the wind corridor in the Isthmus of Tehuantepec, Oaxaca, Mexico. Engaging with the debate on energy colonialism, the article is guided by these questions: How are colonial relations articulated in the deployment of wind energy infrastructure? Can we analyze this from the perspective of colonialism in the 21st century, given the energy crisis? What is the relationship between colonialism and energy? What are the demands of those who oppose these megaprojects? The article's hypothesis is that there is a close relationship between the deployment of large-scale wind energy megaprojects and colonial logic, with the installation of 29 wind farms in the indigenous territories of the Isthmus of Tehuantepec being an expression of energy colonialism.

The rest of the article is divided into the following sections: 2) Methods, describing the process of collecting and systematizing quantitative and qualitative data; 3) the theoretical framework, in which colonialism is used to analyze phenomena related to fossil energy sources, renewable infrastructures and mining extractivism; 4) a cases study, in which the territory is described in demographic and agrarian terms; 5) Systematized results through six dimensions; and 6) Conclusions, including discussion of the most relevant aspects of the six dimensions.

2. Methods

The methodology of used was qualitative and quantitative, based on a situated epistemology (Walsh, 2005) derived from active involvement in movements and resistances. The quantitative parts were generated mainly by the GeoComunes research group, using geographically referenced data layers on wind farms and information from Mexico's Ministry of Environment and Natural Resources (SEMARNAT), Energy Regulatory Commission (CRE), Federal Electricity Commission (CFE) and the Population and Housing Census of the National Institute of Statistics and Geography (INEGI).

The qualitative aspect comes from review of bibliographic sources referring to energy transition, the climate emergency, indigenous territories and colonialism. It explores the classic literature on colonialism, produced mainly by authors from the global South, and then takes up the various meanings with which the term energy colonialism has been applied, delimiting the theoretical approach. Methodologically the case study is analyzed and systematized in six ways:

1) The geopolitical dimension;
2) Economic-financial and inequalities;
3) Power, violation and decision-making;
4) Land grabbing and dispossession;
5) Impacts on territories and common property;
6) Resistance and socio-territorial conflicts.

Two of the authors identify as indigenous people from the Isthmus of Tehuantepec: one belongs to the Zoque people and the other to the Zapotec. They have participated in many assemblies, forums, meetings, political training workshops and demonstrations to defend territories against the onslaught of wind energy megaprojects in the Isthmus region. The GeoComunes collective offers critical cartographic practice with indigenous peoples and organizations, supporting territorial defense through research partnerships and technical analysis. All the co-authors contribute situated knowledge based on fieldwork (Ribeiro, 2023), which we systematize and analyze along with other bibliographic and documentary sources from the territory and beyond.

Multi-situated participant observation between 2014 and 2022 enabled us to recover narrative, discursive and documentary information (reports, pronouncements and communiqués made collectively) (Paño Yañez, 2023. As Connell puts it, the main role of the global periphery (the "South") is to export the raw material of knowledge, while the North collects and processes the data to produce theory (Connell, 2020; Alkhalili, Dajani & Mahmoud, 2023), and this is so for debates on energy transition and climate change. We have inverted this extractive logic, producing theory from practice and knowledge of the territories at the intersection between indigenous movements and academic reflection. We recognize social movements as spaces where collective and intellectual knowledge is produced, among indigenous and Afro peoples (Walsh, 2005). As Marco Mejía points out, this is "a new epistemological place to produce knowledge and knowledge, therefore, to address reality and recognize how it can be narrated and elaborated from the practices of the subjects, just as the other research paths have done so from theory, experimentation, action, self-reflection" (Mejia, 2022, p. 27).

In line with Mejia, we needed to develop grounded theories. The fieldwork allowed dialogue with Isthmus resisters: assemblies, collectives and organizations that have demanded the recognition of their communal lands, criticized the non-compliance and violation of rights by wind companies, and called for the care of their common resources. Workshops were one type of event we participated in, and we also analyzed written workshop materials, press releases, and assembly records. We had dialogue with the actors involved, kept field notes, and held unstructured interviews to contrast and complement our observations.

The interviews were conducted mainly with community authorities, leaders and participants from three collectives. The data was collected through participation in the following meetings and workshops:

1) The meeting-workshop "Communality and territorial defense from the perspective of the knowledge of indigenous women," held in Ciudad Ixtepec, Isthmus of Tehuantepec, Oaxaca on March 15, 2020. This workshop was convened by the collective "La Meña" of the Ixtepecano Committee in Defense of Life and Territory, the Matza collective of San Miguel Chimalapas, Women of the Front for the Defense of the Territory of Comitancillo and Coldiba A.C. "Women Weaving Realities" of Tehuantepec. Zapotec, Chontal, Mixe, Zoque and *mestizo* women participated in the meeting, which strengthened women's roles in territorial defence.
2) Monthly periodic assemblies of the Agrarian Annex of the municipality Unión Hidalgo, held from 2016 to 2020. This ongoing assembly was chaired by the Representante de Bienes Comunales (Representative of Communal Lands) of the Agrarian Annex and was made up of community members and defenders, as well as the non-governmental organization Proyectos de Derechos Económicos y Culturales A.c. (ProDESC). Zapotec and Spanish were spoken, to inform local people about relevant local issues.
3) Informational forums and meetings of indigenous peoples from the Isthmus of Tehuantepec. We attended two regional forums on the impacts of mining, held in the municipality of Ixtepec in 2014 and 2017, convened by indigenous leaders belonging to the Ixtepec Committee and attended by men and women from indigenous organizations, communal property authorities, and regional leaders of the Zapotec peoples, Zoques, Chontales and Mixes. These were conducted in Zapotec and Spanish.
4) An informational forum on mining projects in the municipality of San Miguel Chimalapa held in 2015, convened by the Matza collective and the organization MAIZ (Zapatista Indigenous Autonomous Movement) and attended by leaders of the Union of Indigenous Communities of the Northern Zone of the Isthmus (UCIZONI), collectives of the Zapotec people of Ixhuatán and Juchitán, the Tepeyac Human Rights Center of Tehuantepec and environmental-indigenous organizations of the *ejido* of Zanatepec.
5) Three informative workshops on mining megaprojects in San Miguel Chimalapa held in 2020, convened by the Matza collective and the municipal authorities. Held in Spanish and aimed at local people, these workshops were attended by local residents, women and men, from the young to the elderly.

After 2022 we collected documents and materials to generate the analysis and systematize the information based on the six dimensions above. Access to information, observation and participation has been complex in recent years, because the assemblies and resistance groups are weary from twelve years of struggle and the implementation of agrarian and environmental

justice projects by the Mexican government. The assembly participants have aged (mostly men from 40 to 90 years old), and ensuring the succession of agrarian rights to new community members has been hard. There has been more violence in the region, as well as a criminalization of protest, generating tension among combatants and difficulties in coordinating activities across the region.

3. The political ecology of energy colonialism

Colonialism is a concept that has long been debated in anthropology (Said, 2013; López & Rivas, 2004; Tuhiwai, 2017), sociology (González Casanova, 1969; Quijano, 2000a, 2007b; Davis, 1981; Grosfoguel, 2023; Cusicanqui, 2013; Mignolo, 2018; Mbembe, 2011, 2016), psychiatry (Fanon, 1961b) and philosophy (Cesaire, 1950; Dussel, 2021). It is broadly defined as a phenomenon of domination whose beginning in the Americas dates back to the fifteenth century when the first colonial companies from Spain and Portugal began to make inroads into the hemisphere. It has been developed extensively by theorists and activists in the Americas (Du Bois 1903; James, 1938; Reinaga, 1970; Davis, 1981) and Africa and the West Indies (Fanon, 1952a, 1961b and 1964c; Cesaire, 1950; Cabral, 1961). Several of the latter authors wrote and were involved in the liberation struggles of Guinea Bissau, Cape Verde and Algeria, among many other decolonization processes of the twentieth century. These scholars show that colonialism did not end as a component of global domination. Mexico became formally independent in the 19th century, so in legal terms it cannot be called a colony. However, from the theoretical postulates of colonialism, the country remains part of colonial relations in the international economic sphere, while indigenous people remain as colonized subalterns (González Casanova, 1969).

In the second half of the twentieth century in Latin America, dependency theorists made the link between historical colonialism and contemporary asymmetrical relations with the global North (Marini, 1973; Gunder Frank, 1973; Bambirra, 1977). At the same time, anti-colonial intellectuals emerged such as Fausto Reinaga (1974, 1978), Silvia Rivera Cusicanqui (1984a, 2010b) and an entire Indianist current that sharply questioned state indigenism and became involved in armed revolutionary processes, as was the case of the Aymara Felipe Quispe Huanca (1990). How was it possible to speak of colonialism in the twentieth century, given that independence was well advanced by then? Because of the 'internal colonialism' suffered by indigenous peoples. Mexican scholar Pablo González Casanova (1969) popularized the term using anthropological studies to describe social relations of domination and exploitation between heterogeneous cultural groups. Gonzalez' was inspired by the sociologist C. Wright Mills but 'internal colonialism' had unacknowledged antecedents in the work of Black U.S. scholar and communist organizer Harry Haywood (Haywood, 1948; Iborra & Montañez, 2020).

In the 21st century, other theorists have revisited the term, suggesting that coloniality persists during the historical period after the formation of independent nation-states. These changed the formal status of colonies, but gave continuity to a social, economic and cultural hierarchy of a colonialist nature within an interstate system (Quijano, 2000). The fossil energy matrix was not transformed, asymmetrical relations were maintained, and the former colonies continued to be suppliers of raw materials to the old metropolitan centers of Europe and to the new centers that were being created in the global order, such as the United States of America.

Decolonial studies have not yet brought together the analysis of coloniality and energy. In the last decade of the 20th century, the intersection was explored, relating racism to industrial pollution at the height of the Civil Rights movements in the United States (Bullard, 1993; Chavis, 1987; Sánchez, 2025). Bullard coined the term environmental racism, later leading to environmental justice (Martínez Alier, 2004; Rougeon *et al.,* 2023). Jason Moore (2013a, 2022b), working in sociology and political ecology, developed some approximations with theories of world-ecology. Scholars working on socio-environmental conflicts (Martínez Alier,

2004) associated with fossil fuels and mining extractivism began to use the term energy colonialism (Hamouchene & Pérez, 2016; Kucharz, 2021). Subsequently, new socio-environmental conflicts emerged in the light of the energy crisis, and renewable megaprojects began to proliferate in various parts of the world under the argument of an energy transition. In the 21st century, interesting research began to link colonialism and environmental policies and programs (Hamouchene & Sandwell 2023; Lang *et al.*, 2023). The relationship between colonialism with wind and photovoltaic infrastructures was noted for contexts in Africa (Hamouchene & Sandwell, 2023) and indigenous territories of the global South (Ramírez & Böhm, 2021; Dunlap, 2018, 2019, 2021; Siamanta & Dunlap, 2019; Sánchez & Matarán, 2023), and even within the global North (Batel, 2017, 2021; Fjellheim, 2024; Normann, 2021).

Some relevant contributions identify the close relationship between renewable energy infrastructures, fossil energy sources and mining extractivism (Dunlap, 2018; GeoComunes, 2022; Sánchez & Matarán, 2023; Sánchez, 2024). Others analyze land grabbing, utilizing ideas about neocolonialism (Ávila-Calero, 2017; Manzo, 2012; Sánchez, 2024), the transnational nature of colonialism (Ramírez, 2021), and socio-environmental impacts and conflicts (Lucío López, 2014). These lie at the nexus between ecocide and genocide (Dunlap, 2018), and the six dimensions that characterize colonialism in the deployment of wind and photovoltaic infrastructure (Sánchez & Matarán, 2023; Sánchez, 2025).

This research has contributed to the formulation of a theoretical approach to energy colonialism. However, some theoretical shortcomings are visible. For example, the definitions of colony and colonialism utilized in work on the nexus between ecocide and genocide are mainly based on poststructuralist theories, questioned by a Latin American current of writers who have developed a conceptualization of colonialism located in territories that cross it (Cusicanqui, 2010b). Müller (2024) notes that the term energy colonialism has not been fully defined and is rather dispersed, but her main focus is on one decolonial author (Quijano, 2000a, 2007b) and could go further. This is a frequent trend in research produced in the global North, as other authors have already noted (Alkhalili, Dajani & Mahmoud, 2023). Müller does not discuss the idea of "gender coloniality" elaborated by María Lugones (2008).

The approach to energy colonialism that we present here is based the rich and varied literature from the South. We follow Latin American and Afro-Caribbean theories that colonialism began in the fifteenth century and was articulated with modernity (Dussel, 2021), patriarchy (Lugones, 2008) and capitalism (Robinson, 1983), which, in short, built the world system (Wallerstein, 1979). For Jason Moore (2013, 2023), from the sixteenth century to the eighteenth century of the Industrial Revolution, an ecology-world was constituted through extensive processes of environmental shaping that were related to the rise of capitalism and colonialism. Prior to industrialization sources of energy were based on other systems of exploitation, but it was the eighteenth and nineteenth centuries that marked the beginning of dependence on fossil fuels, where coal was decisive for the industrialization of England and its construction as a metropolis. Not only was James Watt's steam engine key to establishing the dependence of the new industrial societies on fossil sources, but also for the extraction of large quantities of minerals, the accumulation processes deployed by capital, slavery and the new trade routes of the eighteenth century. All these forged new global geopolitics increasingly dependent on coal, to which oil and natural gas were later added.

We draw on this perspective on colonialism to analyze the relations that are woven into the deployment of wind megaprojects, and identify the multiple scalar impacts of transnational capital investments, policies and regulations of the State, and internal community dynamics. For the purposes of this article and this analysis, it is useful to return to the six dimensions that constitute the category of energy colonialism (Sánchez & Matarán, 2023):

1) The geopolitical dimension: Where is the energy generated and where is it used? (Ramirez & Böhm, 2021; Boyer, 2019)
2) The economic-financial and inequalities dimension: Who is the energy for? (Huesca-Pérez, Sheinbaum-Pardo & Köppel, 2015)
3) The power, violation and decision-making dimension: Who decides where and how the energy is produced and consumed? (Zarate & Fraga, 2019; Dunlap, 2018a; Dunlap & Correa-Arce, 2022; MICI-IDB, 2016)
4) The dimension of land grabbing and dispossession: How are territories sacrificed? (Avila-Calero, 2017; Torres Contreras, 2022; Torres-Mazuera & Recondo, 2022)
5) The dimension of the impacts on territory and common goods: What are the sacrifices that territories are making? (Torres Contreras, 2022; Alonso, Zárate & Fraga, 2016; Lucio López, 2014; Zárate, Wood & Patiño, 2021)
6) The dimension of resistance and socio-territorial conflicts: How are territories defended? (Ramírez, 2018; Dunlap, 2018b)

There is literature on these six dimensions, and three additional features are especially important:

1) the continuity of colonial logics even after independence from colonial powers;
2) the continuation of land dispossession; and
3) the link between colonialism and energy.

Energy colonialism is multi-scaled, and considers the various actors involved, particularly the State, corporations and Indigenous peoples. It highlights the importance of Indigenous territories in the context of the global crisis.

4. Case study

The Isthmus of Tehuantepec is in the south of Mexico and geographically forms part of the narrowest strip of land that connects the Pacific Ocean with the Atlantic. The area we analyzed is administratively in the state of Oaxaca, and is made up of two districts, Juchitán and Tehuantepec, which comprise 46 municipalities and have a total population of 683,000 inhabitants (INEGI, 2020), of which approximately 57% are indigenous, mainly Ikoots (Huaves), Angpøn (Zoques), Chontales, Binnizá (Zapotecs), Chinantecos and Tzotziles. In demographic terms, much of the rest of the population is classified as *mestizo*: mixed indigenous and European ancestry, Spanish-speaking and participating in national culture. However, decades of government censuses used *mestizo* as a category for nation-building and assimilation of indigenous peoples in a context of racism and nationalism, denying indigenous and Black populations their identities, with change only beginning in the 2000s (Moreno & Wade, 2023; Saldívar & Walsh, 2014).

We focus more on the relationship between indigenous municipalities and communal lands. Most of the indigenous territory of the Isthmus of Tehuantepec is social property, meaning it is not private property, but has collective land tenure comprised of communal and *ejido* forms. In this context, community organizations and assemblies are the organs of political and legal authority over land tenure. Each agrarian community assembly appoints its Presidente Comisariado de Bienes Comunales (President of the Commission of the Commons), Consejo de Vigilancia (Security Council), and Secretario Auxiliar (Secretary). Each *ejido* is represented by a body made up of its Presidente Comisariado (Commission President), and Secretario (Secretary) y Tesorero (Treasurer). Land tenure is a major issue in a country where 50.8% of

the territory is socially owned, 100 million hectares of Mexico's 196.5 million hectares (RAN, 2020). However, indigenous municipalities do not always coincide with the demarcations of communal and *ejidal* lands, despite maintaining a deep and long-standing historical relationship that is rarely mentioned, especially in the state of Oaxaca.

In the case of the Isthmus, the relationship between indigenous people and communal lands is fundamental. It is also an important and biodiverse habitat, especially for native and migratory birds, given its biogeography and large area of wetlands. It is one of the windiest areas on the planet with an average annual wind speed of over 10 m/s (Zárate-Toledo, Patiño, & Fraga, 2019), which is why it has been projected as having a wind potential for energy of between 33,000 and around 45,000 MW (Elliot *et al.*, 2004; López, 2007; Arenas López, 2007).[2]

5. Results

In this section, we analyze the implementation of wind farms in the Isthmus of Tehuantepec, linked to the six dimensions of energy colonialism. These dimensions are useful for a multi-scale analysis of colonialism, both internal (González Casanova, 1969) and transnational (Ramirez & Böhm, 2021). The six dimensions expose the economic, political, and social aspects of the phenomenon.

Geopolitical dimension: territorial deployment of wind power infrastructure

The southern plain of the Isthmus of Tehuantepec is home to 29 operation wind power plants, with 2,764 MW in 2025 (Figure 2). This is 39% of Mexico's entire wind power capacity (7,055 MW).[3] The arrival of the first turbines in the Isthmus was in 1994, with the installation of a 2 MW wind farm with 7 wind turbines developed by the Federal Electricity Commission (CFE) (Figure 1). This first public investment in the sector was intended as a pilot project and to later open this market to private investment. This was carried out through two "open seasons" (auctions to allocate MW capacity to private bidding companies) that took place between 2006 and 2012. Thus, from 2008 some private wind farms came into operation, and after 2012, 13 new ones started operating.

The 29 current projects comprise 1,564 turbines, on 31,000 ha, distributed between the municipalities of Asunción Ixtaltepec, El Espinal, Juchitán de Zaragoza, Santo Domingo Ingenio and Unión Hidalgo. There are also 13 more projects in the pipeline, with a total projected capacity of 1,763 MW, with 39 turbines on 14,000 ha (Figure 2).[4]

There is a requirement to submit an Environmental Impact Assessment (MIA in Spanish) to the Ministry of Environment and Natural Resources (SEMARNAT) to develop a wind project. However, not all of the MIAs for the pipeline projects were approved, and some were denied another necessary permit from the Energy Regulatory Commission (CRE). The only one that has an approved CRE permit is EDF's "Gunaa Sicarú." The Isthmus is now crossed by numerous electrical substations and medium and high voltage lines designed to transport wind energy to the central part of the country where the greatest demand is concentrated.

[2] The Atlas of Wind Resources of Oaxaca State (Elliot *et al.,* 2004) estimates wind energy as between 33 thousand and 44 thousand MW for Oaxaca while Lopéz (2007) estimates a wind power of 47, 853 MW for the Isthmus of Tehuantepec.

[3] GeoComunes, from the analysis of data from the permits of the Energy Regulatory Commission (CRE) at a national level in March 2025.

[4] GeoComunes information layer: "Mexico Wind Farms 2023": http://132.248.26.105/catalogue/#/dataset/510

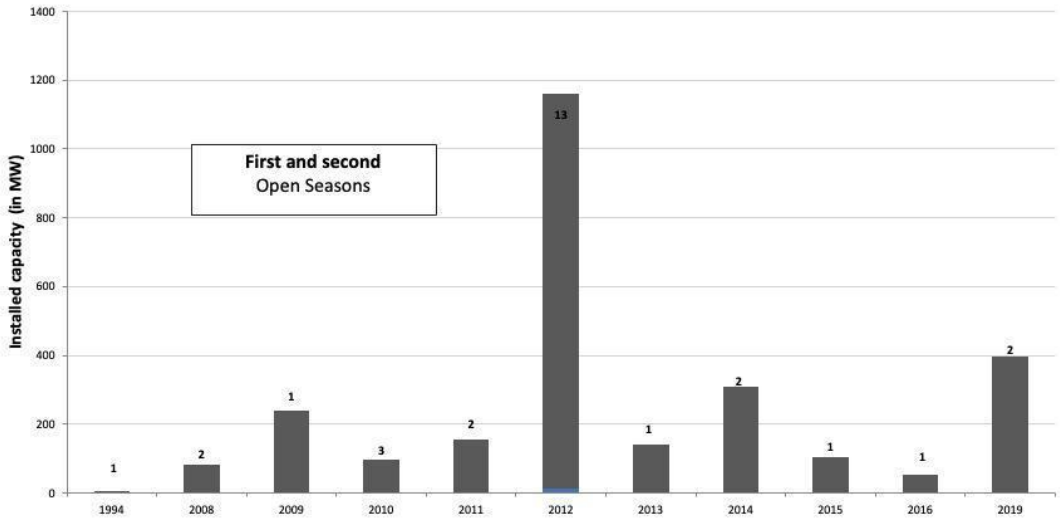

Figure 1: Installed capacity (in MW) and wind farms operation by year. Source: elaborated by GeoComunes on their information layer: "Mexico Wind Farms 2023"

Economic-financial inequality: Who controls wind energy in the Isthmus?

As mentioned above, almost all the wind farms on the Isthmus have been developed and managed by the private sector. Beyond its pilot park, the CFE has only developed one other 83 MW facility and there is another 15 MW park developed by the Ministry of National Defense (SEDENA) to supply energy to different military camps and buildings in the region. In contrast, the private sector has developed 26 projects and currently controls 96% of the installed capacity.[5] Most of these companies are European, and based in Spain, France or Italy. The main companies are Acciona (6 wind farms and 596 MW), Electricité de France EDF (4, 391 MW), Iberdrola (5, 277 MW) and Enel Green Power (3, 246 MW). With the construction of the "Gunaa Sicarú" project (252 MW), EDF will become the company with the largest installed capacity for electricity generation in the Isthmus. An analysis of the companies supplying wind turbines to these developers (for the wind farms in operation or in the pipeline) reveals a new oligopoly also dominated by European companies: Siemens-Gamesa (1,195 turbines), Acciona (404) and Vestas (236).[6]

Who consumes the wind power energy produced in the Isthmus?

This control of the business by private actors is not limited to the supply of technologies and electricity generation, but also encompasses electricity consumption. To understand this requires looking into the details of a type of contract called "Autoabastecimiento" (self-supply). These began in 1992, together with 4 other types of contractual modalities, through the Public Electricity Public Service Law reform (LSPEE, in Spanish), which allowed the participation of private capital (national or foreign) in the generation of electricity in Mexico. It was one of the conditions for signing of the North American Free Trade Agreement (NAFTA) between the USA, Canada, and Mexico. "Self-supply" allows energy production for the generator's own use or that of its partners, including companies with high consumption interested in reducing their

[5] GeoComunes information layer: "Mexico Wind Farms 2023":
[6] GeoComunes information layer: "Mexico Wind Farms 2023"

costs through savings in electricity purchases (GeoComunes, 2021). At the national level, self-supply plants currently represent 11.3% of the total installed capacity (396 plants in operation), and a large proportion are wind energy (40% of self-supply plants). Some 42 of the 71 wind power plants in operation and 60% of the installed wind capacity operate in this way.[7] This illustrates how wind technology in Mexico was developed since its inception by and for the benefit of private actors, and this is still true today.

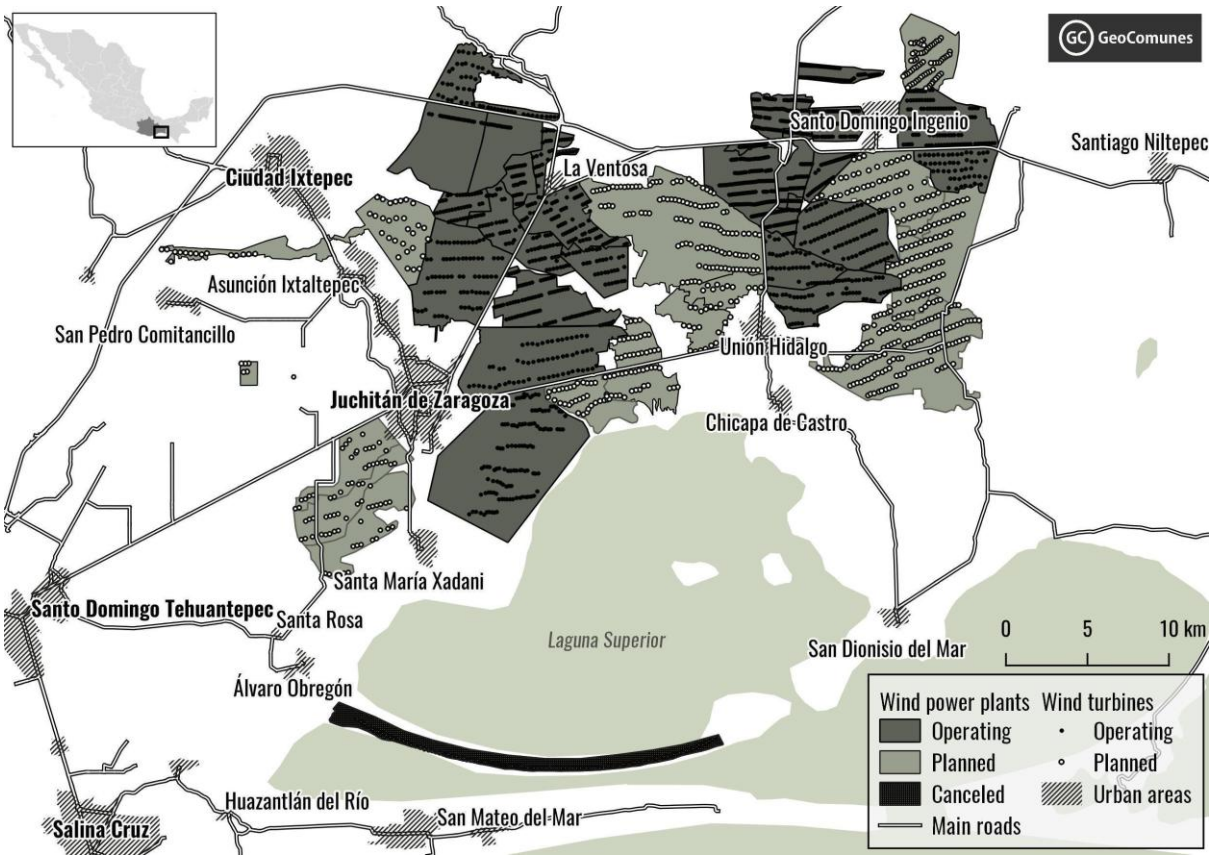

Figure 2: Wind power plants. Source: GeoComunes's (2022) elaboration from own information layers "Wind farms Mexico 2023" and "Wind turbines 2023" and INEGI's layers (roads and localities).

In the case of wind power plants in the Isthmus, this proportion is even higher, as 20 of the 29 new wind farms operate under this modality, 75% of the total installed capacity in the region. A review of the self-supply permits for each plant allows the identification of the "partners" and their respective energy demands associated with each power plant (Figure 3).

[7] GeoComunes with data from the Energy Regulatory Commission's (CRE) permits at a national level in December 2021.

	"Socio" / Empresa	Demanda maxi (MW)	% Demanda Total	Peso acumulativo
1	Tiendas Soriana	617	11,1%	11,1%
2	CEMEX	554	10,0%	21,1%
3	WalMart	552	10,0%	31,1%
4	FEMSA	521	9,4%	40,5%
5	Mexichem	485	8,8%	49,3%
6	Holcim	320	5,8%	55,0%
7	Procter & Gamble	306	5,5%	60,6%
8	Grupo México	270	4,9%	65,4%
9	Kimberly Clark	252	4,5%	70,0%
10	Tiendas Chedraui	183	3,3%	73,3%
11	Telcel	166	3,0%	76,3%
12	Minera Autlán	133	2,4%	78,7%
13	Nissan	131	2,4%	81,1%
14	BBVA Bancomer	119	2,1%	83,2%
15	Grupo Bimbo	115	2,1%	85,3%

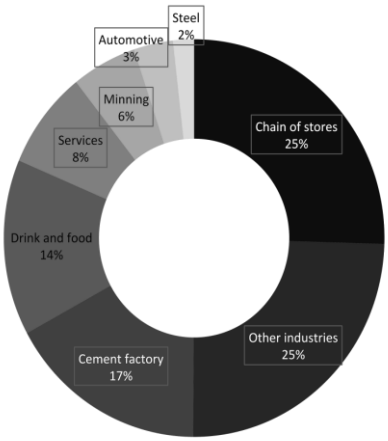

Figure 3: Sectors and companies with the highest demand for self-supply contracts. Source: elaborated by GeoComunes from the revision of permits and resolutions of the CRE for self-supply wind parks in the Isthmus.

As we can see, there are a few private companies that take advantage of this parallel electricity market (but only 5 companies represent half of the total demand for self-supply). The large commercial chains and the food and beverage industry stand out (Soriana, WalMart, Coca Cola - FEMSA, Chedraui, and Grupo Bimbo), as do the mining and cement industries (CEMEX, Holcim, Grupo México, Minera Autlán).

At the national level, the mining and cement industries consume a third of the total electricity generated by self-supply power plants, and for the mining sector, 66% of the electricity it consumes comes from this route, while only 34% is purchased directly from the CFE (CAMIMEX). This strategy allows them to reduce their production costs (electricity consumption represents on average between 30 and 40% of the total costs of a mine) and to hide the socio-environmental impacts linked to their activities in "green companies" and "socially responsible," language, "committed to the environment" through their major investments in so-called "clean energy."

These data allow us to question the term "clean energy," as applied to wind projects on the Isthmus. In addition to the problems of dispossession, violence and other socio-environmental impacts, most of the energy produced ends up supplying activities that are highly polluting and environmentally damaging, such as mining and much of the corporate food industry. It also makes it clear that thinking about other energy models not only involves changes to technologies, but also questioning building an economic and political model that prioritizes the real reproductive needs of people, before capitalist enterprises. What makes an energy transition clean, fair or sustainable is not only the technology used, but the use of that energy, in whose hands it is held, how it is managed and for what purposes. Does it satisfy the profits of a few, or is it directed at collective well-being?

Public utility? Who doesn't have access to electricity on the Isthmus, and where?

The supposed "public utility" of energy infrastructure is often raised. In Mexico, according to 2018 data, industry consumes almost three times more electricity than all domestic users combined (GeoComunes, 2021). If electricity flows to activities and regions that are central to capital accumulation, is this "public"? Most of the consumption of Isthmus' wind farm electricity responds to the logic of internal extractivism; that is, exporting electricity to other regions of the country where it has higher value. Massive export to other regions is not taking

place after the needs of the populations directly affected by the deployment of wind energy have been met. The available data on access and electricity consumption at the local level show another reality.

According to data from INEGI's 2020 Housing Population Census show (2020), there were 4,520 homes without access to electricity in the 46 municipalities of the Oaxacan Isthmus, which is equivalent to 2.3% of the total number. This is a relatively small improvement over the 2010 data for the same municipalities (7,645 dwellings without access to electricity, 4.6% of the total) especially because over this decade wind farm capacity was greatly increased (Figure 1). Considering the 5 municipalities where parks are operating (Asunción Ixtaltepec, El Espinal, Juchitán de Zaragoza, Santo Domingo Ingenio and Unión Hidalgo), a total of 471 dwellings had no electricity in 2020. And for certain neighboring municipalities this was lower: in San Mateo del Mar and San Francisco del Mar, 15.7 and 12.4 % (respectively) of households had no power in 2020.

The figures for these two municipalities are not coincidental. In San Mateo del Mar a campaign began 15 years ago against the installation of the Mareña Renovables wind farm, which was finally cancelled in 2013 (or rather, moved to the lands of Juchitán under the new name of "Eólica del Sur"). This generated a serious conflict between two communities (San Mateo and Santa María del Mar) that took different positions on the wind project, which resulted in one cutting off electricity to the other in 2012 (El Universal, 2019). The conflict has deeper roots and colonial origins, as various studies have reported (Fabiola Bailón-Vásquez, 2001; Castaneira, 1995). However, in the 21st century, this is not merely an "internal" conflict, but one exacerbated by external interests related to the arrival of wind farms in the region.

The relationship between historical colonialism, the development of new electrical infrastructure and changes in access is peculiar and complex. In San Dionisio del Mar, some resisted high electricity bills from the CFE, which increased progressively from 2010, reaching absurd levels of between 10 and 16,000 pesos per month (500-800 euros, US$590-950) for homes with very low levels of electricity consumption (*Animal Político*, 2019). The CFE tried to cut the supply, and between 2010 and 2020 the number of homes without access to electricity in this municipality increased from 169 to 365, according to INEGI data. There is, therefore, a political ecology of energy in the region, with inequality and energy poverty also driven by cost, considering the relatively low living standards and consumption levels of the majority of the *istmeño* population.

Oaxacan Isthmus municipalities showed average annual consumption per user well below the national average (at 3.1 MWh [megawatt hours] per user against 5.1 MWh per user nationally) in 2018. The Isthmus region consumed 0.3% of the national supply in 2018 despite producing 3% of the national installed capacity (2.7 thousands of 91 thousand megawatts). Total consumption in the Isthmus for 2018 was 749 GWh while wind generation in the region was around 8.5 thousand GWh (gigawatt hours). In other words, 11 times more energy is produced by wind farms than energy is consumed in the entire Isthmus region. If we consider only the 5 municipalities where these wind farms are located, generation is 61 times higher than the total consumption, and 110 times higher than domestic consumption.

The southern and south-eastern Mexican states produce much more electricity than they consume (2 to 3 times as much for Oaxaca and Veracruz and more than three times as much for Chiapas), but still have the highest number of households without access to electricity. Figure 4 shows the centralization of the Mexican energy system based on the interests of capital and the inequalities that this generates in the production, distribution, consumption, and access to electricity within the country.

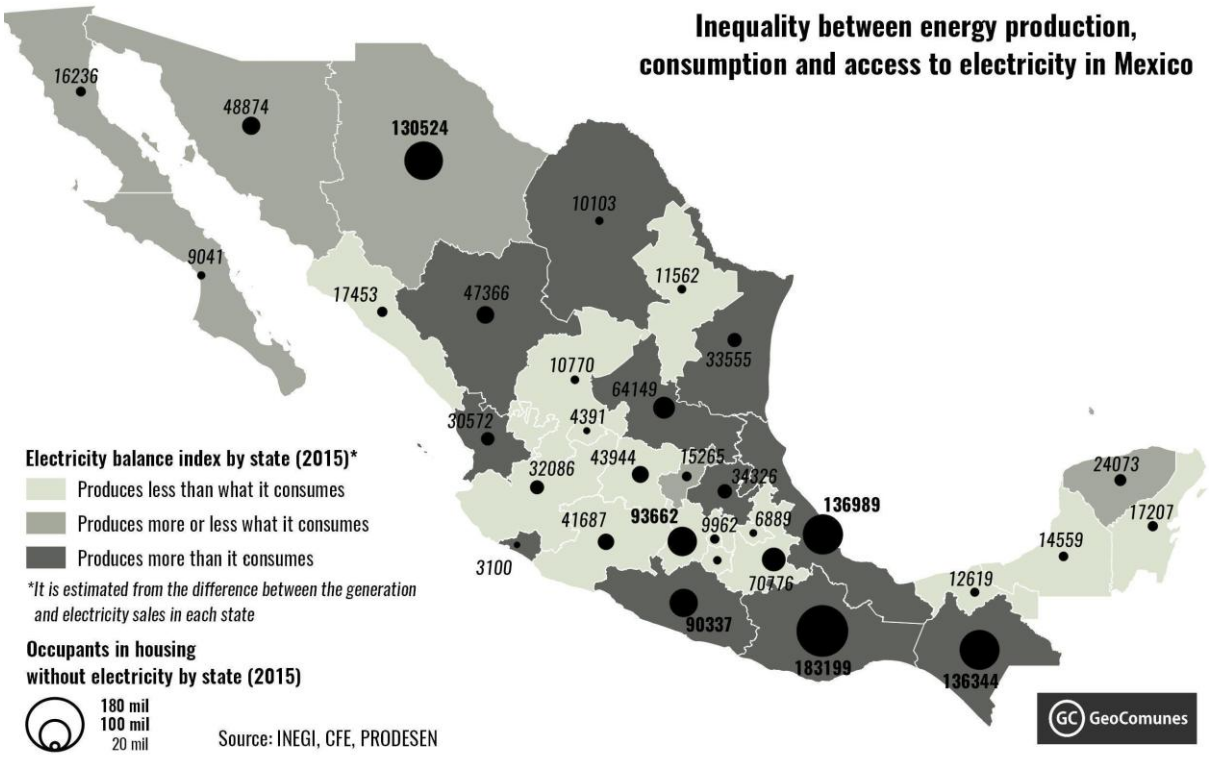

Figure 4: Inequality between energy production, consumption and access to electricity in Mexico. Source: GeoComunes, from the Electricity balance per State (2015) layer and the Housing Population Census (2020) from INEGI

Power, violence, and decision-making

The Isthmus wind farms are built in territories inhabited by the Zapotec and Ikoots peoples, whose legal status is that of indigenous municipalities. As stipulated in the Convention 169 of the International Labour Organisation, which was signed by Mexico in 1991, companies and the State have an obligation to carry out consultations prior to the construction of any project that impacts on the territories of these and any other indigenous peoples. There has been no compliance, because since the installation of the first wind farms no consultations were held, which has led to demonstrations and legal claims by local organizations and communities (Avila-Calero, 2017). Despite the installation of several wind farms in the municipality of Juchitán, it was not until 2014 that the first consultation on the Eólica del Sur project was called, undoubtedly due to pressure from indigenous organizations. Once the consultation began, the process was marked by arbitrariness and inconsistencies, with indigenous representatives minimalized (only 200 participants out of a population of more than 75,000 people), and limited information was given in a climate of tension, aggression, and violence against the defenders of the territory (Flores Cruz, 2015).

Another indigenous consultation began in 2018 by the Federal Government's Energy Secretariat and the state-owned company Électricité de France (EDF), for the installation of the "Gunaa Sicarú" ('beautiful woman', in Zapotec) project. It consists of 96 wind turbines with an energy production capacity of 300 MW, which EDF intends to install on the communal lands of Juchitán in the agrarian annexes of Unión Hidalgo and La Ventosa. However, the consultation procedure was not held prior to construction, since the French multinational has promoted the signing of contracts with small landowners before having submitted the project to an indigenous

consultation. Since 2017 EDF Renouvelables has held permit E/1922/GEN/2017 from the Energy Regulatory Commission to generate 252 MW through its subsidiary Eólica de Oaxaca S.A.P.I. de C.V., another inconsistency.

One of the strategies of the community members of Unión Hidalgo, an annex of the agrarian community of Juchitán, has been to re-constitute their Assembly. Their indigenous and agrarian rights are susceptible to violation, because since 1970 the agrarian community of Juchitán to which they belong had no power in the Assembly or over communal property, explained below. Since the reconstitution of their Communal Assembly, Unión Hidalgo has undertaken legal disputes and community mobilizations denouncing capricious and arbitrary consultation. In 2018 the Assembly managed to get a judge to suspend the consultation process on two occasions (Business and Human Rights Information Centre, 2019). But this was not enough for EDF to desist, as the information phase was resumed a few months later in the same year.

The dispute over the territory has generated an atmosphere of violence, through actions attributed to an EDF subsidiary, witnessed and recorded by the Assembly of Communards of Unión Hidalgo and by various international organizations and bodies (Centro de Empresas y Derechos Humanos, 2018; Dunlap, 2018b). In 2012, AIDA (The Interamerican Association for Environmental Defense) and CEMDA (The Mexican Center for Environmental Rights) called on the Mexican government to guarantee the human rights of the communities of the Isthmus of Tehuantepec affected by the loss of territory to wind farms (AIDA, 2012). In 2019, the Observatory for the Protection of Human Rights Defenders, a joint program of the World Organisation Against Torture (OMCT), recorded threats, accusations and stigmatization against defenders of the territory of the indigenous community of Unión Hidalgo (OMCT, 2019). In 2020, the French National Contact Point issued three recommendations to the EDF group and EDF Renouvelables to consider the indigenous communities affected by the " Gunaa Sicarú" project (France Point de Contact National, 2020).

In 2020, the Assembly of Communards of Unión Hidalgo together with the Mexican Association of Human Rights ProDESC and the Association for the Defense of Human Rights ECCHR filed a civil lawsuit against EDF using the Law of Duty and Vigilance in the Paris Court (Le CCFD-Terre Solidaire, 2021). When a year later the Court dismissed the application, four MEPs again called for the application of the Law of Duty and Vigilance to EDF, due to the inconsistencies of the consultation process, and above all arguing that "French companies should not hide behind the imperative of the energy transition in France and in the world to ignore human rights" (Drexler, 2021).

Regarding "Gunaa Sicarú", Zapotec community members from the Xadani agrarian annex (agrarian community of Juchitán) belonging to the Assembly of Indigenous Peoples of the Isthmus in Defense of Land and Territory (APIIDTT) issued an indirect injunction in the Sixth District Court of San Bartolo Coyotepec, Oaxaca. In the legal protection file 302 of 2020 they denounce the Mexican state authorities and EDF. The case hinged on communal tenure and territorial decision making. In addition, in August 2021, four UN Special Rapporteurs sent a letter to the governments of France and Mexico to warn of possible human rights violations that EDF may commit against the Zapotec community of Unión Hidalgo (UN, 2021). Even though the violence has been documented and denounced by indigenous organizations and human rights institutions, to date it has not ceased.

Women play an important role in the process of territorial defense, and reconstituting the assemblies. Even though many of them lack legal powers in agrarian law, they have participated in assemblies and have been central in the political mobilizations and legal battles. They have denounced the arbitrary nature of indigenous consultations, and challenging the contracts signed between the wind energy companies and small landowners. This has made them targets. The most visible cases are those of Betina Cruz Velázquez, a member of APIIDTT, Guadalupe

Ramírez of the Assembly of Communal Farmers of Unión Hidalgo and Isabel Jiménez of the Popular Assembly of the Juchiteco People. For these women, defending their territory came at the cost of imprisonment, persecution, and constant death threats.

There is also a generalized, hidden violence that is difficult to document. One of its expressions is the increase in feminicides, rarely documented and difficult to relate to the arrival of the companies. With the increase in violence against territorial defenders, violence against people involved in negotiations – workers, union leaders and landowners – has also increased. At least eleven people have been killed in armed attacks in connection with wind farm contract disputes, six of them women. One of the most recent murders occurred on 20 May 2019, when four women and two men were killed in an armed attack, and one woman was seriously injured. These people were at a meeting where, according to official versions, they were to be hired to work on a wind farm. They were attacked by an armed group that was fighting for control of the contracts and services awarded to local construction companies in the region (Manzo, 2019). These armed attacks and murders have gone unpunished and without any involvement by the Mexican state or the companies to which the attacks have been attributed, sowing an atmosphere of terror, and sending a clear message to those who identify themselves as opponents of the installation of mega-projects in the region.

Considering these events, we can affirm that violence is presented as an "indirect" extension of the economy, as new actors appear and seek contacts and direct negotiation with corporations to secure contracts. Violence intensifies through defamation, persecution, threats, rupture of the social fabric, homicides and feminicides. They are part of a dynamic of capital accumulation that is articulated through the criminal economy (Márquez, 2015). The selective repression against territorial defenders in the Isthmus of Tehuantepec is not fully documented, but it is a serious problem. In 2022 Mexico was ranked by Global Witness as the country with the third highest number of murders of different environmental and rights defenders after Colombia and Brazil; and the country with the fourth highest number of murders from 2012 to 2022, after Colombia, Brazil and the Philippines (Global Witness, 2022).

Land grabbing and dispossession

Since the arrival of the wind farms in 2006, the process of privatization of communal lands has intensified. This is because the companies sought to sign contracts with small landowners, privileging the individual and ignoring communal land ownership. With corporate investments, previously existing agrarian problems and uncertainties were exacerbated. This has led to further division of the local population and violent disputes within communities. We will only mention three:

1) community members recognized in the National Agrarian Register (RAN) or not, defend and demand that the communal nature of the land be respected;
2) there have been difficulties for small landowners who at first signed contracts with the wind energy companies but later challenged them and took a stand in defense of the communal property;
3) small landowners who signed contracts with the wind companies to rent them land, and then organized in committees in order to negotiate and control the work offered by wind farms (Alonso & Mejía, 2019).

Undoubtedly, small farms with communal tenure have been giving way to private ownership, and the process dates back to 1950 with the construction of an irrigation system in the south of the Isthmus and later in 1964 when the Presidential Resolution for the agrarian community of Juchitán was issued and it became an *ejido* (Diario Oficial de la Nación, 1964). This allowed members (*ejidatarios*) to push through procedures in the Programme for the Certification of

Ejido Rights and Titling of Urban Land (PROCEDE) to obtain individual titles that would allow them to lease or transfer their plots if they wished. The *ejidos* in La Venta and La Ventosa in Juchitán completed the process in 1997 and 1998, respectively, while Santo Domingo Ingenio did so in 2006, according to the National Agrarian Registry (Alonso, 2021).

In the 21st century, with the arrival of new renewable energy megaprojects, the process has intensified. The companies privilege their dealings and relations with small landowners. In the early 2000s, companies began to promote contracts that offered a percentage of electricity sales, generally totaling between 1 and 1.5% of income once the park was in operation. They also offered a minimum annual rent to landowners, known as a set-aside, to be paid from the signing of the contract until construction of the respective park began, which consisted of a payment of between 150 and 250 pesos (US$8.5 to 14.30 in 2023) per hectare per year. The contracts were generally signed for 30 years. There were also wind rights, keeping 95% of the farm's surface clear in exchange for 3,000 pesos per year in 2006 (roughly US$270) to 9,900 pesos per year in 2018 (US$550). These figures vary according to the municipality and the type of contract (Alonso, 2021).

As explained above, most wind turbines are on the communal lands of the Zapotecs in Juchitán and its annexes: Xadani, Unión Hidalgo, Chicapa de Castro and La Ventosa. Prior to the arrival of the wind farms there had been a process of dismantling and privatization, and communal lands were very fragmented. From 1978 there was no agrarian authority, due to political repression of the Coalición Obrera Campesina Estudiantil del Istmo (Worker-Peasant-Student Coalition of the Isthmus, or COCEI). COCEI was a regional movement that brought together various sectors and then became a political party, positioning Juchitán as the first left-wing municipality of the 1980s, while the Institutional Revolutionary Party governed the entire country. Víctor Pineda Henestrosa, who served as Advisor of Commons of Juchitán, disappeared at the hands of the Mexican army in 1978 (Manzo, 2022).

Still to this day the agrarian community of Juchitán does not have a properly constituted Agrarian Assembly that oversees common property. This complex scenario has allowed the acceleration of privatization of communal lands, reinforced by land hoarding exercised by the wind energy companies through 30-year leases, which do not respect communal tenure and privilege small property. The signing of contracts between the company and the "small landowners" led to polarization within communities. This form of company behavior exacerbates and generates more arbitrary agrarian conflicts that end up undermining communal land tenure.

Territorial impacts and impacts on the commons

Dismantling communal lands is an affront to the community and the ecosystem, as there is a close relationship between social land ownership, biodiversity, and the communities of indigenous peoples. It is no coincidence that in Mexico, 60% of the coastline and 70% of the forests and biodiversity are located on communal and *ejido* lands inhabited mainly by indigenous peoples (Registro Agrario Nacional, 2017). In this sense, the dismantling of communal property and the change in land use directly impacts biodiversity and biocultural conditions. The defenders of the commons denounce the lack of environmental impact assessments and their shortcomings, since in many cases the Ministry of the Environment and Natural Resources did not carry out rigorous assessments and did not monitor environmental effects. Another problem is that each EIA only analyses the impacts of a particular wind project, without considering cumulative impacts at a regional level that the installation of new wind turbines would cause in an area that already has more than 1,500 in operation.

As we have already pointed out, the Isthmus of Tehuantepec is an important habitat for native and migratory birds, given the special biogeographical configuration of the territory. As is well known, these species are seriously affected by wind mega-projects. If the aim of wind

energy is to mitigate climate change and contain the environmental catastrophe, as the wind energy companies claim, it is contradictory to violate indigenous peoples, devastate landscapes, dismantle communal land tenure and harm biodiversity. For hundreds of years the indigenous peoples of the Isthmus of Tehuantepec have stewarded a region rich in biodiversity: the Zapotecs arrived in the southern plain of this territory in the 12th century and the Ikoots arrived as navigators to the coastal lagoons before the Zapotecs. Over millennia indigenous peoples on the lands of this Isthmian region have constituted territorialities that have influenced the biocultural construction of an ecosystem of rich biodiversity.

Resistance and social conflicts

The resistance of the Zapotec and Ikoot peoples of the Isthmus of Tehuantepec is historical, and proof of this is their continued existence despite the genocidal violence and extermination they have suffered during the colonial period and even within the framework of the independent Mexican state. In 1660, the Zapotecs staged one of the largest uprisings, while the Ikoots have historically maintained the communal nature of their lands, their assemblies and their self-government (Manzo, 2013). This shows us that communal tenure is the result of a long process of territorial defense that indigenous peoples have sustained against the dispossession of the conquistadors and the policies of plunder implemented by the Spanish Crown over three centuries, and by the Mexican state from the liberalism of 19th century to the neo-liberalism of the 21st century. Therefore, since the first decade of the 21st century, when the first wind farms began to be promoted and installed in the communal territory of the Zapotecs and Ikoots, opposition from indigenous and peasant organizations was ignited.

As the companies increased pressures to install wind farms, the defense of territory became increasingly urgent. In this context, women, fishermen, peasants, students, collectives, and activists recovered and reconstructed Assembly organizations to resist the renewed offensive of colonialism, this time expressed in energy mega-projects (whose justification that they are mitigating global warming is difficult to question). Zapotec collectivities with other peoples of the region have formed assembly organizations to defend communal land tenure: the Assembly of Indigenous Peoples of the Isthmus in Defense of Land and Territory (APIIDT) was formed in 2007, and on 25 February, 2013, the Popular Assembly of the Juchiteco People, with origins in the installation of the Totopo community radio station in 2006; and since 2013 the Assembly of Communal Farmers of Unión Hidalgo. These organizations have denounced the arbitrariness of the process and violations of human and indigenous rights committed by the wind energy companies. They are helping defenders of territory with lawsuits so that the courts will hopefully protect and recognize the communal nature of land.

In the territories of the Ikoots peoples wind farms have not been installed, one of the reasons being that their assemblies and communal lands are not as fragmented as the agrarian community of Juchitán. Through their assemblies and articulation with other Zapotec and Zoque peoples and organizations, such as the Union of Indigenous Communities of the Northern Zone of the Isthmus (UCIZONI) and the National Indigenous Congress (CIN), Ikoots activists prevented the installation of the Mareñas Renovables wind farm, but as mentioned above the project was relocated to the communal lands of Juchitán and became Eólicas del Sur. The project was financed by a consortium made up of capital from private companies, including Mitsubishi, Fomento Mexicano (FEMSA), the Dutch Pension Fund (PGGM) and the Macquarie Mexico Infrastructure Fund (Flores Cruz, 2015). Some 132 wind turbines with a capacity of 396 MW were planned for the Santa Teresa sandbar, a strip of land located between the Pacific Ocean and the Ikoots lagoons. The impact would have been on three Ikoots communities: San Dionisio, Santa María and San Mateo del Mar. One of the arguments of the Ikoots people against it was the threat that the wind turbines would contaminate the lagoons and put the species that live

there at risk. The destruction of the lagoon also threatened fishing activities, which have been the food base and source of life for the communities.

Since then, the Ikoots of San Mateo del Mar, San Dionisio del Mar, San Francisco and their Zapotec neighbors in Álvaro Obregón have built a resistance corridor to oppose the wind farm. As in other cases like San Mateo del Mar and its conflict with Santa María del Mar, this has led to deep divisions within their communities and has exacerbated agrarian conflicts. Moreover, efforts to rebuild the Assemblies and resolve agrarian problems among the communities themselves have been seriously hampered by external systemic influences closely associated with the criminal economy and the violence that plagues the entire country. Despite internal divisions and fierce disputes in their assemblies and in the appointment of their communal and municipal authorities, women and men have insisted on maintaining their organizations to defend territory and their own forms of government.

In 2018, a Zapotec *ejido* called San Pedro Comitancillo also rose up. Here the *ejido* authorities had signed a "commodatum" contract with the company Tecnologías en Materiales Compuestos (TEMACO) for the installation of a factory making blades and fiberglass derivatives on 10 hectares of common-use *ejido* land. It was mainly women who pushed for their participation in the *ejido* assembly and questioned the *ejido* president's unilateral decision. Women undertook demonstrations calling their community to carry out a reconnaissance of the territory to locate the parcel where the factory was to be built, and once they had located the four boundaries and the point known as the vertex, these were destroyed (*El Universal Oaxaca*, 2018) to reaffirm the common-use nature of the area delimited by the company. They also confirmed that the parcel was 80 hectares and not just 10 hectares as they had been led to believe. In the end, they managed to prevent the construction of the factory, which was a victory for the people defending their territories.

Language is one of the main elements of these mobilizations, through their assemblies, in defensive actions, and for communication through community radio stations. As we have already mentioned, women participate in the daily defense of the commons, integrating themselves as community communicators and de facto community members, forming part of the organizational committees, carrying out territorial tours to recognize the commons that are threatened by the installation of the wind farms, and leading diverse common care tasks in the organizations they are part of. They demonstrate that their struggle as indigenous women constitutes, in turn, the struggle for the integrity of their peoples (Chávez, 2021).

Mobilizations also spread through international networks during the summer of 2021. A collective called "Stop EDF Mexique" organized a tour in France where a delegation of three Isthmus territory defenders travelled there to denounce energy colonialism (Müller, 2024) that EDF is carrying out in Unión Hidalgo as part of a larger dispossession that French and Spanish companies are involved in throughout the Isthmus. The delegation visited territories affected by wind farms and nuclear projects, met with ZAD ("Zones to Defend" in French) collectives and environmental solidarity networks, and met with the European Environmental Bureau in Brussels. Throughout this tour, they called for the re-articulation of the various activist movements that seek to denounce and provoke new debates on energy colonialism and keys to the energy transition.

6. Conclusions

The six dimensions of wind energy in the Isthmus discussed above reveal the colonial nature of renewable megaprojects. The case study has international dimensions, expressed in the asymmetric relationship between energy companies and the Mexican State in which private corporate interests have been prioritized over public interests. At the same time, we have presented its intra-national character, internal colonialism, and an unequal relationship between the State and Indigenous peoples. The free, prior, and informed consent protocols that guarantee

the rights of Indigenous peoples under ILO Convention 169 (FPIC) have not been complied with. Communal land tenure is violated because of arbitrary and ambiguous agrarian practices promoted primarily by government agencies, and there is a disproportionate relationship between energy production in the region and the population's limited access to electricity. The Mexican State supports European energy companies, whose objective is the installation of large-scale wind farms. There is historical colonialism in the implementation of renewable megaprojects, since capitalist relations have sustained the imbalance between the territories of the global South and North in a relationship of patriarchal domination whose violence is primarily directed against women.

This dimension of violence deserves specific mention, as it is an intrinsic characteristic of colonialism. In this case, it is a *sine qua non* for the deployment of wind energy megaprojects, that undermine Indigenous peoples' decision-making, exacerbate conflicts between communities, and generate divisions within those communities between smallholder committees and community members defending communal territories. This disrupts families and the daily lives of residents. A climate of insecurity persists, with murders ascribed to internal community problems but, as we have seen in the cases of San Mateo del Mar and Unión Hidalgo, linked to the renewable energy megaprojects. Harassment, intimidation, and selective persecution take place against those who express their opposition to wind farms. The deployment of mega-wind projects in the Isthmus of Tehuantepec does not represent an energy transition, but rather energy colonialism – with a clear private-corporate dimension. The entire value chain related to wind energy generation in the region (technological inputs for wind farm construction, electricity generation and consumption) is controlled by an oligopoly of private companies. Rather than an energy transition, we are witnessing a "market transition": renewable energies, and the inputs and minerals they require, are new paths for capital accumulation under the same logic of dispossession and exploitation, but now colored green.

In the context of the climate emergency, the case of wind energy development in the Isthmus reveals that basing the definition of "clean energy" on the direct CO_2 emissions of power plants also makes it possible to avoid debates about the upstream phase ("grey emissions" linked to mineral extraction, transport of inputs, and construction of a power plant) and the destination (for what and for whom this electricity is being generated). The Isthmus wind corridor, more than signifying a change in the energy matrix and model, continues to be part of established industrial processes on a regional, national, and global scale. In the logic of colonialism, indigenous territories are now subjected to violent dispossessions carried out by a supposed energy transition that prioritizes industrial sectors largely owned by a global North that rarely questions its high levels of consumption.

Finally, it should be noted that resistance politicizes the energy issue and warns us that the solutions to overcome the fossil fuel regime cannot be based on the same colonial, capitalist and patriarchal dynamics that gave rise to the crises we are witnessing today. The fundamental paradox is that not even colonizing the entire planet will overcome the crisis if demand is rising through capitalist growth. The defense of communal territories in the context of a climate emergency offers keys to overcoming the global crises we are witnessing, given that the communal and *ejido* character of the land is linked to the long histories of societies that have generated ecosystems and territories rich in biodiversity. It is no coincidence that between 70% and 80% of Mexico's biodiverse wealth is found in collectively owned territories.

The vindication of communal and *ejido* land tenure is part of the long struggle for the autonomy of indigenous peoples. In this sense, the rights to territory and autonomy are legal and political emblems that challenge internal colonialism in the 21st century, as they did in the colonial period. In future, it remains to be determined precisely what role autonomies have, in the context of climate change and energy crisis, in promoting an indigenous epistemology that has historically placed limits on colonialism, and on the commodification of land and communal goods. Under this logic, it can be said that the deployment of wind megaprojects in the Isthmus

of Tehuantepec is a case of energy colonialism, in the face of historical and contemporary demands for communal lands and indigenous territories.

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