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Energy as a Way of Life: Energy Reconfigurations in Artisan Collectives of the Social and Solidarity Economy in Tabasco, Mexico

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Energy as a Way of Life: Energy Reconfigurations in Artisan Collectives of the Social and Solidarity Economy in Tabasco, Mexico

Abstract: In the workshops, homes, and lives of those who make up artisan groups in Tabasco, energy is experienced as a condition that permeates daily life and work in contexts of energy poverty. Intermittent electricity service and high costs not only affect quality of life but also reshape the way these groups organize their work and sustain their activities. Faced with these conditions, they develop responses that combine collaboration, adjustments to work schedules, and changes in the use of technologies—without separating these actions from health care, the strengthening of their workshops, and their relationship with the local territory. From these practices, situated forms of energy governance emerge, expressed through shared

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agreements, decisions, and arrangements that enable them to sustain their work under changing conditions. Based on this analysis, the article proposes understanding these dynamics as everyday processes of energy reconfiguration, in which energy ceases to be an exclusively technical problem and is reconfigured as a social and territorial process. In doing so, it contributes to an interpretation of the energy transition that recognizes the groups' organizational capacities and their ways of constructing sociotechnical alternatives rooted in everyday life.

Keywords: Energy poverty, Energy governance, Social and Solidarity Economy, Energy practices, Grounded theory.

Resumen:

En los talleres, los hogares y los cuerpos de quienes integran grupos artesanales en Tabasco, la energía se experimenta como una condición que atraviesa la vida diaria y el trabajo en contextos de pobreza energética. La intermitencia del servicio eléctrico y los altos costos no solo afectan la calidad de vida, también reconfiguran la forma en que los grupos organizan su trabajo y sostienen sus actividades. Frente a estas condiciones, despliegan respuestas que articulan colaboración, ajustes en los tiempos de trabajo y cambios en el uso de tecnologías, sin separar estas acciones del cuidado de la salud, el fortalecimiento de sus talleres y su relación con el territorio. En estas prácticas emergen formas situadas de gobernanza energética, expresadas en acuerdos, decisiones y arreglos compartidos que permiten sostener el trabajo en condiciones cambiantes. A partir de este análisis, el artículo propone comprender estas dinámicas como procesos cotidianos de reconfiguración energética, donde la energía deja de ser un problema exclusivamente técnico y se configura como un proceso social y territorial. Con ello, se aporta a una lectura de la transición energética que reconoce las capacidades organizativas de los grupos y sus formas de construir alternativas sociotécnicas desde la vida cotidiana.

Palabras clave:

Pobreza energética, Gobernanza energética, Economía Social y Solidaria, Prácticas energéticas, Teoría fundamentada.

Introduction

Discussing the energy context of Tabasco leads us down a historical path marked by external visions imposed by centralized logics, as was the case with water resource planning and the oil boom. These processes have transformed the ways in which the territory is occupied, used, and managed, and have influenced the configuration of inequalities in access to and use of energy resources (Uribe 2016;

Vera et al. 2023; Montes de Oca et al. 2024). These inequalities are also evident in the material conditions through which people sustain their daily and productive lives.

In Tabasco, 49.16% of the population lives in energy poverty (García-Ochoa and Graizbord 2016), highlighting the social, territorial, and institutional inequalities that shape differential access to energy resources (Alvarado-Rodríguez et al. 2025). These inequalities manifest in concrete material conditions—intermittent electricity, insufficient firewood, excessive heat, and infrastructure deficiencies—which shape the ways in which energy can be used to sustain productive, reproductive, and care work (Van der Wal and Alvarado-Rodríguez 2025).

These conditions demonstrate how energy—conceived primarily as a technical matter within dominant development frameworks—becomes a field where needs, resources, and forms of organization are negotiated. In everyday life, energy constraints may require adjustments, decisions, and coordination mechanisms to sustain daily activities (Castro and Sen 2022). These practices reflect forms of organization that can be understood as processes constructed through everyday life.

The approaches used to understand these energy constraints have focused on technical and institutional dimensions. However, these prove insufficient for understanding how an alternative form of energy governance takes shape through everyday, organizational, and territorial practices, especially in contexts of energy poverty. Therefore, we propose shifting the perspective on energy poverty from a deficit of access toward an understanding of the organizational processes, coordination, and decision-making through which people manage energy in their daily lives.

In this context, social and solidarity economy initiatives provide important frameworks for analyzing how people collectively organize access to and use of essential resources—including energy—in the face of vulnerability and exclusion.

Based on the above, we pose the following research question: How do the everyday negotiations over access to, use of, and organization of energy in contexts of energy poverty shape collaborative practices and situated arrangements of energy governance within social and solidarity economy groups in Tabasco?

In this article, we analyze how everyday negotiations surrounding access to, use of, and management of energy shape collaborative practices and situated arrangements of energy governance in artisanal social and solidarity economy groups in Tabasco. To this end, based on the analysis presented in this article, we propose the Energy-Territorial Reconfiguration Spiral (ERET), retaining the Spanish acronym for *Espiral de Reconfiguración Energético-Territorial*, as an analytical heuristic for understanding

these processes from a situated and relational perspective. The ERET allows us to interpret how responses to conditions of energy poverty trigger ongoing processes of reorganization of work, care, social relations, and ties to the territory.

We collaborated with two artisanal collectives and a chocolate-making group in Tabasco. These cases illustrate different ways in which energy is managed and organized daily in territories marked by energy poverty, highlighting how local arrangements of alter-governance emerge based on the conditions and needs of the context. In this way, the article contributes to the discussion on energy transition and energy justice by highlighting how people organize and coordinate energy daily, based on a conceptual framework and methodology developed in the following sections.

Theoretical Framework

Energy Poverty as a Situated Experience

The concept of energy poverty is typically addressed in terms of access and affordability (Sovacool and Dworkin 2015; García-Ochoa and Graizbord 2016). Boardman (2010) initially defined it as a household's inability to obtain an adequate service. Quality, cost, and health were subsequently incorporated into the definition (Fernández et al. 2023). However, at the core of most of these definitions lies the supply of goods (Nock et al. 2025) and the resulting deficit.

In this study, energy poverty is understood as a situated condition that is negotiated on a daily basis, in the home and in productive and collective spaces (Van der Wal and Alvarado-Rodríguez 2025). This perspective is in line with studies on the social life of energy, which explore how energy relates to daily rhythms, productive practices, and social ties (Pellicer-Sifres 2018; Blanco-Wells 2019; Hoppe and Miedema 2020). They also align with the epistemologies of situated knowledge (Haraway 1988; Harding 1991), which acknowledge the situated nature and partiality of knowledge. Together, these perspectives allow us to see how energy influences the coordination of relationships, times, and decisions.

Energy poverty is a structural condition that affects daily life; therefore, we focus on how this experience manifests itself in specific practices that allow us to better understand gaps in access or quality, practical adaptations, reorganization of work, and group decisions (Calvo et al. 2021). Structural dimensions take a back seat (Escobar and Firch 2013; Blanco-Wells 2019), while this perspective focuses on the practices through which people in contexts of energy poverty negotiate, coordinate, and organize access to and use of energy in their daily lives.

In rural settings, energy supply is typically shaped by hybrid combinations of electricity, firewood, and gas, determined primarily by their availability, cost, and practical utility (Arenas et al. 2023). These combinations require daily decisions and adjustments that depend on economic, cultural, and geographic conditions. Thus, access to and use of energy are shaped through continuous processes of adaptation and negotiation in daily life.

In Tabasco, various studies on energy poverty and democratization have pointed out that inequalities in energy access and infrastructure are linked to historical processes associated with extractivism and limited decision-making capacities at the local level (Van der Wal and Alvarado-Rodríguez 2025). These conditions shape the context in which households and communities organize their daily access to and use of energy.

From this perspective, energy poverty can be understood as a situated experience involving organizational and territorial dimensions that are often overlooked in approaches focused exclusively on technical indicators, such as the percentage of the population with access to electricity. The analysis therefore focuses on how energy is experienced, organized, and negotiated in everyday practice.

Social and Solidarity Economy and Territorialities

Social and Solidarity Economy (SSE) is described as a set of economic practices based on internal democracy, shared responsibility, and mutual support (Coraggio 2011; Duque et al. 2021). In some cases, they are also studied as spaces that promote greater participation and territorial presence of women, especially in participatory and organizational spheres (Hoinle et al. 2013). These initiatives are organized through shared agreements and distributed responsibilities. They do not follow a single model. Each initiative develops specific forms of coordination linked to its history and territory (Díaz-Muñoz 2015; Aguilar-Hernández 2016).

From an analytical perspective, studying these spaces requires shifting the focus from the individual to the collective. Productive activity is not limited to economic performance. It also manifests itself through relationships, implicit norms, and ethical commitments that structure everyday life (García and Horbath-Corredor 2014). Collective organization can open up the possibility of jointly managing material instability.

Sareen et al. (2023) introduce the concept of "solidarities of solidarity" to refer to energy organization, which is based on principles of justice, shared responsibility, and solidarity. This concept shifts the focus from infrastructure to the agreements that make access to and use of energy possible. This allows us to approach energy as a field of collective decision-making, where technical criteria interact with relationships

among people, territories, identities, and ways of life. In this sense, the interplay between the Social and Solidarity Economy (SSE) and territorialization[6] processes helps us understand how energy practices are organized, negotiated, and sustained in specific contexts of energy poverty.

As Aguilar-Hernández (2016) points out, territory shapes material, symbolic, and cultural conditions where memory, identity, and everyday life intersect, thereby enabling productive organization. These dimensions are embedded in historical trajectories of state intervention and extractive dynamics (Avalos et al. 2021).

In organized spaces, such as SSE groups, experiences of energy poverty can give rise to different forms of collective response. Energy constraints are incorporated into collective dynamics of adjustment and coordination (El-Mekaoui et al. 2024). Organization does not eliminate structural inequalities, but it can help in the way they are addressed in everyday practice.

Collaborative governance as an analytical lens

In the energy sector, governance has generally been associated with institutional arrangements and negotiations among interdependent parties that manage and distribute energy (Goldthau 2014; Szulecki 2018). Most of the literature has focused on technical infrastructure, generation processes, institutional frameworks, or public policies (Sovacool and Dworkin 2015; Essex et al. 2024; Lazaro and Soares 2024). This focus has obscured how energy is experienced, negotiated, and governed in everyday life, especially in the context of territorial vulnerability (Gailing and Röhring 2016; Cowell 2017; Hoppe and Miedema 2020; Fouladvand et al. 2024). When analysis remains at the level of scales, local practices often appear as residual or informal, rather than being recognized as spaces where decisions, collective agreements, and innovations take place.

Collaborative governance is the process by which a group of actors with differing interests takes the time to deliberate and reach agreements on common problems (Emerson et al. 2012; Emerson and Gerlak 2014). This approach, which begins with a recognition of the interdependence among actors, does not assume that there is complete horizontality or an absence of conflict, power asymmetries, gender inequalities, or inequalities in access to resources among actors (Lemos and Agrawal 2008; De Castro et al. 2015).

[6] Territoriality is the process through which different actors construct, give meaning to, and exert influence over a space, combining material, symbolic, and political dimensions. According to Haesbaert (2013), a single territory contains multiple territorialities that overlap, coexist, or are contested. These diverse ways of inhabiting and giving meaning to a place shape practices, relationships, and collective decisions.

Collaborative governance is used in this study as an analytical lens to help explain how agreements and responsibilities are negotiated and made visible in specific everyday contexts.

Energy transitions

The energy transition is a process of socio-technical change in the energy system[7] (Sovacool and Dworkin 2015). In all previous periods, one of the main energy sources has been replaced by another—for example, coal by oil and, more recently, by renewable energy (Martínez-Salvador and Martínez-Salvador 2020). However, in the current context of climate and social crises, an approach limited to changing energy sources and associated technology is insufficient, as an eco-social transition is still required. In addition to replacing technologies, a transition must also address challenges of social, territorial, and environmental justice (Ferrari et al. 2024; Svampa 2023).

At the institutional level, the energy transition has been adopted as a public policy objective. In Mexico, the 2015 Energy Transition Law proposes a transition toward non-fossil fuel sources, clean technologies, energy security, natural resources, and climate regulation. Its formulation focuses on regulatory instruments, technological innovation, and state planning as mechanisms for transformation; however, it does not consider how transitions are experienced, negotiated, and managed in specific territories.

The energy transition can also be viewed as a situated process. It includes technological replacement or institutional reforms and is expressed in the everyday ways in which energy is organized, managed, and adapted in the real world (El-Mekaoui et al. 2024). As the Group for Studies on Geopolitics and the Commons (2020) has noted, an energy transition also involves socio-energetic dimensions that challenge centralized and unequal forms of energy production and distribution, and call for solutions to reduce inequalities in areas affected by energy poverty.

Methodology

[7] Bertinat and Chemes (2020: 4): The energy system encompasses public policies, conflicts, sectoral demands, technological advances, diversification of energy production, demands from the business sector, energy use, community-based energy generation, the relationship between energy and the productive matrix, relationships associated with technologies, and the role of citizens in the processes of public policy-making and decision-making related to energy.

The study was conducted using a qualitative approach, aimed at understanding how communities construct meanings, practices, and organizational arrangements related to energy in their daily lives. The analysis drew on constructivist grounded theory, understood here as a flexible framework for progressively constructing categories through constant comparison and situated theoretical reflection (Charmaz 2006).

The analysis proceeded iteratively, in a constant back-and-forth between data generation, coding, verification, and conceptual reformulation. The categories were constructed and reorganized throughout the fieldwork through successive rounds of coding and constant comparison until theoretical saturation was reached.

Site and Cases

The research took place in the municipalities of Comalcalco and Nacajuca, Tabasco, Mexico. We collaborated with three groups linked to the ESS.

1. Tapotzingo Artisans' Collective. Located in the Yocot'an indigenous communities of Tapotzingo, it consists of twelve family-run workshops whose members range in age from 26 to 63. Their primary occupation is handicraft production, using natural fibers and embroidery techniques such as "punto de lomillo." Many families combine this work with other activities such as farming and household chores.

2. "Las Mariposas" artisans' collective, located in the Yocot'an indigenous communities of Guaytalpa, consists of five women artisans between the ages of 38 and 60. The members primarily create items such as bags, petates, and other handicrafts from their homes, balancing this work with their domestic responsibilities.

3. Group of chocolate makers and cacao processors. Composed of eight family-run workshops represented by women who identify as chocolate makers, cacao processors, or both. Its members are between 36 and 64 years old and come from rural communities in the municipality of Comalcalco, such as Zapotal (2nd section), Sargento López (1st section), Miguel Hidalgo, Tecolutilla, and Emiliano Zapata (1st section), among others. Each workshop has its own unique characteristics, history, work rhythms, and production capacities, which give rise to distinct ways of organizing production and the craft.

The three cases reflect processes of territoriality in their productive activities, local knowledge, and ways of relating to the climate, water, and vegetation. Even so, each differs in terms of the degree of organizational formalization, market integration, group size, and energy-related experiences, which allowed us to observe variations in

the ways of organizing work, sustaining collaboration, and addressing the energy conditions that affect productive activity, domestic care, and collective organization (Yanes and Vera 2025)

Data Collection

Fieldwork was conducted between 2023 and 2026 through a combination of exploratory interviews, focus groups, social mapping, life narratives, and collective feedback sessions. These techniques were implemented progressively, though not linearly, and their findings guided adjustments during the research.

In 2023, 12 individual exploratory interviews were conducted with members of the three groups. The leaders of the collectives were interviewed, and the other interviewees were selected using snowball sampling between June and December. These interviews sought to reconstruct productive trajectories, organizational experiences, and everyday ways of relating to different energy sources and conditions. The data collected allowed us to identify three initial themes related to the organization of the trade, territorial identity, and teamwork.

In January 2024, three focus groups were held with members of each group; this was a participatory process aimed at collectively exploring the values, motivations, lessons learned, and tensions associated with shared work. This technique made it possible to cross-check and expand upon dimensions that had emerged individually in the interviews by integrating a visual and collective interpretation of the organization of productive and domestic work.

Throughout 2025, social mapping exercises (three sessions per group) and life stories (13 individual visits to workshops and domestic spaces, selected based on the families' availability) were conducted. Social mapping was used as a participatory tool to work with the members of each collective to construct their own maps of the territory and networks of collaboration, identifying relationships, conflicts, and energy uses (Richa 2016; Barragán-León 2019).

Meanwhile, the life narratives delved into the practical and material dimensions of daily work, observing the reorganization of tasks, time, and effort under varying energy conditions (Francés et al. 2015).

Finally, in 2026, collective feedback sessions were held with each group during participatory meetings in which preliminary findings were shared and emerging interpretations were discussed. These final interventions allowed us to refine and enrich the categories, recognize omissions, and clarify aspects that had not been sufficiently developed in previous stages.

Construction of Categories

The analysis of each piece of input underwent an initial coding process guided by the study's conceptual framework, using Atlas.ti 25 software. Subsequently, an *in vivo* coding was conducted, prioritizing the expressions and meanings that emerged from the participants, which allowed for the refinement and consolidation of analytical categories.

The emerging categories were triangulated across techniques and reorganized into cross-cutting dimensions by group, with the aim of contrasting individual and collective perspectives on work, care, and energy experiences (Barragán-León 2019). This analysis was complemented by the procedure of constant comparison (Charmaz 2006), which allowed us to identify shared patterns and specific characteristics of each group.

Finally, the categories were reorganized into dimensions that structure the presentation of results. Figure 1 summarizes the sequence of the process and the construction of the categories.

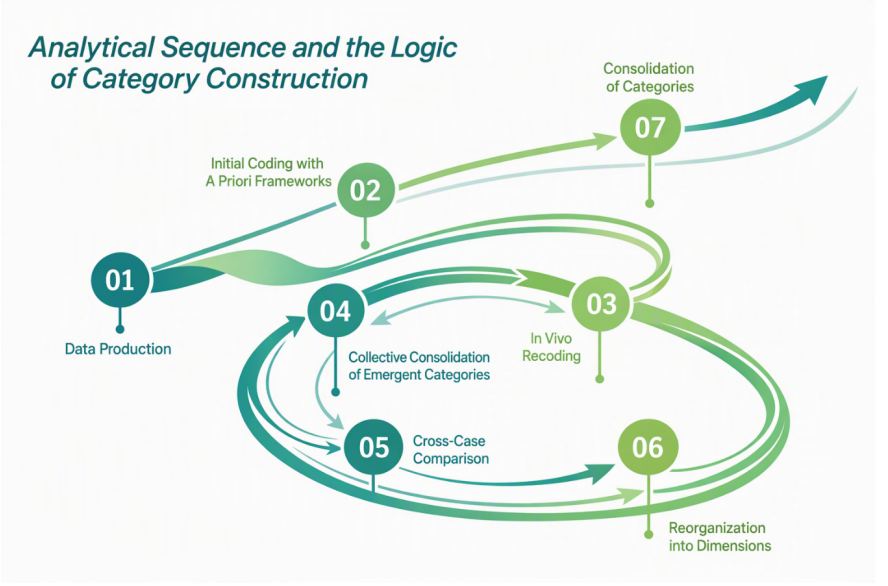

Figure 1. Sequence of the analytical process followed in the study, from initial coding to the progressive reorganization of categories through constant comparison. Source: author.

This process enabled the construction of a relational and situated analysis of the three groups, aimed at understanding how their forms of organization, collaboration, and response to different energy conditions are specifically configured.

Results

Emerging Categories

The comparative analysis identified cross-cutting dimensions and emerging categories that reveal the different ways in which each group organizes, negotiates, and reconfigures access to and use of energy within its territory. Figure 2 summarizes these dimensions and the categories that guide the interpretation of the results.

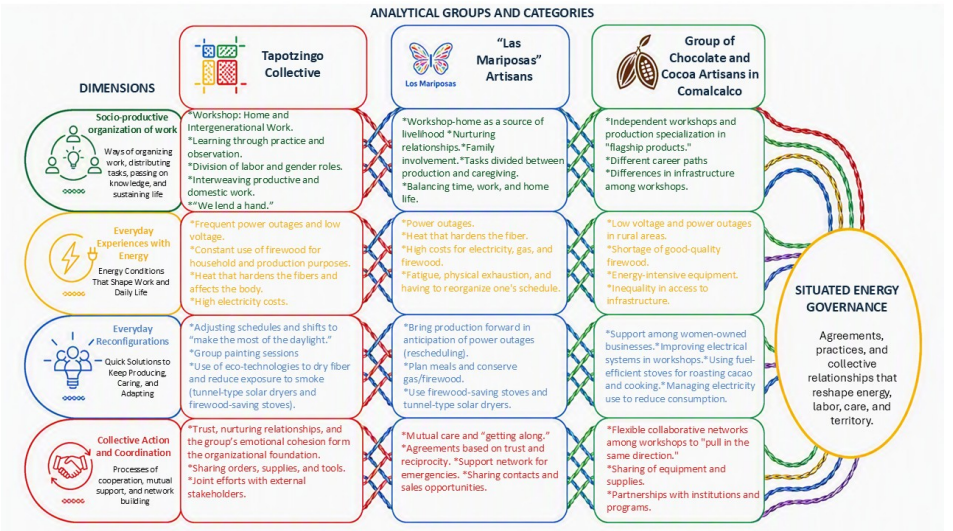

Figure 2. Dimensions and emerging categories among the groups.

Tapotzingo Collective

In Tapotzingo, the everyday management of energy is part of the processes through which families coordinate artisanal work, domestic activities, and caregiving responsibilities. Production schedules and decisions regarding the use of different energy resources are continually negotiated based on the needs of the household and the workshop. During the rainy season, for example, families adjust the drying times for the fiber and redistribute tasks to cope with the humidity, combining these activities with domestic and agricultural work.

Among the items they produce are baskets, fans, flowers, and other decorative objects made from local fibers. Embroiderers create garments and produce traditional embroidery designs like tulips using the "punto de lomillo" stitch. These pieces are then sold to local, national, and international customers at craft fairs and institutional venues.

The craft is learned through daily practice and family life. It is passed down through observation, repetition, and constant practice in both domestic and productive settings. Learning takes place in the courtyard, under the shade of the trees, in a hammock, or next to the workshop, while a mother corrects, a grandmother watches, and a daughter tries on her own: *"I remember that my first craft was a fan—I still have it. My mom taught me when I was 9 years* old" (artisan, Tapotzingo 2025).

This hands-on learning is deeply rooted in the local area and materials. Knowing when the fiber is ready, how it responds to the weather, or which techniques work best in each season comes from years of experience. Through shared practice, artisanal knowledge takes shape as a body of expertise that brings together work, family, and the environment.

Currently, the workshops are made up of parents, children, siblings, and even sisters-in-law who join to learn the craft. In these hybrid workshop-home spaces, productive and domestic activities are constantly intertwined, requiring a reorganization of the time allocated to work, caregiving, and production. In most workshops, each member has a specific role; while some collect and dry the fiber, others weave it, while still others sew, refine details, or treat the product with sulfur[8] . Because many of the workspaces are also homes, it is difficult to separate work from domestic activities. The dynamics vary among families: while in some households domestic chores are shared by men and women, in others they fall primarily on the craftswomen.

One family notes that, to keep production going, the women in the family take turns with household chores; one of them says, *"When we have a lot of work, we tell the other women to come over to the house so we can get ahead. Since there are so many of us, one has to step aside to cook, clean… In the end, it's food for everyone, while the rest of us keep working, and if she falls behind, the rest of us lend a hand" (artisan, Tapotzingo 2026).* Collectively, they also often organize fiber-dyeing sessions to save time, share resources, and avoid prolonged exposure to smoke from the fire.

Each workshop has a representative. Although collective representation is balanced between women and men, in family-run workshops it is usually the men who take

[8] Sulphurizing is a traditional process in which natural fibers are exposed to sulfur smoke to bleach and preserve them. Although it improves appearance and prevents mold, prolonged exposure to the smoke affects people's health.

on leadership roles. This shows that gender dynamics persist in everyday organization. In some cases, this role has been passed down from parents to their sons and daughters.

Knowledge is important for the collective's organization and leadership, because it not only transmits a craft but also guides decisions and organizational structures. Experience, lessons learned, and connections create recognized distinctions regarding who can guide or manage relationships with institutions. This gives certain individuals the legitimacy to suggest, organize, or correct based on practical knowledge that has proven to work.

The collective's workshops are neither silent nor perfect spaces. They are home-based workshops where you can hear the sound of the machete cutting through the fiber, music blaring, the laughter that accompanies the weaving, and conversations about prices, the heat, sales, and power outages.

Conversations about power outages are not merely anecdotal. Long before it was discussed as a collective problem, energy was already shaping family life: the heat that hardens the fibers, the humidity that determines drying times, the power outages that interrupt production, or the unexpected expenses to repair the transformer. Energy was there as a constant presence—known but unspoken.

Its absence isn't always explained in words, but it is experienced and felt in the body: in the interrupted rhythms of work, in the urgency to *"make the most of it while* the *lights are on,"* and in the daily strain on families. As one artisan recounts: *"When the power comes back on, I say to myself: now I have to do things faster. Everything has piled up, and I have to figure it out on my* own" (artisan, Tapotzingo 2025).

Everyday responses to the lack of power are not referred to as "energy strategies." They are practical ways of getting through the day: getting work done ahead of a blackout, adjusting schedules, using equipment that requires more physical effort and time, or turning to alternative energy sources. These practices demonstrate an ability to reorganize based on experience, where energy is managed in a fragmented, domestic, and context-specific manner. However, when these difficulties affect collective production, the reorganization takes on a shared character. At the collective level, workshops support one another to fulfill orders: some families temporarily relocate to other workspaces, fiber-dyeing sessions are organized, energy resources such as firewood and gas are shared, or artisanal pieces are requested from other workshops when power outages delay production.

The opportunity to discuss energy as a collective arose from the convergence of daily needs and bonds of trust with other local actors[9] . Based on these interactions, the collective began experimenting with technological and organizational solutions, such as wood-saving stoves, dryers, and solar panels, as well as workshops on energy management. These experiences expanded the available options and reshaped certain production practices—for example, through the use of eco-friendly stoves and the design of a sulfurizer that reduces exposure to smoke, as well as the optimization of fiber drying via a collectively managed solar dryer.

Through shared decisions, practical arrangements, and partial coordination, the collective seeks to sustain their work and daily lives under conditions of energy poverty. These local-scale actions reshape the way artisans relate both to the energy infrastructure and to their own for decision-making capacity. In Tapotzingo, energy governance is shaped by the social relationships that sustain the craft.

These dynamics resemble what has been described as energy governance processes, built from everyday experience rather than from formal institutional designs (Emerson et al. 2012). In turn, they exhibit characteristics that align with approaches such as Sustainable Rural Energy Systems, where energy management is integrated with local forms of organization, resource use, and community decision-making (Arenas et al. 2023). In Tapotzingo, these practices bring to light principles of the Social and Solidarity Economy (Coraggio 2011)—such as cooperation, autonomy, and territorial roots—which are embodied in concrete ways of reorganizing daily life in the face of energy poverty.

"Las Mariposas" Artisans

The Las Mariposas collective and Tapotzingo share the same region and a craft tradition linked to working with plant fibers. In both cases, production takes place in domestic spaces where craft activities, household chores, and caregiving are intertwined on a daily basis. This overlap of activities directly influences the organization of time, work, and the use of energy resources.

The artisans' workshop is part of the home. Craftwork takes place amid household chores, interruptions, breaks, and constant adjustments, following the rhythm of life itself. The pieces are made in different corners of the home—on the kitchen table

[9] This forum for dialogue emerged from the PRONAII project "Multi-stakeholder Platform for Energy Democratization," in collaboration with Horizontes Creativos A.C., El Colegio de la Frontera Sur (ECOSUR), and the Juárez Autonomous University of Tabasco (UJAT). Through this process, artisans shared their experiences regarding energy for the first time, recognizing that the challenges they faced in their workshops were a common issue among the three groups.

while preparing meals, or in the living room in the early hours of the morning, when silence and the right conditions allow them to continue weaving.

Housework, caregiving, and craftwork are woven into the daily lives of the collective's members. This shared experience allows them to recognize each other's schedules and needs and to adjust the distribution of orders according to each person's domestic responsibilities, even when this means taking on a smaller order individually and thereby reducing their income. Artisanal production depends primarily on them, while the involvement of children, siblings, parents, or spouses is usually limited to transporting the finished product. Occasionally, when there isn't enough time to fulfill orders, they turn to other craftswomen in the community to complete the work. In this way, the organization of craftwork begins in the domestic sphere, where each home-based workshop adjusts its schedule and capacity to coordinate with the rest of the collective.

When these workshops connect with one another, the continuity of the work depends on how relationships among the craftswomen are maintained. Keeping the group small has, in this sense, been a decision that has allowed them to continue producing together and avoid unnecessary tensions. As one of the craftswomen puts it: *"And we said that for now, just the five of us will continue, because we've had a lot of experience bringing in new people, and there are always arguments. We don't want that anymore. With just a few of us, we take better care of each other"* (artisan, Guaytalpa 2023). This decision is part of a strategy developed in response to previous experiences of burnout, subordinate labor, and internal conflicts.

In this context, *"getting* along" becomes a fundamental condition for collective work. The artisans know that if the bond weakens, the workshops come to a halt. That's why nurturing their relationships with one another is part of their daily work, just as much as fulfilling an order or distributing materials. One of them emphasizes: *"We're a group, and I think what keeps us together is that we share values. That's why we continue as a collective. If that weren't there—the trust, the respect, the support among us—maybe we wouldn't have any of this left"* (artisan, Guaytalpa 2024).

The group's organization does not rely on written rules. Agreements are formed through daily conversation, adapting to each person's circumstances. When one person can't keep up, another steps in to cover for her; when fatigue sets in, the pace slows down; when discomfort arises, they try to talk it out before the problem escalates. This way of organizing prioritizes calm and understanding as prerequisites for continuing to work together. When disagreements cannot be resolved, some members quietly withdraw, without open confrontation. This approach to conflict

resolution reveals both the group's strength and its fragility: it preserves calm, but leaves few mechanisms for working through differences.

Amid these everyday dynamics of work and coexistence, the material conditions that shape the craft also come into play. Among them is access to energy. At Las Mariposas, energy is part of daily life in the home-workshop. The artisans speak of energy from a practical perspective: when they can work, how much progress they can make on an order, or how much fatigue sets in by the end of the day.

When the power goes out or there is a shortage of firewood or gas, each artisan reorganizes her work schedule. Some get ahead on tasks while the power is on; others switch energy sources—for example, moving from using appliances to manual labor, such as grinding in a molcajete or washing by hand—which involves greater physical exertion. In these everyday decisions, energy becomes a practical factor that shapes the rhythm of work, the body, and the time available in daily life. When these power outages are prolonged, the work that cannot be completed in a workshop ends up affecting the group's orders. At such times, the artisans may request an extension from the intermediary or reorganize the orders among themselves to meet their commitments, although this reorganization rarely reduces the workload; on the contrary, it tends to concentrate it during the moments when the power returns.

As one of them explains: *"When there's light, we have to hurry, because we don't know how long it's going to last"* (artisan, Guaytalpa 2023). This sense of urgency reorganizes the day on the fly: it forces them to speed up productive activities and to overlap household and workshop tasks that had been put on hold.

In Las Mariposas, this burden falls mainly on women artisans, because they are the ones who juggle productive work with domestic chores and caregiving. This unequal burden directly influences how everyday decisions are made—when to produce, when to stop, and when to prioritize self-care and social connections—silently reshaping the organization of collective work.

One of them puts it clearly: *"I make my bags all by myself. If I devote the whole day to it, when do I make my meal or when do I do the laundry? I don't have time. And when the power goes out, it's even worse. Sometimes we have to put in extra effort—like staying up all night to get everything done or getting up very* early" (artisan, Guaytalpa 2024). These experiences align with what Listo (2018) describes as an embodied experience of energy poverty, where the effects are reflected in working hours, accumulated fatigue, stress, and the forced reorganization of daily life.

In other cases, responses are shaped in relation to external actors. This occurs, for example, with the use of rechargeable light bulbs, solar fiber dryers, solar panels, and firewood-saving stoves. Some of these eco-technologies expand the possibilities for daily work to sustain production. However, adoption is not immediate; each eco-

technology is observed, evaluated, and even readjusted by the artisans based on the conditions of their home-workshops and their individual needs.

Group of Chocolate and Cocoa Artisans in Comalcalco

In the group of chocolate makers and cacao processors in Comalcalco, the organization of work is based on a flexible distribution of knowledge, activities, and production specialties. Although all members participate in different stages of the cacao chain, each has developed specific skills that foster complementarity and collaboration within the group.

The women chocolatiers master various stages of working with cacao: from tending the crops to transforming the beans into chocolate and selling it. Within the group, however, each member has found her own specialty. This diversification is organized around what they themselves call their *"flagship products*," which range from traditional table chocolate and chocolates with varying degrees of purity to derivatives such as liqueurs, mucilage jam, and handicrafts made from cocoa shells. As one of the chocolate makers points out: *"I think something that has worked for us as a group—even though we're all chocolate makers—is that we've never seen each other as competition. We've celebrated each other's successes… so each of us identified our potential in our star* product" (chocolate maker, Comalcalco 2024).

For many of them, learning about cacao and chocolate began in childhood, within the family, through observation and daily practice alongside their mothers or grandmothers, who harvested, roasted, ground, and prepared traditional beverages such as pozol. Others resumed the family trade after the loss of a parent, while still others joined later, through workshops organized by institutions or at the invitation of other women in the same trade. From these backgrounds, working with cacao emerges as a productive activity and a body of knowledge built on experience, intergenerational transmission, and collaborative learning.

Unlike other cases where artisanal production is organized through more established groups, the chocolate makers operate more as a flexible network of family-run workshops. Although they share spaces such as agroecological fairs, exchanges, or specific projects, each workshop maintains its own production and sales dynamics. Some sell their products locally or nationally, while others ship to international customers. This form of organization, based on the autonomy of each workshop, also influences how the chocolate makers engage with other marketing channels.

In the group's everyday experience, the sale of cacao and chocolate does not take place in a stable market that producers can simply access. Rather, it is built on connections, invitations, and specific opportunities. For many of them, their main sales channels

are fairs, local events, and personal networks. Participating involves investing time, money, and physical effort in travel, food, and long workdays. These investments are not always recouped, as profits are sometimes minimal.

The group expresses its collaboration through simple agreements and everyday actions: transporting or displaying fellow members' products, sharing information about prices or calls for participation, warning each other about scammers or debtors, or even negotiating certain sales venues together. As one of them points out: *"I've told them, 'I'll carry your product'… and that's what it's been about seeking out and forming those alliances among* ourselves" (chocolate maker, Comalcalco 2024). This support does not operate as a stable organizational structure. Participation depends on each producer's availability, trust, and circumstances, so agreements are formed selectively and adjusted according to each situation. They themselves describe this form of coordination as *"pulling in the same* direction": collaborating when it is convenient, without adopting formal rules or a permanent organization.

Workspaces vary among families: some have a specific area set aside for processing cacao, while in other families the workshop is inside the house. Although the artisanal process is shared, the techniques and resources available differ from one workshop to another. While some use electric equipment to dry or roast the cacao, others continue to sun-dry it and roast it over an open fire or on household stoves. Something similar occurs with product storage: some use refrigerators, while others rely on iceboxes or relatively cool rooms inside the house. These variations show that, although the artisanal chocolate-making process is shared, each chocolatier combines the available energy sources differently to sustain production.

These differences are also reflected in the everyday work experience. The availability of power affects production times, the physical effort required to perform certain activities, and the ability to preserve or process the cacao. While some chocolate makers have more stable electrical systems that allow them to operate mills and equipment without frequent interruptions, others face constant power outages, low voltage, or limitations in their home wiring in their rural settlements, forcing them to halt work, reorganize activities, or resort to manual alternatives. In some cases, even access to quality firewood becomes limited, which hinders activities such as roasting the beans. These energy conditions affect productivity and contribute to deepening the material inequalities that already exist among the group's members.

As one of them explains: *"Some* of *our colleagues have the resources to have their own facility; they already have their own grinding discs for their mills and all that. Others, like me, have to grind by hand because, even if we make the effort to buy a grinder, we don't have the facilities, and the power goes* out" (chocolate maker, Comalcalco 2026). These differences in access to and use of energy show that not all women producers face the same conditions for sustaining their work.

Faced with these conditions, the chocolate makers have developed different ways of adapting to sustain production. In the home, they rely on practical, improvised solutions and accumulated experience. When the power goes out, some continue grinding cacao using a hand mill or metate to fulfill orders; others take advantage of periods of stable power to grind large batches and store the cacao paste in ice chests when refrigeration is unavailable, even if this requires extra effort. These decisions demonstrate how energy management begins in the home workshop itself, where each producer adjusts her practices according to the available conditions.

When these difficulties affect production, responses also extend to the collective level and local support networks. Among the chocolate makers, it is common to lend each other workshops or equipment when someone faces power outages or burned-out transformers, to share information about gas prices or places to find higher-quality firewood, and even to organize with neighbors to pool resources and hire technicians to restore service when institutions are slow to respond.

At the same time, the group maintains ties with other stakeholders with whom they have participated in energy audits, training on electrical installations, and the implementation of eco-technologies such as eco-friendly stoves. Furthermore, as a result of these support initiatives, some chocolate makers have also made improvements to their home facilities, such as replacing old wiring with heavier-gauge wiring or installing separate circuit breakers to prevent the grinders from tripping the power for the rest of the house.

Discussion

Review by the Groups

Energy sources are not just materials; they are also the social relationships that sustain their production. Access to and use of energy depend on social ties and forms of organization. The conditions of artisanal work dictate how this energy is produced and valued. Therefore, even under the same energy conditions, each group reorganizes its practices across different spheres (organization, the home, or productive activities) (Aguilar-Hernández 2016; Coraggio 2011).

This diversity in starting points reflects a flexible framework whose function is based on the material conditions of work. Energy is not merely a technical resource; it is a means of reorganizing relationships, learning processes, and strategies to sustain artisanal production. These dynamics allow us to observe different forms of energy

governance, which depend on practical agreements and real connections built within the territory.

These forms of organization are grounded in cooperation and shared responsibility and align with "solidarity-based solidarity" (Sareen et al. 2023), a concept used to describe energy management based on collective arrangements that prioritize the continuity of work and mutual care over technical quality. In the case of the chocolate-making workshops, this dimension is expressed in a women-led organization, where collaboration is a key strategy for maintaining production in an uncertain environment (Martínez-Salvador and Martínez-Salvador 2020).

However, the collective arrangements that sustain production are not limited to organizational coordination or resource management. They also involve daily adjustments that affect the bodily experience of those engaged in productive and care work.

From the perspective of energy poverty as a situated and embodied experience (Listo 2018; Madriz-Vargas et al. 2018), these daily adjustments are both physical and emotional, and thus fall differently on those who perform productive and care work. Energy reorganizes production, as well as the rhythms, efforts, and bodily limits of daily life.

Energy Reconfigurations in Daily Life and the Territory

The findings suggest that a just energy transition requires recognizing the structural conditions that shape territories. These are expressed in everyday adaptation practices that involve the reorganization of work, adjustments to time, and the construction of collective decisions (Blanco-Wells 2019; Pellicer-Sifres 2018).

This can be observed in all three cases, where the everyday management of energy is shaped by constant changes and adjustments. Each change in conditions triggers processes of assessment, negotiation, and reorganization. For example, in all three cases, power outages and weather conditions influence their production processes. In response, family-run workshops adjust their schedules and, when necessary, temporarily transfer tasks or orders to other workshops within the group. The adaptation strategies in these cases also require a collective capacity to coordinate work, resources, and schedules.

Placing the processes of reorganizing the social life of energy at the center of the energy transition allows us to recognize that responses to energy conditions also involve organizational and territorial dimensions. This interpretation aligns with the proposal by Blanco-Wells (2019), who notes that energy is shaped by the interaction

between practices, relationships, and meanings. Therefore, moving toward a just energy transition requires recognizing and strengthening the collective capacities, shared values, organizational structures, and processes of territorialization that enable communities to manage, adapt to, reorganize, and sustain energy in their daily lives (Castro and Sen 2022).

Implications for a Just Energy Transition

In the face of energy constraints, groups mobilize their resources, local knowledge, and collaborative networks to sustain their daily and productive activities and develop their own responses. These responses combine different energy sources, forms of organization, and adaptive capacities that enable them to flexibly cope with supply disruptions and other energy limitations. In this regard, these findings contribute to the discussion of procedural justice by demonstrating that these groups are capable of developing practical strategies that could be strengthened through training, knowledge exchange, and mechanisms that expand their capacity to respond to scenarios of energy poverty.

A just energy transition requires recognizing the diversity of aspirations, values, and forms of organization present in local communities. Although all three groups employ collective strategies to address energy constraints, their priorities and scope of action are not necessarily the same. These differences show that there is no single legitimate way to move toward a more just energy future; therefore, a transition must be built on the recognition of different territorial, organizational, and productive conditions (Sareen et al. 2023; Castro and Sen 2022).

However, sustaining these strategies comes at a cost that is not distributed equally. Overtime work, the reorganization of activities, and caregiving responsibilities fall more heavily on certain members of the groups, particularly when issues of gender, age, and domestic responsibilities intersect. Therefore, a just energy transition must also recognize and address these inequalities and value the work through which communities generate alternatives to sustain daily life and productive activities (Listo 2018; Stojilovska et al. 2021; López et al. 2025; Yanes and Vera 2025).

The three cases can be interpreted through the Energy-Territorial Reconfiguration Spiral (ERET), which shows that responses to energy constraints are part of ongoing processes of adjustment, learning, and strategies that simultaneously transform productive, reproductive, and care practices, as well as social relations and ways of inhabiting the territory (Figure 3).

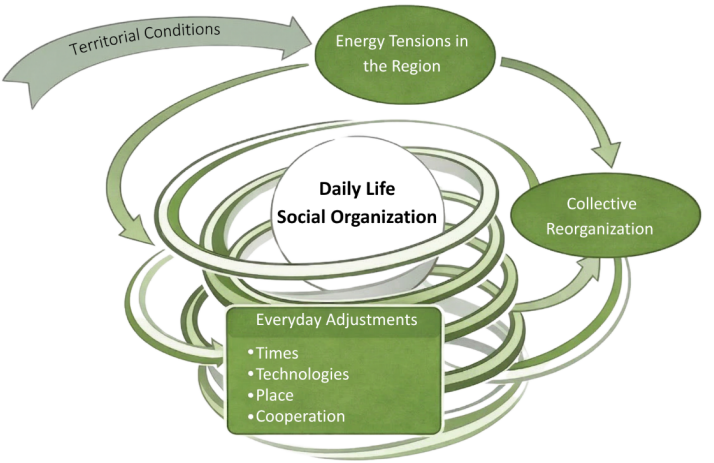

Figure 3. Spiral of Energy-Territorial Reconfiguration (ERET). Source: author's own.

Stojilovska et al. (2021) note that some responses to energy constraints can strengthen collective autonomy, while others are deeply marked by dynamics of exhaustion and vulnerability among people. Similarly, López et al. (2025) suggest that the technical, social, and temporal dimensions of energy are intertwined in everyday practice, as reflected in the ERET.

From the perspective of the ERET, these dynamics can be understood as continuous processes of reconfiguration among energy, labor, collective organization, and territory. The adjustments shared by the groups do not pertain solely to aspects of energy access or distribution; they also involve changes in their work schedules, physical wear and tear, forms of cooperation, and the relationships built with other actors. Recognizing the social life of energy and these interactions allows us to understand the energy transition as a situated process that is built upon everyday practices and the capacities developed within these territories (Warbroek et al. 2019).

Conclusion

The findings of this research demonstrate that energy poverty is more than just a lack of access to affordable energy; it creates a context in which forms of reorganization, coordination, and adaptation emerge, enabling these groups to sustain their daily lives and productive activities. Thus, deprivation ceases to be the sole focus of analysis, giving way to an understanding of the processes of social reconfiguration of energy, where access to, use of, and organization of energy are constructed in a situated manner based on collective ties, shared values, and territorial identities.

In the context of these groups, the Spiral of Energy-Territorial Reconfiguration (ERET) makes the dynamism of these strategies visible, highlighting continuous processes of adjustment, learning, and reorganization among energy, work, care, and territory. This helps us understand that responses in contexts of energy poverty are relational and situated processes that constantly transform the way people organize, collaborate, and sustain daily life.

This analysis contributes to the discussion on energy justice and the energy transition by demonstrating that these groups are capable of developing diverse responses in contexts of energy poverty. These strategies involve combining different energy sources, local knowledge, collaborative networks, and forms of solidarity-based organization, which they develop to strengthen their capacity for action and expand opportunities for adaptation within their territory. This diversity of strategies makes it clear that there is no single path to energy transition, but rather multiple ways to shape it based on the realities, aspirations, and capacities of the people in each territory.

Based on this research, we propose three main lines of inquiry for future studies aimed at understanding the processes of a just energy transition in contexts of energy poverty. First, to delve deeper into the relationship between energy dynamics, gender, and care, considering that physical and mental strain is distributed differently between men and women, and recognizing the central role of women in organizing, adapting, and sustaining these practices within the groups involved. Second, analyze how these forms of reorganization intersect with broader scales of governance, public policy, and energy markets. Third, explore how these local strategies highlight everyday forms of energy justice and expand the agency of these groups to reorganize and determine their own energy trajectories.

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