SUBMISSION BY REVOLUSOLAR TO THE ROADMAP ON THE TRANSITION AWAY FROM FOSSIL FUELS IN A JUST, ORDERLY AND EQUITABLE MANNER

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Revolusolar is a Brazilian civil society organization and a leading technical and community reference in the implementation of community solar energy projects in Brazil. Founded in Rio de Janeiro in 2015, the organization structures its work around three integrated lines of action: community projects, which combines energy access, professional training and community governance; strategic research to inform just energy transition policies; and multisectoral engagement connecting communities, governments, the private sector, academia and civil society to influence public policies that make solar energy an instrument of energy justice and socioeconomic development.

Revolusolar welcomes the initiative of the Brazilian COP30 Presidency to elaborate a Roadmap on Transitioning Away from Fossil Fuels in a Just, Orderly and Equitable Manner. In the spirit of "*mutirão"* that guides this consultation, we present this contribution as part of a collective effort to translate global consensus into concrete implementation, with particular attention to the communities that need it most and have been least included in energy transition policy. We recommend that the Roadmap will recognize community energy as a central instrument of just transition, and that Brazil, as host of COP30 and a global leader in renewable energy, will champion a transition that is simultaneously climate, social and territorial in its ambition.

(a) What are the most critical barriers — whether physical, economic, financial, institutional, technological or social— preventing a transition away from fossil fuels?

- **Global Governance Gaps in Managing Fossil Fuel Phase-Out**

A structural barrier to the transition is the absence of a legally binding international instrument capable of coordinating the reduction of oil, gas and coal production in a just and equitable manner. The Paris Agreement contains no explicit provisions governing fossil fuel supply. Without supply-side regulation, continued expansion of production undermines gains achieved on the demand side. The International Institute for Sustainable Development (IISD) and partners (2026) identify that effective national Transitioning Away from Fossil Fuels (TAFF) roadmaps must treat production and consumption pathways, subsidy reform, just transition and finance as an integrated whole, not as separate agendas.[1]

This gap is compounded by the persistence of massive subsidies. According to the International Monetary Fund (IMF, 2025), global fossil fuel subsidies reached approximately USD 7.3 trillion in 2024 — equivalent to 6.5% of global GDP — combining explicit subsidies (USD 725 billion) with implicit subsidies reflecting unpriced environmental and health costs (USD 6.7 trillion)[2]. The continued flow of public resources toward fossil fuels directly competes with financing for clean energy systems.

- **Regulatory and financial barriers to renewable energy expansion**

Regulatory and financial frameworks built around centralized, fossil fuel-based energy systems create structural barriers to renewable energy expansion — especially in the countries that most need the transition. The International Energy Agency (IEA) World Energy Outlook (2024) highlights a critical investment asymmetry: emerging markets and developing economies (outside China) represent 85% of the world's population but receive only 15% of global clean energy investment. Financing costs for solar projects in developing countries are at least twice as high as in advanced economies. According to the International Renewable Energy Agency (IRENA, 2024), community energy initiatives face regulatory complexity that favors large producers, inadequate credit lines and legal frameworks that do not recognize collective generation models — despite their demonstrated capacity to reduce costs, generate local employment and expand access in underserved territories. In Brazil, while the Distributed Generation Legal Framework (Law 14.300/2022) represented a significant advance, bureaucratic, tariff and financial barriers continue to limit low-income communities' access to these models.

[1] [1] International Institute for Sustainable Development (IISD) - Available at: Progressing the Transition Away From Fossil Fuels: A guide for policy-makers working on TAFF roadmaps and plans
[2] International Monetary Fund (IMF). Underpriced and Overused: Fossil Fuel Subsidies — 2025 Data Update. Washington, D.C.: IMF, 2025. Available at: Underpriced and Overused: Fossil Fuel Subsidies Data 2025 Update

- **Absence of credible just transition models for workers and communities**

The absence of credible just transition pathways is itself a political barrier to the transition. This barrier operates across two complementary dimensions — both of which the Roadmap must address.

The first concerns workers and communities dependent on the fossil fuel industry. Without robust retraining, economic diversification and social protection programs for those whose livelihoods depend on fossil fuels, organized opposition to the transition grows and undermines climate policy progress. The International Labour Organization (ILO) Guidelines for a Just Transition (2023) establish that the creation of decent jobs, protection of affected workers and active participation of trade unions and communities are indispensable conditions for the political viability of the transition.

The second dimension concerns communities living in energy poverty. When transition models do not include mechanisms for affordable clean energy access for low-income populations, the transition loses social legitimacy and faces resistance from those communities — who rightly perceive that benefits will be distributed unequally. In Brazil, research by PSR Energia, in partnership with the Global Energy Alliance for People and Planet (GEAPP, 2025), shows that the poorest households spend up to 18% of their monthly income on electricity. In an Amazon region where approximately one million people still live without electricity access and 2.7 million have precarious supply (National Forum of Energy Consumer Entities — FNCE / Envol Energia, 2025), a transition that does not include these territories is not only unjust — it is incomplete.

- **Technological and infrastructure gaps in hard-to-abate sectors**

Certain sectors of the global economy remain structurally dependent on fossil fuels due to the absence of affordable and scalable technological alternatives. Heavy industry, aviation, shipping and long-haul freight transport — the so-called hard-to-abate sectors — together account for one-third of global energy emissions, and none of them is currently on the pathway required for net-zero by 2050 (IRENA, 2024). The World Economic Forum (WEF, 2024) estimates that these sectors will require USD 30 trillion in additional capital to achieve the transition — a figure that underscores the scale of the challenge and the need for robust international coordination on research, development and technology transfer, especially for developing countries that lack the endogenous capacity to finance this innovation.

- **Institutional fragility and reductionist approach in energy transition policy**

An equally structural barrier is the dominant tendency to treat the energy transition as a technological substitution of energy sources, without transforming the governance models, benefit distribution and social inclusion frameworks that determine who gains and who loses in this process. Energy policies that prioritize scale, efficiency and financial returns

without integrating social, environmental and territorial justice dimensions reproduce — in new form — the same exclusionary mechanisms that have historically characterized natural resource exploitation models in the Global South. Current institutions are, for the most part, ill-equipped to handle the transition as the profound socioeconomic challenge it truly is — and without robust multi-level governance, policy alignment and active participation of affected communities, the process risks collapsing under the weight of fiscal instability and social conflict.

Brazil provides a precise illustration of this paradox. The country has become the world's fourth largest solar market, with 89.1% of its electricity generated from renewable sources — a remarkable technological transition. Yet Brazil also has one of the highest electricity tariffs in the world relative to household income. The poorest families spend up to 18% of their monthly income on electricity (PSR Energia / Global Energy Alliance for People and Planet — GEAPP, 2025) — evidence that renewable abundance and energy poverty can coexist when the transition is conceived as a transformation of the generation mix, rather than a transformation of the conditions of access. The risk, on a global scale, is that the transition away from fossil fuels reproduces the extractive and exclusionary models that have historically marked development in the Global South — now with a different type of infrastructure, but with the same logic of concentrated benefits and energy exclusion.

Overcoming this barrier requires that transition policies be developed in a genuinely inclusive manner — with active participation of workers, consumers, Indigenous peoples, Afro-descendant communities and low-income populations —, incorporate social and environmental safeguards and the right to Free, Prior and Informed Consent (FPIC) for communities affected by energy infrastructure projects, and adopt the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC) both in the international dimension and in the domestic dimension of national transition policies.

(b) What potential levers, whether economic, financial, institutional, social or technological, exist for accelerating the implementation of the transitioning away commitment?

The implementation of the TAFF commitment can be accelerated through a set of economic, financial, institutional, social and technological levers that already exist or are available to be mobilized. Some of these levers represent favorable market and technology conditions; others are public policy instruments that can be created, expanded or strengthened.

Economic levers

- **Historic cost-competitiveness of renewable technologies**

The cost of renewable energy technologies — particularly solar photovoltaics — has fallen dramatically over the past decade, making them competitive with or cheaper than fossil fuels across much of the world. The International Renewable Energy Agency (IRENA, 2024) notes that solar energy is now the cheapest source of electricity generation in history in many markets. This reversal in competitiveness represents a structural economic lever: the transition is no longer a "cost to be absorbed" but an opportunity for economic gain. Countries that accelerate the transition will gain competitive advantages in terms of energy costs, technological innovation and positioning in emerging value chains.

- **Energy security and reduced external vulnerability**

Dependence on fossil fuel imports exposes countries to geopolitical risks and price volatility — as demonstrated by the energy crisis triggered by the war in Ukraine. The expansion of renewable energy sources, especially in decentralized and distributed models, increases the resilience of national energy systems and reduces exposure to external shocks. For net fossil fuel importing countries, the transition represents not only a climate imperative but a strategy for energy sovereignty.

- **Potential for job creation and local market development**

The renewable energy sector is labor-intensive locally, especially in installation, operation and maintenance stages. Community and distributed energy models amplify this potential by creating employment opportunities in territories historically excluded from conventional value chains. The transition to net zero can generate 14 million new jobs by 2030 in clean energy alone, with another 16 million in energy efficiency, electric vehicles, and building retrofits (IEA, 2021), with potential for partial internalization of value chains in developing countries.

Financial levers

- **Redirecting public resources toward an equitable transition**

Global fossil fuel subsidies — estimated at approximately USD 7.3 trillion annually, combining explicit and implicit subsidies (International Monetary Fund — IMF, 2025) — represent a massive volume of public resources that could be redirected to finance the energy transition. Reforming these subsidies is one of the highest-impact fiscal levers available to governments.

However, experience shows that redirecting subsidies toward renewable sources alone does not guarantee a just transition. The Brazilian case is illustrative: the country became the world's fourth largest solar market, but the benefits of expansion were concentrated among corporations and middle- and upper-income consumers, while the poorest families — who spend up to 18% of their monthly income on electricity (PSR Energia / GEAPP, 2025) — remained excluded. For public resources to accelerate a transition effectively aligned with SDG 7 (universal access to clean, reliable and affordable energy), subsidy policy design must ensure that benefits reach those who need them most.

Instruments for this design include: expanded and modernized social tariffs; dedicated credit lines for low-income communities; regulatory modalities that enable vulnerable populations to access renewable energy, such as remote self-consumption, shared generation and energy cooperatives. Brazil has an instrument with this potential that remains unimplemented: the Social Renewable Energy Program (PERS), established under Law 14.300/2022 (Distributed Generation Legal Framework), which mandates the allocation of resources for distributed generation projects benefiting low-income families. Effective implementation of PERS could make Brazil a global reference in equitable energy transition policies — demonstrating that it is possible to combine renewable energy expansion with energy poverty reduction.

- **Mobilizing climate finance and blended finance**

International climate finance represents an essential lever for enabling implementation of the TAFF commitment in developing countries. Available mechanisms include: multilateral climate funds; multilateral development banks with dedicated clean energy credit lines; grant-based resources for community-scale and small-scale projects; and philanthropic financing from foundations.

A particularly relevant lever is blended finance — the strategic combination of public, philanthropic and private capital to reduce risk and lower the cost of capital for renewable energy projects. Instruments such as sovereign risk guarantees, first-loss capital absorbed by concessional finance, and co-investment by development banks can mobilize significant volumes of private capital for projects that would otherwise be unfinanceable. For these mechanisms to accelerate a just transition, they must incorporate distributive justice criteria

in access — prioritizing projects that expand clean energy access for vulnerable populations, not only large-scale projects with conventional financial returns.

- **Research, development and energy efficiency programs**

Public research and development (R&D) programs in clean technologies, as well as energy efficiency programs, represent complementary levers to accelerate the transition. Energy efficiency, in particular, operates on the demand side: by reducing total energy consumption, it decreases pressure on energy systems and accelerates decarbonization. Minimum energy performance standards, building and industrial retrofit programs, and fiscal incentives for efficient equipment are available instruments with proven track records. Resources from multilateral banks and climate funds are already available to finance R&D and energy efficiency programs in developing countries.

Institutional levers

- **Regulatory Frameworks Favorable to Community Energy**

The creation of regulatory frameworks that recognize and enable community-based energy models is a high-impact, low-cost institutional lever. IRENA (2024) demonstrates that where a favorable legal framework exists, community energy initiatives can reduce energy costs, generate local jobs, and expand access in historically underserved territories. Brazil's experience with the Distributed Generation Legal Framework (Law 14.300/2022) illustrates this potential: the regulatory reform unlocked the accelerated growth of the solar sector, making Brazil the fourth largest solar market in the world in less than a decade. The next step—the creation of specific modalities for remote self-consumption, shared generation, and cooperatives in low-income territories, with access to financing and technical assistance—can transform community energy into a central instrument for the implementation of the TAFF.

- **National TAFF roadmaps with verifiable targets and accountability mechanisms**

The development of national Transitioning Away from Fossil Fuels roadmaps represents the most direct institutional lever for translating the global commitment made at COP28 into verifiable national trajectories. Effective roadmaps must integrate, in a single instrument: targets for reducing fossil fuel production and consumption; subsidy reform timelines; just transition plans for workers and communities; and financing strategies. The inclusion of periodic review cycles aligned with the Paris Agreement's progressive ambition mechanism, and of monitoring, evaluation and accountability mechanisms, is essential to ensure that roadmaps translate into concrete action.

Social levers

- **National just transition plans as a mandatory component**

The development and implementation of national just transition plans is an indispensable social lever to ensure the political viability of TAFF commitment implementation. The International Labour Organization (ILO) Guidelines for a Just Transition (2023) establish that these plans must include: mapping of workers and communities dependent on fossil fuels; professional retraining programs with recognized certification; economic diversification of dependent regions. Critically, these plans must explicitly include communities living in energy poverty as active — not residual — beneficiaries of the transition. Just transition plans should be treated as a mandatory component of TAFF roadmaps, not as an optional annex.

Based on our decade-long experience implementing community-based energy transition in vulnerable territories, we propose that the TAFF Roadmap incorporate concrete energy justice mechanisms: quantifiable indicators to monitor the reduction of household income commitment to energy and the expansion of distributed generation access in vulnerable territories; mandatory assessments of distortions in national energy subsidy matrices, identifying policies that benefit higher-income groups to the detriment of the most vulnerable populations; progressive targets to reduce the energy burden on the income of the poorest families; transparency regarding the allocation of public resources, ensuring that investments labeled as "energy transition" do not direct the majority of resources toward fossil fuels; and periodic evaluations of transition policies, covering decentralized renewables, energy efficiency, carbon pricing, and impacts on vulnerable groups.

- **Social and environmental safeguards as conditions for financing and licensing**

Strengthening and effectively enforcing social and environmental safeguards represents an institutional lever to ensure that renewable energy expansion does not replicate the patterns of rights violations and environmental degradation historically associated with the fossil fuel and extractive model. Robust safeguards include: guaranteeing the right to Free, Prior and Informed Consent (FPIC) for communities affected by energy infrastructure projects; transparency and accountability in project implementation; and remediation mechanisms when violations occur. Alignment with the advisory opinions of the International Court of Justice, the Inter-American Court of Human Rights and the International Tribunal for the Law of the Sea reinforces the legal basis of these safeguards. Far from representing obstacles to the transition, effective safeguards are conditions of social legitimacy and long-term political viability.

(c) What country, regional or sector roadmap experiences, best practices, and lessons learned can be shared?

This section presents country, regional and sectoral experiences that offer concrete lessons for implementing transition away from fossil fuels roadmaps with equity and social justice. The selected experiences demonstrate that it is possible to combine decarbonization with inclusion of the most vulnerable populations — provided that public policy instruments are designed with this explicit objective.

Country experiences

- **Brazil - Luz para Todos Program: universal access with lessons for the next stage**

The Luz para Todos (Light for All) Program, established in 2003 and currently regulated by Decree No. 11,628/2023, is one of the world's largest experiences in universal access to electricity. The program brought electricity to more than 18 million people in rural and remote areas, contributing decisively to reducing energy exclusion in Brazil. The main lesson from Luz para Todos is that large-scale energy access policies are viable when there is federal coordination, clear targets, structured financing and integration with existing social registries.

However, the experience also reveals important limitations for the next stage of the transition. The program guarantees minimum access to residential electricity — sufficient for basic lighting — but insufficient to sustain productive activities and community permanence in their territories. In riverside, indigenous and remote rural communities in the Amazon, productive activities — food processing, refrigeration, fishing, forest management, handicrafts — remain dependent on diesel generators, with high cost and environmental impact. The lesson for TAFF roadmaps is that universal basic access is a necessary but not sufficient condition: a just transition requires expanding renewable energy delivery for productive uses, replacing diesel with clean sources and boosting local socio-bioeconomy.

- **Brazil - Social Electricity Tariff (TSEE): consumer protection as a central component of the transition**

The Social Electricity Tariff (Tarifa Social de Energia Elétrica — TSEE), strengthened by recent regulatory reforms, offers progressive discounts on electricity tariffs for low-income families registered in the Single Registry (Cadastro Único). Currently, the program reaches over 17 million households, making it one of the largest energy access protection mechanisms in the world. The TSEE demonstrates that it is possible to implement social protection mechanisms at national scale, integrated with existing beneficiary identification infrastructure.

The lesson for TAFF roadmaps is twofold. First, tariff protection mechanisms are essential to ensure social support for the transition and prevent price volatility from disproportionately penalizing vulnerable populations. Second, tariff protection, while necessary, does not structurally transform families' energy situation: it does not promote autonomy, does not improve service quality, does not generate jobs, and does not address energy poverty in its multiple dimensions. The TSEE must be complemented by policies that transform communities into active producers of clean energy — such as solar energy cooperatives and community distributed generation models.

- **Brazil - Minha Casa Minha Vida with solar energy: social housing as a gateway to just transition**

The Minha Casa Minha Vida (My House My Life) Program, with plans for 2 million housing units by 2026, includes legal provisions for incorporating solar energy systems in developments. This integration represents a concrete opportunity for immediate scale for social solar energy: new social housing units can be delivered with photovoltaic systems already installed, reducing beneficiary families' energy bills from the first day of occupancy.

The lesson is that housing and energy policies can — and should — be integrated. MCMV offers a gateway to just transition with national scale and capillarity, provided that solar systems are effectively implemented and the model includes community maintenance and management mechanisms that ensure system sustainability over time.

- **Brazil - Social Renewable Energy Program (PERS): existing legal instrument awaiting implementation**

The Distributed Generation Legal Framework (Law 14,300/2022) created the Social Renewable Energy Program (Programa de Energia Renovável Social — PERS), which establishes the allocation of resources for distributed generation projects benefiting low-income families registered in CadÚnico. PERS represents an existing legal instrument with the potential to mobilize sectoral resources for just energy transition — but which has not yet been regulated and implemented.

The lesson is that the existence of advanced legal frameworks does not, by itself, guarantee implementation. Brazil has legal instruments with transformative potential — such as PERS — that remain on paper due to lack of regulation, inter-institutional coordination and political will. Effective implementation of PERS could make Brazil a global reference in equitable energy transition policies, demonstrating that it is possible to combine renewable expansion with energy poverty reduction. The COP30 Roadmap should recommend that countries identify and implement already available legal instruments, not just create new regulatory frameworks.

- **Brazil - Auditing of Energy Transition Policies**

Effective implementation of the transition away from fossil fuels requires robust accountability mechanisms. Brazil's Federal Court of Accounts (TCU) provides a replicable model: in 2023-2024, it conducted an operational audit of public policies for energy transition (TC 020.606/2023-0)[3], evaluating coherence between government actions and just transition objectives. The audit identified critical gaps, including insufficient institutionalization of energy justice measures and subsidies disproportionately favoring fossil fuels over renewables. Beyond the audit itself, TCU developed a dedicated audit guide for energy transition policies, offering a methodological framework that other national audit institutions can adapt. This demonstrates that independent oversight bodies — when equipped with appropriate technical capacity and mandates — can play a crucial role in holding governments accountable for transition commitments and ensuring that stated policies translate into effective implementation.

Key lesson: National roadmaps should incorporate provisions for independent auditing of transition policies, with mandates extending beyond emissions metrics to include energy justice, equity and access indicators.

- **Brazil - Community solar energy cooperatives: the Revolusolar experience**

Revolusolar is a pioneering organization in implementing community solar energy projects in vulnerable territories in Brazil, operating since 2015 in urban peripheries, family farming and Amazon communities. The organization developed a community solar cooperative model that combines three integrated dimensions: renewable energy generation with direct economic benefit for families; training of local technicians in photovoltaic system installation and maintenance; and community organization for collective system management and public policy advocacy.

3 https://sites.tcu.gov.br/recursos/transicao-energetica/media/relatorio-completo-de-auditoria/Relat%C3%B3rio-Completo-da-Auditoria.pdf

In 2021, Revolusolar implemented Brazil's first solar cooperative in favelas in the Babilônia and Chapéu Mangueira communities in Rio de Janeiro. The cooperative currently benefits 60 families, with an average 50% reduction in electricity bills. The model demonstrates that it is possible to implement community distributed generation in contexts of land tenure irregularity, informality and absence of initial capital from families — the main obstacles identified in the literature for solar energy expansion in low-income communities.

Over 10 years of operation, Revolusolar has accumulated significant results: 417 kWp of installed capacity across 10 territories in Brazil; 113 people trained as local solar energy technicians and electricians; and more than 15,000 direct and indirect beneficiaries. In urban centers, the organization offers quality solutions at fair and affordable prices. In the Amazon region, it goes further: replacing dependence on diesel with community-based solar energy, transforming energy access into a tool for territorial permanence and socio-bioeconomy development.

Revolusolar's approach demonstrates the importance of linking energy access with social development. Training programs, workshops and educational activities are integrated into project implementation, enabling residents — particularly young people and women — to participate directly in the energy transition as technicians, community leaders and cooperative members. Local residents have been trained and certified in photovoltaic installation and electrical systems, enabling them to work in the rapidly growing solar sector.

The Brazilian experience in community solar energy has served as an international reference: in addition to the visit by Colombia's Minister of Mines and Energy, projects have been recognized by the International Energy Agency (IEA) as a success case in Latin America and have received awards from organizations such as UN Environment, Stanford University and Folha de S.Paulo.

Synthesis of Lessons Learned

The experiences presented converge on central lessons for TAFF roadmaps:

1. A just energy transition requires specific instruments for vulnerable populations — mere expansion of renewables does not guarantee inclusion. The gap between Brazil's position as the world's 4th largest solar market and the persistence of energy poverty affecting millions of families illustrates that market-driven expansion, without equity-oriented policies, reproduces and deepens existing inequalities.
2. Enabling regulatory frameworks for community and distributed energy are essential to unlock the potential of decentralized models. Colombia's experience shows that when appropriate frameworks are established, pent-up demand emerges immediately.

3. Tariff protection mechanisms (such as Brazil's TSEE) are necessary but not sufficient: they must be complemented by policies that transform communities into active energy producers, not just subsidized consumers.
4. Long-term planning with mandatory targets, structured financing and integration with existing social registries is a condition for achieving scale, as demonstrated by China's PVPA.
5. South-South cooperation and learning between countries with similar contexts can accelerate implementation and avoid repeating mistakes. The exchange between Brazil and Colombia exemplifies this potential.
6. Existing legal instruments need to be implemented, not just created. Brazil's PERS, established by law in 2022, remains unimplemented — the gap is often in regulation and political will, not in legislation.
7. Integrating renewable energy deployment with technical training and community governance produces better outcomes than isolated technology transfer. Community-based initiatives can simultaneously reduce electricity costs, strengthen local capacities and generate employment opportunities in territories historically excluded from energy infrastructure investments.

International experiences

- **China - Photovoltaic Poverty Alleviation Program (PVPA): scale and integration with local development**

China's Photovoltaic Poverty Alleviation Program (PVPA), implemented between 2014 and 2020, is the world's largest solar energy experience focused on vulnerable populations. The program installed 26.49 GW of solar capacity, benefiting 4.18 million families living in poverty, 138,000 villages and 1,472 counties. Research published in scientific journals indicates that the program raised available per capita income in beneficiary counties by 7% to 8%, with more pronounced effects in the poorest regions.

The main lessons from PVPA for TAFF roadmaps include: (i) the combination of residential installations, shared community plants and solar agriculture integration amplifies benefits and generates multiple income sources; (ii) long-term state planning with mandatory targets and structured subsidies (35% for distributed projects, 20% for centralized) is essential to achieve scale; (iii) linking productive energy use as a program requirement ensures that access translates into local development, not just residential consumption; (iv) the Chinese process took 25 years from start to completion, but the final intensive phase was completed in 7 years — demonstrating that, with adequate resources and coordination, acceleration is possible.

- **Colombia - National Community Energy Strategy: regulatory framework for community protagonism**

Colombia established Community Energy as a central pillar of its just energy transition policy through Decree 2236/2023, which regulates Article 235 of Law 2294/2023 (National Development Plan). The Colombian legal framework defines the legal and operational regime for vulnerable communities to participate in the electricity value chain as generators, consumers and, eventually, sellers of renewable energy.

Implementation demonstrated massive pent-up demand: when the registration platform opened, 18,460 communities signed up. The government prioritized 2,475 communities — focusing on the Pacific and Caribbean regions, the country's most vulnerable — and began construction of 1,000 projects, with a target of 3,000 operational energy communities by 2026. The Colombian model prioritized ethnic and vulnerable communities in access to financing and created formal social control mechanisms (community monitoring and social oversight) to ensure benefits reach intended recipients.

The Colombian experience has a direct connection to Brazil: Colombia's Minister of Mines and Energy visited community solar projects in Rio de Janeiro's favelas as a reference for Colombian policy design — evidencing the potential for South-South cooperation and mutual learning between countries in the region. The main lesson is that specific regulatory frameworks for energy communities, with explicit prioritization of vulnerable populations and social control mechanisms, are viable and generate immediate demand response.

(d) How can a just, orderly and equitable transition best reflect the diverse realities of countries at different stages of development and with different degrees of dependence on fossil fuels?

The COP30 Roadmap must recognize that the transition away from fossil fuels occurs in profoundly unequal contexts — and that a uniform approach would produce unjust outcomes. The principle of common but differentiated responsibilities and respective capabilities (CBDR-RC), enshrined in the United Nations Framework Convention on Climate Change and reaffirmed in the Paris Agreement, must underpin the architecture of TAFF roadmaps.

- **Differentiation between countries: historical responsibility and distinct capabilities**

Developed countries, responsible for most accumulated historical emissions and with greater financial and technological capacity, must lead the transition with more ambitious targets, shorter timelines and financing commitments for developing countries. National roadmaps must reflect this asymmetry: it is not acceptable to demand the same pace of transition from countries still facing basic energy access deficits and those that universalized access decades ago.

A just and equitable transition must recognize the diverse realities of countries, regions and communities, including different levels of economic development, infrastructure availability and dependence on fossil fuels.

Developing countries face a dual challenge: contributing to global mitigation efforts while expanding energy access for their populations. For these countries, the energy transition cannot be dissociated from the right to development. The Roadmap must recognize that a just transition includes the right of developing countries to expand their renewable energy supply to meet growing demands from populations that have not yet achieved dignified standards of energy consumption. For developing countries, international cooperation must be guided by the principle of common but differentiated responsibilities, recognizing the historical responsibility of industrialized economies for greenhouse gas emissions and their greater financial capacity to support global climate action.

However, global inequalities are mirrored within countries themselves. In Brazil, for example, energy poverty is particularly concentrated in urban peripheries, informal settlements and remote rural territories, where communities face higher energy costs and limited access to reliable energy infrastructure. A just transition therefore requires policies that address both international inequalities and internal social disparities.

- **The Brazilian paradox: renewable matrix with persistent energy poverty**

Brazil illustrates a frequently neglected dimension of diverse realities: inequality within countries. With an electricity matrix composed of approximately 88% renewable sources and positioned as the world's 4th largest solar market, Brazil demonstrates that technological transition alone does not guarantee energy justice.

An operational audit by Brazil's Federal Court of Accounts (TCU), concluded in 2024, evaluated Brazilian public policies for energy transition and identified: (i) insufficient institutionalization and instrumentalization of actions aimed at energy justice; and (ii) government initiatives inconsistent with just energy transition objectives. The report found that for every R$ 1 of support for renewable sources, approximately R$ 4 subsidize fossil fuels — and that for every R$ 1 in subsidies for renewable consumption, R$ 18.95 subsidized fossil energy consumption.

This case demonstrates that the Roadmap should recommend not only decarbonization targets but also equity and access targets, with specific indicators for energy poverty reduction and distribution of transition benefits. Countries with already renewable matrices are not exempt from responsibilities: they must demonstrate that transition benefits are being distributed fairly internally.

- **Flexibility in instruments, universality in principles**

The Roadmap should allow flexibility in instruments and timelines, particularly for countries facing structural inequalities, development gaps and social vulnerabilities that shape their capacity to implement the energy transition. Recognizing these asymmetries is essential to ensure that the transition does not reproduce or deepen existing injustices. However, some principles must be universal and non-negotiable:

Human rights as the foundation of the transition, including the right to energy, health, decent work and participation. Mandatory social and environmental safeguards in all energy infrastructure projects, regardless of financing source. Transparency and accountability mechanisms that allow affected communities to monitor and challenge implementation. Effective participation of affected communities, with consultation mechanisms that go beyond formality and guarantee real influence on decisions.

- **Differentiated financing as a condition of viability**

Differentiation must translate into financial architecture. Developing countries face significantly higher capital costs — in some cases, more than double the cost in developed countries. The Roadmap should recommend: expanded access to concessional financing and grants for transition projects in developing countries; currency and credit risk reduction mechanisms; and specific resource mobilization targets by developed countries, in line with commitments made under the Paris Agreement and subsequent COP decisions