



Task Force 02

SUSTAINABLE CLIMATE ACTION AND INCLUSIVE JUST ENERGY TRANSITIONS

The Social Role of Clean Energy and the Fair and Inclusive Energy Transition Strategy to Alleviate Energy Poverty Through Solar Energy in Communities

Eduardo Avila, Executive Director, Revolusolar (Brazil)

Graziella Albuquerque, Specialist Consultant in International Policies, Revolusolar (Brazil)

Lenin Bandres, Founder, Energy4commons (Belgium)



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Abstract

Energy transitions tailored to each country's realities are urgent to address the climate crisis. Increasing social inequality highlights the need to prioritize the social dimension in designing energy transition solutions. Considering Sustainable Development Goal 7, "Ensure access to affordable, reliable, sustainable and modern energy for all", combating energy poverty is imperative in coordinated actions between countries.

Brazil's G20 presidency prioritizes a fair and inclusive energy transition, leveraging policies and pilot projects as references. International experiences highlight solar energy's role in promoting inclusion and reducing inequalities.

Innovations in technologies, business models and financing for decentralized solar energy offer prospects for a just energy transition, alleviating energy poverty. Innovative financing, international cooperation and regulation of energy companies are crucial for new sources to reach vulnerable communities. Institutional and regulatory innovations are essential for implementation.

Recommendations for the G20:

I) Coordinate actions to promote public policies among member countries, accelerating a fair energy transition by financing and compensating infrastructure that combats energy poverty through the social role of renewable energy.

II) Implementation of Social Impact Businesses through Distributed Generation of Social Interest with Monthly Repayment Mechanisms that offer models of access to subsidized financing for public institutions, micro and small companies.

III) Accelerate financing for energy transitions with cooperative and community solar energy models, promoting social inclusion and sustainability through a fair, accessible and popular transition.

Diagnosis of the Issue

A fair and inclusive energy transition is a priority for the G20 agenda and Brazil's presidency, crucial for promoting energy security and social inclusion across urban, rural, and remote areas.

Energy poverty manifests in a lack of access to electricity, high energy bills—especially in a climate crisis with scarce resources—and low-quality electrical service for vulnerable communities. It is a global reality, affecting 733 million people, with 568 million in Africa. This compromises the well-being of these communities and perpetuates deep-rooted social and economic inequalities in developing countries.

Populations living in energy poverty, particularly in developing countries, are forced to resort to expensive, polluting, and harmful substitutes or even forgo energy services altogether. According to the UN, 2.6 billion people cook with inadequate and unhealthy energy sources. The WHO reports that 3.2 million people die annually from diseases caused by fossil fuels and polluting technologies. However, of the \$1.6 trillion invested in clean energy infrastructure in 2023, 84% went to developed countries and China, with only 16% allocated to other nations, highlighting a systemic economic imbalance.

In Brazil, even though the renewable electricity matrix represents more than 80%, challenges remain in providing safe and accessible energy to vulnerable populations. In the Amazon alone, 1 million people live without electricity (IEMA, 2019). With regard to costs, spending on gas and electricity compromises half or more of the income of 46% of Brazilian families, well above the 6% recommended by international literature (IPEC). Among Brazil's most vulnerable, 41.5% of favela residents have suffered blackouts in the last 6 months and 32.1% have lost appliances and food during power surges.

To promote a fair and inclusive energy transition, policies are needed to ensure that renewable energy access leaves no one behind. Therefore, the G20 Sherpa Energy Transitions Working Group has prioritized a fair and inclusive energy transition, accelerating financing for energy transitions and considering the social dimension of this transition.

Solar energy, officially the cheapest way to generate electricity in history, has the greatest potential to benefit society directly. By 2023, solar PV accounted for three-quarters of renewable capacity additions worldwide.

In 2023, Brazil reached an important milestone: solar energy became the second-largest source in the country's energy matrix, now representing almost 20% of the matrix and over 40 GW installed.

But a restricted look at changing sources of energy generation leaves out the perspective of another crisis we are experiencing - the social. It is important to recognize that access to solar energy still has several limitations, making it inaccessible to less privileged segments of society. Despite the growth in installing photovoltaic solar systems in homes, industries, and businesses, financial barriers prevent low-income citizens from accessing this technology. To ensure an inclusive transition, public policy improvements are necessary, requiring the implementation of financial incentives to make solar energy accessible to all socioeconomic groups and decentralize access to benefits restricted to an elite.

Using solar energy to benefit vulnerable communities can contribute to climate mitigation, promote adaptation and resilience in these territories, reinforce the fight against poverty, promote social inclusion, and enable new forms of community economies. Practical experiences in countries like the USA, China, Europe, Bangladesh,

Colombia, and Brazil highlight prominent examples of solar energy policies with social impact.

This document aims to provide recommendations for using Social Interest Distributed Generation in public policies, business strategies, and social projects, drawing on examples of good practices with the potential to realize the Fair, Inclusive, and Popular Energy Transition.

Recommendations

The growth of Distributed Generation (DG) and Distributed Energy Resources (DER) has enabled new energy production arrangements and community organizations, such as cooperatives, transforming the energy sector through decentralization and democratization.

In the social dimension of solar energy, models like Distributed Generation of Social Interest (DGSI) are being used as social technologies to improve energy access for vulnerable populations, allowing for the creation of microgrids that ensure electricity in underserved regions. An example is the Grameen Shakti social project, which has provided solar energy to over half a million low-income people in rural Bangladesh since 1996.

In 2021, Revolusolar installed Brazil's first solar energy cooperative in a favela, providing energy to 34 local families through a shared generation system on the rooftop of the Babilônia Residents Association. The cooperative, named Percília e Lúcio de Energias Renováveis in honor of two historic local leaders, consists of community families. In 2022, Revolusolar, in partnership with COPIME (Coordination of Indigenous Peoples of Manaus and Surroundings), installed a solar system with batteries at the Arú Waimi Indigenous Municipal School in the Terra Preta indigenous community. This project trained 20 local residents as solar electricians and provided educational and cultural workshops for local teachers.

In remote locations with few consumers, expanding the electrical grid is often economically unviable due to low population density. Therefore, government-supported decentralized generation models, especially in developing countries, are accelerating access to affordable and sustainable energy, helping to combat energy poverty.

China's 'Solar Energy Poverty Alleviation' (SEPAP) program has used solar energy to fight poverty and boost local economies in rural areas since 2014. The program, which includes 2 million beneficiary families in 471 counties, allows families to hold shares in solar plants with capacities of 60 to 100 kW, retaining 40% of the profits. The remaining 60% is used to pay loans and construction fees. The program is funded by government subsidies and corporate donations linked to social responsibility initiatives.

In Gujarat, India, a 2022 initiative in the village of Modhera allows its 6,500 inhabitants to save on electricity bills. With the entire village powered by solar energy, surplus energy not used by families is bought by the government, turning clean energy into an additional income source.

Brazil leads in inclusive, access-oriented public policies. In 2023, the federal government launched the '*Minha Casa Minha Vida Program*', the country's largest housing development policy, aiming to offer 2 million new housing units by 2026.

This program includes the implementation of solar energy, ensuring that renewable sources meet the energy needs of these populations. Additionally, the government is promoting programs that support the distributed generation of solar energy as a viable solution for providing low-income communities with access to sustainable and low-cost energy.

1. Public and private sector cooperation to expand financing channels for developing countries

Cooperation between the public and private sector is crucial to expand financing for distributed generation projects of social interest, especially in developing countries. It is recommended that G20 member countries adopt public and regulatory policies that encourage these projects, including financial subsidies and corporate mitigation

strategies. These incentives must include local socio-environmental compensation clauses in public-private partnership contracts in the infrastructure and energy sectors.

The main actors involved will be governments, electricity concessionaires, financial institutions and the private sector. The proposed financing strategy is blended finance, where 40% of the resources would be non-refundable, coming from government funds, international support and investments from electricity distributors. The remaining 60% would be obtained through loans with subsidized rates and long terms.

The total estimated cost to implement this plan's subsidy is R\$10 billion for the non-refundable part, complemented by subsidized loans. This plan is aimed at developing countries and must be implemented by 2030. The policy aims to serve 10 million vulnerable people, creating energy microgrids and guaranteeing access to electricity in remote areas.

Recommend the adoption of public and regulatory policies, in G20 member countries, that establish incentives for the implementation of DGSI projects, including in the public budget financial and economic subsidies and business mitigation strategies to promote access to clean energy, including social counterparts and local socio-environmental compensation clauses in public-private partnership contracts in the infrastructure and energy sectors, with the aim of promoting decentralized solar energy generation projects in developing countries.

2. Implementation of Social Impact Businesses through Distributed Generation of Social Interest

The implementation of social businesses in this market is essential to guarantee access to clean and sustainable energy for vulnerable communities, significantly contributing to the reduction of energy poverty. This model not only provides energy, but also creates an

accessible and sustainable payment mechanism, allowing different types of customers, including residential, commercial, collective, institutional and productive, to contribute to the maintenance of the system.

It is recommended that US\$30 billion be made available for the creation of credit lines with subsidized interest that increases the supply of resources available to city halls, cooperatives and small businesses, focused on the purchase of DG systems. The policy aims to finance projects with countries below the global energy access average, seeking to reach 100,000 public facilities, including schools and health units, 1 million non-profit social institutions and 5 million micro and small businesses.

The main actors involved will be the financial institutions, which create these lines of credit; local governments to facilitate local implementation; small businesses and non-profit social institutions, to benefit from access to clean energy; and cooperatives for managing projects at the community level.

The proposed financing strategy involves monthly repayment plans, ensuring financial sustainability, and promoting large-scale adoption. This plan developing targets countries with a goal for implementation by 2030, aligning with global sustainable development and energy transition objectives.

National policies should prioritize access to clean energy for groups in the social assistance network of G20 countries, including low-income residential consumers, traditional communities, and social housing developments, as well as non-profit institutions and rural economic activities.

3. Financing Distributed Generation of Social Interest

We recommend that G20 countries prioritize funding for Just, Inclusive and People's Energy Transition Programs, through a broad global financing pact to accelerate the

energy transition, especially through social solar energy. This pact would make available, by 2030, US\$20 billion for programs that serve 120 million low-income families in developing countries, with the lowest percentages of access to energy.

These programs must respond to the needs present in regions with a complete lack of access to electricity, high energy bills, poor quality access or dependence on fossil fuels. These initiatives should focus on disadvantaged countries, the promotion of energetic communities, professional training of the local workforce, social participation and the generation of employment and local income.

This initiative can occur through the integration of these programs with national social databases. For example, Brazil's Single Registry (CadÚnico) covers more than 10 million families living in extreme poverty, offering a model for the unified delivery of public policies to the most vulnerable. Centering people in clean energy policies is vital to successful transitions.

Scenario of Outcomes:

1. Generate new concepts and methods to support energy transitions

By adopting terms such as Fair, Inclusive and Popular Energy Transitions (JIPE) and DGSI, it is expected to facilitate the allocation of resources for projects of social interest and build public policies that promote clean energy for low-income populations, offering access to subsidized financing that popularizes renewable energy, especially solar energy.

2. Offer practical proposals to accelerate the financing of energy transitions

With the adoption of the recommendations, significant progress is expected towards universal access to sustainable energy for millions of previously excluded people in rural and remote areas who will be able to access reliable, renewable electricity in their communities through the social role of renewable energy, boosting socioeconomic development and improving quality of life.

Using solar energy as a tool for sustainable productive activities, especially in small-scale agriculture programs, the productivity of these activities will be promoted, consequently increasing the economic viability of these solutions. Revenue will be generated for the population in need, reducing poverty and hunger and generating new quality products for society.

With the use of solar energy in social housing and urbanization programs, it is expected to improve the quality of life of low-income urban beneficiaries, with better access to energy, resulting in domestic comfort. A structuring action that promotes the reduction of expenses and relief in the family budget, increasing the possibility of using savings to purchase food, education and improving quality of life.

3. Environment and Climate Resilience

The expansion of solar energy will reduce dependence on fossil fuels and reduce greenhouse gas emissions, contributing to the mitigation of climate change. Furthermore, distributed solar energy generation will increase the resilience and adaptation of communities, making them less vulnerable to power outages and extreme weather events.

4. Public-Private Partnerships

The inclusion of socio-environmental compensations in contracts related to public-private partnerships, especially in the infrastructure and energy sectors, can contribute to mitigating the negative impacts of large projects on local communities, ensuring that they also benefit from economic activities in their regions. This will help promote sustainable development and environmental justice, strengthening dialogue between the different stakeholders involved, especially in financing from developed countries to developing countries.

Despite the benefits, the energy transition will face challenges and contradictions:

i. Regulation of energy companies to include socio-environmental compensation clauses may encounter resistance from the private sector concerned about reduced profits. Furthermore, it is important to ensure mechanisms so that these compensations are meaningful and effective, effectively contributing to the well-being of affected communities.

ii. The transition may initially increase energy costs for consumers, especially during the renewable infrastructure implementation phase.

iii. International cooperation to finance the energy transition may face political and bureaucratic obstacles among G20 countries, making it difficult to mobilize the necessary resources.

iv. Implementing local training and hiring initiatives can face challenges such as a lack of educational infrastructure. Furthermore, it is important to ensure that local workers receive fair wages and adequate working conditions, thus avoiding the risk of exploitation and social inequalities.

In summary, adopting the suggested recommendations could lead to several positive outcomes, including promoting solar energy for the most vulnerable groups in society, mitigating the negative impacts of large projects on local communities, and developing local skills for the energy transition.

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