

# ERF Policy Brief

## The Energy Transition and MSMEs in Sudan: Limitations and Opportunities

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### In a nutshell

- Sudan suffers from several political and economic distortions that have hampered growth, and particularly the development of the energy infrastructure.
- There is generally a positive view of renewable energy among MSMEs and many show willingness to switch.
- Increased adoption of renewable energy among MSMEs is mainly hindered by financial constraints related to capital costs.
- A weak regulatory environment and political instability are the main obstacles to large scale renewable energy investment.
- The increase in adoption of renewable energy since conflict started is proving the benefits of decentralized systems and present an opportunity to incorporate renewable energy in post-conflict reconstruction of the energy infrastructure.

## Introduction

The prospects for the post-conflict adoption of renewable energy in Sudan depend on various factors, including political stability, economic conditions, international support, and political commitments. While the growth of renewable energy in Sudan has not kept up with similar countries in the region – for example, Kenya – the variety of uses and renewable energy potential in Sudan has been emphasized in several studies (Abdalla and Qarmout, 2023).

The conflicts in Sudan have led to significant disruptions in the energy infrastructure. The post-conflict period provides an opportunity to rebuild and invest in modern, sustainable energy infrastructure, including renewable energy projects. Investing in renewable energy can contribute to energy security by diversifying the energy mix. Reducing dependence on fossil fuels can make the energy sector more resilient and less vulnerable to external shocks. Widescale renewable energy adoption can contribute to economic development by creating jobs, reducing operation costs and attracting investment, in addition to reducing carbon emissions in the energy and industrial sectors.

Adopting renewable energy, particularly in remote and underserved areas, can help improve access to electricity and promote social and economic development. The development of a supportive policy and regulatory framework is crucial for the success of renewable energy adoption. It's also important to recognize that the successful adoption of renewable energy requires a comprehensive and coordinated effort from the government, private sector, and civil society. Political will, institutional capacity, and stakeholder collaboration are key to overcoming challenges and implementing effective renewable energy strategies.

## Method

This policy brief is informed by qualitative research conducted in Sudan between October 2023 and February 2024. The research design was chosen to understand the nuances of the energy transition in a developing country context. The qualitative approach uses two data collection methods: focus group discussions with owners of MSMEs as participants and key informant interviews with various experts. The study methodology was chosen because it allowed the researchers to understand better the challenges facing

MSMEs and their attitudes towards the clean energy transition as well as the experience of MSMEs with renewable energy technologies across different sectors and states in Sudan.

## Background and context

Sudan possesses vast natural resources but has experienced poor economic performance over the last two decades. The country has a diverse resource base, including significant arable land, gold, oil, various water sources, human capital, and a strategic geographic location. Despite this potential for achieving high economic growth and sustainable development, Sudan's economic performance in the past has been notably weak (Elbadawi and Alhelio, 2023). Between 2000 and 2011, Sudan enjoyed relative economic stability due to oil revenues characterized by high growth rates, stable inflation and exchange rates, and macroeconomic stability. However, this growth, was mainly driven by oil production, ended with the secession of South Sudan in 2011, ushering in a period of declining economic performance, culminating in a revolution in 2018 (Ibid.). Following the December 2018 revolution, the new Transitional Government of Sudan (TGoS) faced numerous challenges but also had opportunities to address historical macroeconomic imbalances and end the multiple civil wars in the country. The transitional government aimed to achieve political and economic stability, comprehensive and sustainable peace, and combat corruption. Key reforms included removing fuel subsidies, unifying exchange rates in February 2021 (Ali and Mann, 2023). Removing subsidies also has the potential to facilitate a transition to sustainable energy. For households, MSMEs and large enterprises, an increase the price of diesel would make solar PV more competitive against diesel generators as a backup source of electricity. These reforms were a major factor in driving the most recent expansion of the solar PV industry in Sudan.

In March 2021, Sudan cleared its arrears to IDA with a \$1.15 billion bridge loan from the United States, enabling access to around \$2 billion from IDA, private sector support from the IFC, and political risk insurance from MIGA (Elbadawi et al., 2023). Clearing arrears also played a major part in creating favorable conditions for an energy transition. With debt relief, access to finance becomes cheaper across all sectors of the economy. Finance for large scale renewable energy projects by independent power producers (IPPs) is a major impediment to increased renewable energy adoption.



## Energy transition: challenges and opportunities

### *Energy access challenges*

Challenges in energy accessibility were prevalent, marked by fuel price volatility, transportation disruptions, and inconsistent electricity supply. These issues mainly affected micro-enterprises that work in handicrafts and food production, leading to direct income losses. Frequent power outages presented a significant hurdle, disrupting effective resource planning and business operations.

In addition to employment considerations and growth strategies, unstable electricity supply decreases firm productivity. Fuel scarcity and high fuel prices are an added burden for most firms, leading to reduced production and challenges in obtaining necessary resources. Despite the many advantages of solar energy, including the flexibility to operate both on- and off-grid, perceptions about its reliability favor diesel generators. For sectors where intermittency cannot be tolerated, diesel generators provide a more wholistic solution.

In the agricultural sector, where electricity is mainly supplied through diesel generators, affordability is a major challenge. Fuel scarcity and the subsequent price increases hit agricultural micro-enterprises particularly hard. The increases in fuel prices, and price volatility, eat away at the savings farmers use to purchase seeds and other agricultural inputs for the next farming season and makes long-term planning unfeasible. Owners of MSMEs have to negotiate prices with suppliers, which is particularly burdensome for women given the social context.

Moreover, one expected consequence of increased spending on fuel is that farmers are less likely, and in most cases unable, to hire workers. Arguably, stable electricity ensures that workers can be more efficient and reduces idleness. Thus, to produce the same output volumes when electricity is unstable, farmers must hire more workers. The broader implications include rising unemployment and increasing rates of poverty.

### *Shifts towards renewable energy*

There's a growing recognition of the benefits of renewable energy, but reservations about the initial investment costs persist. Solutions such as instalment plans, price reductions, or financial assistance for solar

energy installations can help alleviate financial concerns. Users of solar energy were generally satisfied, which led to marked improvements in business efficiency and a reduction in material waste. Solar energy provides a sense of control and security and enhances economic opportunities.

Off-grid, micro-scale solar energy is particularly useful for women, enabling them to engage in various projects at home, such as making cakes and ice cream, leading to income generation and personal benefits. For many MSMEs, the benefits of renewable energy, such as cost-effectiveness (once the capital cost of instalment is guaranteed), reduced reliance on fuel, and the potential for year-round farming, provide a certain level of stability.

In non-agricultural sectors, renewable energy solutions address immediate needs. In certain areas, power outages, increased electricity tariffs and cooling needs have forced the business to shift to solar energy. However, in some cases, solar systems do not provide sufficient power. The capacity constraints and spatial requirements of solar systems are most prevalent in power-intensive sectors.

The feasibility of the transition to renewables is not consistent across sectors. The national grid does not reach most mining areas in the North. In these areas, companies and artisanal miners initially used diesel generators. The use of solar PV as an alternative has solved some of the fuel scarcity issues for the sector. However, the scale of the systems was not enough to satisfy the energy demands of the production processes. Other issues include the learning process required to adopt new technologies. Some farmers who are able to acquire renewable energy systems find them difficult to operate.

Female-run enterprises are particularly supportive of a switch to solar energy, especially its ease-of-use in comparison to diesel generators. Many show a willingness to pay for alternative or renewable energy solutions, with benefits including mental comfort, stability, and reduced costs compared to traditional electricity.

The resistance to transitioning to renewable energy was primarily due to a lack of awareness and exposure to renewable technologies. However, resistance to adoption tends to diminish with experience and exposure. The main challenges in shifting to clean energy include initial investment costs, concerns



about compatibility with existing infrastructure, and differences in devices used for solar energy compared to traditional electricity.

The effect of the conflict has led to more pressure on electricity availability, and it made the transition to decentralized renewables more urgent. However, the conflict also led to an increase in the costs of solar PVs, mainly due to disruptions in supply chains and increased demand. While weaknesses and losses in infrastructure may have created an opportunity for such systems, challenges related to cost, storage, and know-how reveal that MSMEs require substantial support from the state or INGOs to transition effectively.

### *Regulatory frameworks and stable policies*

Government support is crucial in promoting renewable energy initiatives and facilitating the transition to clean energy. There is an urgent need for policy advocacy to address barriers to the widespread adoption of clean energy and ensure a supportive regulatory environment, in addition to incentives and subsidies in making renewable energy technologies more accessible and affordable for MSMEs. This theme underscores the role of external support mechanisms in overcoming barriers to clean energy adoption and promoting sustainable economic growth in the region. Decentralized solutions are generally viewed positively, which stems from the recognition of the limitations in state capacity to provide access to electricity, especially in the context of the current and previous conflicts. Through empowering local communities with reliable energy sources, decentralized energy systems can contribute to stability and resilience. There are various social and political implications of decentralized energy solutions beyond their economic benefits.

Unfortunately, in Sudan energy policy has regressed. The discovery of oil has led all policy makers to focus all policies on fossil fuels and neglect renewable resources. Hydro-power also featured heavily in energy plans. The building of large, expensive dams, such as Marawi dam, has led to displacements of millions, and did not lead to significant grid expansion. After the revolution, the transitional government showed more enthusiasm for renewable energy, however, the process was still slow and protracted.

Despite the potential benefits, Sudan faces challenges in quality standards, engineering practices, and financing capacity related to decentralized renewable energy technologies. Additionally, the absence of clear regulations and policies hinders the transition towards

renewable energy. The existing legislation in Sudan is still in its early stages, with proposed laws awaiting finalization to support the energy transition and progress made under the civilian government was reversed by the current conflict.

The past few years have seen an increase in the adoption of solar. This shift, however, was more a result of the population adapting to its reality, as opposed to being government driven. The recent increase in the adoption of renewable energy was primarily an indirect consequence of the removal of fossil fuel subsidies, which made solar PV much more competitive.

It is generally widely acknowledged that renewables alone are not sufficient for providing energy access. Some see the need for complementary energy sources in off-grid communities, in addition to large, centrally planned projects for energy generation. There is a significant gap in understanding the energy needs of the private sector and its willingness to support an energy transition. While private sector inclusion is necessary, it will require laws and regulations that allow for self-generation and distribution. However, existing regulatory barriers and the need for specific legal frameworks can pose obstacles to the seamless integration of green energy sources into the grid infrastructure, hindering the transition process.

### **Conclusion and recommendations**

Sudan has a horizontally integrated structure of subsidized state-owned enterprises with little oversight and no incentives for private sector participation. The sector is burdened with a weak framework for attracting private sector investment. Perceptions about Sudan being high-risk and the challenges of securing financing for large infrastructure projects have deterred serious investment considerations. Moreover, the electricity sector, like other sectors, has suffered from Sudan's volatile political climate and the transitory nature of government departments. Yet, the current conflict presents an opportunity for an energy transition due to reduced service from the grid and continued demand for electricity across the country.

The following policy recommendations aim to address some of these challenges and to push forward a transition to more sustainable, affordable and reliable energy:

- A robust regulatory framework: to attract private sector investment, the government must institute regulations that incentivize investments in the sector, provide guarantees and protect consumers. This can be done through subsidies for initial project costs and power purchasing agreements. This will





ensure an expansion of energy access to MSMEs and households in underserved areas.

- A targeted block tariff system: to ensure that grid-connected low-income households are able to use electricity supplied grid-connected by renewable energy, the government could implement a block-tariff system where the lowest tranche is charged a subsidized price; this cost could be covered by high-income and industrial consumers. This will also ensure that MSMEs operating household-based enterprises are able to operate profitably.
- MSME-targeted clean energy finance: to increase the uptake of renewable energy among MSMEs, the government must first address the finance hurdle faced by most MSMEs in Sudan. Many MSMEs see the benefit of renewable energy, so financial mechanism to reduce the capital costs of installation or ease the payment burden could increase renewable energy adoption.
- Awareness campaigns and energy efficiency regulations: to increase awareness about the benefits of renewable energy, the government must design and deploy awareness campaigns targeted at all segments of the population. The government should also introduce regulations to increase energy efficiency to exploit the potential of renewable energy; this can be done through customs' regulations and standards for electrical equipment, building efficiency standards and subsidies for more energy efficient appliances.
- Experiment with carbon markets: while carbon markets are most prevalent in developed countries and require robust regulatory and governance, verification and auditing processes, carbon credits present potential income opportunities for MSMEs to supplement their growth and sustainability.
- A broad development strategy: to ensure that the transition to renewable energy is equitable and has its desired developmental outcomes, energy sector strategies must be incorporated into a broad, long-term development strategy to align energy expansion with economic activity and social services.

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