www.repoa.or.tz

No PB 16/2025 October 2025

REPOA Brief

Leveraging Renewable Energy for Inclusive Economic Growth in Tanzania

By Energy CARDS & REPOA

Key Messages

- **Policy and Institutional Gaps**: Despite existing frameworks, implementation is hindered by fragmented mandates, lack of actionable guidelines, and bureaucratic delays.
- **Financial Constraints**: High interest rates (11–20%) and limited access to long-term financing deter private sector investment. Local banks perceive RETs projects as high-risk ventures.
- **Technological Challenges**: Grid infrastructure is underdeveloped, especially in rural areas, limiting integration of decentralized systems. RETs remain dependent on imported technologies.
- **Capacity Deficits**: Stakeholders across the energy value chain lack technical expertise, contributing to reliance on donor-led initiatives.
- **Economic Potential**: RETs could save USD 3.5 billion in fossil fuel imports and USD 8.4 billion in health costs by 2030. Job creation potential exceeds 200,000 positions.
- **Investment Needs**: Estimated at USD 15–18 billion by 2034, with USD 4 billion expected from the private sector.

Introduction

This policy brief presents a comprehensive analysis of the role of Renewable Energy Technologies (RETs) in advancing inclusive economic growth in Tanzania. Despite the country's vast renewable energy potential, the sector's contribution to GDP remains below 2%, constrained by financial, institutional, and infrastructural barriers. However, projections suggest that with targeted interventions, RETs could contribute between 1.5% and 10% of GDP by 2043, generating cumulative economic benefits exceeding USD 18 billion by 2030. These include savings from reduced fossil fuel imports, lower health costs, and increased fiscal revenues. The study identifies strategic opportunities for accelerating RET adoption through improved policy implementation, blended financing, and capacity development.

Tanzania is endowed with abundant renewable energy resources, including solar, wind, hydro, biomass, and geothermal. The country has made notable progress in establishing policy frameworks such as the National Energy Policy (2003) and the Renewable Energy Strategy (2024–2034). However, the transition from policy to practice remains uneven. This study investigates the contribution of RETs to Tanzania's economic development, guided by six objectives: assessing policy effectiveness, identifying barriers, evaluating investment needs, and recommending interventions to enhance energy access, reliability, and productive use.

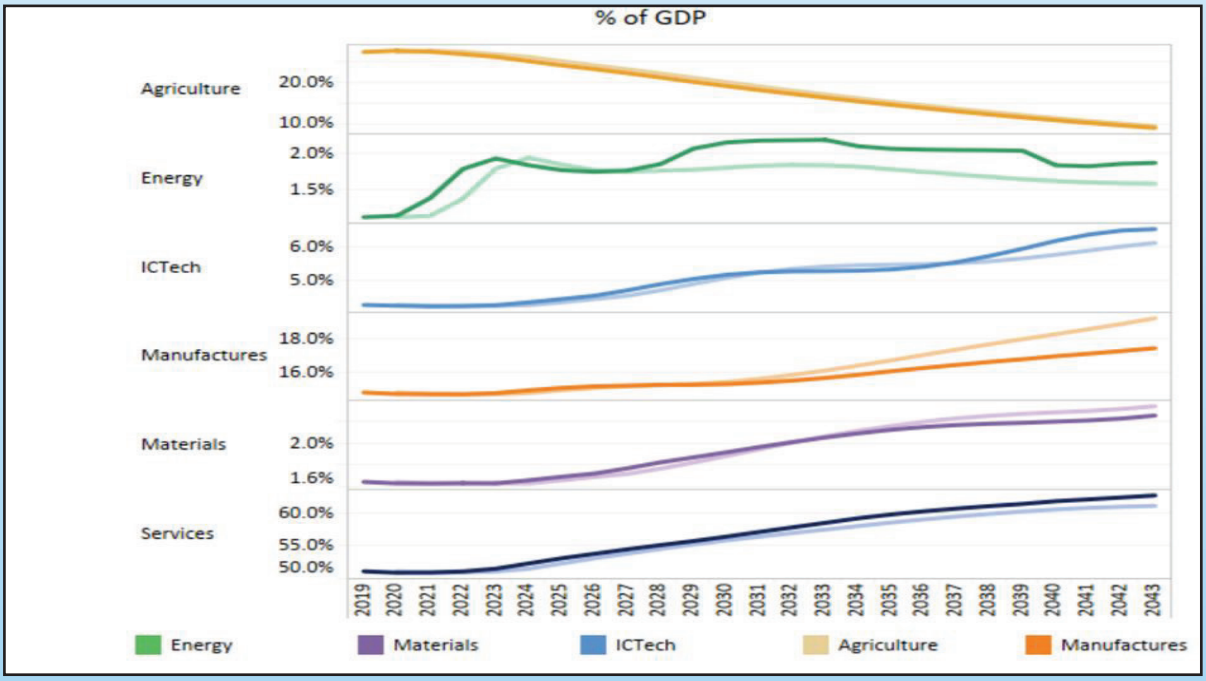
Methodology and Data

This study employs a mixed-methods approach to investigate Tanzania's renewable energy ecosystem, integrating both quantitative and qualitative techniques. Structured questionnaires were administered to 28 respondents from a pool of 50, capturing data on tariffs, fiscal policies, employment, trade, and socio-economic indicators. Fieldwork was carried conducted in March and April 2025 in Dar es Salaam, Morogoro, Dodoma, Njombe, Mbeya, Singida, Shinyanga, and Mwanza regions. Semi-structured interviews complemented this by eliciting stakeholder perspectives on policy effectiveness, financing, institutional readiness, and community engagement across eight regions. Sampling combined purposive and snowball strategies to ensure diverse representation from governmental and non-governmental actors. Field visits to solar, hydropower, and geothermal sites further validated findings and provided practical insights into implementation challenges and community involvement, enriching the study's policy recommendations.

Findings

RETs currently contribute less than 2% to GDP (Figure 1), reflecting their early-stage development. However, projections indicate significant growth potential. The electricity and gas sub-sector grew by 7% in Q1 2024, indirectly stimulating transport and storage services. Further, RETs are expected to supply over 60% of total electricity generation by 2034.

Figure 1: Projected Contribution of the Energy Sector to GDP Growth in Tanzania



Source: Bank of Tanzania, 2024; Cilliers, 2024

Economically, RET are expected to contribute between USD 3.5 and 18 billion to the economy and create over 50,000 direct and 150,000 indirect jobs (IRENA, 2024) between 2025 and 2034. Table 1 below summarizes the projected impact of RET in Tanzania. Further, scaling up renewable energy could yield substantial economic dividends, saving USD 3.5 billion in fossil fuel imports, reducing USD 8.4 billion in health-related costs, and creating over 200,000 jobs, while positioning renewables to supply more than 60% of Tanzania's total electricity generation by 2034.

Table 1: Projected Economic Impacts of RETs (2025–2034)

Indicator		Value	Source
Avoided fossil fuel imports		USD 3.5 billion	Ministry of Energy, 2025
Health cost reductions		USD 8.4 billion	Ministry of Energy, 2025

Jobs created		50,000 direct, 150,000 indirect	IRENA, 2024
Renewable energy share		>60% of total generation	Ministry of Energy, 2024
Cumulative investment		USD 15–18 billion	Ministry of Energy, 2025

However, recent analyses by the Ministry of Energy (2024) and IRENA (2024) suggest that while RETs require higher initial investments, they deliver substantially lower operating costs, greater long-term savings, and enhanced stability. Table 2 illustrates how different energy technologies vary in capital costs, operational risks, and long-term economic impacts, highlighting the competitive advantages of renewables over conventional energy sources.

Table 2: Comparative Costs, Risks, and Economic Impacts of Energy Technologies in Tanzania

Energy Source / Technology	Capital Costs (CAPEX)	Operating Costs & Market Risks	Lifecycle / Economic Impact
Solar PV	~$1,200/kW, 50MWp: $43.1M	Very low, no fuel costs	~$800/kW saved over 25 yrs, ideal for grid/off-grid
Wind	~$1,800/kW, 200MW: $180M	Low, weather-dependent	~$600/kW saved, stable long-term returns
Hydro	~$2,000/kW, 2,115MW: $2.9B	Low, seasonal variability	~$1,000/kW saved, long lifespan
Geothermal	~$3,500/kW	Very low, stable output	High CAPEX, low O&M, long-term savings
Biomass	~$500–2,000/kW	Low feedstock cost	Decentralized savings, rural energy access
Waste-to-Energy (WTE)	~$50–150M/plant	Avoided landfill & fuel costs	High CAPEX, environmental benefits
Green Hydrogen	~$1,000–2,000/kW	Emerging tech, high O&M	Strategic long-term value, decarbonization potential
E-Mobility	High vehicle cost	30–70% lower fuel & maintenance	Long-term savings, air quality improvement
Fossil Fuels (Natural Gas)	LNG Plant: $30–42B	High volatility, fuel-dependent	Risk of stranded assets, economic vulnerability
Traditional Biomass	Very low, minimal equipment	High, seasonal price swings	Unsustainable, deforestation, lost productivity

Source: IRENA (2024), Ministry of Energy (Nishati, 2024)

Key among these limitations are technological challenges associated with harnessing RETs. For example, while the domestic potential for solar and wind is high, grid limitations and lack of domestic manufacturing capacity constrain scalability. In contrast, large fossil fuel projects like LNG plants entail high capital exposure, fuel price volatility, and significant carbon liabilities.

The cost of a 5kW solar PV system remains prohibitive for small enterprises. Moreover, the absence of centralized data systems impedes planning and investment tracking.

Despite these constraints, findings indicate strong political commitment and increasing private sector interest in off-grid solutions. These trends, coupled with global financing innovations such as blended finance and green bonds, present a viable pathway for scaling RETs.

Conclusions and Recommendations

This policy brief underscores the urgency of coordinated action to transform Tanzania's energy landscape. RETs offer a strategic pathway to inclusive growth, environmental sustainability, and long-term resilience. Tanzania stands at a critical juncture in its energy transition. While policy ambition is evident, implementation challenges must be addressed to unlock the full potential of RETs. Bridging the gap between policy and practice, improving financial instruments, and strengthening institutional coordination are essential for achieving universal energy access and sustainable economic growth. This can be done by addressing structural limitations of the RET ecosystem in the following five key areas:

Strengthening Policy and Regulatory Framework including:

- Establishment of a One-Stop Regulatory Centre to streamline approvals.
- Enactment of a Renewable Energy Act to provide legal clarity and enforcement.

Improving Investment and Finance Climate through:

- Creation of a National Renewable Energy Investment Fund.
- Continued promotion of green bonds, concessional loans, and risk-sharing mechanisms.

Investing in Technology and Infrastructure through:

- Modernisation of grid infrastructure and deployment of smart metering.
- Incentivizing domestic manufacturing through tax holidays and land access.

Implementing targeted capacity building by:

- Expanding vocational training and integrate RETs into TVET curricula.
- Promoting applied research and technology adaptation

Renewing Social and Community Inclusion by:

- Supporting gender-responsive energy programs and youth entrepreneurship.
- Engaging communities in planning and ownership of RET projects.

References

Bank of Tanzania. (2024). Annual Economic Review 2024, Dar es Salaam: Ministry of Finance

Cilliers, J. (2024). Economic Implications of Energy Sector Growth in Tanzania. Pretoria: Institute for Security Studies.

International Renewable Energy Agency (IRENA) & Climate Policy Initiative (CPI). (2024). Global Landscape of Renewable Energy Finance 2024. Abu Dhabi: IRENA.

Ministry of Energy (2025). Potential Impact of Renewable Energy Technologies (RETs): Socioeconomic Benefits of Renewable Energy Deployment in Tanzania, Dodoma: Government of Tanzania.

Ministry of Energy (2024). Renewable Energy Strategy 2024–2034. Dodoma: Government of Tanzania.

World Bank. (2023). Tanzania Energy Sector Review and Investment Outlook. Washington, DC: World Bank Group.

World Bank. (2024). Scaling Up Renewable Energy through Public–Private Partnerships. Washington, DC: World Bank Group.

REPOA Resource Centre

Our Resource Centre provides a good environment for literature research, quicker, easier access and use of knowledge and information. It has full internet connection for online library to support Master's & PhD candidates, researchers and academicians with free access to latest journals, books, reports, webcasts, etc.

Tuesday to Thursday from
10:00am to 1:00pm,
2:00pm to 05:00pm.

Friday
10:00am - 01:00pm

The online library https://www.repoa.or.tz opens 24 hours a day.

REPOA
Knowledge is Power

REPOA HQs
157 Migombani/REPOA streets,
Regent Estate, PO Box 33223,
Dar es Salaam, Tanzania.
Tel: +255 (22) 2700083
Cell: +255 78 455 5655
Website: https://www.repoa.or.tz
Email: repoa@repoa.or.tz

Branch Office
2nd Floor Kilimo Kwanza Building 41105,
Makole East, Kisasa,
Dodoma, Tanzania