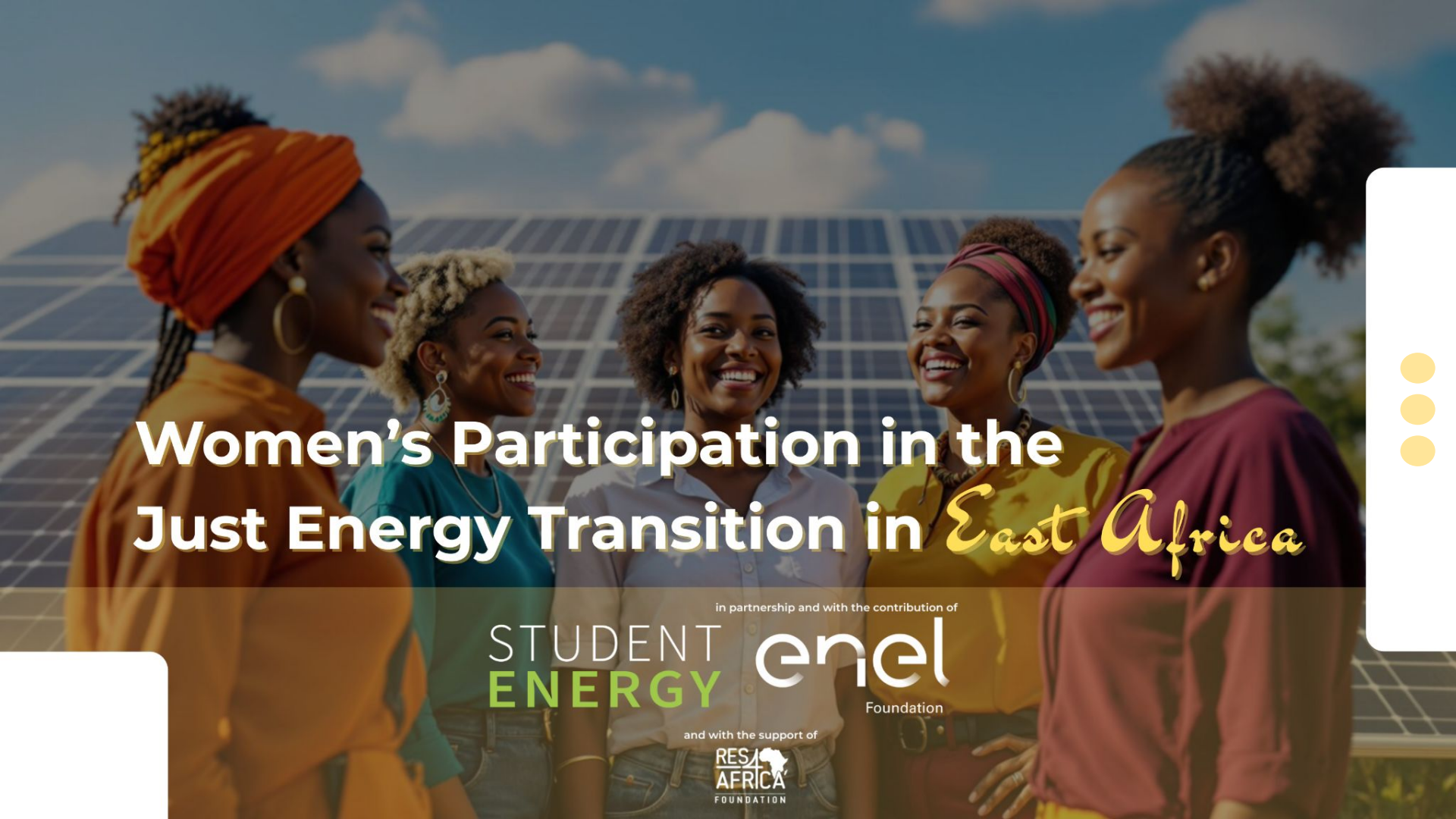

Women's Participation in the Just Energy Transition in East Africa

in partnership and with the contribution of

STUDENT ENERGY

enel Foundation

and with the support of

RES4AFRICA FOUNDATION

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About the authors and report development

This report was prepared by **early-career professionals elected to participate in the sixth cohort Student Energy Career Training (SECT) programme**, a multidisciplinary capacity building initiative delivered by **Student Energy**. SECT is designed to strengthen leadership and employability skills among young people pursuing careers in the energy transition through **energy education, project management training, individualized career coaching, teamwork and collaboration, and experiential learning opportunities**. The authors are **Rosemond Sefa** (Energy Policy Analyst, Ghana), **June Wambui Githinji** (Civil Engineer, Kenya), **Daniella Nhaguilunguana** (Civil Engineer, Mozambique), and **Minaclara Allan Lwiwa** (Electrical Engineer, Tanzania).

The sixth cohort of SECT took place from **July 2025 to February 2026** and was delivered **in partnership and with the contribution of Enel Foundation, and with the support of RES4Africa Foundation**. This cohort specifically focused on **young African women interested in building careers in the energy transition across the continent**.

Throughout the development of this report, participants engaged in a mentored research process designed to strengthen **applied research, analytical, and evidence-based policy skills** while working on real-world topics relevant to their regional contexts. They received continuous coaching, methodological guidance, quality assurance support and professional development training from Student Energy, with Enel Foundation–and RES4Africa Foundation as a support–contributing specialized training in research skills and capacity building

About the authors and report development

This programmatic focus responds to the rapid growth of employment opportunities in low-carbon technologies. While an estimated **30 million jobs are expected to be created globally by 2030**, including approximately **3.3 million emerging in Africa**, many young African women continue to face **structural barriers** to accessing these opportunities. These include limited access to skills training, mentorship, professional networks, and sector-specific resources. SECT seeks to address these gaps by equipping participants with the **skills, knowledge, and networks** needed to engage meaningfully in the energy transition.

The research methodology combined **primary qualitative data**, including interviews with expert women in the field, with **secondary research** drawing on publicly available datasets, policy documents, academic literature and research, and institutional reports. In several instances, participants encountered **data gaps**, limited availability of gender-disaggregated information, or outdated sources within their national contexts. Addressing these challenges required additional efforts to triangulate sources, adapt methodologies, and contextualize findings.

Despite these constraints, the research team demonstrated a **strong commitment to methodological rigor, ethical research practices, and accuracy**, making deliberate efforts to validate information and present balanced, evidence-informed analysis. This report should therefore be understood as both a **learning-driven research output** and a contribution to ongoing policy and research conversations on **women's participation in the just energy transition in East Africa**.

Some figures and illustrations in this report were generated using artificial intelligence for illustrative purposes only. All other images and visual materials are based on original content or appropriately credited sources.

Acknowledgement

We are truly appreciative of **Cristiana Lisi** (Senior Researcher, Enel Foundation) and **Maria Lelli** (Researcher, Enel Foundation) for their steady guidance and thoughtful feedback throughout the research process. Their support was instrumental in shaping the depth and quality of this work.

We also extend our sincere appreciation to **Rima Jreich** (Senior Med, RES4Africa Foundation) and **Paulo Cutrone** (Head of Med, RES4Africa Foundation) for providing direction that helped keep this project grounded in evidence and focused on the role of women in a just energy transition.

We would further like to thank the Student Energy team, particularly the Programme Manager, **Andrea Balcázar González**, for her close oversight, mentoring and encouragement at every stage of the project.

In addition, we are grateful to the remarkable women who generously shared their time and insights for this report. We are especially thankful to **Anna Clements**, Senior Researcher with the UK's Modern Energy Cooking Services (MECS) Programme; **Annika Richter**, Independent Energy Expert and Consultant; **Benedetta Giugliano**, General Counsel at Studio Santi; **Doreen Irungu**, Energy & Climate Finance Strategy Advisor at the United Nations Industrial Development Organization; **Jeanette Gitobu**, Director of the Women in Wind Global Leadership Programme at the Global Wind Energy Council; **Murugi Ndirangu**, Director, Columbia Global Center, Nairobi; and **Rekik Bekele**, Founder and CEO of Green Scene Energy PLC.

Their perspectives and contributions to this project were invaluable in shaping our understanding of women's roles and experiences in East Africa's energy transition, while their expertise, honesty, and willingness to reflect on both progress and persistent challenges enriched this work and provided critical context for understanding women's participation in the renewable energy sector across the region.

Four key messages

1. **East Africa has made progress in integrating gender considerations into energy policies, creating solid platform for impact at scale.** Across the region, growing political commitment is evident with national frameworks. The path forward builds on this momentum: women should not only be beneficiaries of gender-responsive energy policies, but co-creators and drivers of them. When women are actively engaged in defining priorities, guiding implementation, and strengthening accountability, energy systems become more effective, more legitimate, and more transformative.

2. **Women are powerful co-designers of energy solutions.** Across economies, they are the central energy decision-makers at the household and community level, mobilizing communities, leading entrepreneurs, and driving last-mile delivery particularly in decentralized and off-grid energy systems. Their deep connection to local realities allows them to anticipate demand, build trust, and accelerate adoption of clean cooking solutions, mini-grids, and stand-alone solar technologies.

3. **Women are central to the workforce driving the energy transition.** They represent a growing and highly skilled pool of technical talent and leadership potential, critical to addressing one of the sector's most pressing gaps. Continuous investments in STEM education, TVET programmes, and hands-on training ensure that this talent pipeline is fully equipped to lead, innovate and sustain the scale of the energy investments.

4. **The presence of women in both operational and leadership roles drives better outcomes across the energy sector.** Continuous and sustained efforts on retention, promotion, and leadership development are essential to ensure women can progress effectively from education to employment and further to top leadership positions, fully contributing to shaping the sector's future.

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List of acronyms

AfDB	African Development Bank
DRE	Decentralized Renewable Energy
ECOWAS	Economic Community of West African States
ETIP	Energy Transition & Investment Plan
GAP	Gender Action Plans
GESI	Gender Equality and Social Inclusion
ICT	Information and Communication Technology
IEA	International Energy Agency
ILO	International Labor Organization
IRENA	International Renewable Energy Agency
KPIs	Key Performance Indicators
MECS	Modern Energy Cooking Services
MSME	Micro, Small and Medium Enterprises
PV	Photovoltaic
RE	Renewable Energy
SEforALL	Sustainable Energy for All
SDGs	Sustainable Development Goals
SDG 5	Gender Equality
SDG 7	Affordable and Clean Energy
SECT	Student Energy Career Training Programme
SMEs	Small and Medium-sized Enterprises
STEM	Science, Technology, Engineering and Mathematics
UNICEF	United Nations Children's Fund
TVET	Technical and Vocational Education and Training

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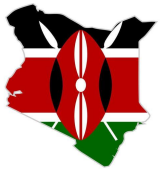
Global



Kenya

Africa

Tanzania

East Africa

Ethiopia

Executive Summary

Executive Summary

East Africa stands at a critical moment in its energy transition. Rapid population growth, rising energy demand, and increasing climate vulnerability have accelerated the region's shift towards renewable and decentralized energy systems. At the same time, this transition presents a unique opportunity to address long-standing social and economic challenges, particularly those affecting women, who remain underrepresented in formal energy systems despite their central role in energy use, access, and influence in community decision-making.

This report looks at to what extent women participate in the energy transition, not only as beneficiaries but as leaders, workers, business leaders and policy makers. Combining desk research with semi-structured interviews the report identifies institutional, structural and socio-cultural barriers and proposes concrete steps going forward.

The report offers evidence, insights, and practical reflections on moving beyond isolated interventions toward coordinated action in East Africa that strengthens implementation, connects education to employment, supports women's leadership and entrepreneurship in the energy sector.

AI-generated image for illustrative purposes (OpenAI, 2026).

The report is structured into Six Chapters, each containing analysis and policy recommendations. The **First Chapter** presents the research methodology used for collecting and analyzing data at global at regional and country levels (Kenya, Tanzania and Ethiopia).

The **Second Chapter** takes a look at the energy and gender policies and to what extent gender considerations are mainstreamed across the energy industry. It identifies success stories as well as missed opportunities.

The **Third Chapter** draws evidence on energy access around the world, East Africa and the selected countries. It argues the need to co-design solutions with women with focus on their role in decentralised energy sources.

Chapter Four looks at women's participation in energy-related education with focus on STEM and TVET. It illustrates the need for a coordinated approach between the policy makers, education institutions and the society to increase women participation.

Chapter Five links education with energy workforce, identifying two main barriers for women: technical skills linked to working in the field and social-work environment associated with retention, progress and leadership.

The **Last Chapter** focuses on women led energy-business and the barriers they face in terms of access to finance and investments, mentoring, peer to peer learning and infrastructure.

The report concludes that the energy transition in East Africa cannot happen without half of the population: The energy transition needs women as much as women need energy.

I. Methodology

1.1 Scope of the report

Inclusive energy transition depends on the meaningful involvement of women at every stage. Women's participation contributes to social equity and expands the available talent pool, while evidence shows that **gender diversity can drive innovation** by introducing diverse perspectives and approaches that lead to more effective and sustainable solutions (McKinsey, 2023). Ensuring equal opportunities for women to benefit from, participate in, and shape the energy transition, is therefore critical to ensure that sustainable energy technologies, services and economic opportunities reach all segments of society.

The report aligns with Africa's development ambitions under **Agenda 2063** ***"The Africa We Want"*** and directly supports the achievement of **SDG 5: Gender Equality** and **SDG 7: Affordable and Clean Energy**.

It reinforces a central principle: **a just and inclusive energy transition cannot be achieved without intentionally recognizing and integrating women's expertise and leadership**. Without such efforts, the transition risks overlooking the very groups most connected to household energy decisions, community needs, and emerging markets.


AI-generated image for illustrative purposes (OpenAI, 2026).

The report explores the role of women across five dimensions of the energy transition as **end users, students, consumers, workers, entrepreneurs and leaders.** Each of these five sections follows a consistent analytical structure, beginning with a global perspective, narrowing to the African and East African context, and then examining conditions in **Ethiopia, Kenya, and Tanzania**.

- Policy enabling environment.
- Energy access,
- Energy-related education,
- Employment and leadership,
- Entrepreneurship,

The report draws on regional policy frameworks, national energy strategies, published datasets, and sectoral reports. It brings together data, policy insights and life experiences to build a clearer picture of women's contributions and the constraints they face within the sector. Based on this analysis, it concludes with targeted policy recommendations for governments, private-sector actors, development partners, and training institutions.

Throughout, the authors demonstrated a **strong commitment to methodological rigor, ethical research practices, and accuracy**, making deliberate efforts to validate information and present balanced, evidence-informed analysis. This report should be understood as both a **learning-driven research output** and contribution to ongoing policy and research conversations on **women's participation in the just energy transition in East Africa**.

1.2 Research methodology and limitations

The research methodology focused on triangulating data sources and analysis.

Primary qualitative data was conducted reviewing publicly available datasets, policy documents, academic literature and research, and institutional reports. In several instances, authors encountered data gaps including limited availability of gender-disaggregated information, outdated sources within their national contexts. Addressing these challenges required an agile approach and research methodology to contextualize findings.

The authors conducted **semi-structured interviews with seven influential women** in the energy space whose work spans innovation, off-grid systems, research, policy, education and leadership development. Their perspectives provided first-hand insights into the opportunities and obstacles women encounter in the sector, enriching the analysis with lived experience and grounded expertise.

The aim was to:

1. Identify systemic barriers: social, economic and institutional challenges, as well as infrastructure gaps such as inadequate energy systems, limited transport, and insufficient digital connectivity, that limit women's ability to apply their expertise across the energy value chain, from access to leadership and entrepreneurship.

2. Assess existing policies and gender mainstreaming efforts, highlighting the potential inconsistencies between commitments and actual practice.

3. Spotlight the success stories of women who, despite facing systemic barriers, have driven significant advances in energy access, renewable energy innovation, leadership, and entrepreneurship in East Africa.

1.3 Research questions

A set of guiding questions was presented to each expert to gain a deeper understanding of women's representation in the sector:

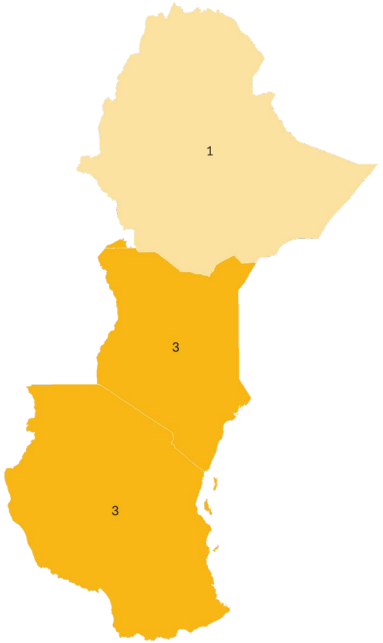
- Do you think East African women are considered/represented in the energy sector? If yes, in which countries within the region (the focus of our report is Ethiopia, Kenya and Tanzania), what entities, and sub-energy sectors are they active?
- If not, why should we consider them when discussing the energy transition?
- To your knowledge, is there any regional/country-wise action in place to promote women's representation in the energy sector? (For example, policies, strategies, national plans, training)
- What are the obstacles for women working in the different segments of the energy value chain?
- What do you hope/foresee/expect will change in the upcoming years in how women are represented in the energy sector?
- To your knowledge, are women and men treated equally in the customary law (for example, in land ownership, authority of the head of household, freedom of movement, and disability)?

The insights gathered aim to inform renewable energy policy design, institutional practices, and capacity-building programmes across East Africa, ensuring that women's skills and leadership are recognised and strengthened as part of the region's clean energy transition.

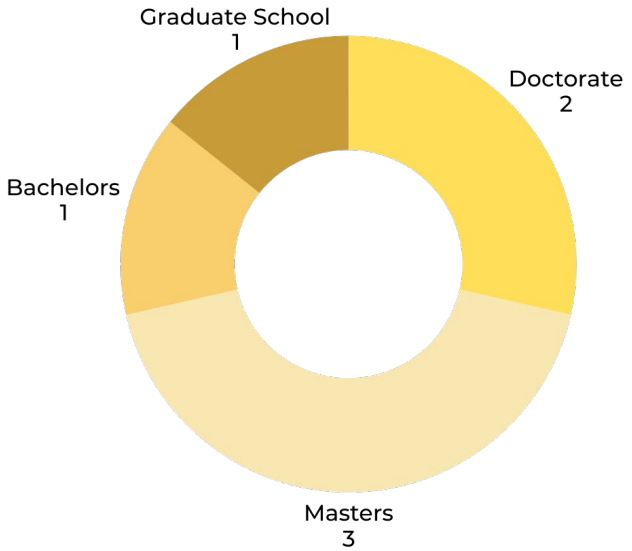
1.4 Profile of interviewees

Region

Interviewees are based in East African countries:
Kenya, Tanzania, and Ethiopia



Education

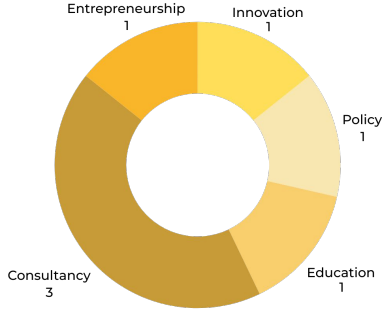


Employment

100% of the interviewees are employed in the energy sector

Years of Experience

Employment by sector



II. Policy Enabling Environment

2.1 Global gender policy frameworks in the energy sector

To enhance inclusivity in the energy sector, particularly in renewable energy (RE), it is essential to examine existing gender policies and assess their implementation and impact. This chapter analyzes how these policies influence women in the RE industry at global, continental, and regional levels, evaluates implementation practices, and outlines recommendations for strengthening gender policy in the East African region to drive industry impact.

The gender policy analysis includes governmental initiatives, corporate measures, and international agreements aimed at addressing structural and cultural barriers that have historically limited women's participation and advancement in the sector. (Energy Sustainability, 2025).

> **Without effective data collection and analysis you cannot create effective gender-related energy policies.**
>
> ~ *Energia Brief, 2021*

While analysing gender policies at the **global level**, we have common elements that could be divided into three main categories:

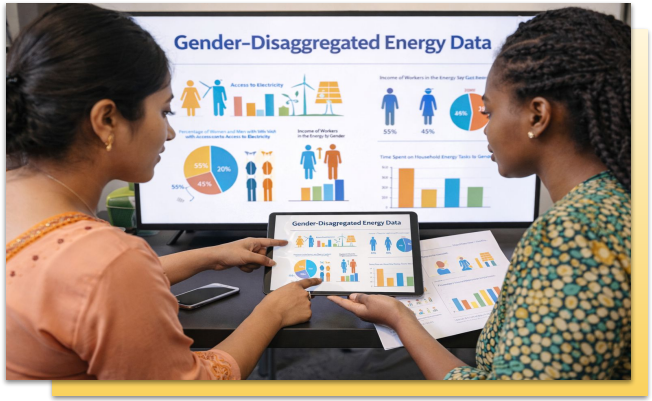
1. **Gender-neutral policies, include limited gender clauses.**
2. **Gender-mainstreamed policies, supported by implementation tools.**
3. **Transformative gender-justice approaches, combine a range of effective strategies to enhance women's and equitable participation in the industry.**

The latter category is often most **effective**, and can be exemplified by the different programmes or initiatives that channel investments towards female talent, education and employment and fosters female participation and generates impact in the RE sector.

High income countries often pair strong social protections, labour transition packages and retraining with gender-sensitive labour market measures. While lower- and middle-income countries, as witnessed in East African countries, frequently rely on donor-backed projects, voluntary employer plans, and weakly enforced gender clauses.

Although global gender policy development has significantly changed how women are seen and involved in the energy sector globally, there are still gaps that should be addressed to ensure energy transition is Just.

Across all categories, a remaining gap is the **absence of sector-specific, time-bound targets with clear implementation strategies**. This gap translates in the underrepresentation of women in decision-making and leadership roles in the renewable sector, as commitments that lack concrete targets and timelines often fail to drive accountability or sustained action. Evidence shows that without measurable targets and defined timelines, implementation is weakened and institutional responsibility diluted, hindering effective monitoring and slowing progress toward equitable participation.



AI-generated image for illustrative purposes (OpenAI, 2026).

Another gap is **the lack of comprehensive, gender-disaggregated data on renewable energy, including information on energy use and energy poverty, which limits the ability to monitor women's participation in technical roles, leadership, and policy influence**. Without targeted solutions, these inequalities remain invisible and difficult to address, hindering women's capacity to contribute to and benefit from the energy transition. Accurate data on women's roles and experiences in the energy sector will enable policymakers to identify key barriers, prioritize interventions effectively, and make measurable progress toward gender-equitable and sustainable energy development (SEforALL Report, 2024).

The UN Women Asia Pacific's report raises an important point that better policies could only be designed and implemented if there is **enough data to ensure that women's rights, health and opportunities are taken into account**. (UN Women, 2025). In order to ensure that gender policies are effectively elaborated there is a need to ensure that policies are human centric and equitable, fostering leadership and inclusive decision making strategies that respond to the global gender challenges.

2.2 Advancing gender-responsive energy policy in Africa

Africa has the potential to be a major driver of the global renewable-energy transition, with vast untapped solar, wind, hydropower, and geothermal resources capable of meeting its electricity needs by 2040 (KFW *et al.*, 2021). Yet the continent still faces significant energy poverty and low renewable-energy use, challenges that strong and effective energy policies could overcome.

In light of this, it is essential for Africa to advance effective gender policies that can further unlock the continent's potential to drive a just and equitable energy transition. Across the region, initiatives led by the African Development Bank (AfDB), Economic Community of West African States (ECOWAS), and national governments aim to increase women's participation in the renewable-energy workforce, expand training opportunities, improve access to finance, and strengthen women's leadership in clean energy institutions.

However, **implementation remains uneven**. Many gender policies struggle to translate into concrete actions due to insufficient monitoring and evaluation systems, while limited data and technical capacity further slow progress. Also, to ensure that commitments - even when not legally binding - are credible and effective, they must be designed with clear accountability mechanisms, measurable targets, and practical incentives that encourage compliance and foster ownership among stakeholders (IRENA, 2024).

2.3 Gender-responsive energy policy in East Africa

Gender-focused policies in **East Africa** are essential to advancing women's participation in the renewable energy sector. Beyond being **beneficiaries** of these policies, it is equally important to assess whether women act as active **contributors** to their formulation, embedding their perspectives and expertise into strategies, regulations, and projects. Our analysis reveals that:

- **Inclusive approaches to gender in the energy transition recognize indeed women as essential stakeholders whose perspectives shape more equitable and effective policies**. Far from being passive consumers, women are key actors - managing household energy, preserving and sharing knowledge, and driving innovation as professionals across the energy value chain. When they participate in policy-making and advocacy, they influence regulatory priorities, ensure that projects reflect community needs, and promote gender-sensitive design aligned with the African context.

- To make this participation truly impactful, **policies must address capacity-building initiatives that enable women to translate their voices into technical expertise and leadership**. University programmes and women-led mentorship networks are nurturing a new generation of female technicians and engineers, as well as researchers, project managers, and innovators. These professionals are driving research, shaping business models, and developing affordable, locally adapted energy technologies.

Furthermore, **gender policies have strengthened advocacy for safe, more inclusive workplaces** and increased awareness to counter gender and culturally specific biases in technical fields.

In line with these efforts, initiatives in Kenya and Tanzania - such as policy reforms, quotas, and donor-supported gender action plans within the utility sector - are helping to open pathways for women in leadership positions, while targeted training and international scholarship programmes are expanding women's access to STEM and energy-related education.

In Ethiopia, the efforts are focused on encouraging national commitments like the Gender-Integrated National Electrification strategy NEP 2.0, 2019. This approach has the potential to unlock participation and empower women to drive innovation and economic growth within the region's clean energy transition agenda.

Across all three countries, **these initiatives align with broader regional efforts to promote women's entrepreneurship**, **with supportive microfinance and enterprise policies** enabling women to enter and lead clean energy markets. These measures are expanding opportunities for women across the energy value chain, from off-grid solar distribution to the development and management of mini-grid enterprises.

However, despite these policy-enabling actions, gender-related **implementation in the renewable energy sector continues to face significant gaps** across the region. In general, energy policies remain largely gender-blind, with gender considerations weakly mainstreamed and rarely supported by large institutions (UNDP Gender and Climate Change Report, 2016).

The region exhibits persistent weaknesses that mirror global trends, notably the **absence of clear, time-bound, and gender-specific norms and provisions**. Policy frameworks often rely on aspirational language without measurable or trackable targets, lack well-defined implementation strategies, and are not supported by robust, sex-disaggregated monitoring and evaluation systems.

As a result, **there are insufficient mechanisms** to systematically monitor, validate, and demonstrate whether women are effectively benefiting from the policies and interventions being implemented.

These combined limit women's participation and equitable access to benefits.

AI-generated image for illustrative purposes (OpenAI, 2026).

2.3.1 Kenya policy analysis

Kenya's Energy Policy Framework is largely aggregated by the National Energy Policy 2025-2034, that sets the strategic direction for Kenya's energy sector over the next decade (Box 1). This policy focuses on promoting **sustainability, inclusivity and resilience** over the energy sector. In alignment with the national development goals like Kenya Vision 2030 and the Sustainable Development Goals (SDGs) related to Energy Access and Affordability, this policy aims to promote national development mainly through:

Expanding universal and inclusive energy access: achieving universal electricity and clean cooking solutions by 2030 through a combination of grid and off-grid approaches, promoting renewable energy deployment (geothermal, solar, wind, bioenergy) and energy-efficient technologies, while ensuring a just transition that benefits vulnerable groups and incorporates climate resilience.

Strengthening governance and partnerships: Establishing strategic government structures for monitoring, evaluation, and accountability, while fostering international cooperation and sustainable financing through public-private partnerships to support the clean energy transition.

On gender-energy nexus, Kenya launched **Kenya's Gender Policy in Energy** mainstreaming gender in broad terms but without establishing specific targets on workforce participation or leadership. This has resulted in progress that is (often) uneven and dependent on short-term projects rather than long-term structural change.

The **Kenyan Gender Policy in Energy**, adopted in 2019, aligns with the gender equality provisions of the national Constitution and international frameworks such as the Sustainable Development Goals (SDGs). The policy seeks to mainstream gender equality across the energy sector by ensuring that **all stakeholders can participate in and benefit from energy access, services, and opportunities**. Grounded in the recognition of diversity among women, men, and special groups, and the need for equitable energy access, the policy aims to:

- **Strengthen institutional frameworks for gender equality** by enabling ministries, state agencies, county governments, and relevant stakeholders to institutionalize gender-responsive planning and programming;
- **Raise awareness on gender in the energy sector** through training, workshops, policy briefs, and knowledge-sharing forums;
- Integrate **gender considerations into energy planning, projects, and monitoring and evaluation systems** through the use of sex-disaggregated data, gender indicators, and impact assessments; and
- Promote clean cooking and sustainability by **addressing the gendered health, safety, and socio-economic impacts of traditional cooking fuels**.

(Practical Action Kenya, 2024)

> **Women are increasingly stepping into leadership and technical positions in renewable energy, gaining opportunities and expertise previously out of reach—the sky is the limit.**
>
> *~ Doreen Irungu, UNIDO*

The adoption of the Kenyan Gender Policy in Energy, alongside sustained efforts toward implementation and monitoring, marked a significant shift in Kenya's energy sector, contributing to increased policy attention and the growing representation of women in technical and managerial roles, particularly within the renewable energy sub-sector.

Reflecting on these changes, **Doreen Irungu of UNIDO in Kenya**, notes that **women are increasingly assuming leadership and technical positions**, acquiring expertise previously inaccessible to them, and participating more fully in both community-level energy initiatives and national energy policymaking.

Collectively, these initiatives have contributed to an environment in which women increasingly feel represented, supported, and encouraged to participate in the energy sector, with clearer pathways for career growth and professional development.

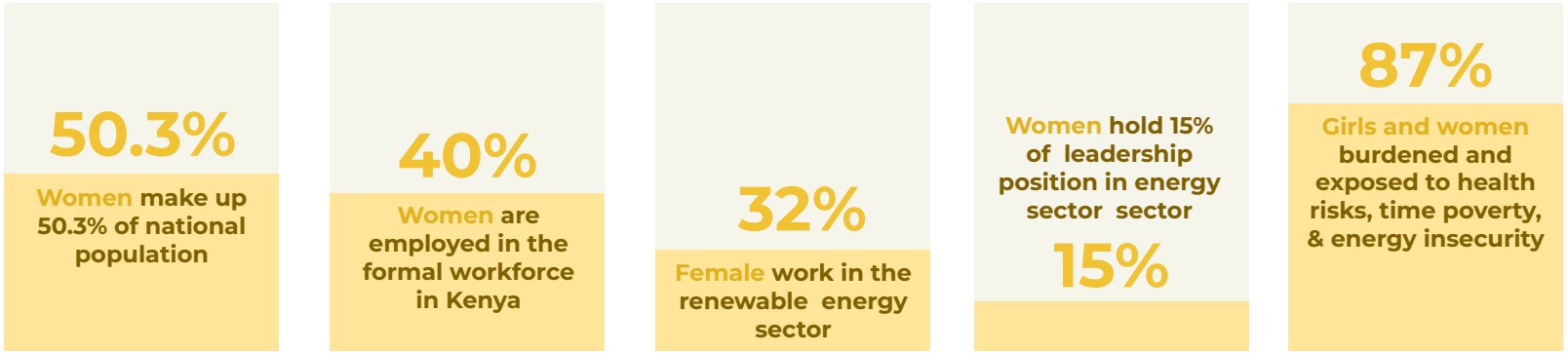
Doreen Irungu drawing on over ten years of experience working on projects across the energy sector, observes that the sectoral environment in Kenya has evolved to better support the **implementation of policy beyond the design stage**.

She notes a growing presence of highly competent female professionals across the sector, while also acknowledging that **further improvements remain necessary**, particularly in relation to maternity policies, lactation room provisions, and workplace amenities to support women as participation continues to increase.

(World Bank, 2020)

Women representation in Kenya

Figure 1: Women's Representation and Energy Burden in Kenya: Population, Workforce, and Leadership



National Bureau of Statistics Kenya, 2022

National Bureau of Statistics Kenya, 2022

TASK BASED EMPOWERMENT: A PATH TO CLOSING THE GENDER ENERGY GAP - Mercy Chelangat, 2025

Gender and Renewable Energy in Kenya, 2025

UN Women, 2022

Gender gaps shaping policy decisions and design

Through the National Energy Policy, Kenya reinforces its commitment over the next decade to developing a clean, resilient, and inclusive energy system. This commitment is further strengthened by explicit gender-responsive measures articulated in the Gender Policy in Energy (2019), which outlines targeted regulations and recommendations to address gender disparities across the energy sector.

Before the design and active implementation of Kenya's Gender Policy in Energy, women constituting approximately **50.3% of the national population** (Kenya National Bureau of Statistics, 2022) were significantly underrepresented in the energy sector. **Women accounted for only about 21% of the energy workforce**, compared to an average **female representation of approximately 40% in other sectors of the economy**.

Furthermore, only **13% of managerial positions in the energy sector were occupied by women**, severely limiting their participation as decision-makers and technical actors (IEA, 2022). This is further explored in the *Employment and Leadership* section of the report.

This exclusion persisted despite the fact that women are typically the primary consumers and managers of household energy and dominate care and service roles, comprising nearly 70% of frontline positions. At the same time, women and girls in Kenya disproportionately bore the burden of traditional biomass use, with **87% of the population still relying on fuelwood for cooking, exposing them to heightened health risks, time poverty, and energy insecurity** (UN Women, 2025).

Box 1: Successful Gender Responsive Policies in Kenya's Renewable Energy Sector

In Kenya, utilities such as **KenGen (Kenya Electricity Generating Company)** provide a strong practical example of how gender-responsive policies can be effectively implemented within the renewable energy sector. Influenced by the national policy established in Kenya's Constitution (2010) (National Policy on Gender and Development, 2019) with a requirement for gender equality within institutions dictating through the **two-thirds rule**, that no more than two-thirds of elective or appointive bodies shall be of the same gender, KenGen adopted and institutionalised internal gender strategies and mentorship initiatives demonstrate the tangible impact of translating gender policies into institutional practice.

This is most clearly illustrated by the launch of the **Pink Energy Initiative** in 2016 by KenGen's then Managing Director and Chief Executive Officer. The initiative represents a strategic effort to build a more diverse, equitable, and innovative energy sector by empowering women through personal and professional development, fostering a conducive work environment, promoting gender awareness, and advancing female potential. Central to the initiative is the deliberate challenge of gender stereotypes and the promotion of gender mainstreaming as a pathway towards a more inclusive energy industry.

Since its inception, the **Pink Energy Initiative** has received sustained institutional support. An organisational health survey conducted by **KPMG** revealed that **70% of KenGen employees reported increased motivation** as a result of the programme and related diversity initiatives. Correspondingly, the initiative has contributed to a measurable increase in female representation: the proportion of women in KenGen's workforce rose to **36% in the 2022 financial year**, up from approximately **17% in earlier years**, with the company expressing an ambition to achieve a **50:50 gender balance** in the long term (UN Women, 2024).

Progress has also been recorded at leadership level. As of March 2022, **women accounted for 27% of top leadership positions**, representing a substantial increase from **approximately 12%** a few years earlier. Notably, a woman served as Managing Director and Chief Executive Officer of KenGen in 2022, providing a high-profile example of female leadership within Kenya's energy sector and reinforcing the role of representation in driving institutional change.

Beyond the Pink Energy Initiative, KenGen has championed additional measures to promote gender equality and increase women's participation across its workforce and leadership. These include **sponsored leadership programmes in partnership with Strathmore University**, as well as collaborations with international organisations such as the **United Nations Global Compact** and **USAID** to implement the **Women's Empowerment Principles (WEPs).**

(Miano, 2021)

Missed opportunity: Gender in the Rural Electrification Model

The **Ministry of Energy's Gender Policy (2019)** has directly shaped the Rural Electrification Model Using Renewable Energy in Kenya providing the national framework for integrating gender considerations across energy planning and delivery.

The policy mandates the systematic inclusion of gender in project design, monitoring, and evaluation, ensuring women are meaningfully represented in energy policies, strategies, and budgetary allocations In practice, this policy guidance translated into two core implementation approaches within the project:

- **The conduct of targeted capacity and needs assessments for women involved in community energy management**;
- **The integration of gender-sensitive and environmentally sustainable practices in the deployment of rural, off-grid renewable electrification systems**.

The project stands out for its emphasis on capacity building in rural and off-grid communities, enabling women to move from energy users to active contributors in system development and sustainability planning. **Through targeted training and inclusive engagement, women provided strategic insight into community energy needs, supporting socially embedded and economically viable energy solutions.**

However, **Ms. Benedetta Giugliano**, **Energy and Sustainability Consultant at Studio Santi** notes that gender equality embedded in statutory and energy policy frameworks does not automatically translate into practice in rural contexts, where customary norms continue to shape labour markets and decision-making power.

In many rural communities, women remain primary caregivers and household energy managers, yet are often excluded from formal technical roles and leadership positions within energy projects. This gap demonstrates a key policy challenge: formal inclusion mechanisms are insufficient without strategies that actively engage with local cultural dynamics.

Insights from **Ms. Doreen Irungu** further emphasize that **broader social norms - particularly perceptions of engineering and technical work as male domains - directly influence policy uptake and workplace culture**, even in well-designed renewable energy initiatives. These norms affect women's confidence, community acceptance, and long-term retention in off-grid energy roles, limiting the transformative potential of gender-responsive policies if left unaddressed.

> Energy connects many aspects of daily life... **when girls spend hours collecting firewood, do they have time for homework** or to preserve food **without access to proper energy?**

~ Dr. Murugi Ndirangu, Columbia Global Center Nairobi

(Rural Electrification and Renewable Energy Corporation, n.d.)

2.3.2 Tanzania policy analysis

Tanzania's energy policy framework is anchored in the **National Energy Policy (2015)**, alongside subsequent strategies, regulations, and implementation plans that guide the development of the country's energy sector. The policy establishes a strategic vision for a **reliable, affordable, sustainable, and inclusive energy system**, aligned with national development priorities such as **Tanzania Development Vision 2025 (1999)**, which emphasizes on expanding off-grid, clean energy access while promoting women's participation in the energy sector.

The National Energy Policy emphasizes the role of energy as a catalyst for socio-economic transformation and poverty reduction, with a strong focus on expanding access to modern energy services. Key policy priorities include: **achieving universal access to electricity**, particularly in rural and peri-urban areas, through a combination of grid extension and off-grid renewable energy solutions;

- **Scaling up access to clean cooking solutions** to reduce reliance on traditional biomass fuels, improve public health outcomes, and address environmental degradation;
- **Promoting renewable energy development**, including solar, wind, small hydropower, biomass, and geothermal resources, alongside improvements in energy efficiency;
- **Strengthening climate resilience and sustainability** within energy planning to support a just and low-carbon energy transition;
- **Enhancing institutional coordination, regulation, and monitoring**, including the role of the Ministry of Energy, the Energy and Water Utilities Regulatory Authority (EWURA), and the Rural Energy Agency (REA);
- **Mobilizing financing and international cooperation**, including public-private partnerships and donor-supported programmes to expand energy infrastructure and innovation.

On the **gender mainstreaming**, Tanzania has integrate gender considerations **into energy policies, strategies, and programmes**, drawing on national gender frameworks and international commitments.

Efforts focused on ensuring that women and men can **participate equitably in and benefit from energy access, services, employment, and entrepreneurship**, particularly within the growing renewable energy sub-sector. (Gender, Energy and Policy: A Review of Energy Policies in East and Southern Africa, 2017)

Key objectives of gender-responsive approaches in Tanzania's energy sector include:

- **Strengthening institutional capacity for gender mainstreaming**, enabling ministries, agencies, utilities, and local governments to integrate gender considerations into energy planning, budgeting, and implementation;
- **Building awareness and technical capacity** through training, workshops, and knowledge-sharing initiatives on gender and energy among policymakers, practitioners, and private sector actors;
- **Integrating gender into project design and monitoring frameworks**, including the use of sex-disaggregated data, gender indicators, and social impact assessments;
- **Promoting clean cooking and sustainable energy solutions** that reduce health risks, unpaid care burdens, and environmental impacts associated with traditional biomass use.

The gradual adoption of these measures has contributed to increased recognition of gender as a critical dimension of energy sector development, particularly in renewable energy and rural electrification initiatives.

Women representation in Tanzania

Figure 2: Tanzanian Women Representation Across Different Institutions in the Energy Sector

84%

Women represent 84% of formal and informal labor force in Tanzania

26%

Women occupy 26% of Leadership and Managerial positions at the Rural Energy Agency

50%

Women hold 50% of highest ministerial positions at the Ministry of Energy

20%

Women occupy 20% Leadership and Managerial positions at the Tanzania Electric Supply Company

Gender and Energy, Tanzania Brief, 2021

Structural gender gaps in energy governance

Women constitute approximately **half of Tanzania's population** and **occupy 50% of the highest ministerial positions at the Ministry of Energy**. In general, women participation in the formal and informal labor sector is around 80% however their involvement remain low in the energy sector, particularly in technical and engineering positions.

Women's occupy **20% of managerial and senior decision-making roles** within energy utilities, regulatory bodies, and private renewable energy companies. This underrepresentation persisted despite the fact that women are the primary users and managers of household energy, especially in rural areas, and bear a disproportionate burden of energy poverty. A large share of households continued to rely on fuelwood and charcoal for cooking, exposing women and girls to health risks, time poverty, and safety concerns, while limiting their opportunities for education and income-generating activities.

These structural imbalances were reinforced by the limited inclusion of women's perspectives in energy planning, project design, and implementation processes, highlighting the need for a more deliberate and systemic approach to gender inclusion in Tanzania's energy governance.

Box 2: Successful Stories – TANESCO and REA

In Tanzania, national institutions such as the **Tanzania Electric Supply Company (TANESCO)** and the **Rural Energy Agency (REA)** have progressively engaged with gender inclusion within strategic and operational frameworks, although the extent and depth of implementation vary significantly across programmes and regions.

TANESCO and **REA** both operate under mandates to expand electricity access and promote renewable energy deployment. In recent years, these agencies have initiated measures aimed at mainstreaming gender within their operational practice. They have increasingly incorporated into energy planning, project design, and workforce development. Efforts include:

- **Gender awareness and capacity building training** for staff and leadership, intended to sensitize technical and managerial personnel to gendered barriers in energy access and employment;
- **Community engagement protocols** that encourage the participation of women's groups in local energy planning committees, feeder line siting consultations, and energy service delivery feedback loops;
- **Partnerships with development actors** to pilot gender-responsive programmes that support women's involvement in solar installation, maintenance training, and energy enterprise creation.

TANESCO and REA's operational efforts reflect a shift from passive acknowledgement of gender disparities to actively implementing deliberate institutional actions aimed at addressing them.

In addition, REA has created a favorable regulatory environment focused on empowering local communities through solar technologies and aligned with Solar Sister's business model.

Box 3: Successful Story – Solar Sister Business Model

Solar Sister Organisation aims invest in local women entrepreneurs to start, grow and sustain successful clean energy businesses, so they can build a brighter future. By supporting women's entrepreneurship, Solar Sister creates a multiplier effect:

- clean energy reaches off-grid households,
- rural economies are strengthened, and
- communities become healthier and more resilient.

Women entrepreneurs - not only agents of energy access - became catalysts for social change, shifting gender norms and increasing women's visibility and decision-making power within their families and communities.

In 2023, Solar Sister has partnered with Puma Energy Foundation Business Booster Programme to scale women-led clean energy enterprises. They trained and equipped **579 women in Tanzania** with smartphones and digital tools to strengthen clean energy sales in off-grid communities. Building on this success, Solar Sister's second phase aims to recruit and train another **500 women entrepreneurs, of whom 200 will receive additional digital business skills and tools**. By combining technical knowledge, business capacity, and digital literacy, the programme seeks to maximize both commercial and social impact.

> **The goal is not just to sell energy products. It's to empower women with confidence, financial independence, and a respected voice in their households**

~ *Cesear Mloke, Solar Sister Tanzania Country Director*

2.3.3 Ethiopia policy analysis

Ethiopia's renewable energy sector is rapidly expanding, with a focus on off-grid solutions, rural electrification, using solar PV, wind, and small-scale hydro. Over the years, Ethiopia has also made remarkable progress in expanding electricity access and developing a renewable energy sector, with nearly all electricity generated from renewable sources.

Women remain the primary end-users of household energy, responsible for cooking, baking, and managing household electricity. Yet, they are rarely involved in key decisions on energy policy or sector reform, limiting their ability to operate as entrepreneurs, innovators, and market actors. The **UNDP Ethiopia *Powering Equality* brief (2023)** observes that *"the design and implementation of projects focused on energy access fail to match the needs of the women, treating them often as beneficiaries rather than active agents of change."*

Ethiopia hosts a range of gender-energy initiatives, including Women in Energy associations, Young Women in Energy programmes, and donor-supported discussions. Networks and programmes such as the **Ethiopian Women in Energy (EWiEn)** have been established to empower female energy professionals through **networking, mentorship, and training opportunities**, enhancing visibility and career pathways..

Despite these notable efforts, they however remain largely under-resourced, weakly coordinated, and often fail to reach women entrepreneurs on the ground. Evidence further highlights how energy access programmes inadequately support women's entrepreneurship. Rekik Bekele, Women in Energy Expert in Ethiopia notes that "There are initiatives, but I don't see them coming down to the ground."

The absence of effective financial instruments constitutes a major barrier for women entrepreneurs. Affordable loans and equity financing are largely unavailable, and while grants exist, they are insufficient for scaling businesses. Additionally, policy frameworks are poorly aligned with domestic financial systems, limiting the replicability of financial instruments from other countries (Financing Female Entrepreneurship in Ethiopia, World Bank (2015).

In addition, customs, tax, and industrial policies that are nominally supportive of clean cooking technologies can create barriers in practice. For example, Ethiopia's high customs tariff (35%) on improved cookstoves raises their cost and discourages private-sector engagement in cleaner cooking technologies, including locally-led enterprises. Without targeted fiscal incentives and implementation of tariff exemptions, such policies can disproportionately disadvantage women entrepreneurs who often have limited access to capital and formal markets (EfD Annual Report 2024).

Women's participation renewable energy value chain (Ethiopia: Expanding Opportunities for Women in the Electricity Sector, 2021) remains exceptionally low due to:

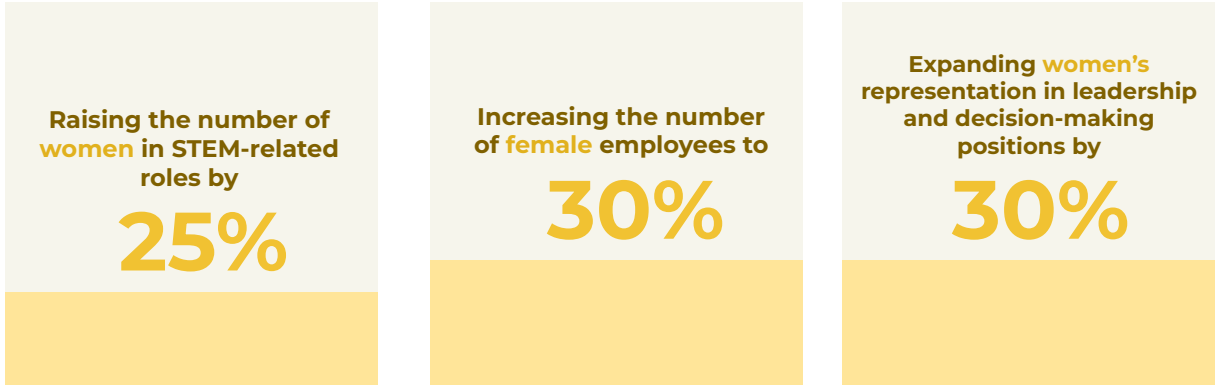
- Gender norms restricting mobility and travel
- Safety concerns in rural work environments
- Unequal care responsibilities
- Scarce promotion among women to pursue engineering and technical professions.

(Ethiopian Women in Energy [EWiEn], 2026)

Rekik Bekele, explains: *"From the companies that I know working in the renewable energy sector, specifically in solar energy, I know two other companies that are women-owned businesses… out of about 60 or 70 companies that I know working in the sector. Female ownership is not represented enough in the sector."*

In 2019, women accounted for just **19.2%** of the Ethiopian Electric Utility (EEU) workforce and only **9% of managerial positions.** Recognizing the structural barriers women face in the electricity sector, EEU launched a comprehensive gender inclusion initiative in 2018 (WRI: Ethiopia's Expansion of Opportunities for Women in the Electricity Sector, 2021). EEU set ambitious targets to increase women's participation in the workforce to 30% by 2023, including:

Figure 3: Ethiopia's Targets for Women's Participation by 2023



EEU Targets for 2023

Box 4: Success Story – Ethiopian Electric Utility

The Ethiopian Electric Utility (EEU) allocated $4.5 million from the Ethiopia Electrification Programme (ELEAP) for gender equity initiatives and citizen engagement, guided by a Gender Steering Committee and a Gender Technical Committee in collaboration with the Ministry of Women, Children, and Youth.

Capacity Building and Workforce Development

EEU partnered with **12 Ethiopian universities** and the Ministry of Science and Higher Education to provide scholarships, internships, and leadership training for women in STEM.

Forty female graduate students received six- to eight-week internships with the potential for permanent employment, while **44 current female employees received scholarships for master's degrees or technical training.**

Policy and Workplace Reforms

Following an assessment of barriers to female employment, EEU introduced its first Sexual Harassment Policy, Code of Conduct, and Grievance Redress Mechanism, alongside a gender-based violence training programme for staff.

Recognizing the need for work-life support, EEU hired a childcare expert and began establishing **20 childcare centers across regional and district office.**

> **"Mentorship has been one of the most powerful enablers of my career."**
>
> *~ Annika Richter, Energy Expert*

Outcomes and Recognition

These gender-responsive policies have strengthened women's access to career opportunities and leadership roles in the energy sector. Complemented by the Ethiopian Women in Energy Network, founded in 2019 to provide networking and training opportunities, EEU's approach demonstrates how targeted skills development, institutional reform, and supportive services can reduce gender gaps **while strengthening the capacity and sustainability of the energy sector.**

II. Policy Enabling Environment

Policy Recommendations for East Africa

East Africa is at a pivotal moment in advancing a just and equitable energy transition. The region holds substantial renewable energy potential, particularly in hydropower, geothermal, solar, and wind, while continuing to expand energy access across Kenya, Tanzania, and Ethiopia. Our analysis showed that policy measures are needed to increase women participation in the energy sector.

Strengthen policy implementation through tracking and accountability mechanisms

Across Kenya, Tanzania, and Ethiopia, significant progress has been made in integrating gender considerations into national energy policies and institutional frameworks. Yet, **translating policy intent into tangible outcomes lack, hence the need for monitoring, accountability, and follow-through by implementing bodies** (UN WOMEN - Energy Equality in the Sustainable Energy Transition, 2023).

Tracking and accountability mechanisms could be guaranteed as follow:

- Assigning dedicated units or officers within regulatory bodies to monitor gender policy implementation.
- Defining quarterly or annual progress reports to assess the effectiveness of gender-responsive initiatives.
- Collecting and analyzing sex-disaggregated data to identify where policies are succeeding or falling short.
- Implementing corrective actions when monitoring indicates gaps in policy application, ensuring policies are not only adopted but also enforced effectively.

By institutionalizing such monitoring and accountability frameworks, East African governments can move beyond “wishful ideation” and ensure that well-designed gender policies actively drive women’s meaningful participation in the energy transition.

Promote rural women's access to STEM education and leadership in the energy sector

Women in urban areas of Kenya, Tanzania, and Ethiopia have access to STEM education and formal energy-sector roles. Yet, women in rural areas remain underrepresented in STEM education and leadership. **Addressing this exclusion could support national efforts on rural energy access, affordability and sustainability.**

Governments and institutions could adopt inclusive approaches that combine education with participatory engagement by:

- Strengthening access to STEM and technical education for girls in rural communities, from primary through tertiary levels, to support long-term participation in the energy sector.
- Creating formal mechanisms such as community energy committees, consultative forums, and local advisory roles that enable rural women, including those without formal education, to contribute their experiential knowledge of energy use, management, and challenges.
- Equipping rural women with training and authority to act as energy mediators, counsellors, or community focal points, supporting the design and implementation of locally responsive energy solutions.

AI-generated image for illustrative purposes (OpenAI, 2026).

III. Energy Access

3.1 Global electricity access reached 92% in 2023

According to the International Energy Agency's Tracking SDG7 (affordable and Clean Energy): Energy Progress Report 2025, **global electricity access reached nearly 92% in 2023**. For the first time in years, new connections grew faster than population increases, reducing the number of people without electricity to more than 660 million, which was nearly 20 million fewer than in 2022 (IEA *et al.*, 2025).

While this signals a return to positive momentum, **the pace remains too slow** to achieve universal access by 2030. Those still unconnected are disproportionately located in remote regions, have lower incomes, and are more likely to live in contexts marked by fragility, conflict, and violence.

Global Electricity Access

92%

Global electricity access reached **92%** in 2023, up from **84%** in 2010. Meanwhile, access to clean cooking fuels and technologies rose from **64%** to **74%** between 2015 and 2023.

Clean Cooking Access

74%

Electricity access has improved unevenly across regions. Between 2010 and 2023, 45 countries primarily in Europe, North America, Australia, and New Zealand, achieved universal access (United Nations Statistics Division, 2025).

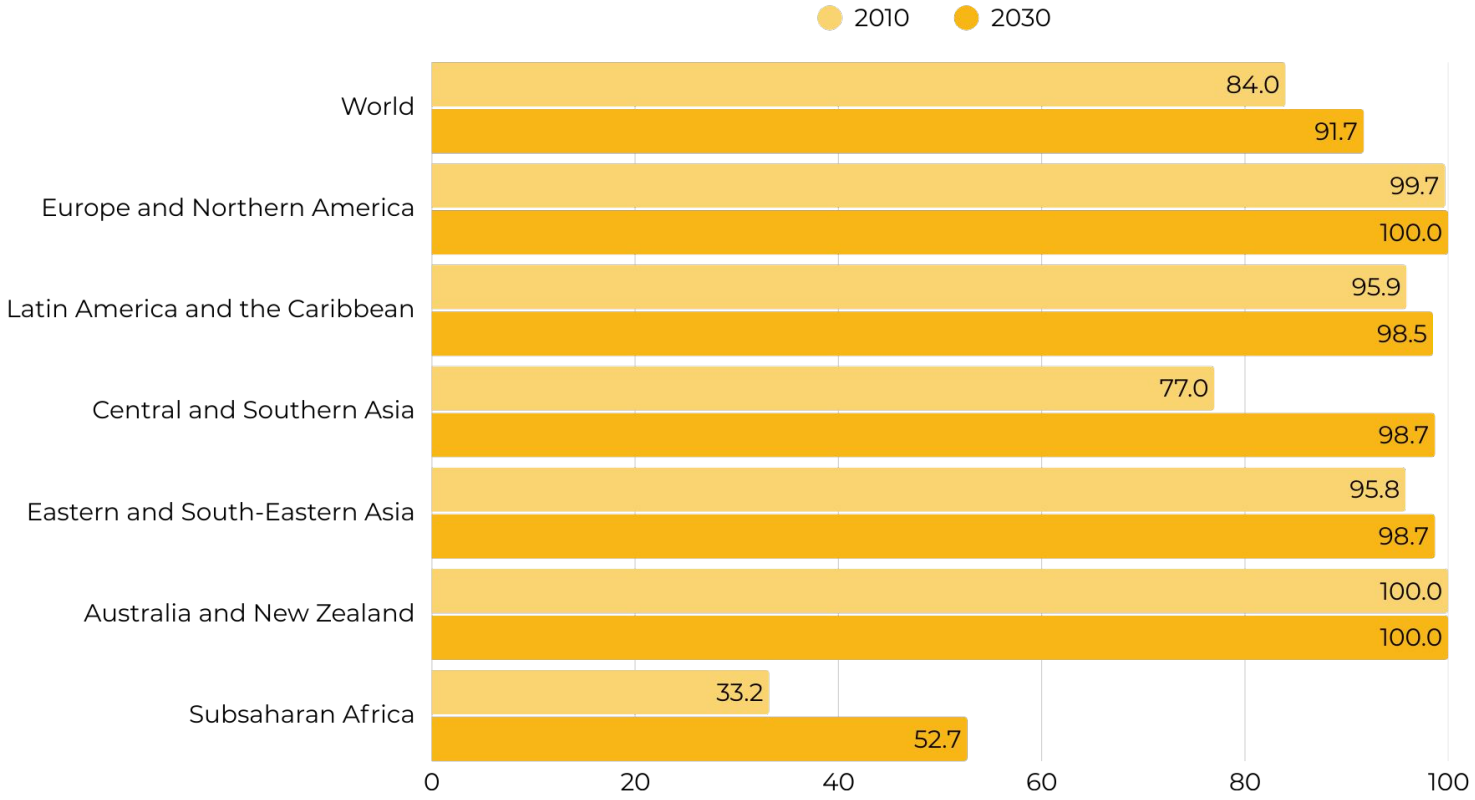
Central and Southern Asia also made significant strides, reducing the number of people without electricity from 414 million to just 27 million over the same period. Achieving universal access by 2030 requires **accelerating electrification to 1.2% annually**. However, current trajectories fall short; at this pace, an estimated 645 million people will remain without power by 2030.

Global access to clean cooking fuels and technologies reached 74% in 2023. However, **around 2.1 billion people still rely on polluting fuels for cooking** (United Nations Statistics Division, 2025). Progress varies across regions, with Eastern and South-Eastern Asia, and Central and Southern Asia making notable gains.

The heaviest burden falls on poorer households, particularly women and girls, who spend long hours collecting fuel and cooking on inefficient stoves. At the current pace, only 78% of the global population is expected to have access to clean cooking solutions by 2030, leaving roughly 1.8 billion people without access. These goals require a major shift in the energy industry in connection with stronger investment, enabling policy frameworks, innovation, and long-term planning.

Crucially, an inclusive energy transition must ensure that women and other marginalised groups are not left behind. In other words, **prioritising women's participation in efforts to expand energy access will significantly accelerate and sustain progress toward achieving SDG 7**.

Figure 4: Global Population with Electricity Access (2010-2023)



(United Nations Statistics Division, 2025)

3.2 Stalled progress in Africa leaving millions unplugged

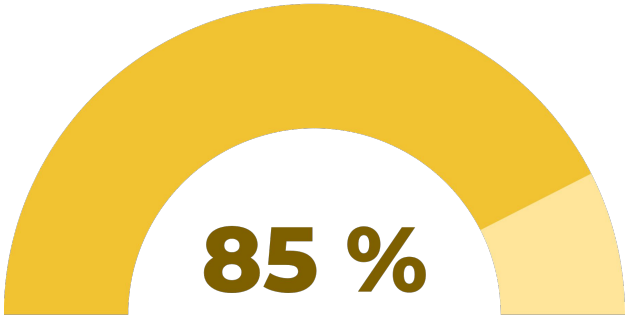
In Africa, access to electricity remains one of the most pressing challenges. This issue is particularly severe in Sub-Saharan Africa, where progress has largely stagnated, despite significant regional disparities (some improvements have been recorded in East Africa, as detailed later in the report).

Between 2010 to 2023, the **Sub-Saharan Africa region**'s unconnected population fell only slightly from 566 million to 565 million, even though overall access rose from 33% to 53%. The region now accounts for **85% of the world's remaining electricity deficit**, up from 50% in 2010 (United Nations Statistics Division, 2025).

Among countries with the largest access gaps in 2023, 18 of the top 20 are in Sub-Saharan Africa. Nigeria (86.6 million), the Democratic Republic of Congo (79.6 million), and Ethiopia (56.4 million) alone represent more than one-third of the global population without electricity.

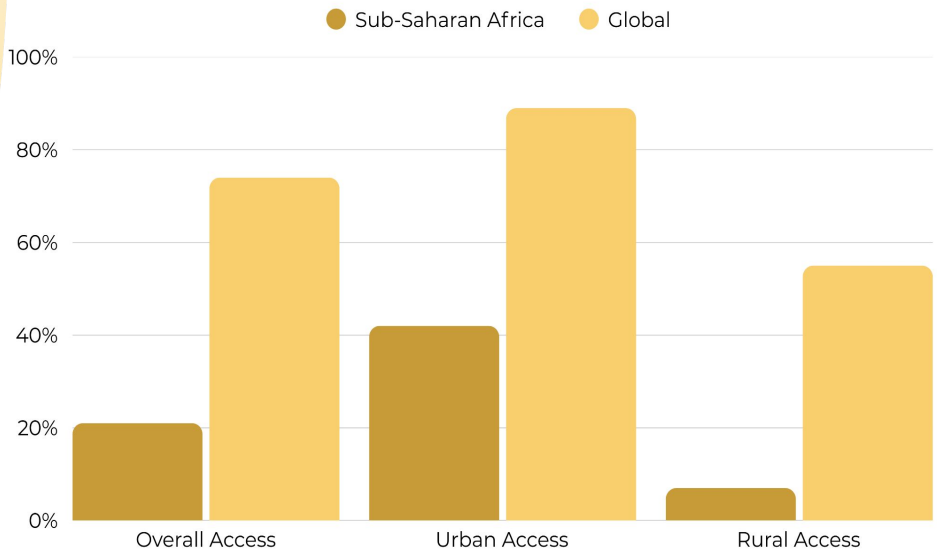
Rural communities bear the greatest burden of limited electricity access, as electrification efforts prioritize urban areas. In Sub-Saharan Africa, rural population growth has outpaced these efforts, leaving **451.1 million people without electricity** in 2023 (IEA *et al.*, 2025).

Figure 5: Sub-Saharan Africa's Share of Global Electricity Deficit



(United Nations Statistics Division, 2025)

Figure 6: Access to Clean Cooking Technologies: Sub-Saharan Africa vs Global



(International Energy Agency et al., 2025)

Clean cooking access also lags significantly. Only **21% of the population in Sub-Saharan Africa can access clean cooking technologies**, far below the 74% global average. The number of people without clean cooking solutions continues to grow by 14 million each year (IEA *et al.*, 2025), as population growth outpaces progress.

Significant urban-rural disparities persist: 42% of urban residents have access compared with just 7% of rural populations. By contrast, global averages are far higher, with 89% of urban and 55% of rural populations having access. **Sub-Saharan Africa's low coverage heavily affects global figures;** excluding the region, urban access rises to 94.5% and rural access to 67.3% (IEA *et al.*, 2025). These gaps underscore the urgent need for targeted interventions in Africa to ensure equitable access across both urban and rural communities.

3.3 Energy access East Africa's varies across countries

All countries are endowed with abundant geothermal, wind, solar, and hydropower resources. Ethiopia also holds significant untapped hydropower potential, while Kenya and Ethiopia together could support an additional 10 GW of geothermal generation (RES4Africa Foundation, 2023). Yet, the **energy mix across East Africa is still dominated by traditional biomass**, where biofuels and waste continue to make up **the largest share of total energy supply (61.6%)** in Kenya, Ethiopia and Tanzania (IEA, n.d.) East Africa has made notable strides in expanding electricity access over the past decade, yet **its renewable energy potential remains largely underutilised**.

However, energy access is more than just electrification; it is a critical enabler of women's empowerment. **Women bear the primary responsibility for daily household tasks**. In energy-poor households, this often means long hours spent collecting firewood and cooking over open fires: tasks that are physically demanding, time-intensive, and harmful to health. Cooking with traditional biomass leads to prolonged exposure to household air pollution, increasing risks of respiratory and cardiovascular diseases, lung cancer, and premature death (World Health Organization, 2025).

The **physical toll is also substantial**. A study conducted in rural Kenya found that women spent roughly three hours each week walking up to 4 km round-trip to gather firewood, often carrying loads as heavy as 43 kg on their backs or heads (Njenga, Gitau, & Mendum, 2021). This repetitive strain has been associated with long-term injuries affecting the spine, neck, hands, and legs. In addition, the journey exposes women to risks such as injuries from falling and encounters with wild animals.

Cooking with biomass is both time-consuming and physically demanding, creating **a cycle of time poverty** that disproportionately affects women and girls. This burden directly limits girls' access to education and, over time, narrows their chances of pursuing higher-income opportunities. According to UNICEF, **girls aged 5–14 spend nearly 30% more time on unpaid household tasks**, including collecting water and firewood, than boys of the same age (UNICEF, 2016). In communities without electricity, women are locked into long hours of domestic labour, reduced schooling, and restricted opportunities for meaningful economic participation.

Moreover, access to electricity significantly enhances safety and security. Poorly lit homes and public spaces increase vulnerability to violence and crime, with women disproportionately at risk to men. Tasks such as walking alone after dark or using outdoor facilities become safer when streets, public areas, and homes are reliably illuminated, creating secure environments and reducing these threats. Similarly, clean cooking technologies minimize women's need to travel long distances to collect firewood, lowering their exposure to harassment and the threat of sexual assault (Sustainability Directory, 2025).

(Njenga, Gitau, & Mendum, 2021)
(The Independent, 2024)

AI-generated image for illustrative purposes (OpenAI, 2026).

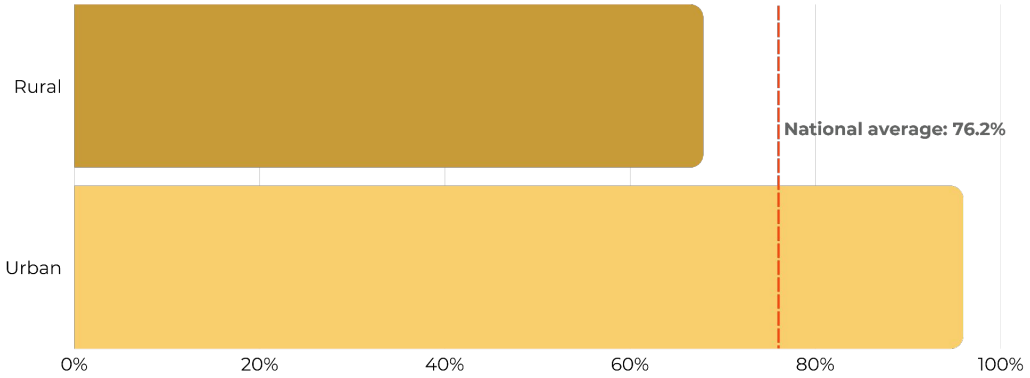
Beyond improving safety, energy access also unlocks opportunities for women as active participants in the energy economy. As primary decision-makers for household energy use, particularly in rural and low-income communities, **women play a central role in driving rural electrification across East Africa**. Their influence extends to the adoption of clean energy technologies, including clean cookstoves, local solar installations, and community-based renewable energy enterprises, which largely benefit off-grid households. This role extends indeed beyond households into entrepreneurship and local business development.

Benedetta Giugliano, observes, “At the community and business level, **women entrepreneurs are driving the growth**. If we look at off-grid solar and clean cooking markets, it’s mostly women entrepreneurs. It’s still a niche, of course, with few men involved.” She adds, “From my experience in the region, there is a strong female presence in distributed renewable energy, including off-grid solar, mini-grids, and commercial rooftop systems. This is a space that tends to be more inclusive, community-driven, and entrepreneurial.”

3.3.1 Energy access in Kenya

Kenya's National Energy Compact aims for universal access by 2030 (Republic of Kenya Ministry of Energy & Petroleum, 2025). As of 2023, **energy access in Kenya reached 76%**, (Tracking SDG7, n.d) driven by the Last Mile Connectivity Project that aims to extend essential electricity services from main grids to low voltage networks in underserved communities. While this national figure is well above the sub-Saharan African average of 52%, it masks a sharp divide between urban and rural areas. Electricity access in urban centres reached 96% in 2023 (World Bank et al., 2025). Yet two-thirds of Kenyans live in rural communities, where progress, though significant, still lags behind. Rural access has risen from 29% in 2013 to 70% in 2023, bringing electricity to approximately 15 million people over the past decade.

Figure 7: Kenya's Access to Electricity (2023)

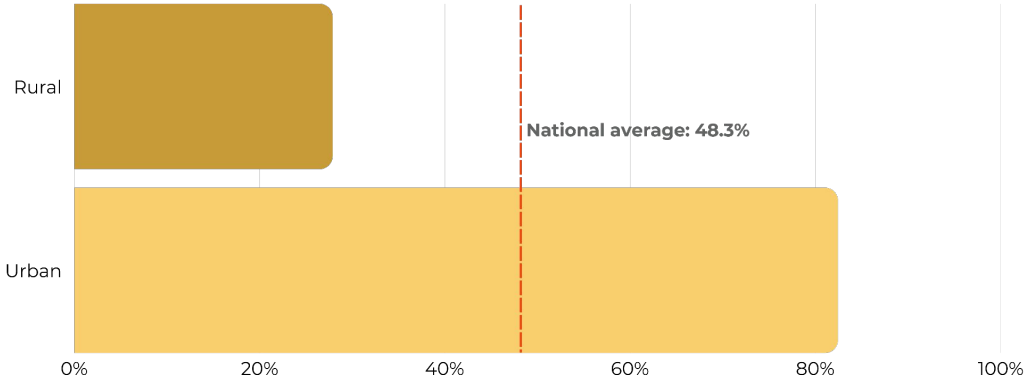


(Tracking SDG7, n.d)

3.3.2 Energy access in Tanzania

Tanzania's National Energy Compact seeks to reach 75% connectivity by 2030 (World Bank, 2025). Between 2013 and 2023, energy access increased **reached** 16.4% to 48.3% respectively. This progress has been driven largely by the Tanzania Rural Electrification Expansion Programme (TREEP), implemented by the Rural Energy Agency with World Bank support, which has accelerated grid expansion in rural areas while scaling up renewable energy, strengthening institutions, promoting productive uses of electricity, and mobilising private sector investment to support local economic development. Despite these gains, electricity access remains uneven: fewer than half of households on the mainland are connected, and in Zanzibar, access remains at around 40% (World Bank, 2025).

Figure 8: Tanzania's Access to Electricity (2023)

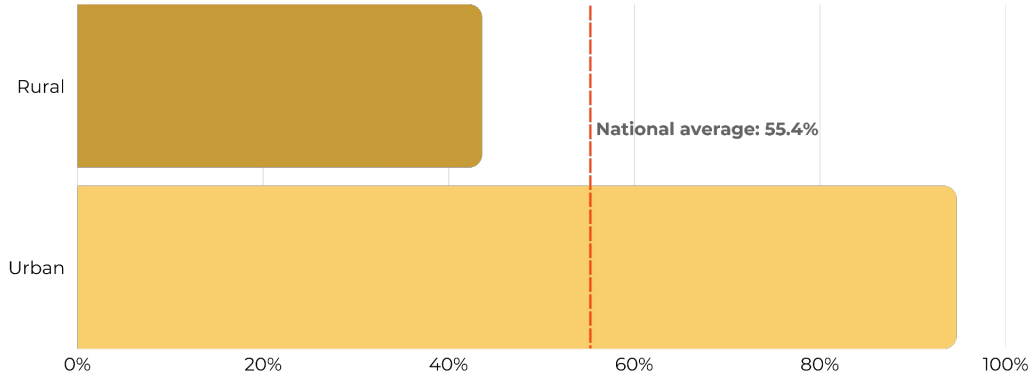


(Tracking SDG7, n.d)

3.3.3 Energy access in Ethiopia

Ethiopia National Energy Compact targets 75% electricity access by 2030 (World Bank, 2025). Over the years, the country made steady progress in expanding **electricity access** with national access rising to **55.42% in 2023**, up from just 30.78% in 2013 (World Bank et al., 2025). Urban areas now have an electrification rate of about 95%, but roughly 60 million Ethiopians still live without power. Much of the progress achieved so far is due to large-scale grid expansion through initiatives such as the World Bank supported Ethiopia Electrification Programme (ELEAP), which has enabled more than 1.6 million new on-grid connections and brought electricity to over 8 million people. Despite these advances, rural access remains significantly lower, hovering around 40% (The World Bank, 2025).

Figure 9: Ethiopia's Access to Electricity (2023)



(Tracking SDG7, n.d)

III. Energy Access

Policy Recommendations for East Africa

Ensure technologies and services are designed around women's needs and daily realities, emphasizing affordability, safety, reliability, and ease of use.

Practical examples include small-scale renewable energy projects **tailored to off-grid communities**.

In Tanzania, the Jiko Makini initiative demonstrates this approach: the improved cookstove provides up to 70% fuel savings compared to the traditional three-stone fire.

Additionally, the project trains and **employs local youth and women to distribute the stoves**, reaching over 5,000 households across six villages, including the most remote "last-mile" consumers (OffgridSun, 2025).

Households contribute a symbolic 10% of the stove's market value, which compensates local distributors, while OffgridSun, the project's investor and developer, covers production, distribution, maintenance, and monitoring costs.

(OffgridSun, n.d.)

Accelerate investment in decentralised renewable energy systems

(SNV Netherlands Development Organisation, n.d.)

Decentralised energy solutions are especially suited to women's needs, as they can support productive household and commercial uses while reducing reliance on biomass. Accelerating the phase-out of fossil fuel subsidies and redirecting public finance toward clean energy infrastructure will help lower costs and attract private investment into rural energy markets (Rehman *et al.*, 2026).

In Kenya, for example, national strategies such as the Kenya Off-Grid Solar Access Project (KOSAP), which targets 14 underserved counties (Republic of Kenya Ministry of Energy, 2024), demonstrate how decentralized solutions like solar mini-grids and solar home systems can rapidly extend electricity to remote areas, and often faster and at lower cost per connection than grid expansion.

Mini-grids, in particular, provide reliable power that supports productive uses such as milling, refrigeration, irrigation, and clean cooking, helping to stimulate local economies.

For women, these systems ease the daily burdens associated with energy poverty, opens pathways to income-generating activities and promotes greater independence with time saved.

Encourage women involvement in co-designing and delivering innovation

When women are actively involved in designing and delivering energy solutions, **innovation becomes more responsive to real needs such as affordability, reliability, and suitability** for rural and low-income settings. The diversity of perspectives leads to solutions that are not only **technically viable, but also socially accepted and sustainably adopted**.

Green Scene Energy is one such woman-led company delivering transformative energy access solutions to Ethiopia's rural communities. Its founder and CEO, **Rekik Bekele**, shared how her experiences growing up in Addis Ababa and later working in rural areas, exposed her to the challenges of electricity access in off-grid communities and motivated her to actively expand energy access in these areas. Today, Green Scene Energy has installed over 1 MW of mini-grid solar PV, 1.55 MWh of battery storage, and launched "Green Cook Ethiopia", a Pay-As-You-Cook initiative that empowers households to switch from biomass to solar-powered cooking in a flexible, affordable, and innovative way (Green Scene Ethiopia, n.d).

She reflects, "I came to see challenge as opportunity. Ethiopia is not just Addis Ababa-the reality of the country is rural and largely off-grid. If I hadn't dared to go beyond the capital and see that for myself, I probably wouldn't be in the energy sector today. I might have remained an employee, moving between jobs in the city. By going into rural areas, I saw the real gaps, the real needs, and a real chance to build solutions that matter."

Box 5: Successful Story – Green Scene Energy

Green Scene Energy **pioneered Ethiopia's first locally manufactured induction stove**, branded ቶሎ ምድጃ–TOLO Stove, by establishing **the country's first dedicated manufacturing and assembly facility** for modern clean electric cooking technologies.

The company manufactures a range of clean cooking solutions for household, commercial, and institutional use, including single and double burner stoves, solar-powered stoves for off-grid settings, and higher-capacity cooking systems. They currently produce approximately 90 stoves per day on a single shift and up to 200 stoves per day with two shifts. The products are certified by the Petroleum Energy Authority, achieve an energy efficiency of 87%, and are associated with cost savings of up to 50% for end users, compared to traditional cooking fuels.

(Green Scene TOLO Stove, 2026)

IV. Energy-related Education

4.1 Women education as a catalyst for the energy transition

Energy-related education refers to the formal, non-formal, and informal learning pathways that equip individuals with the knowledge, skills, and competencies required to participate meaningfully in energy systems. In the context of the energy transition, such education extends beyond traditional engineering and science disciplines to encompass renewable energy technologies, energy policy and governance, climate science, energy economics, digital systems, entrepreneurship, and community energy management.

For women, energy-related education is a critical enabler of participation, leadership, and agency within a sector that has long seen a limited participation of women (IRENA, 2023). According to the International Energy Agency, women's leadership in the global energy sector increased from approximately 13% in 2015 to about 18% in recent years, reflecting gradual gains driven by policy reforms, education initiatives, and workforce development efforts (IEA, 2024).

While many energy access initiatives continue to frame women primarily as end-users or beneficiaries, **energy-related education could reframe women as producers, innovators, system designers, and leaders within the energy transition.** This shift is essential for ensuring that women are not only included in energy systems, but are also empowered to influence the design, governance, and long-term sustainability.

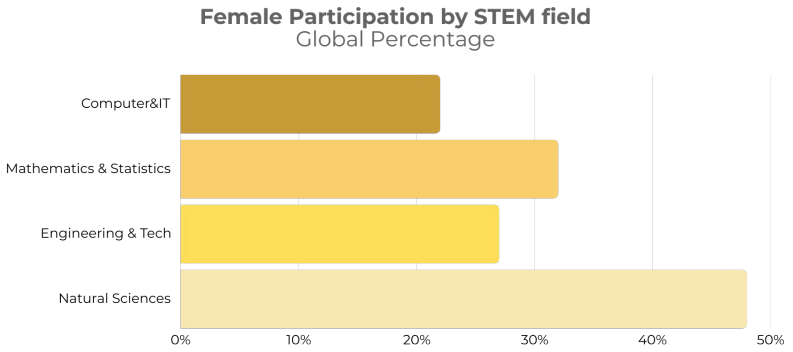
AI-generated image for illustrative purposes (OpenAI, 2026).

The scale of opportunity within the energy transition further underscores the importance of inclusive education. According to the World Energy Employment Report (2025) by the IEA, **energy employment expanded at almost twice the pace of overall global job growth in 2024**, increasing by 2.2% to a total of 76 million workers (IEA, 2024). Importantly, the energy industry has generated more than 5 million new jobs since 2019, accounting for about 2.4% of all jobs created globally over the past five years (IEA, 2024).

This transformation presents a unique opportunity to reskill and upskill a diverse and balanced workforce. **Ensuring women's meaningful participation through targeted education and training can accelerate innovation, strengthen institutional capacity, and speed up the pace of the energy transition**. Crucially, this process must begin with equitable access to education.

Patterns of Women's Participation in STEM Education

Figure 10: Female Participation by STEM field (Global %)



UNESCO. (2025). Global Education Monitoring Report 2024

Limited participation of **women** in STEM fields constrains pathways into the **energy sector**.

Globally, women comprise roughly half of the world's population, their presence in **in energy-related education worldwide, particularly within STEM fields** is still limited (IRENA, 2025).

Women are nearly equally represented in natural sciences (~48%) but remain less dominant in engineering, technology (~27%), mathematics (~32%), and IT (~22%).

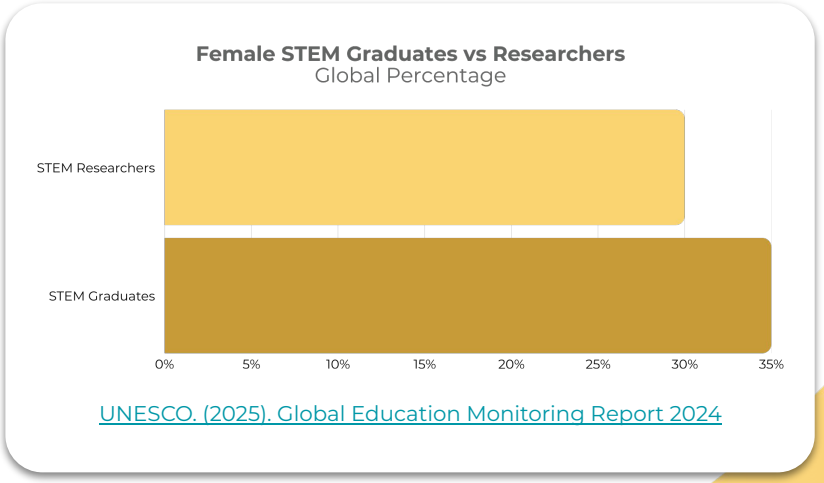
Since energy-related education heavily relies on engineering and technical disciplines, this uneven distribution underscores the limited pipeline of women entering the sector.

While women constitute 35% of STEM graduates, only 30% progress into research roles.

This gap is attributed to systemic barriers, including institutional bias, workplace cultures in which women remain underrepresented, and the disproportionate care burden placed on women, all of which contribute to attrition along the education-to-research pipeline.

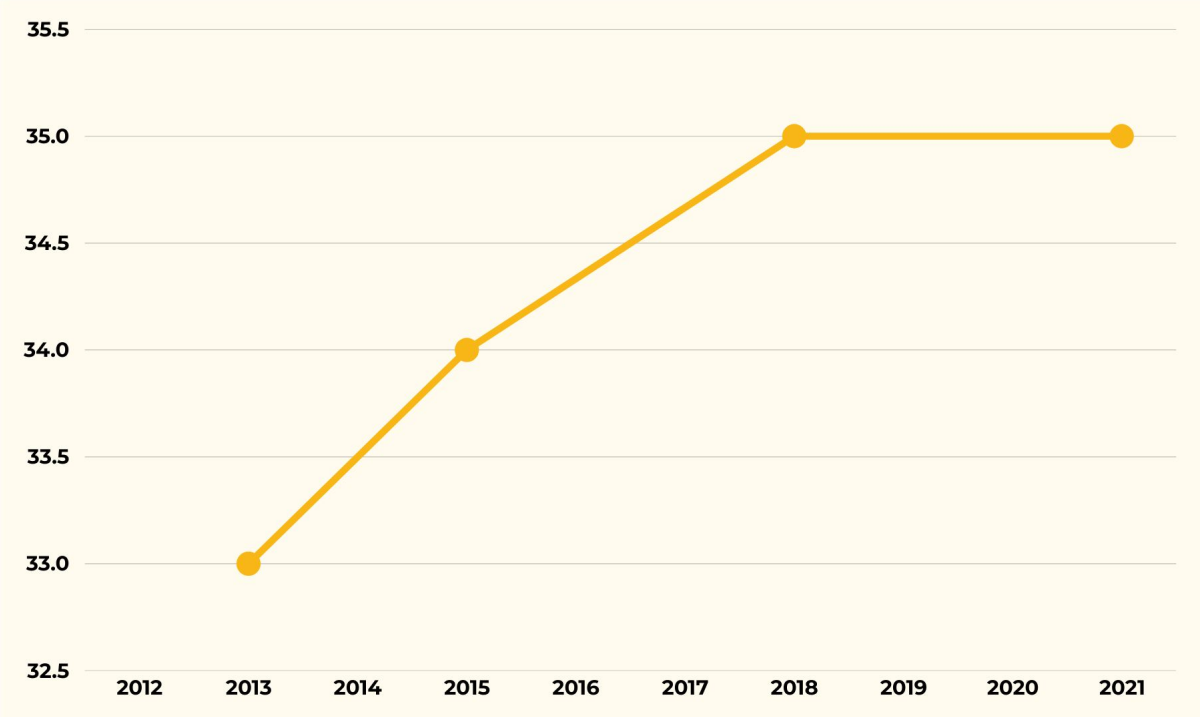
This “leaky pipeline” illustrates that female representation decreases at higher levels of education and research, limiting women’s influence in technical, policy, and leadership roles in energy systems.

Figure 11: Female STEM Graduates vs Researchers



UNESCO. (2025). Global Education Monitoring Report 2024

Figure 12: Female STEM Graduates (%)



UNESCO (2023); UNESCO Institute for Statistics (UIS) (2024)

The proportion of women graduating in STEM fields globally has remained largely stagnant over the past decade, rising only slightly from 33% in 2013 to 35% in 2023.

This highlights persistent gender disparities in education that feed into energy-related technical fields.

4.2 Women participation in STEM remain low and constrained

Women's participation in energy-related education and training across Africa remains **uneven, fragmented, and significantly constrained**, reflecting persistent gender barriers in educational systems (UNESCO-Gender Barriers in Education, 2024).

Women's participation in STEM disciplines across the continent remains **lower than the global average**, and their representation **declines sharply at higher levels** of education (World Bank (2022). Girls' Education and STEM in Africa).

Women constitute less than 25% of engineering students in many African countries, with even lower participation in energy-specific technical programmes (UNESCO, 2023). This imbalance limits women's entry into technical energy education, which is foundational for roles in power generation, transmission, renewable energy deployment, and energy systems design.

Africa's energy transition is unfolding within a landscape marked by persistent energy access deficits, structural inequality, and rapid demographic growth. Expanding access to energy technologies must be paired with **building local technical, managerial, and governance capacities** for renewable and decentralized energy systems.

Technical and Vocational Education and Training (TVET) is a critical pathway for equipping Africans with **practical skills essential to the energy transition**, including: Solar PV installation and maintenance, Mini-grid development, Electrical wiring and energy efficiency services, and Clean cooking technologies

Despite its importance, women's participation in energy-related TVET remains consistently low:

- Women account for **less than 20–25% of enrollment** in most technical and energy-focused TVET programmes across SSA.
- **Gender stereotypes, safety concerns, lack of role models, and limited access to finance** continue to discourage women from pursuing technical trades.

Initiatives such as **solar technician training for women, community energy enterprises, and clean cooking projects** have successfully enabled women to acquire and apply technical energy skills, highlighting the effectiveness of interventions that address structural and social barriers (UNESCO-UNEVOC, 2025).

RES4Africa and Enel Foundation n.d.

4.3 Energy-related education in East Africa

Women in East Africa are actively contributing to this transition as professionals, entrepreneurs, and community energy advocates, even as they navigate persistent barriers to participation. For example, studies show that women account for only about 31.6 % of STEM graduates in Sub-Saharan Africa and a smaller share of those entering energy-related technical fields, highlighting both the challenge and the potential for growth in women's representation in energy sectors (World Bank blog analysis, 2025).

In initiatives like Technical and Vocational Education and Training (TVET) partnerships across Kenya, Tanzania, and Ethiopia, employment rates for female graduates have improved significantly, rising from around 51 percent to 74 percent in some programmes, demonstrating how aligned training and industry engagement can expand opportunities for women in energy-relevant skills and careers (World Bank TVET project report, 2025).

Understanding the interaction between energy sector development, skills systems, and women's participation is critical for building an inclusive and equitable energy transition across Kenya, Tanzania, and Ethiopia. Such an approach not only strengthens gender equity but also enhances innovation and economic growth in the evolving energy landscape of East Africa.

Box 6: Technical and Vocational School on Decentralised Renewable Energy

The Technical and Vocational School on Decentralised Renewable Energy Systems is an initiative supported by **Enel Foundation** and implemented by **RES4Africa** and aims at creating a skilled and conscious workforce to deploy renewable energy solutions.

Formerly called **Micro-Grid Academy**, the school was launched in 2018 in Nairobi with the goal of training people ranging from community technicians to project managers, developers, engineers, and students. To date, 2,100 students have been trained, of which 67% are men and 33% women, with an average age of 31 years. The majority of training modules have been delivered in East Africa, particularly in Kenya (13 modules), Eritrea, Ethiopia, and Uganda.

The curriculum, also registered under the Kenyan National Industrial Training Authority (NITA), consists of 4 modules. It equips participants with a comprehensive set of skills necessary to successfully design, develop, manage, and operate decentralised renewable energy projects, through interactive modules led by experts across the renewable energy value chain.

4.4 Women in STEM in Kenya

Women's participation in STEM and energy-related education pathways in Kenya remains limited. As of the early 2020s, women account for **approximately 22% of university students enrolled in STEM programmes**, reflecting persistent gender gaps at the tertiary level (Teachers Updates, n.d.).

This imbalance is particularly pronounced in engineering and ICT disciplines, which form the core educational pipeline into the energy sector. The disparity becomes more pronounced along the education-to-employment continuum. Registered female engineers constitute **about 11% of the professional engineering workforce**, illustrating the constrained transition from STEM education into licensed technical practice (Teachers Updates, n.d.). National labour statistics further indicate that women make up **around 30% of STEM professionals overall**, with significantly lower participation in engineering, energy systems, and information and communications technology (Kenya National Bureau of Statistics, cited in Kenya Times, n.d.).

These patterns reflect enduring structural and socio-cultural constraints, including gender norms, limited access to mentorship, and insufficient institutional support at key transition points from education to professional certification and employment. Together, these factors continue to narrow women's participation in Kenya's technical and energy-related workforce, despite broader gains in educational access.

Additionally, the World Bank supported TVET reforms implemented across Kenya show encouraging outcomes. Female graduate employment rates in participating TVET institutions increased from **approximately 51% to 74%** reflecting improved alignment between training programmes and labour market demand (World Bank, n.d.). In Kenya, enrolment in flagship TVET institutions expanded significantly, with **nearly 19,000 women enrolled**, signalling progress in access to vocational education (The Star, n.d.) all towards women in energy related education.

4.5 Women in STEM in Tanzania

Tanzania has experienced some positive developments in women's participation in STEM fields, though important gender gaps remain across higher education. Official education stakeholders have highlighted that **a significant share of female students are engaged in STEM disciplines**, with the government reporting that approximately **36 % participation of women and girls**, a rate that compares favourably to some regional peers and reflects ongoing efforts to expand inclusion in science and technology education (Daily News Tanzania, 2025).

Despite such progress, independent academic research points out that gender parity in STEM enrollment remains narrow. Overall, women continue to be less likely than men to pursue core STEM degrees such as engineering, manufacturing, physical sciences, and mathematics. Longitudinal analyses of higher education institutions indicate that although total student enrollments in STEM programmes have grown, **gender parity gaps persist sharply within STEM at the tertiary level** (Breda & Ly, International Journal of Educational Development, 2025).

Government and education sector reporting suggests that **female representation in science programmes has historically been low**, and despite policy initiatives to broaden participation, women still make up a minority of students in several STEM disciplines, a reflection of underlying socio-cultural and systemic barriers (World Bank data; The Citizen, 2025).

With respect to **TVET programmes** in Tanzania, female enrollment remains significantly lower than male participation. Existing analyses highlight that persistent gender stereotypes, such as the perception that technical and engineering roles are unsuitable for women, continue to discourage female participation. In addition, limited mentorship opportunities and unequal access to resources which include funding, training materials, equipments and professional networks that support women in technical and vocational pathways, further constrain women's ability to pursue and succeed in technical and vocational pathways (Association of Tanzania Employers policy brief on TVET gender inclusivity).

Despite initiatives such as gender inclusion workshops and advocacy led efforts to increase women's visibility in technical training, comprehensive gender disaggregated data on TVET outcomes are limited. Available evidence clearly shows that women continue to face multiple barriers from societal expectations and discriminatory practices to institutional and structural challenges that hinder their access to and completion of TVET programmes, particularly those that equip learners with skills relevant to emerging sectors such as renewable energy, electrical engineering, and other technical fields critical to Tanzania's evolving energy landscape.

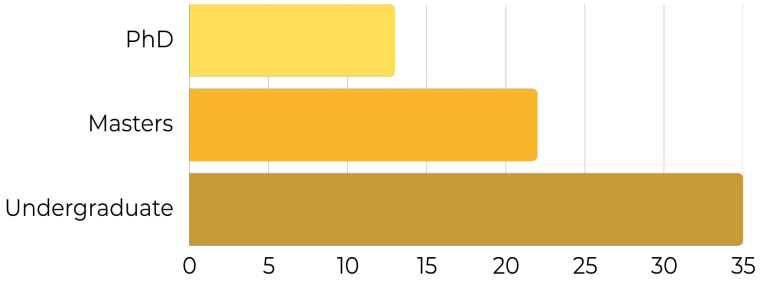
Addressing these challenges requires not only policy reforms but also targeted investments in mentorship, financial support, and infrastructural resources that can help bridge the gender gap in technical training and the labour market.

4.6 Women in STEM in Ethiopia

Evidence indicates that women in Ethiopia are significantly less likely than men to participate in STEM education and careers. Female students make up a minority of higher education STEM enrolments, particularly at postgraduate levels, and women represent a very small proportion of teaching and research staff in science and technology institutions. These disparities reflect structural and socio-cultural barriers that restrict women's pathways into technical and scientific fields (UN Women in its Ethiopia Gender Profile, 2024).

Also, research on academic gender inequality in Ethiopian STEM universities shows **very low female representation among academics**, e.g., only approximately 6.1% and 16.7% female full-time teaching staff at two science & technology universities namely Adama University and Addis Ababa University of Science and Technology, confirming a *substantial gender gap* in STEM education and careers (Women's studies International Forum, 2023).

Figure 13: Female University Enrollment in STEM (%)



(UN Women, 2024)

Although specific gender-disaggregated TVET enrolment data for Ethiopia are limited, evidence from the World Bank–supported East Africa Skills for Transformation and Regional Integration Project (EASTRIP) demonstrates that **female participation in technical training can increase significantly when programmes are aligned with industry needs and supported through institutional collaboration.** Across the 16 Regional Flagship TVET institutes, **female graduate employment improved from approximately 51 % to 74 %**, and overall enrolment of female students expanded markedly, signalling progress in access to technical skills relevant to energy transition pathways (World Bank, 2025).

IV. Energy-related Education

Policy Recommendations for East Africa

Based the desk research and on the insights provided by **Dr. Murugi Ndirangu**, a set of integrated policy measures can be introduced to strengthen women's participation across STEM and TVET pathways.

Early STEM and TVET engagement programmes

Policy frameworks should support early and sustained engagement of girls in STEM and TVET pathways, starting at primary school levels. This includes the introduction of mentorship schemes and hands-on learning activities that expose girls to science, technology, and practical energy-related skills. This could be achieved through partnerships with technical institutions, utilities, and local energy projects to help normalize women's participation in both academic and vocational tracks, to build confidence since early ages, and to expand awareness of diverse education and career opportunities for women in the energy sector.

Education system reforms

Education policies should promote teaching approaches that emphasize active learning, critical thinking, creativity, and problem-solving across both STEM and TVET curricula. In energy-related fields, this includes the integration of opportunities for applied learning, research and laboratory work, apprenticeships, and industry projects that reflect real-world energy challenges. Aligning academic and vocational curricula with the needs found in the labor market can help ensure women acquire relevant and transferable skills and are better prepared to transition into technical and professional roles within the energy sector.

Supportive structures for women in higher education

Governments and institutions should strengthen support systems that enable women to persist and advance in higher education. Taking measures such as targeted scholarships, flexible learning schedules, childcare support, and structured mentorship for women pursuing advanced degrees and research in energy-related fields. Such supports are particularly important for women balancing education with caregiving responsibilities and can significantly improve retention and completion rates.

Public awareness and advocacy

Public awareness and advocacy initiatives should highlight the value of women's participation in energy-related STEM and TVET professions by showcasing diverse role models and career pathways. Campaigns can help shape inclusive public narratives around technical and vocational careers, elevate women's achievements, and encourage girls and young women to pursue careers in the energy sector. Aligning these efforts with national education and energy strategies can reinforce their impact and sustainability.

Workplace gender equity measures

Policies should encourage energy organizations (but also organizations in every sector) to prioritize the creation of inclusive workplace cultures that actively value women's contributions, so to encourage them to pursue energy careers and enroll in energy-related studies. This requires moving beyond from formal equality commitments to address everyday practices, norms, and power dynamics shaping women's experiences in academic, TVET, and professional energy spaces. Concrete actions must include leadership accountability for inclusion outcomes, mentorship and peer-support networks, visible recognition of women's technical contributions, and safe trusted mechanisms to ensure women's safety in the workplace. Embedding these requirements into accreditation standards, public funding criteria, or institutional performance assessments can help sustain cultural change.

V. Employment and Leadership

5.1 Global progress, yet persistent parity gaps

Globally, energy employment expanded at almost twice the pace in 2024, increasing by 2.2% to a total of 76 million workers (IEA, 2025). The electricity sector has emerged as the largest employer within the energy industry, overtaking fuel supply. Over the past five years, employment across electricity generation, transmission, distribution, and storage has grown by about 3.9 million jobs, accounting for nearly three-quarters of total energy job growth. **Solar PV has been the main driver, responsible for roughly half of new electricity sector jobs since 2019**, while nuclear power, electricity grids, and storage together have contributed around a quarter (IEA, 2025).

The International Renewable Energy Agency (IRENA) estimates that the **global renewable energy workforce**, which stood at 16.2 million jobs in 2023, **could grow to around 30 million by 2030 and approach 40 million by 2050**, reflecting the accelerating pace of the global energy transition(54% projected growth 2023-2030) (Renewable energy: A gender perspective. IRENA, 2025).

Women's equal participation to labor force will contribute to this transition making it more resilient, equitable and enduring. As traditionally primary managers of household energy, women bring firsthand insight into energy poverty and its social impacts, which inform more effective, inclusive solutions (Hyder, 2024). Women's involvement could enhance innovation and governance by bringing diverse perspectives and skills to decision-making, leading to solutions that address societal needs.

Research shows that sectors and companies with higher female representation are more likely to create an inclusive and supportive work environment (IEA, 2024) reducing gender gaps and meeting the growing needs in the renewable energy industry.

AI-generated image for illustrative purposes (OpenAI, 2026).

The energy industry has traditionally been male-dominated. The transition to clean energy is beginning to shift this imbalance, with **renewable sectors proving more gender-inclusive than fossil fuel industries**. According to the World Energy Employment 2025 report by the International Energy Agency, with analytical support from the Enel Foundation, **women now hold around one in five jobs in the energy sector, which is about half their share in the wider economy** (IEA, 2025). This proportion has remained relatively stagnant in recent years, largely because the fastest employment growth is occurring in technical and trade roles, such as electricians, welders, and line workers, where women represent fewer than 5% of workers.

Women's participation is notably higher in certain segments, including scientific research (45%) and electrical equipment manufacturing (27%) (IEA, 2025). **Representation in senior leadership has improved**, growing faster than the economy-wide average since 2015. **Progress has been strongest in renewable energy** and nuclear power, modest in oil and gas, and declining in coal. As a result, women now hold 18% of leadership roles across the energy sector, up from 13% in 2015, an important gain, though still below the global economy-wide average of 25% (IEA, 2025).

As **more women are enrolling in STEM programmes**, more female are working in technical fields. In 2024, women accounted for 28.2% of the global STEM workforce. Their representation in research remains particularly limited, with women holding less than one-third of research positions worldwide (Society of Women Engineers, 2025).

At the same time, increasing women's participation in vocational and technical training is equally important. Yet, women participation remain significantly underrepresented in these occupations (IEA, 2024).

Women contribute across the entire energy value chain and many concrete examples can be found in settings where energy access remains a challenge.

Looking at off-grid and rural contexts across the world, **women are driving the uptake of clean cooking technologies, community solar systems, and last-mile energy distribution,** reducing reliance on harmful fuels and strengthening the sustainability, reach, and resilience of the energy transition itself. The future of renewable energy must be **shaped by all and delivered for all**: the greatest measure of success does not lie in the megawatts installed, but in the lives that renewable energy empowers and transforms.

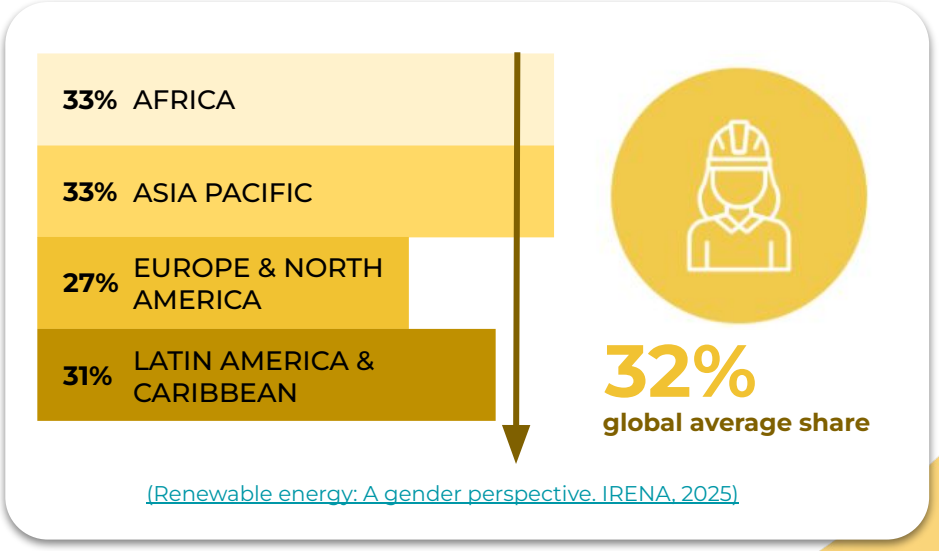
AI-generated image for illustrative purposes (OpenAI, 2026).

Across the world's regions, the share of women in renewable energy employment remains clustered around the 32% global average.

Africa and Asia-Pacific reported female participation levels that are slightly above average (33%), while Europe and North America recorded the lowest levels (27%) (Renewable energy: A gender perspective. IRENA, 2025).

These figures confirm that **gender disparity in the renewable energy workforce is a global issue and must be addressed at global, regional and national levels.**

Figure 14: Proportion of Women in Full-Time Renewable Energy Employment, by Region



(Renewable energy: A gender perspective. IRENA, 2025)

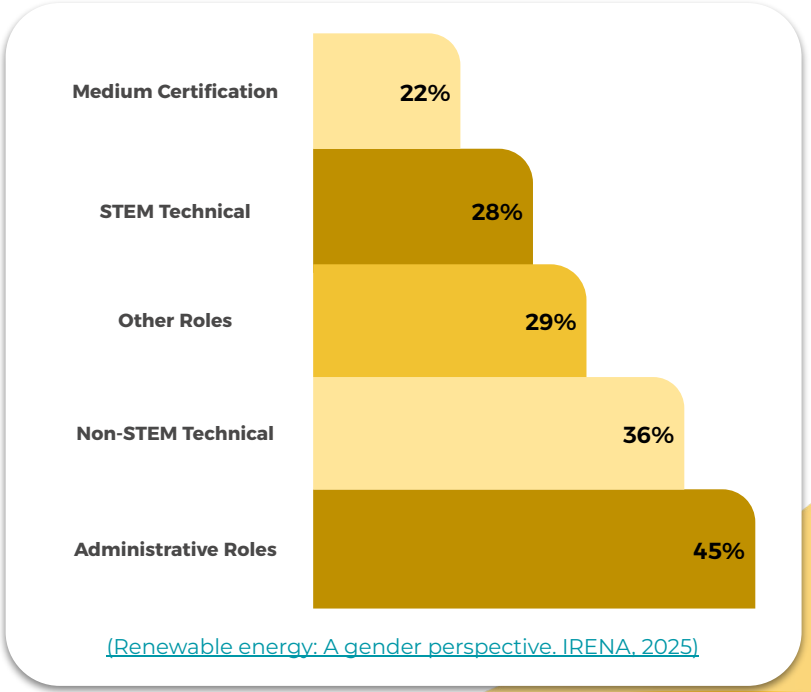
Globally, women's representation in the renewable energy industry is uneven across job categories, with 45% holding administrative jobs, 36% in non-STEM technical positions and **only 28% in STEM-related roles** (Renewable energy: A gender perspective. IRENA, 2025).

The lowest shares of female employment are 22% for medium-skilled roles such as installers, construction workers and machine operators.

According to IRENA, women remain absent at the decision making positions: **26% of middle managers are female, as are only 19% of senior managers or board members** (Renewable energy: A gender perspective. IRENA, 2025).

This imbalance illustrates the persistence of a "glass ceiling" that limits women's influence on strategic and technical aspects of the energy transition.

Figure 15: Proportion of Women in Full-Time Renewable Energy Employment, by Role



(Renewable energy: A gender perspective. IRENA, 2025)

Gender gap in wages

According to a 2022 report by the IEA, in the clean energy sector, **wages for female employees are almost 20% lower than for male employees,** with this gap increasing with age. Significantly, the wage gap remains largely unchanged even after accounting for differences in ability, education and experience. This suggests that the disparity is not driven by gender-based variations in skill levels (IEA, 2022).

The same report found that **the gender wage gap is higher for high-skilled workers.** This may reflect both general barriers to accessing high-wage positions within firms, often referred to as the 'glass ceiling', and wage disparities for work of equal value. These disparities may stem from factors such as individual bargaining power, discrimination, and the role of professional networks, where women often face disadvantages. (IEA, 2022). This inequality in pay reflects systemic gender bias or structural inequalities in how men and women are paid or promoted within the clean energy industry.

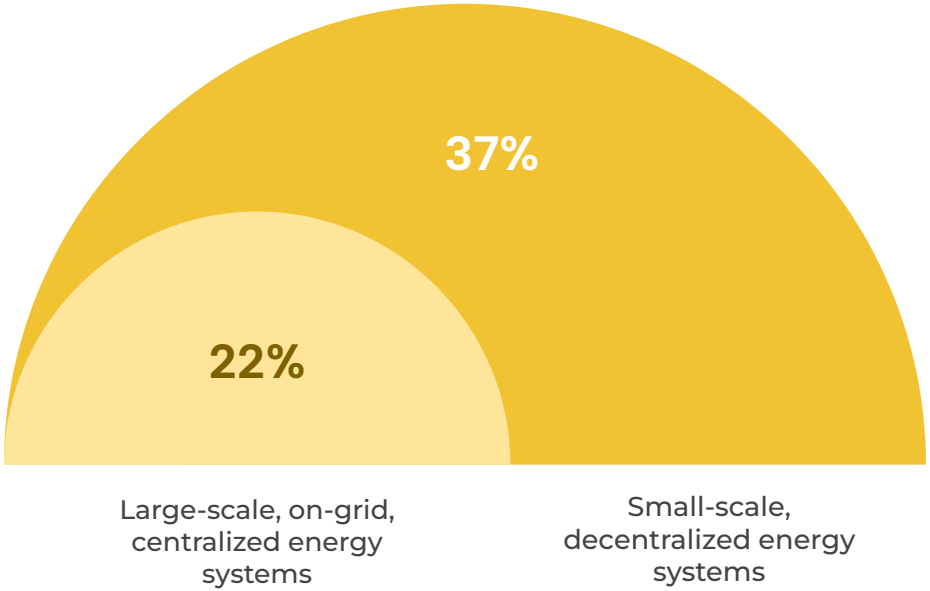
AI-generated image for illustrative purposes (OpenAI, 2026).

5.2 Women participation in energy labor force in Africa

In **Africa**, findings from a 2022 World Bank report show **promising levels of women's participation in the renewable energy sector, particularly in leadership roles**. The report indicates that women are more likely to be employed in small-scale, decentralized energy systems (such as mini-grids) than in large, utility-scale projects like hydro, wind, solar, or geothermal plants (Women's Participation in The Renewable Energy Workforce in sub-Saharan Africa. (n.d.). IFC, 2022).

A key barrier to attracting and retaining women in large, on-grid infrastructure projects is the nature of the work itself, which often involves challenging field conditions and roles that demand advanced technical specialization.

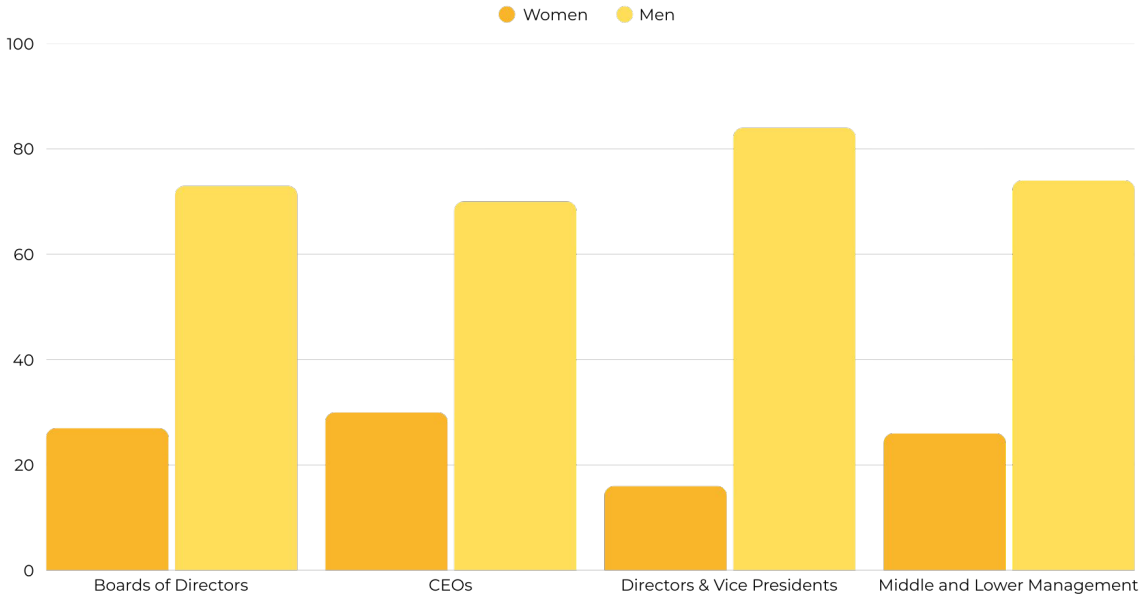
Figure 16: Share of Women in Full-Time Roles across Renewable Energy Technologies in Africa



(Women's Participation in the Renewable Energy Workforce in Sub-Saharan Africa. IFC. 2022)

Looking at RE companies in Sub-Saharan Africa, women accounted for 27% of board members, 30% of CEOs, 16% of vice presidents, and 26% of middle- and lower-level managers (Women's Participation in The Renewable Energy Workforce in sub-Saharan Africa. (n.d.). IFC, 2022). However, while women made up roughly one-third of full-time employees in renewable energy companies, they were **largely concentrated in corporate support roles rather than in core technical and operational positions** that typically form the pathway to senior leadership.

Figure 17: Women in Leadership in RE Companies in SSA



(Women's Participation in The Renewable Energy Workforce in sub-Saharan Africa. (n.d.). IFC, 2022)

5.3 Two main barriers: Policies and skills

Absence of policies

The absence of gender-responsive workplace policies continues to limit women's entry, retention, and advancement in the renewable energy sector. Women commonly face unsupportive work environments, bias in recruitment and promotion, and ongoing risks of harassment and violence at work (Women's Participation in The Renewable Energy Workforce in Sub-Saharan Africa. (n.d.). IFC, 2022).

In Sub-Saharan Africa, these barriers do not exist in isolation. **They are reinforced by wider social and economic inequalities**, as women in the region are more likely to live in poverty and have reduced access to resources, decision-making power, and professional networks. These constraints are further shaped by intersecting factors such as class, ethnicity, age, and social norms, deepening exclusion across the energy value chain.

An IRENA survey reveals a clear **gap between perception and lived experience**. While only 41% of male respondents believed that women face gender-related barriers at work, 60% of women reported having experienced such obstacles firsthand (Renewable energy: A gender perspective. IRENA, 2025). This disconnect highlights how gendered challenges are often underestimated by those who do not encounter them directly.

In the Sub-Saharan Africa, the energy workforce is already constrained by skills shortages and structural inequality. The failure to recognise these barriers undermines efforts to attract, retain, and advance women. **Addressing this barrier requires stronger gender-responsive policies, clearer accountability mechanisms, and workplace practices that actively support women's participation and progression.**

The survey's results showed that women face different challenges at each stage of their careers, but **the obstacles get tougher the further they progress**. Barriers are lowest at the recruitment stage, grow during retention, and peak when women try to advance into leadership roles.

Notably, **workplace-related issues,** such as culture, bias, and lack of support, were identified as **the biggest hurdle for women overall**, while skills and education were seen as far less limiting.

Anna Clements, a researcher with Modern Energy Cooking Services in Tanzania, clearly underscores the decisive role of cultural and supportive factors. She reveals the flip side of the argument: when these factors work in favour, they can become enablers of empowerment.

With a UK doctorate and a Master's degree in Engineering, she acknowledges that her academic background helped propel her career. Still, she noted that a key contributing factor that shifted her trajectory was the encouragement and mentorship she received from senior male colleagues. Their support created space for her to grow, especially in her early career, and **helped reshape the workplace culture** so she no longer felt like an outsider in a male-dominated environment. As she puts it, "It's important for those that have more intrinsic structural power to ceed it. That's where greater awareness needs to be driven."

Male and female respondents also differed in how they understood the barriers women face. Men were more likely to attribute women's underrepresentation to societal norms, such as expectations around caregiving, mobility, and women's roles in technical work.

Women, however, pointed more directly to **workplace practices, including limited flexibility, weak support from supervisors, exclusion from informal networks, and unclear pathways for progression** (Renewable energy: A gender perspective. IRENA, 2025).

Additionally, results showed that **retention-related barriers were rated significantly higher** than those affecting recruitment or advancement, suggesting that **strengthening retention efforts may be the most effective way to improve gender balance in the sector**. Effective retention strategies include flexible work arrangements for site-based roles, transparent promotion criteria, mentorship and sponsorship programmes, safe reporting mechanisms for harassment, and family-friendly policies such as parental leave and childcare support.

Practical constraints also play a role in driving women to leave their jobs: inadequate facilities, strict mobility or relocation requirements, and inflexible work schedules tend to affect women far more than men. **Biased hiring and hostile work environments** remain persistent challenges in the energy sector. World Bank noted that limited childcare options and expectations around travel and mobility significantly restrict women's ability to stay and grow in their roles (Renewable energy: A gender perspective. IRENA, 2025).

These obstacles are not unique to renewable energy, but they are more pronounced in a field where women have historically had a limited presence, is highly technical, and relies heavily on field-based work.

Policy and practices limiting women participation in the workplace

Policy barriers affecting women are wide-ranging and closely linked to social and educational constraints. While not exhaustive, particularly for Sub-Saharan Africa, this summary reflects the key challenges identified in IRENA's Gender Perspective Report (2025):

- **Biased hiring practices** during recruitment, gender-biased language in job adverts, subjective interview processes, and homogenous selection panels.
- **Rigid working arrangements** including lack of flexible schedules, remote work, or job-sharing opportunities.
- **Invisible barriers to progression** such as structural obstacles that restrict career advancement, disproportionately affecting women and under-represented groups.
- **Limited family-supportive policies** in particular inadequate provision of parental leave, childcare, and facilities for breastfeeding and caregiving.
- **Hostile or exclusionary work cultures** marked by discrimination, marginalization, or harassment.
- **Mobility and relocation demands** when it comes to transfers, rotations, or travel without consideration of gender-specific safety and transport needs.
- **Weak national legal frameworks** highlighting insufficient government policies to enforce equal opportunity, prevent discrimination, and support work-life balance.

Addressing the skill gap

Workforce development for the energy transition must go beyond job creation to include sustained investment in education and training, including reskilling and upskilling through universities, vocational programmes, apprenticeships, and on-the-job learning.

This requires close coordination between industry and training institutions to ensure skills align with labour market needs, while supporting fossil-fuel workers to transition into new roles without being left behind (International Renewable Energy Agency & International Labour Organization, 2026).

Across the wider economy, demand for applied technical workers rose by 16% between 2015 and 2022, while completions from relevant vocational training programmes increased by just 9% (IEA, 2024). This growing gap is now **directly constraining the energy sector, as employers face increasing difficulties in recruiting and retaining the skilled workforce required**. The skill gap further threatens to hinder the global transition by impeding progress, limiting effective execution and implementation of projects. To avoid a deepening skills mismatch by 2030, the global number of graduates entering the energy sector would need to increase by approximately 40% (IEA, 2025).

Further, artificial intelligence is increasingly enhancing productivity in the energy sector, particularly by improving administrative efficiency and system performance, with early applications supporting permitting, safety, and training through tools such as virtual reality. However, these advances do little to address critical shortages in applied technical roles, as **AI-skilled workers remain around 40% less prevalent in energy than in sectors such as technology and finance** (IEA, 2025).

Although investment in AI capabilities is growing, current applications have limited impact on reducing demand for largely manual roles in construction, operations, and maintenance.

While this challenge is global, it is particularly relevant in East Africa, where scaling renewable energy projects must go hand in hand with building local capacity and addressing gender disparities in the workforce. **Jeanette Gitobu, director of the Women in Wind Global Leadership Programme** at the Global Wind Energy Council says, “we have a lot of work to do to be able to not just increase the number of projects in the region, but at the same time, make sure that **we’re giving women the technical skills and the professional development networks, and also the personal and professional skills they need to be able to thrive and engage with this sector**.”

Investing in accessible skilling, reskilling, and upskilling programmes is critical to enabling an inclusive energy transition. The International Labour Organization highlights the importance of curricula grounded in universal design, training environments that are both physically and digitally accessible (International Renewable Energy Agency & International Labour Organization, 2026).

(Global Wind Energy Council, n.d.)

5.4 Decentralized renewable energy booming in East Africa

(Skierka, K. 2022)

East Africa's renewable energy potential is significant yet remains underutilized. As the region advances toward universal energy access by 2030, the transition offers major opportunities for economic growth, job creation, and improved livelihoods.

The decentralized renewable energy (DRE) sector is pooling workforce particularly in Kenya, Uganda, and Ethiopia. In 2021, Kenya's DRE industry employed approximately 50,000 people, compared to 30,000 in Uganda and 14,000 in Ethiopia (Skierka, K. 2022). Looking ahead, **green employment is expected to expand substantially**:

Financial Sector Deepening (FSD) Africa projects a 22% increase in green jobs by 2030, with Kenya's solar sector alone anticipated to generate more than 110,000 jobs, Ethiopia's hydroelectric sector around 33,000 (Forecasting Green Jobs in Africa - FSD Africa, 2025), and Tanzania's solar PV industry expected to employ 20,000 people (Renewables Readiness Assessment for the United Republic of Tanzania, 2017). This growth underscores the pivotal role of renewable energy in shaping the region's economic future.

IRENA's Renewable Energy and Jobs 2024 report shows that **women hold a substantial share of roles in decentralised solar PV,** with 41% in Kenya, 37% in Ethiopia, 35% in Nigeria, and 28% in Uganda (Renewable energy and jobs. Annual review 2024. IRENA, 2024).

Benedetta Giugliano observes, "Looking at our companies, colleagues, and professional networks, women in the energy sector in Tanzania, Ethiopia, and Kenya are still largely concentrated in **corporate support roles such as administration, sales, and marketing**. Kenya stands out among the three countries, with women making up roughly 40% of the renewable energy workforce across both the public and private sectors, which is a strong figure. Ethiopia follows closely, with an estimated 30-40% of renewable energy jobs held by women, many of whom are engaged in clean cooking programmes and local energy enterprises. In Tanzania, the data is less clear and women's participation appears lower, though there is growing momentum through emerging women's networks that are actively advocating for greater inclusion in the sector. **While these numbers are encouraging, they also highlight a persistent gap: women remain significantly underrepresented in senior and leadership positions.** In fact, when it comes to women in top decision-making roles across these countries, the number is still small enough to count on one hand."

Women represent 20% of the workforce in Tanzania's energy industry. They also occupy 50% of ministerial-level positions (Deputy Minister and Permanent Secretary in the Energy Sector) (ENERGIA, 2020).

As of 2020, women represented just 20% of the workforce in the Ethiopian Electric Utility (EEU) — 3,270 women total, and they held only 9% of leadership positions (The World Bank, 2020).

35% of the total staff and 15% of the leadership positions in Kenya's Ministry of Energy's headquarters are filled by women (ENERGIA, 2020).

V. Employment and Leadership

Policy Recommendations for East Africa

Skills interventions

Skill development is crucial for **bridging the urgent skill gap** that is threatening the pace and the quality of the energy transition. To address existing skills gaps, every plan for new renewable energy capacity should include a clearly defined strategy for **sourcing, training, and deploying the required talent**. Achieving this will require strong coordination between education and training institutions, technical and vocational centres, accreditation bodies, employment services, and industry stakeholders.

Jeanette confirms this, adding that the Women in Wind initiative is set up in three deliverable formats: (1) One-on-one mentorship, (2) networking events and a (3) 12-month programme that includes a Europe study tour for benchmarking. “In terms of impact statistics, we were founded in 2019. Since then, we have **trained over 110 women. 77% of them have progressed in their careers, and 71% took up leadership roles**.” She adds, “The question is how we create clear and accessible pathways, particularly at university level, so students know how to enter sectors like wind energy and take advantage of the opportunities emerging there. One of the biggest conversations in the industry today is the skills gap: we need a capable workforce to deliver the energy transition, but we simply don’t have enough people with the right skills. According to the Global Wind Workforce Outlook 2025–2030, **by 2030 the global wind industry will require around 628,000 trained technicians** in just the construction, installation, operations and maintenance segments to meet projected deployment and fleet growth—**a roughly 50% increase in demand over current levels. This is where women can step in—not because they are women, but because they are highly capable.** Women represent an untapped, or minimally tapped, talent pool that can play a critical role in strengthening the workforce and driving the energy transition forward.”

Further, **enhancing TVET programmes by aligning their curricula with real industry needs and embedding more work-based learning will give students the practical, hands-on experience required for careers in renewable energy.**

At the same time, investing in the **continuous professional development of teachers and trainers is essential**. Their expertise and confidence directly shape the quality, relevance, and inclusivity of the training students receive (Renewable energy and jobs, Annual review 2024. IRENA, 2024).

According to the World Energy Employment 2025 developed by IEA, targeted outreach and skills-development programmes are helping draw young people into the energy workforce across East Africa. In Ethiopia, Kenya, and Uganda, hands-on training in solar PV design, installation, and maintenance, paired with mentorship and apprenticeships, is building practical skills and creating clearer pathways into long-term careers in the renewable energy sector (IEA, 2025).

To accommodate gender-specific restrictions, it is valuable to **develop in-house training materials that are bias-free and reflect the company's gender equality values**. Additionally, training logistics should be designed to accommodate gender-specific needs, such as family responsibilities, by offering sessions during office hours, online participation, and on-demand, pre-recorded options (Women's Participation in The Renewable Energy Workforce in sub-Saharan Africa. (n.d.). IFC, 2022).

(Global Wind Energy Council, n.d.)

Progressive monitoring and evaluation

Currently, countries across East Africa have established robust policies and strategic frameworks aimed at **strengthening institutional capacities for gender mainstreaming within the energy sector**. These frameworks are designed to ensure that gender equality is systematically integrated throughout the entire energy value chain, from planning and policy formulation to project implementation and workforce development. These policies explicitly acknowledge the need to enhance women's participation, address gender-based barriers, and promote inclusive approaches to energy access and development. However, enforcement of these policies **remains weak**. Many national frameworks lack strong, long-term and well-designed policies, but rely on broad affirmative action statements rather than sector-specific requirements for the energy industry.

Figure 18: Energy Policies for Gender Mainstreaming in East Africa

ETHIOPIA

- National Sustainable Energy Development Strategy of Ethiopia (2024-2030)
- Gender Equality and Social Inclusion Mainstreaming Guideline
- Ethiopian Gender Development Index (2021)

KENYA

- National Energy Policy (2025-2034)
- Gender Policy on Energy (2019)
- Constitution of Kenya (2010)

TANZANIA

- National Five Year Development Plan (2021/22-2025/26)
- National Energy Policy (2015)
- National Strategy for Gender Development

(International Finance Corporation, n.d.)

Currently accountability is limited, and **gender commitments often become a tick-box exercise rather than a meaningful driver of change.** To strengthen implementation, several recommendations for monitoring and evaluation emerge:

- Senior leadership in government institutions and renewable energy companies should champion gender equality by **endorsing diversity targets** that allow representation of either gender across all organisational levels, including boards, management, technical departments, and higher-paying roles (IFC Women's Participation in The Renewable Energy Workforce in sub-Saharan Africa, 2022).
- Diversity targets should be supported with **dedicated key performance indicators (KPIs)**, adequate budgets, and assigned personnel to drive implementation. KPIs should cascade from senior leadership to all departments to ensure shared responsibility.

Creating fair, inclusive, and supportive work environments

Gender-related barriers in the workplace emerged as the **most prominent challenges women face in the renewable energy sector**. These barriers directly influence women's entry into the field, retention, and progress into leadership, thus **tackling them offers the most immediate and visible impact**. Strengthening workplace practices, therefore, is one of the most effective ways to advance gender equity and ensure the sector fully benefits from women's skills and leadership as the energy transition accelerates.

- Practical measures that make it easier for both women and men to **balance work and family responsibilities**. These include flexible working hours, remote or hybrid arrangements, and part-time options that do not penalise career progression.
- **Family-supportive policies**, such as extended maternity and paternity leave that recognises both parents' roles during early childcare, and accessible, affordable on-site childcare facilities.
- **Building awareness** through regular training sessions that helps employees recognise their unconscious gender biases, including the biases that often women have on themselves, and understand the value of inclusion and cultivate respectful interactions.
- **Enforcing strict safeguards against gender-based violence** with clear policies and confidential reporting channels to address any forms of harassment or microaggressions, backed by firm and consistent disciplinary action.

VI. Entrepreneurship

6.1 Women energy businesses remain low globally

Globally, women-owned businesses have huge potential to boost economic growth. In fact, when they get support from investors, they earn **twice as much revenue for every dollar invested** compared to businesses led by men. (Abouzhar *et al.*, 2018; UN Women & UNIDO, 2023).

Investing in women's entreprises yields substantial societal benefits because women typically **reinvest up to 90% of their earned income back to their families and communities** (Soler (ARE) *et al.*, 2020). Gender diversity on leadership has been empirically linked to stronger environmental performance, with gender-balanced leadership correlating positively with increased innovation, resilience, and competitiveness (IFC, 2019).

These impacts invite a closer look at ***who*** is positioned to translate energy solutions into everyday practice. In many energy markets, adoption depends as much on trust, relevance, and daily routines as it does on technology or finance. This shifts attention toward actors who operate at the intersection of households, communities, and emerging energy systems.

(Gender and Energy Compact, 2023)

> **Women are already powerful agents of change in everyday life.**

~ Benedetta Giugliano, General Counsel at Studio Santi

Supporting women as entrepreneurs, innovators and business leaders in the sustainable energy transition is pivot to achieving the Sustainable Development Goals.

Policy discussions have shifted from viewing women solely as victims of energy poverty to recognizing them as significant agents of change and entrepreneurs (UN Women & UNIDO, 2023).

Women's energy entrepreneurship is defined as involvement in the ownership and management of a business, including micro, small, and medium enterprises (MSMEs), start-ups, cooperatives and community enterprises (ILO, 2025).

The overall ambition within the energy sector, as laid out by The Gender and Energy Compact coalition-led by global multi stakeholders in 2022, is to increase the share of women entrepreneurs, women-led and women-owned business in the sustainable energy value chains **by at least 7% per year globally** , aiming to reach **at least 50% by 2030** (UN Multi-Stake Gender and Energy Compact, 2022).

Women entrepreneurs hold a unique value proposition as they are often the **main energy managers at the household level** and possess a deep, **situated knowledge** of community energy needs, positioning them as pivotal agents of adoption (Soler (ARE) *et al.*, 2020). This local knowledge informs business models that respond accurately to community and end-user demands, especially concerning products like clean cookstoves and solar home systems.

Rekik Bekele, Founder and CEO of Green Scene Energy states that "The main beneficiaries of clean energy are mainly women; of course both men and women benefit, but especially women, because most household energy is used by women".

This understanding allows them to propose and distribute better, more relevant solutions to the communities. It also shapes how energy products are framed, marketed, and integrated into daily life, influencing household decision-making and usage patterns.

Through their proximity to users, women entrepreneurs could play a key role in translating technical energy solutions into practical applications. Their involvement strengthens the connection between energy technologies and lived realities. This positions women entrepreneurs at an interface between energy systems and end users.

Only 11% of start-up founders in the energy sector are women (ESCAP Gender and Energy, 2025), even though women own about **one-third of small and medium-sized businesses worldwide** (UN Women & UNIDO, 2023).

Getting funding is a major hurdle: women receive just **7% of climate-related venture capital** (IEA *et al.*, 2025), and are **63% less likely than men** to secure investment (ESCAP Gender and Energy, 2025). On top of that, women-owned businesses face a global credit gap of **$1.4–$1.7 trillion** (IRENA Decentralised Solar PV: A Gender Perspective, 2024) and supportive laws are still lacking, with only **44% of helpful legal measures** in place globally (ILO, 2025).

These constraints shape who can enter, survive, and scale within the clean energy market. They influence the size, risk profile, and growth trajectory of women-led enterprises from their earliest stages. In energy sectors that are capital-intensive and technology driven, these barriers have a compounding effect.

As a result, women's entrepreneurial participation remains structurally constrained despite strong performance potential. Understanding these limitations is critical to identifying effective entry points for policy, finance, and ecosystem-level interventions.

Box 7: Women energy businesses parity gaps and visible impacts

PARITY GAPS

- Globally, only **11% of start-up founders** in the energy sector are women (ESCAP Gender and Energy, 2025).
- Women receive only **7%** of **climate-focused venture capital** (IEA *et al.*, 2025).
- Women are **63% less likely than men** to secure **investments** (ESCAP Gender and Energy, 2025).
- Women face a **credit gap** of $1.4 trillion - $1.7 trillion (IRENA, 2024).
- Only **44% of legal provisions** are currently enacted to support women's entrepreneurship (ILO, 2025).

VISIBLE IMPACTS

- Women-founded or co-founded startups outperform male owned businesses in terms of **cumulative revenue**, generating **10% more** over time (ILO, 2025).
- Women generate **twice as much revenue for every dollar invested** compared to male peers (Abouzhar *et al.*, 2018), generating 78 cents per dollar of funding versus 31 cents for men (Siegrist, 2025).
- Women reinvest up to **90% of their income** back into their families and communities, compared to only **30%–40% for men (**Soler (ARE) *et al.*, 2020).
- The average non-performing loan (NPL) ratio for women-owned portfolios is **4.6%, significantly lower than the 5.3% average** for total portfolios (Siegrist, 2025).

6.2 Women invested in clean cooking and solar energy

In Africa, women's current active participation in energy-related entrepreneurship demonstrates immense potential for driving **economic development**, **enhancing energy access**, and **improving community well-being**. They are becoming visible drivers in Africa's decentralised and clean energy space, though they remain underrepresented in capital access. Across Sub-Saharan Africa, about **26% of entrepreneurs are women** (Remerscheid et al., 2024). In the renewable energy sector, their presence is even more concentrated in last-mile distribution and micro-enterprise, particularly in clean cooking and solar technologies.

Programmes like Solar Sister and ENERGIA's Women's Economic Empowerment (WEE) Initiative have demonstrated with training, financing, and peer support, women outperform baseline expectations in sales volume, community reach, and customer satisfaction.

Solar Sister is a women-centered social enterprise that trains and supports women in rural Africa to become clean energy entrepreneurs. Through a network based model, the initiative operates primarily in Tanzania, Nigeria and Uganda, combining economic empowerment with energy access at the last mile.

(Atlas of the Future, 2022)

(ENERGIA, 2018)

ENERGIA's Women's Economic Empowerment (WEE) Initiative is a global network promoting gender inclusive energy access by supporting women entrepreneurs across the energy value chain. The initiative operated in seven core countries: *Indonesia,* ***Kenya****, Nepal, Nigeria, Senegal,* ***Tanzania****, and Uganda*.

It equipped women with technical training, seed capital, mentorship, and policy advocacy to boost their roles as producers, suppliers, and distributors of sustainable energy.

The vision is to ensure equal and equitable energy access as a right to development and to empower women by enabling their participation in clean energy entrepreneurship.

One of the partners in the initiative is Solar Sister.

However, persistent structural gaps limit scalability. Women-led clean energy companies in Africa secure **less than 10% of available venture financing**, with most investors perceiving these enterprises as informal, low-margin, or high-risk ventures (IRENA Decentralised Solar PV: A Gender Perspective, 2024).

At the same time, women entrepreneurs contribute an estimated **80% of clean cooking market development efforts**, despite receiving **less than 1% of global climate finance** related to cooking access (Remerscheid *et al.*, 2024). The mismatch between contribution and capital highlights both the urgency and the opportunity of closing the gender financing gap.

From a developmental standpoint, women bring distinct assets. According to **Anna Clements, Energy Access Consultant under the UK's Modern energy Cooking Service Programme**, "Women entrepreneurs are already doing it; they are out there, selling cookstoves, doing the work in the communities, managing local savings groups. The systems just have not caught up to value them." This insight reflects a widespread view in the literature: **women are often embedded in local trust networks and are well positioned to convert product adoption into long-term energy behaviour change** (Shankar (ENERGIA) *et al.*, 2019).

The need to amplify women's participation in clean energy is not just moral or inclusive; it is strategic. According to UN Women & UNIDO (2023), regions where women lead a significant share of energy enterprises tend to exhibit faster diffusion of decentralized solutions, particularly in clean cooking and solar home systems. Moreover, **87% of women surveyed across African last-mile energy programmes reported reinvesting earnings into business scale-up and community well-being**, compared to **54% of men** (IRENA Just Energy Transition SSA, 2025) .

Beyond economic gains, **women entrepreneurs often become trusted leaders in their communities**, enhancing their socio-economic and political visibility. In Rwanda, for instance, women running village-level solar enterprises through Nuru Energy were even asked to mediate community disputes; a reflection of their growing authority and social capital (ENERGIA, 2019).

Nuru Energy is a social enterprise primarily operating in East Africa (Rwanda, Uganda and Tanzania) and India. They provide off-grid lighting solutions through rechargeable LED lamps and human-powered charging stations, using a network of village-level entrepreneurs, many of whom are women. Such roles can gradually shift gender norms and contribute to broader cultural transformation. Enabling women entrepreneurs, therefore, has a multiplier effect; accelerating energy access, strengthening households, and reshaping communities.

(Nuru Energy - SEED, 2013)

Box 8: Benoo a decentralised energy app in Togo

Growing evidence show that women entrepreneurs not only drive inclusion but also deliver strong business results. In fact, women-led energy enterprises often perform as well as or better than their male counterparts.

For example, in Togo, Benoo, a decentralized energy service company, developed a mobile application to support energy entrepreneurs in managing their solar kiosk operations more efficiently. The app featured tools for inventory tracking, revenue logging, and customer management to streamline the business processes of off-grid energy vendors.

To assess its performance, Benoo piloted the application by leasing it to three different solar kiosks operating in rural areas. Each kiosk was evaluated on key performance indicators including sales growth, operational efficiency, customer reach, and consistency in service delivery.

Among the three, the kiosk operated by a woman entrepreneur showed outstanding results, **performing 30% better than the others**. Her business served **a community of approximately 2,000 people**, demonstrating stronger customer engagement and higher revenue returns (Soler(ARE) *et al.*, 2020). This case not only highlighted the effectiveness of digital tools in enhancing last-mile energy services, but also reinforced evidence that women entrepreneurs can lead high-performing enterprises when provided with equal tools and support.

The pilot further pointed to the importance of combining gender-responsive entrepreneurship support with digital innovation to accelerate energy access in underserved areas.

Despite their proven impact, many women-led energy enterprises remain small and struggle to scale. Persistent barriers like **limited access to financing, lack of collateral, and exclusion from formal financial systems** undermine their growth potential.

In Sub-Saharan Africa, while **26% of entrepreneurs are women, only 14% of startups are women-led** (Remerscheid et al., 2024). In 2022, startups with female CEOs received **just 3.9% of all investment funding across the continent, a drop from 6.3% in 2021** (Remerscheid et al., 2024). **Only 13% of women in the region report sole ownership of land**, which is a key requirement for accessing loans, and just **37% have a bank account compared to 48% of men** (IRENA Decentralised Solar PV: A Gender Perspective, 2024).

These constraints limit eligibility for credit and often reduce investor confidence. Energy startups tend to rely on equity investment and grant financing, but women generally have less access to these resources due to limited networks, fewer pitching opportunities, and gender bias in decision-making.

> **Women don't lack capacity. They lack doors that open at the right moment, and it's especially true when money is involved.**

~ Benedetta Giugliano, General Counsel at Studio Santi

Box 9: Entrepreneurship parity gaps and visible impacts

PARITY GAPS

- In Sub Saharan Africa region, only **26%** of **entrepreneurs** are women (Remerscheid et al., 2024).
- Only **14%** of **Africa's startups** are led by women (Remerscheid et al., 2024).
- African female CEOs attracted only **3.9%** of total **funds raised** across the continent (Remerscheid et al., 2024).
- Only **13%** of women report **sole land ownership.** The ownership can be used as collateral for loans (IRENA, 2024).
- Only **37%** of women have a **bank account.** This acts as a financial access barrier (IRENA, 2024).

VISIBLE IMPACTS

- Women entrepreneurs contribute an estimated **80%** of **clean cooking market development efforts**, despite receiving less than 1% of global climate finance (Remerscheid *et al.*, 2024).
- **30% of African companies** that track gender diversity have reported **profit increases of 10% to 15%** (IFC Energy2Equal Africa, 2022).
- **87% of women** surveyed across African last-mile energy programmes reported **reinvesting earnings into business scale-up and community well-being**, compared to **54% of men** (IRENA Just Energy Transition SSA, 2025).
- **Digital innovation** is already bypassing traditional barriers: in Kenya, **81% of women** use mobile money for financial services (Winther (ENERGIA), 2019).

6.3 Women Powering East Africa's Energy Future

East Africa stands at the frontline of gendered energy entrepreneurship. In Kenya, **48% of small, and medium-sized enterprises (SMEs) are owned by women, inclusive of renewable energy** (AfDB Increasing Business Opportunities & Access to Credit for Women in Renewable Energy in Kenya, 2023). In Tanzania, over **35% of clean cooking enterprises engaged in a national pilot were founded or operated by women** (ENERGIA, 2020). Ethiopia's landscape is also dynamic, with strong momentum in women's participation.

Companies like Green Scene Energy, founded and led by Rekik Bekele, have been instrumental in integrating women across the solar distribution chain, where **women are at the center of solar distribution chains** (UN Capital Development Fund, 2022).

These outcomes are supported by enabling policies and tailored programmes. East Africa, alongside parts of Southern Africa, has shown strong policy engagement. **60% of countries in the region have integrated gender considerations into their energy policy frameworks**. Among those countries four are in East Africa: Kenya, Tanzania, Uganda, and Somalia (Gender and Energy Policy: A Review of Energy Policies in East and Southern Africa, 2017).

At the enterprise level, women have been effectively engaging in the energy value chain, particularly in last-mile distribution, after-sales services, and product maintenance (Dutto (ENERGIA), 2019).

Organizations like Solar Sister exemplify this through their investment in local women who start and grow clean energy businesses. In 2023, a partnership between Solar Sister and the Puma Energy Foundation trained and equipped **579 women in Tanzania** with smartphones and digital tools to strengthen clean energy sales in off-grid communities (Puma Energy Foundation, nd). The strength of this model lies not only in its reach but also in how women entrepreneurs approach energy services.

Jeanette Gitobu, Director of the Women in Wind Global Leadership Programme at the Global Wind Energy Council, remarks: “They are not just selling a product; they are solving someone’s pain point. That is why trust matters so much in this work.” That trust translates into results. In ENERGIA-supported programmes in Kenya and Tanzania, **women were 15-20% more likely than men to convert customer leads, particularly in household-targeted products like solar lanterns and improved cookstoves** (ENERGIA, 2019).

Still, significant constraints remain. In Ethiopia, less than **12% of women entrepreneurs in the off-grid sector accessed commercial capital in 2023** (Remerscheid et al., 2024). Informal finance mechanisms, while culturally embedded, are often unreliable and insufficient for scaling energy enterprises.

In Kenya, only **18% of women-led clean energy SMEs have ever received equity investment** (Siegrist, 2025), and fewer still report long-term investor partnerships. Many early stage investors view women-run ventures as informal, low-margin, or risk prone, compounding the credibility gap (IRENA Decentralised Solar PV: A Gender Perspective, 2024). Additionally, **restrictive collateral requirements and land ownership disparities limit loan eligibility**.

(Global Entrepreneurship Monitor, n.d)

Despite persistent barriers, women across East Africa continue to lead in expanding energy access and delivering local impact. **By 2024, Solar Sister had empowered over 6,500 women entrepreneurs in Tanzania and Kenya. The organization's operations have reached over 5,800,000 people with clean energy products, with 94% of participating women entrepreneurs reporting investment in their communities and children's education** (Solar Sister Annual Report, 2024).

This model of community embedded entrepreneurship is echoed in Ethiopia, where **Green Scene Energy**, has emerged as a frontrunner in off-grid solar electrification. **Today, the company has reached more than 20,000 households with solar home lighting solutions, impacted more than 100,000 people and offset over 30,000 tonnes of CO2**. Green Scene's work not only addresses access gaps but also creates income-generating opportunities for local women through inclusive distribution networks and franchise models (Green Scene Energy, n.d).

AI-generated image for illustrative purposes (OpenAI, 2026).

> *Women in East Africa **are not merely participants** in the clean energy transition. They are **community rooted entrepreneurs** transforming energy access into social capital, economic agency, and collective resilience.*

VI. Entrepreneurship

Policy Recommendations for East Africa

Increasing access to gender-responsive financing

Women energy entrepreneurs across East Africa continue to face critical financing barriers that limit their potential to scale. Many rely on **informal savings groups or family loans**, which do not offer the consistency or size needed for enterprise growth. Women-led businesses are often excluded from formal lending due to **limited collateral and perceived informality**.

Policy must incentivize financial institutions to design loan and investment products that fit women's realities, such as **collateral-free lending, flexible repayment models, and revenue based financing**. Additionally, development partners and commercial banks should embed **financial literacy** and investment readiness into capacity-building programmes, not as an add-on but as ***a core function***. These must be delivered in local languages, with follow-up mentorship, so women can make informed choices and build trust in formal systems.

This will lead to increased growth and formalization of women-led energy businesses, allowing them to expand operations, reach more customers, and improve service quality. As women re-invest heavily in their families and communities, this also boosts local economies and accelerates energy access in off-grid areas.

(Gender Lens Investing in Africa: Unveiling the Power of Equality. 2023)

Supporting women leadership in energy governance

While gender is now a visible theme in many national energy strategies, implementation remains weak. Women's lived-experiences in managing household energy, navigating community norms, and leading small enterprises should be more often brought into policy rooms. In the initial phase, governments could consider to embed gender quotas, as a temporary tool, in national and sub-national energy institutions, ensuring that **women's voices are present in policy design, budgeting, and implementation**. Monitoring tools should be introduced to assess the performance of gender commitments in energy plans, with clear accountability mechanisms.

Policies shaped with direct input from women will better reflect on the ground realities and address overlooked issues like informal finance, safety in transport, and product design. Over time, this will normalize women's presence in technical, policy, and leadership spaces, driving cultural shifts and encouraging more women to pursue energy entrepreneurship as a legitimate career path.

AI-generated image for illustrative purposes (OpenAI, 2026).

Support women-mentorship programmes and peer-to-peer learning

In many East African contexts, entrepreneurship is deeply relational, driven by individual ambition and community accountability. Women energy entrepreneurs thrive when they can learn from others navigating similar constraints. However, **mentorship structures remain weak, and technical assistance is often delivered in a one-size-fits-all manner**.

Peer-to-peer exchanges between women running similar types of energy enterprises in different regions; for example, solar entrepreneurs in rural Kenya learning from distributors in northern Tanzania or southern Ethiopia, can build solidarity and shared innovation. **Governments and NGOs should fund community-based training hubs where local energy champions lead skill-sharing in culturally relevant ways**. These hubs should be built into existing women's networks, so they reflect existing trust ecosystems.

This will recruit more young women entrepreneurs into the field and help existing entrepreneurs build confidence, strengthen their decision-making skills, and reduce business failure rates. The platforms will also serve as emotional and logistical anchors, reducing dropout rates and promoting sustainability of energy businesses.

(Gender, Energy and Policy: A Review of Energy Policies in East and Southern Africa, 2017)

Designing infrastructure that works for women in energy

Training programmes and support systems often fail to consider the everyday responsibilities women juggle. **Many women are constrained by unpaid care duties, travel limitations, and lack of supportive infrastructure, which prevent them from fully participating in training or enterprise development**.

Interventions must therefore adapt: **mobile training units, digital learning platforms, and localized incubation centers can support wider inclusion**. Providing childcare services, stipends, and digital tools will help address mobility gaps and increase participation.

Such adjustments will significantly increase women's participation in training and access to technology, narrowing digital and operational gaps. **With the ability to manage sales, stock, and client data digitally, women can professionalize their businesses and attract new opportunities**. These investments create ripple effects: as women succeed, they become role models and local resource people for others.

AI-generated image for illustrative purposes (OpenAI, 2026).

Supporting women-centered distribution models

Women are already serving as the invisible backbone of last-mile distribution across East Africa, whether through formal networks like Solar Sister or informal energy product sales in marketplaces. Their unique proximity to community life gives them unmatched reach and credibility. Yet, they are **rarely positioned as central actors in national energy strategies**. Policies must invest in women-centric distribution models that offer not only startup kits but pathways to scale, such as **product diversification, franchising support, and market linkage**. By anchoring distribution within women's community networks, clean energy transitions move faster and stick longer. This is not just about equity; it is about effectiveness.

Increased product reach in remote communities will **improve household energy security**, especially for clean cooking and lighting. With women seen as trusted community actors, adoption rates tend to rise. Their **economic empowerment simultaneously boosts local demand and creates feedback loops of economic activity**, promoting inclusive energy transitions anchored in community leadership.

(Kiva Labs: Make a difference through climate change mitigation, 2023)

Implement gender-lens investing

Systemic biases remain embedded in donor and investor practices. **Women-led enterprises are often viewed as informal or high-risk, especially if their business model does not fit the traditional startup mold**.

As a result, many promising ventures are overlooked. It is essential to **implement gender-lens investing standards across clean energy funding mechanisms**. This includes gender-based reporting, evaluation of impact on women-led businesses, and anti-bias training for funders. Transparent criteria for selecting investees can help dismantle entrenched perceptions that disadvantage women.

These actions will open doors for more women entrepreneurs to access equity or catalytic capital and reduce gender bias in investment decisions. In East Africa, this will lead to **a more diverse ecosystem where women-led firms bring clean energy to households and institutions** that are typically left behind, encouraging inclusive innovation and deepening market reach.

AI-generated image for illustrative purposes (OpenAI, 2026).

Conclusion

Conclusion

Our report **presents evidence that women's participation in the energy transition cannot be understood through a single lens**. Progress in one area, such as policy, design, energy access, or education, does not automatically translate into equitable outcomes across employment, leadership, or entrepreneurship. **Ensuring a Just energy transition necessitates an integrated approach that connects policy, education, employment, leadership, entrepreneurship pathways to ensure women's participation translates into sustained impact across the energy sector.**

The energy transition in East Africa cannot succeed without the full participation of half of the population. **Women are not only primary users and managers of household energy, but also powerful agents of change in energy adoption, entrepreneurship, and community decision-making.** Excluding women from energy planning, financing, and leadership risks slowing progress and deepening existing inequalities. In this sense, the energy transition needs women as much as women need energy to ensure solutions are inclusive, sustainable, and capable of delivering lasting social and economic development.

AI-generated image for illustrative purposes (OpenAI, 2026).

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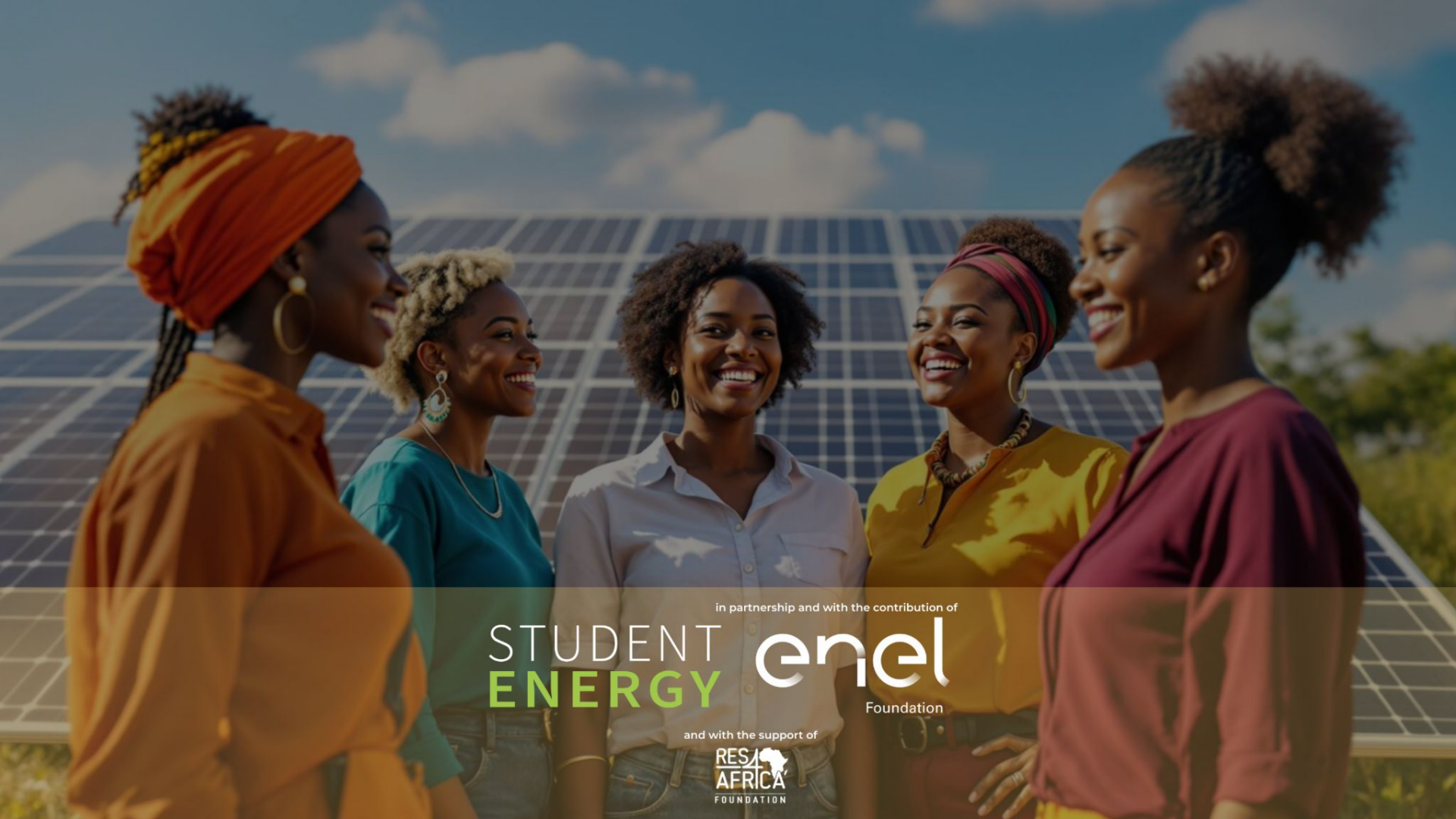
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