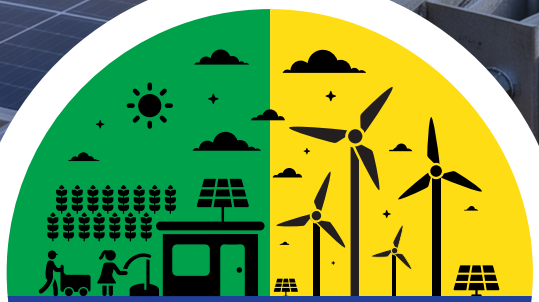
A CASE STUDY ANALYSIS OF LOCALISATION, DECENT WORK AND GENDER EQUITY IN KENYA'S RENEWABLE ENERGY SECTOR

The African Centre for Technology Studies (ACTS)

Joel Onyango, Joan Andega, Faith Kemunto,
Eric Magale, Gillian Achieng, Erica Atieno

October 2026



Just Energy Transition:
Localisations, Decent Work, SMMEs,and Sustainable Livelihoods

INSTITUTE FOR ECONOMIC JUSTICE
COSATU
ACEP Africa Centre for Energy Policy
WORLD ENERGY COUNCIL FUTURE ENERGY LEADERS GHANA
A ROCHA GHANA
ACTS
IDRC · CRDI International Development Research Centre Centre de recherches pour le développement international

A CASE STUDY ANALYSIS OF LOCALISATION, DECENT WORK AND GENDER EQUITY IN KENYA'S RENEWABLE ENERGY SECTOR

The African Centre for Technology Studies (ACTS)

Joel Onyango, Joan Andega, Faith Kemunto,
Eric Magale, Gillian Achieng, Erica Atieno

October 2026

ACKNOWLEDGEMENTS

We would like to acknowledge the support, collaboration of our project partners, the Institute for Economic Justice (IEJ) and African Centre for Energy Policy (ACEP) over the course of the research. We acknowledge researchers at the Shared Value Hub and the Climate Resilient Economies Programme at ACTS who were helpful at different points of this research and the workshops. We also thank the enumerators involved in the fieldwork and our numerous key informants who spared their time to inform the findings of our research. We thank the various stakeholders who participated in the research and subsequent workshops. More particularly, stakeholders at the Ministry of Energy and Petroleum, Rebecca Okello and Sam Ekuru from the Central Organization of Trade Unions (COTU), Mercy Kimalat from the Association of Startups and SMME enablers of Kenya (ASSEK), Eng. Liz Mubari from Women in Renewable Energy (WIRE), Dr. Rosemary Owigar from Maseno University. We also acknowledge internal reviews who reviewed the reports at different times, including Dr Basani Baloyi and Dr Rachel Ruth Alexander. We also acknowledge external reviewers who reviewed the reports at different times including Dr. Bipasha Baruah, Dr Lorenza Monaco, Dr James Musonda, Dalli Weyers, Roger Etkind and Terri Maggott our copy editor.

EXECUTIVE SUMMARY

This case study assesses the extent of localisation in Kenya's solar and wind renewable energy sectors and examines whether the forms of localisation taking place create decent work and advance gender equity. The study reveals that Kenya's solar and wind sectors have expanded significantly, but localisation remains limited and uneven. Kenya is positioned mainly in downstream activities such as distribution; installation; sales; engineering, procurement, and construction (EPC) contracting; civil works; assembly; repair; and maintenance. High-value activities, such as solar cell production, inverter manufacturing, turbine component manufacturing, advanced research and design, technology ownership and intellectual property, remain largely externally controlled. However, the empirical findings also show that localisation should not be understood as full upstream manufacturing. There are feasible entry points for staged localisation such as in the manufacture of solar mounting structures, wiring, electrical fittings and wind turbine towers. These activities can strengthen local value capture, build technical capabilities and create pathways towards deeper industrial upgrading if supported by finance, skills development, standards compliance, procurement reform and enforceable local content measures.

Value capture remains unevenly distributed. Foreign technology suppliers and global original equipment manufacturers capture profits through component sales, technology ownership and long-term service arrangements, while financiers capture interest income and returns from renewable energy investments. Domestic manufacturing remains constrained by competition from cheaper imports. As such, local firms earn profits from assembly, distribution, installation, and maintenance. This reflects policies which focus on duty and VAT exemptions on imported solar and wind equipment rather than domestic manufacturing investment, creating an environment characterised by limited finance, weak technology transfer and low margins. Workers and communities should benefit through employment, energy access, livelihoods and local service provision but these benefits remain uneven and insecure.

The findings show that employment is expanding, particularly in solar installation, sales, distribution, maintenance, customer service, civil works and project-based construction. However, job quality remains a major concern. Many jobs are casual, temporary, low-paid, weakly protected and concentrated in lower-value activities. Social protection, occupational safety systems, formal contracts, skills progression and worker voice remain limited, especially for workers in small, medium and micro enterprises (SMMEs) and informal arrangements. The empirical findings, therefore, confirm the concern that green employment does not automatically result in decent work.

Gender equity also remains constrained. Women participate in parts of the sector, including sales, administration, customer relations, community engagement and some installation and maintenance roles. However, they remain underrepresented in engineering, system design, leadership, ownership and advanced technical functions. The evidence also shows that unpaid care work, social reproduction responsibilities, limited workplace support, weak access to finance, gendered training pathways and cultural norms continue to restrict women's participation and progression.

The findings indicate that Kenya's most viable pathway is staged localisation in activities aligned with its existing industrial capabilities because this can increase the value retained by domestic firms and workers while progressively building the skills, technology and productive capacity required for deeper industrial upgrading. This staged approach is the most viable pathway because it builds on activities where Kenyan firms are already active, such as in assembly, civil works and distribution of finished products, while progressively building the skills, technology and capital needed for more meaningful industrialisation. Renewable energy growth alone will not deliver a just transition, public policy must prioritise feasible local content pathways, expand SMME-oriented finance, link localisation to decent work standards, build gender transformative skills and enterprise pathways, and strengthen policy implementation, institutional coordination and accountability. If these measures are implemented, Kenya's renewable energy transition can move beyond deployment towards domestic capability building, improved work and more equitable participation in the benefits of green industrial transformation.

TABLE OF CONTENTS

Acknowledgements 3
Executive Summary 4
List of Tables 7
List of Figures 7
List of Abbreviations and Acronyms 7

1. Introduction 9
2. Localisation and Structural Transformation 11
2.1 Kenya's Role in the Sector: Value Creation 12
2.2 Current Patterns of Value Capture 15
2.3 Conclusion: Localisation and Industrial Development 19
3. Decent Work 21
3.1 Work in the Sector 21
3.2 Trajectories of Work 22
3.3 Conclusion: Decent Work and Localisation 24
4. Gender 25
4.1 Gender at Work 25
4.2 Gender and Societal Expectations 26
4.3 Conclusion: Gender and Localisation 28
5. Key Factors and Actors Influencing Localisation, Decent Work, and Gender Equity 29
5.1 Shaping Localisation Dynamics 29
5.2 Shaping Work Outcomes 34
5.3 Gender-Specific Dynamics 36
6. Conclusion 39
6.1 Key Challenges 39
6.2 Key Opportunities 39
6.3 Recommendations 41

References 44
Appendix A: Methodology 47

LIST OF FIGURES

Figure 1: Production Networks for Solar Panels 13
Figure 2: Production Network Map for Wind towers in Kenya 14

LIST OF TABLES

Table 1: How the principal actors capture value and the conditions that expand or limit the benefits they retain 16
Table 2: Actors and factors supporting or constraining renewable energy localisation in Kenya 29
Table 3: Key dynamics supporting or constraining decent work in Kenya's renewable energy sector 34
Table 4: Key dynamics supporting or constraining gender equity in Kenya's renewable energy sector 37
Table 5: Overview of recommendations 42
Table A1: Evidence base used in this case study 48

LIST OF ABBREVIATIONS AND ACRONYMS

COTU	Central Organization of Trade Unions
EPC	Engineering, Procurement, and Construction
EPRA	Energy and Petroleum Regulatory Authority
GPN	Global production network
ILO	International Labour Organization
IRENA	International Renewable Energy Agency
OSH	Occupational Safety and Health
ISO	International Organization for Standardization
KAM	Kenya Association of Manufacturers
KEBS	Kenya Bureau of Standards
KenGen	Kenya Electricity Generating Company
KEPSA	Kenya Private Sector Alliance
KEREA	Kenya Renewable Energy Association
KETAWU	Kenya Electrical Trades and Allied Workers Union
KPLC	Kenya Power and Lighting Company
LTWP	Lake Turkana Wind Power
NIPF	National Industrial Policy Framework
OEMs	Original Equipment Manufacturers
Pay Go	Pay-As-You-Go
R&D	Research and design

REREC	Rural Electrification and Renewable Energy Corporation
SEZ	Special Economic Zone
SMMEs	Small, Medium and Micro Enterprises
STEM	Science, technology, engineering, and mathematics
TVETs	Technical and Vocational Education and Training institutions
VAT	Value added tax

1. INTRODUCTION

Kenya's renewable energy transition presents an important opportunity to connect renewable energy expansion with deeper industrial transformation, decent employment and gender equitable development. In this study, localisation refers to Kenyan firms, workers, and institutions creating and retaining value from renewable energy activities. In this report we focus on localisation opportunities that can realistically be developed within the country's existing and emerging industrial capabilities. The existing level of localisation in Kenya remains limited and uneven. Evidence from Andega et al. (2026a) and regional qualitative analysis (Andega et al., 2026b) indicates that Kenya's solar and wind sectors are still heavily import dependent, with domestic firms concentrated mainly in downstream activities such as distribution; low-skill assembly; installation; sales; engineering; procurement, and construction (EPC) contracting; civil works; and after-sales services. A technical survey of 700 renewable energy firms (Onyango et al., 2026) shows that Kenya's renewable energy enterprise landscape is dominated by small and micro solar firms engaged primarily in distribution, assembly and sales, while local manufacturing remains minimal and dependent on imported components, particularly from China. This has expanded market activity and employment without producing equivalent growth in domestic manufacturing, technological capabilities or secure employment. A just transition in this context therefore means expanding renewable energy while distributing its industrial, employment, and social benefits more equitably among firms, workers, women and affected communities.

The research identifies current levels of localisation, barriers preventing deeper domestic participation, activities that are already showing potential, and the policy and changes needed to strengthen local value creation. Decentralised renewable energy activities supported approximately 53,000 direct, indirect and induced jobs in Kenya 2022, indicating an important employment base for the sector (Power for All, 2022). The study further highlights employment potential in construction, installation, distribution, repair, maintenance, sales and customer service.

This case study uses a global production network (GPN) approach to examine how relationships among global suppliers, financiers, Kenyan firms, public institutions, and workers shape domestic production, value capture, and employment. The GPN framework is useful because Kenya's renewable energy sector is not shaped only by domestic policy or firm-level choices. It is also shaped by global lead firms, financiers, technology owners, standards regimes, import markets and procurement systems that influence what Kenyan firms can produce, what value they can capture, and what kinds of jobs are created (Coe et al., 2008; Coe and Yeung, 2015). By focusing on value, power, and embeddedness, this case study shows how renewable energy production networks connect global structures to local outcomes, including firm upgrading, worker conditions, gendered participation and the distribution of benefits across communities and institutions.

Methodologically, the case study draws from a background paper on Kenya's solar and wind manufacturing networks (Andega et al., 2026a); a qualitative regional analysis based on 54 key informant interviews and a focus group discussion conducted across Central, Coastal and Western Kenya (Andega et al., 2026b); a manufacturing-focused survey of five firms (Kemunto et al., 2026);

a policy scan of relevant policy documents and literature (Achieng et al., 2026); a national policy dialogue report, which documents stakeholders' responses to emerging research findings and the policy pathways they proposed (Lolo et al., 2025); and a larger firm-level technical survey of 700 renewable energy firms across the same three regions (Onyango et al., 2026). These are existing outputs of the wider Just Energy Transition project, which this case study brings together. Further methodological details are provided in Appendix A.

Existing studies have examined renewable energy deployment, manufacturing constraints, employment and gender participation (Ndi, 2024; Power for All, 2022; IRENA, 2022), but limited empirical research connects Kenya's position in solar and wind production networks to domestic value capture, job quality and gender equity. This case study addresses this gap by triangulating evidence from firms, workers, policymakers, labour organisations and communities. For Kenya's transition to be just, policy and practice must deliberately support domestic enterprise capability, enforce decent-work standards, expand women's participation in technical and leadership roles, strengthen social protection, and ensure that small, medium, and micro-enterprises (SMMEs) and workers are not confined to the lowest-value and least secure parts of the renewable energy economy.

This case study is structured as follows. Section 2 examines localisation, value creation, and value capture in Kenya's solar and wind production networks. Section 3 assesses employment creation and job quality. Section 4 examines gender equity and social reproduction. Section 5 draws together the underlying factors and actors — local context, firms, government, and other actors — that explain the outcomes described in Sections 2 to 4. Section 6 concludes with the key challenges, opportunities and policy recommendations.

2. LOCALISATION AND STRUCTURAL TRANSFORMATION

This section examines the current level of localisation in Kenya's solar and wind renewable energy value chains and considers where deeper localisation may be feasible. It provides a snapshot of the industry by looking at the types of firms operating in the sector, the activities they currently perform, how different actors create and capture value, and the constraints that limit movement into higher value production. The section also considers the growth potential of selected value chain activities, particularly those linked to assembly, distribution, installation, repair and maintenance, civil works, locally fabricable components, and SMME-led service provision.

The starting point for this analysis is that Kenya's renewable energy transition has expanded rapidly, but this expansion has not yet translated into domestic manufacturing capability. Evidence from the background paper, regional qualitative analysis, and firm surveys shows that Kenyan firms are concentrated in distribution, assembly, sales, installation, and other service activities, with limited participation in advanced manufacturing and technology-intensive functions. Across the research, localisation is seen as a process shaped by firm capabilities, access to finance, skills, standards, procurement systems, technology transfer, and public policy implementation. This case study points to a more practical localisation pathway, where Kenya can increase domestic value capture by strengthening feasible segments of the value chain while building long-term industrial capacity. This includes supporting SMMEs, improving technical skills, linking firms to local and regional markets, strengthening compliance standards, and creating clearer policy incentives for local content and technology transfer.

This section analyses localisation not only as an industrial objective, but as a structural transformation question, considering whether Kenya's renewable energy growth can support domestic enterprise development, better employment, stronger local capabilities, and broader participation in the benefits of the energy transition. The main findings of this section are that Kenya's solar and wind sectors have expanded, but domestic manufacturing has not grown at a comparable pace. Kenyan firms create most of their value through assembly, distribution, installation, construction, repair, and maintenance. Foreign manufacturers and financiers retain greater returns through their control of technologies, component supply, and finance. Solar provides wider opportunities for SMMEs and employment across downstream services, whereas wind opportunities are more capital-intensive and project-based. The most feasible localisation opportunities are therefore in the manufacture of components that are easy to produce locally, such as mounting structures and cables; however, barriers such as competition from low-cost imports, limited affordable finance, weak technology transfer, and uneven policy implementation remain.

2.1 Kenya's Role in the Sector: Value Creation

Kenya currently creates most of its domestic value after imported renewable energy technologies and components enter the country, rather than through the manufacture of the core technologies themselves. The background paper, based on a literature review, mapped Kenya's solar and wind production networks around two components: solar modules and wind turbine towers. These were selected because they represent areas where Kenyan actors are already active or where localisation could be strengthened through assembly, civil works, steel and concrete fabrication, installation, maintenance, and related services. In solar, domestic actors create value through limited assembly, distribution, installation, sales, repair, maintenance, and customer support. In wind, local value creation is concentrated in civil works, logistics, construction, tower foundations, and operations and maintenance. These activities provide employment opportunities, although much of the construction and installation work remain project-based. The empirical findings broadly confirm this assessment, a more grounded picture of the regional, firm-level and SMME dynamics shaping participation in the sector.

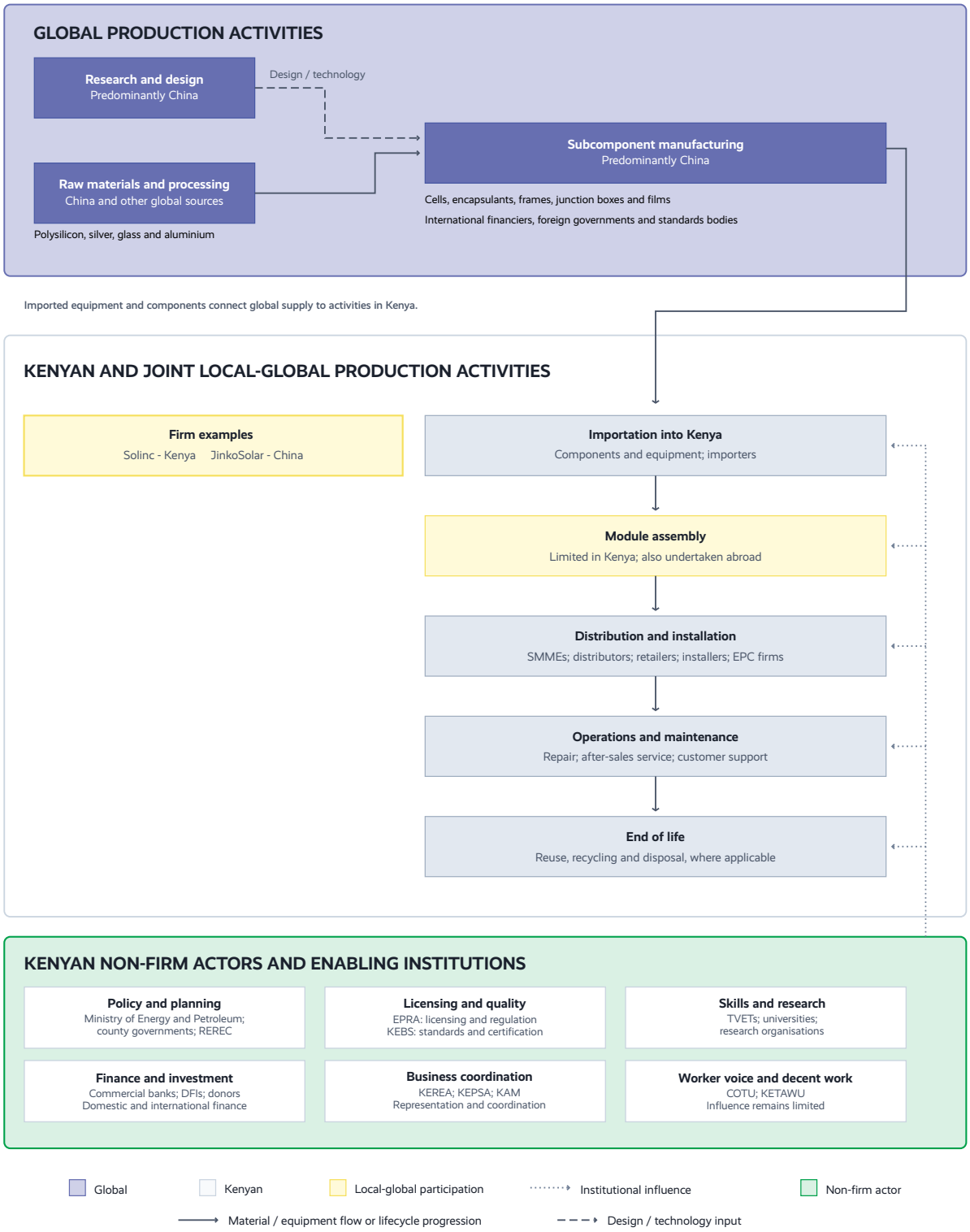
The main firm actors in Kenya's solar production network include local SMMEs, solar distributors, installers, EPC contractors, off-grid energy firms, component assemblers, retailers, maintenance providers, and a small number of firms involved in limited manufacturing or research and development (R&D) related activities. indicates that Kenya's renewable energy sector remains concentrated in downstream activities such as assembly, installation, retail distribution, after-sales service, and recycling, with only a small number of firms involved in manufacturing or assembly. The 700-firm technical survey found that solar firms are mostly involved in distribution, assembly, sales, after-sales service, and other downstream activities.

Additionally, the findings show that while domestic ownership is present, local ownership has not automatically translated into meaningful changes in local production. Stakeholder interviews further illustrated the limited depth of domestic production, showing that most firms remain concentrated in low-skill assembly or basic material supply, with limited participation in higher-value activities such as advanced component manufacturing, technology ownership, or scaled research and development. As mentioned by one SMME worker from one key informant interview:

> *"We are not manufacturing. We are just buying."*

Figure 1 shows how these domestic activities are connected to imported components, global manufacturers and the institutions that influence participation in Kenya's solar production network.

Figure 1: Production Networks for Solar Panels

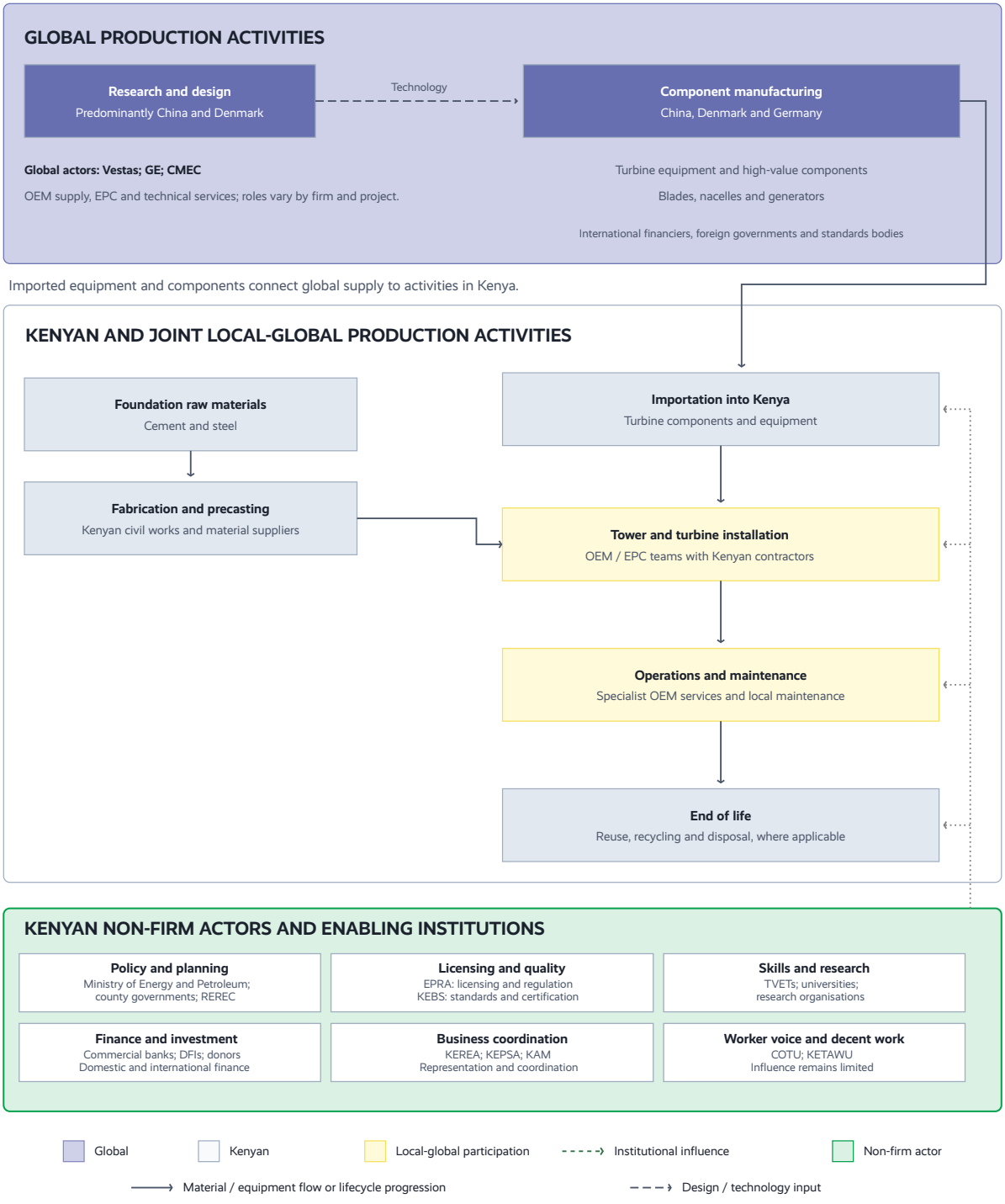


Source: generated by authors using ChatGPT

On the other hand, in comparison with the solar production network, Kenya's wind production network is organised around fewer capital-intensive and project-based developments. Major projects such as Lake Turkana Wind Power (LTWP), Kipeto Wind Power and Ngong Hills have depended heavily on imported turbine technology and foreign original equipment manufacturers (OEMs). The research identifies a select set of multinational firms such as Vestas, GE and China Machinery Engineering Corporation (CMEC) that function as important global actors in Kenya's wind production networks,

particularly in turbine supply, installation, EPC contracting and operations and maintenance arrangements. Local employment potential is therefore concentrated in construction, transport, civil engineering, foundation works, and maintenance, while most specialised manufacturing and technical functions remain externally controlled. The findings from the 700 firm survey confirm this pattern, with local firms in the wind sector participating mainly through civil works, logistics, and construction activities, while turbine blades, nacelles, generators, and other high-value components remain externally supplied. This means that Kenyan firms are situated in lower-margin and project-specific roles, illustrated in Figure 2.

Figure 2: Production Network Map for Wind towers in Kenya



Source: generated by authors using ChatGPT

Public institutions such as the Ministry of Energy and Petroleum, Energy and Petroleum Regulatory Authority (EPRA), Rural Electrification and Renewable Energy Corporation (REREC), Kenya Electricity Generating Company (KenGen), Kenya Power and Lighting Company (KPLC), Kenya Bureau of Standards (KEBS), and county governments shape the enabling environment through policy, licensing, standards, procurement, and infrastructure development. KEBS is particularly important because quality standards and certification affect which firms can participate in formal markets. Skill-building institutions, Technical and Vocational Education and Training institutions (TVETs), universities, and research organisations influence the supply of technical skills, while associations such as Kenya Renewable Energy Association (KEREA), Kenya Private Sector Alliance (KEPSA), and Kenya Association of Manufacturers (KAM) provide platforms for private-sector coordination. Labour organisations, including Central Organization of Trade Unions (COTU) and Kenya Electrical Trades and Allied Workers Union (KETAWU), are relevant to the decent work dimension of the network, although their influence in the renewable energy sector remains limited. Development finance institutions, donors and commercial banks also shape the network by determining access to capital, concessional finance, project finance, and investment support.

Globally, Kenya's solar and wind networks are shaped by foreign manufacturers, technology owners, financiers, and standards regimes . In solar, Chinese, European and other Asian manufacturers dominate the production of cells, wafers, inverters, encapsulants, and other high-value components. Kenyan firms generally import these components and add value through assembly, distribution, installation, warranty services and customer support. In wind, global OEMs and international financiers have stronger influence because utility-scale projects require high capital investment, technical guarantees, long-term service contracts, and specialised technology. Foreign governments such as European governments, multilateral development banks, and international standards bodies also shape the production network through project finance and technical requirements. Because the core technologies, specialised components, and project finance are controlled externally, Kenyan firms generally create value only after imported equipment enters the country. This limits their access to technology ownership, component manufacturing, and the higher returns associated with these activities.

2.2 Current Patterns of Value Capture

Value creation refers to the activities through which firms, workers, and institutions produce goods or provide services. Value capture refers to the income or other benefits that actors retain from those activities, including profits, wages, interest income, taxes, and community benefits. Table 1 summarises how value is extracted by the various stakeholders, as well as the opportunities and challenges that each must navigate.

Table 1: How the principal actors capture value and the conditions that expand or limit the benefits they retain

Stakeholder	How Value is Captured	Opportunities and Challenges
Foreign manufacturers and original equipment manufacturers	Profits from component and equipment sales, technology licensing, and long-term service contracts.	Control over specialised technologies and global supply chains supports high returns, while limited local sourcing reduces the share retained in Kenya.
Financiers	Interest income, lending and arrangement fees, dividends, and capital gains from equity investments.	Large renewable energy projects create financing opportunities, but risk concerns and collateral requirements that restrict lending to smaller Kenyan firms.
Local Firms	Profits from assembly, distribution, sales, installation, engineering and construction contracts, repair, and maintenance.	Growing demand and last-mile markets create opportunities, but low-cost imports, currency fluctuations, limited finance, certification costs, and weak bargaining power reduce margins.
Workers	Wages, employment benefits, skills, and opportunities for career progression.	Employment is expanding, but casual work, low pay, weak social protection, and limited progression reduce the value retained by workers.
The State	Taxes, licensing and certification fees, and financial returns from state-owned energy enterprises.	Sectoral expansion can increase public revenue, but the study did not obtain sufficient evidence to quantify renewable energy tax receipts or enterprise returns.
Communities	Employment income, local business opportunities, improved electricity access, and project benefit-sharing arrangements.	Benefits increase where projects use local labour and enterprises, but remain limited where communities have weak participation or projects have few local economic links.

Sources: Andega et al., 2026a; Andega et al., 2026b; Kemunto et al., 2026; Onyango et al., 2026

Workers capture value primarily through employment in installation, sales, distribution, after-sales service, basic assembly, repair and maintenance. These jobs are important because they create entry points into the renewable energy economy, particularly for youth and technically trained workers.

However, the value captured by workers remains limited by the type and quality of work being created. The empirical evidence shows that employment is expanding but remains largely informal. Women are represented in selected operational roles, particularly solar installation and maintenance, but remain weakly represented in higher-value technical and decision-making functions, including system design, project engineering and wind-turbine technical work. Disabilities are also scarcely represented, with only 17% of surveyed firms reporting that they employ with disabilities (Onyango et al., 2026).

Many jobs are concentrated in low- and mid-skill functions rather than high-value technical, engineering or research roles, and this limits the scope for workers to capture higher wages or long-term career progression. The literature identifies precarious work, gender wage gaps and limited social protections as central concerns in Kenya's renewable energy labour market. empirical findings confirm this, and show that informality, weak labour enforcement, limited union presence, and poor access to benefits remain widespread features of the sector (Andega et al., 2026a).

The impact of employment also extends beyond salaries into household welfare and social reproduction. Renewable energy work may support household income, but where jobs are casual, low-paid or lacking benefits, workers and their families absorb the risks of income instability, illness, care responsibilities and irregular working hours. This burden is mostly gendered, and women's participation is constrained by unequal access to technical training, gendered recruitment norms, limited workplace support for care responsibilities, and the absence of family-friendly employment practices. As a result, value capture by workers is not only a wage question, but it is also shaped by whether employment enables secure livelihoods, social protection, mobility and equitable participation.

The state captures economic value through taxes, licensing and certification fees and financial returns from state-owned energy enterprises operating in the sector. However, a limitation is that the findings do not provide enough evidence on tax payments, profits from state-owned enterprises, or the fiscal returns accruing to the state from renewable energy firms. Therefore, the extent of direct financial value capture remains under-documented.

Foreign manufacturers and OEMs capture value through selling components, obtaining revenues from equipment-supply and engineering contracts, and earning income from long-term operations, maintenance and service agreements. In the solar sector, upstream production of cells, wafers, inverters, batteries and other components remains dominated by foreign manufacturers, with Kenyan firms importing components and adding limited value through assembly, distribution and services. In the wind sector, high-value components such as turbines, blades, nacelles, generators and control systems are externally supplied, while Kenyan firms participate mainly through civil works, logistics and construction-related functions.

Communities capture value in more uneven ways. Energy activities can improve local access to electricity, support livelihoods, generate employment, stimulate small enterprises, and expand last-mile energy services. SMMEs and off-grid solar firms are particularly important because they connect renewable energy technologies to households, rural users and underserved communities through distribution, flexible payment models, installation, and maintenance services. However, community-level value capture is not automatic. Where projects are externally financed, technology-intensive, land-intensive, or weakly embedded in local economies, communities may experience limited benefits,

weak participation, or conflict over land and benefit sharing. Peer-reviewed research on Kenyan wind development highlights the importance of procedural justice, particularly the extent to which affected communities are meaningfully included in decisions that shape project design, land access, and benefit-sharing arrangements (Ndi, 2024). The LTWP project illustrates how large-scale renewable energy investments can generate tensions where local expectations of participation, recognition, and equitable benefits are not fully met (Simberg-Koulumies, 2024). The realities on the ground therefore reinforce the need to understand renewable energy not only as infrastructure development, but also as a question of local ownership, affordability, and equitable benefit sharing.

Financiers capture value through interest income, returns from equity investments, state guarantees, and control over project bankability. Development banks, international financiers, and foreign states shape major renewable energy investments through concessional loans, equity financing, political risk guarantees, and investment conditions (Andega et al., 2026a). At firm level, the findings show that firms rely heavily on conventional finance, particularly commercial banks, but that access remains difficult because of high interest rates, collateral requirements, and the lack of tailored instruments for renewable energy manufacturing and/or SMMEs. This means that while finance supports sector growth, it also reproduces unequal value capture, whereby larger foreign firms are better positioned to access capital, while local SMMEs face financing challenges that limit upgrading and profitability.

Local companies capture value through assembly, installation, sales, distribution, EPC work, maintenance, customer relationships, and local market knowledge. However, the depth of this value capture differs by firm type. Larger firms, foreign-owned firms, and joint ventures are better positioned to access capital, technology, procurement opportunities, and standards compliance. Smaller, locally owned firms capture thinner margins and remain vulnerable to import costs, currency fluctuations, certification requirements, weak procurement access, and limited bargaining power. An SMME worker described the practical difficulty created by these requirements,

> *"when tenders come, they say you must have ISO-certified products. How can we afford that here?"*

Many locally owned firms are concentrated in low-value assembly and basic material supply, demonstrating that local ownership alone does not guarantee strong local value capture. Overall, the field evidence confirms that the greatest value is captured by foreign technology suppliers, financiers, larger firms, and better-capitalised actors, while workers, SMMEs, and communities capture more limited and uneven benefits. However, the evidence adds important nuance by showing that value capture is not static. Kenya captures value in downstream services, last-mile distribution, civil works, maintenance, and local enterprise activity. The central challenge is that these forms of value capture remain too weak to drive structural transformation unless they are linked to stronger local content enforcement, affordable finance, technology transfer, skills development, procurement reform, and decent-work protections.

2.3 Conclusion: Localisation and Industrial Development

Kenya's localisation trajectory in solar and wind is best understood as a slow and uneven movement from downstream participation towards selective, staged upgrading. The literature positions Kenya as a technology-taking economy in which most domestic actors participate through assembly, EPC contracting, distribution, installation, operations and maintenance, and civil works, while high-value activities such as solar cell production, inverter manufacturing, turbine manufacturing, technology ownership, and advanced R&D remain externally controlled. The findings confirm this, but they also show that localisation is not absent. Rather, it is present in partial and uneven forms through SMME activity, service provision, low-skill assembly, last-mile distribution, repair and maintenance, and some emerging knowledge-oriented activity. The clearest examples of local firms entering the renewable energy value chain are in solar distribution, installation, repair, maintenance, basic assembly, and customer-facing energy services. The evidence shows that entry is occurring mainly in the lower value parts of the production network. In solar, firms such as Solinc East Africa illustrate limited assembly-based localisation, where imported subcomponents are assembled locally into panels. In wind, local firms have participated in civil works, logistics, and tower-foundation construction for large projects, but have not moved into high-value turbine component manufacturing.

The evidence points to modest forms of product, process, and functional upgrading. Product upgrading is visible where firms diversify into different solar components or combine products with services such as installation, warranties, customer support, and maintenance. Process upgrading appears more limited. The field research identified Western Kenya's orientation towards R&D as the strongest upgrading signal, suggesting some potential movement towards more knowledge-intensive activities. However, this potential remains fragile because technology transfer, finance, and industrial coordination are weak. There is also evidence of stalled upgrading and in some cases risk of downgrading. Many firms can enter the sector through distribution, sales and installation because these activities have lower barriers to entry than manufacturing. However, these same activities are highly competitive and lower margin, which can trap SMMEs in commercially active but structurally weak positions. The field findings demonstrate that firms are largely stalled at process and product upgrading, with very limited functional upgrading. This means that Kenya's renewable energy firms may grow in number and market reach without necessarily moving into higher-value production. In this sense, sectoral expansion can coexist with industrial stagnation.

Firms are building capabilities through skills, customer relationships, market knowledge, technology access, partnerships, and diversification of their client base with the evidence showing that 80% of firms identified customer-base diversification as a growth strategy, while 60% identified skills and technology transfer as a key opportunity (Onyango et al., 2026). These strategies show that firms are attempting to build resilience, expand markets, and learn from more advanced actors. However, their internal upgrading efforts are constrained by limited capital, small firm size, shortage of skilled workers, weak R&D capacity, high production costs, and limited access to certification. This suggests that firms cannot upgrade through entrepreneurship alone. They require a wider industrial ecosystem that supports finance, skills, standards, technology transfer, and local content rules, which require projects to use a certain amount of locally made products, local services or local workers.

The societal impact of firms is most visible in last-mile energy access, local employment, skills use, and community-based energy services. SMMEs and off-grid solar firms help connect households, rural users, and underserved communities to renewable energy technologies through distribution, flexible payment models, installation, and maintenance. These activities are socially important because they improve access and local value capture. However, their transformative potential remains limited as firms are unable to move beyond sales and service roles. The societal contribution of the sector, therefore, depends on whether local firms can deepen repair capacity, train workers, formalise employment, and retain more value within local economies.

The industry is expected to continue growing, but the research not provide a reliable national projection for future revenue, number of firms, or employment. At the global level, solar additions reached close to 600 GW in 2024. However, the expansion of deployment remains coupled with highly concentrated manufacturing capacity, with China accounting for over 80% of global solar module supply-chain capacity (Chadly et al., 2024). This concentration reinforces the structural challenge facing Kenya and other importing countries: growing domestic demand does not, by itself, translate into domestic control over technology, component production or higher-value manufacturing. However, empirical evidence shows that 60% of surveyed firms expressed strong optimism about future growth (Onyango et al., 2026).

Overall, the empirical findings show that upgrading is already beginning in limited, practical, and socially embedded forms. Kenya's localisation trajectory is therefore not a simple shift from imports to manufacturing. It is a staged process in which downstream services, assembly, repair, maintenance, locally fabricable components, skills development, and SMME capability could become steps towards deeper structural transformation, if supported by deliberate industrial policy.

3. DECENT WORK

Decent work and gender equity are central to assessing whether Kenya's renewable energy transition can support localisation in a way that is socially just and transformative. Localisation cannot be measured only by the number of firms entering the solar and wind value chains, the share of components assembled locally, or the extent to which domestic enterprises participate in distribution, installation, and maintenance. It must also be assessed through the quality of jobs created, the distribution of opportunities in the sector across different groups, and the extent to which women, youth, workers, and marginalised communities are able to participate meaningfully in and benefit from the sector. Our main findings are that renewable energy is creating jobs, particularly in installation, distribution, and sales, but that most of this work remains casual, low-paid, and weakly protected, and that women remain concentrated in mid-level roles while remaining largely excluded from technical and leadership positions.

The International Labour Organization (ILO) defines decent work as work that is productive, delivers a fair income, provides security in the workplace and social protection for workers and their families, offers prospects for personal development and social integration, allows workers to express their concerns and organise, and guarantees equality of opportunity and treatment for women and men (ILO, 2015). Methodologically, decent work was assessed through the 700-firm technical survey (including structured questions on contract type, wages, social protection, union membership, and OSH provision), the five-firm manufacturing survey, and 54 key informant interviews across Central, Coastal, and Western Kenya organised around three thematic areas: (i) the nature and security of employment being created, (ii) the extent of social protection and workplace safety, and (iii) the role of unions and worker voice.

3.1 Work in the Sector

The trajectory of employment expansion should not be read as automatic social upgrading. Social upgrading would require not only more jobs, but also improved wages, safer workplaces, formal contracts, social protection, skills progression, worker voice, and inclusion of marginalised groups. The evidence suggests that this is only happening partially. While youth are present in the sector, they are often in casual roles that rarely allow for career progression, while women and persons with disabilities remain weakly integrated into the workforce. To add to this, many of these jobs remain casual, short-term, and project-based.

There is therefore a risk of social downgrading. If renewable energy firms continue to rely on casual labour, weak safety systems, and limited benefits, the sector may reproduce the same labour-market inequalities found in other parts of Kenya's economy. This then results in an energy transition that create green jobs without transforming employment relations. This echoes findings from the literature state that the green jobs narrative can obscure precarious labour regimes when employment creation is not accompanied by rights, social protection and collective representation (Andega et al., 2026a). Projected job creation remains difficult to quantify from the empirical findings, as the research confirms

that employment is likely to grow as electrification, solar deployment, and energy access deepen, but it does not provide a reliable national forecast for future job numbers by occupation, gender, or region. The safest conclusion is that Kenya's renewable energy sector is likely to continue generating employment, particularly in downstream activities. However, without deliberate policy intervention and implementation, job growth may remain concentrated in lower-value and insecure forms of work rather than in formal, skilled, and protected employment.

3.2 Trajectories of Work

Work in Kenya's solar and wind renewable energy sector is being created mainly in downstream activities rather than in high-value manufacturing. The most common forms of work are in solar installation, sales, distribution, customer service, basic assembly, maintenance, after-sales support, civil works, logistics and project-based construction. In wind energy, employment is more closely linked to large-scale projects and includes site preparation, civil works, tower foundations, logistics, installation support, operations, and maintenance. Higher-value roles in engineering design, advanced manufacturing, R&D, technology ownership, and specialised component production remain limited.

Using the ILO decent work framework, the sector performs better on employment creation than on job quality, rights, social protection, and social dialogue. Renewable energy expansion has opened work opportunities, particularly for youth, technicians, installers, and SMME entrepreneurs. The literature shows that decentralised renewable energy activities supported approximately 53,000 direct, indirect, and induced jobs in Kenya by 2022, with further growth expected as electrification deepens (Power for All, 2022). However, the evidence shows that employment growth does not automatically translate into decent work. Many jobs are short-term, casual, project-based, or informally arranged, especially within SMMEs and community-based enterprises. See Section 5 for an explanation of the factors driving this. As one workers' union leader explained,

> *"Workers in the renewable energy sector, especially those involved in solar installation and maintenance, receive relatively low wages. Many are on casual or short-term contracts, without access to benefits or job security."*

Evidence on wages was uneven, but the available qualitative data suggests that many workers in the lower tiers of the sector receive low and unstable earnings, with field evidence showing that some workers in informal or casual renewable energy roles earn as little as KES 300 to KES 1,000 per day, often without contracts, benefits or predictable career progression.

This reflects a wider labour-market pattern in Kenya, where informality remains high and renewable energy employment is being created within an economy already characterised by underemployment and insecure work. At the upper end of the sector, engineers, managers, and workers in larger or donor-backed firms may access more stable contracts, training, and benefits. This creates a dual labour regime in which a small formal tier captures better employment conditions while a larger informal tier absorbs risk. This range is most pronounced in Coastal Kenya, where interviews with

informal and small-firm workers in the solar distribution and installation value chain reported daily pay within this band, with no contracts, insurance, or hazard allowances.

Working conditions are similarly uneven. The findings show that many workers participate in physically demanding roles such as installation, site work, electrical support, and customer-facing field services. These roles may involve travel to remote areas, long hours, irregular schedules, and exposure to occupational hazards such as the risk of falls when safe access equipment is unavailable and head injuries when helmets are not provided. Evidence indicates that many workers, particularly those in technical and installation roles, lack basic social protection, including health insurance and pension coverage through the Social Health Authority and National Social Security Fund. Furthermore, there have been many reported cases in which technicians were not provided with essential safety equipment, including helmets and safe access equipment such as ladders. Where injuries occurred, the costs were reportedly addressed through family and community fundraising rather than employer liability or workplace insurance arrangements. This evidence is consistent with wider concerns about procedural justice in Kenyan renewable energy development, where the distribution of risks, benefits, and protections is shaped by how projects and employment arrangements are governed (Ndi, 2024). It also reflects broader sub-Saharan Africa in that safe working conditions, social protection, job security, and equitable treatment remain inconsistently realised across labour markets (Fordjour et al., 2025). Literature cautions that renewable energy jobs, particularly in installation, construction, and maintenance, often reproduce precarious labour conditions when not supported by strong labour regulations, occupational safety and health enforcement, and collective bargaining (IRENA and ILO, 2024).

Social protection is also weak. Evidence indicates that many workers lack formal contracts, health insurance, pension contributions, paid leave, or structured benefits. This matters because employment insecurity is transferred from firms to workers and households. When earnings are low or irregular, households become the buffer that sustains workers through unpaid care, informal income support, emotional labour, and family-based coping mechanisms. This means that employment conditions in the renewable energy sector also shape household welfare, care responsibilities, worker retention, and the ability of workers to remain in the sector over time.

Furthermore, the labour market is also unequal, with youth being highly represented in technical and field-based roles, but often under casual conditions that provide limited career progression. Women remain underrepresented overall and are particularly absent from higher-value technical, engineering, and leadership roles. This is concentrated in installation, maintenance, and other field-based technical roles, where 65% of surveyed firms report employing youth, predominantly on casual terms (Onyango et al., 2026). The firm survey did not disaggregate which specific technical, engineering, or leadership roles persons with disabilities are excluded from; it recorded only whether firms employed any at all. People with disabilities are even more excluded, with the survey showing that only 17% of firms reported employing members of this group. These patterns show that renewable energy work is expanding, but access to jobs and upward mobility remains stratified by gender, age, disability, education, and skills.

3.3 Conclusion: Decent Work and Localisation

Taken together, the decent-work findings in this section show the same pattern as the localisation findings in Section 2: Kenya's renewable energy sector is expanding activity and creating jobs, the jobs being mainly in the downstream, lower-margin segments of the value chain where firms themselves are concentrated. Because localisation is currently shallow, the work it generates is correspondingly casual, weakly protected, and concentrated in lower-skill functions. Deepening localisation into staged manufacturing and repair ecosystems, as identified in Section 2, is therefore also the most direct route to improving job quality. The two agendas are not separate policy tracks but the same transition from different angles.

4. GENDER

Gender equity is key to whether Kenya's renewable energy transition can become genuinely just (Fuchs et al., 2025). A transition that expands solar and wind deployment but leaves women concentrated in lower paid, less secure, and influential positions would only reproduce existing inequalities. Addressing gender equity is therefore not only an objective, but also an industrial and developmental issue because women's exclusion from technical training, finance, enterprise ownership, leadership, and decision-making reduces the sector's total skills base, weakens innovation capacity, and limits the distribution of benefits from localisation.

4.1 Gender at Work

The evidence shows a gendered division of labour within Kenya's solar and wind sector, with men dominating technical, engineering, field installation, management, and decision-making roles, while women are more visible in sales, administration, customer relations, community engagement, clean cooking, and some installation and maintenance work. This division reflects wider labour-market and social norms that associate engineering, mobility, electrical work, and field-based technical tasks with men, while assigning women to relational, administrative or lower-paid support roles (Clancy et al., 2019; Johnson et al., 2020).

The research found that women accounted for between 42% and 46% of those in solar installation and maintenance roles across Central, Coastal, and Western Kenya, making this the technical area in which women were most strongly represented (Onyaga et al., 2026). However, these percentages (from the firm surveys) refer to workers reported in solar installation and maintenance roles and should not be interpreted as women's share of Kenya's entire renewable energy workforce. This range is broadly consistent with IRENA's global estimate that women account for 40% of full-time employment in the solar photovoltaic sector (IRENA, 2022). By contrast, Onyango et al. (2026) showed that women's representation remained below 20% in system design, renewable energy project engineering, and wind turbine technician roles.

The strong representation of women in entry to mid-level technical roles in the sector nuances existing literature that emphasises women's concentration in administrative, sales, and community-facing roles and their underrepresentation when it comes to technical work (Andega et al., 2026a). The empirical findings here show that women have entered some technical-adjacent and mid-level technical spaces. This pattern is consistent with global findings on the uneven distribution of women across occupational categories (IRENA, 2025). However, the main problem that women in the sector face is their limited movement into advanced technical, engineering, ownership, and leadership roles, and while this leadership gap is consistent with global evidence, its severity varies by technology: women hold 30% of management positions and 17% of senior management positions in solar photovoltaic roles, compared with 13% and 8%, respectively, in wind energy. Women also hold only 13% of management positions in the oil and gas sector (IRENA, 2022).

Women's underrepresentation is shaped by several barriers, such as cultural norms (including social biases that portray engineering, electrical work, and site-based technical work as 'man's work' and therefore masculine); limited access to science, technology, engineering, and mathematics (STEM) and TVET pathways; employer doubts about women's technical competence; workplace harassment; lack of mentorship; and limited access to finance. These barriers affect both women workers and women entrepreneurs. Women-led SMMEs struggle to access capital, certification support, procurement opportunities, and business networks (International Finance Corporation, 2021). In the regional interviews, this took the form of customers and employers doubting women's competence at technical tasks, spouses discouraging or forbidding women from taking field-based roles, and firms defaulting to placing women in sales or administrative positions, even where they held technical qualifications equivalent with that of male colleagues. One SMME worker described how these perceptions operate in practice:

> *"The lingering perception that certain jobs are 'meant for men' can affect women's participation and confidence in the sector. Many customers would doubt a lady doing installation, even if she is capable."*

Women workers may enter the sector through sales or community-facing roles but face limited progression into higher-value technical roles. The result is a sector in which women participate, but often without equal access to the roles that generate stronger income, authority, learning, and long-term security.

Emerging trends are therefore mixed. On the positive side, renewable energy is creating new entry points for women through solar sales, customer service, entrepreneurship, clean cooking, last-mile distribution, community mobilisation, and some technical service roles. Programmes targeting women's renewable energy participation, providing mentorship, and offering skills development are beginning to challenge the idea that energy work is only for men. These include firm-level initiatives such as "Women in D.Light" and "Sote Tech Queens", which train and place women in solar sales and installation, the WISEe (Women in Sustainable Energy and Entrepreneurship) technician-training programme, and Solar Sister, which promotes an 80:20 women-to-men employment target among its partner distributors. On the negative side, these gains remain fragile and uneven. Gender mainstreaming policies exist, but the surveys and interviews showed that gender inclusion remains at an early stage, with policies not fully embedded in firm practice. Without deliberate action, women may remain concentrated in lower-value roles while men continue to dominate the technical and managerial positions through which value, authority, and upgrading capacity are accumulated.

4.2 Gender and Societal Expectations

Gender inequality in Kenya's renewable energy sector is not produced only inside the workplace. It is also shaped by household roles, care responsibilities, social expectations, and the organisation of social reproduction. Social reproduction refers to the unpaid and often invisible labour that sustains workers and households, including cooking, cleaning, childcare, elder care, emotional support,

household management, rest, and the daily reproduction of people's ability to work. This labour is essential to the formal economy but is disproportionately carried out by women and goes largely unrecognised in economic energy planning. Recent research shows that the distribution of paid work and unpaid household labour shapes how women experience and benefit from energy transition processes, whereby renewable energy jobs are often short-term and poorly paid, while women continue to carry much of the unpaid work needed to sustain their households (Taylor, 2023). Renewable energy expansion can also reproduce unequal social reproductive burdens where the labour required to sustain workers, households, and communities is not explicitly recognised or supported (Akbulut, 2025).

In the context of Kenya's renewable energy transition, social reproduction shapes who can enter the sector, what type of work they can take, and whether they can remain in employment over time. Technical roles in solar installation, maintenance, field sales, and wind project support often require mobility, irregular hours, site-based work, travel, and physical availability. These conditions are easier for workers who are not expected to carry the primary responsibility for household care. For many women, unpaid care work limits the ability to travel, work late hours, accept field assignments, attend training, or take up project-based work far from home. The literature notes that without childcare support, adequate leave policies, flexible schedules, lactation rooms, and safe or nearby care arrangements, women are less likely to enter and remain in clean energy work (Andega et al., 2026a).

Households also subsidise the wage regimes in the sector, and when renewable energy workers are casual, low-paid and/or lack social protection, the costs of maintaining labour are shifted away from firms and the state and onto households. This was shown by the regional key informant interviews, where casual and informal workers described relying on family support, informal borrowing, and community fundraising to cover healthcare, income gaps and workplace injuries that employers did not cover.

Essentially, families absorb income instability through unpaid care, shared housing, informal borrowing, small side businesses, remittances, reduced consumption, and support from spouses, parents, or extended family members. This is especially important for workers in renewable energy SMMEs, where benefits such as medical cover, paid leave, pensions, and childcare are limited or absent. Thus, the sector's labour model is sustained partly by invisible household labour.

Kenyan women often carry a double burden, whereby they may participate in paid renewable energy work while also retaining primary responsibility for household management, childcare, and care for dependents. This is drawn from the regional interviews, where women workers and managers in Central and Western Kenya described spousal resistance, restricted mobility (for example, a limited ability to ride motorcycles for rural field visits), and the need for spousal permission to take up technical roles, which is consistent with international evidence that unpaid care work constrains women's labour-force participation more broadly (Halim et al., 2023). As one woman SMME worker explained:

> *"I do all household chores. Since I don't have domestic help, I cook, clean, and make sure everything is in order. Due to [my fiancé's] work schedule, we agreed that I would take care of most of the household duties."*

This reality affects job retention, productivity, training, and career progression. It may also push women into part-time, informal, flexible, or lower-paid work that can be combined with household obligations, even where they have the capacity to undertake more technical or leadership roles. Men, by contrast, are more likely to be socially positioned as mobile breadwinners able to take up field-based or project-based opportunities. These gendered expectations reinforce occupational segregation within the sector. This is drawn from the regional key informant interviews, where workers and small-firm owners described these coping arrangements directly.

Families and workers also use reciprocity arrangements to survive low or unstable earnings. Young workers depend on parents or relatives for housing while working in entry-level roles, married workers rely on spouses to manage household care when work requires long hours, and informal workers move between renewable energy work and other income-generating activities to stabilise livelihoods. In addition, women entrepreneurs rely on family labour, informal savings groups, or community networks to compensate for limited formal finance. These arrangements allow workers and small firms to remain active in the renewable energy economy, but they also hide the true social cost of insecure green employment.

The emerging trend is that social reproduction is becoming increasingly relevant to the energy transition but remains weakly integrated into policy and firm-level planning. The findings demonstrate that hidden social reproductive work underpins household survival and that social policy must stand alongside industrial policy if Kenya's transition is to be just. This reinforces the literature and confirms the relevance of social reproduction, shows why gender equity cannot be addressed only through workplace hiring targets. Achieving gender equity also requires childcare, healthcare, transport, social protection, and family-friendly employment conditions (Andega et al., 2026a).

4.3 Conclusion: Gender and Localisation

Women's participation is concentrated in the same downstream, lower-value activities — sales, distribution, administration, and some installation and maintenance — where Kenyan firms as a whole, and their exclusion from engineering, system design, and leadership tracks, mirrors the sector's broader exclusion from higher-value, technical segments of the production network. This suggests that staged localisation which builds domestic technical capability will only advance gender equity if it is designed to be gender-inclusive from the outset. Localisation that defaults to existing, male-dominated recruitment pathways risks deepening rather than closing the gap.

5. KEY FACTORS AND ACTORS INFLUENCING LOCALISATION, DECENT WORK AND GENDER EQUITY

The preceding sections examined localisation, decent work and gender equity as three separate outcomes. This section brings the underlying drivers of those outcomes together to show why the patterns described in Sections 2, 3 and 4 occur. While each outcome is discussed separately below, the factors and actors are intertwined in their combined impacts that shape all three simultaneously.

5.1 Shaping Localisation Dynamics

A variety of factors and actors shape localisation dynamics in Kenya. Table 2 summarises how each of these supports or constrains localisation. The rest of this subsection explores these in more detail.

Table 2: Actors and factors supporting or constraining renewable energy localisation in Kenya

Actor/Factors	Support for Localisation	Impediments to Localisation
Local Context	• Regional markets, growing demand • Existing SMME activity • Technical labour • Opportunities in repair, maintenance, mounting structures, and civil works	• Weak industrial clustering • Skills gaps • High energy and production costs • Uneven infrastructure • Regional disparities
Firms	• Import relationships allow firms to access technology and components • Customer networks supported by last-mile distribution • KEREA, KAM, KEPSA, and other associations can support policy engagement and coordination	• Buyer-seller relationships focus on purchasing and distributing imported products • Production and sustained technology transfer remain limited • Firms gain access to products but not to the capabilities required for local manufacturing • Collective action remains weak and not yet strong enough to drive industrial upgrading

Actor/Factors	Support for Localisation	Impediments to Localisation
Government/ Public Sector	• Energy policies, standards institutions, county planning, TVETs, public utilities, and green investment frameworks support business opportunities	• Poor policy implementation and coordination • Unclear mandates • Limited incentives • Focus on renewable energy deployment rather than manufacturing
Global Actors	• Foreign firms, OEMs, financiers, and development partners can provide technology, capital, and standards	• Control high-value technology, procurement, finance, and intellectual property
Finance	• Commercial banks, equity finance, donor finance, crowdfunding, and community investment provide some firm support	• High interest rates, collateral requirements, and uneven access prevent SMMEs from investing in manufacturing
Trade Unions and Workers	• Workers and unions can push for skills, decent work, and fairer value distribution	• Union presence is weak • Labour is casualised • Workers have limited bargaining power
Communities	• Local demand, labour, social acceptance, and community-based energy models support the sector	• Communities may receive limited benefits where projects are externally controlled or weakly linked to local economies

Sources: Andega et al., 2026b; Kemunto et al., 2026; and Onyango et al., 2026

5.1.1 Local Context

The local context shapes localisation through differences in market demand, finance, skills, infrastructure and institutional support, these factors are distributed unevenly across Central, Coastal and Western Kenya, resulting in uneven outcomes across the three regions. Central Kenya benefits from proximity to Nairobi, finance, training institutions, policy actors and market infrastructure. Coastal Kenya is strategically positioned as a port-based import and distribution node, while Western Kenya shows some knowledge-oriented potential through R&D activity. However, these regional advantages have not yet formed strong industrial clusters.

5.1.2 Firms

Buyer-seller relationships shape localisation through material flows, knowledge flows, and market access. Kenyan firms rely on imported solar and wind components, especially from established global manufacturing hubs. These relationships allow domestic firms to access foreign hightech components and meet customer demand, but they also reinforce dependency on the same foreign firms, with the findings showing that domestic firms remain heavily dependent on imported renewable energy components, while technology transfer from foreign firms is inconsistent and largely unstructured. In practice, firms gain access to products but not necessarily to the knowledge, licensing or production capabilities needed to move into higher value manufacturing. Strong competition from cheaper imported products further limits the commercial viability of locally produced alternatives.

Business associations and collective firm organisation are relevant but underdeveloped sources support. Associations such as KEREA[1], KAM[2] and KEPSA[3] can provide platforms for policy dialogue, standards awareness, market coordination, and private-sector advocacy. The field evidence shows that firms engage in partnerships, networking, supply-chain cooperation, and knowledge sharing, but that subcontracting on renewable energy projects among local firms and advocacy remain less common. Onyango et al. (2026) indicates this is mostly potential rather than active practice engagement is largely informal networking and knowledge-sharing between firms rather than associations formally brokering subcontracting or joint ventures. This suggests that firms are beginning to build horizontal relationships, but these have not yet matured into the kind of coordinated industrial strategy which could promote large-scale localisation.

5.1.3 Government

The public sector is one of the most important actors shaping localisation prospects. Kenya has several relevant policy and institutional frameworks that could support domestic renewable-energy capability, but their design and implementation have produced uneven results. The Feed-in Tariff, introduced in 2008, provided predictable pricing and 20-year grid-access arrangements that helped attract early wind and solar investment. However, its fixed tariff structure also created lock-ins, with consumers remaining tied to comparatively high prices despite subsequent declines in global renewable energy technology costs. Similarly, VAT exemptions for solar and wind equipment were reinstated in 2021, lowering upfront costs for decentralised renewable energy systems, but earlier reversals of these incentives disrupted market growth and weakened regulatory certainty for firms and investors.

Kenya's procurement and industrial-policy framework also contain provisions intended to promote local participation. The Public Procurement and Asset Disposal Act (2015) includes a 40% local-sourcing requirement, while the National Industrial Policy Framework (NIPF) proposes minimum local-content thresholds of 25% for domestically produced industrial components and 60% for exports. The NIPF further envisages industrial parks, special economic zones (SEZs) and long-term manufacturing support through the Industrial Development Fund. In addition, the Micro and Small

[1] KEREA promotes and develops the renewable energy sector through advocacy, networking, capacity building, and market development.
[2] KAM represents manufacturers and advocates for policies that enhance industrial growth, competitiveness, and investment.
[3] KEPSA serves as the umbrella voice of Kenya's private sector and promote an enabling business environment through public-private engagement.

Enterprises Act (2012) mandates the Micro and Small Enterprises Authority to support enterprise capacity-building, technological modernisation, business development services and market access (Republic of Kenya, 2012).

However, the evidence shows that these provisions have not yet translated into a coherent and enforceable renewable energy localisation pathway. Achieng et al. (2026) identifies slow progress in establishing a local-content development unit, weak monitoring frameworks, limited investment in research and development, insufficient collaboration between industry and training institutions, and delays affecting industrial parks and SEZs. These constraints are reinforced by the empirical findings, which show that national policies gesture towards local manufacturing but remain weakly implemented, while county governments face unclear mandates, limited financing, and weak coordination in renewable energy localisation efforts. This reflects a wider lesson from local content policy research: such measures do not automatically create domestic linkages unless they are matched by realistic capability-building, effective enforcement and supportive political-economic conditions (Pedersen et al., 2025). Thus, institutional power has not yet been deployed in a way that meaningfully shifts Kenya's position in the production network.

5.1.4 Global Value-Chain Actors

Global actors influence localisation through technology ownership, finance, procurement rules, setting quality standards, and project design. In solar, foreign manufacturers dominate the supply of cells, wafers, inverters, batteries, and other core components. In wind, OEMs and foreign engineering firms control turbines, blades, nacelles, and control systems. International financiers and development banks also influence project bankability, procurement conditions, and risk allocation. These actors can support localisation through investment, technology partnerships, training, and joint ventures with local firms, but the evidence suggests that these mechanisms are weakly structured. By weakly structured we mean firm interactions are mostly informal networking and knowledge-sharing rather than formal subcontracting or coordinated industry advocacy, which the firm survey found to be far less common (Onyango et al., 2026). The result is that Kenya benefits from renewable energy deployment while remaining dependent on external technology, standards and capital, considering the low agency of local firms to influence international regulations.

5.1.5 Financial Actors

In addition, finance is a big challenge, and the findings show that finance is available in principle but is inaccessible in practice for many SMMEs because of high interest rates, collateral requirements, and the lack of tailored financing instruments. Additionally, financial support is uneven across regions: Central Kenya firms rely heavily on crowdfunding and community and family investment, Western Kenya firms draw more on international funding, and Coastal Kenya reports the highest exclusion from financial aid. Components manufacturing, certification, testing, tooling, and skills development require patient capital, and without affordable finance, local firms remain confined to distribution, installation, and service roles. Financing suited to newer renewable energy firms could include loans secured against equipment, loans for clean energy activities, and funding that combines lower-cost public or development finance with private lending. These options would help firms that lack the collateral or business history required for standard bank loans.

5.1.6 Trade Unions and Workers

Trade unions and workers influence localisation indirectly through skills, labour standards, and bargaining over benefit sharing and value distribution. However, union influence in the renewable energy sector remains weak. The technical survey reports union membership below 5% across all Central, Coastal, and Western Kenya, while casual employment remains as high as 41% of firms in Western Kenya (Onyango et al., 2026). This limits workers' ability to shape skills pathways, safety standards, wage conditions, or upgrading strategies. Weak worker voice also means that renewable energy policy debates may focus heavily on investment, deployment, and localisation without adequately addressing employment quality.

5.1.7 Communities

Communities affect localisation through demand, labour supply, and societal embeddedness. Specifically, demand for renewable energy products pay-as-you-go (Pay Go) services and local supply of installation, sales, and after-sales labour. SMMEs and off-grid solar firms have built community-level links through last-mile distribution, Pay Go models, installation, and maintenance services. These relationships support localisation because they embed renewable energy technologies in local markets and household economies. However, communities may also experience limited benefit-sharing, especially where projects are large-scale, externally financed or weakly linked to local employment and enterprise development. An example of this is the community tensions that arose from the LTWP, and the empirical findings reinforce the need to treat communities as active in the production network rather than passive beneficiaries. At LTWP, the community disputed the project's land acquisition process, and in late 2021 the High Court confirmed that title deeds had been irregularly obtained, prompting renegotiation of benefit-sharing arrangements.

The empirical findings confirm the information in the literature that localisation is constrained by Kenya's downstream position in global production networks (Andega et al., 2026a). Downstream position refers to Kenya's concentration in the final stages of the value chain (assembly, distribution, installation, maintenance) rather than upstream stages (raw-material processing, component manufacturing, R&D, design), which remain concentrated in China, Europe, and the US. The field evidence adds that the most immediate localisation opportunities are not in full upstream manufacturing, but in downstream activities associated with manufacturing entry points, such as mounting structures, tower foundations, and locally embedded activities, such as repair, maintenance, assembly, distribution, technical training, and SMME-led service provision. This downstream concentration is driven by the combination of factors examined above: global actors retaining control of technology, finance, and standards; SMME finance that is available in principle but largely inaccessible in practice; business associations and inter-firm collaboration that remain informal rather than coordinated; and union density below 5%, which leaves workers with little influence over skills or upgrading pathways. The central challenge is therefore to convert these existing entry points into a coherent localisation pathway supported by finance, standards, procurement, skills, and enforceable industrial policy.

5.2 Shaping Work Outcomes

A wide variety of dynamics also shape outcomes related to decent work. Firm size and capability play a role, whereby larger and more formal firms are more likely to provide structured employment, while smaller firms often face cash-flow constraints and limited access to financing mechanisms see Table 3. These conditions make casual labour attractive to employers, even though it weakens job security and worker welfare. The empirical findings found that finance, policy inconsistency, skills shortages, and technology gaps remain major constraints for firms. These constraints indirectly affect decent work because firms with weak financial and technical capacity are less able to invest in stable employment, skills upgrading, safety systems, and benefits.

Table 3: Key dynamics supporting or constraining decent work in Kenya's renewable energy sector

Dynamic	Support for Decent Work	Constraint on Decent Work
Local Context	Growing renewable energy demand creates jobs in installation, maintenance, sales, and services	Informality, weak infrastructure, and regional inequality limit job quality
Firm Size and Capability	Larger and better capitalised firms can offer contracts, training, and benefits	Many SMMEs operate on thin margins and rely on casual labour
Public Sector	Labour laws, OSH regulation, TVET systems, and energy policies can improve standards	Enforcement is weak and decent work is not consistently embedded in energy policy
Finance	Access to capital and financing mechanisms can help firms formalise and train workers	High capital requirements push firms to reduce labour costs
Skills Systems	TVETs and certification can support career progression	Training is stronger for installation than for manufacturing and advanced technical work
Trade Unions and Workers	Worker voice can improve wages, safety, and social protection	Union presence in the sector remains very limited
Gender and Inclusion Systems	Targeted recruitment and workplace support can broaden participation	Women and workers with disabilities remain excluded from many high value roles, including technical and leadership roles

Source: Onyango et al., 2026 and Andega et al., 2026b

Renewable energy companies can support gender equity through transparent recruitment, promotion criteria, grievance mechanisms, anti-harassment policies, maternity and parental leave, flexible scheduling, safe transport arrangements, and leadership pathways. The empirical evidence recommends gender-sensitive grievance mechanisms, safeguarding policies, targeted financial products, vocational training, mentorship, and leadership programmes for women. These recommendations respond directly to the problems documented earlier in this section and in the regional interviews workplace harassment with weak enforcement of safeguarding policy, women's underrepresentation in technical training and certification, and women-led enterprises' constrained access to finance (Andega et al., 2026b).

Public policy is another decisive factor shaping labour outcomes, and whereas Kenya has labour laws, energy policies, training institutions and regulatory agencies that could support decent work, the empirical findings show that implementation remains weak. This is largely an enforcement rather than a legal-design gap: the underlying labour laws - the Employment Act (No. 11 of 2007) and the Occupational Safety and Health Act (No. 15 of 2007) - are comprehensive, but regulatory agencies remain understaffed and underfunded, and renewable energy projects reliance on subcontracted labour further weakens accountability for compliance. Integration of the ILO's four pillars of decent work into national and county renewable energy frameworks could strengthen occupational health and safety enforcement, require firms to provide transparent contracts and benefits, and establish skills certification pathways for informal workers.

The limited role of organised labour makes these challenges harder to address. As one SMME worker explained,

> *"there is no channel for workers to raise issue, you just leave if the job becomes unbearable."*

Union density is low mainly because most renewable energy work is project-based, casual and dispersed across small firms and informal installers, which mirrors the wider casualisation of Kenya's labour market and makes it structurally difficult for unions such as KETAWU to organise the sector. Further the implementation capacity is relative to policy ambition: the firm survey found that even well-established frameworks such as the Energy Act (No. 1 of 2019) and the Gender Policy in Energy (2019) are rated "neutral" or "effective at best" by most firms, with very few rating any framework "very effective" (Onyago et al., 2026).

Overall, the findings confirm that the key issue behind poor job quality in Kenya's production network is that Kenya's renewable energy sector is creating work, but much of it remains precarious, unevenly protected, and weakly inclusive. The challenge to decent work creation in the renewable energy sector is not due to labour regulation but is also about Kenya's position in the renewable energy production network. This is primarily an enforcement gap rather than a regulatory-design gap: Kenya's underlying labour laws are comprehensive, but regulatory bodies are understaffed and underfunded relative to the sector's growth, and reliance on subcontracted projects and informal labour further weakens compliance monitoring. As long as local firms remain concentrated in low-margin downstream

activities, the pressure to rely on casual and insecure labour will remain strong. Improving work therefore requires both labour sector reforms and industrial upgrading.

5.3 Gender-Specific Dynamics

Gender equity in Kenya's renewable energy sector is shaped by interacting workplace, household, institutional, and production-network dynamics. The most important drivers are skills, capacity building systems, finance, firm practices, policy implementation, social norms, workplace safety, care infrastructure, community organisations, and the wider position of Kenyan firms in the GPN. This pattern is not unique to Kenya's renewable energy sector: international evidence on export-oriented manufacturing shows that industrial upgrading toward more capital-intensive production is often associated with a shrinking, not growing, female employment share and an "anti-female bias" in labour demand as firms move up the value chain (Tejani and Milberg, 2016, p. 24), reinforcing the point above that upgrading must be deliberately made gender-inclusive rather than assumed to be so.

On the state's role specifically, Achieng et al. (2026) describes that Kenya's 2019 National Energy Policy mandates that at least 30% of technical training positions in renewable energy projects be reserved for women, yet EPRA implementation data show female participation in technical roles remaining below 15%, pointing to an enforcement gap rather than an absence of policy commitment (Achieng et al., 2026). The state's role in provisioning public services that would support gender equity — childcare, safe transport to rural work sites, and workplace safeguarding infrastructure — also remains largely undeveloped, which compounds the household-level constraints on women's participation discussed in the previous subsection.

Women's limited presence in engineering, system design, and leadership roles reflect unequal access to technical education, mentorship, and workplace learning. Expanding women's participation, therefore, requires more than encouraging firms to hire women. It requires gender-responsive TVET pathways, scholarships, recognition of prior learning, employer-linked internships, and deliberate placement of women in advanced technical roles. Without this, women may continue to enter the sector through sales, customer service, and community engagement while remaining excluded from higher value functions.

Finance also remains a major barrier to women's participation in the renewable energy sector, and women-led renewable businesses often face the combined constraints of limited collateral, weaker access to business networks, lower representation in procurement, and less exposure to certification, and technical compliance processes. Targeted credit, grants, procurement quotas, and business development support are therefore necessary if gender equity is to extend beyond employment into ownership and value capture.

Finally, gender equity is shaped by the broader production-network structure. Because Kenyan firms remain concentrated in lower-value and lower-margin segments, the space for high-quality, stable and upwardly mobile work is limited for all workers, but women are more likely to be pushed into the least secure or least technical parts of the sector. This means gender equity depends not only on social policy, but also on industrial upgrading. However, economic upgrading in production networks

does not automatically translate into social upgrading for women and can in some cases deepen occupational segregation if higher-value roles are filled through male-dominated technical pathways (Barrientos et al., 2011). We therefore treat industrial upgrading as a necessary but not sufficient condition for gender equity, requiring deliberate, gender-responsive recruitment and training alongside it. A renewable energy sector with more local manufacturing, better capacity building systems, and more formal contracts, would create more opportunities for women to enter technical, managerial, and entrepreneurial roles. Nonetheless, formal contracts and industrial upgrading alone do not dislodge the cultural norms that code technical and field-based renewable energy work as masculine, which the regional interviews found operating independently of firm formality (Pearl-Martinez and Stephens, 2016; Andega et al., 2026b). These interventions are important, because workplace culture can either reinforce exclusion or make women's participation normal, safe, and professionally rewarding.

Overall, the empirical findings largely confirm the literature-based concerns about gender exclusion, occupational segregation, and unpaid care. Women are present in the sector, but their participation remains constrained by weak progression into leadership, engineering, ownership, and advanced technical work. The policy challenge is therefore to move from basic inclusion of women, towards gender-transformative localisation, where women participate as workers, technicians, entrepreneurs, innovators, and decision-makers across the renewable energy value chain. Table 4 summarises the key dynamics that support or constrain gender equity across these areas.

Table 4: Key dynamics supporting or constraining gender equity in Kenya's renewable energy sector

Dynamic	Support for Gender Equity	Constraint on Gender Equity
Skills and Training	TVETs, mentorship, and targeted technical training can support women's entry into technical roles	STEM and technical pathways remain gendered, with limited progression into engineering and leadership
Firm Practices	Inclusive recruitment, grievance systems, flexible work, and promotion pathways can improve retention	Gender policies are often weak, informal, or not implemented
Finance and Enterprise Support	Women-targeted credit, grants, and procurement support can strengthen women-led SMMEs	Women face barriers to collateral, networks, certification, and business expansion
Finance	Access to capital and financing mechanisms can help firms formalise and train workers	High capital requirements push firms to reduce labour costs
Workplace Culture and Safety	Safeguarding policies can reduce harassment and improve retention	Harassment, stereotypes, and competency doubts discourage women's participation

Dynamic	Support for Gender Equity	Constraint on Gender Equity
Care Infrastructure	Childcare, transport, healthcare, and leave policies can support women's participation	Unpaid care burdens restrict mobility, acces to training, and the ability to enter field-based work
Public Policy	The 2019 Gender Policy in Energy provides a formal basis for gender mainstreaming and women's participation in the sector (Nunoo et al., 2025).	Weak enforcement limits translation into workplace change
Community Norms	Public awareness and women role models can normalise women in energy work	Technical energy work is still often perceived as masculine

Source: Onyango et al., 2026 and Andega et al., 2026b

6. CONCLUSION

6.1 Key Challenges

Shallow localisation: Kenya captures value mainly in assembly, distribution, installation, and maintenance, not manufacturing, R&D, or technology ownership (Section 2). Firms lack capital, standards compliance, and technology needed to move into higher-value segments, while imported components remain cheaper than local production. Without deliberate intervention, renewable energy growth will generate inequality, without building lasting domestic industrial capability.

Precarious work: Casual, temporary, and weakly protected employment remain the norm, especially in SMMEs and informal arrangements (Section 3). Firms concentrated in low-margin downstream activities have little room to offer stable contracts, and union density remains below 5%. This implies that job creation alone will not deliver a just transition if the jobs created remain insecure and low-paid.

Gender exclusion: Women remain concentrated in lower-value roles and largely absent from technical and leadership functions (Section 4). Cultural norms, unpaid care burdens, and limited access to STEM and TVET pathways compound firm-level recruitment patterns that default to male-dominated technical roles. Gender-blind localisation and industrial upgrading risk deepening rather than closing this gap.

Weak enabling institutions: SMME finance, business associations, and trade unions are underdeveloped, limiting collective upgrading (Section 5). In essence, engagement between firms remains informal networking rather than coordinated advocacy, and financiers treat the sector as high-risk. The implication is that individual firms cannot easily upgrade or organise for better terms.

Implementation gap: Local content, labour, and gender policies exist on paper but are inconsistently enforced (Section 5). Regulatory bodies are understaffed and underfunded relative to the sector's growth, and reliance on subcontracted labour weakens compliance monitoring. Stronger policy frameworks alone will not change outcomes without matching enforcement capacity and accountability.

6.2 Key Opportunities

The evidence presented above shows that Kenya's solar and wind renewable energy sector has real potential to support localisation, decent work, and gender equity, but this potential is not automatic. Renewable energy growth has expanded market activity, created employment, and opened space for SMMEs, yet Kenya remains concentrated in downstream segments of the value chain. The key issue is, therefore, not whether renewable energy is growing, but whether growth can be redirected towards stronger domestic value capture, decent work standards, and more equitable participation.

The first major opportunity lies in practical and staged localisation. The evidence shows that full upstream manufacturing of solar cells, wafers, inverters, turbines, blades, and control systems is not currently feasible at scale because these segments require high capital investment, technology ownership, specialised skills, and global competitiveness. However, the research also shows that localisation can be advanced through more feasible entry points, including solar mounting structures, wiring, electrical fittings, battery pack assembly, repair and maintenance, wind tower foundations, civil works, installation, distribution, and after-sales services. These activities may not represent full industrial transformation on their own, but they can deepen local value capture, build technical capabilities, and create a platform for future upgrading. SMMEs play a key role, as they already perform important intermediary roles in last-mile distribution, installation, retail, maintenance, and customer support. Their embeddedness in local communities gives them a comparative advantage in serving households, small businesses, and underserved users. However, they face severe constraints in accessing affordable finance, certification support, procurement opportunities, skilled labour, and technology partnerships. Local ownership exists, but many firms remain concentrated in low-value assembly and dependent on imported components. This means that SMME participation alone is insufficient unless it is supported by finance, procurement reform, technical upgrading, and stronger links to training and standards institutions.

Furthermore, local production, repair, and maintenance ecosystems can create more stable and skilled jobs than short-term project-based installation alone. However, the current employment trajectory remains uneven. The sector is generating work, but much of it is casual, insecure, weakly protected, and concentrated in low- and mid-skill functions. This creates a challenge as localisation may expand domestic participation while fostering poor employment conditions. To avoid this, local content policies, public procurement, donor finance, and enterprise support could be tied to decent work requirements and include formal contracts, occupational safety, social protection, skills certification, and provision for workers to be heard and addressed. Women are present in parts of the renewable energy sector, including sales, administration, community engagement, and some installation and maintenance roles. However, they remain underrepresented in leadership, engineering, system design, ownership, and advanced technical functions. Kenya cannot build a strong renewable energy industrial base while excluding a large share of its potential technical and entrepreneurial workforce.

Additional opportunities exist for improving outcomes for women. Gender-responsive TVET pathways, mentorship, safe workplaces, childcare support, targeted finance, and procurement support for women-led enterprises are strategies that could address gender inequity in the sector and ensure that women equally benefit from the energy transition.

Localisation can benefit from coordinated industrial policy, predictable procurement pipelines, enforceable local content requirements, skills development, and strategic use of public finance. Examples such as South Africa and Morocco show that domestic value capture is more likely when renewable energy deployment is linked to industrial planning, investment coordination and capability building. South Africa's Atlantis Special Economic Zone was designated as a Greentech SEZ to attract wind tower and renewable energy manufacturers by leveraging industrially zoned land, bulk infrastructure, port proximity and targeted investment incentives. Morocco's Noor Ouarzazate Solar Complex, developed as part of a national solar plan, provides another example of using renewable energy infrastructure to build local construction, engineering, operations and maintenance capabilities,

and related service supply chains. However, these cases also caution that localisation policies do not automatically produce decent work or gender equity unless social conditions are built into the design. Evidence from South Africa's Renewable Energy Independent Power Producer Procurement Programme shows that community equity and benefit-sharing mechanisms can institutionalise local participation without necessarily shifting ownership or control over technology choices. For Kenya, the implication is that community benefits and local employment need to be linked to enforceable local content requirements, technology transfer commitments, supplier development and meaningful opportunities for Kenyan firms and communities to build ownership and decision-making influence.

Localisation could also be framed regionally rather than exclusively national scale. Kenya's capabilities in assembly, construction, logistics, and technical services could be strengthened through regional value chains that connect to complementary mineral resources, manufacturing capabilities, and larger markets elsewhere in East and Central Africa. The African Continental Free Trade Area (AfCTA) provides a relevant framework for this approach, as regional coordination could allow countries to specialise in complementary functions rather than attempting to duplicate capital-intensive production across relatively small national markets. For Kenya, this implies a dual strategy: build domestic capability in strategically viable segments while pursuing regional production and supply chain partnerships that increase market scale, diversify inputs, and support investment in manufacturing. Thus, Kenya's localisation strategy could combine targeted domestic capability building with regional production networks in which countries specialise in complementary materials, components, manufacturing, and service functions.

Overall, the evidence confirms that Kenya's strongest pathway is not immediate full-scale manufacturing, but selective localisation that builds from existing capabilities while deliberately improving employment standards and gender inclusion. The opportunity is to turn downstream participation into a ladder for upgrading. The challenge is ensuring that this ladder is accessible to local firms, workers, women, youth, and communities rather than only to well-funded firms and global actors.

6.3 Recommendations

Table 5 below translates the opportunities and challenges discussed above into concrete recommendations. Each recommendation is grouped under one of four strategic objectives: trade, investment, and regional market development; business upgrading; increasing decent work and inclusivity; and improving government effectiveness. Table 5 also shows, in the two right-hand columns, which specific challenge from Section 6.1 it responds to and which opportunity from Section 6.2 it helps to unlock — so that each proposed action can be traced back to the evidence that motivates it.

Table 5: Overview of recommendations

Objective	Recommendation	Challenge Addressed	Opportunity Unlocked
A. Trade, Investment, and Regional Market Development	A1. Frame localisation strategy at a regional (East African), rather than purely national, scale to build economies of scale for component manufacturing.	Shallow localisation; firms too small individually to justify manufacturing investment	Staged localisation entry points
B. Business Upgrading	B1. Prioritise feasible local content pathways in value-chain segments where Kenya already has or can realistically build capability (e.g., mounting structures, wiring, electrical fittings, turbine towers).	Shallow localisation; foreign control of technology and standards	Staged localisation and industrial upgrading
	B2. Expand patient and SMME-oriented finance through tailored instruments (e.g., asset-backed loans, green credit lines, blended concessional finance).	Thin enabling institutions; SMME finance gap	Local production and repair ecosystems
C. Increasing Decent Work and Inclusivity	C1. Link localisation to decent-work standards (e.g., formal contracts, OSH, social protection) in public procurement, donor-funded projects and government support schemes.	Precarious work and lack of decent work	Local production and repair ecosystems creating more stable jobs
	C2. Build gender-transformative skills and enterprise pathways (e.g., technical training, mentorship, childcare support, targeted finance for women-led enterprises).	Gender exclusion	Gender-responsive TVET and workplace reforms

Objective	Recommendation	Challenge Addressed	Opportunity Unlocked
D. Improving Government Effectiveness	D1. Strengthen institutional coordination and accountability between national and county governments on energy planning, industrial policy, standards and procurement.	Implementation gap	Coordinated industrial policy and predictable procurement pipelines

REFERENCES

Achieng, G.F., Onyango, J., Magale, E., and Atieno, E. (2026). *Just Energy Transition: Kenya Renewable Energy Policy Scan: Insights and Questions for Localisation and Decent Employment*. Johannesburg: Institute for Economic Justice. (Accessed: 1 July 2026).

Akbulut, B. (2025). 'Biophysicality, Social Reproduction and the Limits of Renewables Capitalism', *Development and Change*, 56(4–5), 729–754.

Andega, J., Achieng, G.F., Onyango, J., and Magale, E., (2026a). https://iej.org.za/resource/discussion-paper/kenya-solar-and-wind-manufacturing-in-the-renewable-energy-transition/. *Kenya Solar and Wind Manufacturing in the Renewable Energy Transition: Global Production Networks and Local Realities*. Johannesburg: Institute for Economic Justice. (Accessed: 20 September 2026).

Andega, J., Onyango, J., Magale, E., and Achieng, G. (2026b). *Analysis of Kenya's Just Energy Transition in Solar and Wind*. Johannesburg: Institute for Economic Justice.

Barrientos, S., Gereffi, G., and Rossi, A. (2011). 'Economic and Social Upgrading in Global Production Networks: A New Paradigm for a Changing World', *International Labour Review*, 150(3–4), 319–340.

Bhattacharya, T. (ed.) (2017). Social Reproduction Theory: Remapping Class, Recentering Oppression. London: Pluto Press. Available at: https://www.plutobooks.com/product/social-reproduction-theory/ (Accessed: 28 September 2026)

Chadly, A., Moawad, K., Salah, K., Omar, M. and Mayyas, A. (2024) 'State of global solar energy market: Overview, China's role, challenges, and opportunities', Sustainable Horizons, 11, article 100108. Available at: https://doi.org/10.1016/j.horiz.2024.100108?utm_source=chatgpt.com"https://doi.org/10.1016/j.horiz.2024.100108 (Accessed: 1 July 2026).

Clancy, J., Barnett, A., Cecelski, E., Pachauri, S., Dutta, S., Oparaocha, S., and Kooijman, A. (2019). *Gender in the Transition to Sustainable Energy for All: From Evidence to Inclusive Policies*. The Hague: ENERGIA, the International Network on Gender and Sustainable Energy. (Accessed: 1 July 2026).

Coe, N.M. and Yeung, H.W.-C. (2015). *Global Production Networks: Theorizing Economic Development in an Interconnected World*. Oxford: Oxford University Press.

Coe, N.M., Dicken, P., and Hess, M. (2008). 'Global Production Networks: Realizing the Potential', Journal of Economic Geography, 8(3), 271–295.

Fordjour, G.A., Amoah, P., and Chan, C.L.W. (2025). 'Gender Equality and Decent Work Environment in Sub-Saharan Africa: A Review and Future Agenda Towards Sustainable Development', Gender and Sustainability in the Global South, 2(1), 35–70.

Fuchs, J.L., Onyango, L.A., Hirmer, S. and Tomei, J. (2025). 'Energy, equity and inclusion: Exploring gender equality and social inclusion in energy planning in Kenya', Energy Research & Social Science, 130, article 104432. Available at: https://doi.org/10.1016/j.erss.2025.104432) (Accessed: 28 September 2026).

Halim, D., Perova, E., and Reynolds, S. (2023). 'Childcare and Mothers' Labor Market Outcomes in Lower- and Middle-income Countries', *The World Bank Research Observer*, 38(1), pp. 73–114.

International Finance Corporation. (2021). Sourcing2Equal Kenya: Barriers and Approaches to Increase Access to Markets for Women-Owned Businesses. Washington, DC: International Finance Corporation. Available at: https://www.ifc.org/content/dam/ifc/doc/mgrt/sourcing2equal-kenya-barriers-and-approaches-to-increase-access-to-markets-for-women-owned-businesses.pdf) (Accessed: 28 September 2026).

International Labour Organization. (2015). *Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All*. Geneva: ILO. (Accessed: 1 July 2026).
International Renewable Energy Agency. (2022). Solar PV: A Gender Perspective. Abu Dhabi: IRENA. (Accessed: 11 September 2026).

International Renewable Energy Agency. (2022). Solar PV: A Gender Perspective. Abu Dhabi: IRENA. Available at: https://www.irena.org/Publications/2022/Sep/Solar-PV-A-Gender-Perspective (Accessed: 11 September 2026).

International Renewable Energy Agency and International Labour Organization. (2024). Renewable Energy and Jobs: Annual Review 2024. Abu Dhabi and Geneva: IRENA and ILO. (Accessed: 1 July 2026).

International Renewable Energy Agency. (2025). *Renewable Energy: A Gender Perspective*. Abu Dhabi: IRENA. Available at: (Accessed: 11 September 2026).

Johnson, O.W., Han, J.Y.-C., Knight, A.-L., Mortensen, S., Aung, M.T., Boyland, M., and Resurrección, B.P. (2020). 'Intersectionality and Energy Transitions: A Review of Gender, Social Equity and Low-carbon Energy', Energy Research and Social Science, 70, 101774.

Kemunto, F., Andega, J., and Magale, E. (2026). *Kenya JET Firm Survey Report: Just Energy Transition: Localization of Renewable Energy Manufacturing, SMME Capability Development, and Gender Equity*. Johannesburg: Institute for Economic Justice.

Lolo, B., Kemunto, F., Nekesa, U., Ouma, N., Andega, J., Magale, E., and Onyango, J. (2025). *Advancing a Just Energy Transition in Kenya: Localizing Renewable Energy for Inclusive Growth and Decent Work: National Policy Dialogues Report*. Johannesburg: Institute for Economic Justice. (Accessed: 1 July 2026).

Ministry of Energy. (2019). Gender Policy in Energy. Nairobi: Ministry of Energy. Available at: https://www.energy.go.ke/sites/default/files/KAWI/Other%20Downloads/Gender-Policy-in-Energy.pdf (Accessed: 27 September 2026).

Ndi, F.A. (2024). 'Justice Concerns in Large-scale Renewable Energy Projects: A Case Study Echoing the Importance of Procedural Justice in Wind Energy Development in Kenya', *Energy, Sustainability and Society*, 14, 47.

Nunoo, I.K., Klug, T.W., Plutshack, V., Agradi, M., Appiah, S., and Saparapa, R. (2025). 'Who has power over policy? The political economy of Kenya's 2019 gender policy in energy access', Energy Research & Social Science, 127, 104201. https://doi.org/10.1016/j.erss.2025.104201 (Accessed: 27 September 2026).

Onyango, J., Owano, S., and Andega, J. (2026). *Firm-Level Dynamics, Employment Quality, and Inclusive Growth in the Solar and Wind Energy Sector in Kenya*. Johannesburg: Institute for Economic Justice.

Pearl-Martinez, R. and Stephens, J.C. (2016). 'Toward a Gender Diverse Workforce in the Renewable Energy Transition', *Sustainability: Science, Practice and Policy*, 12(1), 8–15.

Pedersen, R.H., Ovadia, J.S., and Hansen, U.E. (2025). 'Local Content and Linkage Development in African Energy Transitions: Lessons from Oil and Gas', *The Extractive Industries and Society*, 23, 101679.

Power for All. (2022). *Powering Jobs Census 2022: Focus on Kenya*. San Francisco: Power for All. (Accessed: 1 July 2026).

Republic of Kenya. (2012). *Micro and Small Enterprises Act, No. 55 of 2012*. National Council for Law Reporting. (Accessed: 1 July 2026).

Simberg-Koulumies, N. (2024). 'Just Sustainabilities: Lessons from the Lake Turkana Wind Power Project in Kenya', *Local Environment*, 29(1), 40–56.

Taylor, J. (2023). 'Just an Energy Transition? A Gendered Analysis of Energy Transition in Northern Cape, South Africa', Agenda, 37(3), 76–89.

Tejani, S. and Milberg, W. (2016). 'Global Defeminization? Industrial Upgrading and Manufacturing Employment in Developing Countries', *Feminist Economics*, 22(2), 24–54.

APPENDIX A: METHODOLOGY

A.1 Research Design and Analytical Approach

This case study used an integrated mixed-methods research design to examine localisation, decent work, and gender equity within Kenya's solar and wind renewable energy sector. The research combined desktop analysis, qualitative field research, and firm-level surveys to examine not only the growth of renewable energy deployment, but also who participates in the sector, where value is created and captured, what kinds of employment are generated, and how benefits and constraints are distributed across firms, workers, communities, and institutions.

The case study is guided primarily by the GPN framework. This framework was used to analyse the renewable energy sector through the interconnected dimensions of value, power, and embeddedness. It enabled the study to examine how global manufacturers, OEMs, financiers, standards regimes, procurement structures, and domestic institutions shape Kenya's position in solar and wind production networks. The approach was complemented by exploring decent work and gender equity to assess employment quality, worker voice, social protection, occupational conditions, women's participation, and the role of unpaid care and social reproduction in shaping access to renewable-energy work.

The study focused on solar photovoltaic systems and wind energy because they are central to Kenya's renewable energy transition, but they present different patterns of localisation. Solar energy has a wider domestic ecosystem of importers, distributors, installers, assemblers, retailers, and service providers. Wind energy is more concentrated, project-based, and dependent on large-scale finance, imported turbine technology, and specialised engineering. The GPN mapping focused particularly on solar modules and wind turbine towers because these represent areas where local participation already exists or where feasible localisation could be strengthened through assembly, fabrication, civil works, installation, maintenance, and related services.

A.2 Evidence Base and Data Sources

This case study drew on four complementary evidence sources, summarised in Table A1.

Table A1: Evidence base used in this case study

Evidence Source	Method and Scope	Main Contribution to the Case Study
Background paper on solar and wind production networks (Adega et al., 2026a)	Desktop review of academic literature, policy documents, industry reports, institutional publications, and trade or sectoral data	Mapped Kenya's position in solar photovoltaic and wind-tower production networks and analysed value, power, and embeddedness
Policy scan (Achieng et al., 2026)	Review of Kenyan energy, industry, labour and gender policies, alongside relevant reports and literature	Assessed how the policy and regulatory framework supports or constrains localisation, decent work and gender equity, and identified gaps between policy commitments and implementation.
Qualitative regional analysis (Andega et al., 2026b)	54 semi-structured key informant interviews and one focus group discussion across Central, Coastal, and Western Kenya	Captured regional perspectives on localisation, SMME participation, decent work, gender equity, social reproduction, and inclusion
National policy dialogue report (Lolo et al., 2025)	Report of a participatory dialogue with 20 stakeholders from public institutions, industry, labour, civil society, and academia, held in September 2025	Documented stakeholder responses to emerging findings and proposed pathways for localisation, decent work and inclusion.
Manufacturing-focused firm survey (Kemunto et al., 2026)	Survey of five firms engaged in solar and related component manufacture, conducted between January and February 2026	Examined ownership, component production, finance, input sourcing, technology transfer, firm linkages, employment, gender, and policy experiences
Larger firm-level technical survey (Onyango et al., 2026)	Structured, mixed-methods survey of 700 renewable energy firms across Central, Coastal, and Western Kenya	Generated wider evidence on enterprise characteristics, employment, local value addition, inclusivity, policy engagement, and firm-level constraints

The background paper used desktop-based literature and secondary-data analysis to map Kenya's solar and wind production networks (Adega et al., 2026a). It reviewed academic studies, policy and regulatory documents, industry materials, institutional reports, and available trade or sectoral data. The mapping combined an activities approach, tracing processes from research and design through manufacturing, distribution, installation, operations, and end-of-life with an inputs-manufacturing-end-of-life approach that identified the cross-border movement of materials, subcomponents, and technologies.

The policy scan reviewed policy documents, reports, and academic literature on Kenya's energy, industry, labour, and gender policy frameworks (Achieng et al., 2026). It assessed how these frameworks address localisation, decent work, gender equity, and enterprise development. The case study drew on this analysis to examine the state's role and gaps between policy commitments and implementation, alongside the interview and firm-survey evidence.

The qualitative data collection drew on semi-structured key informant interviews across Central, Coastal, and Western Kenya as well as one focus group discussion consisting of KENGEN and KPLC labour union representatives from the Coastal region (Andega et al., 2026b). Participants were selected purposively through desktop stakeholder mapping to capture actors with direct knowledge of renewable energy policy; production; enterprise activity; and labour, gender and community outcomes. Respondents included policymakers and regulators, renewable-energy practitioners, entrepreneurs, SMME workers, civil society organisations, labour unions, academics, industry experts, and independent power producers. The focus group discussion centred on labour-union perspectives particularly in relation to worker voice, employment conditions, and collective representation.

The national policy dialogue report documented a participatory discussion of emerging Just Energy Transition research with stakeholders from government, industry, labour, civil society, and academia (Lolo et al., 2025). Participants discussed barriers to localisation, SMME participation, decent work, and gender inclusion, and proposed policy pathways in response.

The manufacturing firm survey was conducted between January and February 2026 and targeted firms involved in solar energy component manufacture and related activities (Kemunto et al., 2026). It examined firm ownership, employment, component production, local sourcing, access to finance, technology transfer, relationships with foreign and local firms, workforce composition, gender policies, and perceptions of the policy environment. The survey received responses from five firms. Given the small number of firms involved in domestic component manufacture, the findings are used as detailed illustrative evidence rather than as nationally representative estimates.

The larger firm-level technical survey gathered responses from 700 renewable energy firms across Central, Coastal and Western Kenya (Onyango et al., 2026). Data were collected through structured questionnaires that combined quantitative and qualitative questions. Quantitative data were analysed using STATA and Excel, while open-ended responses were analysed through thematic coding. The survey was dominated by solar enterprises involved in distribution, assembly, sales, and after-sales services, reflecting the structure of Kenya's active renewable energy enterprise landscape.

A.3 Geographic Scope

The research focused on three regions Central, Coastal, and Western Kenya. These regions were selected because they represent distinct renewable energy enterprise environments and make it possible to assess how geography, infrastructure, market access, county governance, local skills ecosystems, and finance shape localisation prospects. The Central region covered Nairobi, Kiambu, and Kajiado counties. This region was included because of its proximity to national institutions, financial services, technical training institutions, major markets, and established renewable energy enterprises. The Coastal region covered Mombasa, Kilifi and Kwale counties. It was selected because of its role as an import and distribution corridor, its strong off-grid and solar-market activity. The Western region covered Kisumu, Kakamega, and Uasin Gishu counties. It was included to capture a region with growing solar markets, technical training potential, and emerging interest in research, innovation, and decentralised energy services.

A.4 Data Collection and Analysis

The qualitative interviews used semi-structured guides. This allowed the research team to maintain consistency across the main thematic areas while also exploring region-specific experiences and emerging issues raised by participants. The interview themes included localisation and value creation, SMME participation, access to finance and technology, decent work, labour representation, gender equity, unpaid care responsibilities, marginalised groups, policy implementation, county-level governance, and community participation.

Interview transcripts were prepared and coded thematically using Atlas.ti. to compare evidence across respondent categories and regions to identify common patterns, regional differences, contradictions, and locally specific opportunities. The qualitative evidence was triangulated with policy documents, existing literature, and the firm-level surveys.

The larger firm-level technical survey used a concurrent mixed-methods approach. Closed-ended items generated descriptive quantitative evidence on firm characteristics, ownership, value-chain roles, employment, inclusion, financing, and policy experience. Open-ended responses provided contextual explanations of firm constraints, growth strategies, and perceptions of government support. Data were analysed through STATA and Excel, while qualitative survey responses were thematically coded.

The five-firm survey provided a focused view of domestic component manufacturing and assembly. It was used to complement other data sources by providing more detailed evidence on the specific constraints faced by firms attempting to manufacture or assemble renewable-energy components, including imported-input dependence, finance, technology transfer, certification, firm collaboration, and upgrading prospects.

Data from all sources were integrated through triangulation. Where the evidence from different sources produced different findings or measured different aspects of the sector, the analysis drew parallels between them, treating them as directly comparable. For example, firm-level findings were

used to describe enterprise experiences and patterns, while policy and literature were used to explain wider structural conditions and historical trends.

A.5 Limitations and Delimitations

Wind sector evidence is more limited than solar sector evidence. The wind sector is dominated by a smaller number of capital-intensive projects and firms, and access to developers, operators, and workers was more constrained. This limited the number of wind-sector perspectives available for comparison with the broader solar evidence.

The manufacturing survey detailed insight into a limited number of firms engaged in component manufacture or assembly, but it cannot be used to make broad statistical claims about the manufacturing sector.

Finally, in some cases, employers were unwilling to facilitate direct engagement with workers, limiting independent verification of company claims regarding wages, contracts, labour conditions, and gender policies. The perspectives of government employees and firm owners also sometimes differed from those of workers, unions, and community actors.

A.6 Ethical Considerations

The case study findings did not identify individual interview participants or surveyed firms and firms were only named where information was already publicly available. The research prioritised the protection of commercially sensitive, firm information, and the confidentiality of individual respondents.