

Acceleration of sustainable growth through Innovation, Education and Awareness Raising



Image: Erin Hill

Introduction

Despite Africa's vast renewable energy potential – particularly in solar – more than 600 million people, or approximately 43% of the population in sub-Saharan Africa, still lack access to electricity (IEA, 2022). This enduring energy gap compels millions to rely on polluting and expensive fuels such as kerosene and biomass. These fuels not only strain household finances but also pose serious health risks and contribute significantly to environmental degradation (WHO, 2024) with women, girls and the most vulnerable being disproportionately affected by energy poverty (UN Women, 2021). At the

current pace of electrification, coupled with rapid population growth, the number of people without access to electricity is projected to remain largely unchanged in the coming decades (IEA, 2022).

Africa holds vast untapped potential to drive inclusive, clean energy-based development. Realising this potential requires equitable policy frameworks, community-driven innovation, and financing models that empower local actors. The [AU-EU Innovation Agenda](#) and the [EU's Global Gateway Africa-Europe Investment Package](#), which aim to mobilise up to €150 billion in strategic investments, place innovation and energy access at the heart of the bi-regional partnership.

Realising Africa's clean energy future demands more than infrastructure; it calls for inclusive innovation ecosystems, fit-for-purpose financing models, and targeted support for small and medium-sized enterprises (SMEs). It is within this context that a new generation of business models is emerging – designed to overcome affordability barriers, strengthen local ownership, and scale decentralised energy access.

This policy brief shares key insights on Acceleration of Sustainable Growth through Innovation, Education and Awareness Raising emerging from the EU funded project [Smart Energy Solutions for Africa \(SESA\)](#). It draws on lessons from technology demonstrations in Living Labs in Kenya, Ghana, Malawi,

as well as from the replication actions that took place in Rwanda, Nigeria and Tanzania. This brief identifies key policy challenges and opportunities relevant to future EU development cooperation, particularly in support of the AU-EU Innovation Agenda and the Global Gateway strategy. It seeks to inform evidence-based policymaking by identifying replicable models, priority areas for regulatory reform, and targeted recommendations for supporting an inclusive and sustainable energy transition across Africa.

This policy brief is one out of three. The other policy briefs, in line with the SESA project scope of work, explore the following topics:

1. Green Electric Infrastructure: this brief presents policy insights on e-mobility, decentralised solar systems, as well as e-waste and second-life batteries (SLBs).
2. Agri-food Systems: this brief provides policy outcomes on innovations within the agri-food sector, more specifically on solar-powered irrigation and clean cooking technologies – solutions which are essential for addressing agricultural and household energy challenges.

How to Read This Document

This policy brief presents a synthesis of key findings, policy barriers, and regulatory insights emerging from the [Smart Energy Solutions for Africa \(SESA\) project](#). It builds on a combination of evidence drawn from in-country technology demonstrations, stakeholder engagement, and the project's broader policy roadmaps.

While the brief highlights a range of thematic areas, **it does not aim to provide a comprehensive or exhaustive overview of all technologies for all country contexts. Not all participating entities have engaged with every technology or regulatory issue in equal depth.** Instead, the document focuses on consolidated insights, mature practices, and illustrative examples where relevant information was functional to the project logic.

For further insights on the recommendations outlined in this brief, you can refer to relevant SESA documents, such as country policy barrier analyses and country policy roadmaps, on our [project website](#).

By centring innovation, community ownership, and financial inclusion, these efforts align closely with the [United Nations 2030 Agenda for Sustainable Development](#), the [African Union's Agenda 2063](#), as well as with the ambition of the [AU-EU Innovation Agenda](#) to co-develop solutions that address shared challenges. However, barriers such as limited consumer awareness, constrained access to finance, and

underdeveloped supply chains continue to impede broader adoption and scale-up.

Finally, no policy or technology can succeed without the engagement of local communities and the leadership of local authorities. A just and inclusive energy transition depends on trust, participatory design, and local ownership. These are not secondary to infrastructure; they are fundamental to impact and scale.



Image: Antoine Similon

Acceleration of sustainable growth through Innovation, Education and Awareness Raising

Achieving sustainable growth in Africa calls for integrated strategies that align climate action with economic development and energy access. With rising demand for clean energy and resilient infrastructure, the continent stands at a critical juncture where innovative business models, local production ecosystems, and targeted financial support can drive a low-carbon, inclusive transformation. Unlocking this potential will depend on the ability to tailor solutions to diverse regional contexts and audiences – whether through decentralised energy systems, mobility innovations, or sustainable agriculture. **Public-private partnerships, supportive policy frameworks, and investment in skills and entrepreneurship will be central to building resilient economies.**

Inclusive business models

Across Africa, a wave of innovative business models is reshaping the delivery of clean energy and climate-resilient solutions to communities, entrepreneurs, and businesses. From electric mobility services to solar-powered irrigation and micro-grid subscriptions, these models are increasingly tailored to local contexts, income levels, and infrastructure realities. Within this broader movement, the business models tested under the SESA project reflect a diverse range of strategies – such as rental, subscription, lease-to-own, pay-as-you-go, and direct sales – that address specific market needs and affordability constraints. These approaches are particularly effective in underserved

and rural areas, where flexible payment mechanisms are essential for enabling access.

By adapting to local user needs and financing capabilities, this growing ecosystem of business models signals a broader shift toward inclusive, market-driven solutions. These not only expand energy access and enhance sustainable livelihoods but also contribute meaningfully to Africa's transition to a low-carbon future.

In Kenya, the e-mobility sector features an electric motorbike service model where users enter into open-ended contracts, paying a monthly fee of 1,000 KES (approximately €6.90) and a daily fee of 300 KES (approximately €2.10) for unlimited battery swapping. The service includes insurance and full maintenance, targeting rural and peri-urban boda boda (motorbike) riders in Western Kenya. Additionally, the country has adopted a pay-per-use model for solar-powered cold rooms. Users are charged at a fixed rate (per-crate, per-day), with pricing varying by type of produce (e.g., 25 KES/€0.16 for leafy vegetables, or 75 KES/€0.49 for watermelons). This model primarily serves market vendors, wholesalers, and small businesses in the Mbita/Homabay region.

In Morocco, e-scooter services operate on a pay-as-you-go basis, where users pay per minute or per kilometer via a mobile app. Alternative plans allow for daily, weekly, or monthly rentals (e.g., €10 per day, €150 per month), which include maintenance and insurance. The service targets urban dwellers aged 18–40 and tourists, with operations in cities like Marrakech and Agadir.

In Malawi, a bio-cooker initiative has developed and tested two cookstove prototypes, but no formal business model has been implemented yet, as partners are still exploring supply chain



Image: Erin Hill

strategies. For solar irrigation, a SESA supported solar irrigation company uses a lease-to-own model priced at 6,300,000 MWK (€3,279), in total, for the entire system. Farmers make a 20% down payment followed by two seasonal instalments of 40% each which are aligned with the harvesting season. A digital system allows the provider to disable the pump until payments are made. These systems are also sold directly to NGOs and commercial farmers.

In South Africa, an electric vehicle initiative supports local transport through a taxi service and a cargo delivery system. The taxi service charges residents of Alicedale and Care Community Centre a flat fare of 10 ZAR (€0.50) per trip, while tourist excursions are priced at 50, 100, or 150 ZAR (€2.50, €5, and €7.50 respectively). The cargo service operates on a pay-per-trip basis, with fees varying according to distance, weight, and type of goods transported.

Ghana offers a range of micro-grid and solar generator solutions. In rural areas, a micro-grid subscription model charges a 700 GHS (€40) connection fee plus a monthly fee of 100 GHS (€5.80). For individual solar generators, users can choose pay-as-you-go or subscription plans based on capacity, with setup fees between 1,000 and 1,500 GHS (€58–€87) and monthly payments ranging from 100 to 150 GHS (€5.80–€8.70). Direct sales are also available, with battery banks and generator prices varying by wattage. Customers include rural residents, urban households, and businesses.

Incubator programs

Incubator programs aim to enhance the business and entrepreneurial skills of SMEs, to accelerate energy access across the continent. **SESA offered two tailored six-week incubation tracks** to African SMEs that drive both direct and indirect impact – such as increased revenue and business growth, expanded business network, and job creation. The

program provided 20 selected SMEs with comprehensive financial and non-financial support.

Targeting start-ups and early-stage SMEs aligned with SESA's mission, the incubator helped them establish and scale their solutions in local markets.

Based on the successful implementation of the SESA incubator programs and SME feedback across all countries in which the project engaged, the following recommendations are proposed to inform future policy design and guide policymakers within the AU-EU partnership and collaborations:

- ✦ Understanding the support needs of SMEs was critical. The bottom-up approach and SESA's phased implementation strategy (INFORM, INSPIRE, INITIATE, IMPLEMENT, IMPACT) proved effective.
- ✦ Given the varying competency levels among SMEs, a gradual approach is recommended: an incubator program tailored for start-ups and early-stage businesses, and an accelerator program for more mature SMEs seeking to scale and replicate.

- ✦ To ensure SME sustainability beyond the incubator and project lifecycle, proactive engagement with local governments, municipalities, and potential investors should begin early in the process.

While subcontracting has proven valuable in the SESA project by creating opportunities for SMEs to validate and replicate their solutions, it is important to acknowledge the associated challenges. These issues should be carefully considered in the design of future initiatives to ensure that subcontracting mechanisms effectively support both project goals and the sustainable growth of SMEs. The key learnings identified include:

✦ Risk of weak delivery capacity

Not all SMEs possess the technical, operational, or financial strength to fully meet the demands of subcontracts. In some cases, this can result in delays, substandard work, or failure to achieve project objectives. Without thorough assessment and targeted support, subcontracting may inadvertently set SMEs up for failure, impacting the overall success of the initiative.



★ Complex coordination dynamics

Subcontracting often divides responsibility among multiple actors. This can lead to fragmented delivery, making it difficult to maintain coherence, integration, and alignment across project components. Effective coordination, monitoring, and communication become more complex, requiring additional effort and resources from the main implementing partners.

★ Unequal power dynamics

SMEs operating under subcontracting arrangements may have limited influence over broader project design or strategic decisions. This can restrict innovation, adaptation of solutions, and genuine co-creation. SMEs may feel disempowered, with their role confined to implementing predefined tasks rather than shaping outcomes.

★ Risk of exclusion of smaller or informal enterprises

If subcontracting processes are not carefully designed, they may disproportionately benefit SMEs that are already relatively well-established or able to navigate complex procurement processes. This can exclude smaller, informal, or rural businesses that could otherwise offer valuable contributions but lack visibility or bidding experience.

★ Difficulty in measuring long-term impact

Subcontracting arrangements tend to emphasize short-term outputs – what is delivered – rather than long-term outcomes or impact. This can make it challenging to track and evaluate the broader social, economic, or environmental benefits generated through SME participation in the program.

Supporting SMEs and Empowering Women

In the African context, a range of **direct and indirect economic support mechanisms** could be considered to accelerate access to clean energy, strengthen sustainable agriculture, and promote climate-resilient livelihoods. These mechanisms may play a critical role in enabling communities, businesses, and governments in the transition toward low-carbon development pathways. Direct economic support – such as subsidies, grants, and results-based financing – can provide immediate financial relief or incentives for end-users, entrepreneurs, and manufacturers, thus facilitating the adoption and scale-up of green technologies.

Both direct and indirect incentives have proven effective in promoting equal opportunities for disadvantaged groups. Gender inclusion, in particular, was a key focus during the implementation of the SESA project, leading to several targeted actions aimed at enhancing the participation of women. These efforts were especially relevant in underserved and rural areas, where flexible payment mechanisms are critical to enabling access.

In Kenya, for example, solar-powered cold storage solutions were introduced to support small-scale women vendors. These facilities allow women to store and sell fresh produce, helping to reduce post-harvest losses and increase their incomes. In Malawi, the capacity-building program on clean cooking made significant progress in promoting gender inclusivity, with women accounting for 3,703 of the 5,000 participants trained in clean cooking technologies. The initiative also ensured that both men and women were equally involved in the management of the improved MIG Bio Cooker developed under SESA. These actions have greatly contributed to raising awareness and building knowledge around clean cooking solutions, particularly among women.



Image: SESA Project

Among the different areas of intervention, the expansion of subsidies and grants emerge as highly beneficial options. In Kenya, shared community solar programs could be explored as a means to reduce upfront costs by allowing multiple users to jointly own and benefit from off-grid systems. Such programs might leverage public rooftops or accessible surfaces for photovoltaic (PV) installations, helping to lower land acquisition costs and ease implementation. To enhance inclusivity, low-interest credit schemes or mandates allocating a portion of installations to low-income users may also be considered.

In countries like Rwanda and Malawi, where smallholder farmers often struggle with the high initial costs of solar irrigation systems, seed funding for energy-focused incubators, shared-cost models, or government co-financing arrangements could be useful options. Morocco may find value in promoting domestic PV manufacturing by offering

targeted grants that reduce the cost of key system components. In addition, public financing programs for rural households - possibly channelled through local microfinance institutions and funded by levies on fossil fuels - might increase affordability and reach.

Ghana could consider incentivizing second-life battery solutions through subsidies, grants, or capital assistance targeted at local manufacturers. Investment promotion policies that encourage collaboration between government bodies and financial institutions could facilitate access to low-interest credit for businesses involved in battery repurposing or technology innovation.

Results-based financing and **consumer support mechanisms** also offer promise. In the clean cooking sector, targeted consumer subsidies - potentially covering up to 50% of the cost of improved cookstoves

for low-income households - may help increase adoption and enable vulnerable populations to transition to cleaner technologies.

Demonstration and R&D project funding could be another critical area. In South Africa, pilot initiatives and research grants might be used to explore the technical and financial viability of second-life battery systems. Innovative business models such as "Saving to Own" or micro-financed NGO partnerships - may offer alternatives where conventional PAYGO models have not gained traction.

Complementary to direct interventions, **indirect economic support mechanisms** may also create a favourable enabling environment for sustainable energy solutions. These mechanisms include **tax incentives**, **flexible financing models**, and **public investment in foundational infrastructure** that can reduce long-term risks and costs.



Image: Anthony-Ochieng

Tax incentives and policy instruments could be an effective tool in several contexts. In Kenya, revising tax structures and introducing green mobility funds may help de-risk electric vehicle investments. In Morocco, the continuation of import duty exemptions for EVs could support market growth until a domestic industry matures. Additional policy measures – such as emissions-based taxes, registration fees for polluting vehicles, and fleet-level emissions caps – might further promote the shift toward cleaner transport. Ghana could expand local content regulations to encourage domestic production of renewable technologies, with financial incentives such as tax breaks or capital grants to support compliance and growth.

Increasing access to finance will likely be key to uptake and affordability. In Morocco, microfinance-based public lending programs could enhance affordability in rural communities. In Tanzania and Malawi, linking farmers to soft loan products and enabling mobile money payments directly from farms might reduce access barriers and align repayment schedules with agricultural cash flows. Lease-to-own or Pay-As-You-Grow models may also allow gradual ownership of solar irrigation systems, reducing financial pressure on smallholders.

Efforts to **strengthen local production and market ecosystems** may yield long-term benefits. In Rwanda, local manufacturing approaches have demonstrated the potential to reduce raw material and transport costs through circular economy practices. Similarly, in Ghana and South Africa, building domestic value chains for second-life batteries – supported by targeted financial incentives and strategic partnerships – could enhance local competitiveness and reduce reliance on imports.

Altogether, these potential economic support mechanisms – whether through financial incentives, policy frameworks, or market development strategies –

may provide a valuable foundation for advancing Africa's green transition. They represent options that policymakers, development partners, and private stakeholders could consider for fostering innovation, expanding energy access, and safeguarding vulnerable populations from the adverse impacts of climate change. A flexible, context-specific application of these strategies may help ensure a just, inclusive, and sustainable energy future across the continent.

Improving education and awareness raising

Education and awareness-raising are cornerstones for the adoption of smart and renewable energy solutions across Africa. These activities are critical in building trust, reducing resistance to new technologies, and supporting the behavioural and cultural shifts required for a successful energy transition.

A knowledge gap assessment conducted by the SESA project revealed systemic capacity deficits at national, regional, and local levels, and across public and private sectors. These deficits significantly

hinder the design, uptake, and long-term sustainability of clean energy solutions. Key findings include:

★ Tailored training is needed at all levels and across sectors.

Targeted capacity-building efforts are required across governmental institutions, civil society and private actors alike. Supporting entrepreneurs – especially youth and female-led SMEs working on renewable energy – to build and scale their businesses is vital for driving innovation and scaling clean energy solutions. Equally important, however, is ensuring that local, regional, and national government officials have up-to-date expertise. This enables them to address regulatory barriers, foster cross-sector collaboration, and provide clear political leadership.

However, training entrepreneurs and public officials in isolation is not enough. For lasting impact, capacity-building must be embedded within broader enabling ecosystems – systems that promote coordination, unlock investment, and sustain innovation over the long term.



Image: Erin Hill

There is currently a widespread lack of robust technical expertise across the full technology lifecycle, as well as limited institutional capacity – both at national and local levels – to effectively integrate new technologies into planning and regulation. To address this, **formal and informal learning approaches must be combined** with a long-term perspective.

In addition to developing **curricula that incorporate clean energy technologies and offer certified qualifications**, findings from SESA highlight the value of peer learning and in-person exchanges – particularly in the mobility sector – for building practical, context-specific knowledge. To support this, the [SESA Toolbox](#) has been developed as an open-access resource, covering areas such as sustainable energy in agriculture, economics, energy, environment, IT, and mobility.

★ **Short-term engagements risk being counterproductive.**

While pilot projects often spark initial enthusiasm, the absence of sustained support mechanisms can erode trust, especially when communities are left with unmet expectations. Capacity-building programmes must be designed to foster local autonomy, equipping communities with the skills to operate, maintain, and troubleshoot systems independently. Efforts should prioritise inclusion, reaching the appropriate stakeholder groups and empowering vulnerable populations, particularly women, through specifically tailored training and engagement.

The private sector is a key partner and requirements for capacity-building activities should be integrated into contracts with private sector implementers to ensure skill transfer and local job creation.

★ **Contextualised, community-driven learning is essential for meaningful impact.**

Engagement must align with the needs and realities of local communities, building on existing socio-cultural structures, like cooperatives, women's groups, and community gatherings to engage sustainability.

EU-funded projects should **allocate dedicated and flexible resources for continuous education and capacity-building activities**, co-designed with local stakeholders. These efforts should be embedded within existing community frameworks and connected to peer learning networks. Utilizing case studies, live demonstrations, and community-to-community exchanges fosters contextual learning and drives practical adoption.

★ **Language remains a critical barrier.**

Training and informational materials must be provided in local and widely understood languages – not only for end-users but also for public officials – to ensure accessibility and lasting impact. For example, in Malawi, SESA partners collaborated closely with local farmers' cooperatives, integrating clean cooking concepts into training to enhance agricultural practices.

Trust in new energy technologies hinges on engagement strategies that are locally adapted, inclusive, and responsive to community expectations. Community-based institutions play a vital role in this process, and communication – whether messages, channels, or formats – should be tailored to local norms, which often differ from European conventions (for example, WhatsApp invitations may be more effective than emails).

Awareness campaigns must go beyond showcasing benefits; they should also educate users on proper operation and maintenance – such as eco-driving practices – to ensure long-term performance, safety, and sustained adoption.



Image: SESA Project

Policy suggestions that support the EU's Global Gateway strategy

- ★ Financial access remains a principal constraint, particularly for small and medium-sized enterprises (SMEs) and end users. Given the central role of SMEs in driving local innovation and service delivery, targeted financial instruments are required to strengthen their participation in the energy ecosystem.
- ★ Sector-specific interventions in areas such as e-mobility, solar irrigation, clean cooking, and mini-grid development highlight the importance of tailored business models and policy frameworks. These should be complemented by national support systems that encourage private sector engagement and facilitate market development.
- ★ Addressing existing skills gaps at all levels through technical and vocational education, certification schemes, and community-based training is essential to ensuring the quality and longevity of deployed technologies whilst capacitating the local ecosystem. Long-term engagement and continuity, balanced with flexibility, should be pursued in the design of such opportunities.
- ★ Public awareness campaigns – particularly those targeting women and vulnerable groups – are necessary to increasing acceptance, building trust, and promoting behavioural change. Additionally, they should be localised and keep in consideration the values and culture of the targeted audience.



This Policy Brief is part of a collection. Be sure to check out our other Policy Briefs on **Green Electric Infrastructure** and **Agri-food Systems**. All Policy Briefs are available on the [SESA website](#).

About SESA

In response to Africa's urgent need for sustainable energy access and climate resilience, the Smart Energy Solutions for Africa (SESA) project aimed to mitigate climate change and avoid carbon lock-in, while ensuring energy remained accessible, affordable, and reliable. Through close collaboration with local partners and sister projects, SESA co-developed and piloted innovative, replicable solutions that delivered essential energy services and created business opportunities for African entrepreneurs. Guided by a five-pillar approach – Inform, Inspire, Initiate, Implement and Impact – SESA strengthened knowledge, fostered partnerships, supported implementation, and worked to embed clean energy innovations into long-term policy, financing, and decision-making processes.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101037141. This material reflects only the views of the Consortium, and the EC cannot be held responsible for any use that may be made of the information in it.