AFRICA MINIGRIDS PROGRAM

Community-Centric Minigrid Toolkit

November 2025

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Acknowledgements:

The authors thank the following individuals and organizations for offering their insights and perspectives on this work: Robert Hanna (African Sun Energy) and Roger Ouedraogo (L'Agence Burkinabè de l'Electrification Rurale).

All images used are from RMI unless otherwise noted.

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List of Acronyms

AfDB	African Development Bank
AMP	Africa Minigrids Program
CoP	community of practice
CPA	Community Power Association
CPC	Community Power Committee
CRSC	Community Re-investment Sub-Committee
DER	distributed energy resources
EPC	engineering, procurement, and construction
ESCO	energy service company
ESIA	environmental and social impact assessment
GAP	gender action plan
GEF	Global Environment Facility
GEWE	gender equality and women's empowerment
JOA	joint operating agreement
kWp	kilowatt peak (measure of solar generation capacity)
kWh	kilowatt-hour (unit of energy consumption or generation)
M&E	monitoring and evaluation
MEL	monitoring, evaluation, and learning
NEP	Nigeria Electrification Project
NGO	non-governmental organization
PMU	Project Management Unit
PUE	productive use of energy
PV	photovoltaic
QAMF	Quality Assurance and Monitoring Framework
REA	Rural Electrification Agency
RMI	Rocky Mountain Institute
SES	social and environmental safeguards
SPV	special purpose vehicle
UNDP	United Nations Development Programme

Executive Summary

The *Community-Centric Minigrid Toolkit* is a strategic knowledge product developed under the **Africa Minigrids Program (AMP),** which aims to support the design and implementation of more inclusive, resilient, and scalable minigrid systems. The toolkit provides practical guidance to embed more meaningful community engagement and community-centric measures throughout the minigrid project life cycle, responding to a critical need in the sector — moving beyond top-down deployment models toward more demand-driven and inclusive approaches to sustainable energy access.

Why community-centric minigrids?

Across sub-Saharan Africa, the lack of reliable and affordable electricity continues to hinder development, particularly in rural areas. Over half a billion people still don't have access to energy on the continent — accounting for 85% of the global population living without electricity.[1] It is also estimated that globally, more than 1.1 billion people live in energy poverty with unreliable, poor quality, or unaffordable service, and most of those are in Africa.[2] This persistent energy gap constrains economic growth, undermines health and education outcomes, and perpetuates inequality.

Minigrids — self-contained energy generation and distribution systems, which usually operate at the community scale — are widely recognized as the least-cost and most technically feasible solution for many underserved areas. However, current deployment models, which are often top-down and externally driven, frequently fail to account for community dynamics and local needs, resulting in limited uptake, weak sustainability, and operational challenges. At the other end of the spectrum, fully community-led models such as cooperative models, though more inclusive, can overburden communities that lack technical expertise, financial resources, or institutional support for system operation and maintenance. Many of these systems have struggled to remain functional without ongoing external support.

The *community-centric approach* bridges the top-down developer-led or public-led models and fully community-led systems by embedding **local participation**, **inclusive governance**, and **equitable benefit-sharing** throughout the minigrid life cycle. This alignment with community priorities strengthens buy-in, resilience, and long-term sustainability.

A practical framework for the community-centric approach

This toolkit outlines a flexible framework for community-centric minigrids as systems that are designed, governed, and potentially co-owned in close partnership with the host communities. Such projects prioritize inclusivity, transparency, and shared responsibility to ensure that energy systems are both technically sound and socially sustainable. The framework is based on five core aspects:

Exhibit ES 1: A framework for the community-centric approach consisting of five aspects

1. Community Ownership or Co-Ownership: The community may invest financially or contribute land, labor, and other resources to the minigrid and hold formal or informal stakes in the project. This strengthens accountability and long-term commitment.
2. Inclusive Governance Structures: The community participates in decision-making, such as tariff setting, service oversight, and reinvestment planning, often through governance bodies like Community Power Committees, enhancing transparency and trust.
3. Benefit-Sharing Mechanisms: Revenues or profits are shared with the community, which can be reinvested in community-prioritized projects such as water access, education, or local enterprise, creating visible returns to community and tangible social impact.
4. Social and Environmental Safeguards (SES): Minigrid projects should put in measures to protect the environment and health and safety of the community and ensure gender equality and women's empowerment (GEWE) along with social inclusion. Gender-responsive planning, implementation, and monitoring practices ensure that women, youth, and marginalized groups have real influence and equitable access to energy benefits.
5. Safeguards for Community Investments: Transparent financial and institutional mechanisms, such as joint bank accounts, bylaws, and committee mandates, are established to protect and sustain community contributions and benefits over time.

These five pillars are adaptable to a wide range of minigrid contexts, from public-private partnerships to public-led pilots to commercially operated systems seeking to deepen community engagement.

What this toolkit offers

The toolkit supports minigrids practitioners by offering:

- A flexible design framework across different minigrids delivery models
- Practical guidance for incorporating community-centric principles throughout the project life cycle — from pre-feasibility and stakeholder consultation to operations and monitoring, evaluation, and learning (MEL)

- Case studies from Nigeria and Botswana illustrating diverse applications of the approach

Who Should Read and Use the Toolkit

This toolkit supports a broad range of stakeholders across the minigrid ecosystem who are working to strengthen the sustainability, equity, and long-term impact of rural electrification efforts. Minigrid developers and national electrification programs will find actionable strategies to deepen community engagement and integrate the community-centric approach into minigrid project design and delivery. Policymakers, financiers and development partners can use the toolkit to identify opportunities to create a more enabling environment through supportive regulations, concessional financing, or capacity-building investments. Communities and advocacy organizations can draw on the toolkit to better understand the role they can play in shaping energy projects. Together, we aim to reinforce local impacts and long-term sustainability, bringing the sector closer to truly inclusive and empowering energy access at scale.

1. Introducing the Africa Minigrids Program (AMP)

Overview of the AMP

The Africa Minigrids Program (AMP) is a country-led regional technical assistance program for minigrids, active in an initial 21 African countries. It is led by the United Nations Development Programme (UNDP) with funding from the Global Environment Facility (GEF) and implemented together with Rocky Mountain Institute (RMI) and the African Development Bank (AfDB).

AMP's objective is to expand electricity access by improving the financial viability of renewable energy minigrids and attracting scaled-up commercial investment. The program focuses on reducing costs across hardware, software, and financing, as well as fostering innovative business models. By lowering costs, minigrids become more financially sustainable, commercial capital flows increase, and end-users benefit from lower tariffs and expanded service.

The program operates through two pillars:

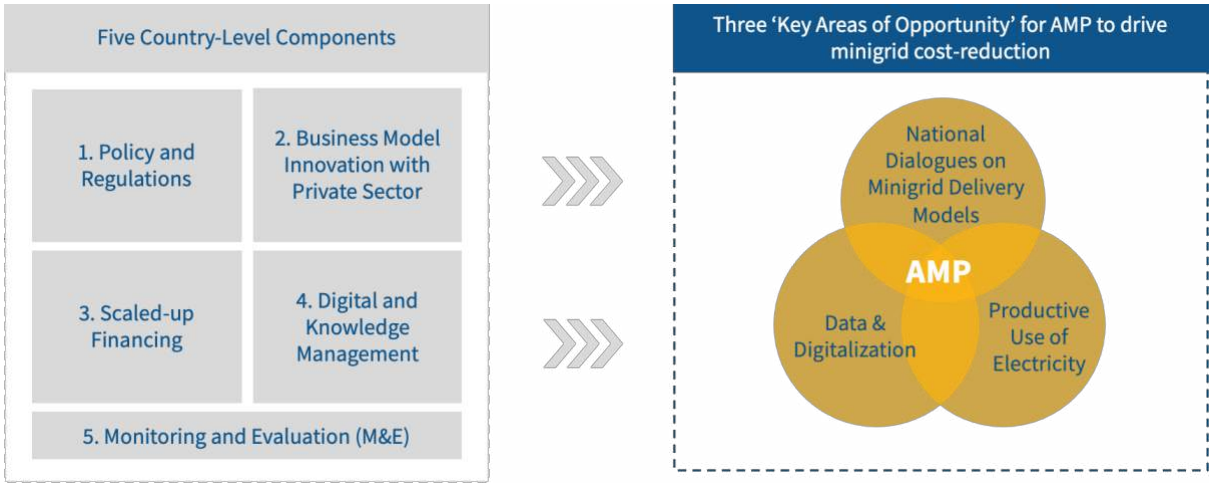
- 21 national projects,[i] each focusing on: (1) policy and regulations, (2) private-sector business model innovation, (3) innovative financing, (4) data and digital tools, and (5) monitoring and evaluation (M&E).
- A regional platform offering knowledge tools, technical assistance, operational support, and digital solutions to reduce minigrid costs.

AMP's strategy centers on three key areas of opportunity:

1. Advancing national dialogues on minigrid delivery models.
2. Promoting productive uses of electricity.
3. Leveraging data and digital solutions for cost reduction.

This dual approach — country-level implementation backed by regional support — positions AMP as a distinctive actor in Africa's minigrid ecosystem.

Exhibit1: AMP key areas of opportunity



[i] Participating countries are organized in three cohorts: Cohort 1— Angola, Burkina Faso, Comoros, Djibouti, Ethiopia, Eswatini, Madagascar, Malawi, Nigeria, Somalia, and Sudan; Cohort 2 — Benin, Chad, Mali, Mauritania, Niger, Sao Tome and Principe, and Zambia; Cohort 3 — Burundi, DRC, and Liberia.

AMP's second area of opportunity — promoting productive uses of electricity — directly connects to the second component of national projects: business model innovation involving the private sector. Under this component, each national project supports investments in up to three types of minigrid pilots designed to demonstrate cost-reduction opportunities. See Exhibit 2 for full descriptions.

Exhibit 2: Types of minigrid pilots in AMP

Type of pilot	Description
Greenfield minigrids	Minigrid systems usually built in previously unconnected areas; they include generation and distribution assets, and in some cases, productive use equipment. In some instances, minigrids can be interconnected to larger grids to expand the electricity supply and/or help stabilize the grid system, therefore reducing technical and commercial losses.
Hybridization of diesel-based minigrids	Retrofitting (i.e., hybridization) of existing fossil-fuel-based minigrids to increase the renewable fraction of power generation and reduce the operations and maintenance costs.
A productive use overlay to an existing or planned minigrid	Investments in productive use appliances and equipment — and if needed in minigrid system enhancements — to increase the number and energy consumption of productive users of power connected to an existing or planned minigrid. This can help generate additional income, improve users' ability to pay for services, and improve utilization of minigrid assets.

To help scale sustainable minigrid policies and practices, AMP established the Africa Minigrids Program Community of Practice (AMP-CoP), a peer-to-peer working group aimed at fostering collaboration and knowledge exchange. The AMP-CoP brings together representatives from African governments, rural electrification agencies, the private sector, academia, and international organizations to jointly address challenges in minigrid development.

Through this platform, practitioners and experts share lessons and coordinate efforts to accelerate sector growth. The AMP-CoP focuses on advancing effective policies, creating enabling regulatory frameworks, promoting viable business models, and unlocking financing to attract private investment, all contributing to the broader objectives of AMP.

2. Scope And Objectives of the Community-Centric Minigrid Toolkit

Growing rural electrification and development efforts across sub-Saharan Africa increasingly include minigrids as a key component. Minigrids have the potential to dramatically improve community-scale livelihoods, economics, and productivity; drive health outcomes; and support a shift to cleaner energy. Recognizing electricity as a cornerstone for economic and social advancement, the community-centric approach illuminates the significant role that communities play not only as beneficiaries, but also as integral contributors to the solution.

The objective of the *Community-Centric Minigrid Toolkit* is to provide a framework for community-centric minigrid design and to offer guidance on how to deploy community-centric minigrids and projects where the community plays an active role in shaping their energy future. It is geared to AMP's national Project Management Units (PMU), minigrids developers, rural electrification agencies, and other energy sector decision markers, as well as community advocate groups. This toolkit draws on several hands-on experiences across Africa, including the community-led models implemented in Botswana, Burkina Faso and Ethiopia, and experience and lessons learned from the Sharing the Power Initiative in Nigeria.[ii]

After reading this toolkit, the reader will:

- Gain understanding and knowledge of the community-centric minigrids approach
- Be equipped with a framework for the community-centric approach, including key design characteristics and implementation considerations
- Learn about community-centric projects implemented through case studies

Overview of sections in the toolkit

The remaining sections of this toolkit are organized as follows:

- Section 3 outlines a framework for community-centric minigrid design.
- Section 4 discusses the implementation of community-centric minigrid projects, including preconditions, guidance, and examples on applying the framework to practical projects, and considerations for monitoring, evaluation and learning (MEL).
- Section 5 delves further into how to integrate a community-centric approach to minigrids project delivery and suggested roles among key actors.
- Section 6 highlights learnings and key insights to date.
- Section 7 offers case studies of community-centric minigrids and projects.

Community-centric approach to enhance minigrid delivery

What is a delivery model?

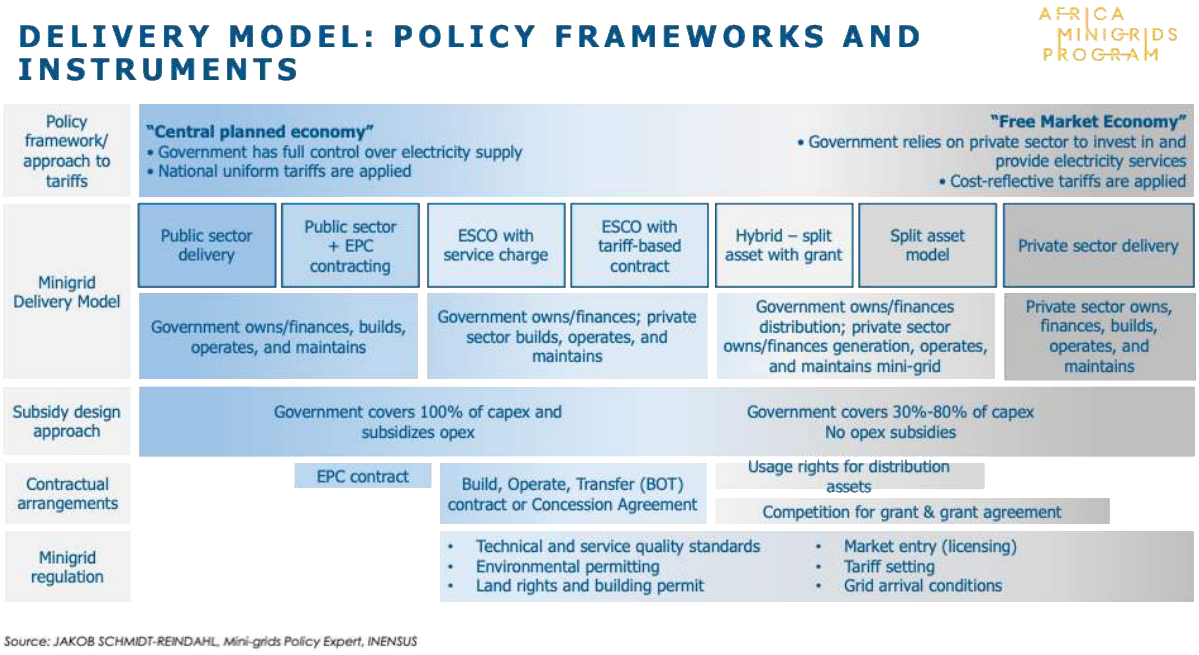
A minigrid delivery model, typically determined by the national government, is the cornerstone of a country's overarching minigrid regulatory framework. It defines **who owns, finances, builds, operates,**

[ii] Sharing the Power is an initiative led by RMI and funded by National Postcode Loterij. Sharing the Power partnered with developers to design and implement community-centric minigrids in Nigeria, https://rmi.org/rmi-insights/sharing-the-power/.

and maintains the minigrids. A minigrid delivery model is therefore closely tied to various components, including tariff structures and mechanisms, licensing requirements, and subsidy design.

Across Africa, minigrid delivery models range from **fully public-led** (where government agencies own, finance, build, operate, and maintain minigrids) to **fully private-led** (where private developers own, finance, build, operate, and maintain systems). In between, hybrid models may include engineering-procurement-construction (EPC) contracting, energy service company (ESCO) arrangement, utility-led efforts, public-private partnerships (PPPs), or other variants that share roles across actors. Exhibit 3 provides an overview of this spectrum.

Exhibit 3: An overview of minigrid delivery models



Source: JAKOB SCHMIDT-REINDAHL, Mini-grids Policy Expert, INENSUS

The role of communities in minigrid projects

Securing community buy-in and support is a must when developing rural electrification projects. Although almost all minigrid projects recognize the essential role of the host communities, the common practice of community engagement is limited to community sensitization, establishing a community power committee or equivalent to facilitate consultation, and discussing land access agreements. The lack of accounting for community intrinsic needs and dynamics can lead to underutilization of systems, abandoned assets, and various operation challenges such as billing, jeopardizing the effectiveness and sustainability of rural electrification efforts.

Some existing delivery models, such as the cooperative models implemented in Burkina Faso and Ethiopia (see Box 1), allow the communities to play more meaningful roles in minigrid projects such as in ownership and operation and maintenance responsibilities. However, this can lead to additional technical, financial, and managerial tasks for communities and can make them challenging in practice. **For clarity, we refer to these models collectively as community-led models throughout this toolkit.**

Box 1 Community-led Minigrids in Burkina Faso and Ethiopia

Electricity cooperatives (Coopels) have played a central role improving energy access to underserved and unserved rural communities in Burkina Faso. Coopels form a local governance entity — often including community leaders and entrepreneurs — that secures a concession from the Agence Burkinabè de l'Electrification Rurale (ABER), and formerly the Fonds de Développement de l'Electrification (national electrification fund, FDE). Then they often hire private technical operators through *affermage* contracts

(e.g., lease-and-operate) to manage day-to-day operations and maintenance,[iii] while the Coopels in most cases retain responsibility for metering, billing, customer relations, and project oversight.[3]

With the Coopel model, the cooperatives act as the public-facing anchor for electrification efforts and help establish a strong sense of community involvement by ensuring community members have a stake in both oversight and service delivery. Coopels successfully build on existing social capital, with the governance structures often composed of trusted local leaders. And by contracting with private operators, Coopels also avoid the need to internalize all operational responsibilities.

The cooperative model in Burkina Faso aims primarily to electrify local communities with clean and affordable energy, while encouraging community participation and management of electricity service to ensure sustainability. However, the implementation of Coopels-led projects reveals critical operational and structural challenges. Many cooperatives lack the in-house expertise to manage equipment faults, supervise contractors, or troubleshoot outages — particularly in cases where private operators did not meet performance expectations. It's common to see minor technical issues and required repairs delayed or unaddressed. Financial sustainability is another recuring obstacle, as Coopels often operate in low-demand, rural areas with minimal electricity consumption, and ongoing operation costs hinge on tight margin and community contributions. Overseeing the private operator can also be difficult for community boards, who in general lack legal and managerial experiences. The experience highlights that cooperative models can foster local accountability, but their success depends heavily on technical support, strong contract governance, and sustainable financing structures.

In Ethiopia, under the Energising Development (EnDev) program, the German Agency for International Cooperation (GIZ) led the implementation of five solar minigrids in four remote villages in rural Ethiopia using a cooperative model.[4] GIZ helped set up the four cooperatives and provided trainings and capacity building to enable them to govern, operate, and maintain the systems. GIZ also supported the development of the *Guidelines for Cooperative-Led Mini-grids in Ethiopia*, offering practical guidance on regulation, licensing, business models, financing, and contracting for future cooperative projects.

The program in Ethiopia leveraged the existing cooperative culture and network in country, and integrated electrification with local value chains and clean cooking. This enabled cooperatives to see energy access not only as a service, but also as a tool for economic growth. GIZ also provided structured support to cooperatives notably around how to appropriately define tariffs — considering battery replacement, cooperative staff salaries, etc. — to balance affordability and sustainability. The effort also helped improve enabling environment and market development for off-grid electrification in Ethiopia.

While the model aimed to promote local ownership and stimulate local economics, it faced significant operational challenges after the minigrids were handed over to the cooperatives. With full ownership came full responsibility — including operations and maintenance — which many cooperatives were not equipped to manage. Without sufficient technical knowledge, financial capacity, or a strong sense of ownership (in part because the infrastructure was provided at no cost), even minor technical failures, such as a broken solar component, could leave systems inoperable. In some cases, these issues were left unaddressed, undermining service continuity and sustainability of minigrids and electrification efforts. The experience underscores the importance of aligning the level of support with the level of ownership, and embedding clear accountability mechanisms from design phase to all major decision-making stages of the project.

[iii] Affermage contracts are generally public-private sector arrangements under which the private operator is responsible for operating and maintaining the utility but not for financing the investment.

Examples from Burkina Faso and Ethiopia show that while community-led models can build local ownership and enable community decision-making, they often face significant operational challenge as communities lack the technical expertise, financial capacity, and institutional support needed to operate and maintain minigrid systems effectively. As a result, these systems have struggled with cost recovery and continuity of service over time. For the community-led models to succeed, they require a unique combination of factors: communities with the capacity and motivation to manage minigrids, and substantial ongoing support to provide training, financial oversight and technical assistance to communities. These requirements make such models difficult to scale and replicate across regions and help explain why broader adoption remains limited.

The community-centric approach can bridge and enhance delivery models

The **community-centric approach** introduced in this toolkit offers a middle path — **not a standalone delivery model**, but a flexible **set of design principles** that can be embedded into **any existing delivery model**. It seeks to enhance project outcomes by embedding **meaningful community participation**, **inclusive governance**, and **shared benefits** across the minigrid life cycle. It promotes minigrids that are designed, governed, and operated in partnership with the host community, accounting for local needs and strengthening project outcomes.

Compared to the community-led models, community-centric minigrids offer greater flexibility in ownership structures and operational roles, allowing for a mix of responsibilities shared among communities, cooperatives, private developers, utilities, and government and public actors. This flexibility supports more innovative approaches to customer engagement, tailored service design, and locally grounded governance structures, making the model more adaptive and scalable across diverse contexts. For example, a successful community-led delivery such as a Coopel in Burkina Faso necessitates co-designing clear and targeted service contracts, engaging external providers where most needed (versus the full minigrids operation and maintenance service packages), and pairing those with supervision and institutional support to strengthen community capacity.

The community-centric approach is versatile and aspects of it can be incorporated into **all types** of minigrid deployment. It builds on the strengths of existing delivery models and forges a vital link between communities and implementing actors through hybrid partnership. By centering the needs, priorities, and leadership of local communities, the approach fosters a "demand pull" dynamic, complementing the "supply push" approach, and helps unlock more sustainable, inclusive, and scalable rural electrification across Africa.[iv]

[iv] A “supply push” approach in minigrids development refers to systems being designed and built primarily based on top-down planning, where supply of electricity comes ahead of local demand with the assumption that energy usage will grow naturally with electrification over time. A “demand pull” approach, on the other hand, starts with needs and priorities of the benefiting community with more bottom-up engagement and alignment.

3. A Framework for Community-Centric Project Design

As discussed above, many existing minigrid delivery models often only involve the community at surface level, missing the opportunity to incorporate community needs, structures, and dynamics into core project decisions. On the other hand, community-led models offer deeper community engagement but might place unsustainable responsibilities on communities, who may lack technical and financial capacity. Community-centric approach presents an alternative: one that embeds more meaningful community participation throughout the minigrid project cycle, while leveraging the strengths of the public and private sectors.

In this section, we introduce a framework for community-centric minigrids consisting of five key aspects (Exhibit 4). Interventions under the five key aspects, taken together, can lead to innovation and transformative impact.

Exhibit 4: Five key design aspects of community-centric framework

1. **Community Ownership or Co-Ownership:** Host communities can own a stake in the minigrid through financial, land, and in-kind contributions. To what extent the community owns the minigrid assets can vary. This offers flexibility and helps foster long-term community buy-in, local accountability, and connection to minigrid projects among community members.
2. **Governance Structure:** This speaks to how the community will be empowered in decision-making on the minigrid project. Community representatives are given a voice and voting rights in determining important matters such as tariff design, service levels, and potential upgrades and project re-investment. This ensures the system is responsive to local needs and realities, and enhances the community's understanding of minigrid design and operations.
3. **Benefit Sharing:** This allows the community to receive a defined share of proceeds (revenue or profit) from the operation of the minigrid, which can be reinvested in public services, local development, or productive use infrastructure. It serves as an important incentive for community buy-ins, increasing development and social impact.
4. **Social and Environmental Safeguards (SES):** Measures need to be put into place to safeguard health, safety, the environment, and natural resources within the community. Based on a gender

analysis and action plan and stakeholder engagement plan, the project should actively promote gender equality and social inclusion by enhancing women's participation, electricity access, and economic empowerment, while embedding gender-responsive planning, governance, and monitoring throughout the project cycle.

5. **Structure to Safeguard Community Investment:** To ensure sustainability of the community-centric minigrid, community investment must be properly safeguarded over the project lifetime. Both the community investments into the project and proceeds from the operation of the minigrid should be subject to "checks and balances" that offer a high degree of transparency.

To ensure the design and implementation of equitable, effective, and efficient community-centric measures, it is essential to have transparent and participatory processes. At the minimum, developers should prioritize engaging local communities from the very beginning of the project,[v] and involve community members at key decision-making points including the location of the minigrid to minimize its impact on land use and natural resources. Also, women and other marginalized groups should not only attend consultations but actively participate, with their concerns and requests clearly collected and documented.

When designing a benefit-sharing mechanism, for instance, developers, investors, and the host community should have dedicated and inclusive discussions to align openly on what will be shared, the amount, the disbursement schedule, and safeguarding measures. Moreover, these participatory processes could extend beyond local communities to include traditional authorities, government agencies, civil society organizations, the private sector, and experts. This sector-wide engagement further helps influence rural electrification efforts and enhance energy access, ultimately stimulating social and economic development.

[v] In this toolkit, "developers" refer to the entities that develop minigrids, whether private or public actors.

4. Implementing Community-Centric Projects

The objective of this section is to explore how to apply and incorporate the five key community-centric aspects into project design and implementation. We also discuss the preconditions for community-centric minigrids and MEL considerations.

Preconditions for implementing community-centric projects

Just like any other minigrid development, developers and communities need to consider several dimensions to evaluate project feasibility, namely regulatory environment, technology and capacity, financing, community dynamics, and environmental and social risks and impacts. It is recommended to incorporate these aspects into the objectives for minigrid projects and the scope of the feasibility study.

Precondition checklist

Policy and Regulatory Environment

- ☐ **Are there national or regional policies and programs supporting community-centric minigrids?** At the minimum, existing policies and programs should recognize the important role of communities and community engagement in rural electrification.
- ☐ **Are there legal structures to formalize community partnership and potential community ownership and shares of minigrids?** For example, can communities be viewed as an entity to participate in business operations and decision-making of minigrids? Having a formal arrangement will help safeguard community investments and benefits.
- ☐ **Leeway to establish community ownership in the national regulatory framework.** Communities or their respective legal entity should have the ability to attain the necessary permits and licenses.
- ☐ **Are there any land tenure systems supporting community-centric minigrids?** For example, are lands owned by the state, the community, tribes, individuals, or families and how does that support community-centric minigrids or what is the general legal framework governing the acquisition and ownership of lands?

Technology and Capacity

- ☐ **Does the community have the skills and knowledge about minigrid technology and projects to be a project partner, or does the community have a trusted partner to advocate for its interests?** This is to ensure the design and implementation of the projects will serve community needs.
- ☐ **Are there any national- or regional-level capacity development programs on minigrid technology, maintenance, and operations that can support knowledge or technology transfer to enable community-centric minigrids?** If the community doesn't already have knowledge, having capacity development programs can help develop the required workforce and enable the community to advocate for its own best interests.
- ☐ **Does the developer have sufficient capacity and experience engaging with communities?** Community-centric minigrids require enhanced community engagement and continuous collaboration with host communities, and developers must be willing to put in more effort than their business as usual.
- ☐ **For developers who have not done community-centric minigrids before, are there resources and technical assistance available for them to properly design and implement community-centric minigrids?** As this is an innovative business model, developers themselves could benefit from technical assistance and capacity building, for example, to navigate through the regulatory and legal process as applicable.

Financing

- ☐ **Can the community financially contribute to the project?** Community contributions can take the form of direct equity buy-in to the project, in-kind contributions, right to use lands, etc.
- ☐ **What other financing sources are available to the community for up-front and ongoing costs?** Developers and communities should explore existing programs and initiatives they can leverage. For example, with support from Dutch Post Lottery, Sharing the Power invests in the minigrids on the communities' behalf. National, federal, and state funds can also be a source for community projects (e.g., rural electrification funds)
- ☐ **Can the developer cover additional project costs associated with the added time and effort taken to engage with communities?** While community-centric minigrids could yield better financial results, developers have to invest additional resources up-front in designing the projects and engaging communities until the community mechanisms and structures are in place.

Community Dynamics

- ☐ **Is the community receptive of the community-centric approach and interested in taking more ownership and decision-making power of minigrid projects?** Aligning the community's interests and desire will ensure meaningful participation in project design and implementation.
- ☐ **Can inherent leadership structures within the community be leveraged for community-centric minigrids?** This can help streamline the community governance and decision-making, and community-centric project design should consider existing social norms and dynamics to further empower community members (e.g., how the community resolves disputes, how it determines the use of communal resources). The presence of existing women's groups, associations, and women-led leadership structures are a plus when selecting communities.
- ☐ **Has the developer put in adequate processes that are transparent and participatory to engage community members to secure buy-in throughout the project?** Developers need to establish a plan to ensure communities' voices are heard, and the design and implementation of community-centric minigrids remain collaborative and transparent to communities.

Environmental and Social Risks and Impacts

- ☐ **Has an environmental and social impact assessment (ESIA) been conducted with a risk management plan developed in consultation with the community?** This is often required by regulation as part of the minigrid licensing. Going beyond "do no harm," developers should properly consult the community and put a plan in place to safeguard community health, safety, and the environment.
- ☐ **Has the developer incorporated GEWE and social inclusion into a pre-feasibility study or does it have the intention and capacity to do so?** A gender-sensitive and inclusive study could enable more accurate and inclusive demand-side assessment to deploy systems and interventions suitable for women, youth, and other marginalized groups.

Box 2: Preconditions and Site Selection for Sharing the Power Pilot Projects

Sharing the Power prioritized Nigeria for the project pilots as it has seen significant minigrid market growth in recent years, with favorable policies and regulatory frameworks, as well as a growing number of experienced minigrid developers and private sector interests. To ensure all pilot projects would be considered community-centric, the following conditions were applied:

- Policy and regulatory environment: Current regulations in Nigeria do not specifically support nor hinder community-centric minigrids. However, community engagement is a fundamental part of the funding process of the Nigeria Electrification Project (NEP). Developers are required to

formalize a community exclusivity agreement to access a NEP grant. RMI and its legal partner identified legal structures to formalize community partnership in Nigeria, including a special purpose vehicle (SPV), and incorporated and unincorporated joint ventures.

- Technology and capacity: Thanks to the development of the minigrid market in Nigeria, there are several active developers with portfolios and pipelines of minigrid projects. In selecting partners and pilot sites, Sharing the Power required developers to demonstrate good track records of community engagement and to be on good terms with the host communities in proposed sites. In the pilot projects, RMI advocated for community interests and provided technical backstopping for developers in project design and implementation.
- Financing: In Sharing the Power, a $50,000 grant was provided per site with funding from Nationale Postcode Loterij, which served as equity investment on the community's behalf. Developer partners also committed to cost share the additional travel and personnel costs for designing and implementing community-centric measures.
- Community dynamics: One of the pilot selection criteria under Sharing the Power was that host communities were receptive of the community-centric approach. Developers were required to develop a workplan indicating at which point communities were brought in, in collaboration with RMI. The project team also prioritized communities with existing female leadership and entrepreneurship (e.g., the presence of women-led businesses, ensuring women had meaningful roles within the community power committee).
- Environmental and social risks and impacts: In Nigeria, an ESIA and management plan is required to obtain a minigrid permit so developers already have the management plan in place. In addition, Sharing the Power required developers to engage communities with a gender-sensitive lens, from project design through implementation.

Applying the five key aspects to minigrid projects

The design of community-centric minigrids is highly flexible and customizable, tailored to a community's unique dynamics and needs. Nevertheless, the core principles of ownership, governance, women's empowerment, social inclusion, benefit sharing, and investment protection are fundamental components shared by all projects and beneficiary communities. The next section summarizes possible design options to apply the five key aspects into minigrid projects. These options are based on what developers have implemented or are trying to implement, and are not exhaustive.

Community ownership or co-ownership

The community ownership aspect has already been tested in minigrid projects in different countries over the years. However, the focus has been on full community-led and owned models. A community-centric approach, on the other hand, would offer flexibility for communities to take all or partial ownership, or no formal ownership agreement at all. This allows communities to divide responsibilities collaboratively with minigrid developers based on their own desires and resource availability.

Community ownership can be reflected in the following ways, from highest, or most formal, to the lowest, or least formal.

- **Fully community-owned:** Communities assume full ownership of the minigrids, typically with support from an external EPC firm or public implementing agency to build the minigrids. After construction, often funded through grants or public programs, ownership is transferred to the community or a cooperative structure, which then becomes responsible for ongoing operation and maintenance. Communities might manage the systems directly themselves or outsource a service package to a private operator through a performance contract. These arrangements closely mirror

the community-led delivery models implemented in Burkina Faso and Ethiopia as introduced in Box 1.

- **Partial ownership (or co-ownership):** Communities and developers can collaborate and align on the level of ownership, usually based on the share of investment and contribution they put in the project, and respective responsibilities throughout project implementation and operations. There are various ways to formalize the ownership and partnerships. For example, the developer and the community can form a special purpose vehicle (SPV), sign a joint operating agreement (JOA), or form other legal arrangements as applicable in certain jurisdictions.
- **No formal ownership agreement:** This can often occur because the community doesn't want to own or take up additional responsibilities, but developers recognize the community as a shareholder of the project. The community is then entitled to receive proceeds from the minigrids and can decide how to use the proceeds (also see the "Benefit sharing" aspect below).

Box 3: A Snapshot of Community Co-Ownership in Sharing the Power and in Botswana

Across the four pilot projects in Sharing the Power, there are varying degrees of community ownership and formality of the arrangement. For projects with community co-ownership, the share of co-ownership is tied to the amount of community investment as a share of the total cost of the minigrid. In the Mbiabet minigrid developed by Prado Power, a 20% ownership stake of the minigrid's assets was established through an agreement along with statutes and mandates with the Community Power Committee, which acts as the community's representative. In Mokoloki, Nayo Tropical Technology and the community entered a JOA and secures the community an 11% stake in the project through an unincorporated joint venture structure. Husk Power, on the other hand, considered having the community co-own the distribution network in Alagye, with the rationale that community members are more likely to play a role in maintaining the distribution assets. In the Kaduna project, there is no formal co-ownership of assets between the communities and Konexa.

In partnership with the UK and the United States, African Sun Energy has developed Botswana's first community-run distributed energy service company, the Jamataka Community Cooperative Energy Company. The community-owned company, with financial support and technical assistance from Africa Sun Energy, delivered solar installations to power a local school, a village office, and households, along with water pumping for the community's agriculture project.

Governance structure

In developing rural minigrids, it is already common practice (and sometimes a requirement by policies and rural electrification programs) to form a community power committee (CPC) or village power committee (VPC) to represent the community on minigrid-related matters. In a community-centric model, the role of the CPC can be expanded to serve as the governance body. In this case, developers might **institute additional functions, mandates, and processes with the CPC**. These could include establishing a clearer accountability framework, specifying how CPC positions should be nominated and held, giving the CPC more voices and decision-making power (e.g., on tariffs, proceed re-investment, minigrids operation, etc.), and having mandates that align with SES to ensure community representation considering local cultural nuances. The latter could mean specifying representation targets for women and other marginalized groups with the CPC, and combining that with awareness-raising activities on gender norms and female leadership with community members.

Developers might opt to **establish a new governance body** to carry out duties on more specific community-centric aspects, such as a re-investment sub-committee to manage and govern the community share of minigrid proceeds. No matter what the format is, the key for community-centric governance structure is inclusivity and transparency, and developers must put in place processes (like regular briefings and meetings, having operational staff embedded within the community) for effective two-way communication with the community. In addition, we encourage the CPC and other governance bodies to

actively partner with existing groups in the community, such as women's cooperatives, savings groups, and associations to leverage existing structures and be grounded in local realities.

Box 4: Minigrid Financial Viability and Tariff Setting for sustainability

Financial viability is a core concern across all rural minigrid projects, regardless of the delivery model. Minigrids often operate in low-density, low-consumption areas with high up-front capital costs and uncertain revenue streams. Balancing cost recovery with affordability remains one of the sector's most persistent challenges. For community-centric minigrids, as developers and communities must align on revenue expectations, service levels, and the use of community contributions or shared proceeds, there is opportunity to co-create project schemes and governance to strengthen the financial state of the minigrids. On the other hand, the tension between communities and developers can be even more complex.

The effort starts as early as site identification (see *Preconditions for implementing community-centric projects*) to understand community dynamics, existing capacities, project financing outlook, etc. Throughout project design and execution, communities and developers need to collaborate openly to tackle key questions arise, such as:

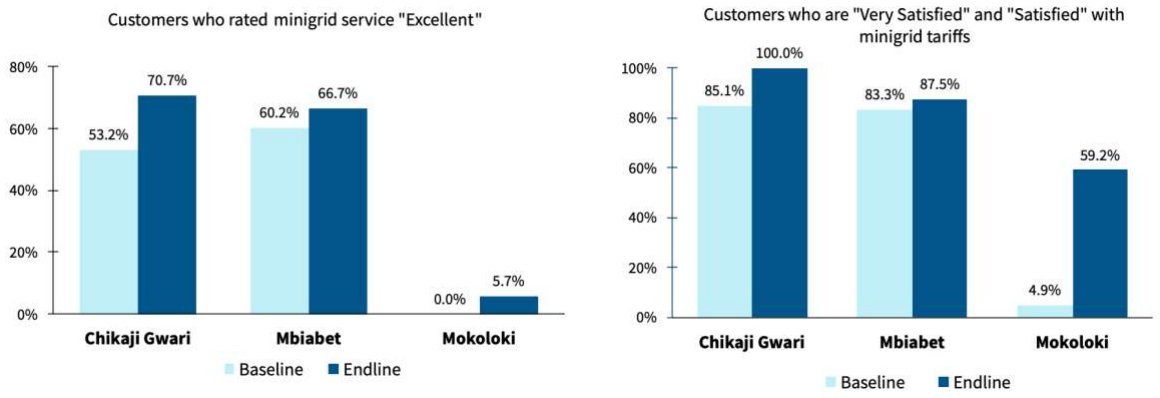
- What is the projected revenue versus operating expenditures? What is the cost-revenue profile across residential, commercial, and productive users?
- In the case where operating expenditures exceeds projected revenue, what can be deprioritized (e.g., service level) and what are potential ways to reduce operating expenditures (e.g., ongoing subsidies)?
- Can communities or developers troubleshoot technical issues in a timely matter to avoid revenue loss due to downtime?

Tariff design sits at the center of the financial viability challenge, and it can be a very sensitive topic, directly affecting community affordability, community perceptions of fairness, and developer revenue. In many African countries, including Nigeria, the norm remains a single, flat tariff for rural minigrids, with limited experimentation around differentiated tariffs or targeted subsidies.

In **Mokoloki**, one of the Sharing the Power pilot sites, rising fuel prices significantly increased operating costs. The developer, Nayo Tropical Technology (NayoTT), was no longer able to maintain previous service levels under a tariff that had been set more than five years ago. This mismatch between cost and tariff led to community dissatisfaction, resistance to re-negotiation, and a breakdown in trust — creating a vicious cycle of underperformance and misalignment.

When Sharing the Power intervened, the first step was to **rebuild trust through inclusive governance and decision-making, transparent communication, and collaborative planning**. Community members were brought into governance discussions, given insight into system costs and revenue flows, and invited to co-own the solution, including the system upgrades. With community-centric measures in place, community satisfaction with the minigrid's service and tariff significantly increased. We also noticed these very promising trends in other Sharing the Power pilot sites (see Exhibit 5 below). This is not because the rate changed, but because the community better understood how the tariff was set and perceived it as fair, as well as appreciated the efforts going into running the minigrids and providing electricity service.

Exhibit 5: Baseline and endline survey results on communities' satisfaction with minigrids services and tariffs in Sharing the Power pilot sites[vi]



With a community-centric approach, particularly with the co-ownership and benefit-sharing aspects, communities may have the opportunity to use their contribution or shared proceeds to reduce tariffs, depending on mutual agreement with the developer. However, across the four pilot projects under Sharing the Power, this option was not implemented. Instead, communities chose to reinvest proceeds into community projects such as clean water access and education initiatives to improve public infrastructure and services. Most developers also preferred to maintain standardized pricing to simplify operations and support cost recovery.

Commercial viability remained a key concern and tariff setting is a deciding factor. Even in contexts where flat tariffs are standard, it is essential that communities are engaged early in the process. Governance structures should empower communities to participate in tariff discussions, understand cost drivers, and help balance affordability with the financial realities of minigrid operations. In addition, we encourage developers and communities to explore more equitable tariff structures that can improve access for the vulnerable without compromising financial sustainability, driving more social impacts. Possible approaches include **tiered or lifeline tariffs** that make basic electricity affordable, **pay-as-you-go models** or other schemes to offer flexible payment, and **cross-subsidies** where higher-consuming or higher-income users (like productive use of energy [PUE] businesses) offset the costs for low-income households.

While this toolkit offers early insights, many of the key questions remain under-explored. Continued experimentation, learning, and collaboration across the sector are essential to better refine inclusive, adaptable tariffs that account for varying demand, income levels, and system costs; ensure financial transparency; and ultimately support the long-term financial sustainability of minigrids.

Benefit sharing

From developers' experiences, the benefit-sharing aspect is valued the most by the community and offers the most tangible added value to the community from the minigrid projects. Benefit-sharing schemes can

[vi] Chikaji Hausa finished customer connection in December 2023 and Alagye's connection was still ongoing when the endline survey was conducted, so they are not included in the Exhibit.

take various formats, and we most commonly see them fall under the two categories today. Whichever formats developers adopt, transparent and inclusive community engagement and decision-making processes are the cornerstone.

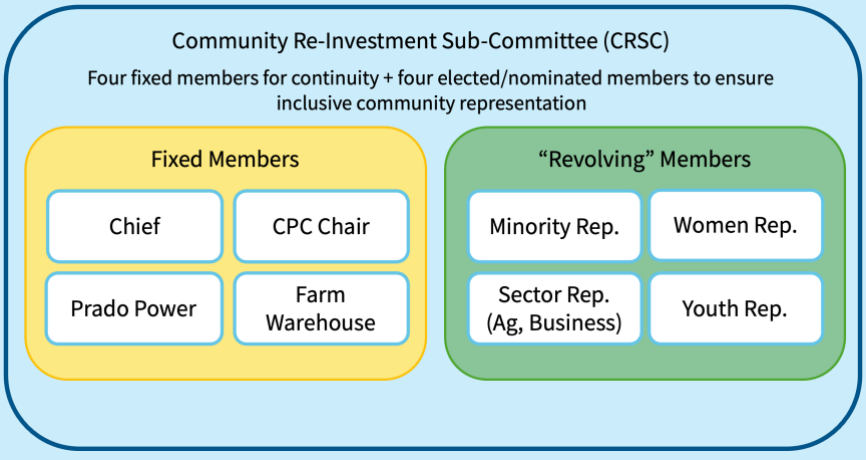
- **Sharing minigrids proceeds with the community:** Developers will remit a percentage of the minigrid revenue or profits to the community. The percentage is often linked to the community's financial contribution to the project. The proceeds will subsequently be re-invested in community initiatives like water boreholes, healthcare post renovations, or the installation of agricultural processing equipment, based on the community's needs and priorities (also see the "Structure to safeguard community investment" aspect below).
- **Developers' corporate social responsibility projects:** Many developers also develop "goodwill" projects such as providing street lighting and electricity for public institutions (e.g., health clinics, churches, mosques) for free, training communities on livelihood activities (e.g., agricultural processing, financial literacy, etc.), and supporting job creation in the community.

Box 5: A Snapshot of Community Benefit Sharing in Sharing the Power

In Sharing the Power, developers took different approaches around benefit-sharing schemes. When proposing the design of the scheme, RMI requested that developers share their financial models and evaluated whether the share is fair from community's perspective. For projects with community co-ownership, the percentage of shared proceeds, most often profits, are tied to the percentage of co-ownership. Then the developer presented the design and implementation plan with community to get their sign off.

In Mbiabet, the community receives 20% of minigrid profits from its 20% co-ownership of the project, and can use the funds to invest in community projects such as clean water stations and agricultural extension services. Prado Power formed a Community Re-investment Sub-Committee (CRSC) to manage the shared proceeds and to ensure the community can make informed decisions on community projects to implement. The CRSC is registered as a nonprofit entity with a joint bank account for the proceeds, and it is comprised of fixed and "revolving" members from Prado Power, the community, and Farm Warehouse (the productive use facility operator).

Exhibit 6: CRSC structure in Mbiabet



In Konexa's pilot in Kaduna, there is no co-ownership considering the community context and capacity. Konexa evaluated the financials (with the Sharing the Power grant serving as community equity investment) and proposed a 5% share of revenue for both communities served by the minigrid. RMI reviewed and found it to be reasonable.

Social and environmental safeguards

Social and environmental safeguards (SES) should be an integral part of minigrid projects to enhance the positive impacts the minigrid may have on the community and avoid or minimize associated risks. In terms of GEWE and social inclusion, it should go beyond having female and minority group representative present in townhall meetings. Developers reported that the gender and inclusion aspects can be most challenging to implement, especially given the low awareness and understanding in local communities of these issues, and the need to be mindful of the existing social dynamics in the community. Below we offer some practical steps to guide developers and project teams in mainstreaming SES (in particular GEWE and social inclusion) throughout the minigrid life cycle. These should be considered "minimum requirements" while additional SES initiatives are encouraged.

- Conduct an environmental and social impact assessment (ESIA) and develop an environmental and social management plan to identify and assess environmental and social risks associated with installation and operation of the minigrid and its associated infrastructure. Aspects such as occupational health and safety, community safety, and waste disposal are important to consider to safeguard the natural and social environment.
- **Conduct a gender-sensitive and inclusive pre-feasibility assessment and develop a gender action plan (GAP).** The assessment should aim to understand gender roles and social norms within the community, labor-intensive and value chain activities and how they are affecting women and youth differently, and energy needs and economic constraints faced by women-headed and vulnerable households. These analyses should inform the development of a GAP, which clearly defines measures and roles to guide project implementation, monitoring, and adaptation with a gender lens.
- **Enable gender-responsive and inclusive consultation processes.** Community engagement and consultation should allow meaningful participation especially from women, youth, and marginalized groups. This requires more intentional process design and practicing care, for example, considering mobility, time constraints, and social norms; organizing women-only sessions; and using culturally appropriate facilitation methods. This is an essential step to ensure gender aspects and inclusivity are embedded into project design and implementation.
- **Ensure gender-sensitive electricity access.** Ensure that female-headed households — where an adult woman is the sole or main income provider and takes primary responsibility for decision-making — have equitable access to information, connection opportunities, and financial or technical support for minigrid electricity services. This includes identifying female-headed households during project preparation, sharing information through channels that effectively reach women, and offering tailored assistance for connection and payment processes to ensure they can fully benefit from electricity access.
- **Support women's access to PUEs and labor-saving appliances.** Pay particular attention to how electricity access can support women-led income-generating activities and/or labor-intensive work, whether paid or unpaid. When deploying productive use interventions, consider value chains and activities where women are heavily engaged, and promote deployment in these areas. Promote gender-sensitive appliance financing mechanisms. The minigrid project team should also proactively partner with local organizations such as women's cooperatives and associations to enhance trust, support awareness building, and provide trainings to improve uptake of PUE appliances.
- **Monitor GEWE and inclusivity outcomes.** Gender and social inclusivity indicators need to be incorporated into the monitoring and evaluation process to track progress and impact. To measure impact at the beneficiary-level, data should thus be disaggregated as much as possible by gender of household head, business, or PUE owner (also see discussion in *MEL Considerations* section and Box 8 below)

In practice, GEWE and social inclusivity aspects should be embedded into the other four community-centric aspects — for example, guiding the establishment of community governance and the selection of community re-investment (benefit-sharing) projects. The goal of implementing GEWE and social inclusivity measures is to enable women and marginal groups to participate in community activities more, especially strengthening their representation and voices in minigrid-related matters, which can have a positive impact on community trust and minigrid utilization.

Structure to safeguard community investments

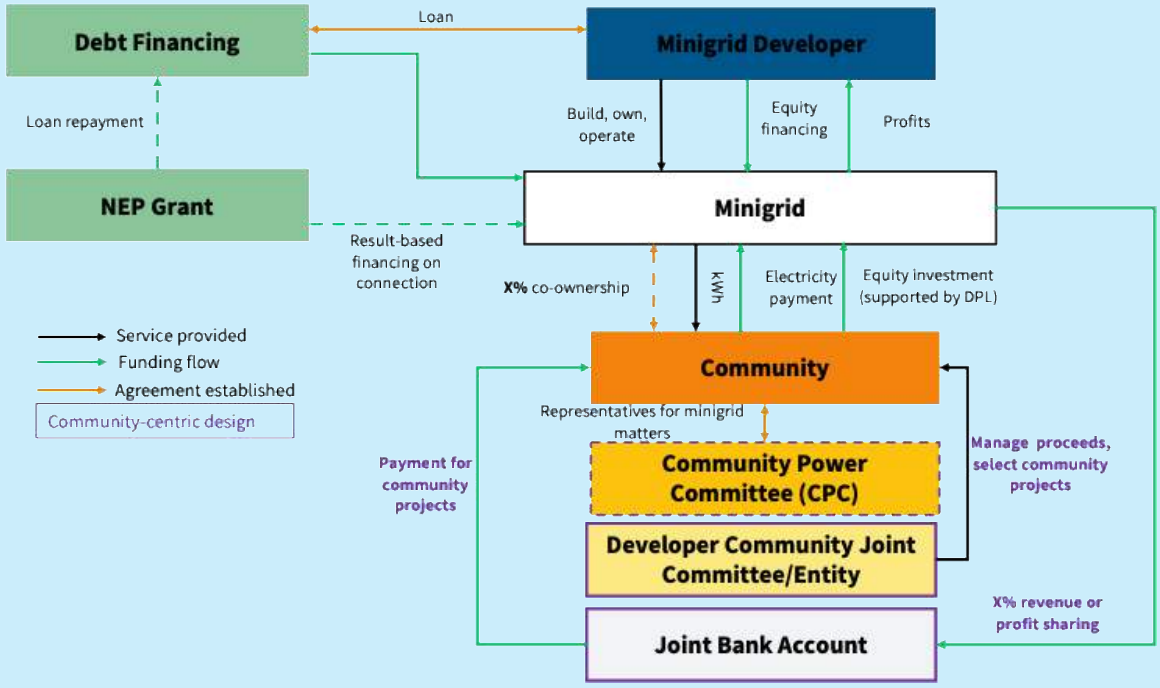
This aspect drives the **sustainability of community-centric measures**, and the key lies in continuous community engagement and building community understanding and trust. A few measures can be adopted:

- Putting in place safeguarding mechanisms to **ensure the protection of community investments**, such as establishing joint entity and joint bank accounts, and instituting mandates and bylaws for various community functions and transactions. For example, developers and communities can collaborate to propose a near-term and long-term community re-investment plan along with process and guiding criteria for community project selection.
- Putting in processes to foster stronger community participation and **increase the transparency and inclusiveness** in decision-making. This can include regular meetings, making project financials transparent, requiring a co-signee from the developer and community to access the joint bank account, requiring financial transactions to be approved by two people, etc.

Box 6: A Schematic of Community-Centric Minigrid in Nigeria

The Exhibit below illustrates a schematic in Nigeria as one of many variants of the community-centric minigrid model. In addition to a typical private delivery model, the host community co-owns a share of the minigrid and receives a percentage of revenue or profit from the minigrid. A Developer Community Joint Entity is established to manage the proceeds and select community projects to re-invest in using the proceeds.

Exhibit 7: Community-centric minigrid business model illustration (an example in Nigeria from Sharing the Power pilot)



Central elements to this set up are:

Community Power Committee (CPC): The mandates, composition, and procedural requirements of the Community Power Committee are drafted by the community and ratified by the community leadership under the principles of inclusivity and transparency.

Benefit sharing: The benefit-sharing arrangement in the private/community partnership is a core element of this model. The revenue/profits generated through the minigrid project are shared with the community members ideally though "spin-off" community projects that enhance the community's sense of unity (inclusion), safety and resilience (e.g., school refurbishment, a community bore-hole, PUE hubs, lifeline tariffs, health post upgradation, etc.) The selection of these projects is subject to an extensive community-led ideation, prioritization, and selection process that is coordinated by the CPC.

Developer/Community Joint Committee: All major decisions relating to the minigrid project are subject to discussion and decision in this committee that usually includes selected members of the CPC and the developer/private sector representative of the community/private partnership.

Monitoring, evaluation, and learning considerations

A robust monitoring, evaluation, and learning (MEL) plan is essential to codify learnings, gather insights, and continue to refine the community-centric business model, streamline project development and implementation, and engage broader sector stakeholder for scaling. Under AMP for example, projects are expected to comply with the Quality Assurance and Monitoring Framework (QAMF) developed by UNDP. In addition, we recommend developing SMART (specific, measurable, achievable, realistic, and time-bound) community impact metrics to evaluate the effectiveness of community-centric interventions. In consultation with developers and academic researchers, we proposed an assessment framework (Exhibit 8 below) for community projects with indicators across five aspects from minigrid and community perspectives, as an augmentation to the QAMF proposed for AMP projects.

Box 7: Quality Assurance and Monitoring Framework (QAMF) for AMP projects

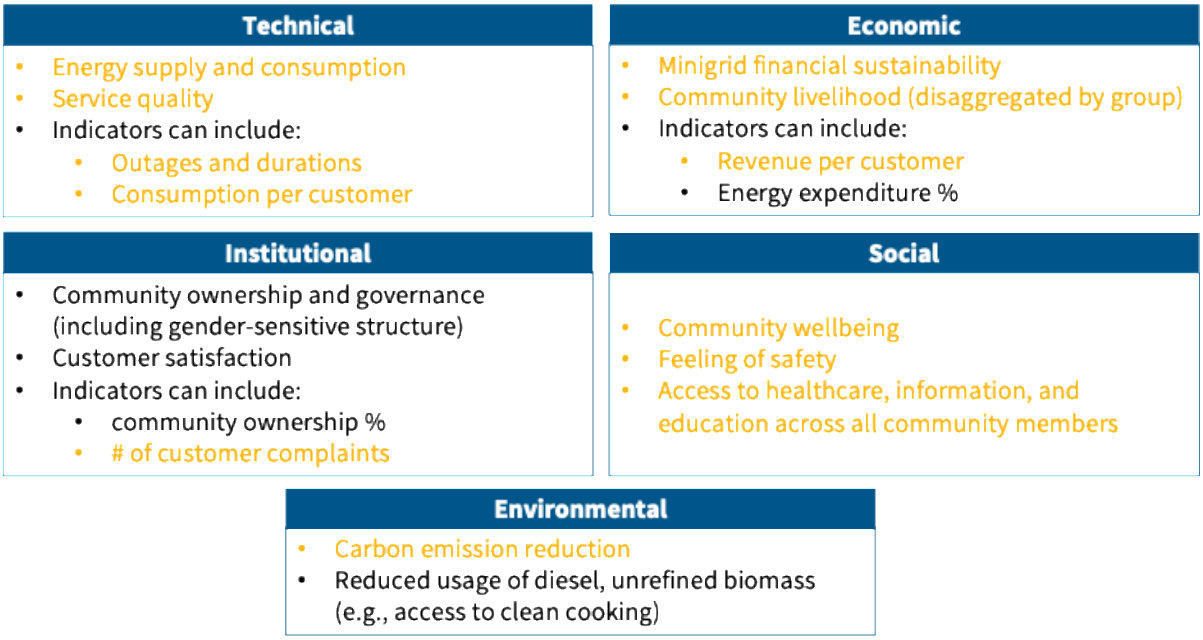
The QAMF is a program-level standardized framework for tracking the performance, sustainability, and impact of minigrid projects under AMP, with the objective to collect consistent, high-quality data to inform implementation, measure outcomes, and strengthen accountability. The framework also provides guidance around M&E to minigrid service providers and sector stakeholders.

UNDP's QAMF includes indicators that are designed to measure the quality of minigrid energy service and delivery and to assess the financial performance of certain minigrid projects or project portfolios, at site, national, and regional levels, with different reporting requirements for greenfield minigrid developments and productive use of energy overlays. QAMF indicators are grouped into four major categories:

- Basic/administrative — such as site details, developer information, number of connections
- Technical — such as system availability, power quality, share of renewable energy
- Social and environmental — such as financial health of households, community safety, and productive use of energy
- Economic — such as project revenue, operating margin, investment return

For more information on the QAMF, please reach out to amp@undp.org.

Exhibit 8: Proposed M&E framework for community-centric minigrids



Technical: This will overlap with the "technical indicators" within QAMF for AMP projects, such as energy supply, minigrid utilization, power quality, and system reliability.

Economic: From the minigrid's perspective, this will overlap with the "economic indicators" within QAMF, including metrics such as average revenue per customer and operating costs. In addition, developers should track the proceeds received and spent by the community (if/when applicable with the benefit-sharing mechanisms). They are also encouraged to track impact on community livelihood. For example, how the percentage of household income used for energy changes over time, if and how the minigrid enables local economic activities, and if livelihood enhances equitably for all community members.

Institutional: This dimension looks at the effectiveness and inclusiveness of community governance, ownership if applicable, and the community's decision-making or negotiation power across various issues, as well as community satisfaction and perception toward minigrid project and performance. It is important to also track gender-sensitive and socially inclusive governance structures.

Social: This dimension aims to examine community wellbeing. For example, how the introduction of community-centric minigrids change the social dynamics in the community and support women or traditionally disadvantaged groups to have more access to modern services and more active roles in society. This overlaps largely with the "social and environmental indicators" within QAMF.

Environmental: A main environmental impact from minigrids is greenhouse gas emissions reduction as a result from electrification, replacing diesel or other dirty fuels used for lighting, cooking, and productive use activities in the community.

For a list of proposed evaluation metrics please refer to *Appendix B: Suggested MEL Metrics to Monitor Community-Centric Minigrid Projects*, where we also noted whether certain indicators are already covered under QAMF for AMP.

Box 8: Why simply counting women in connected households or businesses is not enough

Disaggregating customers by gender, using the household or business as the primary unit of analysis, is insufficient to understand the real impact of electrification on women.

While it is reasonable to hypothesize that women's quality of life may improve in newly electrified households, this assumption overlooks key gender dynamics. Due to systemic inequalities and women's and girls' often limited decision-making power — including within the household — access to electricity and the use of appliances is not automatically equitable. For instance, even in electrified homes, men may have priority over the use of lighting or electronic devices for work, while women may continue to perform domestic tasks with limited access to time-saving appliances. The specific dynamics of polygamous households, and how they affect women's access to electricity and appliances within the household, should also be considered.

Simply counting the number of women living in electrified households, working in connected businesses, or present in social institutions is therefore not a sufficient way to identify or measure female beneficiaries.

To capture meaningful impact, the program must **integrate gender-sensitive social indicators on electricity access**. For example:

- Number and percentage of women-headed households newly connected to the minigrid
- Number and type of time-saving electric appliances used by women in beneficiary households (e.g. cookstove, small refrigerator, water pump)
- Number and percentage of enterprises, cooperatives, or groups using the minigrid for productive use of energy (PUE), disaggregated by sex of the primary owner, manager, or leader
- Number of public and social facilities connected, specifying the facility type (health center, school, etc.)

Integrating these gender-sensitive indicators will allow the project team to move beyond assumptions of evenly shared electricity within households. Measuring meaningful impact, therefore, requires looking beyond simple headcounts to understand how electricity access transforms women's daily lives, work, and decision-making.

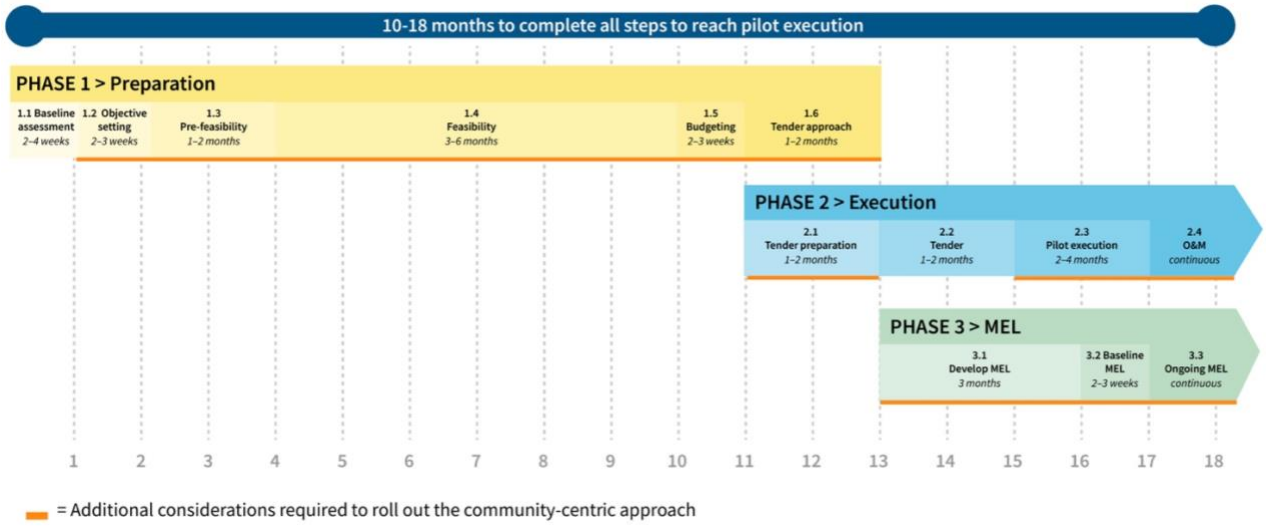
5. Integrating the Community-Centric Approach into Minigrid Projects

In this section, we will examine the integration of community-centric elements into minigrid pilots, following the typical steps in minigrid design and deployment. We will also offer practical guidance on the roles and responsibilities associated with implementing each activity.

Enhancing minigrid delivery with a community-centric approach

The incorporation of a community-centric minigrid approach requires additional planning and execution. Exhibit 9 outlines the typical steps of minigrid development, noting where community-centric considerations may come in.

Exhibit 9: Earmarked Steps for Community-centric Model Considerations



In Phase 1 of the minigrid pilot deployment the focus lies in the selection of suitable communities that are capable and willing to collaborate with a private sector entity in a community-private partnership arrangement. Notably the focus should be to name community empowerment as a key objective for the pilot and incorporate community willingness, capacity, and financial resources in the pre-feasibility study, selection of the communities, and feasibility study as indicated in Exhibit 10.

Exhibit 10: Adaptations to Phase 1 of the minigrid pilot plan when opting for a community-centric minigrid approach.

PHASE 1 > Preparation

Community-Centric Objective: Ensure that willing and capable communities are selected to be part of the pilots

Step	1.1 Minigrid baseline assessment	1.2 Objective for pilot	1.3 Pre-feasibility, site prioritization	1.4 Feasibility study (incl. ESIA)	1.5 Budget analysis	1.6 *(If public-led)* Determine tender approach
Timeline	*2–4 weeks*	*2–3 weeks*	*1–2 months*	*3–6 months*	*2–3 weeks*	*1–2 months*
Community-Centric Considerations		Define community empowerment as a core objective of the pilot	Prioritize capable and willing communities in selection	Evaluate capacity/ willingness and financial capability of the community	Consider community contributions	Integrate five key aspects into tender evaluation approach

Phase 2 focuses on integrating the five key aspects in tender design and project execution. The five key aspects are considered part of the service delivery by either the private company or public agency to the community and are reflected in the tendering documents and the execution of the minigrid pilots. Enhanced community engagement should be implemented throughout design, commissioning, and operations of the pilot. Exhibit 11 provides a high-level overview of the actions to be taken.

Exhibit 11: Adaptations to Phase 2 of the minigrid pilot plan when opting for a community-centric minigrid approach

PHASE 2 > Execution

Community-Centric Objective: Integrate Five key aspects in tendering and project execution

Step	2.1 *(If public-led)* Tender preperation	2.2 *(If public-led)* Project tendering	2.3 Pilot execution	2.4 Project O&M
Timeline	*1–2 months*	*1–2 months*	*2–4 months*	*Continuous*
Community-Centric Considerations	Reflect five key aspects of community-centric approach in tender documents		Set up community-centric structures/ mechanisms	Maintain structures/ mechanisms being set up

Adapting **Phase 3** of the minigrid pilot plan to a community-centric approach requires the introduction of the community perspective into the MEL assessment framework through an enhanced set of community metrics and qualitative surveying methodology that builds on focus group discussions. Proposed community metrics can be found in Appendix B.

Exhibit 12: Adaptations to Phase 3 of the minigrid pilot plan when opting for a community-centric minigrid approach

PHASE 3 > MEL

Community-Centric Objective: Integrate community impact monitoring into MEL framework

Step	3.1 Develop MEL framework	3.2 Baseline MEL	3.3 Ongoing MEL
Timeline	*3 months*	*2–3 weeks*	*Continuous*
Community-Centric Considerations	Include community impact metrics into MEL framework	Include extended catalogue of metrics in surveys, focus group discussions, etc.	Include extended catalogue of metrics in regular monitoring efforts

RACI matrix for designing and implementing community-centric minigrids

Developers, host-communities, and other partners and contactors need to align on the steps and timeline from project initiation to construction to operation, and clarify each other's expected roles and responsibilities. Developers will be responsible for most of the activities and project milestones, while communities need to be at least consulted throughout. Developers and communities might bring in third-party consultants and programs (e.g., advisors from the rural electrification agency or AMP) for technical backstopping and strategic partnerships, as well as contractors for EPC and M&E. Exhibit 13 is a high-level outline of the responsibilities of all actors involved when implementing community-centric minigrid projects.

Exhibit 13: Example RACI matrix for project deployment

***Responsible (R)** – who completes this activity, **Accountable (A)** – who reviews this activity, **Consulted (C)** – who is consulted in this activity, **Informed (I)** – who needs to be informed about the activity*

Activity	Description	Community-Centric Approach Considerations	Outputs	Minigrid Developer	Community	Financier	Consultant[vii]	Legal Consultant[viii]	(other partners)
PHASE 1:	Minigrid Baseline Assessment	-	-	**A/R**	-	-	-	-	
	Objective Setting for Pilot	Define community empowerment as a main objective of the minigrid pilot	Objectives and pilot workplan incorporating community empowerment and a list of measures (five key aspects) that will be deployed	**A/R**	-	-	**R**	-	

[vii] Consultant (or advisor) can be from public or private sector.

[viii] Legal consultant will mainly help navigate through legal structure to formalize community partnership.

	Pre-Feasibility, Site Prioritization	Engage community and gauge community interest while evaluating capacity of the community for this model	Site survey evaluation report includes a section on willingness and capacity of the community	**A/R**	**C**	**-**	**R**	**-**	
	Feasibility Study (incl. ESIA)	Evaluate willingness, capacity, and financial means of the community to establish community-centric interventions	Expanded survey, focus group discussions, feasibility study results	**A/R**	**C**	**-**	**R**		
	Budget Analysis	Consider community contributions and alternative funding sources	Budget analysis and shortlisted sites that are more financially viable	**A/R**	**C**		**-**		
	(If public-led) Determine Tender Approach	Integrate the five key aspects into evaluation criteria	Weighted evaluation criteria	**A/R**					
PHASE 2:	(If public-led) Tender Preparation	Integrate the five key aspects in the tendering documents	Evaluation criteria, Terms of Reference, Scope of Work that incorporates the five key aspects	**A/R**			**I**		
	(If public-led) Pilot Project Tendering	-	-	**A/R**	**I**				
	Pilot Project Execution	Set up mechanisms and structures for the community private partnership	Established committees, MoUs, mandates, by-laws, processes, dedicated bank accounts, which are part of the five key aspects.	**A/R**	**R**	**C**	**-**	**C**	
	Project Operations & Maintenance	Monitor and maintain structures and mechanisms	Community engagement plan, operation updates	**A/R**	**R**	**-**	**C**		
PHASE 3	Develop MEL Framework	Include community impact metrics in MEL framework	MEL plan incl. results, achievement, projections, monitoring and reporting intervals	**A/R**	**C**	**-**	**R**		
	MEL Baseline	Include community metrics in surveys and focus group discussions	Survey design incl. questionnaires and assessment framework	**A/R**	**C**	**-**	**R**		
	Ongoing MEL	Adapt community metrics in surveys and focus group discussions over time.	Survey design incl. questionnaires and assessment framework, MEL reporting	**A/R**	**C**	**-**	**R**		

6. Lessons Learned and Insights from Implementation

One size does not fit all

Recognizing that a one-size-fits-all approach is inadequate, each community framework should be tailored to its unique needs to ensure community buy-in. This means developers will need to go beyond their usual project design process. Nevertheless, the core principles of ownership, governance, gender equity, social inclusion, benefit sharing, and investment protection are fundamental components shared by all project and beneficiary communities we studied. This toolkit could serve as the starting point with practical guidance on designing and implementing community-centric minigrid projects.

In the future, we also recommend developing a scorecard to assess the degree of community-centric approach embedded into minigrid projects. Such a scorecard could provide a simple, unified and transparent way to appraise community-centricity and could serve as a benchmarking and learning tool — useful for implementers, funders, and regulators alike — to compare projects, identify strengths and gaps, and guide improvements over time, supporting some standardizations of community-centric practices across a growing minigrids portfolio.

There is a need for strong partnerships for impact at scale, and public sector can serve as the catalyst

The success of community-centric minigrids lies in community engagement and sensitization, and establishing collaborative partnerships between communities, developers, and wider ecosystem stakeholders including government agencies and development programs. Developers should view communities as partners through the project life cycle and look for ways to enhance community engagement practices. Impactful partnerships, especially with public actors, can catalyze and scale the growth of the community-centric minigrid model. In Nigeria, for example, RMI is collaborating with the Rural Electrification Agency (REA) to facilitate the registration of community organizations as cooperatives under the Rural Electricity Users Cooperative Societies Scheme (REUCS). This strategic partnership aims to empower the community by granting them access to credit facilities and various extension services offered by the National Cooperative Body while institutionalizing the community-centric approach with national partners.

Public actors can play a critical role in mainstreaming community-centric practices by strengthening the enabling environment through policy and regulatory instruments. For example, REA could consider introducing requirements for enhanced community engagement or the incorporation of community-centric measures as prerequisites for accessing public subsidies or grant funding. These types of policy levers would create stronger incentives for developers to embed community participation from the outset.

In addition, public sector advisors can actively support implementation by facilitating partnerships between developers and communities and offering technical assistance in areas as governance design and GEWE and social inclusion integration. In this way they also help reduce the additional burden developers face when integrating a community-centric approach, increasing the likelihood for successful and scalable adoption.

Capacity gaps can be addressed through tailored technical assistance

While community-centric projects gained strong interests from minigrid developers and communities in Nigeria and beyond, the business model is novel and complex. This requires developers to commit to more time and resources (ideally with technical backstopping) in early stages. For instance, RMI handheld developers in designing the benefit-sharing mechanisms and ensured necessary safeguarding measures (e.g., a long-term reinvestment plan, a disbursement schedule) were put in place. In one of the projects where community tension increased, RMI sought partnership with the REA and had them join a site visit to

help sensitize the community with the developer. In Nigeria, there was also a knowledge gap around setting up legal entities (such as SPV, incorporated joint venture, etc.) to formalize the community partnership (especially co-ownership). RMI enlisted support from a legal advisor to review relevant regulations and helped the developer draft agreements. Going forward, development and dissemination of knowledge tools and capacity building for both developers and the communities will be key to prime adoption of the community-centric approach.

Minigrid developers also need to understand community dynamics in project design to better serve community needs and safeguard community resources. At the same time, the community needs a voice to advocate for their interests and ensure measures implemented are fair to them. In Sharing the Power, RMI played the community advocate role to some extent and provided technical assistance. In future projects, the REA and equivalent public agencies are well suited to the role.

Concessional and innovative financing can unlock the pipeline

Financing is another major challenge. Incorporating a community-centric approach often requires more time and resources from developers and the minigrids project team, thus developers need to look for multiple funding sources. In Sharing the Power, pilots received grant funding from the initiative on top of the REA subsidies they were eligible for. The additional funding enabled developers to go above and beyond to test out innovative community-centric measures.

Although there are some communities with financial capacities, generally rural community members do not have the equity themselves to invest in minigrids. Donor funding and low-cost, flexible financing are crucial for the community-centric approach, especially in the early stage. Innovative financing, such as green bonds through public-private partnership (e.g., Africa Energy Sun's in Francistown City Energy Hub in Botswana) and additional ways to monetize clean energy attributes (e.g., renewable energy certificates) can be catalytic. Diaspora funding could be a potential source for community contribution, leveraging the community's network and intrinsic needs for better living and development. There is also room for impact investors to bridge some of the funding gaps.

Sharing community impact can mobilize stakeholders

With the innovative model, it is important to share experiences and insights from community-centric projects broadly to influence and guide sector growth, and ultimately to mobilize stakeholders in the minigrid ecosystem to deploy the community-centric approach into various minigrid delivery models. AMP, for example, offers the platform to foster strategic partnerships, build community of practices, and engage implementation agencies across the 21 countries in Africa to scale the community-centric approach in Nigeria and beyond.

GEWE and social inclusivity can drive community trust and development impacts

GEWE and social inclusivity emerged as one of the most challenging yet transformative aspects of implementing community-centric minigrids. Integrating these aspects meaningfully requires going beyond numeric representation or generic consultation. Projects that embedded GEWE and social inclusivity principles from the outset — through targeted consultations with care and by partnering with women leaders and business owners — demonstrated stronger community buy-in, more equitable benefits, and potentially greater long-term resilience.

Financial viability remains a complex and evolving challenge

Achieving and maintaining financial sustainability in rural minigrid projects require carefully navigating a range of technical, economic, and social factors. As a community-centric approach introduces additional coordination and collaboration touchpoints around benefit sharing, governance, tariff structure, co-

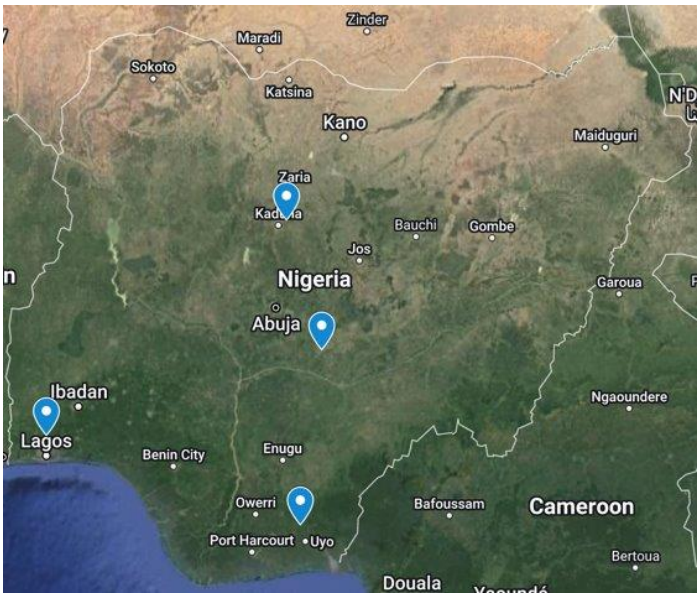
investment, etc., it also presents opportunity to strengthen the long-term sustainability by embedding transparency, shared decision-making, and accountability. Early insights from the *Sharing the Power* pilots indicate that when communities are engaged meaningfully, especially more involved in tariff discussions and understanding the underlying cost structure, they are more likely to view tariffs as fair, even if rates do not change.

However, financial viability in the community-centric context remains underexplored, and key knowledge gaps exist across customer affordability, inclusive and adaptable tariff structures, cost-revenue balance, financing, etc. Continued experimentation, learning, and collaboration, through platforms such as the **AMP Community of Practice,** will be essential to build stronger evidence and will chart a path for both developers and communities. We offer this toolkit as a learning resource and a starting point to invite further thinking, discussions, and collaborations across the sector.

7. Case Studies

To illustrate community-centric minigrids in action, we use real-world examples from RMI's Sharing the Power, which enabled communities in Nigeria to access clean, reliable electricity and empowered them to shape their energy future through community-private partnerships. The four minigrid projects in Mbiabet, Mokoloki, Chikaji Hausa/Chikaji Gwari, and Alagye communities each takes their own interpretation and design of community-centric minigrids. We also include a case study of African Sun Energy's effort in Botswana, where a community-led initiative empowered bottom-of-the-pyramid populations.

Exhibit 14: Four community-centric projects under Sharing the Power



The table below summarizes key characteristics of the five community-centric minigrid projects featured in this toolkit. Each illustrates a different application of the community-centric design pillars, demonstrating that context-specific adaptation is both necessary and feasible.

Exhibit 15: Summary of five case studies and their community-centric features

Project	Ownership	Governance Structure	Benefit-sharing Schemes	SES Measures	Community Safeguards	Notable Features
Mbiabet Akwa Ibom, Nigeria Developer: Prado Power	20% community co-ownership; Community Power Committee (CPC) as legal representative	Community Power Committee (CPC)	20% of profits managed by Community Re-investment Sub-Committee (CRSC)	Women/youth representation in CPC and CRSC	CRSC is a registered nonprofit; joint bank account; transparent project selection	20-year reinvestment plan; cashless mechanism for accountability
Mokoloki Niger, Nigeria Developer: NayoTT	11% community stake through Community Power Association (CPA) and Joint Operating Agreement	CPC, CPA	11% of profits held in joint developer-community account	Women-led businesses supported; community inclusion in planning	Joint signatory account; legal entity registration; CPA governance rules	Community invited to co-design system upgrade and to understand tariffs more after fuel cost increase
Chikaji Gwari / Hausa Kaduna, Nigeria Developer: Konexa	No formal co-ownership	Expanded CPC across both communities	5% revenue share; developer-controlled disbursement to vendors	CPC with gender and youth quotas	Project selection guidelines; developer safeguards funds on behalf of community	Grid extension to increase utilization; cross-community CPC
Alagye Nasarawa, Nigeria Developer: Husk	18% ownership of distribution assets	Village Power Committee (VPC) + Management Committee	18% of profits; community to lead project prioritization	Target 30% women in jobs/training; SES focal point in project team	Joint account with dual signatories (Husk + VPC); reinvestment criteria set	Formalized ownership agreement; targeted support for women-led micro, small, and medium enterprises
Jamataka Botswana Developer: African Sun Energy	100% community-owned	Distributed Energy Service Company (DESCO) + Africa Sun Energy	Revenue used for local infrastructure and agriculture projects	Solar apprenticeship program for women/youth	Apprenticeship to employment; transparent DESCO management	Solar-powered clean water access; mobile cashless transactions

Mbiabet Ikot Esieyere Community: The Community Re-investment Sub-Committee ensures equitable distribution of minigrid revenues.

Mbiabet Minigrid

- **Location:** Akwa Ibom State, Nigeria
- **Developer:** Prado Power
- **Capacity**: 20 kWp solar / 45 kWh battery / 20 kVA generator
- **Number of connections**: 180, including households, shops, a pharmacy and a productive use hub (developed and operated by Farm Warehouse).
- **Date of operation**: Commissioned in November 2022

Mbiabet Minigrid.

Notable community-centric design

- **Co-ownership framework with inclusive governance:** With equity investment from Sharing the Power on behalf of Mbiabet, the community takes a stake of the minigrids by owning 20% of the minigrids assets. An inclusive Community Power Committee (CPC) was established, bridging traditional leadership with modern governance structures, fostering a sense of community ownership and control. Statutes and mandates of the CPC were developed to align with SES principles, and with emphasis on empowering women and minority groups in decision-making by having seats in the CPC while respecting cultural nuances.
- **Transparent benefit-sharing mechanism while incorporating SES:** As a stakeholder, the community is entitled to 20% of the earnings or profits from the minigrids, which will be regularly deposited into a joint community bank account to be used for community projects. The benefit-sharing is designed to be a cash-free mechanism to ensure transparency. A Community Re-investment Sub-Committee (CRSC) was formed, initially comprising representatives from Prado Power, the community, and Farm Warehouse (initially RMI), ensuring informed decisions about reinvestment choices. The CRSC also includes revolving members including a minority representative, women representative, youth representative, and agricultural business representative (also see Box 5). The CRSC is also a registered nonprofit entity. Prado Power led the development of a 20-year re-investment plan for community projects, sharing the minigrids proceeds to drive equity and resilience. The first community project approved by the CRSC was a water borehole to provide year-round clean reliable water supply. The borehole was implemented in 2024 and is running successfully since.
- **Productive use overlay and social impact:** A grinding and cold storage facility was established by the partner program Energizing Agriculture, providing community members, including women fish traders, the opportunity to boost their incomes by keeping fish and produce fresh. An electric tricycle operated on a token basis facilitates timely transport to markets in the area. Electricity access also powers important social infrastructure in the community, including schools, a health clinic, and pharmacies (pictured below), improving the community's access to modern services, especially for youth and women.

Nurse Joy Nwem Sunday now sells medicine until after dark (above).

Fisherman Emmanual Job uses the deep freezers to keep his daily catch fresh for his family and for the markets in the area (right).

Mokoloki Community: System upgrades provide reliable power supply to a growing community.

Mokoloki Minigrid

- **Location:** Niger State, Nigeria
- **Developer:** NayoTropicalTech (NayoTT)
- **Capacity**: 100 kWp solar / 316 kWh battery after the upgrade / 100 kVA generator
- **Number of connections**: 345 active customers, including households, shops, public facilities, and 55 new customers waiting to be connected.
- **Date of operation:** Commissioned in March 2020, system upgrades done in June 2023**.**

Mokoloki Minigrid

Due to growing load demand, the original minigrid system had to depend heavily on diesel generators. With substantial fuel price increases, it became challenging and uneconomical for the developer to maintain the level of service. Through community-centric interventions and grant funding from Sharing the Power on behalf of Mokoloki, NayoTT was able to upgrade the system and improve the system reliability and service quality. Representatives from the Rural Electrification Agency (REA) also visited to further sensitize the

community about the community-centric approach and minigrid operations, restoring the community-developer relationship.

Notable community-centric design

- **Community co-ownership through innovative structure:** NayoTT and RMI partnered with the REA to fast-track community engagement and formed the Community Power Association (CPA). A legal advisor helped register the CPA with the Corporate Affairs Commission to give the CPA the required legal ability to enter contracts and open a bank account for the proceeds from the project. A joint operating agreement was then executed between NayoTT and Mokoloki Community, who became part owner and decision makers of the minigrids project.
- **Benefit sharing with safeguards:** Mokoloki takes 11% of the stake in the minigrids, receiving 11% of all profits from the minigrid at the end of a financial year. All proceeds to the community are kept in a separate account, with the CPA and NayoTT being the joint signatory.
- **Attention to GEWE:** There are several women-run businesses in Mokoloki directly benefiting from improved electricity supply. Their voices were well represented from project design to rollout. Longer hours of electricity supply also enabled students to have better access to school and to study after dark.

Ogunbona Mojisola of Mokoloki showcasing freezers used in her ice-making business.

Student of Mokoloki's Unique Nursery and Primary School attending computer class.

Chikaji Gwari/ Hausa Community: Extending the minigrid to the neighboring community to increase energy access and minigrid utilization.

Chikaji Gwari/Hausa Minigrid

- **Location:** Kaduna State, Nigeria
- **Developer:** Konexa
- **Capacity**: 21.9 kWp solar / 87 kWh battery / 15 kVA generator
- **Number of connections**: 98 customers in Chikaji Gwari, 86 new customers in Chikaji Hausa
- **Date of operation:** Chikaji Gwari minigrids commissioned in March 2022, extension to Chikaji Hausa done in December 2023**.**

Chikaji Gwari/Hausa Minigrid

Chikaji Gwari was utilizing only about 40% of the generation capacity from the minigrid. Konexa then decided to extend the distribution grid by 3.4 km to the neighboring sister community, Chikaji Hausa, to improve utilization of the minigrid and bring energy access to new customers.

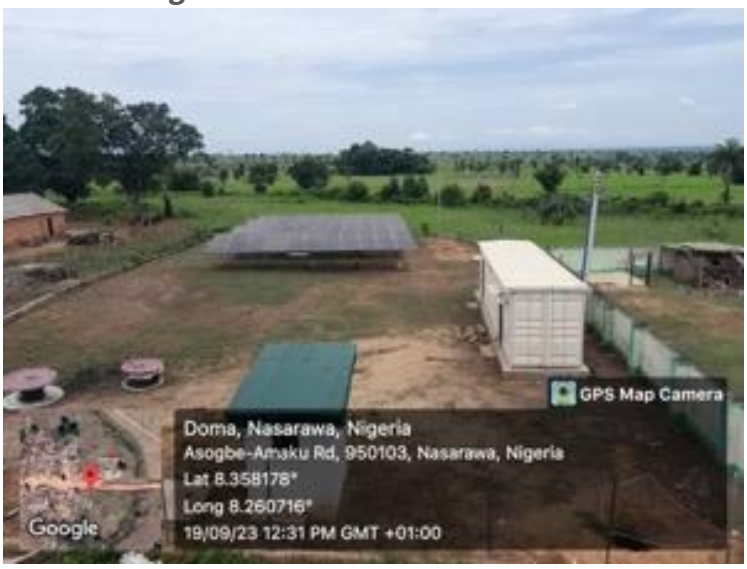
Notable community-centric design

- **Updated and inclusive governance:** An expanded Community Power Committee (CPC) now includes representatives from both beneficiary communities, and SES was a key consideration in selecting committee members. The CPC has a total of seven members — two women, three men, and two youth. The CPC is a democratic structure that carries out a governance role for the project as well as an intermediary between the community and Konexa on matters related to energy delivery and social issues that might arise over the life of the project. The mandate of the CPC was also expanded with other community-centric aspects to include coordinating the community at the end of each calendar year when it comes to deciding on the project to be implemented with the community's share of revenue.
- **Benefit sharing with safeguards:** Despite no formal co-ownership of the minigrids, Konexa plans to share 5% of the revenue generated from energy sales from the minigrids with both communities. The 5% revenue share was proposed by Konexa after evaluating the financials. It was then reviewed by RMI as a third party to ensure its fairness to the community, considering the Sharing the Power grant served as community equity contribution. The selection criteria and the process for community project selection are clearly defined and communicated to the communities. And to safeguard the shared proceeds, Konexa handles the account and only disburses funds directly to providers of goods or services once a project is agreed upon by the community and confirmed by Konexa.
- **Productive use overlay:** Konexa views productive use as a key component for demand stimulation and is providing support for the community to access productive use appliances. So far, the minigrid powers a rice mill, a paste grinder, a welding shop, a barber shop, and five refrigerators at different shops.

Hannatu A, trader and shop owner, no longer needs to worry about sourcing ice blocks to keep goods fresh.

Ibrahim Sonkolo, a barber, powers his salon with solar power from the minigrid.

Alagye Community: Community-centric minigrid enables first-ever access to clean and reliable electricity.



Alagye Minigrid

Alagye Minigrid

- **Location:** Nasarawa State, Nigeria
- **Developer:** Husk Power
- **Capacity**: 50 kWp solar / 180 kWh battery
- **Number of connections**: Customers connections are still ongoing, targeting 200 connections including households and businesses.
- **Date of operation:** Commissioned in November 2023

At Alagye, Sharing the Power helped fill the financing gap that initially stalled project implementation, bringing first-ever electrification. The community established the Village Power Committee (VPC) as the official representative of the community. The VPC is responsible for safeguarding the community's ownership interests in the minigrid. Furthermore, the developer and the community have reached a consensus on both the benefit-sharing and ownership framework, solidifying their agreement.

Notable community-centric design

- **Co-ownership and governance:** Alagye owns distribution assets equivalent to 18% of the minigrids as a whole, and the ownership structure was formalized through an executed contract between Alagye and Husk, who jointly govern the project through the VPC and the management committee. To ensure inclusivity and representation, the composition of the VPC changes at two-year intervals with new community members taking roles in the committee. Currently the management committee consists of two male and three female representatives.

- **Benefit sharing with safeguards:** Alagye will receive 18% of the minigrid's profits, accrued quarterly. The VPC will lead the selection of projects to investment in using the proceeds, following a set of criteria such as urgency of community needs, SES, and sustainability. There will be a joint bank account managed by the management committee, where the treasurer (Husk) and assistant treasurer (VPC) will be signatories. Husk will also establish a vendor list for implementing the community projects selected.
- **GEWE as a critical performance indicator:** A SES focal person will be appointed by Husk and Alagye with monthly reporting. Husk also aims to ensure that there is a 30% representation of women employed for the project, especially for jobs created in the community (e.g., prioritizing supporting women-led micro, small, and medium enterprises) and new business initiatives introduced like productive use. Whenever Husk organizes trainings, they set the target to have 30% women and youth participation as well.

Clean, reliable electricity allows the shopkeeper to operate a point of sales terminal.

As part of the minigrid's development, Alagye now has paved roads and distribution lines for electricity.

Jamataka Community Cooperative Energy Company: A bottom-up clean energy model to boost energy access and local growth.

Jamataka Community Cooperative Energy Company

- **Location:** Jamataka, Botswana
- **Developer:** Africa Sun Energy/Sustainable Energy Botswana
- **Capacity**: A 65 kWp solar and 50 kWh battery minigrid, a 20 kWp portable power charging facility, a 11 kWp solar water pumping system.
- **Number of connections**: The initiative is ongoing, with the goal to provide energy access to household, agriculture, and business use in the main village hub and beyond.
- **Date of operation:** January 2025

DESCO meeting in Jamataka community

Less than 5% of Jamataka community was previously connected to electricity, limiting access to essential modern services and opportunities. In partnership with the UK and the United States, African Sun Energy developed Botswana's first community-run distributed energy service company (DESCO), the Jamataka Community Cooperative Energy Company. This pioneering, off-grid initiative is community-led and provides clean energy access for households and productive uses. The project serves as a practical example of how bottom-of-the-pyramid end-users can be empowered through decentralized, community-owned energy models that are sustainable, inclusive, and replicable across the Southern Africa Development Community (SADC) region.

Notable community-centric design

- **Ownership and governance:** Driven by community needs, the DESCO installed a 65 kWp solar and 50 kWh battery community-owned minigrid to power the local primary school (with 360 students), staff housing, and social housing managed by the Village Development Committee. The DESCO also installed a solar-powered water pumping system, supplying water to the community's new agriculture project. Additionally, a 20 kWp portable power charging facility provides services to village households living outside of the main village hub. The DESCO successfully enables income-generating activities while improving the basic services in an energy-poor rural community. The DESCO has plans to expand and a local clean energy private-public partnership is in place to facilitate the investment of their developments.
- **Community safeguards with focus on GEWE:** As part of the initiative, a Solar Apprenticeship Program was established targeting youth and women. The Program aims to deliver certified skills training in solar system operation and maintenance. The Program recently enrolled a young woman from the Jamataka village, Masego, as Botswana's first solar apprentice. She is now doing an electrical engineering qualification course in a technical and vocational education and training school and working with solar engineers to gain competence-based training. The first phase of the training was funded by the US embassy, and Masego will be employed for the next three years to manage several community-owned solar systems in the community. This exemplifies building local capacity to drive long-term sustainability of projects. In addition, Africa Sun Energy developed a bespoke energy fintech platform to inbound community members as customers and enable them to transact without cash. This helps increase convenience, transparency, and accountability; reduce security risks; and allow flexible, traceable payments.

Solar-powered pumping supplies clean water to Jamataka and agricultural projects.

The community-owned solar installation provides new power supply.

Appendices

Appendix A: Additional Resources on Community-Centric Minigrids

Exhibit 16: Further reading — community-centric minigrids

Title/Link	Description
IRENA – Community Energy Toolkit	• The IRENA Coalition for Action advances renewable energy through global stakeholder dialogues, focusing on community empowerment and participation in energy decisions. • A white paper shows how communities globally are involved in renewable energy projects, detailing benefits and providing resources for these initiatives. • Successful community energy strategies include maximizing local renewable opportunities, promoting inclusive dialogue, building capacity, and establishing partnerships to understand and meet local needs.
Toolkit for Participatory Village Energy Planning	• Several organizations in India have launched community-based renewable energy initiatives featuring community-managed revenue models and sustainable frameworks. These efforts are documented to improve training for local NGOs. • The "Participatory Village Energy Planning" toolkit, created from real-world experiences, offers guidelines for NGOs on managing community-based renewable energy projects, focusing on community needs. • Targeted to decentralized projects in rural areas, the toolkit covers essential project phases from scoping to monitoring but omits highly detailed aspects.
Renewable Energy Tenders and Community [Em]power[ment]: Latin American and the Caribbean	• The report examines how the tendering process for renewable energy can integrate community participation across the region. • Although tenders in Latin America and the Caribbean have successfully attracted extensive participation, they have inadvertently excluded various local stakeholders like small businesses, communities, Indigenous people, and farmers. • The report analyzes different tender processes and community renewable energy projects, proposing strategies to enhance community involvement in renewable energy tenders in the Latin American and Caribbean region.
Understanding the Clean Energy Transition with Community-Driven DRE Projects in Germany and Sub-Saharan Africa	• The publication explores the role of community-driven decentralized renewable energy (DRE) projects in addressing climate change impacts, enhancing electricity access, and promoting socio-economic development amid the challenges of meeting the Paris Agreement goals by 2030. • Highlighting case studies from Germany and sub-Saharan Africa, the report discusses the benefits and notable barriers of these community-driven DRE projects in effectively contributing to sustainable energy transitions.

A Participatory Gaming Approach To Community Energy Planning in Southeast Asia: Spreading Best-Practices on Community Engagement	• The project introduced "The Minigrid Game," a gaming approach that enhances community engagement in planning minigrids by using role-playing to simulate energy decisions, aimed at integrating local insights into energy management. • Workshops in East Malaysia and an online session for Southeast Asian practitioners showcased the game's effectiveness in teaching communities about energy system management and fostering collaborative planning. • Community feedback highlighted the game's educational value, leading to better understanding of energy consumption and system costs, with ongoing refinements to improve its application in energy planning.
PeopleSuN Resources	• This three-year research and development project focuses not only on technical solutions, but also on developing an understanding of local needs and viable financial frameworks. • PeopleSuN works with a bottom-up approach integrating local conditions and needs. The project also developed a tool using qualitative and quantitative data collected to improve the design of decentralized solar PV systems for communities.
Guidelines for Cooperative-Led Mini-Grid Development in Ethiopia	• The guideline is designed to support cooperatives in Ethiopia to develop and operate minigrid projects under current regulatory frameworks. • It defines and compares several business models for cooperative-led minigrids, including solely cooperative model, O&M model, PPA model, and joint venture model, along with a decision tree for cooperatives to evaluate options based on their capacities (finance, O&M, managerial) and the local context. • It includes template agreements (EPC, PPA) designed for cooperative-led minigrid projects in Ethiopia.
World Bank—Minigrids and Gender Equality: Inclusive Design, Better Development Outcomes, 2017	• This is intended to serve as a reference guide to apply a gender lens to the design and implementation of minigrids to enhance development outcomes. • The guidance provides energy access, social development, and gender specialists with additional ideas and best practices to integrate in all stages of the project cycle to enhance gender equality.
The State of Community-Owned Mini-Grids in Africa	• The report provides a continent-wide overview of community-owned minigrids in Africa, including the historical evolution of the model. • It presents examples of cooperative-led energy models in Ethiopia, Burkina Faso, Nigeria, and Zambia, highlighting regulatory, institutional, and financing pathways. • It examines key enablers and challenges for community ownership, and recommends policy and financing levers to foster more enabling environments.

Appendix B: Suggested MEL Metrics to Monitor Community-centric Minigrid Projects

Exhibit 17: Suggested community-centric MEL metrics

Results	Category	ID	Indicators	Units	Indicator in QAMF?
Technical (T) outcomes for minigrid developers (M) and communities (C)	TM.1 Energy supply from minigrid	TM.1.a	Increased electricity supply to customers, segregated according to customer segment (PUE, HH, institutional, public), and disaggregated by gender, for example male- and female-headed households or male- and female-led businesses/groups	kWh/month	Yes
		TM.1.b	Electricity generated from solar PV/diesel generator/grid supply (including excess)	kWh/month	Yes
		TM.1.c	Average duration of daily service (for non 24/7 service), or evening supply service (for non 24/7 service)	hours	Yes
		TM.1.d	Minigrid system solar utilization (measured monthly)	%	Yes
		TM.1.e	Minigrid system reliability — number and duration of unplanned system outages (technical versus human induced)	number, average hours per day	Yes
	TM.2 Improved energy consumption	TM.2.a	Number of connections per category (residential, commercial, public) • For public connection, can further specify facility type such as school, church, hospital	#	Yes
		TM.2.b	Number of women-headed households newly connected to the minigrid	#	Yes

		TM.2.c	Average daily consumption per connection (by category)	kWh	Yes
		TM.2.d	Customer real hourly time load (by category)	kW over day	Yes
		TM.2.e	Average customer monthly fuel purchases (by category)	liters/month	No
	TC Community outcomes from DER project and resulting improved supply	TC.1	Average number of each tier of electric appliances per household	#	No
		TC.2	Number of locals trained for technical support of DER operation and maintenance • Disaggregated by gender	#	Yes
Economic (E) outcomes for minigrid developers (M) and communities (C)	EM.1 Improved minigrid financial sustainability	EM.1.a	Average revenue per user (by category)	Naira/month	Yes
		EM.1.b	Total revenues from power sales	Naira/month	Yes
		EM.1.c	Commercial losses, to identify theft occurrences (by category)	%	No
		EM.1.d	Payment collection rate — no of collections/recharges per month, and defaults (by category)	%	Yes
		EM.1.e	O&M expenses (personnel, maintenance)	Naira/month	Yes

		EM.1.f	Liters of fossil fuel used and fuel expenses for minigrid electricity generation	liters/month, Naira/month	Yes
		EM.1.h	Expected return on investment	%	Yes
		EM.1.i	Number of incidents (e.g., theft, vandalism)	#/month	No
	EC.1 Improved financial sustainability for the community to access energy	EC.1.a	Average reduction in cost and time spent on energy, including electricity, diesel, candles, kerosene, batteries, gathering wood for lighting/cooking etc.	Naira/kWh	No
		EC.1.b	Community return on investment	%	No
	EC.2 Contributed to improving livelihood in the community	EC.2.a	% of total revenue going to community for benefit sharing	%	No
		EC.2.b	Shared proceeds received by community	Naira (to date)	No
		EC.2.c	New community-led businesses or jobs driven by electricity, actual or predicted depending on whether minigrid was already operational or not (segregated by formal/informal job, women, youth, marginalized)	#	Yes in PUE overlay
		EC.2.d	Business model performance of any productive use hubs being funded	N/A	No

Institutional (I) outcomes for minigrid developers (M) and communities (C)	IM.1 Improved customer satisfaction with minigrid developer and operators	IM.1.a	Number of customer complaints	#	No
		IM.1.b	Customer reported satisfaction with electricity service and tariff	N/A	Yes on service, no on tariff
	IC.1 Improved community ownership of minigrid projects	IC.1.a	Innovative ownership scheme designed and implemented with community buy-in (community buy-in means majority of community surveyed agrees with scheme)	N/A	No
		IC.1.b	Level (%) of local ownership of minigrid assets, and formality — SPV versus hand-shake agreement	%	No
	IC.2 Improved inclusive community participation in events related to the community and decision-making for community outcomes	IC.2.a	Number of community events related to minigrid	#	No
		IC.2.b	Attendance of community events • Disaggregated by gender	%	No
		IC.2.c	Community-driven decision-making: Community agreement reached (majority of community in attendance supports the outcome)	N/A	No
		IC.2.d	Community-driven decision-making: Community reported sense of inclusion with decision-making and meaningfulness of participation (include women, youths, marginalized, elders etc.)	N/A	No

		IC.2.e	Women and youth representation in decision-making positions (e.g., serving in community committee)	%	No
	IC.3 Improved effectiveness of minigrid governance	IC.3.a	Innovative/tailored governance structure designed	N/A	No
		IC.3.b	Regularity of governance body meetings	#/month	No
		IC.3.d	Number of governance incidences/disputes	#/month	No
		IC.3.e	Number and type of community projects launched — funded through revenues/proceeds of the minigrid	#/year	No
		IC.3.f	Co-investment into community projects by community	Naira/month	No
Social (S) outcomes for minigrid developers (M) and communities (C)	SC Improved wellbeing in the community	SC.1.a	How is the revenue/profit being used to improve key infrastructure (e.g., hospitals, schools, street lighting, water pumping, etc.)	N/A	No
		SC.1.b	Improved access to health service	# and types of health services provided in the community, time to reach health services	Yes

		SC.1.c	Increased availability for education among children and women	N/A	Yes
		SC.1.d	Increased perceived safety for women	N/A	Yes
		SC.1.e	Increased community sense of unity	N/A	No
		SC.2	Improved understanding of minigrid functions within the community	N/A	No
Environmental (E) outcomes for minigrid developers (M) and communities (C)	E Environmental impacts of electricity replacing other fuels	EM.1	Carbon emissions reduction from community-led electrification (e.g., replacing diesel or other fuel use)	Tonnes CO2	Yes in PUE Overlay
		EC.2	Reduced unrefined biomass (wood, charcoal, etc.) used by community	kg	No
		EC.3	Number of environmental and health incidents (e.g., safety accidents, inadequate waste disposal)	#	Yes

Endnotes

1 *Tracking SDG 7: The Energy Progress Report 2025*, World Bank, 2025, https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099062425150569718.

2 "Beyond access: 1.18 billion in energy poverty despite rising electricity access," UNDP, June 12, 2024, https://data.undp.org/blog/1-18-billion-around-the-world-in-energy-poverty.

3 *Evaluation of Rural Electrification Concessions in sub-Saharan Africa Short Case Study: Burkina Faso,* World Bank, December 2015, https://documents1.worldbank.org/curated/en/357991498163872158/pdf/116662-WP-PUBLIC-P150241-8p-Short-Case-Study-Burkina-Faso.pdf.

4 "Expansion of Off-Grid Renewable Energy in Rural Ethiopia (EnDev)," Delegation of the European Union to Ethiopia, February 18, 2025, https://www.eeas.europa.eu/delegations/ethiopia/expansion-grid-renewable-energy-rural-ethiopia-endev_en?s=98.