The Project has stayed adaptable, innovative, and close to the communities we serve—much like the off-grid technology it promotes.

DAVID THOMPSON, ACTING COORDINATOR, POWER AFRICA
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</tbody>
</table>
After 20 years distributing PUE, this grant gave us the encouragement and opportunity to focus specifically on women in the farming community and to adapt our solutions to more directly target the problems they face.

GREGORY DENN, MANAGING DIRECTOR, PSS, KENYA

ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COIN</td>
<td>Catalyzing Off-grid Investment Fund</td>
</tr>
<tr>
<td>DRC</td>
<td>Democratic Republic of Congo</td>
</tr>
<tr>
<td>FY</td>
<td>Fiscal Year</td>
</tr>
<tr>
<td>LPG</td>
<td>Liquefied Petroleum Gas</td>
</tr>
<tr>
<td>MFI</td>
<td>Microfinance Institution</td>
</tr>
<tr>
<td>NGO</td>
<td>Nongovernmental Organization</td>
</tr>
<tr>
<td>PAOP</td>
<td>Power Africa Off-grid Project</td>
</tr>
<tr>
<td>PAYGO</td>
<td>Pay-As-You-Go</td>
</tr>
<tr>
<td>PUE</td>
<td>Productive Use of Energy</td>
</tr>
<tr>
<td>RBF</td>
<td>Results-Based Financing</td>
</tr>
<tr>
<td>SHS</td>
<td>Solar Home System</td>
</tr>
<tr>
<td>U.S.</td>
<td>United States</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USG</td>
<td>United States Government</td>
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</tbody>
</table>
Power Africa is a United States Government-led partnership, coordinated by the United States Agency for International Development (USAID), that brings together the collective resources of over 170 public and private sector partners to double access to electricity in sub-Saharan Africa by 2030.

Contributing to this goal, the USAID-funded Power Africa Off-grid Project (the Project):

• Facilitated new off-grid electricity connections in sub-Saharan Africa
• Catalyzed new investment capital for energy projects in the region
• Improved off-grid energy policies and regulations for 12 African countries.

Duration: 5 years (November 13, 2018 to November 12, 2023).

Objectives

The Project aimed to accelerate private sector-led energy access by:

• Providing off-grid energy companies with tailored technical assistance to help them grow sustainably.
• Offering off-grid energy financiers and investors broad-based market intelligence to inform capital investments.
• Advising governments on policy frameworks that support the growth of the off-grid energy sector.
• Managing the Power Africa-funded Catalyzing Off-grid Investment Fund and awarding grants for piloting and scaling sustainable business models that increase energy access.

Partners

• RTI International implemented the Project in collaboration with Fraym, Norton Rose Fullbright, Practical Action Consulting, and Tetra Tech.

• Power Africa consists of 12 U.S. Government agencies; more than 170 private-sector partners; and 20 bilateral and multilateral development partners, key government institutions, and counterparts that work together to increase the number of people with access to power.

The Power Africa Off-grid Project (the Project) was a five-year program (November 2018 to November 2023), funded by USAID, to accelerate off-grid electrification across sub-Saharan Africa. RTI International implemented the Project in collaboration with Fraym, Norton Rose Fullbright (NRF), Practical Action Consulting, and Tetra Tech.
To achieve its objectives, the Project designed the unique Beyond the Grid (BTG) 2.0 Sustainable Market Transformation Framework. The Project framework consisted of the following five specific focus areas:

**Business performance:**
Find tailored solutions for off-grid solar companies to improve sales.

**Access to finance:**
Catalyze capital for the off-grid energy sector.

**Policy and regulations:**
Advise governments on private-sector-friendly policy frameworks.

**Market dynamics:**
Commission and publish off-grid energy market research.

**Cross-sectoral integration:**
Identify and capitalize on opportunities to realize socio-economic benefits through clean energy.

All framework aspects included an ongoing focus on gender equality, to deliver the benefits of clean energy to women and men equally.

• Supported SHS, mini-grid, and PUE companies to access finance.
• Introduced off-grid companies to potential investors.
• Provided advisory support to lenders, donors, and investors.
• Supported microfinance and bank partnerships with the off-grid sector.
• Filled capital pools with off-grid opportunities.
• Increased the financial capacity of local financial institutions.
• Provided capital-raising support to off-grid companies.
• Supported the World Bank’s Regional Infrastructure Finance Facility.

• Provided business advisory services to solar home system (SHS) and mini-grid companies.
• Supported companies to operate in underserved counties.
• Supported off-grid companies and associations with operations and partnerships.
• Supported SHS and productive use of energy (PUE) companies with distribution and retail strategies.
• Supported companies to improve their sales, operations, and offerings in non-focus countries.
• Supported the deployment of payment options for off-grid solar.
• Supported SHS companies to adopt and implement gender-inclusive practices.

**SUMMARY OF ACTIVITIES WITH EXAMPLES OF ACTIVITIES BY WORKSTREAM**

**Business performance:**
Find tailored solutions for off-grid solar companies to improve sales.

**Access to finance:**
Catalyze capital for the off-grid energy sector.

**Policy and regulations:**
Advise governments on private-sector-friendly policy frameworks.

**Market dynamics:**
Commission and publish off-grid energy market research.

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### Three Key Outcomes Achieved:

<table>
<thead>
<tr>
<th>Power Africa Off-grid Project</th>
<th>Surpassed all 20 of its life-of-project targets</th>
</tr>
</thead>
</table>

**Original Target:** 6 Million

**Life-of-Project Result:** 7.223 Million

**Percentage Achieved:** 120%

<table>
<thead>
<tr>
<th>POWER AFRICA STANDARD INDICATOR</th>
<th>LIFE-OF-PROJECT TARGET</th>
<th>LIFE-OF-PROJECT RESULT</th>
<th>PERCENTAGE ACHIEVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of new off-grid actual direct connections</td>
<td>6,000,000</td>
<td>7,223,118</td>
<td>120%</td>
</tr>
<tr>
<td>Number of new grid and off-grid anticipated direct connections at financial close</td>
<td>6,000,000</td>
<td>12,342,827</td>
<td>206%</td>
</tr>
<tr>
<td>Amount of investment mobilized for energy investment</td>
<td>$500 million</td>
<td>$1.22 billion</td>
<td>245%</td>
</tr>
<tr>
<td>Number of laws, policies, regulations, or standards to enhance energy sector governance formally proposed, adopted, or implemented</td>
<td>57</td>
<td>78</td>
<td>137%</td>
</tr>
<tr>
<td>Number of productive-use off-grid devices or systems sold</td>
<td>16,515</td>
<td>92,155</td>
<td>558%</td>
</tr>
<tr>
<td>Number of supported investors, lenders, and foundations that introduce and expand off-grid-specific financial products and/or begin marketing to off-grid companies after receiving support</td>
<td>42</td>
<td>341</td>
<td>812%</td>
</tr>
<tr>
<td>Number of United States companies participating in PA projects/transactions</td>
<td>50</td>
<td>98</td>
<td>196%</td>
</tr>
<tr>
<td>Number of African governments that received PA support to implement improvements to their frameworks</td>
<td>11</td>
<td>12</td>
<td>109%</td>
</tr>
<tr>
<td>Number of healthcare facilities electrified</td>
<td>227</td>
<td>377</td>
<td>166%</td>
</tr>
<tr>
<td>Number of beneficiaries from electrified healthcare facilities</td>
<td>2,000,000</td>
<td>2,051,061</td>
<td>103%</td>
</tr>
</tbody>
</table>

**ORIGINAL TARGET: 6 MILLION**

**MOBILIZED $1.22 BILLION**

**SUPPORTED 12 GOVERNMENTS**

**245% OF OUR GOAL ACHIEVED**

**200% OF OUR GOAL ACHIEVED**

**109% OF OUR GOAL ACHIEVED**

**120% OF OUR GOAL ACHIEVED**

---

**This section presents the Project’s results tracked against performance indicators, including 10 Power Africa standard indicators and 10 custom/contractual indicators.**

**WHAT HAVE WE ACHIEVED?**
ELECTRICITY ACCESS:
NUMBER OF NEW GRID AND OFF-GRID
ACTUAL DIRECT CONNECTIONS

Actual direct connections reflect the actual number of new households and businesses that have access to electricity through on-grid connections, and off-grid solutions.

RESULT:
7.22 MILLION
TARGET: 6 MILLION
120% OF OUR GOAL ACHIEVED
ELECTRICITY ACCESS:
NUMBER OF NEW GRID AND OFF-GRID ANTICIPATED DIRECT CONNECTIONS AT FINANCIAL CLOSE
Projected direct connections reflect the number of new households and businesses that are expected to have access to electricity through on-grid connections and/or off-grid solutions upon financial disbursement for a given activity.

RESULT:
12.34 MILLION
TARGET: 6 MILLION
206% OF OUR GOAL ACHIEVED

AMOUNT MOBILIZED:
AMOUNT OF INVESTMENT MOBILIZED FOR ENERGY PROJECTS
The total cost of power sector transactions that reach financial close, enabled by USG and/or Power Africa partner assistance.

RESULT:
$1.22 BILLION
TARGET: $500 MILLION
245% OF OUR GOAL ACHIEVED

ELECTRICITY ACCESS:
NUMBER OF NEW GRID AND OFF-GRID ANTICIPATED DIRECT CONNECTIONS AT
FINANCIAL CLOSE
Projected direct connections reflect the number of new households and businesses that are expected to have access to electricity through on-grid connections and/or off-grid solutions upon financial disbursement for a given activity.

RESULT:
12.34 MILLION
TARGET: 6 MILLION
206% OF OUR GOAL ACHIEVED

AMOUNT MOBILIZED:
AMOUNT OF INVESTMENT MOBILIZED FOR ENERGY PROJECTS
The total cost of power sector transactions that reach financial close, enabled by USG and/or Power Africa partner assistance.

RESULT:
$1.22 BILLION
TARGET: $500 MILLION
245% OF OUR GOAL ACHIEVED
POLICY REFORMS:
NUMBER OF LAWS, POLICIES, REGULATIONS, OR STANDARDS TO ENHANCE ENERGY SECTOR GOVERNANCE FORMALLY PROPOSED, ADOPTED, OR IMPLEMENTED AS SUPPORTED BY USG ASSISTANCE

For Power Africa, reforms, laws, regulations, technical codes, and administrative procedures to be considered under this indicator would also include those that encourage investment in clean and cleaner energy, small scale and off-grid options, and/or support gender integration in the energy sector.

RESULT: 78
TARGET: 57
137% OF OUR GOAL ACHIEVED

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>NUMBER OF POLICIES/REGULATIONS/STANDARDS SUPPORTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
<td>1</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>1</td>
</tr>
<tr>
<td>Cameroon</td>
<td>4</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>4</td>
</tr>
<tr>
<td>DRC</td>
<td>9</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2</td>
</tr>
<tr>
<td>Ghana</td>
<td>2</td>
</tr>
<tr>
<td>Guinea</td>
<td>1</td>
</tr>
<tr>
<td>Kenya</td>
<td>7</td>
</tr>
<tr>
<td>Liberia</td>
<td>13</td>
</tr>
<tr>
<td>Mali</td>
<td>2</td>
</tr>
<tr>
<td>Niger</td>
<td>10</td>
</tr>
<tr>
<td>Rwanda</td>
<td>4</td>
</tr>
<tr>
<td>Senegal</td>
<td>6</td>
</tr>
<tr>
<td>Tanzania</td>
<td>2</td>
</tr>
<tr>
<td>Togo</td>
<td>2</td>
</tr>
<tr>
<td>Uganda</td>
<td>8</td>
</tr>
</tbody>
</table>

KEY
1 LAWS, POLICIES, REGULATIONS SUPPORTED
5 LAWS, POLICIES, REGULATIONS SUPPORTED
10 LAWS, POLICIES, REGULATIONS SUPPORTED
13 LAWS, POLICIES, REGULATIONS SUPPORTED
NUMBER OF PRODUCTIVE-USE OFF-GRID DEVICES OR SYSTEMS SOLD AS A RESULT OF USG/POWER AFRICA ASSISTANCE

Number of productive-use off-grid devices or systems (agriculture processing machines, water pumps, refrigerators, etc.) sold as a result of support provided by USG to off-grid companies.

RESULT: 92,155
TARGET: 16,515
558% OF OUR GOAL ACHIEVED
NUMBER OF BENEFICIARIES FROM HEALTHCARE FACILITIES ELECTRIFIED

Total number of beneficiaries with access to an electrified healthcare facility. The healthcare facilities should have improved solar off-grid electrical energy production equipment and related electrical installations to guarantee the supply of essential services.

RESULT: 2,051,061
TARGET: 2,000,000
103% OF OUR GOAL ACHIEVED

Photo Credit: Carla Visser
HIGHLIGHTS OF ACCOMPLISHMENTS AGAINST ANNUAL WORK PLANS

INDIVIDUAL IMPACTS
Support for a unified commercial model for ____ to accelerate connections in ____ countries. This support helped the company to develop a leaner and more efficient company structure, align its operations in each country, and ensure that best practices were shared, replicated, or adapted across countries. This support resulted in improved sales in all of ____’s ____ countries of operation, leading to hundreds of thousands of new connections.*

A market assessment for ____ in Uganda, contributed to increased sales. With the Project’s business-performance support and market intelligence, ____ a distributor of solar home systems in ____ leveraged a new, focused strategic approach to guide its expansion to Uganda. Consequently, the company achieved steady sales growth in the period following the Project’s assistance.

Sales-strategy support to ____ Uganda increased its sales by 60 percent. The Project’s business-performance support helped ____ assess its sales approach and develop a more efficient and effective strategy to reduce costs and employ local sales agents. During the period after PAOP provided this sales-strategy support, the company increased its sales by 60 percent.

Support for developing a gender action plan and adopting gender-inclusive policies and practices helped ____ unlock a $____ million investment from the CDC and qualify as a 2X Challenge investment. Also, as a result of PAOP support over 12 months, ____ experienced a 14 percent increase in female leadership and a 30 percent decrease in employee turnover. Revenue growth of 60 percent during the same period can be correlated to the adoption of gender-inclusive practices and increase in female leadership based on a well-established business case.

Companies developed, piloted, and refined new business models and approaches to accelerating energy access. The Project advised companies to adopt pay-as-you-go (PAYGO) financing models, develop bankable business plans to improve the cost-effectiveness of their operations, optimize risk-management practices, and more. In FY 2022, the Project developed, published, and disseminated a PAYGO Guide for Off-grid Energy Companies and a PAYGO Credit Risk Management Guide.

BUSINESS PERFORMANCE

[As a result of Power Africa’s support] insights have sprung up which point to critical success factors and how and where we can gain more efficiencies and scaling power across our markets by replicating best practices already embedded in some countries. Getting this down on paper so clearly lets us move from reliance on insights held by a few through direct experience to a tangible knowledge bank that senior leaders can use to make critical organizational decisions in the future.

* Highlights throughout the report show major results and outcomes.
In 2022, with Power Africa’s help, _____ piloted a community-driven sales structure to reduce costs and achieve sustainable growth. Through this model, _____ works with local networks, such as savings groups and cooperatives, to promote solar products and drive sales. The model relies on local “sales ambassadors” recruited from within the community and assigned to specific customer profiles, to promote and explain _____’s products.

SYSTEM-LEVEL IMPACTS

86 partnerships brokered in West Africa. In West Africa, the Project identified parties with aligned interests and facilitated introductions between 86 off-grid energy companies and private investors, resulting in productive, mutually beneficial partnerships. Consequently, Project-supported transactions in West Africa have totaled more than $____ million, contributing to PAOP surpassing life-of-project targets.

Support for expansion into new markets. Thanks to the Project’s targeted insights, companies such as _____ and _____ expanded their operations and reach across West Africa and southern Africa. In FY 2020, the team supported the Ethiopian company _____ to win a _____-fed Future grant and pursue its mini-grid license application, resulting in _____ becoming one of two companies to receive a mini-grid license for Dak Island.

Rapid Project-led information-sharing, coordination, and advocacy efforts enabled solar companies in 10 countries to operate as essential services during COVID-19 lockdowns.

• Essential service designation. In FY 2020, at the onset of the pandemic, the Project contributed to efforts to designate the off-grid sector as an essential service, encourage the suspension of disconnections, and more. As of the end of FY 2020, governments effectively designated off-grid companies as essential services in all the Project’s focus countries where such a designation was necessary for these companies to operate (Liberia and Tanzania had no such need).

• Recommendations for governments and donors. The Project shared recommendations among key sector-wide stakeholders to minimize pandemic-related economic hardships through payment relief for off-grid customers; deferrals of taxes, duties, and levies for off-grid companies; exemptions on public health-related energy equipment; mobile money and transaction fee suspensions; and donor-funded subsidies to alleviate company default rates.

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• GGGLA coordination, information sheets, blogs, and updates to companies. The Project quickly developed, published, and disseminated six information sheets on priority topics, as identified by off-grid companies, and two blogs (one on the sector’s role and another on lessons from the Ebola response). Many companies said they found the information sheets very useful and changed their operations, to some extent, after reading them. The Project regularly provided policy and regulatory updates for GGGLA’s COVID-19 Policy Tracker for the off-grid solar sector in Africa. Also, the Project participated in weekly meetings related to the Feed the Future Fund spearheaded by _____ and GGGLA, as well as the Technical Assistance Working Group associated with these efforts.

The Project directly supported 23 companies to adopt gender-inclusive policies and practices toward increasing women’s employment in the sector, including in leadership positions, and increasing women’s access to energy products and services. The support included disseminating the Project’s gender-assessment tool and developing a gender action plan based on the findings of the assessment. The Project shared other resources to promote good practices by companies, and provided on-demand and tailored advisory support. The Project developed a market-focused gender strategy for Simusolar, based on research on the agricultural PUE needs of female farmers in Simusolar’s market. The strategy developed for Simusolar informed the Project’s creation of a general use roadmap for sector stakeholders to develop a market-focused gender strategy to increase the uptake of agricultural PUE by women.

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Power Africa
Off-Grid Project

Final Report
2018 – 2023

23 gender action plans implemented across sub-Saharan Africa. Overall, PAOP's support to companies on gender inclusion raised awareness about the business case for gender equality and the importance of tailoring marketing and sales strategies to women customers, based on an understanding of their energy needs and barriers to access. Companies also recognized the imperative of incorporating gender considerations into their financing strategies. PAOP directly supported 13 companies in West Africa and 10 companies in East Africa to adopt gender-inclusive policies and practices toward increasing women’s employment, including in leadership positions, and increasing women’s access to energy products and services.

The companies included:

1. [PUE]
2. [SHS]
3. [SHS]
4. [SHS]
5. [PUE]
6. [Investor]
7. [Investment Facility]
8. [SHS]
9. [Mini-grid]
10. [SHS]
11. [Investor]
12. [SHS]
13. [SHS]
14. [MFI]
15. [Investor]
16. [PUE]
17. [Investor]
18. [Investor]
19. [PUE]
20. [SHS]
21. [Investor]
22. [Mini-grid]
23. [Mini-grid]

Business Performance

Photo Credit: Kat Harrison

“I am the one who persuaded my husband to purchase the product, although he also needed it. Since this product has been of help to us, my husband now trusts my ideas, even in choices of other things.”

Female Solar Home System User, Kenya
ACCESS TO FINANCE

Individual Impacts

Application assistance in West Africa helped companies win tens of millions in funding. The Project worked closely with companies to identify and prepare financial applications for grants and other sources of funding. In West Africa, among other examples, the Project’s application assistance led to the following grant funding: $2.5 million in Burkina Faso, $7.2 million in Liberia, $1.8 million in Sierra Leone, and $1.2 million in Côte d’Ivoire.

Legal support to ______ $____ million facility could lead to 2.5+ million connections. In FY 2021, the Project extended legal support to ______ in Kenya, one of the largest companies in the off-grid energy market, which was raising significant debt to fund its expansion. Thanks to this funding, ______ expects to deploy 2.5+ million connections.

Regulatory and grant support enabled a U.S. Government-funded $1-million feasibility study to develop 100 rural mini-grids for 192,000 people in Côte d’Ivoire. In 2020, when the Côte d’Ivoire government sought mini-grid development opportunities, the Project proposed funding through the U.S. Trade and Development Agency, which expressed interest in receiving a grant application within two weeks. The Project worked rapidly with the Ivorian government to review and translate the grants agreement into French, facilitate approvals and leadership commitments from ministry staff, finalize the selection of sites, and draft terms of reference. As a result, USTDA officially approved the funding. The Project then supported the parties to draft a request for proposals, and helped arrange the list of USG contractors to participate in the bid. The study assesses 100 unelectrified rural communities, with a potential 32,000 connections that will benefit 192,000 people.

We have worked over the past two years with our partners, including USAID/Power Africa, to develop an Off-grid Action Plan for rural areas. It is time to implement that Off-grid Action Plan, and this grant from U.S. Trade and Development Agency is critical to take a concrete step forward toward this implementation.

CÔTE D’IVOIRE MINISTRY OF PETROLEUM, ENERGY, AND RENEWABLE ENERGIES

The Project developed and launched innovative financing mechanisms and products, including:

- asset-based financing of PUE
- local currency hedging facility
- carbon credit strategy
- receivables aggregation financing platform
The Project supported several large-scale facilities in local currency, with the promise of future replicability, including:

- Legal and technical assistance to enable a trailblazing $50 million multi-currency receivables-financing facility. In FY 2023, Solar Frontier Capital Limited, a private equity investor, jointly established the $50 million facility.

The financing structure promises to improve energy access for nearly three million people. Kenyan shilling-denominated $50 million expansion in the region includes partial financing from a $10 million facility, which enabled a path to bond and debt jointly finance. The Project provided legal assistance and technical advice for the transaction, and continued to support its efforts to expand the facility in other projects across East and West Africa. It is still relatively unusual for any sector to raise these types of debt facilities in sub-Saharan Africa to raise similar facilities in other regions. This transaction demonstrably demonstrates the value of localization of Africa-based entities developing West African markets, as it is a 100-year bond deal.

- Grant and capital-raising support to unlock multiple funds. A $5 million shared risk fund, which supported the joint venture’s expansion and acceleration of $26 million, has contributed to unlocking multiple funds. The support given for the pitch deck creation and investor pitch decks has helped us prepare to meet with investors. The coaching session [PAOP] conducted has given our management team the confidence to meet with investors and pitch our company and funding needs. We are so thankful for the support because we know it will help us mobilize the funding needed to grow our company.

LAURA CORCORAN, CHIEF BUSINESS DEVELOPMENT OFFICER, APTECH AFRICA

The Project provided with legal assistance and technical advice, and

- End-to-end capital-raise support over three years was catalyzed by the establishment of a new $50 million debt facility in FY 2023. This is a DRC-based company whose urban solar photovoltaic mini-grids and utility-scale solar sub-projects cater to both commercial and residential customers. In FY 2021, the Project provided assistance with capacity-building support; technical assistance, financing opportunities, and introductions, as the company explored partnerships with investors. By FY 2021, it announced the $50 million debt facility and equity into $26 million, which has supported the company’s expansion throughout the DRC. The Project supported this deal by providing end-to-end capital-raise technical assistance. In FY 2023, the Project supported a $50 million debt facility, reaching the end of three years of Project support. The capital unlocked has enabled the expansion of 13+ MWh in projects and potentially contributed to attracting further investments in the DRC.

- Access-to-finance coaching, treasury management services, portfolio quality support and interim leadership support. From FY 2020 through FY 2023, the Project provided to companies and investors a range of targeted, custom-tailored, short-term technical assistance related to interim Chief Operating Officer and Chief Financial Officer services, coaching, treasury management, fundraising assistance, carbon credit strategies, credit-rating, and gender lens investing. End-to-end transaction-focused support focused on support areas such as legal structuring, financial modeling, investor pitch decks, shareholder agreements, capitalization tables, management accounts.

- Local company [PAOP] and U.S. company [PAOP] partnered to raise $50 million in capital in frontier West African markets. This comprises two sister companies with operations in Mali: the African company [PAOP] and the U.S.-based company [PAOP]. In 2020, the project pitched to investors [PAOP] and the joint venture [PAOP], which resulted in $50 million in capital, debt, and equity from [PAOP] and [PAOP]. The Project further supported [PAOP] with its financial modeling and structuring challenges. The Project’s introductions, insights on commercial structures, valuation recommendations, and other transaction-related support led to a financial close of $50 million. This milestone investment for West African solar markets will help [PAOP] develop and expand its services in Burkina Faso, Côte d’Ivoire, and Mali. This transaction demonstrates the value of localization of Africa-based entities developing West African markets, as it is a 100-year bond deal.

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Thank you for your advice and support throughout the long and heavy [grant] selection process. It was a great and decisive help for us to identify the opportunity, better understand DIV’s expectations, and finally, find solutions to the issues raised along the way.

chief marketing and sales officer

Tens of millions granted to off-grid energy companies in five countries. Power Africa is a partner of the Beyond the Grid Fund for Africa (BGFA), managed by the Nordic Environment Finance Corporation (Nefco), implemented by the Renewable Energy and Energy Efficiency Partnership (REEEP), and funded by the Government of Sweden. PAOP technical experts dedicated substantial time and effort to supporting the process of awarding grants, from beginning to end, in five countries: Burkina Faso, DRC, Liberia, Uganda, and Zambia. The Project’s role included promoting the opportunity widely across the sector; advising BGFA leaders on criteria and evaluation-process improvements; helping certain companies apply by supporting their applications, proposals, and business plans; evaluating other companies’ prequalification-phase and final submissions; and providing due-diligence support. As a result, BGFA awarded tens of millions in funding, including $____ million to Liberian companies, and ___.

Project-moderated event in DRC led to $122 million in pledged donations to electrify 400,000 households.

In FY 2022, as a result of a roundtable organized by the USAID Mission in DRC, the Project, and the national off-grid energy agency, a total of $122 million was pledged by donors to the Mwinda Intermediary Fund, which aims to electrify 400,000 households in DRC. Contributions came from USAID through the Alliance Garamba Project; Sweden through Beyond the Grid Fund for Africa; the World Bank; REDD+ (Reducing Emissions from Deforestation and Forest Degradation) National Fund, funded by the Government of Sweden; the Japan International Cooperation Agency; and the French Development Agency (Agence Française de Développement [AFD]).

Four funds realized results from the Project’s significant gender lens investing support. For several years, the Project delivered customized gender-lens-investment training to several funds, for example, in 2022 to _____, and ___. This support mobilized capital for off-grid companies that either achieve Power Africa’s objectives for gender equality or agree to take measurable steps to meet these standards as well as Power Africa’s objectives to increase women’s participation in the sector and improve women’s access to clean-energy technology. As of the end of 2023, the following four funds achieved results from PAOP’s significant gender-lens-investing support:

1. _____
2. _____
3. _____
4. _____

$____ million off-grid climate fund benefited from PAOP’s legal support and gender lens investing expertise. In FY 2022, the Project began advising the $____ million _____, a blended-finance climate fund managed by ___. This fund expects to deploy $____ million for mini-grids, SHS, and PUE in sub-Saharan Africa, with a strong focus on gender. PAOP assisted the fund with transaction documentation, condition precedent closure, and local legal advice. The Project provided gender-lens-investing training to _____ management and staff, as well as representatives from impact investor ___. ______ requested that the Project train its team to apply a gender lens throughout the investment process, which contributed to the results.
Several funds have benefited from Project support:

**$1+ million**. In FY 2021, the Project provided support to the East African Trade and Development Bank (TDB), which manages the $1+ million off-grid fund debt fund called **Zesco Off-Grid Project**. The Project also provided technical support to manage the fund's development, transactional support, market analysis, and introducing and appraising off-grid businesses. It also provided the Project's help to understand carbon offset/credit markets, set up carbon finance programs, and identify guarantees options for its $1+ million facility. The facility comprises a credit line and a $1+ million concessional technical assistance credit.

**$1+ million**. In FY 2021, the Project awarded two investments, through their East Africa-focused, to off-grid companies. A $1+ million waivered investment in a Ugandan company to develop the first grid connection (UCB) primarily in Zambia received **$1+ million**. The Project shared leads with the Project Global Fund, a $1+ million facility, which provides debt, equity, and revenue-based financing to companies.

**$1+ million**. In FY 2021, the Project launched with Project support, starting with a $1+ million transaction. In FY 2021, the Project provided significant support to launch an unprecedented partnership of governments, foundations, and investors, managed by the Project. The Project's technical assistance involved gender mainstreaming and legal advisory support to manage closing this complex fund with multiple lenders. The Project supported the legal process of assessing and identifying market trends and opportunities in the sector.

**$1+ million for Tanzania**. In FY 2021, building upon well-established results-based financing (RBF) mechanisms and structures, this fund supported the recovery of firms throughout Tanzania. The Project supported two $1+ million transactions, offering microfinancing for off-grid solar, which provided debt, equity, and revenue-based financing to companies.

The Project also provided support to microfinance institutions (MFIs) to model and access a grant. We are now in initial conversations with two equity investors as a result.

**Widespread adoption of Financial Modeling Tool**. In FY 2021, the Project launched its open-source Financial Modeling Tool together with African Enterprise Challenge Fund's portfolio companies had found the tool useful, and asked if the Project could hold a session with investors to explain how to use it. In Ghana, INN's Renewable Energy Development and Acceleration Project requested its portfolio to use the tool. In Kenya, PAOP used the tool for the portfolio of its World Bank-funded facility, the Kenya Off-Grid Solar Access Project. This also included PAOP's support in its training program, an essential tool for on-grid distro. In FY 2022, the Project helped companies improve their financial modeling, analyze profitability, and build a fundraising strategy that funded a $1+ millon project.

**Microfinance institution (MFI) webinars** attracted 200+ unique participants. In FY 2020, the Project produced and led five live, hour-long webinars for microfinance institutions (MFIs) in the series “An Introduction to Renewable Energy Financing in Sub-Saharan Africa,” which attracted more than 200 unique participants. The sessions were recorded as YouTube webinars. Topics included identifying loan opportunities, developing energy loans, evaluating MFI readiness, researching the industry and market, developing products, launching and monitoring a pilot, selecting products and partners, and understanding carbon offset/credit markets. The Project supported discussions on sector-wide recovery needs, ticket sizes for the grant, potential impact parameters relevant to the post-lockdown period. From 2020 to 2021, the Project provided support to model its finances using the tool. The Project helped the company to model their finances using the tool. The Project helped the companies improve their financial modeling, analyze profitability, and build a fundraising strategy that funded a $1+ million project.
**INDIVIDUAL IMPACTS**

In Kenya, the Project supported the off-grid industry’s efforts to preserve value-added tax (VAT) exemptions for FY 2020 and advised the Finance Bill of 2022. The Tax Laws (Amendment) Bill, submitted in 2020, included the revocation of key VAT exemptions that had enabled the growth of the off-grid solar industry. With support from the Project, the sector was successful in advocating for the Government of Kenya to strike the deletions of the exemptions from the Tax Laws Bill before its passage.

In FY 2022, the Project assisted the Kenya Renewable Energy Association (KEREA) by reviewing the draft Finance Bill (2021) and proposing amendments (e.g., extending allowances to mini-grid generation investments to serve the government’s goal of promoting rural electrification in off-grid areas), which the government accepted. As a result, the Cabinet of Kenya acknowledged the Project’s support in providing comments and suggestions on the energy policy. The Project also contributed to the ministry’s new strategy for its National Renewable Energy Platform as well as its National PUE Roadmap, launched in July 2023, which focuses on how the government can facilitate greater deployment of off-grid electrification in off-grid agricultural systems (e.g., water pumps and cooking devices) and sets clear policy actions and activities to spur electricity demand and economic development. These documents increased awareness among key stakeholders and set timelines for the establishment and implementation of PUE strategies.

**POLICY AND REGULATIONS**

In Uganda, the Project supported the off-grid industry’s efforts to preserve value-added tax (VAT) exemptions for existing and future sites, and these cost-effective tariffs resulted in an amendment to the 2017 policy, which added solar equipment importation guidelines and a list of renewable energy equipment applicable for import duties and/or VAT waivers. Within a year, the off-grid energy sector saw positive effects, such as a renewed confidence among development partners. For example, after delaying their support due to lack of an enabling regulatory framework, the European Union and German partners released $11.8 million through Kreditanstalt für Wiederaufbau (KfW). As another direct impact, national renewable energy associations and the Ministry of Energy established a highly constructive platform for discussions to address remaining policy and regulatory barriers to private-sector investment.

Cross ministerial awareness-raising and coordination resulted in solar equipment duty and value-added tax (VAT) exemptions in Senegal, and the Project facilitated several workshops and consultations with the National Renewable Energy Agency, Senegalese Agency of Standards, Ministry of Petroleum and Energy, and Council of Professionals of Renewable Energies to coordinate policy and regulatory modifications. The Project led discussions between stakeholders on critical distinctions between tax categories and helped define eligibility lists for categories of renewable energy equipment. The Project, African Clean Energy, and the Tony Blair Institute coordinated the terms of reference for the drafting of solar energy equipment importation guidelines and a list of renewable energy equipment applicable for import duties and/or VAT waivers. Within a year, the Government of Senegal announced the final signature of the adapted bill.
On the VAT exemptions, which in part aims to boost off-grid renewable energy access rates as part of the push for universal electricity access by 2025. The Project coordinated and organized a workshop to raise awareness among public sector stakeholders and explain the operationalization of the decree. The VAT exemption contributed significantly to SHS and PUE connections reported by off-grid energy companies.

The Government of Liberia passed new, favorable technical regulations, guidelines, and standards for solar products. In FY 2023, the Government of Liberia adopted Technical Regulations for Solar Energy Products, which establish a process for controlling the quality of imported or manufactured solar products. Liberia’s Minister of Commerce and Industry signed the Pre-Verification of Conformity Import Guidelines for Solar Products, which establish a process for importers to apply for quality certification so that their products can proceed through Liberian customs, with the potential to suspend import duties. The Project drafted the first iteration of these regulations and guidelines and participated in validation and adoption sessions. These activities facilitated the Government of Liberia to implement Executive Order #107, which suspends import duties on quality-verified solar products. In FY 2023, the Minister of Commerce and Industry officially launched the National Electrotechnical Committee, and the Government of Liberia officially endorsed Technical Standard IEC 62257-9.8 governing solar photovoltaic systems.
POWER AFRICA
OFF-GRID PROJECT

SYSTEM-LEVEL IMPACTS

The Project proactively shared legal information for data-protection bills across East Africa in the interest of supporting PAYGO companies. In FY 2020, the Project worked with international PAYGO companies to map all data touchpoints within each organization, to understand how data protection bills affect their work. The Project finalized four legal memos regarding data-protection regulations in Kenya, Rwanda, Tanzania and Uganda, and how these might affect PAYGO companies. The data protection bill in Kenya, in particular, had the potential to negatively affect PAYGO companies in East Africa, prompting PAOP to provide a strong legal opinion and circulate documentation across sectoral stakeholders. In each of these countries, subsequent data protection legislation did not negatively affect the sector.

The Government of DRC rapidly established an off-grid energy enabling environment with nine key policies and regulations. In FY 2021, the Government of DRC pivoted to open its doors to greater international donor support and rapidly build an enabling environment for off-grid energy. Following this shift, the Project supported the following policies and regulations:

- Termsheet Operationalization of Mwinda Fund;
- Technical Standards for Solar Products;
- Pilot Electrification Project of Mining Communities;
- ANSER’s (the national association’s) Local Energy Access Plan;
- ANSER’s Gender Policy and Action Plan;
- Customs Exemptions on Solar Kits;
- Draft Decree Defining Administrative, Technical and Financial Files of Applications for Permits to Operate in the Electricity Sector;
- Draft Decree on POLICY AND REGULATIONS

Mechanisms and Procedures for the Interconnection of a Regional Network and an Isolated Network in the Electricity Sector; and Simplified Procedures for Awarding the Operation of Isolated Electrical Networks. The Project assisted the government’s initial steps in adopting and sharing drafts, assisted the renewable energy agency to organize meetings, and helped develop these key documents.

PAOP supported 78 laws, policies, regulations, or standards proposed, adopted, and/or implemented to strengthen the enabling environment of the energy sector. In all:

- 71 were proposed
- 40 were adopted, and
- 34 were implemented.

Of the 78 laws, policies, etc., the Project supported some of them across multiple stages. For more information about these activities, please refer to the Project’s FY 2023 Annual Report.

This strategy, supported by Power Africa, outlines ANSER’s commitment to gender equality in the workplace and in communities. It guides the agency to prioritize women’s empowerment and improved economic and health outcomes.

IDESBALD CHINAMULA, DIRECTOR GENERAL OF ANSER, DRC

Photo Credit: Emily Allen
The analysis conducted by Joseph and his team [Power Africa contractors] was detailed and comprehensive. It provided us with updated information and data on the sector landscape, which is proving useful as we implement our strategies for the next few years.

CHIEF EXECUTIVE OFFICER,

The off-grid solar market assessment series by Power Africa is very helpful in driving deeper understanding of markets where we have no current business activity. The reports were the most exhaustive and complete review of the potential markets for the industry I have seen.

SENIOR VICE PRESIDENT,
The Project developed the Distribution Partnership Tool to guide reaching underserved markets. The Project designed a resource guide to help off-grid solar companies in sub-Saharan Africa identify and partner with last-mile distributors to reach underserved markets.

**SYSTEM-LEVEL IMPACTS**

Support for 20 off-grid energy associations, and support for the creation of four new associations. In addition, the Project connected and communicated with 18 other associations in peripheral sectors, on economic growth and energy nexus activities. For more information on how PAOP supported the Association of Off-Grid Electrification Professionals of Cameroon (APELCA), see its impact story at the end of this report.

Three nascent markets developed with significant business advisory support and 45 new policy and regulatory frameworks. In 2018, the off-grid energy markets of Benin, Sierra Leone, and Côte d’Ivoire were nascent, but as of 2023 had matured significantly, thanks in part to the Project’s targeted business advisory services to SHS, mini-grid, and micro-grid companies, as well as 45 successful policies and regulations. This resulted in an increased number of connections in rural and peri-urban areas, and new mini-grids built or under construction in West Africa with the participation of the private sector.

Detailed market assessments in 12 countries published, with accompanying fact sheets. Off-grid companies and other stakeholders widely praised Power Africa’s off-grid solar market assessments, particularly those for Côte d’Ivoire, DRC, and Niger, which previously had much less in the way of published market information. Several companies reported that the market assessments directly affected their critical decisions to enter new markets and new countries, or to further scale up their operations.

GOGLA published PAOP insights in its bi-annual sales and impact reports. On an ongoing basis, the Project provided country-level insights to GOGLA. The association’s reports containing this information reached a wide international audience of investors, companies, and other stakeholders that used them to inform their operations, strategies, and technical offerings.

SHS results-based financing (RBF) pilot in Rwanda catalyzed a $100 million nationwide program. In 2020, Energising Development (EnDev) and the Rwandan utility Energy Development Corporation Limited launched the Pro Poor Results-Based Financing pilot program for SHS in five districts in Rwanda. These targeted subsidies resolved serious affordability challenges by supporting more than 22,000 households to obtain access to electricity, with more than 15,000 of these in the lowest socioeconomic category defined by the government. The $100+ million pilot was funded by Power Africa and the United Kingdom’s Department for International Development, and designed by the Project, EnDev, and the World Bank. The success of SHS RBF led to the Government of Rwanda receiving $80 million in World Bank funding for a nationwide program that uses the pilot as a blueprint. PAOP provided the World Bank with technical assistance throughout the design phase, and directly funded modifications to the software, which enabled and expedited funding. The program’s success demonstrates that targeted technical assistance and a relatively small amount of funding for a pilot and software infrastructure can multiply impacts. Since 2020, several other sub-Saharan Africa governments have developed similar RBF pilots and programs, some of which drawing on Rwanda’s success.
PUE companies and in Côte d’Ivoire have transformed agriculture. The Project’s individualized support to companies has resulted in better access to PUE at the energy–agriculture nexus, thus increasing the climate resilience of rural communities and smallholder farmers. Two Ivorian companies stand out in this regard:

• In 2023, rapidly established itself in the Côte d’Ivoire market as a solar irrigation provider. The Project advised Greeno’s two-year rapid business strategy and market strategy; introduced it to ministry officials, associations, and women’s agricultural cooperatives; and guided its entry into the region, where Greeno estimates it can sell more than 2,000 solar pumps. With this support, the up-and-coming company has already made significant strides toward its target of 25,000 sales in Côte d’Ivoire by 2025, with the potential to impact more than 1.5 million family farms involved in both cash crops and subsistence farming.

• After the Project’s business, market, and financial coaching, the Ivorian solar-pumping startup company raised through investors and donors to build the first factory of irrigation systems. The Project’s assistance involved developing plans and applying for funding to pilot water-pumping tech for female farmers across ten villages; exploring new business models to supply drinking water; expanding its business into ten administrative regions of Côte d’Ivoire; and deploying its low-cost irrigation and well-drilling services, which will add 7,500 additional connections over a three-year period.

Grants under contract led to clear outcomes among women in off-grid communities in Kenya. Through the COIN Fund, Power Africa provided $100,000 to four PUE companies in Kenya to promote the uptake of PUE among women customers. Three of the four companies were required to develop gender action plans as a deliverable, and the fourth company delivered a case study on developing tailored financing for women customers. One grantee, Agsol Limited, completed a case study on financing women solar-milling entrepreneurs in Africa, and will use its insights to develop gender-targeted financing solutions and accelerate the widespread adoption of the Agsol MicroMill. Another grantee, Ecobora Limited, completed its gender action plan, conducted 224 surveys on PUE performance and women’s needs, provided PUE business model training to 926 women, and sold three solar freezers to kiosks in remote areas.

Grants under contract brought new clean energy technologies and sustainable business models in Liberia. The four grantees under the sixth COIN Fund grant window (Ecopower, Easy Solar Liberia, LBS Two, and Liberia Engineering & Geo-Tech Consultants) successfully completed all activities, including deploying devices and testing new fee-for-service business models. Activities included introducing PUE equipment such as solar dryers, freezers, water pumps, irrigators, and generators, as well as other offerings such as solar community charging stations, icemakers, and fishing lights. For information on the impact of Power Africa’s healthcare facility electrification grants, see the impact story at the end of this report.

CROSS-SECTORAL INTEGRATION

The grant offered technical expertise and support to help adapt and customize the PUE technology to the specific requirements and conditions of Liberia’s market. This involved assessing the local energy infrastructures, regulatory framework, and consumer needs to ensure a successful implementation.

PATRICK TAMIA TEWULEH, PRESIDENT AND CEO, LIBERIAN ENERGY NETWORK TWO INC. (PUE GRANTEE IN LIBERIA)
After 20 years distributing PUE, this grant gave us the encouragement and opportunity to focus specifically on women in the farming community and to adapt our solutions to more directly target the problems they face.

GREGORY DENN, MANAGING DIRECTOR, PSS, KENYA

Gender strategy adopted by Government of DRC energy agency. In FY 2022 and 2023, the Project strengthened the capacity of managers and staff of the Government of DRC’s National Rural and peri-urban Electrification and Energy Services Agency (ANSER) on strengthening gender inclusion institutionally and integrating gender equality while planning and implementing rural energy projects. The Project advised the agency to draft and adopt a strategy to promote and monitor gender equality in the organization and its projects in rural and peri-urban areas in DRC. In FY 2023, the Director General of ANSER formally adopted the strategy during a validation workshop. For more information, see Power Africa’s blog.

CROSS-SECTORAL INTEGRATION

The Project managed, supported, and promoted clean cooking through financing opportunities.

- In FY 2020–2021, the Project administered a COIN Fund grant window called Distributed Electricity Services and Modern Cooking Fuel Delivery. Three grantees, Bboxx Capital Kenya, LivelyHoods in Kenya, Solar Kamerun Technology (Solkamtech) in Cameroon, received funding to introduce a new product or business model, such as combined liquefied petroleum gas (LPG) and SHS products. LivelyHoods sold 903 LPG/SHS bundles, Bboxx sold 488 LPG/SHS bundles, and Solkamtech sold 1,254 LPG/SHS bundles.

- In FY 2022, for a Beyond the Grid Fund for Africa (BGFA) clean-cooking grant window in Zambia, the Project supported the fund manager, Nordic Environment Finance Corporation (Nefco) by sharing information that USAID gathered on clean cooking in Zambia.

- In FY 2023, the Project supported the World Bank to review materials for and inform interested parties about a workshop introducing its new results-based financing mechanism for off-grid renewable energy and clean cooking, which it will start implementing after the end of the Project.

The Project advanced an innovative energy-agriculture model to benefit 20,000 farmers, provided targeted PUE market strategies to the local PUE developer, and increased sales among farmers.

- In 2020, PAOP helped the introduce solar-irrigation technologies to farms, through its innovative farm hubs. By studying farmers’ use of its solar pumps, found that solar-powered pumps compared favorably—in terms of customer experience and economics—with those powered by fossil-fuel diesel. Through the farm hub model, developed a one-stop shop for agricultural services, managed by private service providers, that offers a range of products and services to local smallholder farmers. The model includes the use of digital tools in the framework of value-chain projects. In Senegal, implemented 13 farm hubs, supporting nearly 2,000 smallholder farmers in rural areas.

- In FY 2021, with the Project’s assistance, partnered with three PUE suppliers: , , and . ran a six-month pilot around the towns of Kayar, Keur Mbir, and Mboro (80 percent of vegetable crops in Senegal are grown in this region), involving 18,000 smallholder farmers. The PUE suppliers trained interested agripreneurs on solar water pumps and energy systems. As a result, 1,500 farmers in the network expressed their interest in solar water pumps, for which has seen increased demand. Among those interested, in 2022, 55 farmers bought solar water pumps, totaling $ in value.

GREGORY DENN, MANAGING DIRECTOR, PSS, KENYA

Photo Credit: Carla Visser

In FY 2022 and 2023, the Project strengthened the capacity of managers and staff of the Government of DRC’s National Rural and peri-urban Electrification and Energy Services Agency (ANSER) on strengthening gender inclusion institutionally and integrating gender equality while planning and implementing rural energy projects. The Project advised the agency to draft and adopt a strategy to promote and monitor gender equality in the organization and its projects in rural and peri-urban areas in DRC. In FY 2023, the Director General of ANSER formally adopted the strategy during a validation workshop. For more information, see Power Africa’s blog.
Six companies received remittances support. In FY 2020, the Project launched remittance support to six companies in West Africa, including [Company A], [Company B], [Company C], and [Company D], all of which have either recently launched remittance platforms for their off-grid products or are developing such platforms. The Project developed a factsheet on launching and continuing remittances during the COVID-19 pandemic, mapped organizations and key contacts for the Senegalese diaspora, and began reaching out to diaspora organizations to gauge their interest in remittance payments for off-grid products.

SYSTEM-LEVEL IMPACTS
The Project contributed to notable impacts across five PUE supply chains:

1. Solar cold storage, freezing, and refrigeration systems. PAOP’s market intelligence informed the business decisions of manufacturers such as [Company E]. The Project brokered partnerships between these companies and national distributors, allowing their products to achieve extensive market penetration. In Senegal, PAOP organized a public-private workshop by which Senegal’s Department of Rural Equipment informed the design of its cold-chain programs, by learning about the cold-storage rooms and technological innovations of three companies—[Company F], [Company G], and [Company H].

2. Solar water-pumping systems. In FY 2022, the Project provided input into the design of a mobile solar pumping and irrigation initiative under the Feed the Future Hinga Weze program, which supported more than 200,000 farmers in ten districts across Rwanda in agriculture and nutrition. In FY 2021, the Project shared market intelligence to Feed the Future Innovation Lab for Solar Irrigation and Agriculture and Nutrition (FFILSAN) Facility, evaluated the cold-storage initiative and funded it with $27 million (NAMA) Facility, the UNDP and United Nations Capital Development Fund (UNCDF) created a food security program to reduce post-harvest losses through solar-powered cold-chain services in Nakuru and Meru counties, with the support of Kenya’s Ministry of Environment and Forestry. PAOP advised these parties on Kenyan cold storage markets and connected them with cold-storage providers [Company I] and [Company J]. A multi-government-funded climate-finance initiative to accelerate carbon-neutral development, the Nationally Appropriate Mitigation Actions (NAMA) Facility, evaluated the cold-storage initiative and funded it with $27 million.

3. Solar agricultural processing technologies. In FY 2023, the Project promoted the Niger-based Benalya Group’s solar greenhouse regionally, provided deep technical support, and supported its participation in the Great Green Wall initiative of the United Nations Convention to Combat Desertification. For more information, see the impact story at the end of this report.

As with the previous support from your side, we have appreciated the information and the linkages for our work in solar irrigation in Mali. The competition for the sub award was strong, with several good candidates. Your information related to the finance context and banking for smallholders in Mali was particularly helpful in enabling us to assess the proposals. Also, the connection between and would not have happened without your network.

Nicolle Lefere, Director, Feed the Future Innovation Lab for Small Scale Irrigation

4. Solar sprayers. In FY 2020, the Project conducted a study and developed a market entry strategy to inform plan to distribute its battery-stick-equipped agricultural solar sprayer products across outgrower networks in Burkina Faso, Cameroon, Côte d’Ivoire, Mali, Senegal, and Togo, across the cotton, horticultural, cereal, and cocoa value chains. Partnerships that the Project helped build in Cameroon paved the way for to penetrate Chad markets. The Project undertook a market study to identify the value-chain potential for Solar Village products in Senegal, including introducing in-country partners to establish distribution value chains for horticultural and cotton sectors.

5. Solar agricultural processing technologies. In FY 2023, Liberia Engineering and GeoTech Consultants, a COIR Fund grantee, successfully marketed a food-preservation method using its solar dehydrators (i.e., solar dryers) to farmers. manufactures and distributes equipment in Kenya, Lesotho, and Uganda. ’s products include the , a solar-biomass hybrid stove that allows users to cook with less fuel and generate electricity for mobile charging and lighting. In FY 2022, PAOP helped the company close a $5 million equity round by helping develop and review fundraising materials, making introductions to investors, providing legal support for the transaction, drafting and reviewing equity-transaction documents, and providing business-performance support for operations in Kenya and Uganda. In FY 2021, with grant funding via the research services of Efficiency for Access, the Project analyzed data and customer feedback from various pilots for ’s micro-mills so as to propose strategies for its business model.
The technical support and [services] that PAOP provided have been of great value to Simusolar in tackling areas outside our competency but critical for realizing our intent and mission of inclusivity. Over several years, we have received guidance, direction to resources, and thought partnership in thinking about our gender strategy. This informal (not contracted) technical assistance set the foundation for a formal project that PAOP provided with USAID support: establishing a market gender strategy serving smallholder farmers. There is no way we could have undertaken such a comprehensive and expert analysis and strategy creation without that support.

MICHAEL KUNTZ, CO-FOUNDER AND CO-CEO, SIMUSOLAR

The Project’s study informed gender-inclusive programming across the sector. In FY 2022, the Project published Reaching Women, Unlocking Value: How Gender Inclusivity Boosts Customer Satisfaction for Off-Grid Solar Products. The Project provided the surveyed companies—Deevabits Green Energy (Kenya), Ablek Group (DRC), and Mwezi (Kenya)—with tailored recommendations for gender inclusivity. The Project’s summary of findings from a study of 899 people has helped inform how clean-energy companies and investors can reach more women. The Project also published Increasing Women’s Access to Productive Use of Energy for Agriculture: A Roadmap for Developing a Market-Focused Gender Strategy based on a strategy developed for Simusolar. This contains several tools for off-grid companies, such as guidance for focus-group discussions, questionnaires for key informant interviews, and a template for a gender action plan.

Healthcare facility electrification support benefited the sector before, during, and after the pandemic. The Project conducted healthcare facility electrification support since the beginning of the Project in Q1 of 2019 and made its mark more widely as the COVID-19 pandemic marked a shift in donor and stakeholder priorities. The Project demonstrated sector-wide leadership across sub-Saharan Africa in the following ways:

- Technical support, with thousands of health facilities electrified over the life of the Project and more anticipated to be electrified in the coming years (e.g., In FY 2021, the Project helped a Benin-based company win $____ million in equity).
- COIN Fund grants, through which more than 2 million people in 10 countries now have access to electrified healthcare services.
- Information sharing with partners, including USAID healthcare facility electrification programs.

Power Africa Off-Grid Project

Final Report 2018 – 2023
Throughout the life of the Project, the COIN Fund helped bolster the off-grid sector across sub-Saharan Africa, with $6,093,180 distributed to 32 grantees across seven grant windows.

**COIN Window 1**
West and Central Africa Market Entry and/or PAYGO Integration
Four grants awarded to expand off-grid energy operations and access in underserved geographic markets in Cameroon, DRC, and Sierra Leone.

**COIN Window 2**
Distributed Electricity Services and Modern Cooking Fuel Delivery
Three grants awarded to test and scale the supply of SHS and liquefied petroleum gas (LPG) cooking solutions, in tandem, to off-grid households and businesses in Cameroon and Kenya.

**COIN Window 3**
Catalytic Funding – Investment Products, Structures and Transactions for the Off-grid Sector
Five grants awarded to financial institutions to develop and deploy catalytic investment products, structures, and transactions tailored to help off-grid companies grow in 7 countries across sub-Saharan Africa.

**COIN Window 4**
Solar Electrification of Healthcare Facilities in Sub-Saharan Africa
Nine grants awarded to increase access to electricity services for healthcare facilities in rural, peri-urban, and urban communities in Madagascar, Malawi, Nigeria, and Uganda.

**COIN Window 5**
Healthcare Electrification to Improve Maternal and Child Health Services
Two grants awarded to electrify healthcare facilities that provide maternal and child healthcare services in Malawi and Uganda. The grant program is dedicated to the memory of USAID Foreign Service Officer Madeline C. Williams of Minnesota. In her 28 years of distinguished service at USAID, Madeline devoted herself to improving the lives of people in underserved communities.

**COIN Window 6**
Productive Uses of Energy in Liberia
Five grants awarded to support and promote clean energy technology for productive use by off-grid communities. Through this technology, the grant boosted productivity and economic growth in the Liberian market.

**COIN Window 7**
Productive Uses of Energy in Kenya
Four grants awarded to promote the adoption and scale-up of off-grid technologies for productive use, especially among women, to boost productivity, gender equality, and economic growth in the Kenyan market. This window was successfully implemented in four months (all grantees completed activities March–June 2023).
Examples of activities and results include:

- Supported SimpliPhi and REIc to advance a successful proposal for more than $900,000 in U.S. Trade and Development Agency (USTDA) funding for a mini-grid feasibility study in Cameroon.
- Supported Weldy Lamont to win a $20-million deal in Senegal, resulting in approximately 500 U.S. jobs in 14 states.
- Supported with end-to-end capital-raise support over three years with catalytic results: closed a $10-million deal in FY 2021 and a $20 million equity raise in FY 2023.
- Mapped stakeholders for which manufactures cold-chain storage equipment in Ghana, with COP Fund grantees EcoPower distributing dozens of freezers.
- Supported OffGridBox as a COIN Fund grantee; with market intelligence, such as information on local off-grid product suppliers and geographic information systems data; and on policy and regulatory aspects related to standards, utility compliance, and subsidy programs in Rwanda.
- Advised about a PAYGO user interface it is developing for its solar refrigerator.
- Facilitated SparkMeter and Power:On winning a $1 million USTDA grant in Benin and Mali in FY 2021 to field-test new information technology for grid and mini-grid management.
- Supported with mini-grid market intelligence and introductions with the regulators in Liberia; in FY 2021, the Beyond the Grid Fund for Africa awarded funding, which will result in more than 4,100 residential, commercial, and institutional energy service connections.
- Worked with a foundation of and an affiliate of to finalize the tender for a "MAP REDACTED_ community desalination plant on the coast of Kenya.
- Brokered a partnership between and partners exploring providing cold-storage appliances to health centers in Tanzania and advised on its expansion into Rwanda and Cameroon.
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The Project supported 700+ local companies. The following examples represent some of PAOP’s activities supporting local companies:

• In Tanzania
• In Tanzania
• In Kenya
• In Ethiopia
• In DRC

Read more about how PAOP supported Deearbas Green Energy, Sun King, and their investors in the value-chain project story.

The Project assisted local companies to access international finance.

• Raised $5 million for expansion in FY 2020 with new prospects and partnerships to grow in coming months.

In FY 2019, the Cameroonian company announced raising $____ million for expansion in FY 2020 with several investors, pitching the company, and more. In FY 2020, the Project continued to advise and support to certify its SHS products in Cameroon and sought to finance this certification through the European Union. With Project support, closed a $____-million debt facility with the European Union’s to accelerate its expansion into rural Cameroon. The Project provided market intelligence during the due diligence phase, advised on ways to align its and employed resources and prioritized and coordinated interim Chief Financial Officer services and treasury-management support to accelerate its expansion into rural Cameroon.

The Project also supported to create a webinar on technological innovations for the energy transition in Africa, organized by the company’s Chief Executive Officer with the Ivorian Federation of Energy Efficiency, Renewable Energy, and Climate Associations (Fédération Ivoirienne des Associations en Efficacité Énergétique, Énergies Renouvelables, et Climat [FAECER]). The Project chaired the webinar that brought together representatives of companies, development finance institutions, investors, and government agencies from across Benin, Burkina Faso, Côte d’Ivoire, Liberia, Kenya, and Togo to discuss how to address climate change through partnerships.

The Kenya National Treasury’s Draft National Green Fiscal Indicator Reference Sheets. The Project also developed a original methodology similarly correlating solar pump sales to GHG impact.

Methodology developed by the Project for calculating greenhouse gas (GHG) emissions in monitoring, evaluating, and learning practices. The Project’s leaders developed a way to quantify not just the Project’s outputs but also its environmental outcomes. Based on GOGLA sales data and impact metrics, PAOP adopted a simplified formula for calculating GHG emissions effectively avoided from off-grid SHS sales and mini-grid installations through kerosene replacement and began applying it.

Power Africa approved the methodology and its associated Performance Indicator Reference Sheets. The Project also developed a original methodology similarly correlating solar pump sales to GHG impact.

We will be promoting this approach as best practice for all Power Africa mechanisms that report on these indicators.

POWER AFRICA ON APPROVING THE PROJECTS METHODOLOGY FOR CALCULATING GREENHOUSE GAS EMISSIONS
The Project supported one of Niger’s largest horticultural federations to introduce PUE technologies. The Federation of Horticultural Cooperatives of Niger (Federation des Cooperatives Merisicheres du Niger [FCPM-NIYA]) is one of the largest horticultural federations, comprising 1,003 cooperatives and 107 unions across eight regions, representing 42,055 farm managers, including 14,410 women (making up 34 percent of its members). FCPM-NIYA has a national reach and promotes small-scale irrigation sector across several value chains (e.g., onion, sesame, potato, tomato, and sorghum); provides commercial services and asset inputs (e.g., seeds and fertilizers); access to credit and consulting and training. In FY 2022, the Project introduced PUE technologies to FCPM-NIYA, particularly solar water-pumping systems, solar dryers, and cooling solutions. The Project supported a $10 million equity raise with Persistent Energy Capital, resulting in 6,000 jobs. In FY 2022, the Project provided end-to-end capital-raising assistance to the company, concluding with $6 million in equity raised. The company began using the funds to expand its operations and investments, which will lead to 280,000 household connections, create 6,000 jobs, and avoid 700,000 tons of carbon dioxide or equivalent.

The Project helped coordinate participants in a USAID-funded capacity-strengthening and business-to-business learning program. USAID funds the Impact Champions for International Development program, which builds private sector employees’ capacity to pursue strategic social benefits by deploying teams of highly skilled private sector employees to support Power Africa partner organizations with selected projects that solve challenges facing the organizations. In FY 2021, the Project contacted ten companies to explain and confirm their interest and capacity to participate in the Impact Champions program and supported coordination between the program implementer and companies across three cohorts. Employees formed teams of 12-14 private sector consultants to engage with partner organizations virtually for the ten- to 13-week programs related to business management, market outreach assistance, and growth strategies and information technology.

Supporting internships for women through Women in Energy Tanzania (WIET) program. In FY 2021, the Project supported Power Africa’s East Africa Energy Program (EAEP), which implemented an internship program to onboard female interns and pair them with partnering energy companies. This opportunity gave young female students and graduates an opportunity to build their technical skills and increase their chances of securing employment within the energy sector, which will contribute to increasing the number of women engaged in the energy workforce in Tanzania. The Project shared this opportunity with several off-grid companies and supported implementation. Both participated in the internship program, and the Project facilitated coordination between the program implementer and companies supported coordination between the program implementer and companies across three cohorts. Employees formed teams of 12-14 private sector consultants to engage with partner organizations virtually for the ten- to 13-week programs related to business management, market outreach assistance, and growth strategies and information technology.

Examples of activities and results include:

• In FY 2020, the Project developed a draft pilot playbook to communicate the lessons learned from the Uganda De-Risking PAYGO SHS grants pilot, with the grants resulting in the sale of 4,127 SHS and the creation of 285 jobs. A United States Africa Development Foundation (USAID) grantee Solar Freeze received an award of $100,000 with which it distributed 60 solar-powered freezers on a PAYGO platform and trained 16 youth and six women.

• In FY 2022, the coalition published four lessons learned and best practices for refugee settlements and reported results, including 5,318 stakeholders with new or improved access to energy, 199 jobs created, and 3,331 clean energy products sold.
The Project supported PUE water purification solutions at schools and health centers. PUE is a startup company that develops PUE solar water-purification installations and high-quality drinking water. With Project support, PUE deployed 40 solar-powered kiosks for the sale of purified bottled water. It also deployed 51 PV solar-powered kiosks developing PUE solar equipment, especially for water treatment. In FY 2020, the Project supported the rehabilitation of a 5 MW hydropower plant and distribution grid in Bunia, northeastern DRC, as well as efforts to connect 3,000 electric meters. This electrification initiative aims to increase the plant’s distribution capacity to 20 MW, and co-financing through the Mwindia Fund is expected to connect the surrounding villages. The Project coordinated with Southern Energy to advise on the assessment of electricity demand in the villages surrounding Bunia and estimate the costs of electrifying them.

Harnessing Hydropower in DRC webinar. In FY 2020, the Project presented the webinar. Harnessing Hydropower in DRC, informing the DRC mining industry and potential investors, funders, and service providers about hydropower’s potential in the country, as well as challenges, opportunities, and best practices. There were 233 attendees.

The Project supported a social-infrastructure electrification project with Green People’s Energy’s pilot projects for solar water pumping, healthcare facility electrification, and school electrification. In FY 2020, the German development agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), awarded $725,000 to Rensys in Ethiopia to deploy solar water pumps in 5,420 female farmers’ PEG Africa and the cocoa network, Cacao360, pursued partnership activities to connect 8,000 farmers to the Green People’s Energy’s pilot projects for solar water pumping, healthcare facility electrification, and school electrification. In FY 2020, the German development agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), awarded $725,000 to Rensys in Ethiopia to deploy solar water pumps in 8,000 farmers. The Project collaborated with the Ministry of Energy of Côte d’Ivoire to launch a successful application to the Renewable Energy Performance Platform (REPP) dedicated COVID-19 bridge facility to help the company cope with the effects of COVID-19 on its business. The facility allowed it to continue its operations in Côte d’Ivoire, Ghana, Mali, and Senegal, and boost sales.

OFF-GRID ENERGY SECTOR RESILIENCE

Beyond coordinating action, developing knowledge products, and disseminating key information widely across sub-Saharan Africa, the Project supported sector-wide resilience through the COVID-19 pandemic, for example:

• Bridge facility support for PEG Africa’s COVID-19 loan. The Project supported the legal and financial structuring of PEG Africa’s COVID-19 loan. The Project supported sector-wide resilience through the COVID-19 pandemic, for example:

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• Bridge facility support for PEG Africa’s COVID-19 loan. The Project supported the legal and financial structuring of PEG Africa’s COVID-19 loan.
Assisted off-grid energy companies with carbon-finance strategies to secure carbon financing in Liberia, Senegal, Sierra Leone, and Tanzania.

From FY 2022 to FY 2023, the Project provided carbon-financing strategy support to help two companies, and and, navigate the carbon-offer credit markets and set up their own carbon-finance programs.

In FY 2023, the Project introduced two suppliers of solar-powered water pumps, and, to AtmaClub, an underwriter and financier of carbon credits. AtmaClub can provide finance credits for carbon-offsetting projects and. These products have the strong potential to offset emissions, with these companies capable of supplying 3,000 pumps of varying sizes through PATGO financing over the next two years. The Project strengthened the capacity of these companies to access funds for carbon credits to subsidize solar pumps for farms smaller than one hectare, where solar pumps can subsidize those powered by diesel.

Supported the strengthening of major climate finance PAP in the following sub-Saharan African countries:

Kenya: Fund. Starting in FY 2022, PAOP began extending legal advice to this climate-focused blended-finance fund, which aimed to raise $100 million from the public and private sector and deploy $50 million to finance off-grid solar technology in SSA and incorporate gender mainstreaming. The Project also provided legal advice to this climate-focused blended-finance fund, which aimed to raise $100 million from the public and private sector and deploy $50 million to finance off-grid solar technology in SSA and incorporate gender mainstreaming. The Project also provided legal advice to this climate-focused blended-finance fund, which aimed to raise $100 million from the public and private sector and deploy $50 million to finance off-grid solar technology in SSA and incorporate gender mainstreaming. The Project also provided legal advice to this climate-focused blended-finance fund, which aimed to raise $100 million from the public and private sector and deploy $50 million to finance off-grid solar technology in SSA and incorporate gender mainstreaming. The Project also provided legal advice to this climate-focused blended-finance fund, which aimed to raise $100 million from the public and private sector and deploy $50 million to finance off-grid solar technology in SSA and incorporate gender mainstreaming. The Project also provided legal advice to this climate-focused blended-finance fund, which aimed to raise $100 million from the public and private sector and deploy $50 million to finance off-grid solar technology in SSA and incorporate gender mainstreaming.

Climate finance webinar. In FY 2021, the Project co-hosted a webinar with SunFunder, a leading off-grid financier, titled "Accelerating Climate Investment in Africa: Using Structured Finance to Scale Clean Energy Innovations." The webinar brought together structured finance experts from the off-grid solar industry, and included a presentation by SunFunder and a panel discussion among legal advice, resulting in the fund securing a commitment from the U.S. Development Finance Corporation and reaching its first financial close of $50 million. PAOP's conservative estimates suggest that even if the fund deploys only $50 million, it will be able to develop off-grid solar energy, this investment will yield approximately two million clean-energy jobs over ten years.

• The Fund's $5 million Fund and $5 million Fund. In FY 2020, the Project helped close a transaction through which the EU-funded Fund made a $5 million investment in a private utility. The Project supported the investor with a capacity-strengthening session for Investment Officers and support to plot a gender-smart investment approach for the investment. This proactive strategy helped the investor to satisfy its gender requirements and unlock further funding. This investment furthers the fund's aim to mobilize more capital for off-grid solar. The Project also supported the investor to the creation of approximately 6,500+ jobs over ten years.

• Fund's $5 million Fund and $5 million Fund. In FY 2020, the Project awarded two investments through Africa-focused Restart Fund to off-grid companies. In Rwanda received $5 million and in Zambia received $5 million. The Project supported the investor with a capacity-strengthening session for Investment Officers and offered access-to-finance support for its Fund, which provides debt, equity, and revenue-based financing.

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The Project supported the implementation of e-waste-recycling initiatives in Côte d'Ivoire, Kenya, and Zambia. The Project contributed to the development of e-waste and circular economy initiatives by producing a factsheet and reviewing a baseline survey.

KawiSafi Ventures, PowerGen, SunCulture, InfraCo Africa, and SunFunder. Power Africa delivered the opening remarks. The webinar had more than 400 registered participants, with 183 participating live and providing positive feedback.

• The Fund launched with Project support, starting with a $5 million transaction. In FY 2021, the Project provided significant support to launch an unprecedented partnership of governments, foundations, and investors, managed by SunFunder. The Project's technical assistance involved gender mainstreaming and legal advisory support to manage this complex fund with multiple lenders and helping the fund comply with Green Climate Fund (GCF) gender requirements. Reaching its first close of $5 million in July 2021, the fund began disbursing concessional loans to off-grid solar companies affected by the COVID-19 Pandemic. As of the end of the Project, the fund provided secured working-capital funding to support $172 million and small and medium-sized enterprises in this sector. These funds help companies maintain solvency, staff, and products; position themselves for post-COVID recovery; and align with the fund's aim to reduce 1.3 million tons of carbon dioxide equivalent in emissions.

COIN Fund grantee SunFunder provided an $11 million debt facility to SunCulture for climate-friendly food security solutions and PUE equipment. SunFunder is an investor and a grantee of PAOP's COIN Fund Window 3: Catalytic Funding. In FY 2021, with COIN Fund support, SunFunder invested $500,000 to United Kingdom-based InspiraFarms for work capital to deploy solar-powered, agriculture-focused cold-storage solutions to address the challenge that post-harvest losses of fruits and vegetables account for approximately 40 percent unrealized sales. SunFunder finalized its second innovative financing structure through a COIN Fund, announcing an $11 million facility for off-grid solar company SunCulture to expand its PUE activities. These solar water pumps are a means to generate income and replace diesel-powered alternatives.
E-mobility company [Company Name] generated capital. The company runs an electric vehicle network with a battery-swap business model, having facilitated more than 12 million battery rentals and displaced more than 8.9 million kilograms of carbon dioxide in its lifetime. The Project reviewed the company’s pitch deck over several rounds, provided executive coaching on fundraising, introduced it to investors and donors, and supported it to win opportunities, including $[Amount] million in equity from [Investor] in FY 2021 and $[Amount] million through [Program] in Liberia in FY 2022.

Uganda-based solar motorcycle rental company accessed $[Amount] million in capital. The climate-friendly e-motorcycle company [Company Name] raised $[Amount] million with the Project’s support. In FY 2022, the Project provided Chief Financial Officer services to support [Company Name]’s $[Amount] equity raise from several investors to enable [Company Name] to supply more electric motorcycles on lease-to-own agreements in the local currency. As part of its funding, [Company Name] has committed to reaching more female drivers. Read more about [Company Name] in its impact story at the end of the report.

A new e-mobility association launched in Uganda. In FY 2023, with the support of the Project and the African Association for Electric Mobility and Development in Africa (AEMDA), a new e-mobility consortium in Uganda formalized its status as an association and officially launched, calling itself the Uganda Electric Mobility Association (UEMA). The Project has continued providing regular advisory support to the new association.

[Company Name], a solar storage company, raised $[Amount] million. It provides a rechargeable, repayable, solar-powered battery service. Its energy hubs charge battery packs for rural, last-mile customers to power lights and small appliances at home. In FY 2022, [Company Name] announced that it had raised $[Amount] million in funding, after PAOP supported its financial analysis and procedures to manage cash flow and investments. [Company Name] has built 70 energy hubs, serving over 23,000 people in rural Tanzania. The company employs 140 women in the Tanzanian regions of [Region] and [Region]. With this funding, [Company Name] expects to add 10,000 new clients and more than 5,000 new customers.

The Project provided the Kenyan electric-transportation company [Company Name] with Chief Financial Officer services. In FY 2023, having raised $[Amount] million in equity, [Company Name] leveraged the Project’s support to develop an asset-finance strategy to raise additional capital within the next few years.

Thought leadership on how e-mobility companies can access more finance. In FY 2023, Power Africa published the blog Scaling E-mobility in East Africa with insights from the Access to Finance team about unlocking the future of the sector.
The Project has frequently been involved in extending far-reaching support to other U.S. Government, USAID, and Power Africa agencies, programs, Missions, and initiatives, with the following examples:

- **Support to USG funding mechanisms.** In FY 2020, across multiple countries, PAOP encouraged and reviewed companies’ applications to the U.S. Trade and Development Agency (USTDA), including in Senegal (Winch), Liberia (Black Star Energy), and Cameroon (Privida). The Project also participated in the Investment Committee of the West Africa Trade and Investment Hub (WATIH), reviewed two applications in DRC, and evaluated an SHS project. In FY 2022, The Project, the Government of DRC, and USAID INVEST (a mechanism for facilitating private-sector investment) discussed how to increase USAID INVEST’s involvement in structuring the mini-grid component of the Mwinda Fund to attract private finance. The Project supported Development Innovation Ventures (DIV) to build partnerships with local entities. At the request of the U.S. International Development Finance Corporation (DFC), the Project provided market intelligence about mini-grid and commercial and industrial companies and supported exchanges with InnoVent, SolarX, and Access SA in Mali. The Project also linked DFC with e-mobility and battery-rental projects, notably Mobile Power.

- **Sharing market, business, and management expertise.** In Burkina Faso, the Project provided an important concept note to the USAID Office of Transition Initiatives (OTI) regarding an intervention based on nano-grids, which would use healthcare centers as anchor loads and provide purified water. The Project proposed a contrasting approach that would include BGFA funding and support to the Government of Burkina Faso for a lighter approach to regulating nano-grids. Project leaders assisted the USAID-Orange Healthcare Facility Electrification Global Development Alliance in Sierra Leone by helping negotiate the pricing offered by a solar company for three sites. Project experts gave key inputs on the proposed redesign of the program and advised the newly announced Healthcare Electrification and Telecommunication Alliance (HETA), informing the business case against over-subsidization and suggesting leveraging tax payments against government payment risk.

- **USG interagency coordination.** In FY 2020, USTDA granted $969,825 to Côte d’Ivoire’s Ministry of Energy for a feasibility study for mini-grids to electrify 100 remote communities, the largest off-grid electrification project in Côte d’Ivoire to date. As part of the initiative, in partnership with the Millennium Challenge Corporation (MCC) and the Millennium Challenge Account (MCA) Côte d’Ivoire, the Project helped electrically 74–84 secondary schools in these off-grid communities by providing renewable energy-policy guidance, disseminating market intelligence, and informing the terms of reference for procurement. The Project played a major role in coordinating USG agencies. From FY 2021 and on, the implementers launched the feasibility study, and the Project continued the Ministry of Energy review the deliverables and coordinate with the USTDA consultant to implement off-grid energy reforms. After the study concluded successfully with new mini-grids benefiting 192,000 individuals, the Project helped USTDA advise and review the deliverables with the government. In FY 2023, the Project helped to organize and participated in a meeting between the U.S. Ambassador to Kenya, Margaret Whitman, and U.S.-affiliated off-grid companies working in Kenya on transparency in regulation and taxation; as a result, the USAID Mission in Kenya, with the Project’s support, committed to exploring solutions to the issues the off-grid companies raised.
Duty and VAT Tracker. The Project developed a detailed tracker that includes all duties and VAT charged on a full range of solar products, including their Harmonized System (HS) codes, across 48 countries, including all of sub-Saharan Africa. The tracker includes country-specific contexts on exemptions, administrative fees, and more. In FY 2020, after receiving feedback from stakeholders, the Project finalized the tracker and shared it with GOGLA and other relevant stakeholders. In FY 2021, GOGLA adopted and launched the tracker as an official tool on its website, and took over its management and upkeep. In successfully passing on ownership to GOGLA, the Project has improved its sustainability after the life of the Project. The tool is publicly available.

110 knowledge products addressing critical gaps and needs in off-grid energy. The Project released 110 knowledge products over five years. For example, the Project released Off-grid Solar Market Assessments in multiple languages in focus countries, the Financial Modelling Tool for PAYGO Companies with two webinars and follow-up support offerings, bundling it with a suite of resources that guide internal financial management, enable scenario-based projections of company financials, introduce methods to guide company valuations, and model key aspects of PAYGO companies. Another example is the collection of Productive Use of Energy Catalogs, analyzing and sharing information on the PUE equipment for agriculture, fishing, livestock, and poultry as well as manufacturers, suppliers, and other relevant institutions. As a result of sharing these resources across each country’s PUE markets, stakeholders across the sector have reportedly connected with new partners, brokered business agreements, and expanded offerings.

THOUGHT LEADERSHIP

Foresight Activity: The Future of Off-Grid Infrastructure in Africa. At the 2020 Global Off-Grid Solar Forum and Expo, the Project hosted a foresighting session, highlighting possible scenarios for the future of the off-grid energy sector in sub-Saharan Africa. The scenarios—developed by the Project in collaboration with Institute for the Future researchers, technologists, and social scientists—included opportunities at the intersection of off-grid energy and digital finance, micro-mobility, gender equity, and climate change. PAOP illustrated the scenarios, drivers of change, and signals of innovation in the Power Africa Energy Foresight Report.

Foresight Activity with live illustration presented in 2020. The illustrations depict cultural, economic, technological, and environmental drivers and emergent signals that suggest disruptions and innovations that might become widespread.
**BUSINESS PERFORMANCE**

- Target smaller and newer companies for business-performance support. Larger companies are often not as interested in business-performance support; smaller, in-country firms benefit most.
- Business performance support takes time, trust, and clear communication. Companies that request support under this workstream highly value what they gain from the Project. However, developing a trusting relationship with the Project can be a lengthy process. Before the Project can provide targeted support, companies must first accept and recognize their needs and clearly articulate opportunities for technical assistance.
- Focus on managing relationships and communicating frequently. From Project onset, through the conclusion of activities, individuals leading technical assistance must work closely with both a company's in-country local team relevant regional and international teams. The Project must ensure that all parties clearly understand the steps that need to be taken, by whom, and by when.
- Identify and broker new, mutually beneficial partnerships between entities. This is one of the main practices that leads to new partnerships between manufacturers and suppliers, often cross-regionally, which can be a lengthy process. Before the Project can provide targeted support, companies must first understand their own needs and clearly articulate opportunities for technical assistance.
- Find light-touch ways to build and maintain relationships with companies. The Project's lead in-country advisors adopted targeted techniques to communicate with companies, including dissemination of webinars, funding opportunities, studies, and market news. Stakeholders differ according to their needs and operating environments, but all can benefit from enriching their expertise and engaging in technical discourse. For many partners, the Project served as a key source of this information, and frequent information dissemination helped maintain relationships.
- Adapt to the changing needs of supported companies. It is likely that companies will need support over a longer period, and the type of support may change; so, it is important to ensure that the support is flexible enough to change course in a rapid and efficient manner.
- Effectively accelerating companies' market entry and expansion can yield good results. The Project made special efforts to support both new companies and companies entering new markets, and these companies often see high levels of connections after one year. Market intelligence and geospatial mapping have proven valuable, as they help companies formulate strategies to maximize their potential sales and impact.
- Revenue generation is the key to sustainability. While supporting companies to develop profitable and self-sustaining business models and operational approaches, on their journey to self-reliance, the Project helped them focus on revenue-generating activities.

**ACCESS TO FINANCE**

- Increased access to the right type and amount of capital, to fuel the capital-intensive push of off-grid businesses, is a key driver to scaling the sector. Examples of the Project's high-impact capital-raising efforts include raising $1.5 million through its supported revolving fund. These transactions demonstrate the ability of financial intermediaries focused on the off-grid sector to attract capital from a mix of established development finance institutions and new private investors. Such funding can address the medium- to long-term financing needs of the sector.
- Raising capital for the off-grid sector is time-consuming and complex. Companies tend to overestimate the momentum of investors, and their interest. Complex transactions often take a minimum of two years to close. Transaction costs are also very high, as they may change, so, in high-growth markets. Successor projects should therefore take a long view on supporting transactions, while balancing priorities, maintaining objectivity, and actively discussing relevant context.
- Transactions are not easily standardized, especially across different markets. Tailored and flexible financial advisory support for companies needs to be efficient, and upstream investment readiness is crucial.
- Gender-lens investing yields results across multiple objectives. Gender-lens investing is highly effective both to correct gender disparities in the energy sector and advance Power Africa's goals of increasing connections and megawatts. It incentivizes leadership and participation among women in clean energy, which improves business outcomes and returns on climate investments. Gender-smart climate finance places an emphasis on women as energy users and entrepreneurs, which helps mitigate the disproportionate effect of energy poverty and climate change on women.
- Gender action plans and gender strategies improve businesses. Investment strategies that encourage women's empowerment in the workplace and beyond yield better working environments for employees, access to upstream customers, better returns for investors, and other positive outcomes. The Project took every opportunity to support companies and investors to ensure more inclusive and empowering policies and practices.
- Certain innovative financial instruments are difficult to scale and replicate. Due to this challenge, there is a large unmet need in the sector for tailored supporting structure, which future programs can fill.
- Prioritize unlocking finance through local banks for off-grid energy rather than large international investment banks. Local capital can achieve higher returns on local market and can lead to more sustainable results given the lower transaction costs and additional long-term benefits. The Project made special efforts to support local banks for off-grid transactions, while balancing priorities, maintaining objectivity, and actively discussing relevant context.
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**WHAT HAVE WE LEARNED?**

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MARKET DYNAMICS

- Assess the value of studies and prioritize technical assistance. To assess potential support and prioritize activities that deliver the greatest value, the Market Dynamics team should communicate directly with companies, investors, and other entities to identify the extent to which they require, and find value in, studies and market research. Providing these services can take significant resources and costs.

- Market dynamics support must be responsive and nimble. At the onset of the COVID-19 pandemic, the immediate, decisive action the Project took to coordinate sector-wide efforts, alongside GOGLA and other key stakeholders, resulted in time-effective communications and broad consensus about priorities and next steps. The Project relied extensively on good workuczients, partnership, and leveraging market intelligence in the energy field.

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- Policy and regulations outside the energy sector can threaten the financial viability of energy companies; however, companies require high-quality market intelligence to make informed regulatory decisions (e.g., qualifying off-grid energy as an essential service) and help companies sustain their businesses.

- There is no one-size-fits-all solution across markets. Each market requires different interventions, due to different government regulations, access to technology and connectivity, predatory lenders, lack of trust in mobile money, literacy levels, and languages.

- To be useful, market intelligence products and training materials require more than just a launch. Targeted efforts are required to ensure the adoption of materials by key stakeholders (e.g., government agencies, financial institutions, etc.).

- Local associations are effective coordinators and bridge builders. The Project supported many companies through business associations, effecting change in governments by uniting multiple stakeholders in a single voice.

- Innovative approaches, partnerships, and business models can transform markets for the benefit of hard-to-reach end-users. Innovative end-user financing methods have the potential to facilitate affordable payment methods for off-grid energy products, and unlock new, previously unreached customer bases in rural and underserved areas. For this reason, the Project actively pursued opportunities to support emerging PAYGO systems, partnerships with telecommunications companies, and mobile-money platforms.

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LESSONS LEARNED DURING IMPLEMENTATION

- Stakeholders should be supported to advocate for the non-regulation of standalone solar systems. Stakeholders should be supported to advocate for the non-regulation of standalone solar systems and for their free deployment across countries (i.e., no zoning).

- Include safeguards against counterfeits and consumer protections in regulations. Regulations on technical standards and quality must be coherent and comprehensive enough to combat counterfeits. This should be coupled with enhanced enforcement mechanisms to achieve proper consumer protection.

- Mauritius’ experience of, and active support to, proposed policy and regulations that negatively affect the energy sector. Policy and regulations outside the energy sector can threaten the business models and profitability, especially those using PAYGO financial models. Examples of laws that directly or inadvertently harm the sector are those related to consumer data storage and protection, microfinance, micro leasing, and VAT regulations.

- Advocacy for the affordability of systems. Increasing consumer demand for off-grid connections involves improving the affordability of these systems (e.g., through the government enacting incentives, capital expense (capex) subsidies, and operating expense (opex) subsidies). This requires a clear process, from project preparation to tariff approval. Tariff policy must encourage cost-reflective tariffs for electricity, even if this means using subsidies to achieve affordability, capital expense (capex) subsidies, and operating expense (opex) subsidies. Transparency is necessary to ease the process, from project preparation to tariff approval. Tariff policy must encourage cost-reflective tariffs for electricity, even if this means using subsidies to achieve affordability.

- Pursue one-on-one meetings with key government officials. Decision-making in the sector is often political, so it is important to understand the political incentives or key officials and build on that knowledge. As an advisor, Power Africa can present approaches and business models that resolve perceived challenges, and pilot studies to address major questions.

- Seek opportunities to engage with governments on new technology. Governments benefit from Power Africa support and assistance. Research. Providing these services can take significant resources and costs.

- Publish high-quality market intelligence. At the onset of the COVID-19 pandemic, the immediate, decisive action the Project took to coordinate sector-wide efforts, alongside GOGLA and other key stakeholders, resulted in time-effective communications and broad consensus about priorities and next steps. The Project relied extensively on good workuczients, partnership, and leveraging market intelligence in the energy field.

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LESSONS LEARNED DURING IMPLEMENTATION

**CROSS-SECTORAL INTEGRATION**

- Ensure that technical assistance is sustainable by helping supported entities prioritize funding and dedicated staff. To maximize the impact of gender strategies that serve the female market, support entities prioritize funding and dedicated staff.
- Establish linkages between PUE manufacturers and suppliers, and between suppliers and agricultural networks. The Project promoted PUE by identifying and promoting potentially fruitful partnerships. PUE has a significant impact on local economic growth, poverty alleviation, and connections. Strategic partnerships can promote the speedier deployment and uptake of PUE technology.
- Take a dual approach of targeted finance and assistance to develop the PUE sector. Grants and concessional finance (e.g., the Project’s COIN Fund, PUE grants, and BGFA) catalyze growth in the PUE sector; however, it is necessary to provide concurrent and well-designed technical assistance to maximize the long-term impact of these funds. This technical support should include business plans, financial modeling, customer service training, aftersales service, and gender integration.
- Bridge the unmet demand for gender-related technical assistance from investors. The Project offered significant value via technical assistance to investors’ portfolios. Support for public and private sector investors is an effective strategy that contributes to Power Africa’s gender integration and access to finance objectives.
- Advance PUE technologies to serve multiple purposes. The semi-arid Sahelian region is home to about 135 million people, 75 percent of whom are involved in agriculture production. In the Sahel, packaged PUE solutions like the Benya Group’s solar greenhouses, which the Project supported from FY 2021 to 2023, have the potential to improve food security by improving growing conditions for crops.
- Understand how to optimize, complement, and finance health facility electrification efforts sustainably. Future projects should find ways to meet the latent demand for distributed renewable energy applications at healthcare facilities, even grid-tied facilities. In the long run, the provision and maintenance of healthcare facilities cannot rely solely on government payments, and private-sector incentives can help bridge the gap. Pairing of revenue-generating activities with public infrastructure can cross-subsidize much-needed operations and maintenance activities.
- Gender activities succeeded due to several factors.
  - Efforts to promote gender equality in the clean energy sector by other development actors (e.g., DFIs).
  - Teamwork of Project advisors in identifying opportunities for gender integration (e.g., Access to Finance advisors identifying opportunities for gender lens investing through various funds, financial modeling and customer service training, aftersales service, and gender integration).
  - Bridge the unmet demand for gender-related technical assistance from investors. The Project offered significant value via technical assistance to investors’ portfolios. Support for public and private sector investors is an effective strategy that contributes to Power Africa’s gender integration and access to finance objectives.
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**LESSONS LEARNED DURING IMPLEMENTATION**

- Lead support locally through in-county advisors. A key value- add of the Project was the trust lead in-country advisors cultivated over time with partners. Lead in-country advisors can take the pulse of the sector at all times, and serve as liaisons to coordinate support to stakeholders from the larger team.
- The team’s collaborative approach has been effective, including experts specializing in cross-cutting technical topics with in-county advisors. One supported activity identified a specific challenge to electrification and collaborated to advise on and develop a road map of high of specific activities. Key to the effectiveness of the engagement was the trust lead in-country advisors, ensuring that the most broadly experienced experts led this guidance. Through this collaborative arrangement, beyond the standard technical assistance laid out in workplans, the Project’s flexible, demand-driven responses to sectoral needs have helped foster more enduring sector-wide growth.
- Effective management requires persistent prioritization. In line with its “open-door policy,” the Project communicated with a range of participants across the off-grid energy sector, including companies, investors, financial institutions, government institutions, and NGOs. However, due to high demand for Project support, leaders carefully deliberated before dedicating significant time and resources prioritizing support to companies with low risk and a strong potential for success, as well as markets with greater growth potential.
- Plan grant timelines realistically. Future projects should allow extra time for the sometimes lengthy process of finalizing agreements with facilities and/or the managing entities of a grant site and site assessments. Also, maintain flexibility in adapting to customs clearance for imported equipment and supply chain delays due to unforeseen circumstances (i.e., COVID-19).
- Prepare to adapt to grant implementation challenges. Budgetary flexibility is important to account for price increases of components, delays in the planning and implementation phases, remediation and capacity-building support that may be necessary after improper installation of equipment, and interventions for rewiring to accommodate equipment.
The Project’s Business Performance approach initially relied on in-country advisors to build relationships, with a focus on market assessments to tailor support to various entities. Over time, the team’s engagement became broader. Due to COVID-19 and evolving markets, the Project adapted by seeking new partnerships and integrating Business Performance support into other areas, such as access-to-finance assistance, gender activities, and PUE integration.

A significant proportion of the Project’s key performance indicators come from support in mobilizing large transactions. In the Project’s five years, this multifaceted workstream expanded and evolved, as companies worked with investors, financial institutions, crowdfunding platforms, and others to attract, raise, and receive capital. The Access to Finance team continued to explore individualized solutions in coordination with collaborating Project staff, a highly advantageous management approach. Examples of practices that developed over time were pitch-deck development, legal services, executive coaching, and other more targeted activities. These activities are not commonly offered by donors, and lay the groundwork for companies to invite and expedite new and greater levels of investment.

The Project’s approach to this workstream initially involved offering ad hoc support for policy issues, but evolved into proactively engaging stakeholders, initiating policy discussions, and advocating for more supportive enabling environments. This shift made policy and regulatory support integral to the Project’s overall success, as more sector stakeholders recognized factors contributing to and detracting from the enabling environment.

The Project contributed to energy–agriculture activities through support to on-the-ground implementers and stakeholders at several levels. While this approach remained consistent over time on a case-by-case basis, supporting an entity at one level sometimes led to extending support to other entities on other levels, scaling support to activities more widely, and facilitating the involvement of new external partners. Examples of this support include assisting governmental bodies to promote PUE through policies, helping companies adopt new PUE technologies and business models, and raising awareness among farmers and agricultural networks about products and companies.
### CHALLENGES

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<th>BUSINESS PERFORMANCE</th>
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<tr>
<td><strong>Lack of subsidies.</strong></td>
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<td><strong>Smaller and medium-sized off-grid energy companies lack business and operational capacity.</strong></td>
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<td><strong>Limited access to finance across many markets in sub-Saharan Africa.</strong></td>
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<td><strong>Technical-assistance needs can exceed a project’s budget and capacity (e.g., needs involving complex capital structures).</strong></td>
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<th>MARKET DYNAMICS</th>
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<td><strong>Companies face challenges navigating uneven tax regimes across geographies.</strong></td>
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<td><strong>Governments often lack transparency to endorse international standards and enforce regulations.</strong></td>
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<td><strong>Obtaining buy-in from companies for business performance support took a lengthy amount of time.</strong></td>
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<td><strong>Coordination among stakeholders is limited.</strong></td>
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### SOLUTIONS

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<tr>
<td><strong>Build stakeholder buy-in and government will to finalize duty and tax exemptions through decrees. Facilitate dialogue and partnerships with financing institutions.</strong></td>
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<td><strong>Offer tailored support to a wide range of companies and investors, but also build more standardized financial support and models. These models can include PAYGO integration, as a means to facilitate end-user financing of products, and design and develop innovative financial instruments, such as green bonds.</strong></td>
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<td><strong>Plan programming to include more support for endorsements and regulation enforcement, and communicate the need for these among donors.</strong></td>
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<td><strong>Continue to raise awareness and strengthen the capacity of policymakers, demonstrating the benefits and successes of past efforts.</strong></td>
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<td><strong>Develop a solid understanding of local markets to help companies and local distributors optimize their business models. These models can include PAYGO integration, as a means to facilitate end-user financing of products, and partnerships with financing institutions. Strong partnerships across agricultural value chains and national agencies supporting the agricultural sector can enhance market penetration for these products.</strong></td>
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CHALLENGES | SOLUTIONS

Standards, regulations, and tax irregularities remain critical barriers to deploying PUE technologies more widely. Application of duties and taxes is often inconsistent for PUE, leading to unpredictability and delays during dispute resolution.

As tax governmental partners and sector-wide advocates to develop policies conducive to more consistent exemptions and waivers for PUE appliances and equipment, to encourage their adoption and stimulate economic growth. Support regulatory and implementing agencies and authorities to apply these rules with greater consistency.

Quality standards are generally not in place for PUE appliances and equipment. As a result, companies in some markets suffer from low customer interest, due to low-quality products failing with no warranty or after-sales service.

Promote quality standards by supporting international quality-verifying entities, industry associations, and governments. Preventing low-quality products from entering the market can foster positive perceptions about PUE products, leading to greater adoption among customers.

Providing support to companies is a time-consuming process. In many cases, their staff cannot dedicate time to communicate with and receive Power Africa support, as they are busy managing their businesses.

Clearly explain the process for Power Africa support at the start of discussions, and ensure that more than one point of contact is available to dedicate time to regular catch-up calls and meetings. Support from in-country advisors is essential to building relationships with companies. A company’s contracts team can assist by developing scopes of work that can be adapted easily and extended, as required.

Collecting certain data is difficult and time-consuming.

Use local experts located in each country to collect more accurate and useful data. Dedicate time, resources, and special attention to ensure quality before, throughout, and after the process of data collection.

Photo Credit: SolarWorks!
The key limitation of this indicator is that it does not capture the Project’s actual totals achieved, as it relates only to connections that incentivize implementing partners to exercise inclusiveness while pursuing both large and small off-grid connections and investments. The current indicator is not as useful as it could be. This was PAOP’s only indicator that tracked community-level economic growth; therefore, it should rank higher in importance. Project leaders view PUE as critical to poverty reduction; once the Project was within reach of its targets, the team was able to shift its focus toward supporting more PUE-related income-generating activities, in line with localized, community-level USAID development goals. The current indicator is not as useful as it could be. It was PAOP’s only indicator that tracked community-level economic growth; therefore, it should rank higher in importance. Project leaders view PUE as critical to poverty reduction; once the Project was within reach of its targets, the team was able to shift its focus toward supporting more PUE-related income-generating activities, in line with localized, community-level USAID development goals. Power Africa may consider designing and applying a methodology to calculate the economic growth potential of each category of PUE equipment installed. In future programming, Power Africa may consider further honing this indicator to help implementing partners prioritize inclusive support to all entities, of any origin, that close transactions and achieve connections of any size. The Project has consequently maintained an open-ended policy to provide inclusive support to small and large, local and international companies, to enhance energy sector regulations, or standards governance formally proposed, adopted, or implemented as a result of U.S. Government / Power Africa assistance; Unit: Number (PA/standard) This target is somewhat useful as an output indicator, but does not fulfill its potential to link with the Project’s top goals. There is no direct link in the Performance Indicator Reference Sheet to connections. In future revisions, the target could more comprehensively capture less-formal governmental outputs and support, international standards support, and more. The key limitation of this indicator is that it does not capture the Project’s actual totals achieved, because most companies do not share their connections. For all companies, reporting connections requires both confidence in Power Africa and extra administrative bandwidth, and in any case, sharing these numbers may not be in their best interest from a business perspective. The Project strongly believes that a delayed reporting schedule for this indicator should be standardized as a best practice of all Power Africa implementing projects; Unit USD (million) (PA/standard) reporting connections on a delayed schedule improves accuracy. Since inception, the Project has taken a rigorous approach to validating the accuracy of connections, by systematically recording these numbers one quarter after a given reporting period. This approach maximizes response rates and ensures greater accuracy, as a large proportion of companies modify their originally reported connections numbers after the fact. The Project strongly believes that a delayed reporting schedule for this indicator should be standardized as a best practice of all Power Africa implementing projects; Unit USD (million) (PA/standard) Link legislative achievements to market impacts by collaborating with GOGLA and associations. To inform the design of future targets, Power Africa can explore how effective policy and regulatory interventions impact off-grid energy market sales and other indicators of improved economic prosperity, which GOGLA and local associations already capture. By collaborating and communicating systematically with GOGLA and its member associations, Power Africa can tie its interventions to wider impacts. One hidden limitation of this indicator is that certain governments may not be incentivized in direct interventions, in which case projects can pursue other revenue activities toward supporting the enabling environment. Power Africa can explore how effective policy and regulatory interventions impact off-grid energy market sales and other indicators of improved economic prosperity, which GOGLA and local associations already capture. By collaborating and communicating systematically with GOGLA and its member associations, Power Africa can tie its interventions to wider impacts. Since the climate impact of different sizes of solar pumps, irrigators, sprayers, food-processing units, cold-storage units, and others. Linking PUE equipment sales to existing methodologies for GHG emissions reduction would help Power Africa collect important information to drive programmed priorities. These renewable energy products serve as a means of climate change mitigation and adaptation. It may be worth exploring/drafting a standard methodology to calculate the climate impact of different sizes of solar pumps, irrigators, sprayers, food-processing units, cold-storage units, and others.
This indicator may not be useful or meaningful to capture, as most institutions have already explored creating financial products and marketing them to off-grid companies, and it is beyond the purview of a project to develop financial products for these institutions. PAOP's greatest impact has been helping stakeholders raise capital and understand business models, technical issues, and markets.

This indicator could be more useful. While it roughly shows Power Africa's outputs, it does not convey the Project's net outcomes across markets, and should be specifically captured the Project's successful interventions. Power Africa could further define the significance of a single interaction with a company, e.g., whether a project is disseminating information en masse or targeting a specific company with deeply tailored research. To further contextualize the scarcity of monitoring and evaluation-related responses, Power Africa could also request that projects report the ratio of companies that report versus those that do not. Power Africa could further define this indicator by categorizing intelligence targeted toward the market as a whole (e.g., market assessments) as opposed to individual companies (e.g., unsolicited requests). This indicator is similar to indicator 8 ("Number of OGCs that access market information/intelligence"), and could be combined and defined to have a more specific orientation with Power Africa's top goals.

This indicator is not useful or meaningful beyond tallying the Project's total number of technical outputs. It does not speak to the quality, usefulness, or meaningfulness of the knowledge products created, and does not capture the fact that several companies leveraged the Project's financial modeling toolkit and integrated it into their operations. Likewise, this indicator does not capture how the Projects shared its original VATIS database with GOGLA to enable its widespread use for long-term sustainability. A more descriptive and instructive indicator might measure off-grid energy sector entities' uptake, use, and adoption of such resources and tools. Future projects might explore surveying stakeholders to evaluate the utility of work products and provide qualitative feedback on their impact.

This is a useful indicator toward the goal of maximizing the number of governments supported. It measures policy and regulatory activities in a way distinct from “Number of laws, policies, regulations, or standards to enhance energy sector governance formally proposed, adopted, or implemented as supported by U.S. Government assistance.” However, it would be ideal to combine this indicator with “Number of African governments that receive PA support to implement improvements to their frameworks.”

This indicator is not a useful or meaningful beyond tallying the Project's net number of technical outputs. It does not speak to the quality, usefulness, or meaningfulness of the knowledge products created, and does not capture the fact that several companies leveraged the Project's financial modeling toolkit and integrated it into their operations. Likewise, this indicator does not capture how the Projects shared its original VATIS database with GOGLA to enable its widespread use for long-term sustainability. A more descriptive and instructive indicator might measure off-grid energy sector entities' uptake, use, and adoption of such resources and tools. Future projects might explore surveying stakeholders to evaluate the utility of work products and provide qualitative feedback on their impact.
The Project recommends considering the inclusion of the following indicators in addition to those selected above:

**Additional off-grid indicators to consider in future programs**

- **Number of local entities supported**
  - To ensure widespread impact, this indicator could be divided between facilities electrified through grants and through technical assistance.
- **Amount mobilized through gender lens investing**
  - This is a useful indicator that PAOP recommends using in future programs. If applicable, to specify the nature of Power Africa support, this indicator could be divided between facilities electrified through grants and through technical assistance.
- **Number of gender action plans or equity strategies developed or adopted**
  - A very useful indicator that PAOP recommends using in future programs. If applicable, to specify the nature of Power Africa support, this indicator could be divided between facilities electrified through grants and through technical assistance.
- **Number of women-owned and led entities supported**
  - This is a useful indicator. Project leaders developed and submitted a methodology to attribute (a) off-grid solar photovoltaic systems ranging in size from 0 to 50+ watt peak (e.g., SHS), (b) mini-grids, and (c) solar photovoltaic pumps replacing diesel pumps in the PUE sector. The formula for (a) and (b) was adapted and simplified from a GGGLA methodology, with the formula for (c) representing the Project’s original thought leadership. Future projects may explore methodologies for calculating emissions avoided systems and equipment beyond these categories. The Project especially recommends that future Power Africa projects explore establishing methodologies to understand carbon dioxide-equivalent reduced, sequestered, or avoided in relation to categories of PUE products (e.g., mills, sprayers, dryers, fridges, etc.). Future programs may also apply similar methodologies to collect data based on e-mobility and transport sales.
- **Amount of anticipated income generation resulting from PUE equipment sales**
  - This is a useful indicator that PAOP recommends using in future programs. If applicable, to specify the nature of Power Africa support, this indicator could be divided between facilities electrified through grants and through technical assistance.
- **Number of healthcare facilities electrified**
  - This is a useful indicator. Project leaders developed and submitted a methodology to attribute (a) off-grid solar photovoltaic systems ranging in size from 0 to 50+ watt peak (e.g., SHS), (b) mini-grids, and (c) solar photovoltaic pumps replacing diesel pumps in the PUE sector. The formula for (a) and (b) was adapted and simplified from a GGGLA methodology, with the formula for (c) representing the Project’s original thought leadership. Future projects may explore methodologies for calculating emissions avoided systems and equipment beyond these categories. The Project especially recommends that future Power Africa projects explore establishing methodologies to understand carbon dioxide-equivalent reduced, sequestered, or avoided in relation to categories of PUE products (e.g., mills, sprayers, dryers, fridges, etc.). Future programs may also apply similar methodologies to collect data based on e-mobility and transport sales.

**RECOMMENDATIONS FOR FOLLOW-ON WORK**

**ACCESS TO FINANCE**

Tailor technical assistance to the needs of the rapidly maturing off-grid market and tap into new climate funding sources. Investors need support with fundraising, capital deployment, structuring, and innovations on financial products and structures (e.g., climate finance, securitization, and local currency).

- Companies need hands-on financial support to access the capital they need to scale (e.g., Chief Finance Officer services, financial management, legal advisory support, portfolio quality improvements, and fundraising support).
- Continue to prioritize sector-wide initiatives, as Power Africa knowledge products such as the Financial Modeling Tool have been widely adopted across companies and investment portfolios. Plan to provide support focused on removing key barriers for companies to access finance and for investors to deploy capital. Ensure that technical assistance is focused toward closing transactions. Ensure that grants under contract include windows focused on small-scale finance initiatives, and launch requests for proposals in the early stages of the program. Through these grants, support the development and scaling of innovative finance structures and products integrating climate-finance-related concepts such as carbon credits, carbon offsets, and special purpose vehicles (SPVs). Ensure that grants could also focus on expanding sources of financing.

- Ensure that the team has a mix of corporate, project finance experience that includes finance strategy, fundraising, structuring, and innovations on financial products and structures (e.g., climate finance, securitization, and local currency).

**BUSINESS PERFORMANCE**

Build upon previously successful work with supported companies, especially targeting smaller, newer, and local companies for this support, because they benefit the most. Focus on accelerating market entry and expansion through dedicated activities, as these efforts often result in more connections. Serve as a decision hub and connector by providing networking opportunities between off-grid energy sector entities and brokering mutually beneficial strategic partnerships that can serve unmet needs, access new geographies, and enter new markets. Analyze the operations and business models of supported companies to look for opportunities to improve their sales strategies, after-sales service, gender equity, staffing, marketing, and product offerings. Offer capacity-strengthening, coaching, and training support to company leaders and through national energy associations, international industry associations, and peripherally related associations.
matchmaking, and industry training. Build roles and processes on the team for managing relationships, monitoring deliverables, leveraging third-party advisors, and providing follow-up support. Procure third-party advisory support as needed to address specific technical needs of supported partners and entities. Third-party support may include upstream-investment-readiness support for securing early/earlier-stage capital as well as capital for local companies. Types of legal transaction support, for example, may entail facility structuring, transaction closing, research on the legality of new climate-finance funding structures, legal reviews of large, more mature companies with off-balance sheet structures.

Make efforts to promote quality standards, safeguard against counterfeits, and improve the affordability of solar systems. To expedite mini-grid deployment, promote and support policies and regulations that improve the transparency of allocation procedures and simplify the licensing of procedures for operators. Champion modern, innovative, and more efficient technologies for government use (e.g., smart meters and digital procurement platforms), including assisting relevant partners to promote and implement them. Offer to organize, facilitate, and contribute to public-private dialogues that drive enabling environment transformation. Contribute recommendations to national and regional planning and policy efforts for rural off-grid electrification, and advocate for subsidies, incentives, and waivers that facilitate the financial viability of rural off-grid electrification.

Establish the expertise of USAID and Power Africa programs at startup by assessing baseline market information with detailed analyses and widely sharing insights. Publish, disseminate, and provide follow-on support based on tailored resources for key market-related topics and geographical locations in multiple languages according to the needs of the sector. Partner with GOGLA and other industry leaders to offer extensive support, align and communicate with teams and activities that share objectives, and conduct mutually beneficial market information gathering and sharing. Share the best practices from previous activities in one country with companies, associations, and governmental stakeholders leading similar activities in other countries. Ensure that all outputs entail a longer process of follow-up with stakeholders by continually offering support, as most supported stakeholders benefit from more thorough support beyond the initial publishing of market intelligence products and training materials. Pursue innovations and explore their scalability across markets. Lead activities proposing and championing solutions to reaching last-mile customers and electrifying underserved communities.

CROSS-SECTORAL INTEGRATION

Gender

Dedicate significant efforts to identify new funds for potential gender lens investing support, for which there are many opportunities across the sector. Offer gender training and advisory support to funds and development finance institutions to improve the gender equity provisions of their portfolios of investees and offer supplemental technical assistance. Continue technical advisory support to entities which the Project has already supported, for example, with DRC’s National Rural and Urban Electrification and Energy Services Agency (ANSER) to continue the process of implementing the Gender Strategy and Action Plan. Develop guidance and tools to support gender integration into rural electrification project planning, development, and monitoring as well as capacity strengthening. Follow up with previously funded grantees, such as the Kenya-based COIN Fund PUE grantees, to provide further support, as needed, to reach women customers with PUE.

Energy–Agriculture

Identify gaps at each level of local value chains and provide the tailored technical assistance based on stakeholders’ needs. Inform support at other levels, study and focus facilitating PUE as a means to resolve the challenges of and generate greater yields and incomes among smallholder farmers. Help local stakeholders communicate their interests with governmental bodies to inform policy improvements. Dedicate activities in workplans to engaging with, surveying, and providing technical assistance to end-users. In designing future projects, beyond measuring only outputs of project support (e.g., the number of PUE products distributed), examine how key performance indicators can reflect the real impacts from the end-users’ adoption of PUE technology. Understanding distinctive local contexts and addressing end-user needs across regions and supply chains requires keen insights into local perspectives through on-the-ground engagement with the end-users themselves. Alongside support to the companies, provide side support to local communities through the companies or other stakeholders.
HIGHLIGHTS:
GENDER-RELATED INTERVENTIONS
The starting point for all gender-related interventions in the Project was Power Africa’s overall commitment to women, while creating opportunities for women throughout the energy sector value chain. Opportunities to advance this goal were identified under each work stream—business performance, access to finance, policy and regulatory, market intelligence, and energy-agriculture—as well as through the COIN Fund.

Gender integration was aligned with Project targets “Number of new grid and off grid actual direct connections” and “Amount of investment mobilized off grid.” Gender is therefore not an add-on to the Project but key to its success. Informed by the business case for gender equality, the Project aimed to contribute to these targets and deliverable by leveraging gender-smart investment approaches to increase the enrollment and investments into clean energy in sub-Saharan Africa. With this approach, the Project was also able to take a role in emerging areas of women as necessary stakeholders in a clean energy transition and not only as poor electricity customers.

The Project aimed to contribute to these targets and deliverable by leveraging gender-smart investment approaches to increase the enrollment and investments into clean energy in sub-Saharan Africa.

The Project was also able to take a role in emerging areas of women as necessary stakeholders in a clean energy transition and not only as poor electricity customers.

Gender equality was not an add-on to the Project’s core objectives. Gender integration was aligned with Project targets “Number of new grid and off grid actual direct connections” and “Amount of investment mobilized off grid.”

Some highlights from the Project’s gender integration work, including into one annual Partner’s Week.

Four funds realized results from the Project’s significant gender lens investing support. For several years, the Project delivered customized gender-lens-investment training to several funds, for example, in 2022 and 2023.

This supported mobilized capital for a gender lens investing framework for deal support. The COIN Fund supported 87 small and medium-sized enterprises in the sector.

Power Africa’s overarching gender goal: to meet the energy needs of women and girls, and to increase women’s access to energy products and services.

The Project directly supported 23 companies to adopt gender-inclusive policies and practices to target women customers, based on an understanding of women’s energy needs and barriers to access. Companies also recognized the imperative of incorporating gender considerations into their financing strategies. In the SADC region, the Project worked with 10 companies in East Africa to adopt gender-inclusive policies and practices.

More than 500 million people in sub-Saharan Africa do not have access to electricity. These are mostly women and girls as well as marginalized communities. The Project was created to unlock a $100 billion annual investment in energy in the region.

Grants under contract led to clear outcomes among women in off-grid communities in Kenya. Through the COIN Fund, Power Africa provided $100,000 in four PUE companies in Kenya for peer-to-peer mentorship and training for PUE women customers. Results included the uptake of PUE by 96 new customers (65 women) and 4,787+ potential new customers identified by project outcomes.

The Project was also able to take a role in emerging areas of women as necessary stakeholders in a clean energy transition and not only as poor electricity customers.

Support for developing a gender action plan and adopting gender inclusive policies and practices helped unlock a $1 billion investment from the CDC Group, a multilateral donor. Support for developing a gender action plan and adopting gender inclusive policies and practices helped unlock a $1 billion investment from the CDC Group, a multilateral donor.

The Project was also able to take a role in emerging areas of women as necessary stakeholders in a clean energy transition and not only as poor electricity customers.

The Project worked with ANSER to integrate gender considerations into its projects and strategies. PAOP introduced to PUE (2,276+ women) in four months a gender strategy to promote gender equality.

The Project worked with ANSER to integrate gender considerations into its projects and strategies.

Through the COIN Fund, Power Africa provided $100,000 in four PUE companies in Kenya for peer-to-peer mentorship and training for PUE women customers.
I feel so secure when I’m being called when a mother comes in at night. Power has really made me feel so free. It makes my work so easy.

JACQUI, MIDWIFE, BUGANA, UGANDA

“You have to improvise to save life,” remarked Brenda, sitting outside Namatale Healthcare Center on Buvuma Island in the Ugandan waters of Lake Victoria. As Namatale’s medical-records officer, Brenda recalled the working conditions at the clinic before Power Africa grantees SustainSolar and Equatorial Power equipped the facility with its solar-energy system and water purifier. At night, staff held torches between their teeth or lit candles to attend to mothers giving birth. Despite its location near the shore of a vast lake, the clinic’s only sources of safe drinking-water were rainfall and jerrycans brought over long distances from the mainland.

Today, “there is a great change,” noted Samuel, a nursing assistant at Namatale clinic. “The laboratory is functioning well. Any time—at night, or even at midnight—whoever comes in, the light—everything is just clear. You can do something: writing, examining patients, suturing, delivery.”

The round-the-clock services that lighting and electricity have brought to Namatale are saving precious time for patients. “They do appreciate the services,” Brenda illustrated:

A woman had an accident. She got a cut [on her head]; she was bleeding seriously. When she came, she was helped. The bleeding stopped and they [the facility’s staff] cared for her—she got treatment. Then she said the following morning: “Thank you so much. I was to die. If I was to cross the water to go for services in Jinja, I would have died on the way. Now I’m alive because of the service here. It’s near.”

To help the clinic make the most of its solar array, Power Africa’s grantees also installed refrigerators, autoclave sterilizers, incubators for infants, and a water-purification facility. “Everybody knows they can get clean water here; they collect water,” Samuel said. “Our water is purified well from our power.”

POWER AFRICA’S $3 MILLION IN GRANTS ELECTRIFY 227 OFF-GROUND HEALTHCARE FACILITIES, HELPING 2 MILLION PEOPLE LEAD HEALTHIER LIVES

Uganda’s islands pose unique challenges for patients and electricity utilities alike. Nevertheless, the clinics in these areas share many of the difficulties experienced at off-grid healthcare centers across the continent. Common issues are a lack of lighting which hinders night-time care, long travel times to better equipped healthcare facilities, and vaccine shortages due to unreliable refrigeration. These limitations are one reason the highest mortality rates for mothers and children younger than five occur in the world’s least-electrified regions. Although the challenges are longstanding,
“You have to improvise to save life,” remarked Brenda, sitting outside Namatale Healthcare Center on Buvuma Island in the Ugandan waters of Lake Victoria. As Namatale’s medical-records officer, Brenda recalled the working conditions at the clinic before Power Africa grantees SustainSolar and Empowering Power equipped the facility with its solar-energy system and water purifier. At night, staff held torches between their teeth or lit candles to attend to mothers giving birth. Despite its location near the shore of a vast lake, the clinic’s only sources of safe drinking-water were rainfall and jerrycans brought over long distances from the mainland.

Today, “there is a great change,” noted Samuel, a nursing assistant at Namatale clinic. “The laboratory is functioning well. Any time—at night, or even at midnight—whomever comes in, the light—everything is just clear. You can do something: writing, examining patients, suturing, delivery.” The round-the-clock services that lighting and electricity have brought to Namatale are saving precious time for patients. “They do appreciate the services,” Brenda illustrated:

A woman had an accident. She got a cut [on her head]; she was bleeding seriously. When she came, she was helped. The bleeding stopped and they [the facility’s staff] cared for her—she got treatment. Then she said the following morning: “Thank you so much. I was to die. If I was to cross the water to go for services in Jinja, I would have died on the way. Now I’m alive because of the service here. It’s near.”

To help the clinic make the most of its solar array, Power Africa’s grantees also installed refrigerators, autoclave sterilizers, incubators for infants, and a water-purification facility. “Everybody knows they can get clean water here; they collect water,” Samuel said. “Our water is purified well from our power.”

Uganda’s islands pose unique challenges for patients and electricity utilities alike. Nevertheless, the clinics in these areas share many of the difficulties experienced at off-grid healthcare centers across the continent. Common issues are a lack of lighting which hinders night-time care, long travel times to better equipped healthcare facilities, and vaccine shortages due to unreliable refrigeration. These limitations are one reason the highest mortality rates for mothers and children younger than five occur in the world’s least-electrified regions. Although the challenges are longstanding, effective methods to solve them have only begun to emerge. A traditional healthcare-electrification model is to donate solar systems to clinics, an approach that has often neglected the monitoring and maintenance required to keep the equipment running. In 2020, Power Africa requested proposals from the private sector to offer reliable, long-term power provision for off-grid healthcare. Later that year, Power Africa awarded $2.6 million in grants to nine companies to pilot their business models to
Since the solar power came, the clinic offers more services and more people from the community visit the clinic for check-ups and when they are ill.

MME MOLAPO, LOCAL CHIEF, TLHANYAKU, LESOTHO

supply cleaner, more reliable energy to clinics. With this grant yielding 220 electrified healthcare centers in nine African countries, Power Africa followed it with a $363,000 grant to electrify services for mothers and children, electrifying seven additional facilities in Malawi and Uganda.

“Let’s go to Bugana”: Patients and staff enjoy enhanced care and convenience

On top of more advanced care, electrified clinics also offer psychological benefits because of improved security, convenience, and staff morale. All these advantages are evident at Bugana Healthcare Center, which Uganda’s Ministry of Health has upgraded from a Tier II to Tier III facility thanks to Power Africa’s grant. “Now with stable power and vaccines in place, we are able to schedule our vaccine days and our mothers come and get what they expected to get without any inconveniences,” said Jean-Pierre, Bugana’s facility manager.

Situated in Uganda’s Namayengo District, Bugana serves approximately 15,000 people, some living in island communities ten kilometers away by boat. Today, the clinic’s solar-energy systems power more advanced services which save patients up to 40 kilometers in travel distances. Bugana now employs 16 additional healthcare staff, offers 24-hour care, processes up to ten times more rapid diagnostic tests a month, and has seen ten times the number of expectant mothers delivering each month. For Jacqui, a midwife at Bugana, reliable energy has been essential to her and her patients’ wellbeing. “I’m also happy, as staff, having power around. I feel so secure when I’m being called when a mother comes in at night. Power has really made me feel so free. It makes my work so easy.” With the sense of security that lighting brings, mothers are seeking the facility’s services around the clock. “They come anytime,” said Jacqui. “Every time is good for them, even during the night hours because of the power supply and we, the staff, being around. […] Mothers feel so free coming anytime.”

With clean, reliable power enabling higher-tier care for Uganda’s island residents, it is no surprise that, in the words of a local leader, “the community advised themselves, ‘Let’s go to Bugana,’ because there is good service for our people.”
“When you go to a Zembo swapping station, it takes less than two minutes to get a fully charged battery and be on the road again,” says Constant, one of the first e-motorcycle drivers in Kampala. For drivers, time is money. A resident of Kampala, Uganda’s capital and most populous urban center, Constant lives alongside 1.7 million people, 65 percent of whom are of working age. Every day, this workforce of more than 1 million take to the streets, using the safest, most affordable means of transportation available. At the top of the list, according to the latest survey by the Government of Uganda, are two-wheeled vehicles, including hundreds of thousands of motorcycle-taxis. Locals have come to rely on these motorcycle-taxis, or boda bodas, for their compact size and maneuverability across a terrain of hills and floodplains, rugged road conditions, dense traffic congestion, and unpredictable circumstances.

With Uganda’s population growing by three percent each year, demand for boda bodas is on the rise, and ferrying riders from point A to B has become Uganda’s second-most-common profession. Drivers are predominantly young men, and studies estimate that some 750,000 people in Kampala depend on their income. Contributing to the boda boda boom, mobile-phone apps like SafeBoda, Uber, and Bolt have streamlined the pickup process and facilitated cashless mobile-money payments for riders. Boda bodas have become so prevalent, and so fundamental to the flow of daily life, that authorities have helped develop the once-informal sector by building new infrastructure, including an intercity electric corridor, and accelerating efforts to train and register drivers.

Unfortunately, as the world faces a global climate-change crisis, the vast majority of boda bodas still run on fossil fuels. The carbon dioxide they discharge is detrimental to both the earth’s atmosphere and local air quality, contributing to Kampala’s ranking as the fifth most polluted city in Africa (according to IQ Air’s 2020 World Air Quality Report), while the clamor of their engines exacerbates the city’s noise pollution. To address these challenges, with Power Africa’s support, local business Zembo Motorcycles has been fast-tracking the transition of Kampala’s transport sector toward renewable energy, one boda boda at a time.

Driving toward net-zero emissions

Since the founding of Zembo in 2017 by two engineers, Étienne Saint-Sernin and Daniel Dreher, its flagship electric motorcycle has become more than just a climate-friendly alternative; it has inspired confidence in Ugandan drivers and riders alike and surpassed traditional gasoline-powered vehicles in several notable ways:

1. Zembo e-motorcycles effectively mitigate climate and air quality risks, as they emit no greenhouse gases, particles, or pollutants, and their 27 lithium-ion battery-charging stations largely run on solar power.
2. In contrast to the cacophony of an internal combustion engine, an e-motorcycle is virtually noiseless, benefiting anyone within earshot of roads.
3. While the superheated exhaust pipes of gasoline-powered motorcycles put riders at risk, e-motorcycles operate at safe temperatures and emit no fumes.
4. Traditional motorcyclists lose precious time at the pump and have to endure soaring gasoline prices, but e-motorcyclists incur only minimal costs and no delays during two-minute pit stops at Zembo’s battery-swapping stations.
5. Fuel-powered vehicles are subject to market shocks and price hikes, while Zembo’s mix of hybrid energy sources is resilient and sustainable.
6. With one affordable initial down payment, aspiring drivers can start their careers with a two-year pay-as-you-go agreement and warranty.
7. E-motorcycles offer a number of user-friendly features, such as a dashboard to monitor the 60-kilometer (~37 mile) range of each battery, charging ports for mobile phones, anti-theft wheel-locking remotes, company-controlled remote shutdown and tracking capabilities, and disc brakes for increased safety in wet conditions.

8. Under a battery-as-a-service model, Zembo retains ownership of all its high-capacity batteries and ensures the circular economy by monitoring battery lifecycles, maximizing battery utility, and repurposing battery components according to environmental best practices.

With this environmentally and economically valuable product and business model, Zembo has continued to expand its customer base and operations, facilitating the transition of the 90 percent of drivers in Kampala that do not own an electric vehicle. E-motorcycles have been a boon to boda boda drivers, who demonstrate a 60 percent increase in profits upon ownership. In partnership with the government, Zembo has broadened its network of conveniently located charging stations to rural villages, creating more green jobs, ushering more young professionals into the energy sector, and increasing ridership. What’s more, in early 2023, the Ugandan government announced its historic plan—a first in the region—to offer its citizens the opportunity, at no cost, to replace their gasoline-powered motorcycles with electric ones.

Unlocking finance to transform the transport sector

In late 2020, Power Africa helped Zembo secure more than $790,000 in grant funding from USAID’s Development Innovation Ventures. The company acknowledged that Power Africa’s “wise and detailed advice on our proposal, during the complex application process, was crucial for the formulation and the credibility of this project. It significantly contributed to the success of this application.” Since then, Power Africa has provided continual advisory support for Zembo’s business and financial practices, playing an especially instrumental role in guiding the company to obtain further equity. In late 2021, this assistance resulted in a successful investment of more than $3 million from three European investors: InfraCo Africa, DOB Equity, and Mobility 54. Zembo stated its appreciation for Power Africa’s “field-oriented advice, corresponding to real needs we have in daily operations, financial organization, training of the accounting and finance team, and structuring of our processes.”

The road ahead

Having successfully unlocked more than $3.7 million in funding with Power Africa assistance, Zembo is well on its way to expanding its current fleet from 200 to 2,000 motorcycles, adding more than 60 battery stations, and reaching more female drivers. The company’s expansion translates into greater job creation for youth, higher incomes for boda boda drivers, healthier quality-of-life conditions for Kampala, and a better carbon footprint for the world.
Since the solar power came, the clinic offers more services and more people from the community visit the clinic for check-ups and when they are ill..

MME MOLAPO, LOCAL CHIEF, TLHANYAKU, LESOTHO

After seven years as a sales agent for Deevabits Green Energy in eastern Kenya, Teresaa Mums is known to the off-grid communities she visits, and the women’s club she leads, as Mama Taa (“light-bringing mother”). Mums recently sold a Sun King Home 120 solar home system (SHS) to Peter Musyoki, a husband and father of three children, and recalls the family’s reaction to turning on the unit as being “overjoyed by the presence of light,” so much so that they recommended the product to friends and family.

With their new SHS, everyone in the Musyoki household realized quality-of-life improvements: Peter and his wife could listen to radio news and charge their mobile phones, their children could study after dark without costly kerosene lighting, and the whole family could enjoy the benefits of nighttime lighting for security. It was a transformative moment for the Musyoki family, and a moment that more and more Africans are experiencing every year. Power Africa is helping to bring that moment to more than half of the 471 million people in sub-Saharan Africa who still lack electricity, as well as the 1.4 billion people across the continent who stand to benefit from the promise of solar technology.

Tracing the Musyoki family’s SHS backwards from its point of sale offers a glimpse into Power Africa’s role as a pivotal change-maker. Before reaching end users, SHS products are subject to multi-scale coordination across the value chain—from investor to manufacturer to distributor to last-mile sales agent. Power Africa is involved in all these processes, supporting its partners to advance SHS quantity, quality, and delivery speed.

Deevabits Green Energy, the Local Distributor

Six kilometers from the nearest town, Kwa Mutuna, lies the Musyoki family’s hilly off-grid village of Nyumbani, where Deevabits Green Energy became the first local company to sell SHS. To travel to hard-to-reach communities like Nyumbani, Deevabits trains a commission-based sales force of over 450 people, mostly women and youth Village Solar Entrepreneurs. To date in 2023, this sales model has allowed the company to sell 30,000 solar products, with affordable pay-as-you-go options, to benefit more than 150,000 Kenyans. Power Africa has been supporting Deevabits since 2016 and since 2020 has fostered its growth by supporting gender integration and access to finance.
Power Africa helped Sun King qualify for gender-lens financing under 2X Challenge accreditation, which enabled the company to close a $10 million transaction to expand its operations and mitigate legal and financial risks during the closing process for a successful $80 million transaction in Kenya.

Power Africa supported Deevabits by developing a gender-lens investing framework for deal screening, underwriting and monitoring and evaluation, which is applying to all investments. This includes an innovative provision for investees to develop a gender action plan, with Power Africa’s support, within 90 days of signature.

Gender integration. Equipped with Power Africa’s tailored recommendations for gender equality and inclusivity, Deevabits refined its internal policies and practices. Power Africa helped Deevabits survey female customers to understand this customer base and develop a Gender Action Plan. Based on these survey results and 899 responses from multiple customers, Power Africa published Reaching Women, Unlocking Value: How Gender Inclusivity Boosts Customer Satisfaction for Off-Grid Solar Products, a resource open to all companies and investors.

Winning three funding opportunities. With Power Africa support, Deevabits won financing from three separate funds to enhance its last-mile distribution, thus expanding its reach from 13 to 25 counties across Kenya. Power Africa supported Deevabits in major ways:

- Introduced Deevabits to the, assisted with its business model enhancements and investor presentations, and supported the drafting of its winning application.
- Reviewed the company’s financial model, coached its leadership, brokered partnerships, and provided gender-mainstreaming recommendations to meet the requirements of the.
- Offered application assistance, resulting in Deevabits receiving an award under the.

Sun King, the Manufacturer

Before the Musyoki family purchased its SHS from Deevabits, the company procured the unit from a product designer and manufacturer called Sun King. This US-based company is one of the largest distributors of SHS systems in sub-Saharan Africa, and its pay-as-you-go products have benefited more than 90 million people worldwide. Contributing across the continent; and financing support. Notably,

Power Africa and Sun King’s growth and expansion, Power Africa provided significant market intelligence; policy, tax, and import guidance; strategic partner introductions across the continent; and financing support. Notably,

System-level impacts

Deevabits and Sun King represent just two of the 604 companies that Power Africa Off-grid Project has helped to resolve challenges, accelerate sales, and expand customer reach. Likewise, , and are just three of the 362 investors and financial institutions that Power Africa Off-grid Project has supported over the past five years, with executive coaching, portfolio management support, and more. Not only is Power Africa’s support individualized to particular investors, manufacturers, and distributors; its guidance has affected system-level change on a wider scale, resulting a better enabling environment for SHS to flourish. Each strategic optimization set in motion by Power Africa ripples across the value chain, enabling more households, like that of the Musyoki family, to enjoy the benefits of SHS.

The investors

Beyond helping companies like Sun King and Deevabits Green Energy, Power Africa recognizes that unlocking more investment is an essential ingredient to getting more SHS units into more homes. To this end, Power Africa provides technical assistance to investors to structure financial vehicles, perform due diligence on companies, and facilitate transactions. In this case, Power Africa supported the three funds in major ways:

- Across many funding rounds, Power Africa supported’s market studies, introduced it to stakeholders, and clarified contract details to expedite contracts.

The OFF-GRID PROJECT

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- Power Africa helped structure and enact this $80-million fund and helped it to comply with the gender requirements of the Green Climate Fund, which resulted in raising $80 million, a loan, prioritizing businesses with women leaders, helped firms maintain solvency, staff, and products as they recovered from the economic effects of COVID-19. Power Africa also developed an Environmental and Social Governance (ESG) tool, including climate-finance provisions to reduce 1.3 million tons of carbon dioxide equivalent in emissions, and strengthened the capacity of senior leadership and staff in gender lens investing. As a result, it has received more than 500 applications.

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I am very grateful to you for all the multifaceted support Power Africa has given. We salute the professionalism and dedication that you have demonstrated through our various SHS activities and PUE projects.

MOULAY BACHIR BENDEEKEN, PRESIDENT, THE BENALYA GROUP, NIGER

POWER AFRICA OFF-GRID PROJECT

NIGER’S LOCALLY OWNED BENALYA GROUP LAUNCHES SOLAR GREENHOUSES FOR DESERT AGRICULTURE

As a young child in Agadez, Niger, Moulay Bachir Bendekken contracted polio. It took years of orthopedic care before he could walk on crutches – which, from the age of seven, was how he made his daily two-mile journey to school. Although his family had no formal education, Moulay excelled as a student; so much so that after graduating from high school, he went on to study electrical engineering, electronics, and information technology. The aptitude and the resilience he cultivated in childhood prepared him well for the business world, which he entered with a desire to “start small but see big.”

After Moulay’s first two entrepreneurial ventures, he founded the Benalya Group in 2010, a company focused on the energy, agriculture, and water sectors. Dedicated to social responsibility and results-based management, the Benalya Group has become a leading provider of energy solutions in Niger.

Benalya operates in the solar energy sector under the banner of Benafsol, and offers an array of solutions for off-grid power generation. Its products include solar lighting and home system kits from U.S.-based distributor Sun King, and larger systems for cooling and targeted practical applications. The company prides itself on its customer support; it is not only a contractor, but a partner. For example, when asked by a customer to install a pump to supply water to cattle, the company not only installed the pump, but recommended that the customer grow alfalfa as animal feed. When contracted to install 115 solar streetlights, the company proposed – within the same budget – installing standard streetlights on direct-current mini-grids, which could also power a pump to provide drinking water to the nearby community. Benalya also provides productive use of energy (PUE) solutions for water treatment, water pumping, drilling, irrigation, and food processing, including integrated solutions such as its innovative solar greenhouse.

In Niger, off-grid products are in high demand, with the Benalya Group selling hundreds of products every month. Niger has one of the lowest electrification rates in Africa; nearly 84 percent of its population lives in rural areas, but less than four percent of rural households have access to electricity.

The solar greenhouse

In 2021, the Benalya Group conceptualized and won support for its pioneering PUE activity, the Sahel Solar Greenhouse Project (Projet Serre Solaire du Sahel), a fully integrated solution for agricultural production in the sandy plains of the arid Sahel region. The concept won co-funding through a grant from Energy Saving Trust (EST) under the Efficiency for Access ( EfA) Research and Development Fund, and was supported by agronomists from two implementation partners, the nongovernmental organization N-DEV and the Institute of Radioisotopes (Institut des Radio-isotopes [IRI]). Customizable to sizes of 200m², 500m², or more, each greenhouse leverages 100 percent solar energy, allowing for control of indoor temperature in the range 26–30°C – enabling all-season agricultural production in Niger’s hot (typically 55°C) climate. The greenhouse’s solar energy powers a water pump, misting system, air blowers and ventilation, smartphone-compatible data-recording interface, and other customizable electronic devices to control temperature, humidity, sunshine, wind, and pests.

Equipping locals with the means to cultivate rice and other garden crops, in conditions that would otherwise be challenging, increases incomes, nutrition, food security, and climate resilience. In 2017, 20 percent of the Nigérienne population faced food and nutritional security issues.

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with women and rural residents disproportionately affected. The solar greenhouse allows for consistent agricultural yields per square meter throughout the year, dry and rainy season alike. Over the course of 15 months beginning in 2021, the Benalya Group trained 134 women in the use of its product, and provided specialized training to 23 women in greenhouse nursery production. These women participated in the planting and production of 110,000 tomato plants (especially suited to drying and storage) in partnership with the German development agency GIZ’s Promotion of Agricultural Production (PromAP) program.

Power Africa has supported the Benalya Group with its solar greenhouse project from beginning to end, helping the team draft its winning concept note; facilitating meetings with EST, local mayors, and women’s groups; providing information on integrated technology; mapping stakeholders with a participatory market-system-development approach; and advising on water access, business model, and commercialization, customer payment plans, and the first greenhouse test.

In 2023, Power Africa facilitated working sessions to support the Benalya Group’s grants under the Efficiency for Access Coalition (EforA), capturing impacts of the greenhouse pilot projects, assessing approaches to upscale its success, and improving the agricultural practices for youth and women. Power Africa also supported the Benalya Group’s successful efforts to be selected for the Great Green Wall, an initiative of the United Nations Convention to Combat Desertification (UNCCD).

Five years of Power Africa support

Power Africa’s partnership with the Benalya Group dates back to 2018, when USAID coordinated meetings between Benalya and a telecommunications company for a potential pay-as-you-go (PAYGO) partnership to reduce the upfront cost of solar products. The partners have since implemented a PAYGO platform, designed by the U.S. company Angaza, which has made Benalya’s products more affordable for low-income communities. In 2020, Power Africa helped the Benalya Group install solar systems across seven off-grid localities, under the Government of Niger’s Light Up Niger Rural Communities initiative. In 2021 and 2022, Power Africa continued to assist the company by brokering new partnerships (for example, with microfinance institutions, donor programs, and compatible companies) and providing insights on the off-grid market, business performance optimization, new sources of funding, and PUE product development.

The growth of the Benalya Group demonstrates Moulay’s hard work and determination, while the company’s integration of multiple product lines into holistic solutions is a testament to its successful localized awareness and leadership. For the solar greenhouse project, off-grid Sahelian communities can now cultivate previously ungrowable, highly nutritious, income-generating crops year-round, while 134 local women are now well-versed in sustainable growing practices. These achievements underpin Power Africa’s commitment to assisting local companies in nascent markets, so that “start small and see big” can change lives in lasting ways.

“I am very grateful to you for all the multifaceted support Power Africa has given. We salute the professionalism and dedication that you have demonstrated through our various SHS activities and PUE projects at the Benalya Group. Your consistent positive attitude has made a huge difference in our business. One of the notable successes of your collaboration with our company is the $100,000 grant that we received from the Energy4Efficiency R&D Fund to develop the solar greenhouse project in Niger. Your firm commitment throughout the development of the concept note, detailed proposal phase, and finalization of the grant agreement was greatly appreciated and has made it possible to carry out today this innovative and highly relevant project for Niger.”

—MOULAY BACHIR BENDJEKKE, PRESIDENT, BENALYA GROUP

MOULAY BACHIR BENDJEKKE DISPLAYS HIS COMPANY’S SOLAR HOME SYSTEM PRODUCTS NIGER.

Photo credit: Benalya Group
The end of 2020 marked a new beginning for off-grid energy companies in Cameroon, with the launch of the Cameroon Association of Off-grid Electrification Professionals (Association des Professionnels de l’Electrification hors réseau du Cameroun), or APELCA. Since then, among its other accomplishments, APELCA has helped the Government of Cameroon pass more-informed national policy and regulations—a testament to how associations can achieve more collectively than any single company can achieve on its own.

The transformative potential of associations
Associations are a boon to a country’s enabling environment and to all companies that operate within it. Internally, association members can productively network with fellow members, and business-to-business matchmaking often leads to mutually beneficial partnerships. Externally, member companies enjoy easy access to an extensive range of partnerships with investors, donors, nongovernmental organizations, academic institutions, and businesses outside the sector.

Associations offer their members opportunities for knowledge sharing and capacity building, through open discussions at meetings and third-party trainings. They circulate news and connect members with global industry associations, such as GOGLA. Associations also serve as mouthpieces for public awareness raising and governmental advocacy. They aggregate and communicate member and end-user priorities and ideas so as to foster innovation, investment, and market expansion. Wherever associations form, cross-ministerial governmental officials come to rely on them as a first point of contact when crafting and fine-tuning policies and regulations, organizing participatory stakeholder feedback, and designing electrification strategies and programs. Finally, associations facilitate sector-wide coordination during crises such as COVID-19, and can help address supply-chain challenges to advance energy access in off-grid communities.

Power Africa’s support to APELCA
Since the association’s inception, Power Africa has helped APELCA grow, prosper, and endure. It started in 2020 when the local Cameroonian company upOwa sought Power Africa’s support to facilitate its first meeting with members Canopy, Renewable Energy Investors Cameroon (REIC), and Solectivem, and a second meeting with GOGLA. Power Africa equipped APELCA with the resources to draft its constitution, drawing from similar associations in Kenya and the Democratic Republic of Congo. After guiding APELCA’s office setup, Power Africa advised the association on value-added tax exemptions, harmonized system codes, and customs duties. This guidance informed APELCA’s letter to Cameroon’s national regulatory agency on customs requirements, with clarifications that would benefit all international off-grid energy product imports. Through Power Africa’s support, APELCA shared new business opportunities with upOwa’s growing membership, including calls for productive use of energy (PUE) solutions for large-scale farms and medical caravans in rural areas.

In 2022, after two years of development, APELCA coordinated, published, and disseminated its most in-depth work to date—an off-grid electrification white paper with seven propositions to improve the enabling environment, accelerate electrification, and boost PUE integration in Cameroon. The white paper includes information on product standards and quality, taxes and customs duties, regulations, local funding, mini-grid development support, advocacy, and off-grid energy provisions in Cameroon’s national electricity access policy. In 2023, the association’s agenda included further advocacy for an import-duty waiver, importation guidelines for solar products, a resolution for quality standards, and collaboration with GOGLA and the United Nations Industrial Development Organization. Power Africa supported APELCA to negotiate and sign its first collaborative contract with GOGLA to develop importation guidelines in Cameroon and establish a consultative platform to facilitate public-private dialogue.

Power Africa’s new association unified and empowered the off-grid energy sector
GOGLA and the United Nations Industrial Development Organization. Power Africa supported APELCA to negotiate and sign its first collaborative contract with GOGLA to develop importation guidelines in Cameroon and establish a consultative platform to facilitate public-private dialogue.

20 off-grid energy associations across sub-Saharan Africa
Since 2019, Power Africa has similarly supported 20 off-grid energy associations in Sub-Saharan Africa, including four that were newly founded (see map on next page).
Enduring, self-sustaining support structures

Off-grid energy companies and their end users have realized tangible benefits as a result of Power Africa’s efforts to unify, coordinate solutions, and broker effective partnerships through associations. By belonging to associations, not only are companies better able to build their networks, but they can also enhance their service delivery and offerings, increase their capital and connections, and explore new feasibility markets. Associations stabilize the off-grid sector and help local companies cope with unpredictable market events, supply chain challenges, and climate change impacts. As the indispensable support structures that associations afford their members are self-sustaining with or without Power Africa’s support. For this reason, as APELCA continues to reinforce its members’ efforts to reach the 60 percent of communities in Cameroon without electricity, its influence and impact will grow accordingly.
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<td>Microfinance Webinar 4: Developing an Energy Finance Product</td>
<td>2020</td>
<td><a href="https://www.youtube.com/watch?v=1vEi7Dd17N0&amp;list=PLHQub6j97Y6Amovn">https://www.youtube.com/watch?v=1vEi7Dd17N0&amp;list=PLHQub6j97Y6Amovn</a>...</td>
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<td>Microfinance Webinar 5: Rollout of Renewable Energy Finance Products</td>
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<td><a href="https://www.youtube.com/watch?v=1vEi7Dd17N0&amp;list=PLHQub6j97Y6Amovn">https://www.youtube.com/watch?v=1vEi7Dd17N0&amp;list=PLHQub6j97Y6Amovn</a>...</td>
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<td>Webinar: Accelerating Climate Investment in Africa Using Structured Finance to Scale Clean Energy Innovation</td>
<td>2022</td>
<td><a href="https://www.youtube.com/watch?v=MCfZF6qzgpQ">https://www.youtube.com/watch?v=MCfZF6qzgpQ</a></td>
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<td>Improving Livelihoods through Clean Energy</td>
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<td><a href="https://powerafrica.medium.com/improving-livelihoods-through-clean-energy-eb354a4c9e89">https://powerafrica.medium.com/improving-livelihoods-through-clean-energy-eb354a4c9e89</a></td>
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<td>Power Africa Awards Four Grants to Promote Productive Uses of Energy to Empower Kenyan Women</td>
<td>2023</td>
<td><a href="https://powerafrica.medium.com/power-africa-awards-four-grants-to-promote-productive-uses-of-energy-to-empower-kenyan-women-fece0e9af0fe">https://powerafrica.medium.com/power-africa-awards-four-grants-to-promote-productive-uses-of-energy-to-empower-kenyan-women-fece0e9af0fe</a></td>
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<td>Promoting Women's Leadership on Climate Change</td>
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## SUPPORTED ASSOCIATIONS

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<tr>
<th>COUNTRY</th>
<th>NAME</th>
<th>OFF-GRID ENERGY</th>
<th>NEW OR EXISTING</th>
<th>EARLIEST MENTION</th>
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<tbody>
<tr>
<td>Cameroon</td>
<td>Association of Off-Grid Electrification Professionals of Cameroon (Association des Professionnels de l'Électrification hors réseau de Cameroun [APELCA])</td>
<td>Off-grid energy</td>
<td>New</td>
<td>2020</td>
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<tr>
<td>CIV</td>
<td>AFRICAN Association of Renewable Energy Professionals of Ivory Coast (Association des Professionnels des Energies Renouvelables de Côte d'Ivoire)</td>
<td>Off-grid energy</td>
<td>New</td>
<td>2019</td>
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<tr>
<td>CIV</td>
<td>AEER. Ivorian Association of New and Renewable Energies (Association Ivoirienne des Energies Nouvelles et Renouvelables)</td>
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<td>2020</td>
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<tr>
<td>CIV</td>
<td>FICER - Fédération Ivoirienne des Associations et Éfficacité Énergétique, Énergie Renouvelable et Climat (FICER)</td>
<td>Off-grid energy</td>
<td>Existing</td>
<td>2022</td>
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<tr>
<td>CIV</td>
<td>ACERD Congolese Association for Renewable and Decentralized Energy (Association Congolaise pour les Energies; Renouvelables et Décentralisées)</td>
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<td>Existing</td>
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<td>Ethiopia</td>
<td>Ethiopia Solar Energy Development Association (ESEDA)</td>
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<td>Association of Ghana Solar Industries (AGSI)</td>
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<td>Kenya</td>
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<td>Liberia</td>
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<td>Off-grid energy</td>
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<td>Mali</td>
<td>National Federation of Electricity, Electronics, and Renewable Energy of Mali (Fédération Nationale de l’électricité, de l’électronique, et des énergies renouvelables du Mali [FENEM])</td>
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<td>Association for Electric Mobility and Development in Africa (APMDA)</td>
<td>Off-grid energy</td>
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<td>2023</td>
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<td>NRECA National Rural Electric Cooperative Association</td>
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<td>Cameroon</td>
<td>ASCOVPE Association of Skills for a Better Life (L'Association des Compétences pour une Vie Meilleure)</td>
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<td>SODECOTON Cameroon Cotton Development Association (Société de Développement du Coton du Cameroun)</td>
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<td>Tanzania</td>
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### Supported U.S. Companies

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**TOTAL: 136**

**TOTAL: 137**
### COIN FUND GRANTS

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<th>PERIOD OF PERFORMANCE</th>
<th>ANTICIPATED IMPACT</th>
<th>IMPACT TO DATE</th>
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<tr>
<td><strong>AMERICAN ENGINEERING GROUP (AEG) CONGO</strong></td>
<td>$199,348</td>
<td>Non-U.S. (The organization is an affiliate of a U.S. entity called AEG International)</td>
<td>Democratic Republic of the Congo</td>
<td>Develop an offline Android application for PAYGO monitoring, evaluating, and learning efforts and create a defined distribution network of Firefly PAYGO sales agents and technicians, all with access to appropriate communication technologies</td>
<td>March 1, 2020–August 31, 2021</td>
<td>Improved Android PAYGO application, with a projected 6,000 off-grid connections in Year 1 (Y1)</td>
<td>Completed development of offline PAYGO application, SHS sales totaling 198 kits</td>
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<tr>
<td><strong>BBOXX CAPITAL RDC</strong></td>
<td>$199,360</td>
<td>Non-U.S.</td>
<td>Democratic Republic of the Congo</td>
<td>Introduce PAYGO solar energy solutions to DRC’s Ituri and Grand Nord regions by establishing a distribution network and points of service for sales and customer support</td>
<td>March 1, 2020–August 31, 2021</td>
<td>Extended PAYGO solar energy solutions, with an estimated 6,000 off-grid connections in Y1</td>
<td>Opened 3 retail outlets, SHS sales totaling 2,339 kits</td>
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<tr>
<td><strong>IGNITE POWER</strong></td>
<td>$196,142</td>
<td>Non-U.S.</td>
<td>Sierra Leone</td>
<td>Expand Ignite Power’s clean energy distribution network to eastern Sierra Leone, and leverage partnerships with rural entrepreneurs, independent village agents, savings groups, local distributors of electronic products, and youth groups to serve rural off-grid communities</td>
<td>March 1, 2020–August 31, 2021</td>
<td>Expanded clean-energy distribution, with an anticipated 12,500 off-grid connections in Y1</td>
<td>Operation expansion activities completed, SHS sales totaling 3,542 kits</td>
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### WINDOW 2: DISTRIBUTED ELECTRICITY SERVICES AND MODERN COOKING FUEL DELIVERY GRANTS

<table>
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<tr>
<th>GRANTEE NAME</th>
<th>TOTAL AMOUNT</th>
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<th>PURPOSE</th>
<th>PERIOD OF PERFORMANCE</th>
<th>ANTICIPATED IMPACT</th>
<th>IMPACT TO DATE</th>
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<tbody>
<tr>
<td>upOwa</td>
<td>$191,225</td>
<td>Non-U.S.</td>
<td>Cameroon</td>
<td>Upgrade upOwa’s PAYGO software and conduct area mapping of the East Region of Cameroon to adapt and replicate the company’s marketing and distribution strategy to be region-specific. The marketing strategy adaptation will include upOwa employing sales and customer support staff from the East Region.</td>
<td>March 1, 2020 – August 31, 2021</td>
<td>Upgraded PAYGO software, with an anticipated 7,000 off-grid connections in Y1</td>
<td>SHS sales totaling 3,401 kits</td>
</tr>
<tr>
<td>LivelyHoods</td>
<td>$215,041</td>
<td>U.S.</td>
<td>Kenya</td>
<td>Establish a credit program for households to obtain more affordable LPG cooking and SHS in urban locations and expand activities to peri-urban and rural areas where households typically have lower incomes.</td>
<td>July 1, 2020 – October 31, 2021</td>
<td>Up to 900 combined LPG products and off-grid SHS connections in Y1 and Y2.</td>
<td>Sold 903 LPG and SHS bundles</td>
</tr>
<tr>
<td>Bboxx Capital</td>
<td>$249,904</td>
<td>Non-U.S.</td>
<td>Kenya</td>
<td>Assess how LPG cooking and SHS can be combined to offer more affordable modern energy to households in a viable manner. Evaluate how to use the existing infrastructure of the SHS business unit to leverage and maximize LPG sales.</td>
<td>July 1, 2020 – October 31, 2021</td>
<td>Improved access to combined LPG cooking solutions and SHS for an estimated 400 households and businesses. Opened 2 of 2 LPG and SHS retail outlets and sold 488 LPG units and SHS bundles.</td>
<td>Completed product development completed</td>
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### WINDOW 3: CATALYTIC FUNDING GRANTS

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<th>GRANTEE NAME</th>
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<th>PERIOD OF PERFORMANCE</th>
<th>ANTICIPATED IMPACT</th>
<th>IMPACT TO DATE</th>
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</thead>
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<tr>
<td>Solar Kamero Technology (Solkamtech)</td>
<td>$84,913</td>
<td>Non-U.S.</td>
<td>Cameroon</td>
<td>Expand the PAYGO SHS distribution business model to include LPG cooking and use synergies to offer energy to households and small businesses in Northern Cameroon.</td>
<td>July 1, 2020 – October 31, 2021</td>
<td>An improved PAYGO system adapted to LPG distribution business model to include LPG cooking and use synergies to offer energy to households and small businesses in Northern Cameroon.</td>
<td>Grant closed February 2021 as expected COVID-19 support funding (grant/concessional capital) to enter the market was substantially delayed</td>
</tr>
<tr>
<td>Helios Investment Partners</td>
<td>$3,259</td>
<td>Non-U.S.</td>
<td>Coté d’Ivoire, Ghana, Nigeria, Rwanda, and Tanzania</td>
<td>Set up a blended financing structure and provide legal support to allow Zola Electric to attract capital for a COVID-19 response program</td>
<td>August 17, 2020 – February 28, 2021</td>
<td>Providing electricity to 2,000 hospitals and more than 22,500 off-grid connections by August 2021</td>
<td></td>
</tr>
<tr>
<td>Nithic Holdings Inc.</td>
<td>$241,349</td>
<td>U.S.</td>
<td>Kenya, Nigeria, and Uganda</td>
<td>Cover legal fees related to setting up a receivables-warehousing facility and analyze receivables portfolio of select off-grid solar companies</td>
<td>August 17, 2020 – August 16, 2021</td>
<td>Up to 45,000 estimated new connections to clean and reliable energy by investee companies</td>
<td></td>
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# WINDOW 4: HEALTHCARE ELECTRIFICATION GRANTS

| GRANTEE NAME       | TOTAL AMOUNT | ORG TYPE | COUNTRY    | PURPOSE | PERIOD OF PERFORMANCE | PERIOD OF PERFORMANCE | PERIOD OF PERFORMANCE | PERIOD OF PERFORMANCE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE | IMPACT TO DATE |
|--------------------|--------------|----------|------------|---------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| KÝA-Energy Group  | $450,650  | Non-U.S. | Togo       | Install standalone systems and hygienic solar-powered automatic hand-washers at 20 rural public health centers in Togo. | September 25–November 30, 2021 | 20 healthcare facilities electrified, with improved provision of healthcare. | 20 healthcare facilities electrified and commissioned | September 25–November 30, 2021 | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned | 20 healthcare facilities electrified and commissioned |
| Muhanya Solar  | $209,996  | Non-U.S. | Zambia     | Collaborate with Churches Health Association of Zambia to establish solar electricity for lighting, medical equipment, computers, and internet services at 7 rural health facilities in Zambia. | September 25, 2020–January 31, 2022 | 7 healthcare facilities electrified, with improved provision of healthcare. | 7 healthcare facilities electrified and commissioned | September 25, 2020–January 31, 2022 | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned |
| Nanoé  | $238,939  | Non-U.S. | Madagascar | Facilitate mini-grids to electrify 35 rural health facilities, unelectrified or partially electrified, in the Ambanja and Ambilobe districts and provide with energy-efficient appliances. The mini-grids also serve staff quarters. | September 25, 2020–September 24, 2021 | 35 healthcare facilities electrified, and improved provision of health services. | 35 healthcare facilities electrified and commissioned | September 25, 2020–September 24, 2021 | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned | 35 healthcare facilities electrified and commissioned |
| OffGridBox  | $246,404  | U.S.     | Rwanda    | Install 6 container-based solar PV solutions for communication technology, lighting, refrigeration, sterilization, and water purification for rural clinics. | September 25, 2020–February 28, 2022 | 7 healthcare facilities electrified, with improved provision of healthcare. | 7 healthcare facilities electrified and commissioned | September 25, 2020–February 28, 2022 | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned |
| OnePower  | $282,706  | Non-U.S. | Lesotho   | Electrify 7 rural healthcare facilities serving approximately 120,000 people and operate and maintain the connected mini-grid system. | September 25, 2020–June 30, 2022 | 7 healthcare facilities electrified, with improved provision of healthcare. | 7 healthcare facilities electrified and commissioned | September 25, 2020–June 30, 2022 | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned | 7 healthcare facilities electrified and commissioned |
| PEG Solar  | $348,963  | Non-U.S. | Ghana     | Facilitate access to electricity for 23 rural healthcare facilities in Ghana and install solar generator systems in partnership with the regional administrative government of Ashanti Region. | September 25, 2020–January 31, 2022 | 23 healthcare facilities electrified, with improved provision of healthcare. | 23 healthcare facilities electrified and commissioned | September 25, 2020–January 31, 2022 | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned | 23 healthcare facilities electrified and commissioned |

**POWER AFRICA OFF-GRID PROJECT**

**FINAL REPORT 2018 – 2023**
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<thead>
<tr>
<th>GRANTEE NAME</th>
<th>TOTAL AMOUNT</th>
<th>ORG TYPE</th>
<th>COUNTRY</th>
<th>PURPOSE</th>
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<th>ANTICIPATED IMPACT</th>
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<tr>
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<td>$348,963</td>
<td>Non-U.S.</td>
<td>Ghana</td>
<td>Facilitate access to electricity for 23 rural healthcare facilities in Ghana and install solar generator systems in partnership with the regional administrative government of Ashanti Region.</td>
<td>September 25, 2020–January 31, 2022</td>
<td>23 healthcare facilities electrified, with improved provision of healthcare. 23 healthcare facilities electrified and commissioned.</td>
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</tr>
<tr>
<td>International Power Control Systems</td>
<td>$139,360</td>
<td>Non-U.S.</td>
<td>Malawi</td>
<td>Electrify maternal wards at two health facilities with modular, prepackaged energy technology</td>
<td>October 15, 2021–September 15, 2022</td>
<td>Two healthcare facilities electrified, with improved maternal and child healthcare services. 2 MCH healthcare facilities electrified and commissioned.</td>
<td>Two healthcare facilities electrified, with improved maternal and child healthcare services. 2 MCH healthcare facilities electrified and commissioned.</td>
</tr>
<tr>
<td>Sustainable Solar Systems</td>
<td>$224,247</td>
<td>Non-U.S.</td>
<td>Uganda</td>
<td>Electrify five healthcare centers to provide reliable power for medical equipment and maternal and child healthcare services</td>
<td>October 15, 2021–September 15, 2022</td>
<td>Five healthcare facilities electrified, with improved maternal and child healthcare services. 5 MCH healthcare facilities electrified and commissioned.</td>
<td>Five healthcare facilities electrified, with improved maternal and child healthcare services. 5 MCH healthcare facilities electrified and commissioned.</td>
</tr>
<tr>
<td>WINDOW 6: PRODUCTIVE USES OF ENERGY (PUE) IN LIBERIA</td>
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<tr>
<td>Ecopower</td>
<td>$128,205</td>
<td>Non-U.S.</td>
<td>Liberia</td>
<td>Set up franchises to distribute PAYGO and fee-for-service PUE equipment (solar dryers, freezers, and irrigation)</td>
<td>18-May-2022 – 30-June-2023</td>
<td>Scale up off-grid technologies for productive use to boost productivity and economic growth.</td>
<td>Scale up off-grid technologies for productive use to boost productivity and economic growth.</td>
</tr>
<tr>
<td>WINDOW 7: PRODUCTIVE USES OF ENERGY (PUE) USES IN KENYA</td>
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</tr>
</tbody>
</table>
| Agoul | $99,870 | Non-U.S. | Kenya | Design and pilot pay-as-you-go model for solar mills, with a specific focus on financing female entrepreneurs | 01-Mar-2023 – 30-Jun-2023 | Improved operations and services to deliver solar-powered PUE products, and uptake of PUE products by women | Improved operations and services to deliver solar-powered PUE products, and uptake of PUE products by women Case study was successfully completed enabling the further development of gender-specific financing models.
<table>
<thead>
<tr>
<th>GRANTEE NAME</th>
<th>TOTAL AMOUNT</th>
<th>ORG TYPE</th>
<th>COUNTRY</th>
<th>PURPOSE</th>
<th>PERIOD OF PERFORMANCE</th>
<th>ANTICIPATED IMPACT</th>
<th>IMPACT TO DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecobora</td>
<td>$100,000</td>
<td>Non-U.S.</td>
<td>Kenya</td>
<td>Introduce a new revenue stream by adding solar coolers for sale and use in existing solar locaux stocked with fast-moving consumer goods</td>
<td>01-Mar-2023 – 30-Jun-2023</td>
<td>Improved operations and services to deliver solar-powered PUE products and uptake of PUE products by women</td>
<td>Completed a Gender Action Plan, conducted 224 surveys on PUE performance and women’s needs, provided PUE business model training to 926 female beneficiaries, and sold three solar freezers to locals in remote areas.</td>
</tr>
<tr>
<td>Rafode</td>
<td>$100,000</td>
<td>Non-U.S.</td>
<td>Kenya</td>
<td>Increase access to PUE products through a lease-to-own financing model, primarily targeting primarily women customers</td>
<td>01-Mar-2023 – 30-Jun-2023</td>
<td>Improved operations and services to deliver solar-powered PUE products and uptake of PUE products by women</td>
<td>Provided finance access for PUE devices to 86 Clients, trained 86 beneficiaries on installation and maintenance of PUE devices.</td>
</tr>
<tr>
<td>Sidai Africa</td>
<td>$100,000</td>
<td>Non-U.S.</td>
<td>Kenya</td>
<td>Introduce a new revenue stream and to explore cost-effective approaches to the marketing and sales of new PUE products, on a pilot basis</td>
<td>01-Mar-2023 – 30-Jun-2023</td>
<td>Improved operations and services to deliver solar-powered PUE products and uptake of PUE products by women</td>
<td>Trained 4,489 beneficiaries on PUE devices, reaching over 6,000 customers.</td>
</tr>
<tr>
<td>SJedi Green Energy</td>
<td>$150,000</td>
<td>Non-U.S.</td>
<td>Liberia</td>
<td>PUCs in farming communities with pay-to-use services such as milling, water pumps, washing machines, freezers, and dryers.</td>
<td>18-May-2022 – 21-July-2023</td>
<td>Scale up off-grid technologies for productive use to boost productivity and economic growth</td>
<td>Established initial PUC center with the goal of establishing five more in the coming months (pending equipment clearance).</td>
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</tbody>
</table>