



**Global Energy Alliance**  
*for people and planet*

# The tools that drive Africa's green economy



**21,800** new and improved jobs and livelihoods



**16,000** appliances across six countries



**\$83.5 million** in financing unlocked



**Harnessing innovative financing to unlock the tools that create jobs and improve lives**



## At a glance

- **Project name:** Productive Use Financing Facility (PUFF)
- **Pilot locations:** DRC, Ethiopia, Kenya, Nigeria, Sierra Leone and Uganda
- **Duration:** 2022-2024 (pilot), 2025-2029 (Phase 2)

## Objective

To deploy catalytic capital to expand access to equipment, such as solar-powered water pumps and cold storage units, helping small businesses in Africa boost incomes, create jobs and grow.

## Outcome and pathway to scale

Using an innovative, results-based financing model to support distributors and manufacturers, PUFF enabled the distribution of 16,000 appliances, across six countries over the initial two-year pilot. Equipment prices fell by up to 60 percent and people who bought the equipment reported greater productivity, lower workloads and more free time. Household revenues grew by more than 60 percent and the incomes of women, who made up nearly half of all customers, almost doubled. Overall, the program improved prospects for up to 58,000 households. PUFF 2.0 is now under way in three countries — Ethiopia, Kenya and Nigeria. Expansion beyond Africa is planned.

Tucked into a pocket of land to the west of Nairobi, Urban Valley Natural Farms is the picture of lush productivity. In a country where low rainfall and urbanization has left Kenya deeply dependent on imported foods, the rich, green bunches of chervil, basil, chives and more are particularly striking.

It wasn't always this way. Under the midday sun, the farm's produce used to wilt, almost as soon as it was harvested.

A traditional charcoal cooler (*pictured, right*) — a timber framed structure with charcoal-filled walls — helped. But even so, farmworkers would rise long before dawn and work well into the night to take advantage of cooler conditions. The hours proved particularly challenging for women who were expected at home with their families during those times.



"Sometimes we would leave home in the evening and come back after midnight," recalls 24-year-old worker, Maureen Wavomba.



A cold storage room (*pictured, left*) would help — improving working hours, boosting profits and cutting waste. (Kenya loses up to half of its produce to spoilage, a loss valued at \$500 million a year.) However, with costs starting at around US\$8,000, this option once seemed far out of reach — especially when factoring in the electricity required to run it.



**Cover:** Sorting herbs in the new SokoFresh cold room at Urban Valley Natural Farms, Kenya  
**Photo:** Global Energy Alliance



## A powerful opportunity

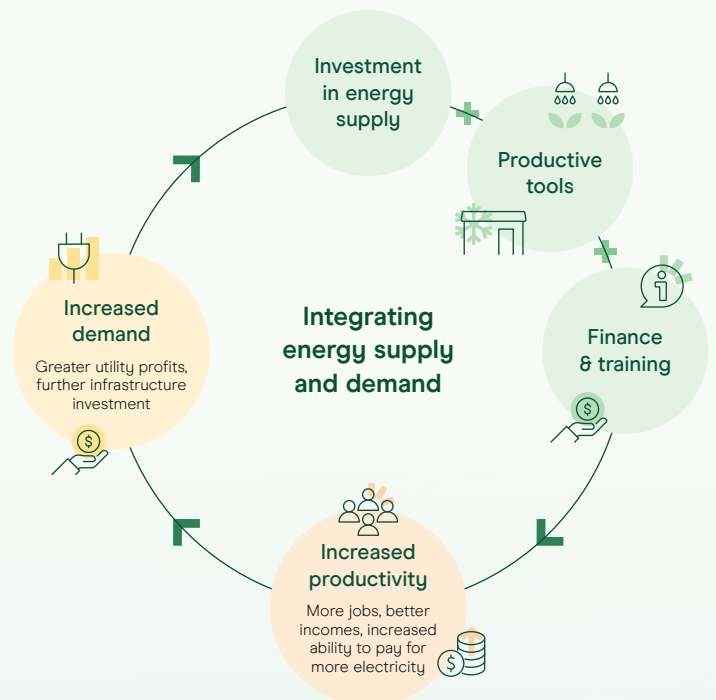
Nearly half of Africa's population — some 600 million people — lacks reliable access to electricity. Mission 300 is a powerful country-driven initiative to connect 300 million people in sub-Saharan Africa to electricity by 2030. Led by the World Bank Group and the African Development Bank in partnership with Global Energy Alliance for People and Planet, The Rockefeller Foundation and SEforAll, the program has already delivered 44 million new connections, with tens of millions more to come.

But in a continent where 1.2 billion young Africans are expected to enter the workforce by 2030, connections are only the first step. It is critical to also deliver finance, training and tools — such as cold storage — so that people can use that energy to create jobs, make their businesses more sustainable and create economic opportunities for all.

As Dr. Akinwumi Adesina, former President of African Development Bank, said in 2025: “Access to power is not just about lights. It’s about productivity, competitiveness and prosperity.”

**1.2 billion young Africans are expected to enter the workforce by 2030, but the continent is on track to create only 420 million jobs.**

Tools — such as electric irrigation and solar-powered cold storage — not only improve livelihoods and create jobs, they also help ensure a vibrant energy infrastructure. By stimulating demand for electricity, they also help build an economically robust energy system, helping energy developers and utilities to keep prices manageable, stay profitable and expand their service. Together, this virtuous circle can support the continent to meet its growth trajectory with a robust energy system built on ample supply and demand.



Urban Valley Natural Farms, Kenya  
Photo credit: Global Energy Alliance





The tools — commonly called productive use equipment, or PUE — also create direct jobs in manufacturing, installation and repair.

But despite its transformative potential, PUE use is hobbled by a lack of accessibility, affordability and awareness. Global Energy Alliance estimates that solar PUE technologies reach less than one percent of the serviceable African market. According to a 2021 report from the World Bank Group, just 10 percent of the roughly 5.4 million farmers in sub-Saharan Africa use solar irrigation systems.

When it comes to equipment powered by clean energy, cost is an enormous barrier, particularly in lower income, rural communities. A solar-powered irrigation system costs a minimum of \$600 compared with \$200 for diesel-powered water pumps.

As a result, African households have the lowest uptake of PUE, globally.

**Just 10 percent of the roughly 5.4 million farmers in sub-Saharan Africa use solar irrigation systems.**

Women, who make up 60 percent of the continent's agricultural workforce, have the most to lose. A lack of access to electric water pumps, for example, limits the ability to irrigate crops, leading to lower yields and incomes. And labor-intensive work, such as fetching water from a well instead of using a pump, forces them to spend more time and effort on household chores than on work that generates an income.

Even when communities do have the means to purchase PUE, it's not always easy to obtain. Suppliers and manufacturers are often small companies and they receive only a small fraction of African venture capital.

In 2024, financial tech captured 25 percent of total equity funding across Africa, while clean tech, spanning everything from renewable energy generation to electric mobility, attracted just \$550 million. According to the World Bank, small companies serving agriculture, irrigation and cold storage markets in sub-Saharan Africa face an estimated \$245 billion financing gap.



A woman in Niger State, Nigeria, using an electric milling machine. Photo: RMI



Inspecting a SokoFresh cold storage facility, Kenya Photo: Global Energy Alliance

## Our approach

Analysis by CLASP, a global leader in appliance market transformation, found that the current lack of solar PUE technologies in Africa represents an unrealized income potential of \$15.9 billion each year. CLASP estimates that over 10 years, \$265 million in financing could create or improve up to 50 million jobs.

**The lack of solar PUE technologies in Africa represents an income potential of \$15.9 billion a year.**

Source: CLASP

If we could find a way to supercharge availability of equipment, we could unlock some of this potential — creating jobs, improving livelihoods and supporting Africa's economies to grow and thrive.

As Global Energy Alliance began working alongside PUE manufacturers and distributors, a clear pattern emerged. Farmers and small businesses wanted solar pumps, mills, cold storage and more. But the equipment often wasn't available when or where it was needed — or at a price point they could manage.

Manufacturers lacked the working capital to scale production. Distributors lacked access to credit, so struggled to buy and hold inventory. Promising companies were operating on thin margins, unable to absorb risk or extend credit. If PUE was to reach scale, the companies delivering the tools would need financial support.



To break the bottleneck, Global Energy Alliance partnered with CLASP and Nithio, a pioneer in energy finance, to launch the Productive Use Financing Facility (PUFF).

The premise was simple: Since customer demand already existed, extending credit to manufacturers and distributors would make it easier for them to meet demand.

Drawing inspiration from other sectors, a core part of the pilot was a reverse auction in which participating companies were invited to bid for the grants. They provided details of their business plans, including target markets and projected sales volumes. Successful bids were those that had the lowest cost of subsidy relative to the number of projected sales.

By structuring the incentives to be results-based — with 40 percent of funding granted upon approval of applications and 60 percent released after sales were verified — the model incentivised manufacturers and distributors to complete sales and expand into new markets.


This pay-for-results approach ensured funding translated into verified sales and a stronger pipeline of investable companies and not simply promises on paper.

Backed by Global Energy Alliance funding, PUFF became a multi-country platform bringing financing of productive use equipment to communities with limited or unreliable power. Greater access to equipment would stimulate electricity demand, grow customer profits, create jobs and in turn, stimulate demand for further equipment.

By working upstream with credible local PUE suppliers, PUFF would strengthen their business models, enabling them to continue to provide high-quality service, even after the program ended.

“The biggest barrier wasn’t interest, it was the upfront cost,” said Global Energy Alliance’s Wanjiru Wambugu, who helped design the pilot. “The model was designed to reduce that hurdle so companies could move equipment faster and reach customers they couldn’t reach before.”



 In Nigeria, Helen Obina is using a solar refrigerator from Consistent Energy. Photo: CLASP

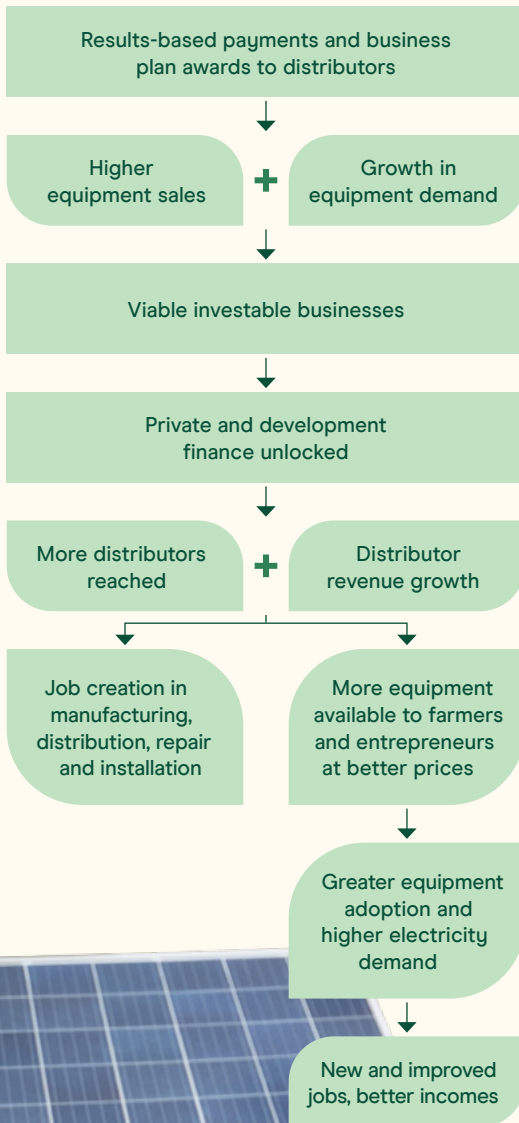
In the initial stages, PUFF supported 24 suppliers and distributors across six African countries. Results-based financing, along with capacity-building grants of up to \$30,000, helped companies scale operations and reach more customers. In Kenya, 11 appliance companies received funding to sell agricultural appliances specifically to women entrepreneurs at lower prices.

The up-front payments also enabled many suppliers to offer their customers financing plans, such as payments by installment and lease-to-own programs (see *PUFF in action*, page 7).

“The landed costs of the fridge to a customer in Nigeria would have been very high if not for the subsidy that we received,” said Segun Adaju, chief executive of Consistent Energy, Nigeria.



## Unlocking supply chains, changing lives



## PUFF in action

Rekik Bekele understands the power of electricity to drive economic and social change. As an electrical engineer and founder of Green Scene Energy, she is working to put affordable solar energy products into the hands of women in off-grid areas of Ethiopia.

Founded in 2016, Green Scene began by specializing in solar home lighting systems and later expanded to include solar mini grids and other solutions for off grid communities. The company began distributing solar-powered water pumps in 2022 in response to the growing need for irrigation pumping in rural areas.

Like many entrepreneurs, however, she struggled to get the financial investment needed to make that happen. Green Scene was forced to use its existing sales revenue to import small numbers of pumps at one time.

“Building and scaling renewable energy projects require significant investments, and securing adequate funding can be a daunting task,” Bekele said in an interview with the African Energy Chamber, which named her as one of its 25 Under 40 Energy Women Rising Stars in 2023.

That all changed after the company secured a PUFF award. With capital support, Green Scene sold 40 pumps in three months. Bekele expects that number to increase sixfold in the following months.

Green Scene used the funding to attract new financing and partnerships, including joining forces with a local bank to provide loans to consumers to buy the solar water pumps.

“Green Scene’s expanded capacity to make larger, more efficient orders, is allowing us to reach many more end users,” Bekele said in a video by CLASP.



Rekik Bekele, founder of Green Scene Energy, Ethiopia. Photo: CLASP





## Our impact



**13x**  
Every **\$1** invested by Global Energy Alliance unlocked **\$13** in follow-on capital

Between 2022 and 2024, PUFF financed 16,000 appliances across six countries.

The impact was swift and significant. Data collected from third-party monitoring found that appliance prices fell by up to 57 percent. Sales increased by an average of more than 11 times. PUFF also strengthened companies' future prospects, because their additional sales and proven business models built confidence and credibility with investors and donors.

This success opened up a wave of new investment for participating companies, which have raised \$59 million in follow-on equity and debt. At the same time, CLASP has deepened its support for the productive use market, harnessing a further \$24.5 million in funding to support product research, energy access projects and more, using similar incentive-based funding structures to PUFF.

With suppliers more financially stable, their customers' lives improved too. During interviews conducted over the two-year pilot, more than 60 percent of customers reported an increase in revenue. 30 percent reported starting a new business and nearly one in five business owners said they'd hire at least one more employee. For women, who made up nearly half of all buyers, monthly incomes almost doubled.

In Nigeria, for example, Koolboks, a provider of portable solar-powered refrigerators, said its \$25,000 PUFF award helped it to expand assembly and distribution operations in Lagos and create 47 new jobs. The company also used the support to offer discounts to business owners like Doris Chuwa (pictured, above) who now uses a solar-powered chest, instead of blocks of ice, to chill her inventory of cold drinks.



In Nigeria, Doris Chuwa sells cold drinks thanks to a new chiller from Koolboks.  
Photo: CLASP

"This machine is good. If you have this, your business will change," she says.

Back at Urban Valley Natural Farms, business has also transformed. Thanks to a solar-powered walk-in cold room supplied by SokoFresh, a Kenyan cold-chain company supported by PUFF, what was once a race against time and sun, has become a predictable, market-ready operation.

Post-harvest losses have dropped from 40 percent to under five percent. Harvesting and processing happens during daytime so women are better able to take the jobs. Buoyed by greater storage capacity, the farm has expanded from one acre to four.

"The support offered under PUFF has helped us ... catalyze over a dozen cold storage units at subsidized prices," says Dennis Karema, the co-founder and CEO of SokoFresh. "This has allowed us to refine our pricing model and make cold storage available to rural farmers at rates they can afford."

SokoFresh also offers cold storage units on both lease and lease-to-own terms — options that would otherwise place the appliances out of reach for most farmers.



## The pathway to scale

Building on PUFF's success, in June 2025 Global Energy Alliance and CLASP announced a second round of funding. PUFF 2.0 will incentivize the purchase of up to 10,000 appliances across Ethiopia, Kenya and Nigeria. The program, which runs through 2029, expects to expand appliance availability, support distribution companies to catalyze further private investment and create or improve more than 230,000 jobs and livelihoods from factory floors, to farms and fields.

"This is early market shaping," said Global Energy Alliance's Wanjiru Wambugu. "We're helping companies reach the scale and track record they need to attract larger pools of capital. Over time, you reduce the subsidy and increase local financing and that's how the market becomes self-sustaining."

PUFF 2.0 operates in conjunction with the [Energizing Women & Youth in Agri-Food Systems Programme \(EWAS\)](#), an initiative launched in early 2024 in partnership with the Mastercard Foundation and [Clean Energy Solutions for Women \(CES4W\)](#), a Gates Foundation partnership. Both programs expand economic opportunities for African women in agriculture by improving their access to energy-powered tools.

Companies supported by PUFF are also diversifying into new technologies and products. For example, [SunCulture](#), a Kenya-based company which supports farmers with off-grid solar powered irrigation, lighting and mobile charging, is now expanding into other agricultural products such as seed, fertilizer and pesticides.

To date, 13 companies in Kenya are participating in PUFF 2.0 with a target of \$500,000 awards for 2,000 appliances. In Nigeria and Ethiopia, the auction process is underway.

"The opportunity extends well beyond Africa," said Wambugu. "With just \$1 million in catalytic start-up capital, we see strong potential to unlock productive-use equipment markets in Latin America and other emerging economies where Global Energy Alliance operates, accelerating livelihoods and economic resilience globally."

SokoFresh co-founder and CEO, Denis Karema with Raj Shah, president of the Rockefeller Foundation and co-chair of Global Energy Alliance's Leadership Council.  
Photo: The Rockefeller Foundation





## Project partners



### Funders

IKEA Foundation, The Rockefeller Foundation, Gates Foundation (through CES4W)

### Implementing partners

CLASP, Nithio

### Financial literacy training

Cooperative Bank Foundation/  
Cooperative Bank

### Equipment distributors

Agsol Limited, ALLTIMEFRESH Limited, Altech Group, Baobab + Group, Bidhaa Sada, BURN Manufacturing USA LLC, Consistent Energy Limited, Deevabits Green Energy Ltd, Ecozen Solutions Limited, EnerGrow, Enterprise projects Ventures Limited, FINCA Plus LLC, Green Scene Energy PLS, Koolboks Limited, Okra Solar Pty Ltd, POPO Universal Energy Limited, PowerUp, Rensys Engineering and Trading PLC, SokoFresh Agri Innovations East Africa Limited, SunCulture Limited, SureChill Africa Limited, Tulima Solar Limited

## About Global Energy Alliance for People and Planet

Global Energy Alliance for People and Planet builds transformative public, private, philanthropic partnerships to end energy poverty and accelerate green economic opportunity. Founded in 2021 by The Rockefeller Foundation, IKEA Foundation and Bezos Earth Fund, we work in more than 30 countries to unlock finance, strengthen institutions and transform markets, delivering progress that goes beyond individual projects to drive lasting systems change.

Through our two interconnected global pillars, **Grids of the Future** – focused on innovation and infrastructure – and **Powering Opportunity** – with a focus on jobs and livelihoods – we work toward our vision: a world where everyone has access to affordable, reliable, clean electricity and the means to use it to improve their lives.



PUFF provides affordable tools to boost income, reduce labor and power rural economies.

Photo: AGSOL

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