GAIA IMPACT

Impact **Report** 2025

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The year 2024 marked a pivotal phase for Gaia Impact, with the operational deployment of our second fund, the Gaia Energy Impact Fund II (GEIF II). Classified as an Article 9 fund under the SFDR regulation, GEIF II reflects our commitment to combining rigorous investment practices with measurable contributions to global energy transition goals.

Through GEIF II, we support companies that are improving access to energy in regions where needs remain critical, while building sustainable, locally rooted, and economically viable models. Over the past year, we have added several innovative companies to our portfolio, spanning the entire value chain of decentralized energy—from a C&I platform to enabling technologies for smart energy use.

We also strengthened our local presence by opening a new office in Nairobi, enabling us to stay closer to our investees and engage more directly with local dynamics. In impact investing, this proximity is not a luxury—it is a necessity. It enhances our understanding of the field, deepens relationships with entrepreneurs, and sharpens the relevance of our investment decisions.

Beyond capital deployment, we have maintained a strong focus on impact measurement and monitoring, supported by a dedicated governance framework and robust indicators. This report presents the first tangible results: avoided CO_2eq emissions, improved energy access for thousands of people, and the creation of quality jobs. Achieved with only a portion of our committed capital, these outcomes affirm the transformative potential of our portfolio.

Yet the challenges ahead are significant. The global shortfall in clean energy infrastructure investment—particularly in low- and middle-income countries—calls for faster and more coordinated action. In response, Gaia Impact is determined to keep demonstrating that finance can be a powerful driver of sustainable development—provided it embraces its full set of responsibilities.

I would like to extend my sincere thanks to all those who contribute to this shared ambition—our partners, teams, entrepreneurs, and experts. The path we walk together is a demanding one, but it is grounded in a clear conviction: a just energy transition is within reach, as long as we stay anchored in the realities of the people and communities we serve.

Editorial By

Hélène Demaegdt

President of Gaia Impact

Presentation

In this section

Gaia Impact & GEIF II

Gaia Impact is an investment advisory firm that created and developed Gaia Impact Fund I from 2017 to 2023.

In September 2023

€43 million

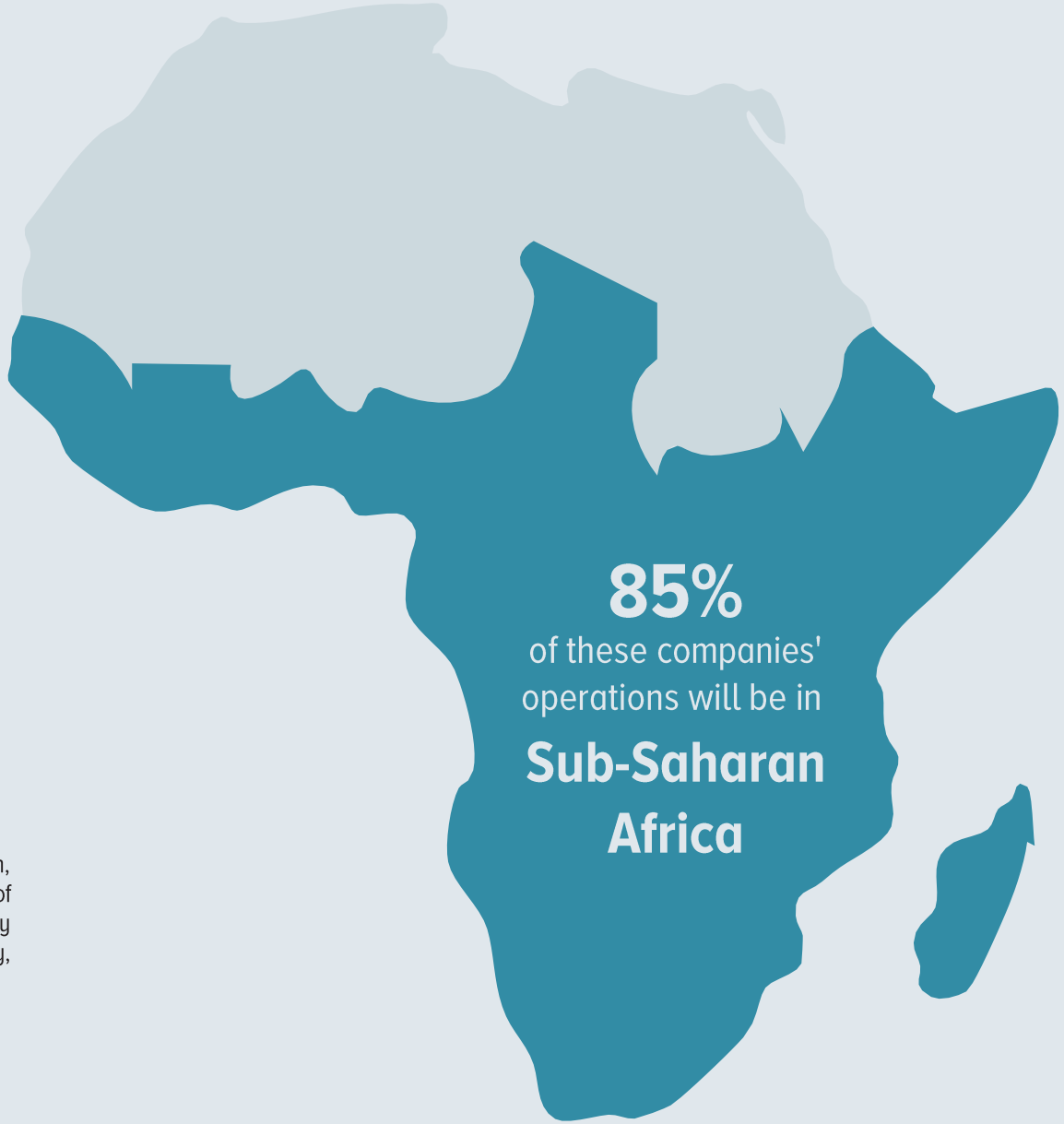
was closed for the

Gaia Energy Impact Fund II (GEIF II)

In Coalition with

GAIA IMPACT · Capital Croissance – CLUB D'ENTREPRENEURS – · Schneider Electric · CAPELAN SUSTAINABLE FUND · IIP INVESTISSEURS & PARTENAIRES

GEIF II, a fund that complies with the strict impact criteria of Article 9 of the SFDR regulation, aims to finance and support startups and SMEs operating across the entire value chain of decentralized energy. Investments will be made in approximately fifteen to twenty companies in sectors such as access to decarbonized energy, productive use of energy, electric mobility, new energy sources, and enabling technologies.



Our Measurement & Monitoring of ESG Impact & Performance

Our Methodology For Measuring and Monitoring Impact

To ensure the robustness and relevance of its impact measurement methodology, GEIF II has established an Impact Committee. This independent committee is composed of individuals external to the fund (researchers, and sector experts). The role of this committee is to assess whether general and specific objectives have been achieved and, if so, to trigger the incentive mechanisms tied to impact goals ("carried" impact). More broadly, it provides expertise on the impact and sustainability risks of all investments made by the fund.

In this report, we present the impact performance of GEIF II for 2024. We monitor three types of indicators:

- General indicators allow us to measure each investment's contribution to the fund's impact goals **(based on a target €70M raise):**
  i. **Avoid 4,000,000 tons of CO_2eq emissions**
  ii. **Provide improved energy access to 4,000,000 people,**
  iii. **Create 6,000 full-time equivalent jobs through the activities of GEIF II portfolio companies.**
- In addition to these general indicators, two specific indicators must be defined for each GEIF II investment to reflect its unique impact.
- Funds governed by Article 9 of the SFDR regulation are required to publish an annual report on several **"Principal Adverse Impacts" (PAIs)**, as defined by the regulation ; we also monitor and report on these indicators in this impact report.

Members of the Impact Committee

Catherine Bobtcheff

- Research Director at the French National Centre for Scientific Research (CNRS) and Professor at the Paris School of Economics.
- Researcher at the Centre for Economic Policy Research and member of the Louis Bachelier Institute.
- Winner of the "Best Young Researcher in Finance and Insurance" award from the Europlace Finance Institute in 2018.
- Her main research topics focus on theoretical economics, finance, insurance, and industrial organization.

Hilary Maxson

- Executive Vice President and Chief Financial Officer of Schneider Electric
- Member of Schneider Electric's Executive Committee since 2020
- She led companies across 5 continents over a 12-year period at AES
- Non-executive Director of Anglo American since 2021

Benedicte Faivre-Tavignot

- Associate Professor in Strategy at HEC Paris, where she created the Master's in Sustainable Development and the Social Business / Enterprise and Poverty Chair at HEC.
- Co-founder of the Society and Organizations Institute.
- Member of the Scientific Committee on Sustainable Finance at Standard & Poor's.
- Member of the Ethics Committee of the Red Cross.

Thierry Fornas

- Co-founder and President of EcoAct until 2022
- Director of Climate Pal in Kenya until 2022
- Founding member of the Association of Climate Consulting Professionals (ACCP)
- Founded Altabaya in 2021, a support and investment structure dedicated to impact startups

Sophie de Fontenay

- Member of the Executive Committee of RAISE since 2019
- Legal Director and Head of CSR at Compagnie Lebon (2017–2019)
- Head of Legal Europe for the Ascott Group from 2015 to 2017
- General Counsel at Inovalys (2010–2015)
- M&A and Real Estate Lawyer at Baker & McKenzie and Ernst & Young (2003–2010)

Samuel Monteiro (Observer)

Expert, representative of the strategic partner Investisseurs & Partenaries

Our Impact Measurement & Monitoring Methodology

Integrating Impact & ESG Factors Throughout The Entire Investment Process

- The integration of ESG criteria (Environmental, Social, and Governance), along with impact indicators, takes place at every stage of the investment process.
- From the pre-screening phase to post-investment monitoring, a series of analyses, tools, and indicators are used to assess, measure, and enhance the extra-financial performance of the supported companies.
- This rigorous process is based in particular on the "ESG DD" tool, which combines the standards of the Social Business Scorecard and the 2X Challenge to identify key ESG risks and issues, especially in terms of social, ethical, and gender-related practices.
- This structured approach ensures alignment with international best practices and Gaia's commitments to sustainability and impact.

Screening

- Verification of the company's reputation
- Compliance with the exclusion list

Preliminary Assessment

- Characterization of the company's contribution to the three general impact objectives

Due Diligence

- Environmental, social and governance due diligence via our ESG DD tool

Investment Decision

- Verification of compliance with the ESG policy of Gaia, and in particular:
  - i. United Nations Global Compact
  - ii. United Nations Guiding Principles for Business and Human Rights
  - iii. OECD Guidelines for Multinational Enterprises
- Establishment of an ESG monitoring system enabling the company to ensure its future compliance
- Plan for the improvement of social, environmental and governance practices

Monitoring

- Quarterly 2X challenge indicators
- Quarterly general and individual impact indicators
- Annual PAI indicators
- Ad hoc to ensure compliance with the ESG action plan

The ESG DD Tool

This tool was built by merging the Social Business Scorecard – as regards social, HR and ethical practices – and the 2X Challenge indicators – as regards gender policy. It thus makes it possible to assess and rate the main risks in terms of environmental, social and governance sustainability. These risks are divided into 3 themes, which are themselves divided into several sub-themes:

1.Social Practices & HR

- HR Policy
- Safety at work policy
- Employee benefits
- Training
- Employee well-being analysis policy
- Social & HR practices of suppliers of key goods & services

2. Ethical Practices

- Environmental policy
- Management & reduction of environmental risks
- Local community responsibility policy
- Financial transparency & compliance with tax regulations

3. Gender Policy

- Gender representation in leadership
- Gender representation in the workforce
- Consideration of gender-related issues in product design, development and delivery
- Consideration of gender in the selection of suppliers of key goods and services

Our highlights in 2024

New Investments

In 2024, GEIF II completed three new investments:

i. **Ecoligo: €2.25M** (convertible bonds) as part of a bridge round ahead of its Series B.
ii. **BPS (Beacon Power Services): €1.5M** (equity) as part of its Series B.
iii. **Agros: $750K** (equity) as part of a Series A round.

Strengthening Communication on Impact Investing and Off-Grid Electrification

In 2024, the Gaia Impact team participated in several key international events, demonstrating its commitment to promoting impact investing and off-grid electrification solutions. These engagements highlighted the importance of innovative, context-specific solutions, showcased the companies supported by Gaia, and illustrated how tailored financing models can catalyze the deployment of renewable energy in off-grid areas.

Guilhem Dupuy at EAIF in Lagos, Nigeria


Hélène Demaegdt at the French Week in Nairobi, Kenya

Opening of a Nairobi Office

A strategic step to strengthen our local presence by expanding our team in Kenya, staying close to our portfolio companies, and developing our network in Africa, complementing our Paris office.

2024 Events:

- Emerging Valley ***(Marseille, December 2024)***
- Digital Energy Challenge Bootcamp 2024 ***(Belgium, November 2024)***
- French Week ***(Nairobi, November 2024)***
- Nairobi Mixer ***(October 2024 – co-hosted with EDFi & Triple Jump)***
- ARE Energy Access Investment Forum (EAIF) – (***Lagos, May 2024)***
- Future of Energy – ***(Amsterdam, March 2024)***

Our Portfolio

SOLAR HOME SYSTEMS	C&I INSTALLATIONS	MINI GRIDS	PRODUCTIVE USE	ENABLING TECHNOLOGIES
€3M	€3.2M	€0.9M	€2.1M	€1.5M
28%	29%	8%	20%	14%

To date, GEIF II has deployed a total of

€10.7 Million

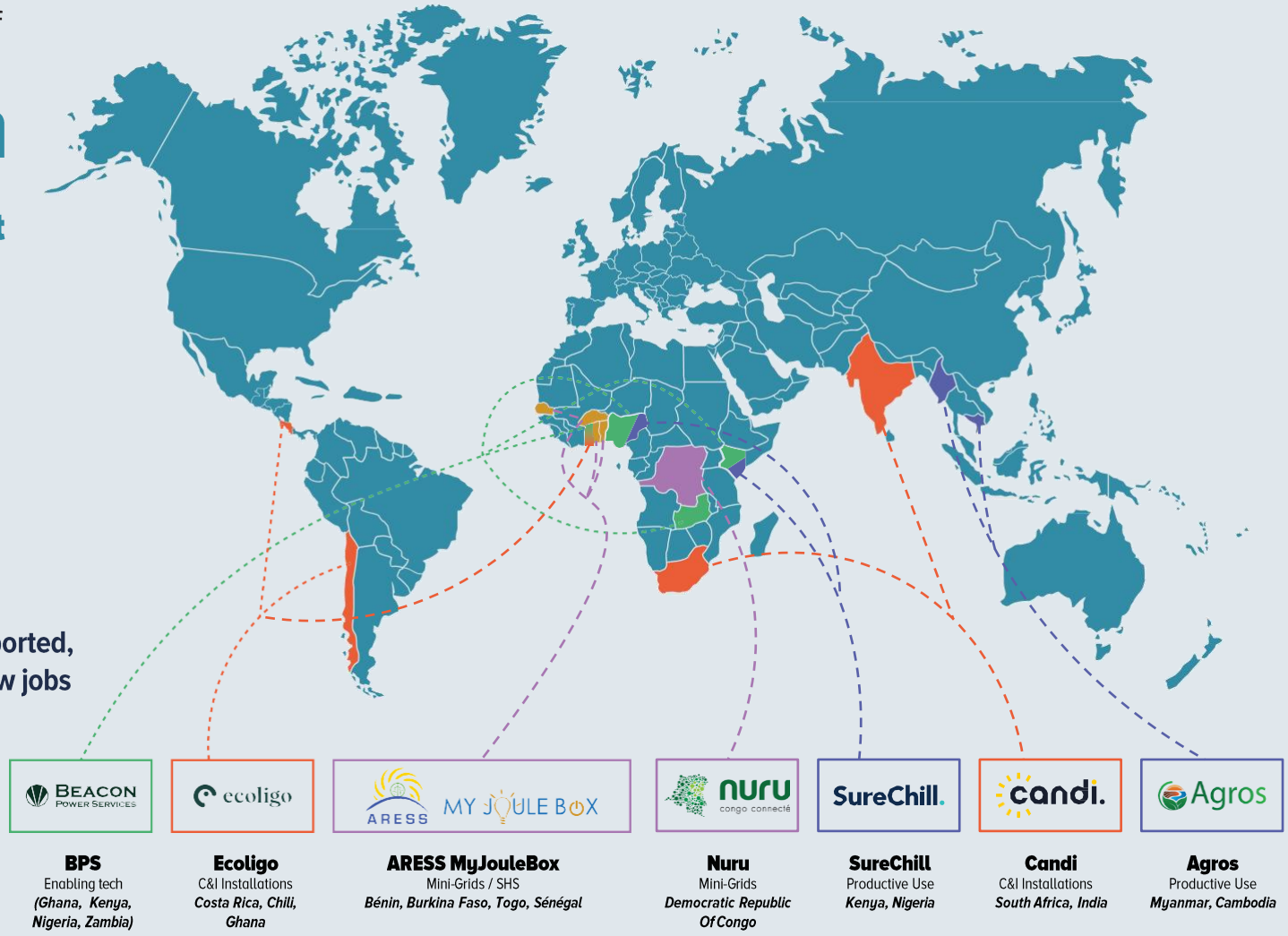
21% of the deployable amount

distributed across five sectors.

144,000
tCO_2eq avoided

681
Jobs created or supported, including 158 net new jobs

54,000
People with Improved Access To Energy



BPS
Enabling tech
(Ghana, Kenya, Nigeria, Zambia)

Ecoligo
C&I Installations
Costa Rica, Chili, Ghana

ARESS MyJouleBox
Mini-Grids / SHS
Bénin, Burkina Faso, Togo, Sénégal

Nuru
Mini-Grids
Democratic Republic Of Congo

SureChill
Productive Use
Kenya, Nigeria

Candi
C&I Installations
South Africa, India

Agros
Productive Use
Myanmar, Cambodia

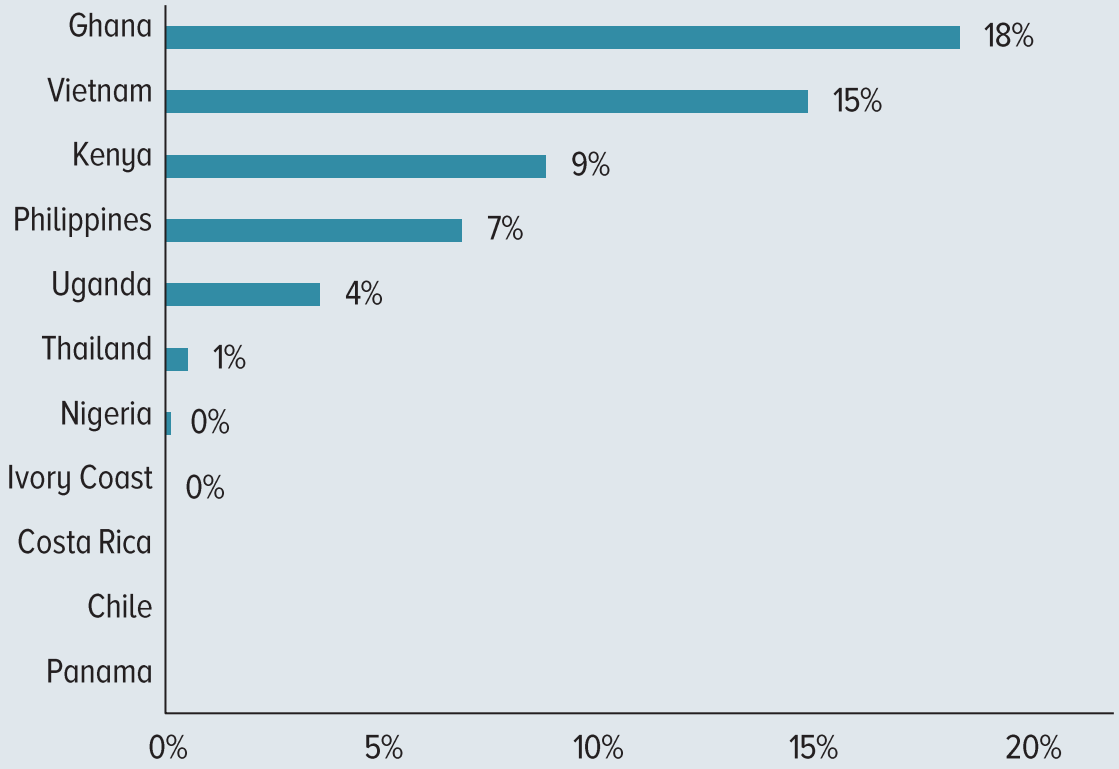
Measuring & Tracking the Impact of GEIF II

Tonnes of CO_2eq Avoided*

- **Energy — and electricity in particular** — remains one of the **main drivers of CO_2 emissions, especially in developing countries.**
- In this context, since GEIF II's initial investments in 2023, **portfolio companies have already helped avoid more than 144,000 tonnes of CO_2 equivalent emissions — with only 20% of the fund's target capital deployed.**

Spotlight on Ecoligo: A Climate Impact Driver and Energy Transition Catalyst

- Since our initial investment in 2023, **Ecoligo alone has avoided over 40,000 tonnes of CO_2eq emissions**, representing nearly a third of our portfolio's total impact.
- A key player in the energy transition in its countries of operation, Ecoligo directs 85% of its investments to markets where renewable energy accounts for more than 5% of sectoral FDI.
- This strategic positioning enables Ecoligo to act as a catalyst, accelerating the shift to clean energy and embedding the Sustainable Development Goals (SDGs) into national development trajectories.



Ecoligo's signed investments as a percentage of annual FDI flows dedicated to renewable energy (2023 data)

GAIA IMPACT

**This indicator tracks the tonnes of CO_2 equivalent avoided by our portfolio companies. To measure this metric, several methodologies are used: the standard GOGLA methodology for solar kits, a comparison to grid electricity intensity for C&I (Commercial & Industrial) installations, and a comparison to baseline energy use (before deployment) for mini-grids. For our investments in productive uses, ad hoc methodologies – reflecting the specific products and models of these systems – are used.*

The Environmental Value Creation of GEIF II Portfolio Companies

The companies in our portfolio actively contribute to the fight against climate change by avoiding the emission of tonnes of CO_2eq. They act through two main levers

- **Replacing the use of highly carbon-intensive energy sources, such as diesel generators, with clean and decentralized alternatives;**
- **Reducing electricity consumption from predominantly carbon-intensive grids, thanks to more efficient and local solutions.**

Avoiding one tonne of CO_2eq is not just an environmental gain: it also has economic and social value, as estimated by the social cost of carbon.

A recent study (1) estimates this cost at $185/tonne (range: $44 – $413). Assuming a 20% annual growth trajectory in avoided emissions and applying a discount rate between 4% (impact investing market reference (2)) and 12% (private equity average (2)), the discounted socio-economic benefits resulting from the reduction of CO_2eq emissions by our portfolio companies are estimated to range between €387 million and €544 million.

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What is the social cost of carbon?

It represents, in dollars, the economic damage avoided for each ton of CO_2eq not emitted. We use an estimate that includes the impact of CO_2 eq emissions across four major sectors:

Temperature-Related Mortality:

Meta-analysis of studies evaluating the effect of temperature on mortality (cardiovascular, respiratory, infectious diseases, etc.).

Contribution to total cost: $90/t$CO_2$eq

Agricultural Impacts:

Meta-analysis of the effects of CO_2eq , temperature, and precipitation on crop yields.

Contribution to total cost: $84/t$CO_2$eq

Sea Level Rise:

Modeling of coastal damage and adaptation costs under various sea-level rise scenarios.

Contribution to total cost: $2/t$CO_2$eq

Energy Costs:

Model projecting the climate's impact on building energy demand through 2100.

Contribution to total cost: $2/t$CO_2$eq

Other costs not included: **The calculation does not account for biodiversity loss, labor productivity, conflicts, or migration, which could further increase the real value of carbon**

Sources: (1) https://www.nature.com/articles/s41586-022-05224-9,
(2) https://faculty.haas.berkeley.edu/morse/research/papers/BarberMorseYasuda.pdf

Measuring & Tracking the Impact of GEIF II

Beneficiaries of Improved Energy Access*

Since GEIF II's investment in 2023, companies across **our portfolio have already enabled over 54,000 people to gain improved access to energy — with only 20% of the fund's target capital deployed.** This impact is all the more significant **given that over 700 million people worldwide** still lack access to modern, reliable, and affordable energy.

Focus on Agros: Rapid Expansion to Improve the Daily Lives of Thousands of Smallholder Farmers

Since our initial investment in 2023, **Agros has already enabled 15,000 people to access clean energy for irrigation and agricultural use.** In 2024, **we reinvested $750,000 in equity as part of their $4.25 million Series A round,** supporting their acceleration phase.

Two key drivers have fueled this growth:

- **Geographic Expansion:** Launch of operations in Indonesia, Agros' third active country, with three hubs opened in East and Central Java.
- **Technological Diversification:** Introduction of high-flow pumps in Indonesia, bifacial solar panels across all models, and new surface and submersible pumps designed to better meet the needs of higher-income farmers in Myanmar and Cambodia.

"In 2024, we expanded our product offering in three countries, reaching more customers than ever before. We introduced over 10 new pump models to cater to diverse client needs. A key innovation this year was optimizing our entire product line to support large bifacial solar panels: this reduces the number of panels required, lowering costs while maintaining high operational efficiency. We also developed the first version of a high-efficiency solar-powered air compressor designed specifically for agricultural applications."

Aziz, Head of Engineering at Agros

** This indicator tracks the number of people who benefit from improved access to electricity through the products and services provided by our portfolio companies. We do not include C&I (Commercial & Industrial) portfolio companies, which do not have direct individual beneficiaries. For all other investments, we apply the standard GOGLA methodology (sales multiplied by average household size).*

GEIF II's Contribution to Expanding Access to Energy

Today, our estimates of GEIF II's impact on energy access are based solely on the number of newly connected direct beneficiaries. The case of Nuru, a portfolio company deploying mini-grids in the Democratic Republic of Congo, illustrates the broader scope of our impact.

A public lighting installation managed by Nuru

Powering Critical Infrastructure

Nuru supplies electricity to 28 essential infrastructures vital to community functioning: telecom towers, water treatment and distribution stations, schools, health centers, and more. While we do not yet have the data to directly count the beneficiaries of these services in our official indicator, their impact is very real. By making these public services more reliable and continuous, Nuru's mini-grids contribute to tangible improvements in living conditions, strengthening community resilience and access to quality basic services.

Public Lighting & Social Cohesion

To date, Nuru has installed 458 public lights across four intervention zones. A study conducted by Energy Peace Partners (EPP) reveals major social impacts in these newly electrified neighborhoods:

- Improved perception of safety, especially among women and girls
- Increased evening economic activity (shops stay open later, easier mobility)
- A 9% higher social peace score in electrified areas compared to non-electrified ones
- A greater sense of dignity, visibility, and belonging expressed by residents

Measuring & Tracking the Impact of GEIF II

Net Jobs Created*

Since GEIF II's investment in 2023 — and with only 20% of the target capital deployed — **our investments have already contributed to the creation or support of 681 jobs, including 158 net full-time equivalent (FTE) jobs.**

By contributing to the creation of quality employment, our portfolio actively supports the achievement of Sustainable Development Goal (SDG) 8, which aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

Spotlight on Beacon Power Services (BPS): Combining Technology, Skilled Job Creation, & Local Development.

- A job creator from the early stages:
  As of Q4 2024, BPS employs 121 full-time equivalents (FTEs).
  This adds to the temporary field agents which have been mobilized across five regional offices for electrical infrastructure tagging missions — while not included in the current job calculation methodology, this labor has a significant socio-economic impact.
- An innovative, human-centered model for skilled job creation:
  Unlike typical SaaS models, **BPS places people at the core of its value chain —** conducting infrastructure mapping, customer registration, and asset identification. **AI is applied only at the final stage,** following thorough, on-the-ground work by qualified local teams. **This hybrid model** supports the digitalization of electric grids while **promoting human expertise and local employment.**
- An ambitious growth trajectory:
  By 2028, BPS aims to reach 778 FTEs and 1,500 field agents.

BPS agents in Accra, Ghana

** This indicator tracks the number of direct, full-time equivalent (FTE) jobs created within our portfolio companies since the date of our investment.*

GEIF II's Contribution to Local Economies

The impact of GEIF II's investments goes beyond direct job creation within portfolio companies. It also includes:

The creation of high-quality jobs: companies supported by GEIF II **currently employ nearly 681 full-time equivalent (FTE) staff**. All have committed to upholding fundamental international labor rights standards through our ESG policy, which is aligned with:

- The UN Global Compact
- The UN Guiding Principles on Business and Human Rights
- The OECD Guidelines for Multinational Enterprises

This commitment is assessed annually as part of GEIF II's SFDR reporting (see slide 16).

The creation of indirect jobs and local value chains : beyond direct employment, GEIF II's investments support the growth of a broader economic ecosystem — suppliers, subcontractors, maintenance technicians, distributors. According to the Rockefeller Foundation (2022), the transition to clean energy could create 5.2 million net jobs in Sub-Saharan Africa by 2030, by mobilizing the entire value chain.

Access to reliable and affordable electricity: a catalyst for added value and job creation: by delivering quality electricity at a lower cost, GEIF II's portfolio companies are transforming the lives of local entrepreneurs: ***"I pay three times less at Nuru than I did for diesel, so you can imagine what that means for my business... That generator also used to overheat all the time. We lost machines because of it."*— Ezekia Rubona, 27, Nuru customer and owner of a digital service center**

"I've been working at Agros for nearly five years, and I love the company's collaborative culture. The team is fantastic, and there are always opportunities to learn. No two days are the same, and it's incredibly rewarding to know that we're making a real impact. Employees benefit from a good work-life balance, open communication, and a supportive atmosphere. It's wonderful to be part of a company that truly values its people."

Myat Noe, from Accounting Assistant to Head of the Finance Team in Myanmar

Our ESG indicators

As an Article 9 fund under the SFDR regulation, GEIF II is committed to full transparency. Each year, we measure and publish our performance on the Principal Adverse Impact (PAI) indicators, in line with regulatory requirements — a critical exercise to ensure alignment between our impact ambition and accountability.

Greenhouse Gas Emissions	Greenhouse gas emissions	**N/A**
	Carbon footprint	**N/A**
	GHG intensity of beneficiary companies	**N/A**
	Exposure to companies active in the fossil fuel sector	**0%**
	Share of consumption and production from non-renewable energy sources	**1%**
	Energy consumption intensity by sector with high climate impact	**0.09**
Biodiversity	Activities with negative impact on biodiversity-sensitive areas	**0%**
Water	Emissions into water (Tons of emissions in million EUR invested)	**0.02**
Waste	Rate of hazardous and radioactive waste	**0**
	Violations of OECD and UN Global Compact principles	**0**
Social & Employee Matters	Absence of processes to monitor compliance with principles	**40%**
	Gender pay gap (as a % of average wage to male workers)	**0.015**
	Gender diversity on the board of directors	**14%**
Optional Indicators	Number of severe human rights violations	**0**
	Distribution of energy consumption by source	**N/A**

NB1: Indicators 1, 2, and 3 entail a high fixed cost of data collection for our portfolio companies. Given the ongoing uncertainty surrounding the SFDR (with consultation results expected by the end of summer), we have decided not to impose this reporting burden on them at this stage.

NB2: Two portfolio companies have not reported their performance across all PAI indicators due to extenuating circumstances

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The Impact Of Our Investments & Our Support

In this section

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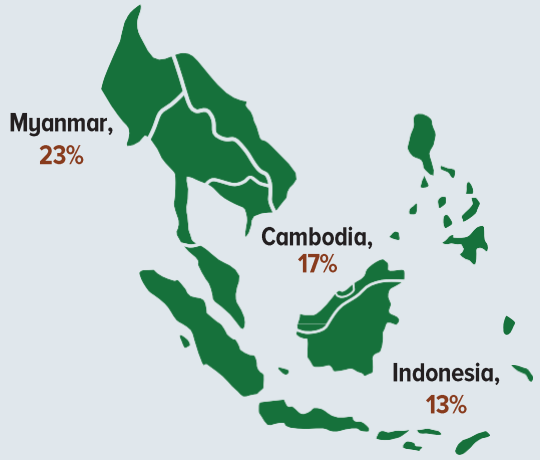
Helping farmers increase their profits and reduce their emissions

Agriculture is a key sector in many Southeast Asian countries, representing % of GDP



Reducing this yield gap could increase farmers' incomes in contexts of deep poverty: **around half of rural households in Cambodia live near the poverty line and are vulnerable to falling back below it; rural areas are home to 70% of people living in poverty in Myanmar; and the rural poverty rate in Indonesia (13%) is nearly twice that of urban areas.**

The challenge

In this context, one of the main challenges is to increase agricultural yields while minimizing the environmental impact of current practices. Irrigation still largely relies on diesel-powered water pumps, which impose significant economic and environmental constraints:

- **High cost of diesel pump operation:** $600 per hectare per year (including pump purchase, fuel, and maintenance). This financial burden weighs heavily on farmers' resources, often diverting funds from more profitable yield-boosting investments, thereby helping to maintain low income levels. (SDG 2: By 2030, double the agricultural productivity and incomes of small-scale food producers, particularly women, Indigenous peoples, family farmers, pastoralists, and fishers, including through secure and equal access to land, productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.)

- **High environmental cost:** 3.5 million hectares are irrigated using diesel pumps in Southeast Asia. Diesel combustion releases numerous harmful emissions: fine particulate matter (linked to heart and lung disease), carbon monoxide, nitrogen oxides (NOx), and other greenhouse gases.

To sustainably increase agricultural productivity, improve farmers' quality of life, and meet growing demand, it is essential to replace fossil-fuel-powered pumping systems with renewable energy-based solutions.

Agros

Agros' response to this environmental and social challenge

Agros sells solar water pumps to smallholder farmers in Myanmar, Cambodia, and Indonesia as replacements for diesel pumps. The result: no more emissions, no more fuel costs.

Their solution, AgroSolar, includes irrigation accessories (such as drip systems, timers, etc.) and enables savings of $50 per hectare per month, with a return on investment in under 16 months. Beyond cost savings and emissions reductions, AgroSolar helps farmers cope with climate change by offering:

- Improved access to water, even during diesel supply crises
- More flexible and sustainable irrigation, promoting water-efficient practices

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Sources: (1) https://phys.org/news/2022-03-southeast-asia-yield-gap-major.html ; (2) Agros NCI 2024 Serie A ; (3) https://www.epa.gov/dera/learn-about-impacts-diesel-exhaust-and-diesel-emissions-reduction-act-dera ; (4) https://www.ifad.org/documents/d/new-ifad.org/investing-in-rural-people-in-cambodia-pdf ; (5) https://documents.worldbank.org/en/publication/documents-reports/documentdetail/755601467996737531/growing-together-reducing-rural-poverty-in-myanmar ; (6) https://pmc.ncbi.nlm.nih.gov/articles/PMC10284375/#:~:text=Rural%20poverty%20rates%20(13%25),34.54%20million%20people%20%5B12%5D.


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“

Daw Mu Yar Win, a 44-year-old farmer from the village of Than Ywar, Myanmar, adopted solar-powered irrigation after hearing about Agrosolar from a well worker. Using diesel pumps had become difficult and expensive for her, so she decided to give Agrosolar a try.

Previously, she spent USD $14 per day on fuel during the growing season and $60 per year on machine repairs. Since switching, her costs have become virtually zero, and she now has reliable and free water for her crops.

This change enabled her to double the size of her farm from 1 to 2 hectares, grow more produce—including bananas—and reduce her labor costs.

”

Agros Innovation: Overcoming Barriers to the Adoption of Agricultural Technologies

Although profitable, solar pumps sometimes struggle to gain adoption due to limited access to credit, lack of information, or doubts about their effectiveness. **Agros overcomes these barriers through:**

- **A network of 50 field agents,** who carry out awareness campaigns and organize on-farm demonstrations directly with farmers.
- **A farmer-to-farmer referral program,** which leverages local word-of-mouth and allows farmers to see the pumps operating on nearby farms.
- **Flexible payment solutions,** such as post-harvest payments or microfinance, to ease cash flow constraints.

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Agros' Impact

Since its creation, **Agros's innovative business model has enabled it to sell solar water pumps (SWPs) to nearly 6,000 farmers.** Since GEIF II's investment, **Agros's SWPs have helped avoid approximately 25,000 tonnes of CO_2eq emissions.** We estimate that around 16,000 people benefit from Agros's SWPs, either directly (through farmers' use of the pumps) or indirectly (via increased household income).

> The cumulative savings achieved through **reduced diesel-related costs now amount to €7.8 million.**
>
> **Nearly 14,000 hectares irrigated with Agros' solar pumps** are now cultivated sustainably.

Transforming Energy Management Through Innovation

Limited monitoring of grid performance

In many Sub-Saharan African countries, electric utilities have very limited visibility over the reliability of their networks. They still rely on infrequent and often biased surveys to measure outages or voltage drops. This lack of reliable data prevents effective targeting of investments, whether to meet demand or to address recurring technical issues.

The vicious cycle of non-payment

Utilities also face high rates of unpaid bills, which reduces their revenues, limits their ability to invest in maintenance or grid expansion, and further degrades service quality. An unreliable service leads users to pay less, which worsens utilities' financial difficulties and hampers any improvement efforts.

The challenge

Improving electricity quality has positive effects for:

- **Businesses:** Improved reliability of electricity supply can be a key driver of growth and productivity. In the short term, it reduces downtime of productive capital and cuts expenses related to costly backup sources. In the long term, it encourages investment in energy-intensive equipment, thus supporting business development.
- **Households:** Better electricity quality—particularly in terms of voltage stability—lowers the risk of appliance damage. This can encourage households to invest more in appliances, increasing the utility and benefits derived from access to electricity.
- **The environment:** Diesel generators, often used as a fallback during national grid outages, are major emitters of greenhouse gases and local pollutants. These effects are significant—**for example, pollution from such generators is equivalent to 20% of road transport CO_2eq emissions.** They are also a major source of local pollution, with heightened impact due to their proximity to homes and businesses.

BPS's response to this environmental and social challenge

BPS offers innovative solutions tailored to the specific needs of public utilities across the continent:

- **CAIMS (Customer and Asset Information Management System):** a digital addressing and mapping platform (GIS) powered by AI. It enables electricity companies to collect and organize data more efficiently—particularly by identifying commercial and technical losses and detecting fraud (e.g., meter tampering)—thereby increasing utility revenues.
- **ADORA:** a real-time grid monitoring and control tool that helps utilities optimize electricity distribution, improve operational efficiency, and reduce outages.

Sources: (1) https://www.theigc.org/publications/are-we-path-sustainable-health-electrification-lessons-remote-power-quality-and ; (2) https://www.aeaweb.org/articles?id=10.1257/jep.34.1.145 ; (3) https://www.theigc.org/sites/default/files/2018/06/Abeberese-et-al-2017-Working-paper.pdf ; (4) https://openknowledge.worldbank.org/entities/publication/556f9d48-89d4-4f88-b770-2d49d0135b2e ; (5) https://www.aeaweb.org/articles?id=10.1257/mac.20210248 ; (6) http://www.robynmeeks.com/wp-content/uploads/2018/05/Carranza_Meeks_2018May.pdf (7) https://www.ifc.org/content/dam/ifc/doc/mgrt/20190919-summary-the-dirty-footprint-of-the-broken-grid.pdf

BPS innovation : A job-creating « African tech on legs » approach

BPS stands out through a unique approach that combines technology with strong on-the-ground presence, ensuring integration and adoption by public utilities:

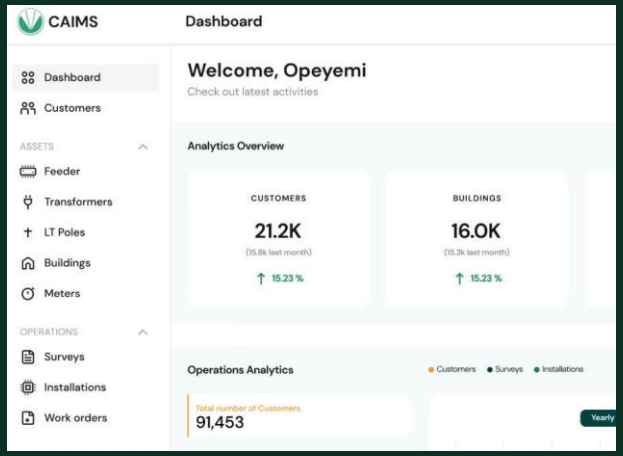
- **A "tech on legs" approach:** Unlike purely software-based solutions, BPS activates its digital tools through large-scale field deployment. A fleet of 1,000 surveyors is mobilized to verify all assets and collect data.
- **Support for utilities: I**ntegration of BPS's solutions goes beyond technology. BPS provides ongoing support to electricity companies, offering both commercial and operational guidance to help them use and embed the tools into their processes.
- **An approach rooted in the African context:** BPS's technology is built on in-depth knowledge of local challenges and the ability to adapt to real-world conditions. This "African tech" model blends digital expertise with fieldwork to address the specific needs of public utilities on the continent.
- **A model that creates skilled jobs:** Unlike standard SaaS solutions, where optimization is driven solely by algorithms, BPS emphasizes local talent by creating skilled field jobs. Artificial intelligence is applied at the end of the process, after data has been collected by on-the-ground teams.

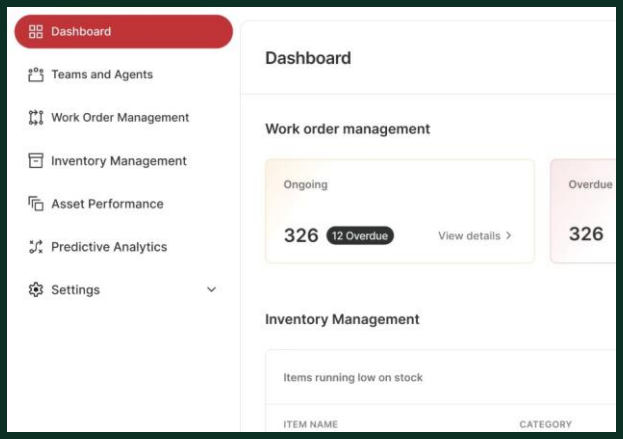
BPS' Impact

While our consolidated impact metrics are still being formalized, several key figures already highlight the scale of the systemic transformation led by BPS:

- **Direct impact on over 50 million consumers and businesses** across the African continent.
- **Up to 500,000 tCO_2eq emissions avoided** over time (methodology under refinement), driven by the reduction of carbon-intensive off-grid sources.
- Strong momentum in local job creation: **121 full-time equivalents (FTEs) as of Q4 2024.**
- **Secured contracts with 9 national utilities,** strengthening operational reach and credibility.
- **Over 1 billion data points processed** daily to enhance the reliability and efficiency of power grid management.
- **Reduced reliance on diesel generators, with up to 1 hour less usage per day** — a tangible step toward a more accessible and cleaner energy transition.

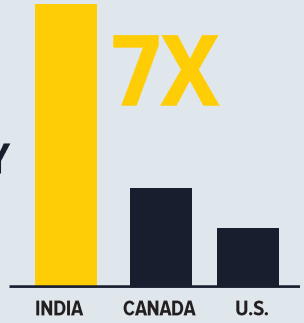
BPS tagging of an East Accra district, Ghana





Tailored Solar Solutions for Businesses

INDUSTRIAL ELECTRICITY PRICES



In India, industrial **electricity prices are nearly seven times higher than in Canada or the United States (in purchasing power parity)**. Due to tariff equalization, industrial customers have paid up to 15 times more for electricity than households and agricultural users.

LOAD SHEDDING IN SOUTH AFRICA

Power outages **lasting 6 to 12 hours per day**

In South Africa, load shedding – caused by a supply unable to meet demand – has surged in recent years, leading to massive power outages lasting 6 to 12 hours per day. This situation stems from underinvestment by Eskom, the national utility that provides over 90% of the country's electricity, in generation and transmission infrastructure.

The challenge

- Reliable and affordable electricity is a major driver of growth for the commercial and industrial (C&I) sector
- High prices or power outages hinder production, employment, and productivity, as shown by a study on manufacturing firms in India (Abeberese (2013)).
- In the long term, energy instability prevents investment in more electrified equipment, slowing down business modernization.
- Outages also have an environmental cost, as companies turn to polluting diesel generators.
- A "missing link" in financing exists for intermediate C&I projects (30 kWp to 2 MWp), despite an estimated potential of 2 to 4 GW in Sub-Saharan Africa.

Candi's Response to This Environmental and Social Challenge

Candi is a solar installer, financier, and asset operator active in India and South Africa.

Candi offers its clients a fully financed solution with no upfront costs or maintenance fees, through long-term PPP contracts.

In South Africa, Candi has also deployed battery-backed solutions, enabling C&I clients to cope with the frequent power outages of the national grid.

Sources : (1) https://www.iea.org/data-and-statistics/charts/industrial-electricity-prices-in-india-and-selected-countries-2005-2019 (2) https://voxdev.org/topic/energy-environment/cost-power-electricity-pricing-and-firm-output-india (3) 'https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2273729); (4) https://www.theigc.org/sites/default/files/2018/06/Abeberese-et-al-2017-Working-paper.pdf ; (5) https://openknowledge.worldbank.org/entities/publication/556f9d48-89d4-4f88-b770-2d49d0135b2e ; (6) https://www.aeaweb.org/articles?id=10.1257/mac.20210248 ; (7) https://www.ifc.org/content/dam/ifc/doc/mgrt/20190919-summary-the-dirty-footprint-of-the-broken-grid.pdf ; (8) https://medium.com/thebeammagazine/the-missing-middle-supplying-sub-saharan-africas-commercial-and-industrial-sector-with-solar-256d6dc196b7

Candi's Innovation: Providing a Cost - Effective & De-Risked Solution to the "Missing Middle."

- **Bridging the "missing middle":** Candi delivers solar solutions (with or without batteries) in India and South Africa for the "missing middle" segment, specifically targeting installations between 500 kW and 1 MW. This directly addresses strong demand from SMEs facing high electricity costs and unreliable power supply.
- **Optimized and cost-effective contracts:** Candi designs optimized Power Purchase Agreements (PPAs), enabling businesses to achieve significant savings compared to grid electricity. By eliminating upfront costs and offering stable long-term rates, Candi makes solar energy accessible and predictable for companies that would otherwise be unable to invest in renewables.
- **A turnkey, hassle-free solution:** Candi manages the entire process—from installation to financing and long-term maintenance—removing technical and financial barriers for businesses looking to adopt solar energy without operational risk.

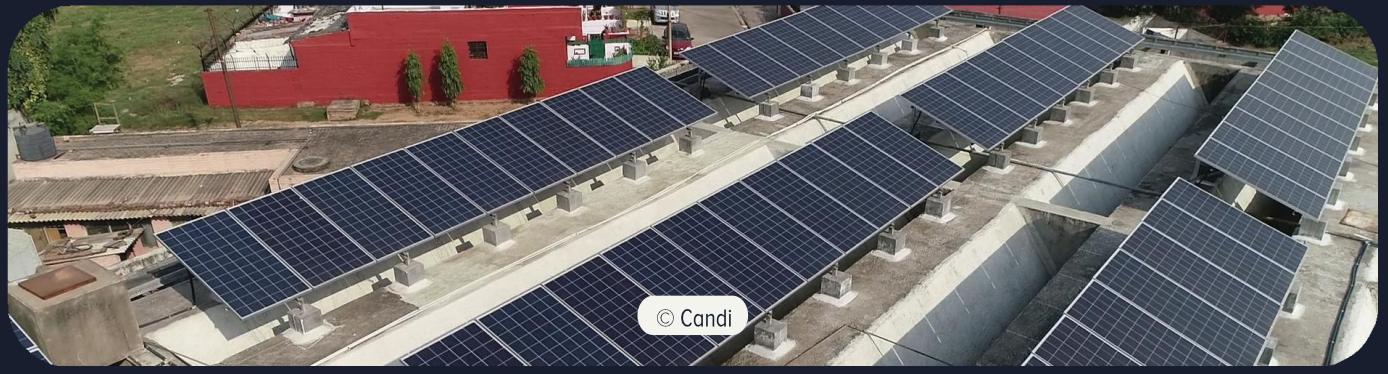
The Eveready manufacturing plant in Somanhali, Karnataka, faced two major challenges:

High manufacturing costs: Rising expenses for raw materials and electricity significantly increased production costs.

Frequent grid outages: Power cuts were disrupting Eveready's operations nearly five days a week. To cope, the company relied heavily on diesel generators, raising both financial and environmental concerns.

In response to these challenges, Eveready partnered with Candi Solar to install a 650-kW solar system under a customized Power Purchase Agreement (PPA).

Shashidhara, the plant manager, says: *"Our electricity cost has come down to ¤8.00 per kWh, which is a 30% reduction. During power outages, we use diesel generators. However, there were instances when the generators couldn't fully support our operations. In such cases, solar power proved essential to keeping us running."*



Candi's Impact

Since its inception, Candi's optimized and de-risked contracts h**ave enabled the deployment of solar solutions across nearly 160 sites, with a total installed capacity of 150 MWp, including 19 sites equipped with battery storage.**

By offsetting electricity consumption from expensive, carbon-intensive grids, **Candi's installations have helped avoid approximately 78,000 tonnes of CO_2eq emissions.**

> The percentage of **savings achieved compared to the electricity grid currently stands at 39%.**

This indicator, based on the cost per kWh compared to grid electricity, is not cumulative but directly reflects the price competitiveness of their offering.

> **The share of installations that include battery storage, allowing firms to mitigate the effects of blackouts, currently stands at 12%.**

Impact Investment Provider Specializing in Solar Projects

CO_2 emissions from electricity generation account for the majority of global emissions, reaching a record high of 37.4 billion tonnes in 2023.This trend casts doubt on our ability to meet climate targets, despite efforts to accelerate the energy transition.

The rise of clean energy has helped slow the growth of emissions, but not yet to reduce them significantly. However, the energy transition remains deeply unequal. The bulk of clean energy investments and infrastructure is concentrated in China and advanced economies, leaving many regions of the world behind.

In many developing countries, electricity generation remains heavily reliant on fossil fuels, resulting in high carbon intensity[3] and slowing the decarbonization of the sector.

The challenge

- To meet the growing electricity demand in low- and middle-income countries (LMICs) while ensuring that electrification contributes to emissions reduction, it is imperative to scale up investment in renewable generation capacity.
- The financing gap in the energy transition is substantial: investments in low-carbon technologies must quadruple to keep the world on track to meet the 1.5°C warming limit.
- Renewable energy projects are highly capital-intensive, making the cost of financing a critical factor for their viability. However, in LMICs, the cost of capital is significantly higher than in high-income economies, hindering the rollout of low-carbon infrastructure.
- Lowering the cost of financing is essential to unlocking the investments needed in LMICs.

Ecoligo's Response to This Environmental and Social Challenge

Ecoligo is a German platform which designs, develops, finances, constructs, and operates solar projects for commercial and industrial (C&I) clients in emerging markets.

Ecoligo relies on its own crowdfunding platform, a fast and flexible financing solution, offering low-cost debt **(over €17.6 million raised at an interest rate of 5-6% to date).**

Sources : (1) https://www.iea.org/reports/co2-emissions-in-2023/executive-summary (2) https://www.iea.org/reports/clean-energy-market-monitor-march-2024 (3) https://ourworldindata.org/grapher/carbon-intensity-electricity (4) https://www.iea.org/reports/financing-clean-energy-transitions-in-emerging-and-developing-economies/executive-summary (4) https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2023/Feb/IRENA_CPI_Global_RE_finance_2023.pdf

Since installing a Solar PV system, our business has seen notable benefits. The switch to solar has drastically reduced our electricity costs, allowing us to allocate resources more efciently. Our operations have become more reliable, with fewer disruptions from grid outages, and we've been able to minimize our dependence on diesel generators, cutting both expenses and emissions. Additionally, the project contributed to local job creation during installation & maintenance.

We're proud to be part of the clean energy transition and partnering with Ecoligo. Solar has not only been an economic decision but also a step toward sustainable growth.

Shiv Danda, CEO de Spice World Limited (Nairobi, Kenya)

Ecoligo Innovation: Mobilizing Private Capital to Finance the Energy Transition in Emerging Markets

Ecoligo's crowdfunding platform allows private savings from investors in Germany, the Netherlands, and Luxembourg to finance solar projects across three continents (Asia, Africa, and South America). One of Ecoligo's key contributions lies in its ability to channel private financing, transforming capital that could have remained idle into a driver of sustainable development.

A significant contribution to renewable energy investments: 85% of the investments signed by Ecoligo are in countries where these funds represent more than 5% of the total Foreign Direct Investment (FDI) dedicated to sustainable energy. This high proportion gives Ecoligo a catalytic role, capable of helping some countries achieve their Sustainable Development Goals (SDGs) related to clean energy.

Ecoligo's Impact

In 2024, the installations financed by Ecoligo produced nearly 66 GWh of renewable energy.

> Since the investment from GEIF II, **Ecoligo has helped its client companies avoid over €1.8 million in electricity costs and has raised €7.3 Million in debt through crowdfunding.**

By replacing carbon - intensive grid electricity with energy from renewable sources, w**e estimate that the installations financed by Ecoligo have helped avoid approximately 46,000 tonnes of CO_2eq.**

Provider of innovative energy access solutions in Africa

In Sub-Saharan Africa, **over 600 million people** still lack access to reliable electricity. In several of the countries where **MyJouleBox operates — Benin, Burkina Faso, Senegal, Ivo and Niger** — the situation is marked by:

- **A persistent rural electrification deficit:** In all these countries, **the rural electrification rate is below 50%**, with extremely low levels in Niger (7%) and Burkina Faso.
- **Unreliable electricity even in connected areas:** In 25 of the 29 African countries with recent data, fewer than one-third of businesses have reliable access to electricity.

© MyJouleBox ARESS

The challenge

The **lack of access to electricity limits access to essential services** (health, education) and hinders productive activities, posing a major **obstacle to economic development.**

More than **two-thirds of businesses in Sub-Saharan Africa face frequent power outages, directly impacting their productivity and operations.** This energy instability also affects households, reducing the actual benefit they can derive from their electricity access and complicating the adoption of essential electrical appliances.

Solar energy represents a crucial solution to accelerate electrification in Sub-Saharan Africa. **However, the currently available technologies — mini-grids, solar home systems, and photovoltaic installations for businesses — are still insufficiently deployed due to several barriers: lack of financing, weak market structuring, and solutions that are inadequately tailored to users' specific needs.**

In the face of these challenges, innovative solutions adapted to local contexts are needed to ensure universal and reliable access to clean energy, a critical condition for the region's sustainable development.

MJB's Response to This Environmental and Social Challenge.

AIn response to the challenges limiting the deployment of solar solutions, MyJouleBox adopts an integrated approach, combining several solutions tailored to the diverse needs of users:

- **Solar kits for households:** A simple and accessible solution for immediate access to electricity.
- **Mini-grids in rural areas:** To electrify remote villages beyond the reach of the national grid.
- **Solar installations for businesses:** Reliable and affordable energy to enhance competitiveness.

Through this combined approach, MyJouleBox addresses the various needs of users while structuring the market and facilitating access to financing, thus actively contributing to accelerating electrification in Sub-Saharan Africa.

Sources: (1) https://data.worldbank.org/indicator/EG.ELC.ACCS.RU.ZS (2) https://documents1.worldbank.org/curated/en/837061552325989473/pdf/Electricity-Access-in-Sub-Saharan-Africa-Uptake-Reliability-and-Complementary-Factors-for-Economic-Impact.pdf); (3) https://www.theigc.org/sites/default/files/2018/06/Abeberese-et-al-2017-Working-paper.pdf ; (4) https://openknowledge.worldbank.org/entities/publication/556f9d48-89d4-4f88-b770-2d49d0135b2e

Previously, due to the lack of electricity, I used to operate my sewing machine manually. However, since we have been connected to electricity, I am extremely happy to be able to use it electrically, which provides me with more comfort, speed, and efciency. Furthermore, to increase my income, I have developed a business selling fresh products.

Rosalie Ainin, Customer of an ARESS / MJB Mini-Grid

Innovation MyJouleBox: an innovative local player with integrated expertise across the entire value chain

- Having raised very little external capital, MyJouleBox is able to maintain a strong local presence and develop an in-depth understanding of the market, which is essential for offering tailored solutions to its markets
- MJB covers all energy needs, from solar home kits to industrial solar solutions, making it one of the few companies capable of addressing diverse demand across various user segments.
- Unlike companies that specialize in a single type of solar solution, MJB's comprehensive expertise, from engineering to installation, ensures better project execution. MJB develops specific hardware and software solutions to address the challenges of its operational markets. **For example:**
  - **SOLI:** A technology designed to optimize energy distribution and improve the reliability of systems.
  - **Custom smart meters for mini-grids:** Enabling efficient management of decentralized electrical networks.

MyJouleBox's Impact

Since the investment from GEIF II, the solutions deployed by **MyJouleBox have helped avoid 1,300 tonnes of CO_2 eq. Nearly 27,000 people** benefit from the electricity produced.

Thanks to MyJouleBox's solar systems, households have collectively saved nearly 800,000€ in fuel costs since GEIF II's investment.

3,720 people have benefited from improved access to financial services through MyJouleBox's PAYGo sales

Bridging the energy access gap in the Democratic Republic of Congo

The Democratic Republic of the Congo (DRC) is one of the poorest countries in the world, ranking 164th out of 174 on the Human Capital Development Index. This situation is the result of one of the longest and most complex humanitarian crises in the world.

13 million people are in urgent need of humanitarian aid, and nearly 4.5 million people are displaced within the country. This instability was further exacerbated in January 2024 by the takeover of Goma by the M23 movement, worsening the humanitarian and security situation in the region.

Only 20% of the population has access to electricity, making the DRC one of the most behind countries in terms of electrification. Even in urban areas, access is limited to 40%, highlighting the major challenges related to infrastructure and the capacity of the electrical grid to meet the population's needs.

The challenge

The energy crisis in the DRC is linked to several major challenges:

- **Lack of financial resources:** Approximately USD 10.5 billion (30% of GDP) is needed to electrify the provincial capitals, an effort that is beyond the state's capacity alone.
- **Instability and fragility of the context:** Conflicts, poverty, poor infrastructure, and population displacement make demand difficult to predict and complicate large infrastructure projects.
- **Many households cannot afford a connection to the grid.**
- **Large-scale grid extensions are not realistic in this context, highlighting the need for local and decentralized solutions, such as solar or hybrid mini-grids close to populated areas.**

Nuru's response to this environmental and social challenge

In response to the energy challenges in the Democratic Republic of the Congo (DRC), Nuru has deployed large-scale urban mini-grids to improve access to reliable and clean electricity. Currently, four mini-grids are operational in Goma, Beni, Tadu, and Faradje. These infrastructures play a key role in electrifying urban areas, where access to electricity remains limited.

In Goma, a 1.3 MW hybrid solar site has been established. This is the largest off-grid mini-grid in Sub-Saharan Africa, demonstrating the potential of solar solutions to provide stable electricity and reduce dependence on fossil fuels.

Sources : (1) https://www.worldbank.org/en/country/drc/overview (2) https://www.theigc.org/sites/default/files/2024-07/Mahmood%20and%20Hamilton%20Case%20Study%20July%202024.pdf (3) https://www.theigc.org/sites/default/files/2024-07/Mahmood%20and%20Hamilton%20Case%20Study%20July%202024.pdf (4) https://openknowledge.worldbank.org/server/api/core/bitstreams/e1f7bc4d-e47c-512f-93d53e216255aa2f/content

I connected to Nuru's electricity just after its launch. We were among the first to sign up for Nuru energy and were even eligible for a bonus.

Since subscribing to Nuru, I am satisfied with the lighting capacity in my house. Now I can turn on all the lights in the rooms, the living room, and I can watch TV anytime. I charge my phone, plug in my laptop, and I am very happy with that. Nuru energy makes things easier for us.

MUSHAGALUSA NTABARA JOSPIN
(Inhabitant of the Ndosho district in Goma)

Nuru's innovation: a local innovator with integrated expertise across the entire value chain

Nuru adopts an "ABC" mini-grid model (Anchor - Business - Community), which is based on a strategy of diversifying the customer base in urban areas: anchor (key institutional or industrial clients); business (enterprises and businesses); community (households and public infrastructure).

This model is supported by Power Purchase Agreements (PPAs) signed with commercial and industrial clients, ensuring a predictable and stable demand from the moment the grid is commissioned. This approach allows Nuru to secure commercial profitability from the outset, making its mini-grids economically viable and sustainable.

The launch of the interconnection with the Virunga hydropower plant in the fall of 2024 marks a major advancement for Nuru's mini-grids. This connection will allow:

- An increase in electricity production capacity, particularly during the night.
- A reduction in dependence on diesel generators, leading to:
  (i) Fewer power outages (reduction in downtime),
  (ii) A decrease in local and global pollutant emissions

Nuru Impact

The 1.69 MWc from Nuru's 4 deployed mini-grids serve 2,714 connections, including 28 essential services. Since the GEIF II investment, **Nuru's mini-grids have helped avoid 761 tonnes of CO_2eq. Nearly 15,000 people** and **more than 800 institutions (public institutions, SMEs) benefit from the electricity produced.**

For the four mini-grids currently in operation, the target of 771 connected institutions has already been reached, demonstrating excellent on-the-ground performance by local actors. **The number of power outages per week (0.1) and the average duration of outages (0.05 hours) are now very low, and in line with the performance standards set set by the Multi-Tier Framework for Energy Access (Energy Sector Management Assistance Program (ESMAP), World Bank).** These performances are primarily due to the structuring impact of the interconnection with the Virunga hydroelectric grid, which has led to a drastic reduction in interruptions and a significant improvement in the reliability of the electricity supply.

Innovative refrigeration for off-grid and weak-grid contexts

SureChill.

Reliable refrigeration remains a major challenge in Sub-Saharan Africa (SSA), where unstable electricity grids and a lack of infrastructure make it difficult to preserve temperature-sensitive products.

Although about **20% of children in the region have never received a single dose of vaccine** the **WHO estimates that up to 50% of vaccines are lost each year, largely due to inadequate temperature control**.

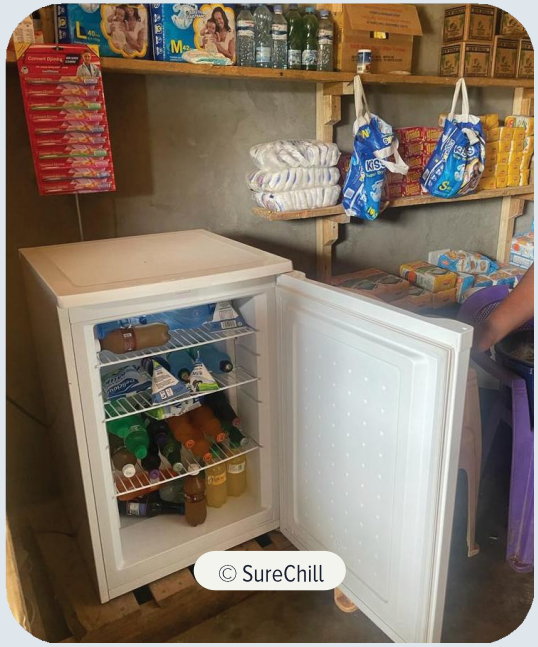
In Sub-Saharan Africa, some **small businesses require refrigeration but struggle to cope with electricity instability.** The lack of cold storage leads to revenue losses and limits business expansion opportunities.

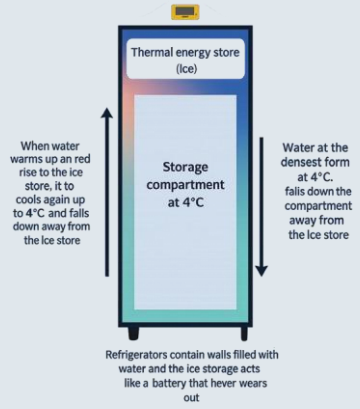
It also impacts food security: up to 40% of agricultural products are lost due to poor storage conditions, while nearly **180 million people face acute food insecurity**.

The challenge

The **instability of electricity grids in Sub-Saharan Africa makes access to reliable refrigeration** particularly challenging, especially for the health, food, and small business sectors. Frequent power outages and the lack of suitable infrastructure compromise the preservation of vaccines, medicines, and perishable goods, thus increasing losses and health risks.

In the face of these challenges, **it is essential to offer a refrigeration solution that is not only reliable and capable of operating without a continuous grid connection but also financially accessible and tailored to the needs of users.**





Sources : (1) https://www.afro.who.int/sites/default/files/2023-10/Status%20of%20immunization%20coverage_final-compressed_compressed.pdf (2) https://www.unep.org/news-and-stories/story/why-optimized-cold-chains-could-save-billion-covid-vaccines#:~:text=The%20World%20Health%20Organization%20estimates,support%20an%20unbroken%20cold%2Dchain. (3) https://energyalliance.org/cooling-food-insecurity-in-africa-with-sokofreshs-solar-powered-cold-storage-solutions/ (4) https://www.worldbank.org/en/news/immersive-story/2022/10/17/putting-africans-at-the-heart-of-food-security-and-climate-resilience

SureChill's response to this environmental and social challenge

- SureChill **distributes refrigerators equipped with innovative technology that ensures a constant temperature, even during power outages or in the absence of a network.**
- The Group's activities include the sale of **(i) medical refrigerators for vaccines and (ii) refrigerators for households and small businesses (HSB) with a PAYGo or CaaS option.** PAYGo is more like a lease-to-own approach, while Cooling as a Service (CaaS) relies on perpetual leasing, a less capital-intensive model that allows for adoption by a wider audience.

SureChill Innovation: Innovative & affordable refrigeration for reliable access to cooling

- **Over 10 years of R&D have resulted in a unique technology** where water is used as a natural energy reservoir. This allows SureChill refrigerators to maintain a constant temperature for up to 12 days (even with ambient temperatures reaching 43°C), with no or limited network connection. SureChill HSB and Medical refrigerators are WHO certified.
- The **absence of a battery (Solar Direct Drive), often the most expensive component in solar equipment, makes SureChill refrigerators relatively affordable financially** (1).
- **Innovative business models (PAYGo, CaaS) help increase financial accessibility.**


© SureChill

Surechill's Impact

In 2024, **SureChill sold 1,277 HSB refrigerators** and **distributed nearly 600** through a CaaS model.

> Over the course of the GEIF II investment period, **11,700 people benefited** from improved access to refrigeration **thanks to SureChill products.** Often installed to replace a complete lack of refrigeration, **these refrigerators have led to the emission of 72 tonnes of CO_2eq.** Their deployment has helped **avoid the waste of 6,700 tonnes of food.**

An example of our extra-financial support **- the case of MyJouleBox | Aress**

With Aress/MyJouleBox, we illustrate the concrete value of our non-financial support as a strategic lever to accelerate company growth and enhance investment impact. Specifically, our contributions have included:

Victor Beulque, Managing Director of Gaia Impact, on a field visit to the Idadjo A **"Les Soleils du Bénin" minigrid, built, operated, and partially owned by MyJouleBox | ARESS**, in 2024.

- **Facilitating connections to legal and financial advisors.**
- Supporting the **implementation of structured internal processes and governance reporting frameworks.**
- Encouraging **strengthened HR strategies,** prompting increased internal focus and effort.
- Assisting directly with **strategic recruitment processes** (including CFO and CDO positions).
- **Actively participating in fundraising rounds** by providing detailed feedback on investment documentation.
- Supplying a quarterly Environmental & Social (E&S) indicators template, **improving internal impact tracking and reporting capabilities.**
- Maintaining **consistent availability** through email and video meetings to **address specific impact-related issues and queries.**
- Responding promptly to **targeted ad-hoc requests, such as sharing entrepreneurial best practices relevant to mini-grid initiatives.**

Additionally, to deepen our understanding of the effectiveness and perceived value of our non-financial support within the GEIF II portfolio, we are currently undertaking a dedicated internal assessment. Results and insights, including potential areas for improvement and refinement, will be shared in Q3 2025.

© Nuru

Research

In this section

© BPS

Research

- To continuously refine our understanding of the real impact of our investments, we have chosen to go further: **we are investing in high-level academic research.**
- **Our impact manager thus dedicates part of their time to a PhD at the Paris School of Economics,** one of the most recognized economic institutions in Europe. **This work enables us to strengthen the effectiveness of our actions, contribute to global knowledge on sustainable energy in Africa,** and ensure that every euro invested has the maximum measurable impact.
- **Her main research project is a large-scale randomized controlled trial (RCT) in Freetown, Sierra Leone, involving 500 small and medium-sized businesses,** in order to concretely measure the demand and barriers to adopting solar energy. Data collection is complete, and analysis is ongoing. This report presents the first results of the study on the RCT in Freetown.
- **This research project has received funding from the International Growth Center (IGC)**, Private Enterprise Development in Low-Income Countries (PEDL), and the King Climate Action Initiative (K-CAI) at J-PAL, and has been carried out jointly with Niccolo F. Meriggi (University of Oxford) and Maarten Voors (Wageningen University).

Context

In Sub-Saharan Africa, less than one-third of businesses report having reliable access to electricity (World Bank Enterprise Surveys, 2023).

This electricity instability has heavy economic and environmental costs:

- **Short-term impacts:** It interrupts production, diverts resources toward costly backup solutions (such as diesel generators), and hinders productivity.
- **Long-term impacts:** It discourages investments in more efficient and productive electrical equipment.

Faced with recurrent power cuts, businesses often turn to diesel or gasoline generators (DGs), a costly and polluting solution. DGs increase emissions of NO_x and particulate matter (PM), harmful to human health and the environment.

However, alternatives do exist: *Decentralized renewable energy solutions can represent a profitable investment for SMEs, with a payback period of around three years according to our data.*

Yet, their adoption remains hindered by several obstacles:

- **High upfront cost**
- **Limited access to credit**
- **Other market failures** (information gaps, adoption risks, etc.)

- **In Sierra Leone, approximately 29.4% of the population had access to electricity in 2022, with only 4.9% of rural households connected to the national grid.** In 2022, the total operational installed capacity of the national grid in Sierra Leone was around 120 MW.
- **The Bumbuna hydropower plant**, which g**enerates 50 MW** during the rainy season, sees **its production drop to 8 MW** during the dry season.
- **To compensate, the country relies on the Karpowership barge, which runs on heavy fuel oil (HFO)** and provides **up to 60 MW** of power. **In 2023 and 2024,** due to payment arrears, **Karpowership reduced its capacity** to provide only essential services, **resulting in widespread, prolonged, and frequent power outages in Freetown.**
- **The Côte d'Ivoire-Liberia-Sierra Leone-Guinea (CLSG)** interconnection provides **an additional 10 MW** of power.
- **The demand is around 360 MW.**
- Exacerbated by an aging transmission network, with losses estimated at around 34.5%, one of the highest rates in the region, the gap between supply and demand leads to frequent, both planned and unplanned, power outages. **SMEs in the Freetown region report facing around 25 outages per week, and nearly all (97%) consider the low reliability of electricity a major constraint on their business operations.**

Methodology

The field experiment in Freetown, Sierra Leone, was conducted in partnership with EasySolar, a local off-grid solutions distributor, to assess the demand for Bluetti AC200MAX solar generators (2 kW) among 494 SMEs.

EasySolar is a portfolio company of GEIF I, in which Gaia Impact invested in 2018.

A Technically Adapted Solution

The suitability of the Bluetti AC200MAX for the energy needs of our target group was rigorously tested using sensor data collected:

- **By EasySolar, from a panel of SMEs in Sierra Leone and Liberia**
- **By the Access to Energy Institute (A2EI), from 150 SMEs connected to a weak grid in Nigeria (Abuja and Lagos).**

These data show:

- **Average daily consumption:** about 2000 Wh
- **Average load:** 400 W
- **Power peaks exceeding 2500 W** — handled by the Bluetti, which can manage surges up to 4000 W.

Very Positive User Perception

Among our sample, the majority of SMEs believe that the Bluetti meets their energy needs:

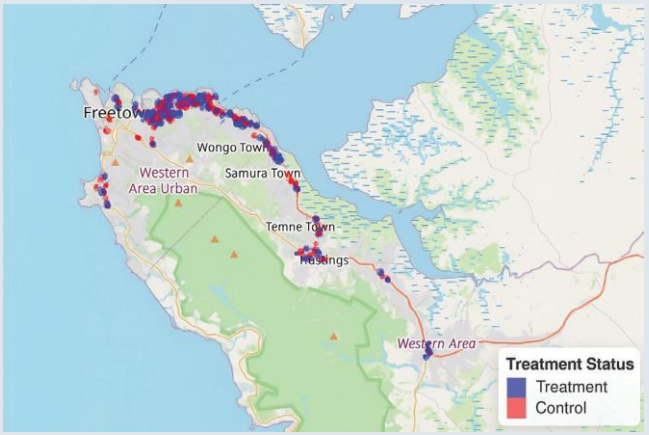
- **Battery autonomy:** 84% satisfied
- **Output capacity:** 88%
- **Recharge time:** 93%

An Experimental Approach to Understanding Credit Constraints

To better understand the role of financial barriers in the adoption of clean technologies,businesses were randomly assigned to one of two groups:

- **Cash payment**
- **One-year credit plan**

This experimental setup allows us to isolate the effect of liquidity constraints on demand and provides insights to improve the financing models for broader deployment.



Our panel consists of 494 dynamic small businesses, with an **average of 5 employees**, and **predominantly active in the service sector (80%): grocery stores, tailoring workshops, restaurants, computer centers, etc.** In the **manufacturing sector (20%), the SMEs surveyed include small businesses in metalworking and carpentry/joinery.**

These businesses generate an average of $241 in weekly revenue, with **costs averaging around $77** per week. Energy represents a significant expenditure: **$34 per week is spent on diesel generators**, which is nearly double their electricity expenses from the national grid.

PROFILE OF THE SURVEYED BUSINESS OWNERS

OVER 90%
have completed primary school

MORE THAN 40%
hold higher education degrees

20%
of the respondents
Women represent about indicating a still limited presence in local entrepreneurship

An SME (small grocery) in Freetown, en Sierra Léone

1. First visit: Baseline data collection

- **Eligibility check:** Verifying if the SME qualifies for the program.
- **Information gathering:** Collecting data on the use of electrical devices to assess the technical suitability of the Bluetti AC200MAX for the business's specific needs.
- **Establishing baseline energy consumption:** Recording the SME's energy consumption patterns.

2. Second visit (≈ 2 weeks later): Feedback & Information Objectives of this step:

- **Presenting consumption data:** Sharing the business's energy consumption data and introducing the Bluetti AC200MAX solar generator's features.
- **Explaining financing options:** Detailing available financing options, particularly access to a line of credit to facilitate the purchase.
- **Introducing the BDM auction mechanism:** Familiarizing participants with the BDM auction process through a simulation using a low-value item (e.g., a pack of rubber bands).
- **Informing about the upcoming auction:** Notifying the SME about the actual auction scheduled to take place three weeks later.

3. Third visit (≈ 3 weeks after the second): Main auction

- **Conducting a second BDM practice exercise:** Using a simple item (e.g., a pen) for another BDM simulation.
- **Hosting the real BDM auction:** Organizing the actual BDM auction for purchasing the Bluetti AC200MAX, allowing the SME to demonstrate the true value they place on the product, while maintaining a fair and informed framework.

easy solar

Firm "X"

We estimate that the AC200MAX solar generator may power your appliances as follows:

Around 6 hours in the daytime throughout the year. Since your estimated load is low, depending on the specific wattage of your appliance, there's a possibility that your solar generator might charge more quickly than you use it. This could mean that you might be able to use it continuously during the daytime throughout the year.

Around 7 hours in the daytime in the dry season. Given your estimated load, depending on the specific wattage of your appliance, there's a possibility that your solar generator might charge more quickly than you use it. This could mean that you might be able to use it continuously during the daytime in the dry season.

Around 5 hours in the daytime in the rainy season. Given your estimated load, depending on the specific wattage of your appliance, there's a possibility that your solar generator might charge more quickly than you use it. This could mean that you might be able to use it continuously during the daytime in the rainy season.

Around **3 to 12 hours** during the night.

These estimates are based on the following appliance use:

- **1 Fan:** around 20 W to 100 W EACH, used 14 hours per day;
- **1 Freezer (upright and chest freezer):** around 80 W to 300 W EACH, used 6 hours per day;
- **5 Lightbulb:** around 5 W to 23 W EACH, used 14 hours per day;
- **1 Music system:** around 50 W to 200 W EACH, used 14 hours per day;
- **1 Television:** around 80 W to 200 W EACH, used 5 hours per day;

These estimates are based on our best knowledge of the wattage of the types of appliance which you use. The actual solar autonomy you experience may be higher or lower than these estimates.

The actual autonomy of your solar generator will notably depend on the specific types of appliance you use, the energy efficiency of these appliances, as well as the specific size, tilt and direction of your roof. These estimates assume that the solar generator battery is fully charged when the blackout occurs.

Results

Preliminary results reveal a significant gap between the willingness to pay and the market price of the Bluetti AC200MAX:

Average willingness to pay with cash payment:

$620

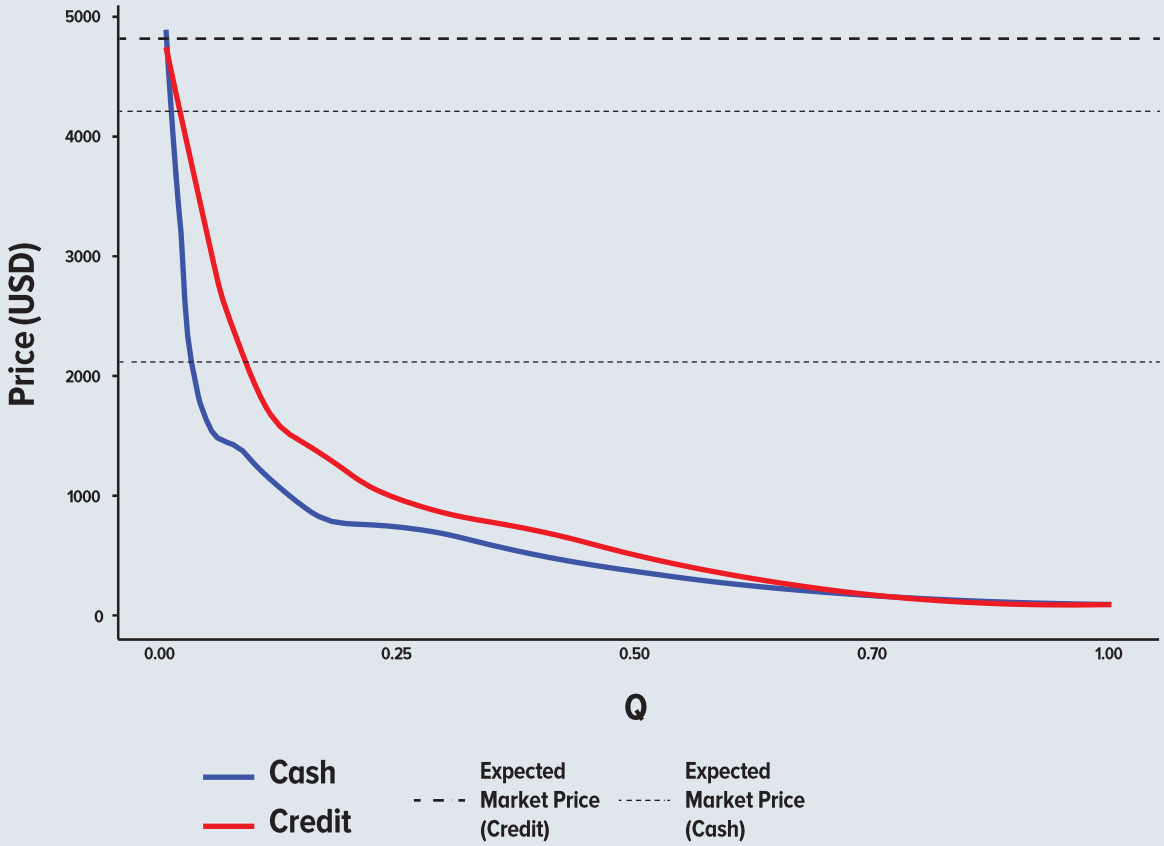
→ **Much lower than the estimated market price of $4,500.**

Willingness to pay with a 12-month credit offer:

$867

→ **A significant increase, both statistically and economically.**
→ **Sufficient to cover the estimated cost of financing.**

These results highlight the importance of tailored financing solutions to expand access to solar technologies for urban SMEs, even when the products effectively meet their needs.



Implications

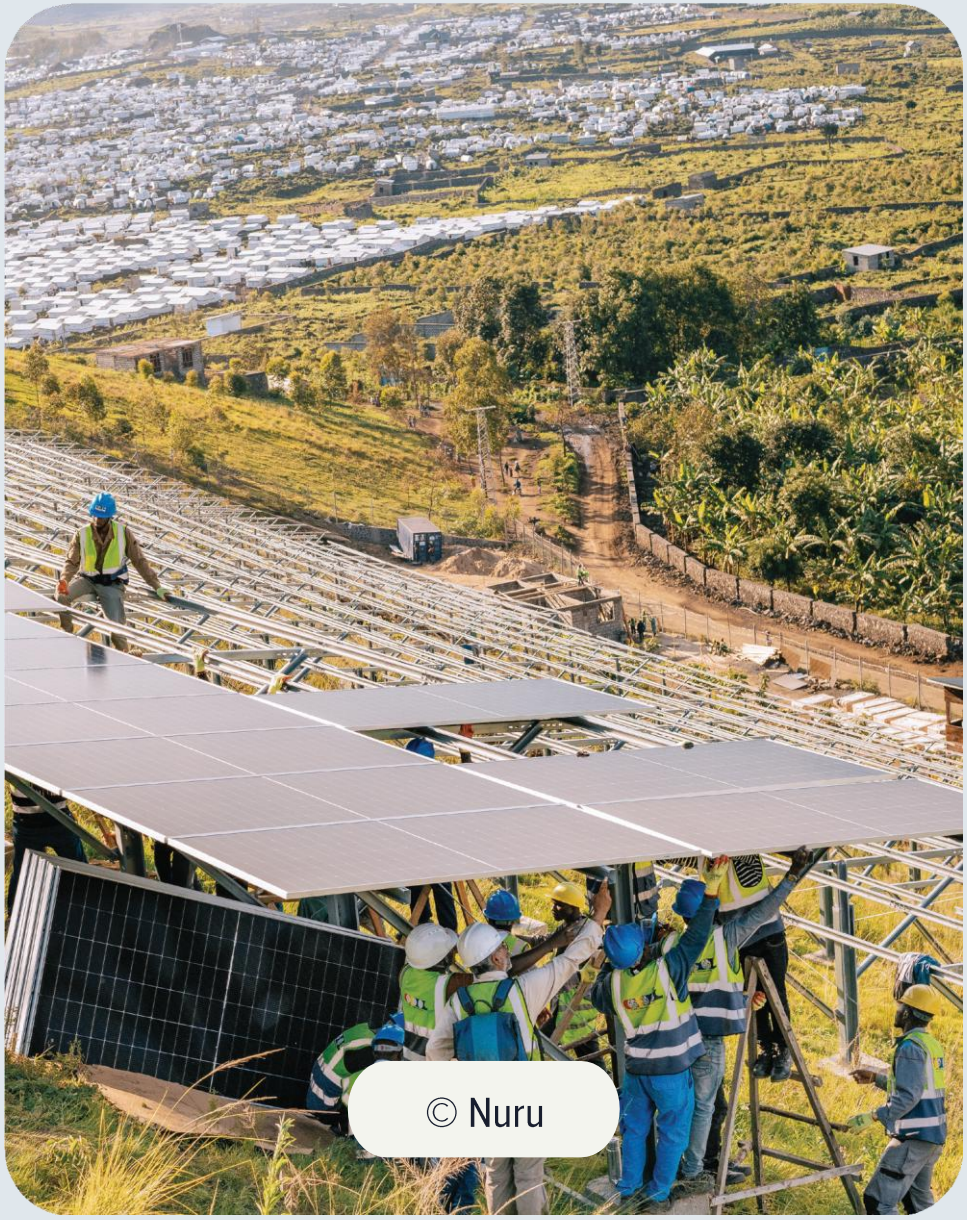
- Less than 1% of SMEs are willing to pay the expected market price, even with access to credit.
- Access to credit seems to play an important role in the adoption of new technologies.
- A one-year credit plan, by reducing diesel and maintenance costs, could increase their willingness to pay up to $867.
- Other constraints (informational, risk-related, behavioral?) also seem to play a role
- Our results suggest that, in the short term and in Sierra Leone, off-grid solutions may be too capital-intensive for large-scale adoption.

However, in the medium term and in other contexts, adoption rates for this type of solution could be much higher than what this study's results suggest:

- **Next-generation solar generators, more affordable:** Since the completion of our study, several models comparable to the Bluetti AC200MAX have emerged on the market at significantly lower prices. A generator of equivalent capacity can now be purchased for around $3,000 (cash payment), making the technology more accessible to a larger number of businesses.

- **Structural decline in solar technology costs:** The cost of photovoltaic panels and batteries – key components of a solar power generation and storage system – has dropped significantly in recent years. **This trend is expected to continue, with a projected decrease of 17% to 52% between 2022 and 2035**, representing an annual decline of between 1.4% and 4%.[1]

- **At this rate, the adoption prospects become tangible: by 2030, nearly 10% of SMEs may be willing to pay the market price for these solutions**, with this figure potentially reaching 25% by 2035.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Doubling Down On Impact

Intriguing times for the seasoned impact investor. After a Cambrian explosion of methodologies, initiatives, frameworks, think tanks and conferences that tried multiple combinations to simultaneously target social & environment impact targets in the 2010s, the concept of impact investing is quietly retreating from the public debate on Africa's growth.

Professionals are taking notice and moving on. The tech world speaks of "impact by design", embedding social outcomes directly into product architecture rather than measuring them post-hoc. Climate investment strategies focus on parametric discussions around carbon accounting, shelving the more complex debates around social impact measurement. Beneficiaries and end users, once central in impact narratives, went back to the realm of political discourse: under the impulsion of the World Bank and the M300 initiative, the African energy sector is rediscovering the basics of programmatic public spending to finance infrastructure that would connect hundreds of millions.

What those new trends have in common: a quest for clarity, efficiency, and accountability. Focusing on one single key outcome (CO_2eq displacement, new connections to the grid) makes for a clear, and investable, investment strategy. The days of sophisticated multi-factor, multi-universe, multi–stakeholders' frameworks are seemingly over. Investors eventually applied to themselves the recipes they've been advising their portfolio companies with for ages – narrow down your growth objectives, focus on one single customer pain point, and push hard.

But there's a glitch. In recent years, rural electrification strategies gradually became un-investable as post-Covid macroeconomic shocks rippled through Africa. Currency devaluation, massive inflation, declining purchasing power, regional conflicts, and reduced international financing, exercised untenable pressure on impact-first energy access initiatives.

In this context, the status quo is a dead end. The tried-and-tested approaches that delivered new electricity access to 370 million people in Africa since 2010 – primarily through grid extension and standalone solar home systems - won't be sufficient to reach the remaining 600 million people without access, let alone achieve universal electrification goals by 2030. Energy access rates have stalled in recent years.

How to reverse this trend? By fully embracing and strategizing energy as a multi-dimensional, complex system, requiring a unique blend of financing and support instruments orchestrated by a razor-sharp sector focus. Deep, life-changing innovation will come from strange encounters between fields and players not used to talking to each other.

Utilities and tech startups have **started collaborating** and suddenly unlocked billion-dollar opportunities servicing the bottom of the pyramid. There'll be many more seminal examples.

We're convinced that impact unicorns are around the corner. Now more than ever is the time for impact investors to back impact entrepreneurs. This is why we're doubling down on impact.

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