GAIA
IMPACT FUND

IMPACT REPORT 2023

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Editorial

To address urgent environmental challenges such as climate change, pollution, and the collapse of biodiversity, nations and businesses must transition to greener, climate-resilient and climate-neutral economies and societies. In 2017, we therefore decided to actively engage in the combat by creating the Gaia Impact fund.
Through this fund, dedicated to the Energy Transition of emerging countries by tracking the economic, environmental and social impact of the companies in which we invest, we pursue the goal of a Just Transition: making the economy greener in a way that is as fair and inclusive as possible for all concerned, by creating decent work opportunities and leaving no one behind. (According to the ILO definition) Ensuring a just transition is important for all countries, regardless of their level of development, but particularly in Africa, a continent where more than 800 million people still do not have access to electricity and whose economic development will require a major increase in energy capacity.
According to Irena, the International Agency for Renewable Energies 'Energy is the key to development in Africa. Green energy is the answer to climate change and a key step for climate neutrality. Without a global transformation of the energy sector, it is futile to hope to achieve the 1.5-degree target set by the Paris Agreement.'
Ensuring a Just Transition is also important for all economic sectors – not just in terms of energy supply – and in both urban and rural areas. It has the potential to be a new driver of sustainable growth in low-, middle- and high-income economies. It can be a net generator of decent green jobs that can contribute significantly to the eradication of poverty and social inclusion.
The just transition does not therefore only contribute to advancing climate action. It also enables progress to be made in achieving all Sustainable Development Goals (SDGs), including those related to affordable and clean energy, economic growth and reducing inequalities, and our fund is actively working to achieve these Goals.
Within the framework of this established action and after six years of experience and monitored (measured) impact, it is our responsibility to now work on the development of a 2nd fund, Gaia Energy Impact Fund II, in the wake of the first investment scope, which consists of financing and supporting VSEs/SMEs that deploy decarbonized solutions (distributed renewable energy).

The purpose of this impact report is to present the issues, the first indicators and a review of the last few years, as well as to open up the field and broaden our perspectives to the immense work remaining in this area by specifying the methodologies and indicators, closely monitoring the PAIs (principal adverse impacts) and finally presenting a best-in-class impact fund that dares to challenge itself and conduct in-depth work combining research (economic and social high level) and action/ analysis on the ground.

Hélène DEMAEGDT, President of Gaia Impact Fund

Glossary

2X Challenge: launched by multiple development finance institutions at the 2018 G7 Summit, the 2X challenge calls on development finance actors to invest $3 billion in private sector businesses enabling women to access leadership opportunities, quality jobs, financing opportunities and products and services that improve women's participation in economic life. Gaia's investment performance in terms of gender is measured using the 2X Challenge criteria.

Willingness to pay: willingness to pay is defined as the maximum price a buyer agrees to pay for a given quantity of a good or service (Le Gall-Ely, 2009). In the absence of market failures - a particularly strong assumption in developing countries - this corresponds to the present value of the net benefits of the good or service for the consumer (Berkouwer and Dean, 2022).

Creation of social welfare: we define the creation of social welfare as the difference between the social benefits (private benefits - for the consumer and the producer - and external factors - environmental, social and economic) and the social costs.

Clean energy ladder: the wide range of off-grid solutions allows consumers to move up the clean energy ladder: 'once their clean energy solution has been repaid, or enough savings have been made, they can move on to broader solutions and additional services' (Lighting Global, 2022).

Last mile: in the off-grid sector, this refers to the most rural (and often the most deprived) households without access to electricity; offering electrification solutions in 'last mile' areas is often complex and expensive (high cost of logistics to ensure supply and provide after-sales services, in particular).

PAYGo: pay-as-you-go (PAYGo) means a credit facility in which the customer makes a down payment to benefit from the product then pays regular instalments until the product has been paid for in full. By reducing the initial costs of solar kits, this mechanism has made them affordable for more modest households.

Gaia ESG policy: Gaia Impact Fund has adopted an ESG (environmental, social and governance) policy to ensure that environmental, social and governance risks are properly considered by the companies in which we invest. This policy is based in particular on international standards (e.g. the principles of the United Nations Global Compact, the United Nations Guiding Principles on Business and Human Rights and the Performance Standards of the International Finance Corporation).

Central grid: the central electricity grid is the national electricity generation and transmission grid (long distance, high voltage) and distribution grid (short distance, low voltage), often managed by a public electricity service. The cost of expanding this grid, which has been estimated in Sub-Saharan Africa at $25,000 per kilometre, can only be cost-effective in densely populated areas with high demand.

Enabling technologies: any technological innovation (Internet of Things, hardware, software), the aim of which is to reduce costs for operators and improve service for customers. Two typical examples of enabling technologies are SaaS (Solar as a Service) CRM (customer relation management) platforms, enabling the deployment of PAYGo solutions, and predictive maintenance solutions and smart meters.

Off-grid solutions: refers to the production of electricity through small solar installations, whether or not connected to the grid. The companies in which we invest offer various types of solutions, including:

- Pico-solar lamps: often with less than 10 watts of peak power (Wp), these types of solar equipment include a battery, a solar panel, one or more bulbs and often a telephone charging port.
- Solar Home Systems (SHS): with power of up to 200 Wp, this equipment is installed on the roof of a building and can supply several light bulbs, charge telephones and possibly other devices, such as televisions and refrigerators for the most powerful.
- Solar generators: more powerful than SHS and portable, these cutting-edge innovations have power of up to 6,000 Wp (comparable to diesel generators). The models currently distributed by our portfolio companies have a capacity of 1,000W to 3,000W.
- Commercial and industrial solar power installations ('C&I installations'): supply electricity to industrial or commercial customers: their power is variable, and can reach several MWp. These solutions are very expensive and are therefore, in general, only sold in the form of leasing.
- Mini- and micro-grids: independent grids that produce electricity on a small scale and can serve a limited number of consumers. They are connected to a power generation source that is most often renewable (e.g. solar, hydraulic, biomass). They may be owned and operated by private or public operators, or by various forms of public-private partnerships.

Domestic uses: we define domestic uses of electricity as all uses of electricity by households with no direct productive purpose (e.g. use of light for study, television for information or entertainment).

Productive uses: productive uses can be defined as '*agricultural, commercial or industrial activities where electricity is directly mobilized to produce goods or services*'. The entire range of off-grid solar devices can be used for productive purposes, a potential that increases with the power of the system used. Solar Home Systems and 'pico' solar kits allow users to work longer or undertake new activities, such as a phone charging business. More powerful products are used to fuel more varied activities in homes (refrigeration, irrigation systems or solar mills), communities (e.g. charging grids for electric vehicles) or on a different s cale f or industrial and commercial customers.

(c) Gaia Impact Fund
«Impact report 2022/23»

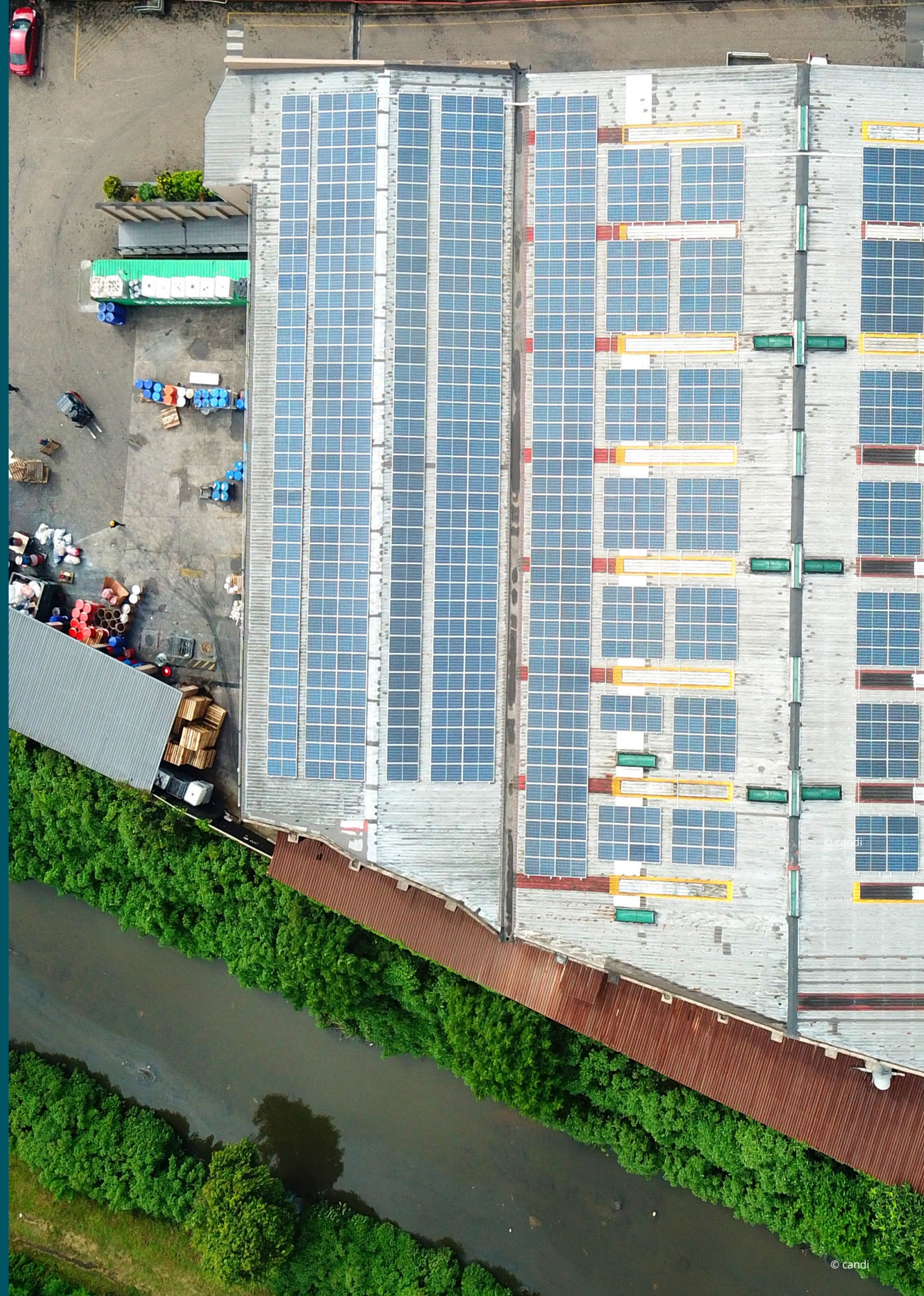
[1] *https://hal.science/hal-00522826/document*
[2] *6 Attigah, Benjamin and Anna Brüderle. 'Productive Use of Energy - PRODUSE, A Manual for Electrification Practitioners'. GIZ, 2011. http://www.euei-pdf.org/sites/default/files/field_publication_file/150907_euei_productive-use-manual rz_04_web.pdf.*

01

Investment in the electrification of developing countries - lessons learnt

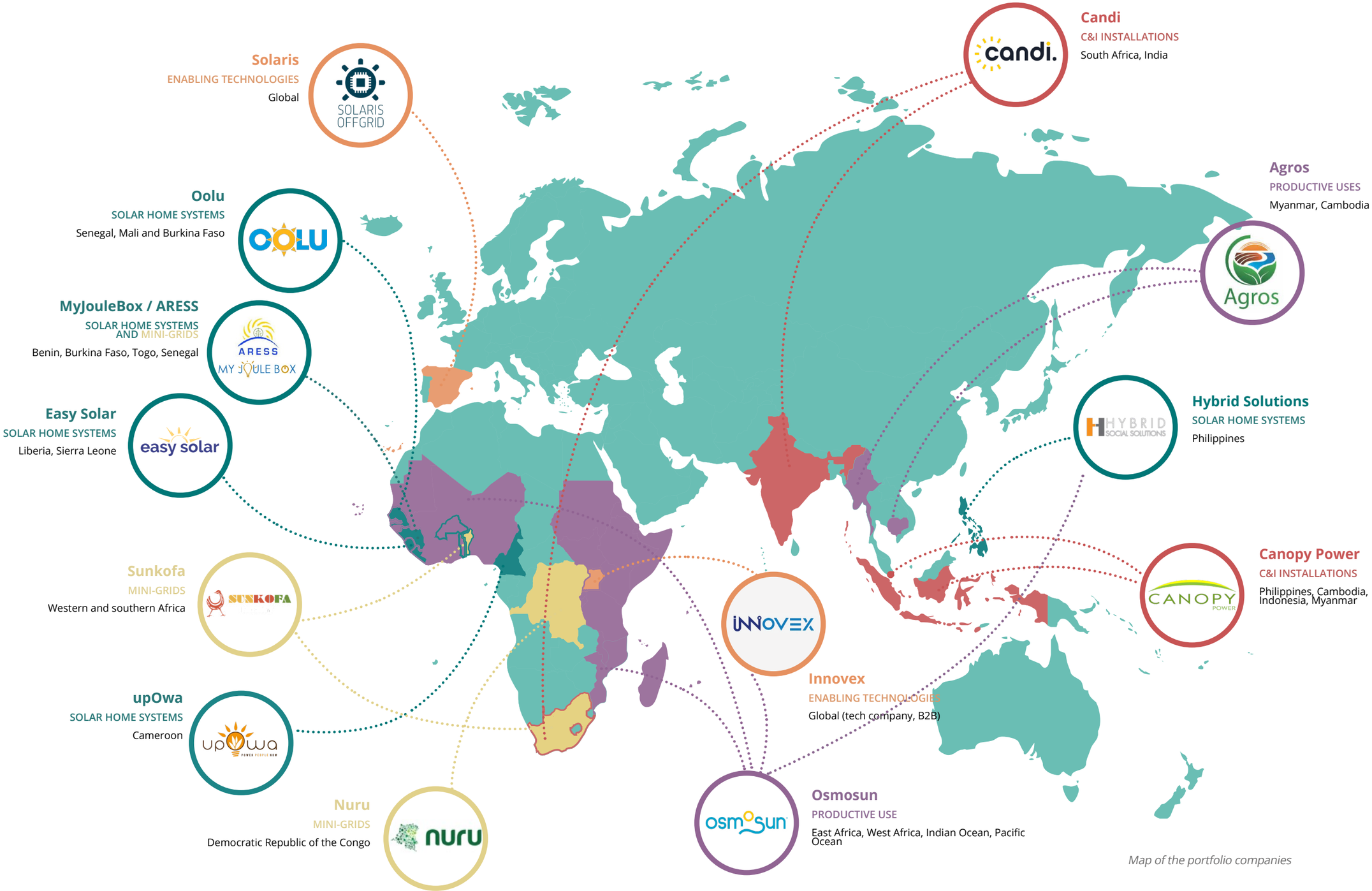
Review of Gaia

Gaia was created in 2016, based on the observation that more than one billion people do not have access to electricity. Designed as a catalyst for impact and as an early stage investor, Gaia gives SMEs and start-ups starting out on their entrepreneurial adventure the means to achieve their full social and environmental potential.



€7M INVESTED IN FIVE SECTORS:

SOLAR HOME SYSTEMS
C&I INSTALLATIONS
MINI-GRIDS
PRODUCTIVE USE
ENABLING TECHNOLOGIES



Map of the portfolio companies

Since its inception, Gaia Impact Fund has contributed to[3]...

Creating or maintaining

1 376

full-time jobs

Avoiding the emission of

280 000

tons of CO2eq

Providing nearly

100

small and medium-sized enterprises with better access to energy

Deploying

31MWp

of C&I and mini-grid solutions

With

1/3

of women in leadership positions in portfolio companies

Improving access to energy for

1.7

million people

11 SDGs

[3] *Figures for Q4 2022*

It is harder to be an impact investor now than it was 15 years ago, which is good news

The impact investment sector has evolved significantly since the launch of the United Nations Sustainable Investment Principles (PRI), from a disruptive and niche investment class to a multi-billion dollar market. Stakeholders' expectations of funds' ability to articulate a compelling impact thesis (or theory of change) and prove their impact have also increased significantly. The reinforcement of these expectations is based both on a better theoretical understanding of impact mechanisms (impact is never obvious) and on the multiplication and dissemination of general and sectoral resources, enabling funds to verify and manage their impact. GOGLA (global association for the off-grid solar energy industry), for example, provides a simple and operational framework for measuring the impact of the distribution of off-grid solutions in developing countries. In this context, the responsibility of funds to demonstrate their social, economic and environmental value in a robust manner has increased considerably.

Gaia has embraced this responsibility with a high level of ambition. We have assessed the impact of all our investments using (or inspired by) the GOGLA methodological framework. This framework, accepted by all players in the sector, provides standardized reporting indicators. We have also gone further, in order to qualify and assess the specific characteristics of our investments: review of the academic literature and case studies described in the 2019 impact report and definition of a theory of change specific to access to better energy for SMEs for the 2021 impact report.

Strategic positioning is key to maximizing collective value creation

A fund's positioning defines the investor's contribution to the collective value creation of the companies in its portfolio. Gaia's position makes it possible to maximize this contribution. First, by signaling the importance of considering impact across the class of assets financed. Second, by financing companies in the often undercapitalized markets of start-ups and energy access ecosystems in Sub-Saharan Africa and South-East Asia. Third, by actively engaging with our portfolio: strategy consulting, provision of a network of experts, operational assistance and support to measure their impact. Fourth, by providing them with patient capital, enabling them to create viable business models and long-term growth.

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A binding value proposition: main characteristic of impact investment

At the time of Gaia's first investments, the off-grid solutions market was still very underdeveloped in most countries in Sub-Saharan Africa and South-East Asia. In 2015, pico-solar lamps and home solar systems had a combined capacity of 55 MWp on the African continent, compared with 220 today (IRENA, 2022).

The ability of off-grid and, by extension, private-sector solutions to meet the latent demand of households and businesses in developing countries was not certain. Gaia's impact thesis - investing equity in off-grid solution entrepreneurs will accelerate the achievement of SDG 7 - was not empirically verified. Urban consumers might have preferred a central yet often unreliable grid ; peri-urban and rural consumers might have preferred traditional solutions (kerosene lamps and diesel generators) or to wait for a hypothetical arrival of the central grid. Demand, and therefore the social, economic and environmental value of our investments, would then have been low.

Today, nearly 500 million people have been able to access or improve their access to electricity through off-grid solutions (Lighting Global, 2022a). Governments are increasingly advocating approaches that incorporate the off-grid sector to achieve their electrification goals, with the World Bank (Lighting Global, 2022b) estimating that 77 countries have included off-grid solutions in their electrification plans. Academic research has also demonstrated the significant benefits of these solutions, particularly in terms of the ability to generate avoided costs for households, reduce emissions of local and atmospheric pollutants and improve household health. The following section presents these results in more detail.

While the gamble thus seems to have paid off, the formulation of an enforceable impact thesis and the ability to evaluate this thesis over short periods of time - and to change the strategy if it is not materializing - seems to us to be one of the key characteristics of impact investment. Today, the launch of the GEIF II fund calls for the creation of a new enforceable impact thesis. This thesis is set out in section III. Outlook and theory of change.

Significant progress and benefits, with a central role for off-grid technologies

The share of the world's population with access to electricity increased from 83% in 2010 to 90% in 2019[4], the largest increase in a decade. In Sub-Saharan Africa, the significant progress made by Kenya, Senegal, Ghana and Rwanda has enabled the region to achieve an access rate of almost 50%, compared with 33% in 2015.
Off-grid solutions have played a central role in improving access to electricity. At the end of 2021, nearly 500 million people had obtained access (or improved their access) to electricity through off-grid solutions[5]. These solutions have the twofold advantage of providing clean electricity at a lower cost than extending the central grid in the least densely populated areas.

In Kenya, Rom and Gunther (2019) - for pico-solar lamps - and Wagner et al (2021) - for SHS - show that off-grid solutions significantly reduce household energy spending (notably via a reduction in spending on kerosene). In total, it is estimated that pico-solar lamps and small SHS systems have saved poor households $26 billion (Lighting Global, 2022).
By replacing kerosene lamps that emit fine particles, off-grid solutions can also improve household health (Lam et al, 2018). The study by Rom and Gunther (2019) shows that the use of pico-solar lamps allows a reduction in symptoms of respiratory diseases, particularly in children (main users of lamps).
In addition, off-grid solutions enable households to display a certain social status, access consumer electronics (e.g. television) and household appliances (e.g. freezers) and reduce the strain and mental load associated with other energy sources (batteries, kerosene and diesel). Nearly 90% of households say they have seen their quality of life increase following the purchase of an off-grid solution (60 Decibels, 2020) - see box below.

Domestic uses and consumer well-being

Joséphine Gbondo, EasySolar client

In Sierra Leone and Liberia, EasySolar products - pico-solar lamps, SHS systems and consumer electronics and household appliances (freezers, televisions, fans, mobile phones, etc.) - have made it possible to transform the daily lives of their customers.

Joséphine Gbondo, a resident of the Kono district in Sierra Leone and a client of EasySolar:

«I received a plasma TV, a touch light, a radio and a fan. EasySolar gives me a lot of advantages; if I want to charge my laptop, I charge it; if I want to watch a movie, I can watch it. It allows my kids to study at night … the whole neighbourhood is plunged into darkness, but you can see the lights coming from my home. […] When I charge the fan, I can use it all night. I don't even need to lower the blinds, the mosquitoes are pushed back by the breeze.»

The benefits of developing off-grid solutions are also environmental. Lighting Global (2022), an initiative of the World Bank, estimates that off-grid solutions have already made it possible to avoid the emission of around 190 million tCO2eq - the equivalent of the annual emissions of more than 50 coal-fired power plants – by replacing kerosene lamps. This estimate is conservative, as it only includes emissions avoided by replacing kerosene lamps. If all the carbon energy sources that off-grid solutions replace were accounted for, their environmental benefits could increase significantly. The use, in all developing countries, of diesel generators to compensate for the lack of reliability of the central grid, for example, emits more than 100 megatonnes of tCO2eq per year (IFC, 2019).

[4] https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity
[5] https://documents1.worldbank.org/curated/en/099235110062231022/pdf/P175150063801e0860928f00e7131b132de.pdf

Increased investment is needed to achieve universal electrification

Despite the significant progress made, 770 million people remain without access to electricity, the vast majority of whom are in Sub-Saharan Africa and South-East Asia[6]. For the first time since 2013, the number of people without access to electricity increased in Sub-Saharan Africa in 2020, particularly due to population growth[7].

There are many reasons for this downturn. First, the least expensive areas to electrify have now been electrified and the challenge now is to electrify the most rural and hard-to-reach areas, where the marginal cost of electrification is higher. Second, the Covid crisis significantly impoverished people in developing countries, reducing access to electricity. Nearly 100 million more people now live below the poverty line (World Bank, 2021)[8].

Also, the International Energy Agency (IEA)[9] estimates, in its Business as Usual scenario, that around 670 million people will still be without access to electricity in 2030, the vast majority of whom will be in Sub-Saharan Africa.
The IEA's Net Zero scenario, which achieves the goal of universal electrification by 2030, includes:

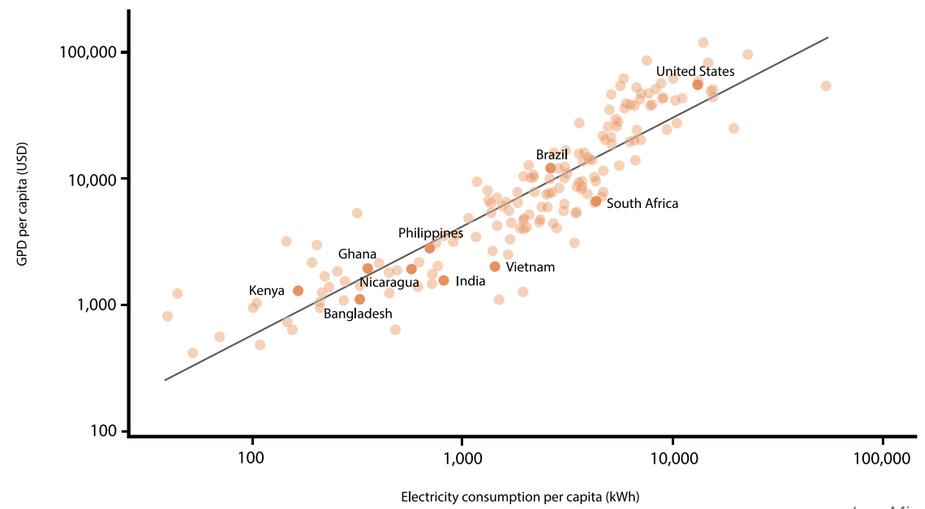
- A significant increase in investments in the electricity access sector in general, from $10bn to $30bn per year[10] ;
- Significant development of the off-grid solutions sector; it is these solutions that will make it possible to carry out, at a lower cost, approximately 40% of new connections by 2030. The importance of these solutions to achieve the goal of universal electrification could be exacerbated by the increase in poverty and the cost of living: in addition to their technical characteristics, rendering them the least expensive solutions for accessing electricity in rural areas, they often have better financing opportunities (PAYGo) than the central grid, improving their financial accessibility (Lighting Global, 2022).

[6] *https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity*
[7] *https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity*
[8] *https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-povertv-turning-corner-pandemic-2021*
[9] *https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity*
[10] *https://www.iea.org/data-and-statistics/charts/investment-in-electricity-access-in-2019-and-what-is-required-to-reach-universal-access-by-2030*

To maximize the creation of social welfare by electrification, electricity uses are key

The strong correlation between electricity consumption and GDP per capita has made electrification a high priority for politicians in developing countries (Lee, Miguel and Wolfram, 2020).

The strong correlation between electricity consumption and GDP per capita



Lee, Miguel et Wolfram (2020)

This correlation says nothing, however, about causation: are richer countries more likely to consume more electricity, or does access to electricity have a causal effect on income and development? Academic literature on the major electrification efforts of the last ten years provides some answers.

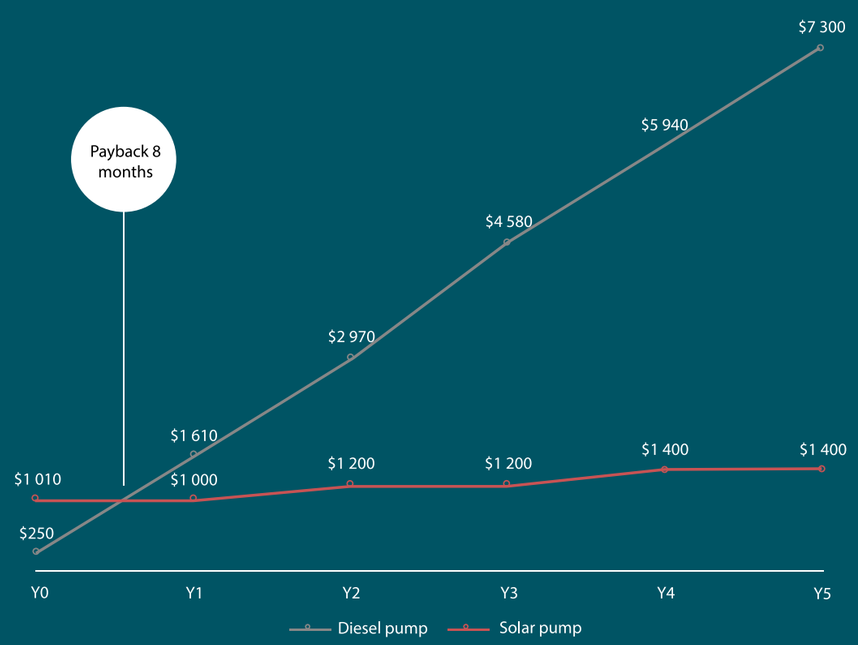
In particular, while the effects of electrification are more discreet in the most remote areas, it seems that electrification can have strong transformational effects (productivity and employment) in areas already benefiting from a certain minimal economic fabric. Also, in India, the rural extension of the central grid has had a significant impact on household consumption, as well as business creation, in the most populated villages. In smaller villages, no effects are detected (Burlig and Preonas, 2022). Also in India, Vanden Eynden and Wren-Lewis (2022) show that the extension of the central grid has only had an effect on the rate of harvests in the dry season in communities benefiting simultaneously from investment in the road grid (and no effect in communities benefiting from a single type of investment, whatever it may be). In Nepal, Meeks, Thompson and Wang (2022) find that building mini-grids is driving manufacturing growth only in less rural areas.

In other words, electrification alone does not seem to trigger strong economic impacts likely to permanently reduce the poverty rate; the ability of consumers to do something with it, particularly through productive uses, is key. The simultaneous removal of other barriers (e.g. access to markets and financing to buy additional production inputs), where they exist, enables electrification to have a strong effect on local economic development.

While there has been little research into urban and suburban areas – since the majority of electrification efforts are now concentrated in rural areas – these areas (often benefiting from a more developed economic fabric) may be most likely to create the transformational effects expected from electrification in developing countries. Markets are also important, both to improve the access of households connected to an unreliable central grid (775 million people are connected to a 'weak grid'[11]) and for households without access to electricity (20% of the urban population of Sub-Saharan Africa do not have access to electricity).

In rural areas, the deployment of solutions to directly use electricity for productive purposes - such as solar water pumps - appears to be central to stimulating demand and maximizing the value creation of these off-grid solutions (see box below).

Cumulative cost analysis overtime; diesel vs. Solar pump



source: Agros

Productive uses in rural areas - the case of solar water pumps

Agros provides solar water pumps, drip systems and advice to farmers in Myanmara and Cambodia. Less expensive than diesel pumps in less than one year of use, solar water pumps enable operators to quickly reduce their operating expenses; these savings can, for example, be reinvested in productive capital (e.g. agricultural machinery) or used to increase their income and improve their quality of life. Ultimately, by increasing productivity and reducing water consumption, Agros' offer should enable farmers to transition to sustainable and profitable agriculture.

Daw Myint San

Daw Myint San is a floriculturist in the village of Thanbo (Myanmar), and a client of Agros. Before using the Agros pump, she found it very difficult to keep her flowers alive, due to insufficient and irregular water intake. She had to rely on manual work to draw water from a pond; this work was physically exhausting and resulted in a significant loss of time. When she invested in a solar water pump, her life changed for the better. The pump allows her to irrigate her crops with ease and precision, ensuring her plants receive the right amount of water. With a constant supply of water, Myint is able to grow her business and expand her farm. The solar water pump has not only allowed her to improve her business, but also to overcome the limits of manual work

source: Agros

[11] *Lighting Global, 2022*

To ensure access to last-mile households, affordability is key


© Solaris

In addition to the issue of the development effects of electrification in developing countries, the issue of access will be central over the next 10 years. In effect, SDG 7 is a goal of universal access: Ensure access to affordable, reliable, sustainable and modern energy for all.

The issue of access is primarily a rural and last-mile issue; the rate of access to electricity in rural areas is less than 30% in Sub-Saharan Africa[12].

Off-grid solutions deployed in dense urban, peri-urban and rural areas, as well as solutions for productive uses, have been able to demonstrate real economic models of profitability. Demand for electricity from last-mile households is low, however. Grimm, Lenz and Peters (2016) show that willingness to pay (WTP) from rural Rwandan households for three types of off-grid solutions (pico and SHS) is lower than the market price. Lee, Miguel and Wolfram (2020) find similar results for the central grid in a rural area of Kenya.

The low WTP of these last-mile households appears, to a large extent, to be explained by the limited opportunities provided by electricity in rural areas. Also, while the potential of off-grid solutions to reduce the costs of rural households, improve their health and displace GHG emissions has been demonstrated, the transformational, and in particular economic, effects of access to electricity alone appear to be marginal (see below).

[12] *https://data.worldbank.org/indicator/EG.ELC.ACCS.RU.ZS?locations=ZG*

In the short term, this low level of demand implies that the goal of universal electrification cannot be achieved without public sector support. While off-grid remains the least expensive solution for electrifying the most rural areas of Sub-Saharan Africa and South-East Asia, the prices of these solutions often remain higher than the WTP of rural households.

The public sector has recognized the benefit of deploying off-grid solutions in rural areas, and signalled strong support for the sector. Seventy-seven countries have included off-grid solutions in their electrification plans (Lighting Global, 2022b). Financing is growing rapidly: more than $200 million has been disbursed by the public sector to support the off-grid sector in developing countries, including $100 million in 2020 (Lighting Global, 2022b).

In the medium and long term, the development of local economic networks (increasing the demand for electricity for productive uses) and the gradual rise in income of the population (increasing the demand for electricity for domestic uses) in rural areas will enable the sector to free itself from support from public funds. Moreover, where off-grid solutions constitute a first step in the 'clean energy ladder' and facilitate access to complementary input necessary for the emergence of transformational effects (such as productive uses, as highlighted by Lighting Global, 2022), they can also form the basis of a virtuous circle of electrification and development (see below).

Off-grid solutions, a first step in the clean energy ladder

The electrification journey for households, especially in rural areas, often starts with small kits, satisfying an often low demand and enabling them to familiarize themselves with the products and build up a PAYGo credit history.
The wide choice of off-grid kits enables households to support the increase in demand characteristic of an increase in income by purchasing new, more powerful kits. The purchase of these new, more expensive kits can also be facilitated by the potential of the off-grid sector to generate revenues and avoid costs (e.g. kerosene and mobile charging).

Elie Ayede is an ARESS client:
'The first product I paid for at ARESS was the Sun King Pro. Satisfied with how it worked, I looked into it then switched to the Home 400, which is a kit with a television [...] that I paid for with PAYGo. [...] I looked into ARESS products further and this time it was the freezer kit that was presented to me, with several advantages and ease of access. I therefore took a freezer kit for my shop, in order to sell chilled products [water and drinks] in the village. If business continues to grow, with the freezer kit, I will definitely take an even bigger kit. [...] The most interesting thing is the lighting system that was offered to me when I bought the freezer kit for lighting my shop; everyone in the village talks about it.'

Source: (212) ARESS- Corporate Video - YouTube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02

GEIF II - a best-in-class fund for measuring ESG impact and performance

Gaia Energy Impact Fund (GEIF) II aims to stimulate electrification that maximizes social value creation, in particular by mobilizing new investments in off-grid solutions and by extending the scope of investments to productive uses.

As highlighted in the first chapter of this report, as an impact fund we have a strong responsibility to measure, in a robust manner, and report to our stakeholders, the extra-financial performance of GEIF II. We will select and manage our investments based on three complementary approaches: measurement of our ESG performance (environmental, social and governance), our impact and our efficiency.

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Article 9: A best-in-class approach

GEIF II has three general sustainable development objectives: to avoid 4,000,000 tonnes of CO2, to provide 4,000,000 people with better access to energy and to create 20,000 full-time jobs. Furthermore, we ensure that our investments do not significantly impede other environmental or social objectives and that our beneficiary companies apply good governance practices.
These three principles enable us to classify GEIF II as an article 9 fund under the "Sustainable Finance Disclosure Regulation" (SFDR). The aim of this European regulation is to increase the transparency of financial market players vis-à-vis their shareholders and limit greenwashing. It defines three categories of funds:

- Article 6 funds have no sustainable investment objectives and do not promote any environmental or social characteristics;
- Article 8 funds promote environmental or social characteristics while taking ESG criteria into account in their investment process;
- Article 9 funds state an environmental or social objective. This category is the most ambitious and best-in-class (only 4% of SFDR funds are classified as Article 9), with high reporting requirements. Annual communication on the fund's performance includes an annual reporting of the fund's performance on 14 negative impact indicators on sustainability factors (PAI: Principal Adverse Impacts). These indicators are divided into two themes: environmental (e.g. greenhouse gas emissions, activities that negatively affect biodiversity-sensitive areas) and social (e.g. unadjusted gender pay gap and exposure to controversial weapons).

Taking into account ESG performance and impact throughout the investment process:

SCREENING	PRELIMINARY ASSESSMENT	DUE DILIGENCE	INVESTMENT DECISION	MONITORING
• Verification of the company's reputation (see 'ESG indicators…' section below) • Compliance with the exclusion list (see 'ESG indicators …' section below)	• Characterization of the company's contribution to the three general impact objectives (see 'Impact indicators…' section below)	• Environmental, social and governance due diligence via our ESG DD tool (see 'ESG SD tool' box)	• Verification of compliance (in particular) with the ESG policy of Gaia, and in particular (see Glossary) • United Nations Global Compact • United Nations Guiding Principles for Business and Human Rights • 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 ('ESG action plan') (see 'ESG indicators…' section below)	• Quarterly 2X challenge indicators • Quarterly general and individual impact indicators (see 'Impact indicators…' section below) • Annual PAI indicators (SFDR - see 'Article 9: a best-in-class approach' box) • Ad hoc to ensure compliance with the ESG action plan

ESG indicators, to understand the sustainability risks

The first component of our approach is based on the consideration of ESG factors. These factors are measured by activity indicators: these measure our performance in absolute terms and not in a counterfactual sense (i.e. Compared to what would have happened in the absence of our activity).

For each prospective investment reaching the due diligence phase, an assessment of ESG performance is carried out through our ESG due diligence tool (ESG DD) (see box on the ESG DD tool).

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:

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

- **Ethical Practices**
  - Environmental policy
  - Management and reduction of environmental risks
  - Local community responsibility policy
  - Financial transparency and compliance with tax regulations

- **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

For investments made, ESG performance will be measured via an annual reporting of the PAIs defined by the SFDR (see Article 9: a best-in-class approach). In addition, all portfolio companies commit to a plan to improve social, environmental and governance practices, where necessary. These practices are identified during ESG due diligence and may, for example, take the form of the implementation of a responsible management policy for end-of-life batteries, or an improvement in the protection policy of their customers.

Impact indicators, to understand our added value

While ESG indicators allow us to identify and manage sustainability risks, they do not enable us to assess and manage our impact: what is the social and environmental capital gain of GEIF compared to a situation where this fund would not have existed?

To measure our environmental and social contribution, we estimate two categories of impact indicators for each investment made.

First, general indicators allow us to measure the contribution of each investment to the general impact objectives of the fund: thanks to the action of the companies in the GEIF portfolio, avoid 4,000,000 tonnes of CO2, provide 4,000,000 people with better access to energy and create 20,000 full-time jobs.

In addition to these general indicators, two specific indicators will be defined for each GEIF investment, to reflect the specific impact of these investments. The increase in agricultural productivity and the creation of additional revenues could, for example, be defined as specific impact indicators for an investment in a company selling solar water pumps.

Specific indicators will, as far as possible, be derived from the indicators defined to measure the achievement of the UN Sustainable Development Goals. The calculation methodology and the achievement of objectives, as well as the choice of indicators for particular indicators, will be validated by the fund's Impact Committee (see Impact Committee and Impact Carried).

Impact Committee and Carried Impact

To ensure the robustness and relevance of its impact measurement methodology, GEIF has set up an Impact Committee. This independent committee is composed of individuals from outside the fund (entrepreneurs, researchers and experts in the sector). The purpose of this committee is to validate whether or not the general and specific objectives have been achieved and, where necessary, to trigger the impact carried. More broadly, it will provide expertise on the sustainability impact and risks for all the investments made by the fund.

Impact carried makes it possible to align remuneration with impact. While investment funds typically pay part of their profit to their manager based on the fund's financial performance, GEIF subjects 50% of this remuneration to the achievement of the general and individual impact objectives.

Efficiency indicators, to maximize our creation of social welfare

The last building block of our approach to measure the efficiency of our investments: how can we compare the very diverse economic, financial, environmental and social costs and benefits generated by our investments? More broadly, how can we select and manage our portfolio to maximize its social, economic and environmental return on investment?

In order to answer these questions, we are developing a cost-benefit analysis (CBA) tool in partnership with the Paris School of Economics, by funding a thesis on the subject.

CBA is a scientifically robust quantitative evaluation methodology used by donors to determine the collective utility generated by an investment. It therefore makes it possible to prioritize different investment options according to their socio-economic profitability.

CBA has three specific features:

• It offers differential analysis: the costs and benefits made possible by the investment are compared to the costs and benefits of what would have happened in the absence of the investment. CBA therefore relies on impact indicators as input data.

• All costs and benefits are monetized: in order to be able to compare all costs and benefits of the investment, which are different in nature (environmental, social, economic and financial), the costs and benefits are transformed into a common unit: the monetary unit. This is the exercise of monetization. Economic value can, for example, be attributed to the tonnes of CO2 avoided by relying on the social cost of carbon (SCC), which estimates the marginal damage caused by each additional tonne of carbon emitted. Wang et al (2018) estimate a median SCC of about €100 per tonne of carbon avoided.

• The analysis is carried out over the long term: all costs and benefits are estimated over the life of the project and converted to today's value using a socio-economic discount rate. Two types of indicators can then be estimated:
- The socio-economic net present value (SE-NPV) indicates the creation of social welfare by the project over its entire life, net of costs:
- The socio-economic Return on Investment (SE-ROI) indicates the creation of social welfare for each euro invested.

With regard to investments in the GEIF portfolio and impact investments more broadly, the development of a CBA tool is particularly innovative. In effect, while there are multiple recommendations and models for carrying out CBAs in developed countries, academic literature - and operational guidelines - are very sparse when it comes to application in developing countries, particularly in Sub-Saharan Africa. Literature is also lacking regarding the adaptation of CBA methodology to the specific characteristics of impact investments, which notably present radically different risk profiles and sources of uncertainty to public investments, for which CBA was developed.

03

Outlook and theory of change

We have defined the theory of change for GEIF II based on our experience as impact investors, as well as the lessons learned by the sector as a whole and the academic literature (detailed in Section 1: Investing in electrification in developing countries - feedback).

This theory of change is outlined below. It is a central element of our impact investment approach, as it enables us to:

1. Link what we do as impact investors – inputs and activities – to the social, economic, and environmental changes we aim to promote. In other words, how does our investment - financial and non-financial – in portfolio companies contribute to achieving universal access to reliable, sustainable, and modern energy services at an affordable cost, as well as triggering sustainable economic and social development?
2. Identify the indicators over which we (or our portfolio companies) have direct influence, which contribute to achieving our short, medium, and long-term impact objectives. These are the activity indicators, directly observable (in absolute value, not differential), listed in the relevant column of the theory of change.
3. Identify the core conditions necessary for our inputs and activities to trigger the desired impacts (the assumptions). These conditions correspond to pre-existing social, economic, and institutional contexts and behaviors over which we have no control; identifying these assumptions therefore helps us identify risks as well as the conditions under which our investments will have the most significant impact.

We summarize this theory through our impact thesis, which will guide our investment and portfolio management decisions at GEIF II: «**If we finance and support entrepreneurs throughout the decentralized renewable energy value chain, from generation to use, then we can accelerate access to clean and affordable energy and promote sustainable economic and social development.**»

Throughout the lifetime of its investments, GEIF II will ensure the existence of continuous feedback loops between the portfolio, management team, and impact committee to maximize the impact of its investments.

Theory of change for GEIF - Gaia Energy Impact Fund - II

DESCRIPTION

INPUT

- Invest in the entire value chain of renewable energies:
  - Mini / micro-grids
  - Decentralized systems
  - Commercial and industrial systems
  - Productive uses
  - Enabling technologies
  - New renewable energies
- Investing patient capital

ACTIVITIES

- Strategic advice and sector expertise
- Guidance and requirements on ESG performance and impact
- Financial expertise
- Mobilization of other (types of) financing

OUTPUTS

- B2C companies: improved access to electricity at an affordable price
  - *Sales via PAYGo financing systems*
  - *Number of decentralized systems sold: productive (e.g. electric vehicles, solar water pumps) and domestic (e.g. refrigerated fan televisions) use*
  - *Quantity of MW of mini/ micro-grid and commercial and industrial systems*

Multiplier effect

- B2B companies (enabling technologies, e.g. PAYGo platforms): reduction of costs, increase in adressable market and improvement of user experience
  - *Number of client companies of the portfolio's enabling technology companies*

OUTCOMES

Short term: Electrification

- Increase in the number of households with reliable access to electricity and home use solutions
- Increase in the number of companies (formal or non-formal) with reliable access to electricity and productive use solutions

Medium term: Development

- Increase in quantity and quality (salary, working conditions) of income-generating activities
- Transformation of production functions (e.g. more productive capital) and the competitiveness of local companies: directly (thanks to better access to electricity) and indirectly (thanks to investment by portfolio companies in the local economic fabric: infrastructure, skills)
- Improvement in the quality of life of households (leisure, health, income, education)
- Reduction of greenhouse gas emissions and local pollutants

IMPACT

Long-term

- Universal access to affordable, reliable, sustainable and modern energy
- Contribute to triggering sustainable economic and social development

ASSUMPTIONS

- Existence of sufficient companies meeting the investment thesis criteria
- Macroeconomic context: stable local and regional political and economic situation
- Availability of solutions (logistical access, in particular to the last mile)
- Cost-efficient price (particularly in relation to potential profits)
- Availability of financing solutions
- Availability and accessibility of markets for additional inputs (e.g. additional production factors such as skilled labour) and output (markets for purchasing the goods produced)
- Information and risk: knowledge of new technologies (e.g. existence of early takers); positive perception of the potential benefits of solar tech (particularly facilitated by good product quality and good after-sales service)

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