

# ENGIE

## RASSEMBLEURS D'ÉNERGIES

# IMPACT REPORT 2022



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# 1.WHO ARE WE?

The year 2022 marks the 10th anniversary of the first investment by S.A.S ENGIE Rassembleurs d'Energies (RDE). RDE is one of the pioneers of corporate impact funds. The fund has developed a strong reputation and enjoys recognition in France and abroad through several labels and distinctions such as ESUS , B Corp certifications or the status of société à mission recently adopted for the first time by a company of the ENGIE group.

On behalf of the Group and its employees through the solidarity employee savings scheme which is directly attached to it, RDE has built up a diversified portfolio of investments centered around the original themes (access to energy and the fight against energy poverty). , gradually extended to areas such as micro-methanisation solutions, sustainable mobility or circular economy.

More than sixty transactions have been carried out with some thirty innovative start-ups which are characterized by the social utility of their business models and the positive environmental impacts they generate. With €38.3 million invested to date, RDE activities have generated significant impacts in response to 11 of the Sustainable Development Goals (SDGs) established by the UN, in particular on access to energy, fight against climate change and employment in particular. The latest investments address SDGs 11 and 12, sustainable cities and communities as well as responsible consumption and production.

For more than 10 years, the Fund's team has been proud to support inspiring and innovative entrepreneurs on several continents who aim at providing solutions to the main challenges highlighted by the UN SDGs.

The fund carries out its mission by adopting a very selective approach in its search for new files (more than 300 files analyzed each year) with the requirement of combining a strong social and environmental impact, a sustainable economic model and the possibility to leverage on the Group's expertise.

# 2. OUR ORGANIZATION

## Governance (at 31.12.22)

### Steering Committee



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**Julia Maris**

VICE-PRESIDENT CSR ENGIE GROUP / PRESIDENT OF RASSEMBLEURS D'ENERGIES

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**Quentin Ploix**

HEAD OF SHAREHOLDING AND EMPLOYEE SAVINGS – ENGIE GROUP HRD

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**Bertrand Haas**

VICE-PRESIDENT MERGERS AND ACQUISITIONS ENGIE GROUP

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**Valerie Gaudart**

VICE-PRESIDENT EXTERNAL COMMUNICATION & CIVIL SOCIETY

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**Celine Normand**

UNION REPRESENTATIVE

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**Alon Rozen**

DEAN AND PROFESSOR "INNOVATION AND MANAGEMENT" AT THE ECOLE DES PONTS DE PARIS BUSINESS SCHOOL

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# 2. OUR ORGANIZATION

## OUR TEAM (at 31.12.22)



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**Julia Maris**

VICE-PRESIDENT CSR ENGIE GROUP / PRESIDENT OF  
RASSEMBLEURS D'ÉNERGIES



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**Jerome Broutin**

FINANCIAL DIRECTOR



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**Loic de Fontaubert**

INVESTMENT DIRECTOR



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**Alexandre Sohm**

INVESTMENT DIRECTOR



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**Thibault Couturier**

INVESTMENT DIRECTOR



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**Judith BONHOMME**

MANAGEMENT ASSISTANT

# 3. HIGHLIGHTS OF 2022

The year 2022 has been marked by some notable changes for Rassembleurs d'Energies.

Once again this year, our portfolio companies continued to be impacted by the shortage of components and by the effects of the health crisis on their customers and staff. In this context, on the whole, however, they still held up well and continued to serve more beneficiaries.

On April 6, Rassembleurs d'Energies brought together at the Group's headquarters some entrepreneurs from the portfolio committed to the fight against energy poverty (La Foncière Chênelet), sustainable mobility (Teebike) or the circular economy (Qarnot Computing and Axibio). and enabled Group employees to share views with them.

In August, Rassembleurs d'Energies finalized a seed investment in the French start-up Enerpro Biogaz in order to support it in its development. Enerpro Biogaz is a French company whose core business is based on the design, supply and distribution of modular and decentralized biogas systems for small and medium-sized farms and small agri-food industries.

The acquisition of PEG Africa by BBOXX was also finalized in September, thus enabling the combination of two areas of expertise to accelerate their growth in Africa and offer unconnected populations in Sub-Saharan Africa clean and affordable decentralized energy.

Teebike came to present its bicycle electrification device to ENGIE employees during the Sustainable Mobility Week.



At the end of the year, Rassembleurs d'Energies concluded a new investment in Enogrid, a French specialist in collective self-consumption, which thus allows users to benefit sustainably from economical and ecological energy, produced as closely as possible to needs. Beyond the issue of energy sovereignty, Enogrid offers new forms of local solidarity and social justice by sharing the benefits of decentralized energy production.



## **COMMITMENT TO SOCIAL RESPONSIBILITY**

In accordance with their respective commitments when Rassembleurs d'Energies invested, the two companies Solar Brother and Wattsgood obtained ESUS certifications, which reflects their commitment to a social and solidarity business model in line with the fund's commitments.

Rassembleurs d'Energies was named one of the B Corp Best for the World 2022 for the third time in the client category. This nomination recognizes our support for more than 10 years with entrepreneurs who work every day to respond to major social and environmental issues.

2 holdings, Foncière Chênelet and Iluméxico were also named .

The B. Corp certification obtained in 2019 was renewed in 2023 with an improved score thanks to the ongoing efforts made by the entire team and investments. The certification was obtained for a new period of 3 years.

## **GOVERNANCE**

In 2022, the board of directors chaired by Paolo Almirante for 6 years gave way to a steering committee chaired by Julia Maris which endorsed the fund's new roadmap.

## **TEAM**

After nearly 40 years with the Group and 6 years as general counsel of Rassembleurs d'Energies, Pierre Fettu has asserted his retirement rights.

# 4. COMMITMENTS AND COMPLIANCE

The company and its teams are fully aware that mutual trust and sustained commitment in favor of the projects deployed by the companies in the portfolio is one of the major factors in the success of their economic project and the creation of lasting value for all.

In particular, the company and its teams act in accordance with the four fundamental ethical principles of the ENGIE Group [[www.engie.com/groupe/ethique-et-compliance](http://www.engie.com/groupe/ethique-et-compliance)]:

1. Act in accordance with laws and regulations
2. Behave with honesty and promote a culture of integrity
3. Demonstrate loyalty
4. Respect others

Thus, any investment project is the subject of an in-depth study which includes in particular due diligence in terms of ethics and compliance of its managers, partners and founders, and with regard to competition law and the obligations of compliance that may apply to the investment transaction.

The company implements its "raison d'être" by taking into consideration the social, societal and environmental consequences of its decisions on all of its stakeholders.

Finally, the members of the team who sit on the governance bodies of the companies in its portfolio are committed to defending the interests of these companies, and if it happens that one of these bodies raises the existence of a conflict of interest, ENGIE Rassembleurs d'Energies will endeavor, through dialogue, to put in place the appropriate remedial measures.



# 5. OUR PORTFOLIO

22

Investments

4

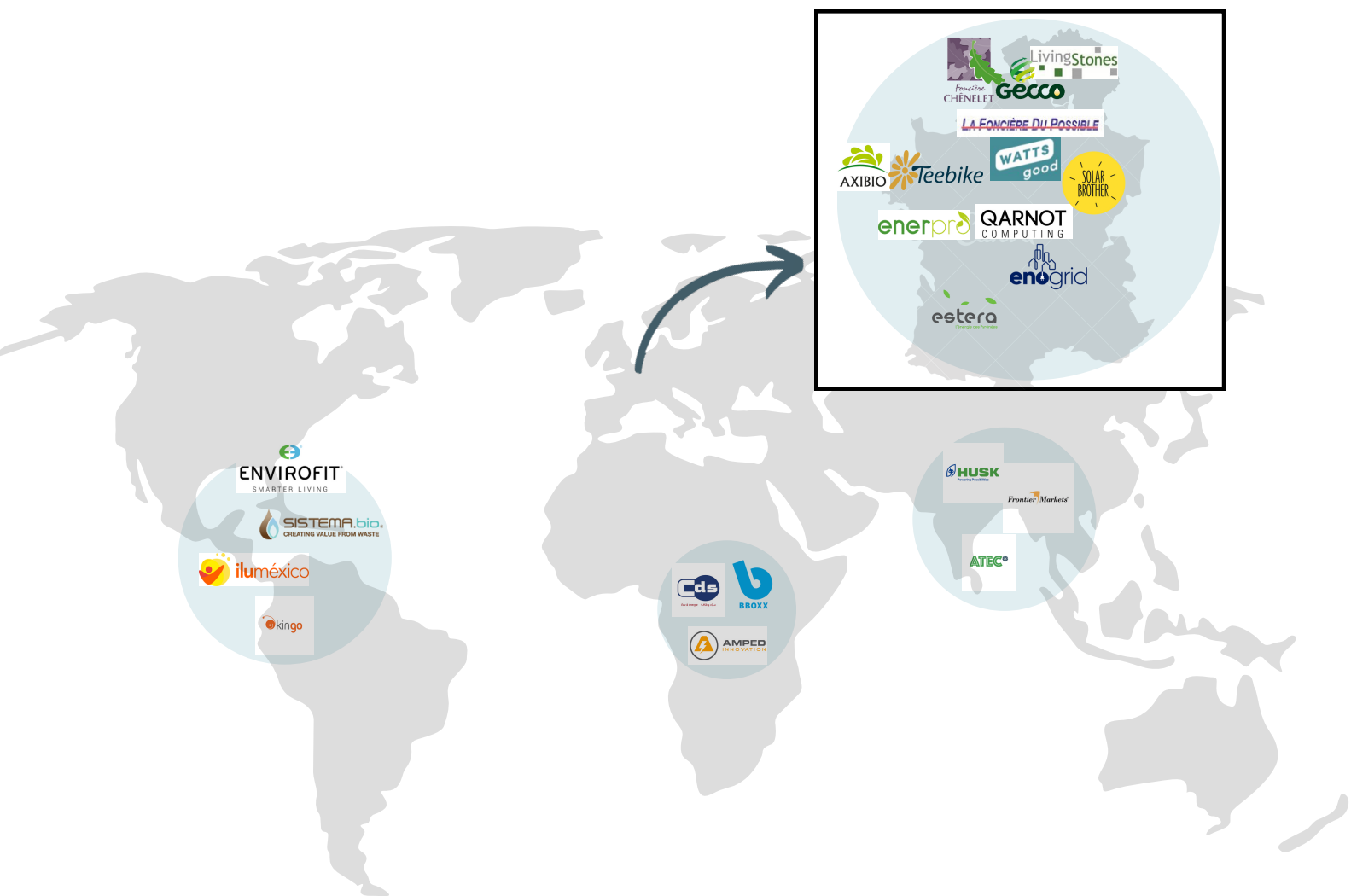
Continents

>20

Countries

6

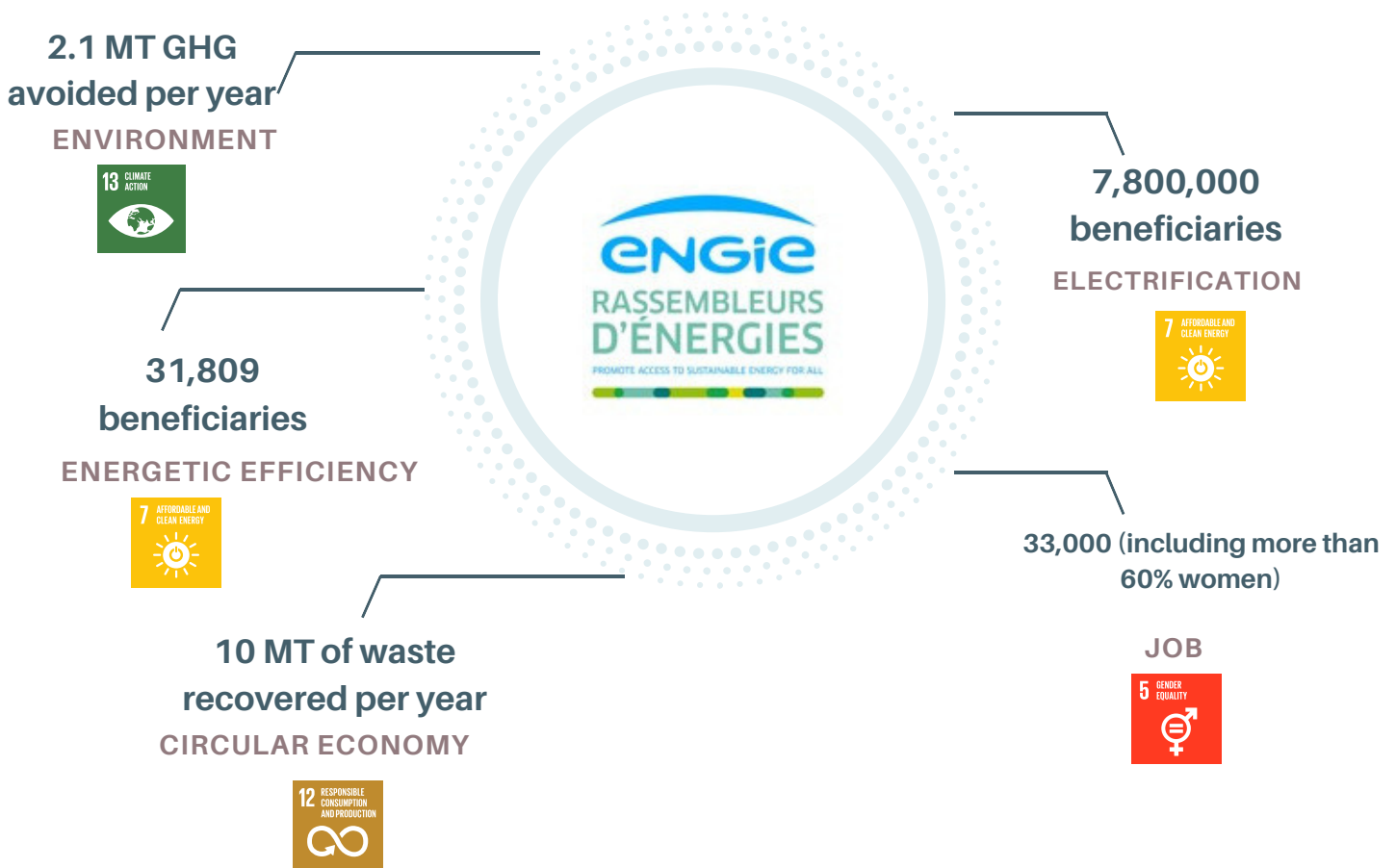
Business lines



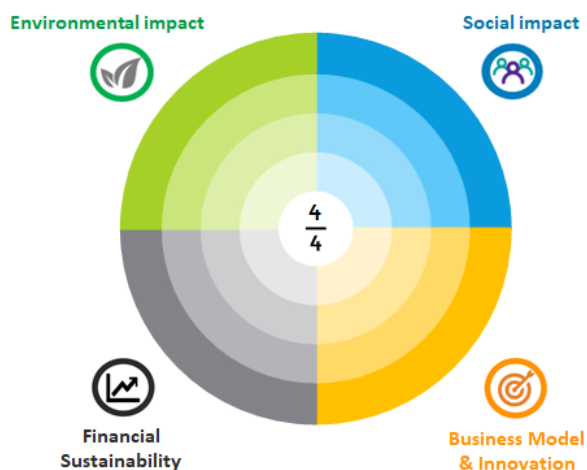
# 5. BUSINESS LINES



# 6. MAIN IMPACTS AS OF 12.31.22



## MEASURE: MULTI CRITERIA TOOL



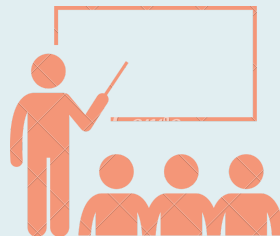
ENGIE Rassembleurs d'Énergies has developed an assessment tool for each investment according to a common analysis grid which scores the following criteria:

- Social performance
- Environmental performance
- Synergies & business model
- Financial value

# 6. OTHER IMPACTS AT 12.31.22

## EDUCATION

437 electrified schools for 160,000 students



## SUSTAINABLE MOBILITY

3,000,000 km covered with clean solutions



## CLEAN COOKING

164,543 beneficiaries of clean and safe cooking systems



## FUEL POVERTY

9,935 housing units equipped or renovated



# A. FUEL POVERTY

## 6M\*

**Households affected  
by fuel poverty in  
France**

In the current context of rising energy prices, the number of households affected by energy poverty is likely to increase significantly.

To fight against this phenomenon, extensive support for this vulnerable public is essential in order to promote energy-efficient and efficient renovation of housing.

The National Energy Poverty Observatory (ONPE) has called for the fight against energy poverty to be made a national priority. Too many households are still confronted with this phenomenon, despite the measures launched by the various players and the steps taken. Indeed, according to indicators from the ONPE, 5.8 million households will be in fuel poverty in France in 2022.

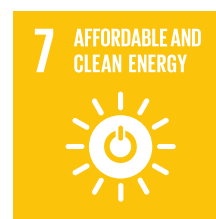
## 20%\*\*

**of French people  
suffered from the cold  
during the winter**

This corresponds to more than 20% of households, or 12 million people, who cannot afford to heat their homes properly. The situation seems increasingly worrying. The very significant increase in the price of electricity, like that of gas, since the health crisis has counterbalanced, or even reversed, the dynamic that was going towards a reduction in the number of precarious people in France.

## 12 M

**People who cannot  
afford to heat their  
home properly in  
France**



### Sources :

Précarité énergétique : un accompagnement social, technique et financier indispensable, 1er Février 2022, Energie Plus, ATEE (Association Technique Energie Environnement)

\*5,8 millions de ménage ont reçu un chèque énergie en 2022

\*\* Au cours de l'hiver 2020-2021

ENGIE Rassembleurs d'Energies gives the floor to Marc Mordacq, founder of "Toits de l'Espoir and La Foncière du Possible", who gives us his vision of the challenges of fuel poverty in France.

"During the winter of 2020-2021, 1 in 5 people say they have suffered from the cold, a situation that is even worse than the previous year; and more than 4 million people are poorly housed or in precarious conditions. Difficult to stand idly by in front of these figures!

For 25 years, in a complex and uncertain regulatory environment, we have been accomplishing our mission: renovating and improving the energy performance of dilapidated properties to offer rehousing solutions to disadvantaged populations in fuel poverty. At the rate of one dwelling every two days, we have already renovated 3,500 dwellings and rehoused 13,000 people.

To achieve this, with Les Toits de l'Espoir/Solidaritoit, we are implementing various levers to allow owners to upgrade a property that has fallen into disuse, while relocating disadvantaged families who cannot find a solution in the traditional park.

Or, with owners of modest means and occupying veritable energy sieves, we take charge of the overall engineering of projects (design, study of financing and tax implications, carrying out the work) allowing them to live in decent conditions.

With Foncière du Possible, we go even further: the acquisition of properties allows us, once renovated, to rent them out in order to consider reselling them to their occupants in the future on advantageous terms. This prospect of becoming owners offers them the possibility of building up a heritage and imagining passing it on to their loved ones, which they would certainly never have considered. We put them back on their feet!

But beyond the questions of rehousing, we also seek to recreate social ties and revitalize these territories. The Vaudricourt site (Pas de Calais), recently acquired and renovated, illustrates these different dimensions at the heart of our ambition. On 14 hectares, there is a Maison Relais for 23 homeless people, 6 social housing, integration sites, vegetable gardens in permaculture, beehives, an artisanal bakery and its bakery, an educational farm which welcomes children and people with disabilities, etc. Vaudricourt thus symbolizes the dream of Foncière du Possible: to revalorize abandoned sites by making them places teeming with activities and living together.

Let's continue to imagine the rest together!"



Establishment of collective vegetable gardens

**LA FONCIERE DU POSSIBLE ET LES TOITS DE L'ESPOIR: KEY FIGURES**

**13,000**  
beneficiaries



**3,500**  
housing



# Other portfolio companies



1<sup>er</sup> investment : 2014

## Main features

Specific purpose of **refurbishing an entire disused building** in Brussels downtown aiming at **re-housing** elderly people, among others  
 Fight against **Energy Poverty**  
 Energy Efficiency & Social Housing



## Impact

- **39** apartments delivered (7 buildings)
- Close to **100** people housed
- **2** buildings dedicated to inter-generation housing

## Geography



1<sup>st</sup> Investissement : 2012  
 Re-investments : 2013, 2017

Foncière  
 CHÊNELET

## Main features

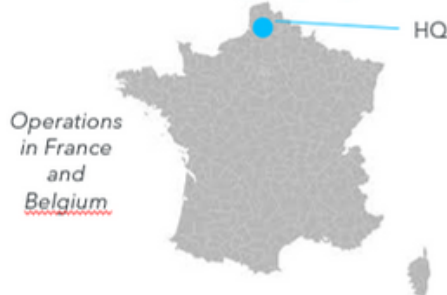
- Builds and rents newly built or renovated **social housings**
- Promotes affordable, **energy efficient**, and comfortable housing for low-income populations



## Impact

- **ESUS** certified
- Qualified as French **Société à Mission**
- **212** direct beneficiaries
- **104** houses delivered
- **515 tons** GHG avoided

## Geography



# Other portfolio companies



1<sup>er</sup> Investissement : 2022

## Description

- Leader de l'**autoconsommation collective** en France avec pour raison d'être "apporter à tous les citoyens la possibilité de **contribuer à la transition énergétique** dans un esprit de **justice sociale**",
- Deux métiers : (i) études et **accompagnement des clients** et (ii) solution digitale dédiée au suivi opérationnel des projets
- Clients et références : collectivités, bailleurs sociaux, entreprises, bureaux d'études, développeurs ENR, copropriétés.

## Impact

- **Réduction de la facture énergétique** avec une énergie (photovoltaïque) à coût maîtrisé sur le long terme,
- Levier de **lutte contre la précarité énergétique** notamment dans le **logement social** (réduction des charges de 15 à 30%),
- Développement des **ENR et des circuits courts de l'énergie** pour **accélérer la transition énergétique** dans les territoires (**160 projets accompagnés, 500 bénéficiaires** directs, **20 tonnes** de CO2 évitées en 2021)
- **Cohésion sociale** dans les territoires et création **d'emplois**



## Géographie



1<sup>er</sup> investment : 2021

## Main features

- Designs and markets **green fitness solutions** which transform physical efforts into **renewable energy** and **actions of solidarity**
- "Made in France" manufacturing aiming at reaching a neutral carbon footprint
- Intends to **raise awareness** of eco-gestures and **energy sobriety** among spectators of events organized, in fitness rooms, in schools and elsewhere...

## Impact

- **ESUS** labeled Company
- **1% of revenue** donated to NGOs fighting against Energy Poverty
- Create jobs for **vulnerable people** (target 20%)
- 350,000 people sensitized by 2024



## Geography

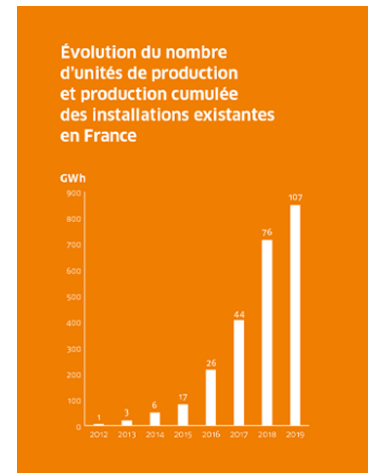




# B. BIOGAS

## 100%

**of renewable gas in  
2050**



Produced locally, biogas accompanies the energy transition. Produced from organic materials, it is a 100% renewable energy that significantly reduces greenhouse gas emissions and improves air quality. Anaerobic digestion allows the recovery of waste and the reduction of the use of chemical fertilizers, resulting in a better return to the soil of the nutrients essential for organic growth and a reduction in CO<sub>2</sub> emissions linked to the manufacture of imported chemical fertilizers.

Biomethane has properties similar to natural gas and can be used as fuel, to produce heat, electricity or as fuel for vehicles.

Relatively recent, the deployment of an anaerobic digestion unit may raise questions. However, the production of biogas is governed by very strict regulations: the decomposition of waste is carried out in the absence of oxygen, without contact with the ambient air and therefore without smell. The risks of ammonia release into the air or water pollution linked to the digestate are closely monitored. The landscape integration of the installations is taken into account from the choice of the site, the noise emissions of a biogas unit are minimal and traffic is kept to a minimum.

A vector of flexibility both in its production and in its use, biomethane is set to play a major role in an entirely carbon-free energy system by 2050.

The Energy Transition Law for Green Growth sets the objective of increasing the share of renewable gas to 10% of gas consumption in France by 2030. Since the start of production of its first facilities in 2011, French biomethane has experienced the strongest expansion in Europe.

A true example of what the circular economy can represent in a territory, the development of biomethane irrigates an entire ecosystem of actors, boosting the local economy and preserving nature.

In particular, it offers farmers a tremendous opportunity to diversify their activity. Thanks to anaerobic digestion, their organic waste becomes a resource: agricultural residues and livestock effluents are recovered to produce gas. Digestate, a by-product of methanization, replaces mineral fertilizers to improve the soil and fertilize crops. By committing to the production of biomethane, farmers are involved in a collective project: contributing to the greening of the energy mix.

Finally, communities find in the biomethane sector a new outlet for their food waste, fermentable household waste and green waste.

For each new unit commissioned, the sector creates an average of three to four direct jobs that cannot be relocated, contributing directly to regional competitiveness and strengthening France's energy independence from natural gas exporting countries.



Esther Altorfer, Strategy Director Sistema.bio shares her vision on decentralized biomethanation solutions.

"The world's most important challenges—poverty, food security, and climate change—intersect at smallholder farms around the world. Our company is founded under the idea that smallholder farmers are key players in our social fabric. Today, 400 million family farms produce 70% of the world's food manage the majority of arable land, and are home to a quarter of the World's people. These farms collectively represent one of the largest carbon mitigation, sequestration and adaptation opportunities on Earth. Yet, small-holder farmers live trapped in poverty, and threatened by climate change. Agriculture is responsible for a quarter of all greenhouse gas emissions, while climate change threatens global food production. These farmers are the most vulnerable in face of these challenges and often do not have access to technology, education or financing services to help them overcome them. Paradoxically, while they are the main food producers in the world, smallholder farmers face latent food insecurity.

Women on farms are specifically impacted by many of the economic and health problems smallholder farmers face.

They are in charge of many of the domestic and farming activities and they are the most affected when using woodfuel as the main source of household and farm energy (such as boiling water for milking machines cleaning processes). With over 75% of our end-users being women and over 91% of our farmers using woodfuel for some portion of their energy needs prior to getting a biodigester, our innovation has a significant impact on both the time availability and health of women around the world.



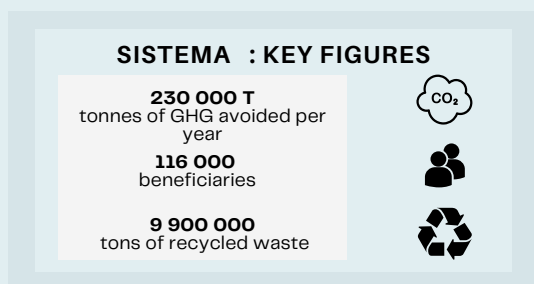
Sistema.bio is a suite of technology, training, and financing that creates infrastructure and capacity in farms to convert waste into renewable energy and fertilizer. This allows farmers to improve the economic and health conditions of their households while increasing the productivity and sustainability of their farms. Each part of our model addresses the issues that smallholder farmers face: with our technology, we reduce greenhouse gas emissions and contamination to water sources such as rivers and basins. At the same time, as farmers produce their own renewable energy, they can reduce costs and time collecting wood or buying LPG. Our financing model allows farmers to access technology at an affordable rate, which in turn makes our impact inclusive for smallholder farmers around the world.

Sistema.bio is now working in over 53,200 farms in 31 countries around the world, with the potential to bring clean energy and sustainable agricultural practices to 100M farmers on over 15% of the world's farmland. In line with the global Climate agenda, Sistema.bio has committed to Impact over 1.5M people (290K farms) with their technology by 2025, leading to 5M tons of reduced GHG emissions and the creation of over US\$100M in net positive economic benefits in rural economies; and by 2030 its goal is to reduce 1% of annual global GHG emissions."



**"My wife and I run a primary school. In the beginning, kids couldn't believe we could get fire from the waste, and while we installed the digester, they kept asking, "What is this?". We told them, "It is biogas for cooking," and they replied, "Cook? Can dung cook? How?". The day we lit the cookstove for the first time, they were all amazed that fire could come from cow and pig dung, and that we could use it for heat and cook their meals."**

Mr. Ssalongo Washigton, Sistema.bio User in Uganda



**My first digester was constructed and required much work, but my Sistema.bio digester is easier; It does not need much of my time and effort to operate. The flame that comes from it is better and bigger.**

**I'm saving and earning at the same time! I'm creating the commodities I need; otherwise, I could not afford them. Now, I love my biogas the way I love my animals.**

Rose Muwanguzi – Sistema.bio Uganda User

# Other portfolio companies



1<sup>st</sup> Investment: 2022

## Main features

- French company specialized in designing and distributing **decentralized modular methanation units**
- Customers : farmers (small / medium size) & small and local food industries
- **On - site waste recovery** (manure, waste water...) through autonomous and compact methanation units + production of organic fertilizers, replacing chemical fertilizers

## Impact

- Ambition to create **12 jobs** within 2 years
- EnerSilo Solution 40KW : **328,000 kWh injected into the electricity grid, 225t eq CO2 avoided / year**
- EnerKub Solution (pilot unit) : **43,000 m3 of waste water treated / year, ambition to recover & re-use 50% of the total**



## Géographie



# C. CIRCULAR ECONOMY



**Farah Doumit**

Farah doumit, PhD student at the Centre for Management Research (I<sup>3</sup>-CRG\*) at École Polytechnique (IP Paris) and doctoral student at ENGIE LAB CRIGEN shares her latest thoughts from the world of research around the theme of the circular economy.

“Much of the materials, water, or energy that we produce today is either lost, wasted, or discarded from the economic system even though they still have value. A circular economy model questions how that value can be retained or even created from resources – that would, under other circumstances, be lost or wasted – through reduction, reusing, repairing, remanufacturing, recycling and recovering of these resources. Hence, a circular economy is an opportunity to rebrand unwanted waste and losses into valuable resources.



## **#1 Circular economy is a recycled notion**

Let's re-establish the truth around a common misconception: circular economy is not a novel revolutionary idea. As far back as 1966, the economist Kenneth Boulding defined what we can qualify as the embryonic notion of circular economy. In his essay, “The Economics of the Coming Spaceship Earth,” he describes an economy of the past as one with seemingly unlimited resources, reckless and exploitative behaviour of extraction, production, and consumption. He compares it to a closed economy of the future, which he calls: the “spaceman” economy.

In a spaceman economy, “the Earth has become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy.” Also, in 1990 the term circular economy was explicitly coined in an environmental economics book and in the Chinese law promoting circular economy.

## **#2 Circular economy is now a well branded discourse**

The Ellen MacArthur Foundation (EMF) and the consulting firm McKinsey joined forces to strengthen the argument for the solution proposed by the circular economy to the problems created by the linear economy. They staggeringly succeeded in embarking a wide panel of economic actors and policymakers through a well branded and attractive discourse, clear visual representations of circular biological and technical fluxes, canvas, and concrete models.

As such, circular economy was then perceived as a way out of the economic crisis of 2010. Back then, the economic sphere suffered from the soaring prices of raw materials due to the high demand inflicted by the Chinese economic development, the global embargo by China on rare metals, and the global environmental degradation and damages translated by concrete indicators and proofs. Other institutions followed the lead of the EMF and started introducing their own perceptions and definitions for circular economy, such as the French Agency for Ecological Transition (ADEME). To date, there are more than 100 definitions carrying different meanings!

## **#3 Circular economy is an impossible physical utopia**

A circular economy where waste no longer exists, and all resources are indefinitely valued is unrealistic.

In any pragmatic system, it is impossible to have perfectly closed resource loops containing indefinitely recycled or recyclable materials and entirely recovered dissipated energy due to thermodynamics constraints.

In fact, there are limitations in material properties leading to unavoidable wear and tear.

For example, due to material fatigue after use, the recycling of aluminium is limited to a number of cycles, and to ensure it meets quality standards, the addition of approximately 5 % pure virgin aluminium is required<sup>8</sup>. Also, multiple plastic recycling cycles reduce the polymer chains they contain, which degrades quality.

There are also limitations in technologies leading to inevitable dissipation in the environment, possible contamination, and retaining of hazardous substances in the economy when engaging in circular economy activities. Illustrative examples of this issue are sludges from industrial waste waters, that contain nutrients like phosphorus, and incineration bottom ashes containing scrap metals. They can respectively be used as fertilizers and construction aggregates whilst avoiding the extraction of virgin materials such as mineral fertilizers and gravels. However, their level of pollutants is higher than the traditional material they replace. These factors make it hard for companies to replace well-functioning value chains with primary resources with waste as a resource from circular activity.

Concerning energy, it is in constant need across the world. And, while we can capture, transform, and transport it, each of these operations in turn consumes energy with the available technologies we have. Hence, having closed energy loops without additional inputs of energy is consequently unfeasible in the foreseeable future.

## **#4 Circular economy cycles are not always green**

Numerous benefits can be associated with circular economy principles – namely, a reduction in the extraction of primary resources and waste creation. However, for many researchers, there is still significant uncertainty on the concrete positive environmental and social impact of circular economy. Some argue that implementing circular strategies does not by default diminish environmental impact for a simple reason: The Rebound Effect (Jevon's Paradox).

It happens “when circular activities, which have lower per-unit-production impacts, also cause increased levels of production, reducing their benefits.

Different mechanisms can lead to a circular rebound effect. For example, when secondary products (from upcycling, reusing, remanufacturing, or recycling activities) are not adequate substitutes to primary products (products manufactured using virgin materials). A recent study showed that a company selling upcycled marble slabs generated an additional environmental impact equal to 13.2% of the emission savings expected. The secondary product being inadequate for the market, it was not able to draw customers away from the primary product. Another mechanism triggering rebound effect is clients' behaviour such as increased consumption or use. In the United States, researchers showed that smartphone reuse generated a rebound effect that offsets from 30 to 45 % of the expected emissions savings. As such, avoiding these rebound effects requires ecosystemic thinking to keep an eye on the full picture.

Furthermore, concerns are being raised about the social costs of a circular economy. Bad working conditions, power asymmetries, issues of equity and inclusion may be overlooked. Examples of this involve jobs in collecting and sorting recycling content, and repairing activities undertaken by socially marginalized groups. Studies estimated that in 2016 approximately 58% of all plastic recycled globally was collected by the informal sector, often operating in unsafe conditions and without employment benefits. This leads to weak circularity excluding social responsibility and reinforcing unequal power relations.

Therefore, professionals are developing indicators and metrics allowing managing the deployment of circular practices and assessing their actual impact. The objective is to make it less easy to make unfounded statements on the circular economy and bring real issues raised by the transition.

## **#5 Circular economy is a matter of creative collaboration**

The metaphor of the circle is a powerful tool. It helps companies rethink the way they produce and the way we consume. It triggers creative thinking and fosters cooperation between economic actors to create bright solutions. It can be done through new partnerships, management indicators, methods of eco-design, frugal conception of materials and energy use, criteria for performance evaluation and value creation.

Ultimately, the issue raised is how to stimulate cooperation not only within companies and entire industries, but also with governments and policymakers to make it happen. It is time for producers and the state to reclaim the idea of strong circularity based on “a closed, material loop limited in size and space, embedding the principle of fair distribution of resources. It is time to push aside false hopes and promises of the utopian circular economy and provide careful explanations of its limits and cocreating auspicious conditions to implement it successfully.



Pierre-André Galy – President of AXIBIO, explains how the solution developed by AXIBIO meets the challenges of the circular economy in France.

"Axibio's mission is twofold:

Reduce food waste, in particular through the systematic and continuous measurement of what is thrown away ("what cannot be measured does not exist").

Divert the organic and fermentable fraction present in household waste (bio-waste) to channel it towards methanisation and composting for which they are a resource.

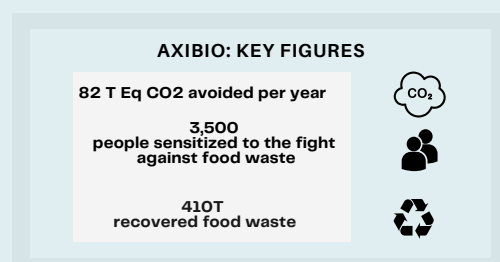
The company is aimed at economic players generating food waste (collective catering in particular) as well as at local authorities who must set up, by the end of 2023, the sorting of bio-waste at source and their separate collection.

Axibio provides these players with equipment and software – which it designs – for the collection and recovery of bio-waste by intervening at each stage of the sector, from the bin to the entry to the recovery site. These include voluntary drop-off terminals equipped, where appropriate, with access controls (Gaïabox), smart containers equipped with an on-board weighing system to measure waste (GaïaPro), depackers, collection accessories and business software.

These elements of the Axibio offer, like the components of a mechanics game, make it possible to structure local and robust, tailor-made channels, facilitating the collection and treatment of this waste as well as the support of the populations concerned.

In Brittany, Axibio has been supporting the Sittommi\* for several years in the development of a local bio-waste management loop covering the north of Morbihan. Axibio supplied ten Gaïaboxes for household collection, GaïaPros to certain high schools for measuring food waste, nearly eighty traceable chipped containers supplied to major producers of bio-waste (commercial catering, hospitals, medico-social establishments, central kitchens ...), a deconditioner in a dedicated center, as well as software for tracking and measuring all containers allowing the syndicate to have an overall view of the waste collected from households and similar (nearly 400 tonnes in 2022) and their recovery on the local methanisation site. This anaerobic digestion unit injects its biomethane into the GrDF network, supplies the city's service station with bioNGV, several companies and high schools as well as the swimming pool with heat and distributes its digestate to farmers in the region. The territory, thanks to the Axibio software, knows in real time the quantity of biomethane and fertilizers that its bio-waste can produce.

Axibio's solutions thus make it possible to meet a regulatory obligation, to associate households and professionals with territorial objectives of energy production and decarbonization."





# Other portfolio companies



1<sup>st</sup> Investment: 2019

## Main features

- Local actor of **circular economy** : collects and converts **used food oils into biofuels & biolubricants**
- Synergies with **local economy** in **biowaste treatment** and **clean mobility solutions**

## Impact

- Social-economy (**ESUS**) & social integration (**Entreprise d'Insertion**) - certified company
- **~2,050** sites collected (region Hauts de France) of which **~500 sites with social impact** (hospitals, high schools, retirement homes)
- **~2,200 tons / year** used food oils & bio waste **collected** from restaurants and industrial customers
- 30 staff, hiring **local people**



## Geography



1<sup>st</sup> investment : 2020

## Main features

- French company **pioneer in the field of distributed cloud and smart buildings**
- Develops **innovative and sustainable solutions** combining an offer of **High Performance Computing (HPC)** towards large customers and computing heaters / boilers that allow to **recover the heat generated by the HPC and to heat freely buildings and social housings**

## Impact

- **15,000 beneficiaries**
- **4,600 households** equipped
- **Environmental performance** of computing heaters & boilers recognized by French authorities
- **Almost 80% reduction** in the CO2 footprint of HPC; **730t CO<sub>2</sub> avoided / year** (2021 figures)
- **Staff x2** since 2019



## Geography



# D. SUSTAINABLE MOBILITY

>4M

Premature deaths from air pollution around the world

THE TRANSPORT SECTOR

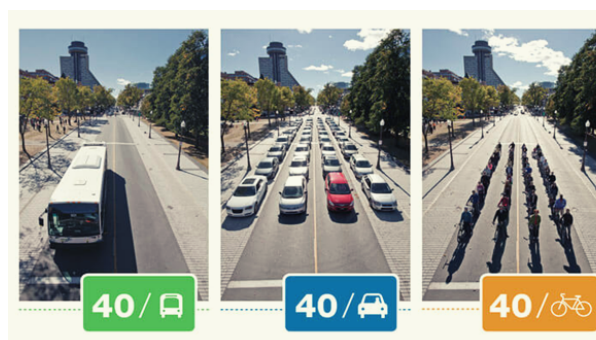
25%

GHG emissions

70 min

Average daily travel time in France

In France, seven million people encounter difficulties in their daily journeys. Young people, the elderly, people in integration and the inhabitants of rural areas are obviously the most affected by mobility problems. In order to provide suitable solutions, many projects related to sustainable mobility are emerging and developing in the territories. Talking about sustainable mobility spontaneously leads to an interest in the environmental impact of travel. Many efforts are being made to reduce greenhouse gas emissions, but at the same time the number of trips is increasing. Consequently, the quantity of polluting gases emitted does not decrease. Mobility and transport, in particular, are essential to achieving sustainable and integrated cities and communities in a dedicated goal, SDG 11, even if many other goals and targets of the 2030 Agenda refer, even indirectly, to the need for more sustainable, accessible, inclusive and efficient urban and territorial transport.



The concept of mobility is not limited to the question of the means of transport themselves, but includes, more generally, the capacity of each individual to move. It therefore differs from the concept of sustainable transport. The United Nations recently adopted a program to promote sustainable mobility and in particular to reduce the consumption of fossil fuels and greenhouse gas emissions linked to transport.

However, mobility is only truly sustainable if it is also part of an economic and social approach. The social dimension is all the more important as mobility is an essential pillar of social and professional integration.



**Sources:**

Collectivités Viables : mobilité durable  
 Avise: mobilité durable, de quoi parle-t-on ?

Laurent Durrieu, founder of Teebike, explains how the solution developed by Teebike responds to 3 major challenges facing society.

"Ecomobility or sustainable mobility aims to respond to 3 major challenges for our society:

- Reduce transport-related CO2 emissions
- Reduce our dependence on fossil fuels
- Develop inclusive mobility to facilitate travel for all.

The entire Teebike Team, with the wheel that electrifies non-electric bikes, is committed to meeting these 3 challenges.

1. By electrifying your bike rather than buying a new one, Teebike supports you in a logic of reasonable, sustainable consumption aimed at reusing and making it last, rather than throwing away to replace. To put it simply, Teebike is the best in cycling recycling: you create something new with the old without deconstructing or throwing away what you already have!

By electrifying your bike, you avoid throwing away 15kg of materials and you save 100kg of CO2 (impact linked to the manufacture of a new bike).

2. The electric bike and the Teebike wheel are the number 1 solution for ecomobility. Thanks to its motor and battery, you can cover an average of 60 kilometers without worrying about your physical condition and the profile of the route.

Your bike changes from the status of a leisure vehicle to that of an everyday vehicle, allowing you to leave the car more often in the garage.

Today, more than 5,000 teebikers travel daily with their hair in the wind with a carbon impact close to 0:

- 20g of CO2 are released for 100km on a Teebike (2 battery charges)
- Versus 10kg of CO2 released for the same trip traveled with a small gasoline-powered family car!

3. Finally, Teebike with several associations (we now have 5 workshops) recovers bicycles from municipalities and various operators in order to recondition these bicycles and train people in integration to the profession of bicycle mechanic.

Several hundred bicycles have thus been refurbished and put into circulation when they were intended for scrapping. Our ambition is to reduce waste around bicycles and make sustainable mobility accessible by offering economical and sustainable solutions.

Teebike now accompanies thousands of individuals, businesses and communities on the road to ecomobility. It is the virtuous solution that allows you to REuse your bike, REDuce your carbon footprint and REcycle your bicycle into an electric-assisted bicycle."



# E. ELECTRIFICATION DECENTRALISÉE



## 770 M

People without access to electricity

## 29%

Of the rural population of sub-Saharan countries has access to electricity

## 300M

Citizens around the world benefit from solar lighting

World energy markets are in full transformation, the centralized systems that have characterized modern development are giving way to dynamic systems using a large panel of fuels with structures of various properties. Since Edison's original vision, which saw the potential of local electricity generation using a series of micro-grids, the last hundred years have been marked by the extension of existing grids. The latter centralize the distribution of energy and thus manage the electricity supply for large population areas.

However, microgrids gradually began to gain popularity, providing an interactive and functional relationship between the core network and its users. Microgrids can connect to the core network and use its services as well as provision network services when it is advantageous to do so. They also offer a more resilient system because they allow users to isolate themselves from the network and can be deployed at different scales: from a single building to an entire municipality.

Although mini-grids can run on any type of energy, from diesel to solar and wind, their implementation has gone hand in hand with the development of renewable energies, providing clean energy and independence. energy.

However, 770 million people still do not have access to electricity, 75% of them in sub-Saharan Africa. Closing this gap will require significant additional investment, particularly in rural and remote areas.

Indeed, only 29% of the rural population has access to electricity in sub-Saharan countries, compared to 78% in urban areas. For this, in addition to the implementation of decentralized collective energy solutions, another type of individual clean energy solutions exists such as solar home systems (SHS).

At present, SHS business models have reached approximately 2-4 million households (equivalent to 10-20 million citizens worldwide). If we add pico-solar products, more than 300 million citizens worldwide have benefited from solar-powered lighting and electrification solutions.

Faced with the significant challenges associated with the development of mini-grids in rural and remote areas, business models based on SHS are proving effective and fast in raising capital in the years to come. Indeed, SHS business models have embarked on the path to financial sustainability and are reducing their dependence on government support and donor grants.



Mansoor Hamayun, CEO of BBOXX talks about the main challenges posed by access to sustainable energy for all.

“Bboxx has spent over a decade delivering clean, renewable and potentially life-changing energy to households and small businesses in Sub-Saharan Africa.

Bboxx has built a fully integrated operating system, Bboxx Pulse®, backed by an extensive network on the ground to deliver goods, services and utilities across Africa. With these capabilities, we have been able to provide more than just access to electricity; we offer households, businesses and communities across Africa a highly convenient and affordable way to access life-changing solutions, through data-powered logistics and innovative financing methods.

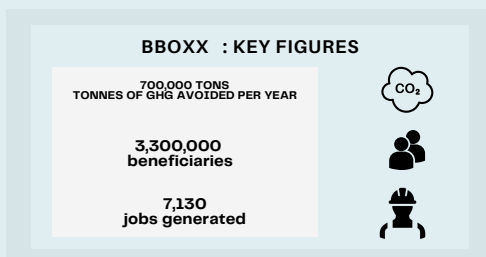
Bboxx supports the economic development of Africa, accelerates the transition to the digital economy and creates new markets. We connect both underserved rural communities and up-and-coming urban communities with services such as clean energy, clean cooking, smartphones, e-mobility, enabling African consumers to unlock their potential.

In 2022, Bboxx cemented its status as a market leader with the acquisition of PEG Africa, one of the largest decentralized energy providers in West Africa, giving Bboxx access to new markets on the Coast d'Ivoire, Ghana, Mali and Senegal.

Along with expanding the market portfolio, Bboxx has also expanded its product range. In Q1, our new entry-level brand, Flexx by Bboxx, was launched to provide affordable, reliable and flexible clean energy solutions to those at the bottom of the energy pyramid. During the second half of 2022, smartphones and e-mobility products were added to the Bboxx Pulse platform, providing customers with an affordable way to acquire these products on a pay-as-you-go basis.

New partnership opportunities have enabled Bboxx to reach even more households. The partnership with Solar Sister is reaching more households in Nigeria and giving more women the opportunity to work in energy access. In Kenya, a partnership with Unilever through its Sunlight brand will combine marketing campaigns and agent engagement with resources and training to promote clean energy solutions, as well as increase agent revenue. In the DRC, alongside the major telecommunications operator Orange, Bboxx launched an innovative mini-network model to connect 150,000 people.

Today, Bboxx positively impacts the lives of over 3.3 million people in 11 markets, directly contributing to 11 of the 17 UN Sustainable Development Goals."



# Other portfolio companies



1<sup>st</sup> investment : 2015

## Main features

- Designs & operates **modular mini heat plants** supplied with **local forest biomass** from the Pyrenees mountains
- Logic of **short circuit** in link with **local economy**
- Production of a **renewable, efficient and decarbonized energy as a service**

## Impact

- **205,000 beneficiaries**
- **Social impact: 4 sites** (hospitals, high schools, retirement homes)
- **1,245 t CO<sub>2</sub> avoided / year**
- 3 employees



## Geography



1<sup>st</sup> Investment : 2016

## Main features

- Water and Solar and **renewable Energy sources** : operator of **Power mini-grids** and **Water distribution Networks** with a « clean » focus
- Moderate risk profile : business model relying on diversified activités o/w **long term contrats** (concession model)

## Impact

- 5 500 Access to Energy kits sold for **34,000 beneficiaries**
- **Almost 3 000 households connected** to Electricity and Water Networks
- 80 full-time **jobs created**
- Decent **working conditions and wages** (far above national average level)



## Geography





1<sup>st</sup> investment: 2017  
Reinvestment : 2018

### Main features

- Designs and markets **sustainable pre paid solar home systems** in **Central America** (Guatemala)
- **Perpetual lease** business model



### Impact

- **38000** beneficiaries (8000 customers)
- **54** employees

### Geography



**AMPED**  
INNOVATION

1<sup>st</sup> Investment: 2019

### Main features

- Designs and manufactures **solar powered appliances**, solar energy generation and management equipment.
- Sells through **local distributors** spread out around the world (Africa, South East Asia)



### Impact

- **762,000** (final) beneficiaries through distributors
- **190,000** customers served

### Geography



# Other portfolio companies



1<sup>st</sup> Investment: 2018

## Main features

- Designs, builds, owns and operates **100% renewable minigrid** offering flexible PAYGO energy service in **India and Nigeria**. Serves both **households and productive use**
- Available **24/7**
- **Grid-compatible**

## Impact

- **154 HMG** deployed (12 Nigeria, 142 India)
- **270,392 beneficiaries**
- 326 direct jobs
- 815 solar pumps sold
- **242 schools connected** (hosting 121,000 pupils)



## Geography



1<sup>st</sup> Investment: 2015  
Re-investments: 2017, 2018, 2019

## Main features

- Last mile **Paygo solar home systems** for marginalized communities that are isolated and difficult to access
- **Rural Community of the future**: program to analyse, rank and offer the best electrical appliances needed

## Impact

Since creation:

- **130 000** users
- **70** direct jobs created
- **14** indigenous cultures served
- **34 000** tons of CO<sub>2</sub> displaced



## Geography





# F. CLEAN COOKING

**2.4MDS**

People without access to clean cooking solutions

**25%**

Share of soot carbon (black carbon) emissions caused by the use of household solid fuels

INDOOR AIR POLLUTION

**4M**

deaths each year in the world



Cooking is a fundamental part of life. This activity, which brings families together, is of cultural and social importance throughout the world. In some developing countries, solid fuels such as wood and charcoal are often used in traditional stoves for cooking. The use of these polluting fuels and technologies degrades the air quality in homes, causing respiratory illnesses, heart problems, and even death.

Women and children are disproportionately affected by household air pollution, due to their level of exposure and because they often spend a significant part of their day collecting fuel – wood for example – needed to prepare a meal. 25% of black carbon emissions come from household solid fuel use, and unsustainable firewood harvesting contributes to forest degradation and climate change.

The share of the world's population with access to clean cooking fuels and technologies increased to 69% in 2020, an increase of 3 percentage points from the previous year.

This corresponds to more than 20% of households, or 12 million people, who cannot afford to heat their homes properly. The situation seems increasingly worrying. The very significant increase in the price of electricity, like that of gas, since the health crisis has counterbalanced, or even reversed, the dynamic which was going towards a reduction in the number of precarious people in France.

However, given population growth, particularly in sub-Saharan Africa, the total number of people without access to clean cooking means has remained relatively stable for decades. It stands at around 2.4 billion worldwide in 2020. It is mainly in the large, heavily populated Asian countries that progress has been made. In contrast, the access deficit has almost doubled in sub-Saharan Africa since 1990, reaching a total of around 923 million people in 2020. A multisectoral and coordinated effort is needed to achieve one of the targets of SDG 7 of the universal access to clean and affordable cooking by 2030. It is essential that the global community learn from the successes and challenges faced by countries that have attempted to design and implement clean household energy.

**"The repercussions of the COVID-19 pandemic have reversed recent progress towards universal access to clean cooking means. Today, Russia's invasion of Ukraine has triggered a global energy crisis, causing major price spikes that have particularly serious consequences for developing economies"**

Fatih Birol, Executive Director of the International Energy Agency





Ben Jeffreys, Managing Director of ATEC, discusses the challenges of clean cooking for populations and the solutions proposed to respond to them.

Around the world, almost 3 billion people, or a third of the world's population, do not have access to clean and modern cooking services. The negative externalities associated with the use of polluting traditional cooking systems cost the global economy an estimated \$2.4 trillion each year due to its negative impact on health, climate and the livelihoods of people and communities. women. At the same time, it generates more carbon emissions than the global airline industry.

But this problem can be solved by technology. ATEC\* exists to solve the question of clean cooking and large-scale climate change through disruptive technology. This breakthrough consists of bringing high-quality, low-cost cooking solutions to market, thanks to our modern digital business model, Paygo and carbon credits. ATEC's Impact Flywheel white paper, published on Next Billion, details how addressing clean cooking and climate change benefits simultaneously is the biggest bottom line opportunity of this decade.

In summary, the ability to generate data-validated carbon credits that can be sold to organizations around the world that aspire to net zero emissions goals is the solution that can solve one of the world's biggest social impact problems. current.

ATEC\* is proud that ENGIE is the first partner to purchase ATEC's carbon credits and validate our impact wheel. The agreement covers Gold Standard carbon credits generated by biogas projects in Cambodia, with the possibility of extending them to new markets, and ATEC's new range of induction cooking. This long-term agreement allows ENGIE to guarantee high-quality offsets while providing ATEC\* with the visibility it needs on carbon revenues to deploy its ambitions in Cambodia and further afield in Asia and Africa.



**ATEC : CHIFFRES CLES**

**30,600T  
GHGS AVOIDED PER YEAR**



**48,400  
beneficiaries**



**67,000 tons  
tons of recycled waste**



# Other portfolio companies



1<sup>st</sup> investissement: 2018

## Main features

- Global product line of smart **clean cooking** technologies
  - **Cookstoves:** household wood and charcoal, professional
  - **Smart LPG** solution (Kenya)
- Active from design to commercialization



## Impact

- To cook faster while reducing fuel use, smoke, and toxic emissions
- Since creation:
  - **3m** people **livelihoods** improved (working weeks and fuel costs saved)
  - **3m** tons of **CO<sub>2</sub>** emissions prevented
  - **220** jobs created

## Geography



1<sup>st</sup> Investment: 2021

## Main features

- French company active in innovative **solar solutions** for the outdoors
- Designs and markets solar solutions through various distribution channels.
- shares **open-source plans** for self-construction, accessible to all.



## Impact

- **310,000** direct beneficiaries at end 2022
- **2 projects per year** in open source
- **1% of revenue** donated to NGOs
- **10 employees**
- **ESUS certified**

## Geography



# G.DIVERSITY – INCLUSION

1/4

of people do not feel  
valued at work



ONLY

1/3

of companies measure  
their inclusion



Diversity and inclusion go hand in hand with better productivity, more innovation and well-being for staff. However, efforts to promote them, especially among minority groups, are insufficient, which means that companies, workers and society are depriving themselves of considerable potential benefits.

According to a new report on diversity and inclusion from the International Labor Organization (ILO), one in four people do not feel valued at work and those who feel included hold higher positions.

The survey conducted for this report indicates that only half of respondents say that diversity and inclusion is sufficiently identified and sufficiently resourced within the culture and strategy put in place where they work. Currently, only a third of companies measure inclusion within their organization, yet it is truly essential to improve it.

Previous diversity and inclusion studies have tended to focus on large companies, often multinational corporations, in Western and high-income countries. The new report, titled "Transforming Business through Diversity and Inclusion", looks at businesses of all sizes in lower-middle-income and upper-middle-income economies and gathers insights from diverse samples of staff, managers and senior executives.

It reflects diversity in age, gender, sexual orientation, different ethnic/religious groups, people with disabilities and those living with illness.

Only 1/4 of respondents believe that women represent a significant proportion (40–60%) of management positions and 1/3 of them indicate that there is no person with a disability at management level. Some minority groups also tend to be relegated to lower-level positions, as these inequalities have been exacerbated by the pandemic. But 2/3 of respondents believe that since the start of the crisis, the level of attention and action on diversity and inclusion in the workplace has increased.

The report outlines 4 principles for achieving fundamental, lasting change applicable to all types of workforces, on a global scale:  
diversity and inclusion must be a priority and an integral part of strategy and culture;  
there must be diversity among senior leaders;  
management and staff have a duty to set an example;  
actions must be taken at all stages of employment.  
"It is this transformational approach to diversity and inclusion that will significantly contribute to successful business outcomes globally," says Déborah France-Massin, Director of the Bureau for Employers' Activities at the ILO.

Aijata Shah is the founder of Frontier Markets, an Indian rural distribution platform, founded in 2011. This entrepreneur is a symbol of diversity and inclusion. Women, and rural women in India, are in the spotlight in his entrepreneurial project. And she deeply believes in inclusion as a tool to improve the performance of her project, to work towards a sustainable world, and above all as an effective way to act in the face of climate change.

Women who work for Frontier Markets use our Meri Saheli app to better understand who the women farmers are, and with this data the company has been able to work with agritech companies and climate tech companies to create solutions. The solutions Ajaita talks about range from launching climate-resistant seeds to introducing organic pesticides and organic farming practices to supporting farmers with the right farming tools. She says that when women realize that there are solutions to make better use of their land, even save it from destruction, they are ready to adopt the solutions in the blink of an eye!

Ajaita describes the journey of one of the women working for Frontier Markets, Anita, a resident of Uttar Pradesh. She is a farmer struggling with growing debts to become a problem solver. Anita, 40, grew up with climatic realities and has seen everything from droughts to floods. As a farmer, she lost almost 50% of her crop yield due to climate damage, and to pay off his debts, her husband had to leave the village and become a migrant worker. Anita heard about Frontier Markets, and after joining the startup and becoming a Sahelian, she began working intensively with a network of local women. She realized that local women were all facing the same kind of climate change-induced farming challenges and started collecting data to take to Frontier Markets.



“The rural women we work with are mothers, farmers, community leaders, entrepreneurs and problem solvers in their own way. These women had to deal with drought conditions, destruction of land, etc. Their understanding of the climate is huge, which is why they are also the most eager to change it,” says Ajaita.

On the importance of corporate partners joining this revolution, says Ajaita, FMCG giants like P&G, Marico, Unilever and others that have been around forever, embrace a gender perspective, understand the power of commerce rural and understand that technology needs to be innovative. On the next steps, in partnership with the Government of India, Frontier Markets aims to scale up its efforts to reach one million women and 100 million rural households by 2025. It wants to become a one-stop solution to help families access all solutions related to the SDGs, and showcases digitally-savvy women as the driving force for impact – from climate to healthcare to education to economic prosperity.



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