



# Impact report 2020





# Table of Contents

**04** Mission, vision, values and story

**14** Global snapshot  
Letter and Q&A from CEO

**24** Business overview

**40** Review of 2020  
Spotlight on key projects  
Story of 2020  
COVID-19 impact  
Environmental impact  
Community impacts  
a) Education  
b) Entrepreneurship  
c) Female empowerment  
d) Safety

A landscape photograph capturing a sunset over a savanna. The sun is low on the horizon, casting a warm, golden glow across the sky and the landscape. The sky is filled with scattered, dark clouds that catch the light of the setting sun. In the foreground, a dirt road winds through a field of green and brown trees and shrubs. The overall scene is peaceful and evokes a sense of a long journey or a path leading towards a bright future.

Mission,  
vision,  
values  
and story



# Introduction

## Bboxx exists to solve a major global problem: energy poverty

The numbers in 2021 are still staggering.

Currently, 770 million people live without access to energy, of which 590 million are in Africa. An additional 840 million people are connected to an unreliable grid.

A lack of access to clean cooking solutions also means over four billion people cook with polluting, dangerous fuels, resulting sadly in the premature deaths of four million people annually caused by household air pollution (2021, IEA).

Inaction on the clean cooking crisis is not just having a profound human impact; it costs the world over \$2.4 trillion each year (2021, World Bank). The use of charcoal and wood causes significant emissions of greenhouse gases and black soot, and the reliance on these fuels is a major contributor to deforestation. 60-80% of black carbon emissions in African and Asian countries are coming from household cooking (2013, Bond et al.)

At Bboxx, we believe energy access is a basic human right. Clean, reliable, and affordable energy unlocks an otherwise impossible future. Our ambition to end energy poverty goes beyond powering homes and communities with just light. Bboxx aims to transform lives with the on-grid experience, cleaner cooking fuels, and access to a marketplace of goods and services, meeting the needs of these forgotten populations.

We recognise the importance of our work towards the UN Sustainable Development Goals and through our electricity and clean cooking solutions commit particularly to the success of goal 7: affordable and clean energy for all.



## Our mission

To transform lives and unlock potential through access to energy.

## Our vision

To become a next generation utility platform that every under-served person will use to get connected to a utility.

The global pandemic has grown our passion and dedication to address the global problem of solving energy poverty.



## Our Company Values

# Ambition, trust and openness are the pillars of our company.

## We are ambitious

As a company and as individuals, we constantly strive to develop and grow. We thrive because we are brave in our actions, sure in our responsibilities, quick to act, and relentlessly focused on delivery.

## We are trusted.

We continuously learn from and understand our customers. Growing together, we are a responsive partner that meets their needs and enables them to unlock and fulfil their potential.

## We are open.

We are a global team; our shared purpose defines us. We learn from each other's strengths and experiences and thrive in our cultural diversity.

# Our Story



Over 13 years ago, we met at Imperial College London where we were studying Electronic and Electrical Engineering.

Through our experiences travelling, we understood first-hand the challenges that communities and businesses face without access to energy supplies.

In response, while studying, we created a charity called e.quinox.

After finishing university, we saw the potential where technology and business, when used in combination, could allow for unprecedented access to energy.

So together, we developed a clean, affordable and reliable solution to transform the lives of people living off-grid or with unreliable grid.

As a result, we co-founded Bboxx in 2010.



**Mansoor Hamayun**  
CEO and Co-founder



**Laurent Van Houcke**  
MD Capital Division  
and Co-founder



**Christopher Baker Brian**  
MD Product Division  
and Co-founder

# Global Snapshot



# Message from the CEO

As a next generation utility, we provide affordable, reliable, clean electricity, cooking solutions and other utility services to many communities who are living without; transforming lives and unlocking the potential of communities, cities, and countries.

The technology and business model we have created and developed are there to improve the lives of our customers. Everything we do, we do it with the meaningful purpose in mind; to solve energy poverty.

The global pandemic posed a huge threat to the off-grid energy sector and the millions of customers it serves. UN Sustainable Development Goal 7 – energy for all – unlocks the potential of people, businesses, communities and whole countries at scale. Access to energy is the trigger for economic growth as it powers sustainable development by providing opportunities otherwise not possible. We remain committed to our mission to transform lives and unlock potential through energy access.

Yet governments were faced with an almost impossible task: the competing duality of putting health of citizens first while also ensuring economies do not collapse, which itself would lead to irretrievable damage to health, education and livelihood opportunities for all.

During 2020, Bboxx continued to serve our communities, owing to our resilient business model and our brave staff. We served 497,629 active customers with clean, reliable, and affordable electricity.

At this pivotal juncture for the sector, a global coordinated approach was needed to tackle this head on, ensuring continuity of energy provision.

We recognised the role we can play, and we stood ready to work with, and collaborate further across, the off-grid energy industry alongside governments, Development Finance Institutions (DFIs), investors, and the donor community to overcome these mounting challenges.

Going forward we need to position Bboxx as a platform that every underserved person will use to get connected to a utility. In the next ten years we will impact the lives of 90 million people. The expansion into new markets to support these numbers is going to be a critical part of our strategy. We will provide financial inclusion through Bboxx Pulse®, which will provide a marketplace of new goods and services.

We look forward to the year ahead and to building on our progress. We remain committed to our mission to transform lives and unlock potential through energy access.

**Mansoor Hamayun**  
CEO and Co-Founder





## Q&A with Mansoor Hamayun



### How is Bboxx tackling the challenges of the COVID-19 pandemic?



Throughout the ongoing global pandemic, we have found that demand for our services has been robust, as energy truly is an essential need.

We have been innovating to ensure that we can keep the lights on for our customers even in tough times. Our focus was also on the safety of our employees, who we trained and supported on the WHO guidelines.

We introduced the 'crisis energy' scheme in Togo, the DRC, Kenya and Rwanda, providing bonus days of energy for free for customers who pay upfront.

In the DRC we have been providing vital electricity for lighting in hospitals as well as donating hand washing stations for local government.



### What would you say is the highlight of 2020 for Bboxx?



The first half of the year was spent assessing the situation, making sure our customers and employees were safe, and making sure our skills were available for our communities.

Being awarded the title of "essential service" in many of the markets we operate in cemented the importance of our business.

In the second half of the year, we regained our business rhythm in the “new normal” and were delighted to reach the milestone of receiving more than one million individual payments per month.

We started to focus on ways to rebound, bigger and better. We started new services that are critical to customers such as clean cooking and introduced the bPower20 to provide better service to our entry level customers. We also began to prepare for our expansion into Nigeria and Burkina Faso, both of which launched in early Q1 2021. Despite the pandemic, our revenue in 2020 increased by 12.4% which is a testament to our teams and the resilience of the business we have built.



## Why enter a totally new segment, clean cooking?



In Sub-Saharan Africa, more than 900 million people rely on polluting fuels to cook. LPG is a transition fuel with huge potential to provide a clean cooking solution, and Bboxx has the ability to do this on a PAYG (Pay-As-You-Go) model to make it affordable to the mass population. The impact of this new product range will not only have an impact on Sustainable Development Goal 7 (affordable and clean energy access for all), it will also support good health and wellbeing and gender equality. Women are particularly harmed by the use of charcoal and similar fuels, and therefore these alternative cooking solutions can make a dramatic impact.



## Despite the pandemic, we reached impressive milestones in 2020...

First 100 Pumps

Installed with SunCulture in Togo. 5,000 more to install next year!

\$3M

Funding secured for DRC in partnership with USAID for PAYG LPG.

Trafigura

Closed our Series D round and become an exciting partner for LPG expansion.

bPower20

Launched, with 1200 units produced and 24000 in the pipeline for Q1.

Nigeria

Opened in partnership with BEAM. Full launch in 2021

EDF Kenya

Investment deal signed, with closing expected early January.

\$55M

Funding raised this year, despite difficult conditions.

>\$55M

In mobile money payments received since pulse was established

\$250M

Receivables under management by Pulse

## ...and our customers continued to place their trust in us.

124,599

new households with access to electricity and moving out of energy poverty.

16,145

Customers upgraded, moving up the energy ladder.

\$23M

In customer repayments received across the NGUs this year alone.

First LPG clients

In Kenya and DRC, offering clean cooking to more markets.

1 Million

Payments/month received by Pulse® for the first time in October.

# Business Strategy Overview



# Bboxx contributes directly to 11 UN Sustainable Development Goals (out of 17)



## Global impact over the past 11 years

2020 marked our 10th birthday and we celebrated having impacted nearly 1.5 million lives around the world.

We have worked with governments and corporates alike to provide energy access to underserved communities - whether rural or urban. This is driven by the firm belief that electricity is the foundation for modern life and the trigger for economic growth in our ever-growing communities.

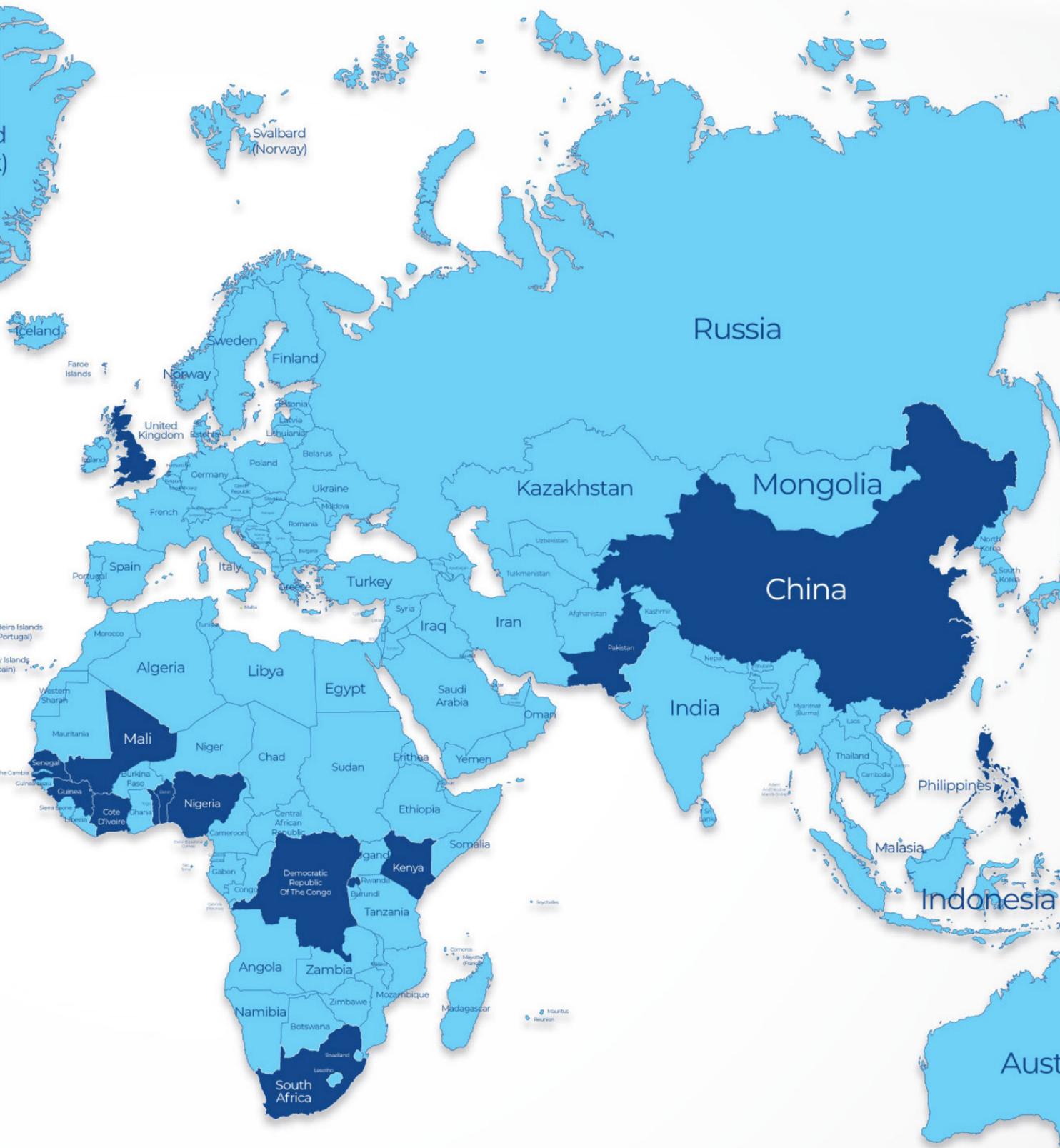
For our customers, access to energy acts as a springboard for many other activities. Electricity brings people into the digital economy and fosters financial inclusion.

Bboxx has enabled 110,434 people who undertook more economic activities as a result of using our energy products and services.

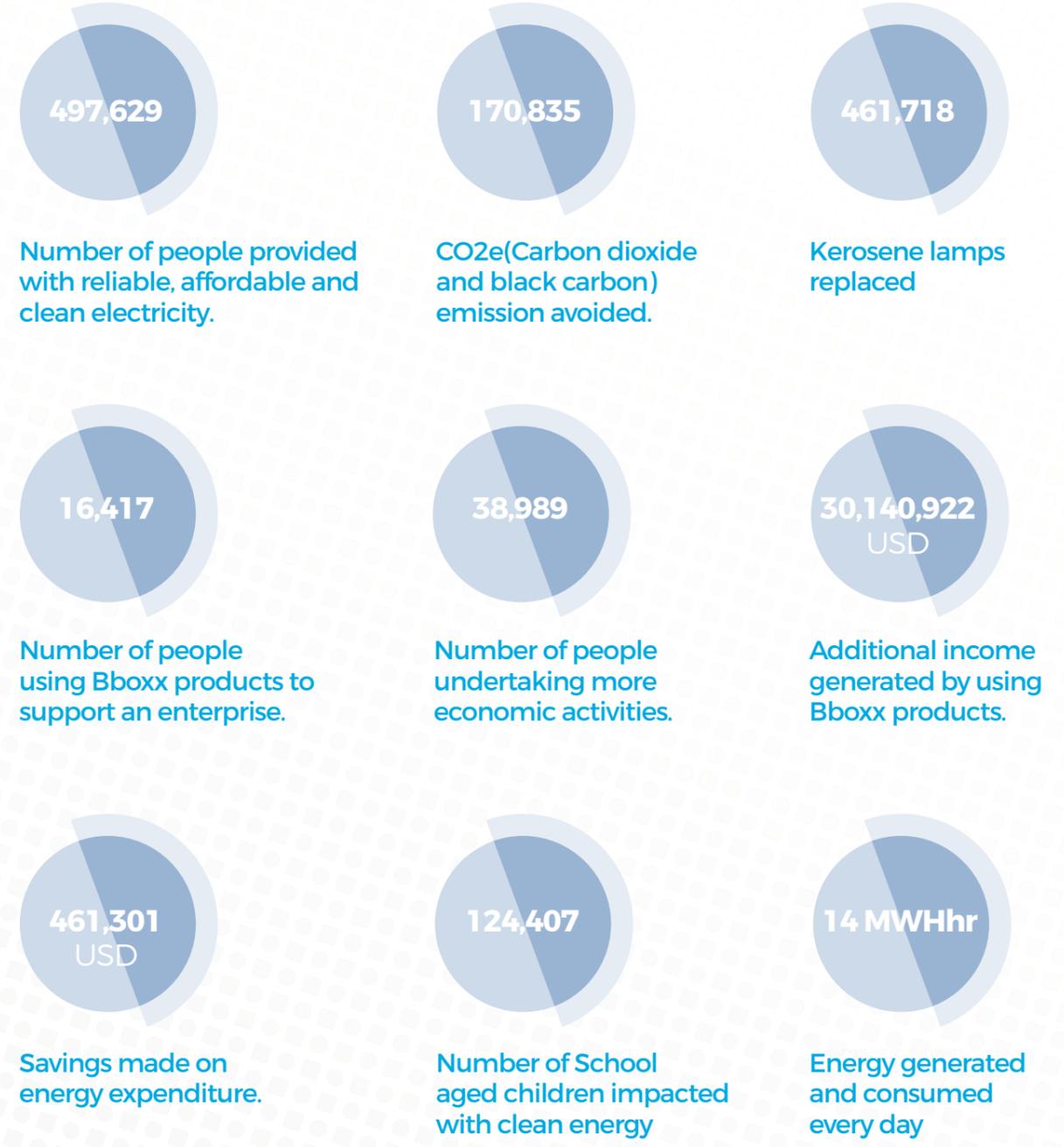
Through our solar home systems and appliances, we have generated entrepreneurship within hard to reach communities who have otherwise been overlooked.

In fact, **\$30M** income has been generated by our customers as a result of Bboxx's products.

# Our global footprint



# Bboxx impact 2020





# Business Overview

## Our business model

Bboxx Ltd and its subsidiaries are the core of the group with commercial entities in each country. This structure enables us to expand our business efficiently. Commercial entities are called Next Generation Utilities (NGUs) and are categorised into two groups: those with Bboxx equity, and third parties.

The business model for Bboxx NGUs and third party NGUs are almost the same. Bboxx Ltd supports NGU operations by providing hardware and software on a commercial basis. The difference is in the NGUs' structures.

Bboxx NGUs are established by Bboxx Ltd and equity is provided through its wholly owned subsidiary Bboxx Capital. In addition, Bboxx Ltd supports the NGU with core human resources, developing local distribution channels, and a wide range of administrative services including legal, financial, and accounting. Bboxx NGUs' strategies are closely aligned with the group. Bboxx also expands through third party NGUs.

An entity is normally partnered with due to its established market presence and strong local networks, and the business can be deployed in a short time at high speed.

We also call Bboxx Ltd and its subsidiaries as B2B, and NGUs as B2C. Though they are in the relationship of seller and buyer, one cannot grow without the other.

# Business areas



# Corporate division

## Supporting the group

Bboxx Ltd has sub-divided its organisation into three departments: Corporate division (Corporate planning, Marketing, Partnerships, Legal, Finance and Human Resources), Product division (Hardware and Software) and Capital division (NGU Management). While we are in a rapid expansion phase, large amounts of investment are required at both B2B and B2C levels, and the Group must sustain a deficit.

# Product division

## Hardware and Software sales as a business model:

The mission of the Product division is to design, develop, deliver and support Bboxx's product range to NGU customers.

The Product division must analyse and respond to the needs of our NGUs (and their end customers) by adapting its hardware, software and service offering.

It will also have to optimise the supply of hardware (including appliances) to those markets to stay relevant in an increasingly competitive alternative energy sector.

# Capital division

## B2C sales and development of NGUs as a business model:

Bboxx is making a strategic balance between being a product/service provider and project developer. A major source of revenue is the sale of products and services (i.e., solar home systems) and related business.

Another source of revenue is the sale of such business. In other words, Bboxx creates NGUs and sells part of its stake. This build-operate-transfer model does not only create revenue upfront but helps utilise our cash more efficiently.

## Principal activities

The principal activity of Bboxx Limited (the Company) and its group of subsidiaries (together the Group) is the manufacture, provision, installation, and maintenance of solar home systems and cooking solutions through a Pay-As-You-Go model to customers in developing countries.

As a next generation utility, we provide affordable, reliable, and clean electricity and other utility services to millions who are living without, transforming lives and unlocking the potential of communities, cities, and countries.

We are a vertically integrated business, and our business model is based on our physical (distribution network) and digital (Bboxx Pulse®) highways, our bold technology (hardware and software), and our partnerships.

Bboxx is scaling through forging strategic partnerships and its innovative technology Bboxx Pulse®, a comprehensive management platform using Internet of Things (IoT) technology.

The operations of the Group are via subsidiaries in Democratic Republic of Congo, Kenya, Rwanda, and Togo in addition to selected partners across the African and Asian continents. During 2020, we focused on setting-up Nigeria and Burkina Faso as our next subsidiaries.



# Market overview

## Sector insights

The off-grid solar sector has grown tremendously over the past 10 years into a vibrant, US\$ 1.75 billion annual market, which remains on a solid growth curve.

The sector is currently serving 420 million users. From 2017 to 2019, revenues grew rapidly at 30 percent annually, while sales volumes grew at 10 percent annually. In 2020 the sales declined due to COVID-19.

A shift towards higher-priced Pay-As-You-Go (PAYG)-enabled products that provide higher levels of energy service has driven this rapid growth in sector turnover.

As the sector matures, companies are increasingly focused on financial sustainability.

Companies are moving into new geographies and under-served markets as established markets become more saturated.

In addition, new business models are solidifying; companies are using consumer PAYG data to offer financing for non-energy products and services.

## Impact on Bboxx

**Bboxx is well positioned to tackle the change of focus in the PAYG sector as this has been our core business model now for many years. The bPower50 is a 50W solar system which is bigger than the average.**

**Bboxx has shown resilience during the pandemic which is a testament to the strength of our business and teams.**

**Bboxx is looking to grow by moving into new countries, by selecting markets with the highest potential.**

**Bboxx is leading the next-generation off-grid utility model to increase the value per customer and by going into adjacent models. Launching in 2021, Bboxx Pulse® will provide a marketplace for financial inclusion and access to goods.**

## Sector insights

The off-grid solar sector remains on a strong growth trajectory; the sector is projected to serve 823 million users with off-grid solar products by 2030.

To sustain the current market growth trajectory, the sector will require an investment of US\$ 1.7-2.2 billion in the next five years.

Increased specialisation across the value chain will drive efficiencies. Previously vertically integrated firms continue to shed value chain operations to increase focus on their core business by partnering more effectively with other players in the value chain. Meanwhile, new companies entering the sector specialise on individual components of the value chain. This will allow companies to achieve profitability more quickly.

Chinese manufacturers are engaging directly with end markets.

Chinese manufacturers are engaging directly with end markets. Chinese manufacturers have increased the appeal of their own-brand products through local distribution partners and in the future through their own distribution networks, including PAYC. This will increase competition at the product level and increase the amount of high quality but lower cost products on the market.

## Impact on Bboxx

**The core business of Bboxx in the off-grid solar sector still has great potential for growth by electrifying millions of customers.**

**There will be more companies challenging on key parts of the business model of Bboxx.**

**Bboxx will have to be careful in identifying the areas where it can add the most value.**

**Bboxx will introduce an entry-level brand in 2021, to make sure we still have a cost competitive offering.**



# Review of 2020



# Key Projects 2020

During 2020, we have seen unprecedented levels of disruption, hardship, and uncertainty due to the COVID-19 pandemic. At Bboxx, we were determined to emerge from the crisis as a stronger company. Our global teams have worked tirelessly through the COVID-19 pandemic to ensure our customers continue to have energy access.

We remained driven by our purpose to transform lives and unlock potential through access to energy. It is our continued motivation to fulfil this purpose that has enabled us to respond, adapt and find ways to build for the future - even in these challenging times. Here are some key projects of 2020.

## Strengthen

- Bboxx Ltd signed a memorandum of understanding with the Government of the Democratic Republic of Congo (DRC). The partnership aims to bring affordable, reliable and clean electricity to 10 million citizens – the equivalent to 10% of the population – in the DRC by 2024.
- We celebrated our 10th anniversary and launched our new global visual identity. Ten years on, the business has achieved scale driven by its innovative IoT technology and forging partnerships with multi-national firms, investors, and governments across the globe.
- We partnered with CANAL+ to expand access to TV and media content. Through this partnership, Bboxx and CANAL+ have a common ambition to provide underserved African households with both access to electricity and to quality TV content thanks to the bundled offer. This is the first time CANAL+ is adapting its business model to the pay-as-you-go (PAYG) model used by Bboxx's solar home systems integrating their services with Bboxx's IoT technology. As a result, the service is more affordable and accessible to underserved communities.
- We teamed up with EDF to increase access to solar-powered water pumps. With the launch of this new business line, Bboxx and EDF are stepping up the pace of their cooperation launched in 2018 with the creation of a joint venture, Bboxx EDF Togo. Together we are committed to making sustainable irrigation more accessible for underserved communities in Togo, increasing agricultural productivity, generating additional income, and improving economic opportunities.

## Products Expansion:

- We launched our flagship product, the bPower20, created to power rural households and micro-businesses. Bboxx's research identified a gap in the market to better serve the significant proportion of the population in the developing world with lower energy requirements, but who still demand a superior customer experience and the provision of reliable, high quality electricity.

- We partnered with USAID to expand clean cooking access in the DRC. Through this new partnership, we ultimately aim to reduce deforestation and greenhouse gas emissions by decreasing the consumption of charcoal used for cooking.
- We partnered with Trafigura, one of the world's leading independent commodity trading companies, to accelerate progress on clean cooking access and thereby meet SDG 7 – clean energy for all – in Africa.

## Markets Expansion:

- Nigeria: During 2020, we focused on setting up Nigeria as our next subsidiary.
- Burkina Faso: we started working on a partnership with Geocoton Advens Group as part of Bboxx's market entry into Burkina Faso.



# Story of 2020

## Impact theme: COVID-19

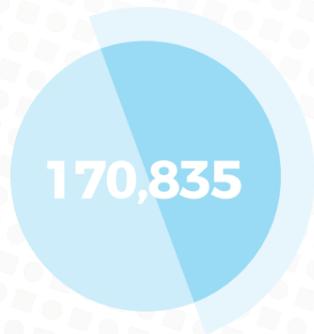
Challenges	Solutions
<p>Governments across the developing world have taken a wide range of approaches in responding to the COVID-19 crisis, from full lockdowns to partial curfews to just encouraging good hygiene. Conventional wisdom is that developing countries are even less able to cope with lockdowns than richer countries: many people live hand to mouth, and few can work from home in economies where most work is still subsistence agriculture and manual labour.</p> <p>Moreover, even as lockdowns lift, the economic pain is not yet over. Tourists will not return for a long time, depriving countries like Kenya, Rwanda, and Tanzania of a top source of jobs and foreign exchange. In addition, the slowdown in manufacturing activity has led to a collapse in commodity prices on which many African countries rely, starving resource exporters like the DRC, Angola, and Nigeria of revenues.</p>	<p><b>At Bboxx, we've been monitoring trends closely as the crisis has unfolded in our 12 markets. We collect over one million payments per month from more than 497,629 (PAYG) solar customers buying daily electricity bundles and have been using this repayment data to assess the impact of the crisis and plan mitigation strategies.</b></p> <p><b>To help those most impacted, we reduced the minimum payment size for expired customers. We have also put in place bonuses that allow our customers to earn more days of electricity for the same price—effectively, a discount on their daily rate. Togo and the DRC were particularly quick to act, launching bonuses in April that give 14 free days for customers who buy 30 days, and 30 free days to customers who buy 60 days. Rwanda launched their own “buy 1 get 1” bonus, and Kenya launched soon after.</b></p>

# Impact theme: Environmental

Through our work, we are directly contributing to Sustainable Development Goal 13 – helping to take urgent action to combat climate change and its negative impacts. Our newly launched flagship product, the bPower20, was designed with eco-friendly packaging made from recycled paper, which itself is widely recyclable.

When our customers switch from kerosene and other fuels to clean energy, it is safer, healthier, more reliable and better for the environment. Our own research in Rwanda has shown that after using a Bboxx SHS for three to four months, the percentage of households using kerosene lamps dropped from nearly 25% to just 1%. As rising greenhouse gas emissions are driving climate change, we are passionate about being a key force to tackle this head on.

As part of this, we are proud to have offset 170,835 metric tonnes of CO2e (carbon dioxide and black carbon) emissions as a result of our SHSs. 461,718 kerosene lamps – which are highly polluting for the environment and for customers' health – have been replaced. Every day, over 14 MWhrs of solar energy are generated and consumed from our SHSs.



Metric tonnes of CO2e (Carbon dioxide and black carbon) emission avoided



Energy generated and consumed every day



Kerosene lamps replaced

# Impact theme: Community

## 1. Education

Our mission is to transform lives via access to energy – and education is continually recognised as a means to unlock a future that is otherwise not possible. In this way, we contribute to Sustainable Development Goal 4: ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. Through access to energy, our customers have found that their children have had more hours of light to support their schoolwork, homework and studying. Over 124,407 school-aged children have been positively impacted in this way by our solar home systems in 2020.

In addition, at the Kivu International School in Goma, Democratic Republic of Congo, we have collaborated with General Electric (GE) to power the school of 300 children via a mini-grid. This is significant as UN data has shown that Sub-Saharan Africa faces the biggest challenges in ensuring quality education as a direct result of lacking electricity at school and at home.

We are also applying this same vigour to educational opportunities for our employees. Within our business, we are ensuring quality training for our employees across all our operating countries, which for many is the first time they have had formal employment. Underpinning this is the work we do at the Bboxx Academy in Kigali, Rwanda. Our Academy exists to develop skills and competencies needed for our employees to deliver their work to the best of their ability.

Through the Bboxx and CANAL+ partnership, we have provided access to electricity and quality TV and news content which was crucial for education during the pandemic.

“You cannot do anything at night because of the darkness. You cannot study or develop your business. I used a candle to study and when I didn't have money to buy one, I couldn't study and failed my tests at school. My school performance was very poor. However, when we got Bboxx my grades improved a lot.” - Jean de la Croix Muhire, from Ntarama sector, Bugesera district in Rwanda.



Number of School aged children impacted with clean energy



# Key Projects 2020 (suite):

## 2. Entrepreneurship

Together, we are unlocking potential and unleashing economic development worldwide. In doing so, we are helping to meet Sustainable Development Goal 8 – promoting decent work and economic growth. For our customers, access to energy acts as a springboard for many other activities.

Electricity brings people into the digital economy and fosters financial inclusion. In 2020, Bboxx has enabled 16,417 people to support an enterprise as a result of using our energy products and services. Through our solar home systems and appliances, 38,989 people have undertaken economic activities within hard-to-reach communities. In fact, \$30,140,922 of additional income has been generated as a result of Bboxx products during 2020.

“Since becoming a Bboxx customer, everything is easier. I don’t have to worry anymore or wait for electricity. It has been a game changer for my business and my kitchen is always ready to be used. The customers can arrive and eat a warm dish at any time.” - Gisele Nabintu Muyoboke, a Bboxx customer in the DRC.



Number of people using Bboxx products to support an enterprise.



Number of people undertaking more economic activities.

## 3. Female Empowerment

In Sub Saharan Africa, women increasingly are choosing PAYG solutions for electricity and cooking as they provide affordable and safe alternatives to traditional fuels. These solutions also provide healthier and greener options, many of which are more developed and “leapfrogging” the systems used in the developed world. A PAYG solar home system can be bought for less than many households spend on candles, batteries, and kerosene. The electricity provided by the SHS can give women more productive hours in the day by providing light and energy when they need it.

Additionally, clean cooking solutions like LPG save hours every day. They heat faster than traditional fuels such as charcoal and do not emit the dangerous fumes that, in an unventilated room, can be equivalent to smoking one hundred cigarettes a day. By moving away from traditional cooking fuels, women are improving the health of their families, saving money, and helping to save the environment by limiting the demand for charcoal and reducing deforestation.

At Bboxx, our customer research during 2020 has shown the importance of these solutions on women’s lives. Our female customers have been keeping up with their payments more than their male counterparts. Our previous research has shown that women are more likely than men to prioritise energy expenditure as part of household resource allocation.

We believe energy access is a basic human right and have seen first-hand the transformative effects of our solar home systems on the lives and well-being of over one million people with no or unreliable energy access. Closing the energy gap enhances education, health and productivity, while advancing female empowerment and gender equality.

## 4. Health & Safety

Kerosene causes serious health and safety issues, from respiratory and eye problems to burns and major accidents. Bboxx products replace the need for kerosene and thereby remove the risks associated with its use. Firewood fuel is also harmful. Every year, more than four million people die due to respiratory problems from burning fossil fuels, which is more than the deaths caused by malaria, AIDS, and cholera combined. Bboxx Cook, our clean cooking product line, helps to decrease this number.

Bboxx Cook also allows customers to save hours of searching for firewood to cook each meal and enables its customers to cook safely at any time outside the house at night.



Kerosene lamps replaced

# Appendix

The impact figures in this report are calculated using 'Standardized Impact Metrics for the Off-Grid Solar Energy Sector' by GOGLA for the PAYG category. It is important to note that, while these metrics have been created using the best available data, results created by using the metrics should always be referred to as estimates.

Carbon dioxide and black carbon emission avoided:  
 $S*(1-DF)*R*C*PL$

Savings on energy expenditure:  
 $S*(1-DF)*((EF-EB)*PL) - TCO$

People undertaking more economic activities (PAYG)  
 $(SL)*(1-Df)*EA$

# Abbreviations

- S** number of units sold (cumulative i.e. ever)
- SL** number of units sold within lifespan of products (1.5 x warranty period)
- PL** Estimated solar product lifespan (1.5 x warranty)
- DF** Discount for loss factor: products for which full usage is not received (PAYG only)
- DR** Discount for repeat sales: to avoid double counting of customers, but does not try to estimate proportion of customers who owned solar more generally before
- TCO** average total cost of ownership of solar product (cost to customer), in US\$ (PAYG only)
- H** Household size
- AI** Average additional income generated, per household (annual)
- R** Replacement ratio of kerosene lanterns per solar product
- E** Percentage of customers using products to support enterprise (including those that have opened a new business)
- EA** Percentage of customers undertaking more economic activity (including a household member doing one of more of: spending more time working, using their system to support enterprise or getting a new job)
- EF** Average annual expenditure on energy post-purchase (lighting and phone charging), per household
- EB** Average annual expenditure on energy baseline (lighting and phone charging), per household
- G** Average annual carbon dioxide and black carbon (CO<sub>2</sub>e) emissions per kerosene lantern, in metric tonnes
- IG** Percentage of customers creating additional income

**Please refer to the appendix for the Impact Metrics used for calculations.**

Add glossary with terms definition + Add Methodology

